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DILUTION JETS IN ACCELERATED CROSS FLOWS

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NOMENCLATURE

A	area
A_1	entrainment coefficient
A_2	entrainment coefficient
b	nominal jet radius
C_D	aerodynamic drag coefficient
C_p	specific heat at constant pressure
D	non-accelerating drag contribution
D_0	mean combustor diameter prior to bend
D_1	mean combustor diameter at exit
$Dr=\rho_{jo}/\rho_s$	density ratio
$Fr=\dfrac{\rho_{jo}V_o^2}{(\rho_{jo}-\rho_s)gb_o}$	Froude number
g	gravitational acceleration
G	buoyancy force
h	enthalpy
H_o	channel height at entrance
H_1	channel height at exit
$J=\dfrac{\rho_{jo}V_o^2}{\rho_s U_o^2}$	momentum ratio
L	channel length
$M_j^2=\dfrac{V_o^2}{\gamma RT_{jo}}$	jet Mach number squared

$M_s^2 = \frac{U_o^2}{\gamma R T_s}$	cross flow Mach number squared
n	coordinate perpendicular to s
P	static pressure
q	volumetric flux
Q	volumetric entrainment
r	radius vector in the bend originates at its center
R	air gas-constant
R_i	radius of inner wall of bend
R_o	radius of outer wall of bend
s	longitudinal jet coordinate
S	spacing between jets
$Sr = S/(2b_o)$	spacing ratio
T	absolute temperature
U	cross flow velocity
v	local jet velocity
V	average jet velocity
W	weight factor
x	x axis
y	y axis
z	z axis

Greek

α	angle between cross flow direction and the x axis
β	angle between the direction of g and the x axis
γ	specific heats ratio
θ	angle between jet center-line and the x axis
ρ	density
$\tau = \frac{T_{j\ local} - T_s}{T_{j0} - T_s}$	non-dimensional local temperature

Subscripts

a	ambient
j	jet
s	cross flow
o	initial,or,location of jet injection port

Superscripts

-	non-dimentional

CHAPTER I

INTRODUCTION

The structural behavior and interaction of turbulent jets with their surroundings has been an important field of theoretical and experimental study for many years.

Jet interactions may be found in many areas of engineering importance. Atmospheric and Marine ecological problems, propulsion and combustion are just examples of problems which require the understanding of turbulent jet behavior.

A reasonable amount of information is available on the mixing problem of single jet in quiescent surroundings (for example see Ref. 1,2,26) and non-accelerating cross flows (Ref. 1,11,19). There is also information about free slot jets and slot jets in coflowing streams (Ref. 2,35), but only some in cross streams (Ref. 27,29).

Most of the works feature studies of jets either with weak body forces and large momenta, or jets with very low momenta dominated mainly by body forces. There are fewer investigations which embody both large inertia and body forces and there are apparently none who deal with pressure gradient effects associated with acceleration of the fluid surrounding the jet, in conjunction with inertia and gravitational forces.

This work was motivated by the lack of information concerning

the cooling jet mixing problem typical of compact reverse flow combustors for jet engines. In such combustors [Fig. 1] the combustion gases accelerate longitudinally as well as transversely as the flow turns through the angle of 180 degrees before impinging upon the turbine blades.

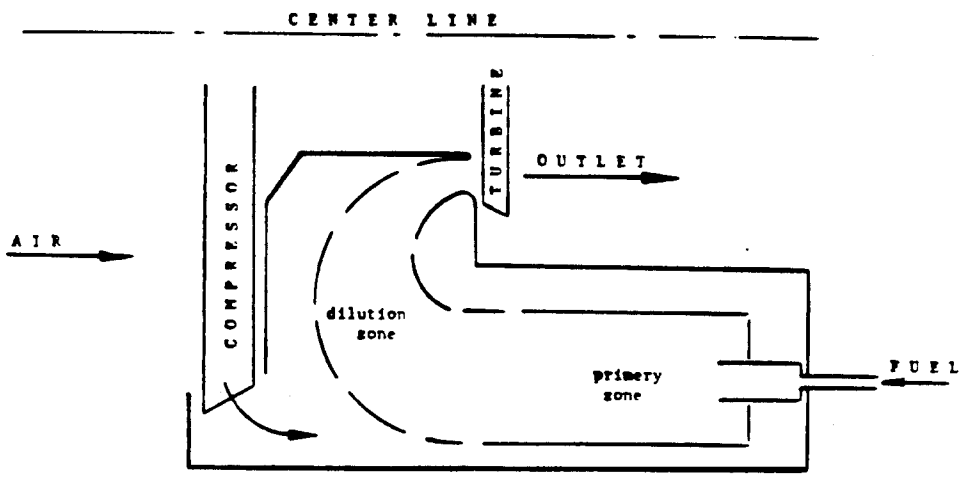

Figure 1. A typical reverse-flow combustor

The blades, pushed to their endurance limit due to a demand for efficient engines, are designed for a specific environment, part of which is a tailored temperature profile at the combustor exit. A typical profile is shown in Figure 2. It has a high value at the blade tip location, gradually decreasing towards the root. This distribution is wanted due to the centrifugal loads which become higher closer to the blade hub.

To achieve such a profile, it is common practice to use cooling jets which mix with combustion gases and create a temperature profile which depends on the location of the jet ports, the jet fluxes, and other parameters.

The purpose of this study is the investigation of some of the fundamental mixing characteristics of these flows and the identification of the governing parameters of such flow configurations.

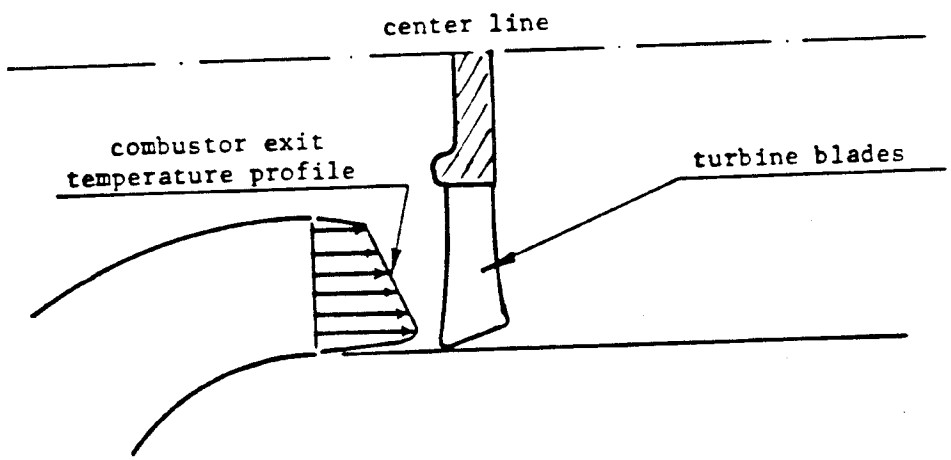

Figure 2. Desired temperature profile at the combustor exit

CHAPTER II

PREVIOUS STUDIES

II-A. The Free Single Jet

A free jet (sometimes called momentum jet) is the flow pattern generated by a continuous source of momentum as shown in Fig. 3 .

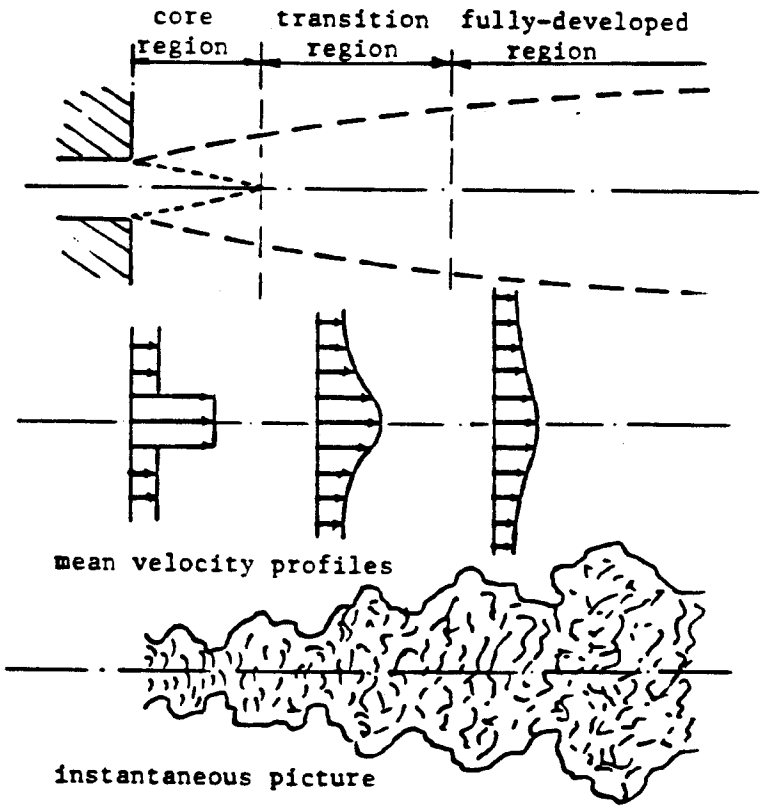

Figure 3. A turbulent free jet

Because of its fundamental importance the details of free jet flows have been studied by numerous investigators.

Experimental results (for turbulent flows) reported by

Abramovich[1], Albertson, Dai, Jensen and Rouse[2] as well as others, demonstrate that the fully developed velocity profiles are self-similar and that the nominal jet boundary grows linerarly ($b \sim s$), and therefore that the centerline longitudinal velocity varies inversely as the distance of travel ($V \sim s^{-1}$). The velocity profile was shown to follow a Gaussian distribution closely. Albertson et al, and later Ricou and Spalding[26] and others, showed that the gross volume flux is given by

$$\frac{q}{q_o} = 0.32 \frac{s}{2b_o} \qquad \text{(II-1)}$$

In many pratical problems, the jet originates from a finite size nozzle with a flow having an almost uniform velocity profile. The turbulent jet is usually divided into three regions depicted in Figure 3. As Bee'r and Chigier[6] describe it, immediately downstream from the nozzle there is a region, the potential core, within which the velocity and temperature of the nozzle fluid remains unchanged. Outside this region a free shear layer develops in which the velocity smoothly varies from the core to the ambient value. The fully developed region of the jet is preceeded by a transition region. The length of the potential

core and transition regions are 4 to 5 and 10 nozzle diameters respectively. These values also depend on initial conditions such as velocity distribution and turbulence level at the nozzle exit.

The entrainment formula (eq. II-1) which was established for a simple free jet, was extended for the case of a free jet with buoyancy effects by Rouse, Yih and Humphreys[28], and later Ricou and Spalding, whose experiments suggested a simple density correction factor.

$$\frac{q}{q_0} = 0.32 \frac{s}{2b_o} \sqrt{\frac{\rho_a}{\rho_j}} \qquad \text{(II-2)}$$

II-B. The Single Jet In a Cross Flow

When a round turbulent jet is discharged perpendicularly into an otherwise uniform stream, as shown schematically in Fig. 4,

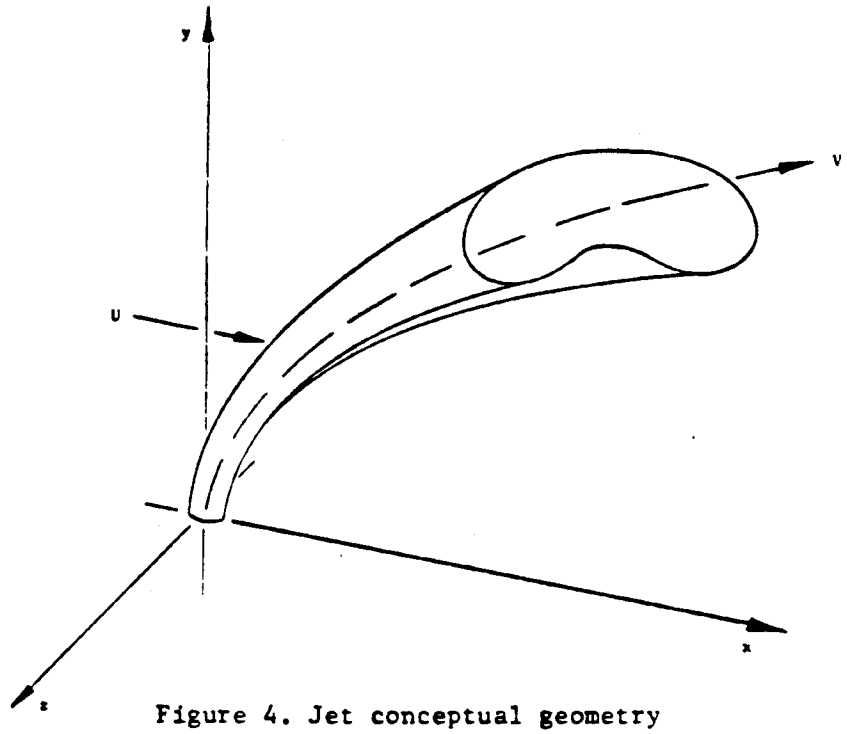

Figure 4. Jet conceptual geometry

complexities arise due to the three dimensional character of the flow that results from the interaction between the jet flow and the cross flow. The cross flow deflects the jet in the downstream direction and is partially blocked by it. Deflection of the jet results from the pressure force exerted on it by the ambient flow, and from fluid particles being entrained into the jet form the cross flow.

Just in front of the jet, near its origin, the cross flow is retarded, producing a quasi-stagnant zone, while a wake region

similar to that in the lee of a rigid cylinder is formed behind the jet. The cross stream fluid flowing around both sides of the jet is swept into the low pressure wake, and forms a pair of induced vortices inside the jet. Platten and Keffer[24] suggest that these vortices account for a large portion of the entrainment of the cross flow fluid into the jet which in turn, causes it to expand and diffuse much more rapidly than the free jet.

For the case of a jet discharging through a sharp edge orifice into a cross flow, three principal regions have been distinguished in the jet. As in a free jet, the initially uniform irrotational flow issuing from the orifice encounters the ambient flow and a shear layer develops at the interface between the two flows. The cone shaped potential core, unlike in the free jet case is a function of the jet to cross flow momentum ratio, jet diameter, and possibly also the Reynolds number of the jet based on its diameter (Pratte and Baines[25]).

The next region, downstream of the potential core zone, consists of entirely turbulent flow. The vorticity produced initially at the jet entrance by the interaction between the jet and the cross stream rolls into a vortex pair, the strength of which remains fairly constant in this region as shown by Turner[32] and thereafter decays. A distinctive kidney-shaped jet cross section is formed as the mean jet velocity decays rapidly along its trajectory, the direction of which differs only by a few degrees

from that of the cross flow after a relatively short distance. This region has been termed the "curvilinear zone" (Keffer[20]), and the "zone of maximum deflection" (Pratte and Baines, 1967).

In the third zone, the two vortices are swept along at nearly the cross flow velocity, while the total circulation of each of them decreases although the size increases. Asymptotically the jet reaches the cross stream direction and speed. This zone is defined as the "far field zone" (Keffer 1963), whose continued existance up to 1000 initial jet diameters downstream of the jet source has been observed (Pratte and Baines).

Abramovich is one of the first investigators to suggest an analytical technique to predict the trajectory of a turbulent jet in a cross stream.

It is based on the assumption that the jet is exposed to a drag perpendicular to its trajectory, so that the drag is balanced by the centrifugal force, and that the jet may be treated locally as a cylinder with a very high drag coefficient.

Visel and Mostinski[33] put forth somewhat diferent models for axisymmetric and slot jets by assuming that the jet experiences a force in the cross flow direction not necessarily perpendicular to the jet itself, and is proportional to the cross flow dynamic pressure. The constant of proportionally is obtained by fitting the result to the trajectory data of Ivanov[15].

Keffer and Baines (1963) carried out experiments in a wind

tunnel using hot wire anemometers to measure the velocy distribution for the ratios of cross flow to initial jet velocity of 2,4,6,8 and 10.

Similarity of velocity profiles was tested and trajectories and decay of maximum velocity of these cases were obtained. The analysis of the problem employed an integral type approach, assuming an entrainment mechanism based upon the scalar difference of the local maximum speed and the cross stream speed. The coefficient of entrainment thus defined was found to grow along the jet axis. The lateral jet spreading was found to have the same general trend as that of a free jet. This analysis shows good agreement with some visualized jet trajectories having different jet to cross flow momentum ratios.

In the course of attempts to find a better representation of the bulk entrainment mechanism, Fan[12] suggested incorporating a single entrainment coefficient E into a correlation containing the magnitude of the vector difference between local jet and cross flow velocities, thus writing for the entrainment velocity U_e

$$U_e = E \mid \vec{V} - \vec{U} \mid = E\,[(V_x - U)^2 + V_y]^{1/2} \qquad \text{(II-3)}$$

With E between 0.4 and 0.5 for U/V ranging from 5 to 20. This correlation agreed satisfactorily with experiment he made, but

as will be seen later in the present work, is not general enough to cover different cross flow configurations, but only a simple uniform cross flow.

Hoult, Fay and Forney[15] compared asymptotic solutions for jet trajectories with experiments conducted at different velocity ratios, and obtained an entrainment description which depends on the difference of the local jet speed and the parallel component of the cross flow as well as on the perpendicular component of the cross flow. The entrainment velocity was written as

$$U_e = E_1(V - U\cos\theta) + E_2 U\sin\theta \qquad \text{(II-4)}$$

where $E_1 = 0.11$ and $E_2 = 0.6$ for velocities ratios ranging from 1 to 10.

Kamotani and Greber[17] indicate in their paper that the components of cross flow normal and parallel to the jet trajectory independently control the entrainment rate. Based on the maximum local jet speed rather than on the average jet velocity as Hoult et. al. suggested, the entrainment velocity is written as

$$U_e = E_1(V_{max} - U\cos\theta) + E_2 U\sin\theta \qquad \text{(II-5)}$$

but E_1 and E_2 were found to change some with momentum ratio.

For J= 15.3, E_1=0.07 and E_2= 0.32, and for J = 59.6, E_1 = 0.067 and E_2 = 0.182. Their work which contains a very rich quantity of experimental information[18], also shows that confinement of a single jet hardly influences its trajectory provided that the momentum of the jet does not bring it to the vicinity of the opposing wall. Tzeng-Long et. al.[31] present a review of the work done on the problem of single jet in a cross flow. Different methods and approaches studied, all based on an integral, phenomenological view of the problem, are brought forth.

Campbell and Schetz[8], in an extremely comprehensive study of the jet-cross flow problem, present some additional experimental evidence, and develop a predictive scheme for a three dimensional jet trajectory which includes buoyancy forces and momentum entrainment in the momentum equation perpendicular to the jet trajectory.

Also, the work gives a detailed review of the previous literature with particular attention paid to analytical developments.

At the extreme end of the theoretical spectrum, Chien and Schetz[11], have solved numerically the three dimensional incompressible Navier-Stokes equations and the energy equation written in terms of velocity, vorticity and temperature. The equations are solved numerically for jets injected into channels with cross flow. Comparisons were made with experimental results for laminar flow in the entrance region of a square channel, and good agreement was obtained. The method was also applied to a

turbulent buoyant jet in a cross flow, incorporating the Bousinesq approximation, the Prandtl constant eddy viscosity model, and a simplification in the oncoming flow upstream boundary conditions. The solution provides a good qualitative description of the three dimensional behavior of the phenomenon, and a trajectory which agrees weel with experimental data. The main limitation of this work is the very simple model of eddy viscosity and the inaccurate boundary conditions.

As the authors point out, this calculation ran for several hours on an IBM 370/158 computer, and a more accurate one which uses a better model of turbulent viscosity, is not realistic for the present generation of computers.

One of the very few attempts to predict the jet behavior in a non-uniform cross flow was done by Sucec and Bowley[30]. The analysis is not detailed, and combines the drag and entrainment phenomena into a single effective force. It also does not consider a change in the direction of the cross flow but only its magnitude. It essentially follows the Arbramovich approach which views the jet in cross flow as a cylinder subject to drag of a cross flow.

II-C. 2-D Jets

Unlike the round single jet problem, the two dimensional jets has received relatively little attention.

Albertson et. al. (1950) in their pioneering paper on jets, showed both analytically and experimentally that the speed of a free

slot jet falls as the reciprocal of the square root of the distance from the jet origin ($V \sim s^{-1/2}$) and that the spreading rate is proportional to the square root of the distance ($b \sim s^{1/2}$), a completely different behavior from that of the round jet. Also, the gross volume flux over a section, increases as

$$\frac{q}{q_o} = 0.62 \sqrt{\frac{s}{b_o}} \qquad \text{(II-6)}$$

Here b_o is the initial jet width.

Abramovich also, theoretically arrived at the expression for longitudinal distribution of the jet velocity

$$\frac{v_{max}}{V_o} = 1.2 \Big/ \sqrt{\frac{a \cdot s}{b_o}} \qquad \text{(II-7)}$$

where the constant "a" weakly depends on the initial conditions and has to be matched experimentally; the value is approximately 0.1.

Weinstein et al.[35] investigated the problem of 2-D jet in parallel outer flows,giving special attention to the spreading rate. Rouse, H., was one of more active investigators to deal with 2-D jets in cross flow, reporting in several articles experimental results for both buoyant and momentum 2-D jets in cross stream (Ref. 26,27,28). Cederwall[9] discusses and compares experimental

results of buoyant, two dimensional jet in stagnant or flowing environment with existing theories. The main emphasis is on jets subject to body rather than inertial forces, and there is no reference to pressure difference across the jet trajectory. These pressure effects are discussed by Rouse (1957) in his paper on the diffusion in the lea of a 2-D jet. The investigation of the bubble pressure under reataching jets is discussed by Greber[13], based on the Chapman[10] -Korst[21] assumption that the pressure downstream of reatachment is equal to the stagnation pressure of the reataching streamline. Bourque and Newman[17], in their calculations of bubble pressures under 2-D fully turbulent jet, incorporate the implicit assumption that the centrifugal forces acting on the jet during its curved path are insignificant, an assumption probably suitable only for regions where the curvature and speed are small.

It is interesting to note that there was no calculation or model found concerning a confined two dimensional jet in a cross stream.

Some experimental information can be seen in the paper by Kamotani and Greber (1974) on confined turbulent jets.

II-D. Row of Jets

This subject is apparently the most neglected in the wide field of research on jet phenomena. In the course of a search of the literature on this subject, it became apparent that there is no basic phenomenological information about the behavior of a row

of jets. Some seven papers on the subject were found, the key ones of which are by Kamotani and Greber[18], Holdeman and Walker[14], Walker and Eberhardt[34], Norgren and Humenik[22] and Cox[12]. They are all reports on experimental work done in conjunction with the practical and unique problem of rows of jets mixing in combustion chambers. The results, although presented in a non-dimensional form, are purely empirical correlations of jets trajectories with no physical reasoning behind them. These correlations are useful in predictions of similar flow configurations, namely row of jets injected into straight channel flows. However, the correlations are not useful for other geometries because they are not constructed from basic pieces of information, as are the ones available for a single jet.

Although intuitively one may think of a row of jets as an intermediate case of the single jet at one limit and a 2-D jet at the other, it is not so. As shown by Kamotani and Greber, the trajectories produced by a row of wide spacing are similar to those of a single jet, and for close spacing, they approach the trajectory of a two dimensional jet, but, not in a monotonic manner. This behavior is shown in Fig. 5. As explained in their paper, the above behavior can be accounted for by considering the vortex structure of well separated jets, and the effect of closeness on the vortex interaction and the entrainment process. Representing the jet in cross-section as a pair of counter rotating vortices, one sees

that two pairs of vortices will drive each other downward, and hence the trajectories of a row of jets will become lower as the spacing decreases. This explanation alone would predict continually lowered trajectory with decreasing spacing. For sufficiently close spacing, however, the initial vortices are relatively weak (they vanish in the two-dimensional jet limit), and the jets interfere with each other's entrainment of cross flow. This later effect results in slower decay of initial momentum flux of the jet. The result of the decreased downwash is that for close enough spacing, the jets maintain their upward momentum longer, and experience only limited deflection due to mutual vortex interaction.

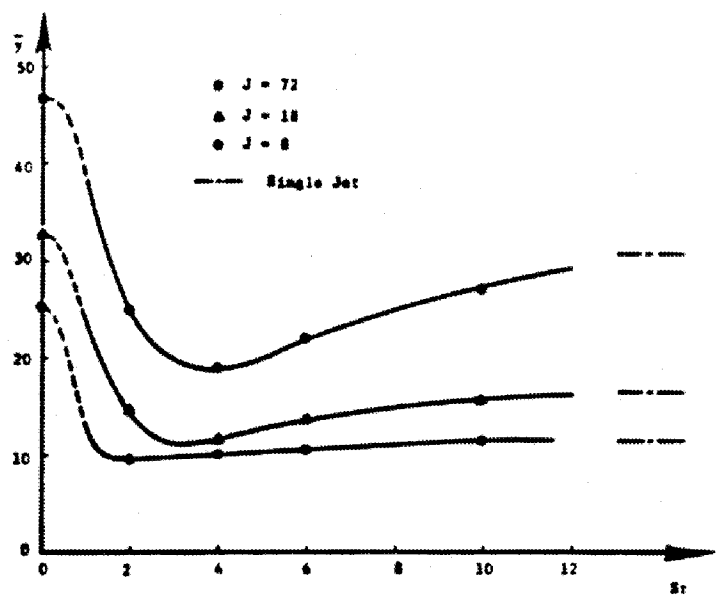

Figure 5. Change of jet center-line location with spacing ratio at $\bar{x}$ = 30 (from ref. 18)

Cederwall's study of buoyant slot jets (1971) is motivated by the practice of power plants using deep-water outfalls in the ocean with a multiple-port diffuser. In a common manner, the spacing

of ports is not taken into consideration and the problem is converted to a two dimensional one. This treatment may not be valid for all cases, and the assumption of two dimensionallity should be weighed carefully.

CHAPTER III

EXPERIMENTS IN LIQUIDS

III-A. Configurations and Range of Parameters

A typical reverse flow combustor incorporates two types of accelerations: a longitudinal acceleration due to a reduction in the annulus radius and a transverse acceleration due to turning of the combustion gases along the bend.

The experiments were designed to examine the separate effects of longitudinal and transverse accelerations (or pressure gradients) on the jet trajectory and spreading rate, in simple configurations which allow easy flow visualization.

Figure 6 shows the two basic geometrics of these tests: A channel with straight side walls and an adjustable angle between them, and a 180 degree bend with rarallel side walls.

In both geometries, the effect of density difference between the hot cross flow and the cold dilution jets is simulated by using liquids of different densities. Water was used as the cross flow fluid, and an aqueous solution of zinc bromide ($ZnBr_2$) as the dilution jet fluid. A schematic sketch of the experimental set-up is shown in Figure 7. The water velocity varied between 0.03 and 0.09 M/Sec and the single jet speed between 1 and 6 M/Sec. The jet to cross flow density ratio, Dr, was 1.25 or 1.5, with $ZnBr_2$ solution kinematic viscosity about 5% larger than that of water

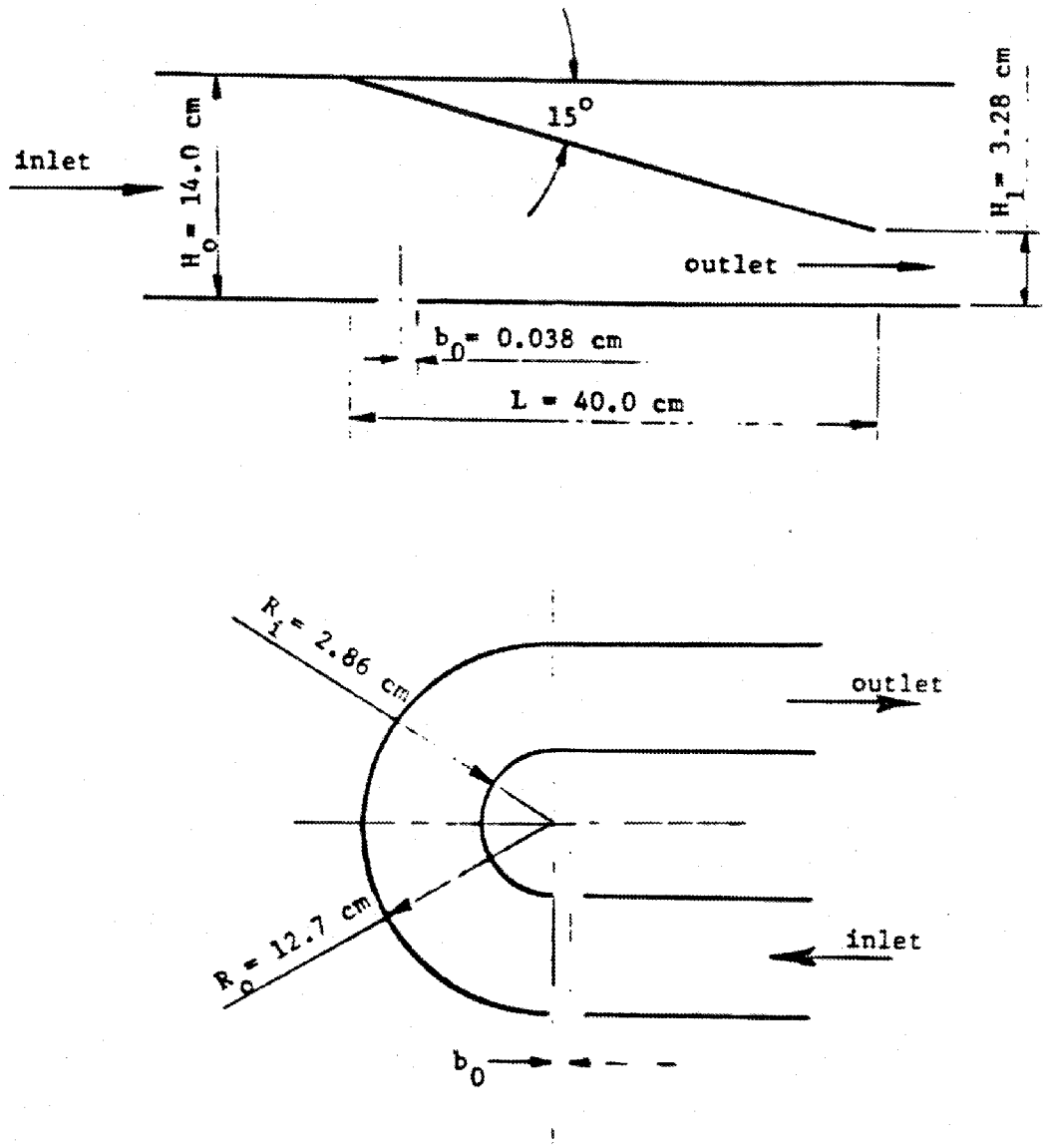

Figure 6. Geometry of channels

($\nu_{H_2O} = 0.95 \times 10^{-6}$ m^2/sec) for both densities. The jet Reynolds number, based on the diameter and initial speed, varied between 500 and 5000 and the densometric Froude number, Fr, between 2000 and 25,000.

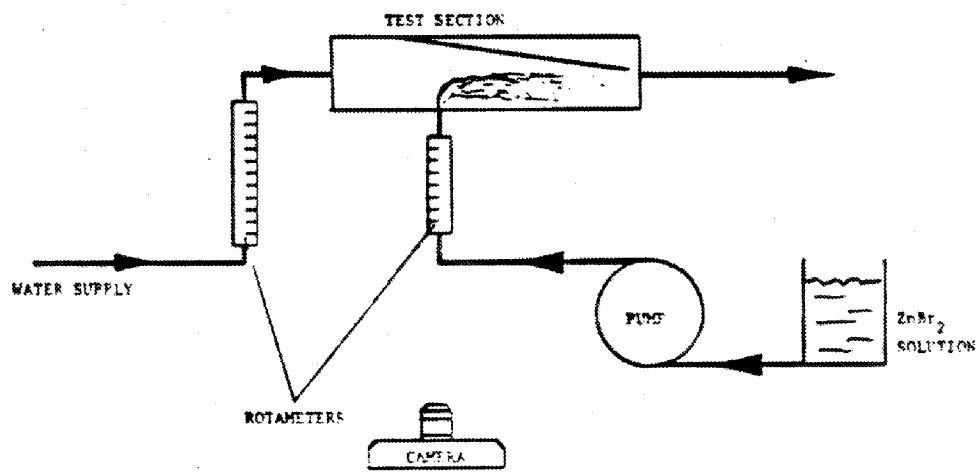

Figure 7. Schematic sketch of liquid experimental set-up

The geometric parameter describing the longitudinal accelerations is $\frac{H_o - H_i}{L}$ and for these experiments equals 0.27, corresponding to an angle of 15 degrees. The parameter associted with the transverse acceleration is b_o/R_i and equals 1.33×10^{-2} in the experiments.

III-B. Cross Stream Velocity and Pressure Distribution

As will be seen later, the calculational model requires the cross flow velocity field and pressure gradients along and across the trajectory. To obtain this information, main stream velocity

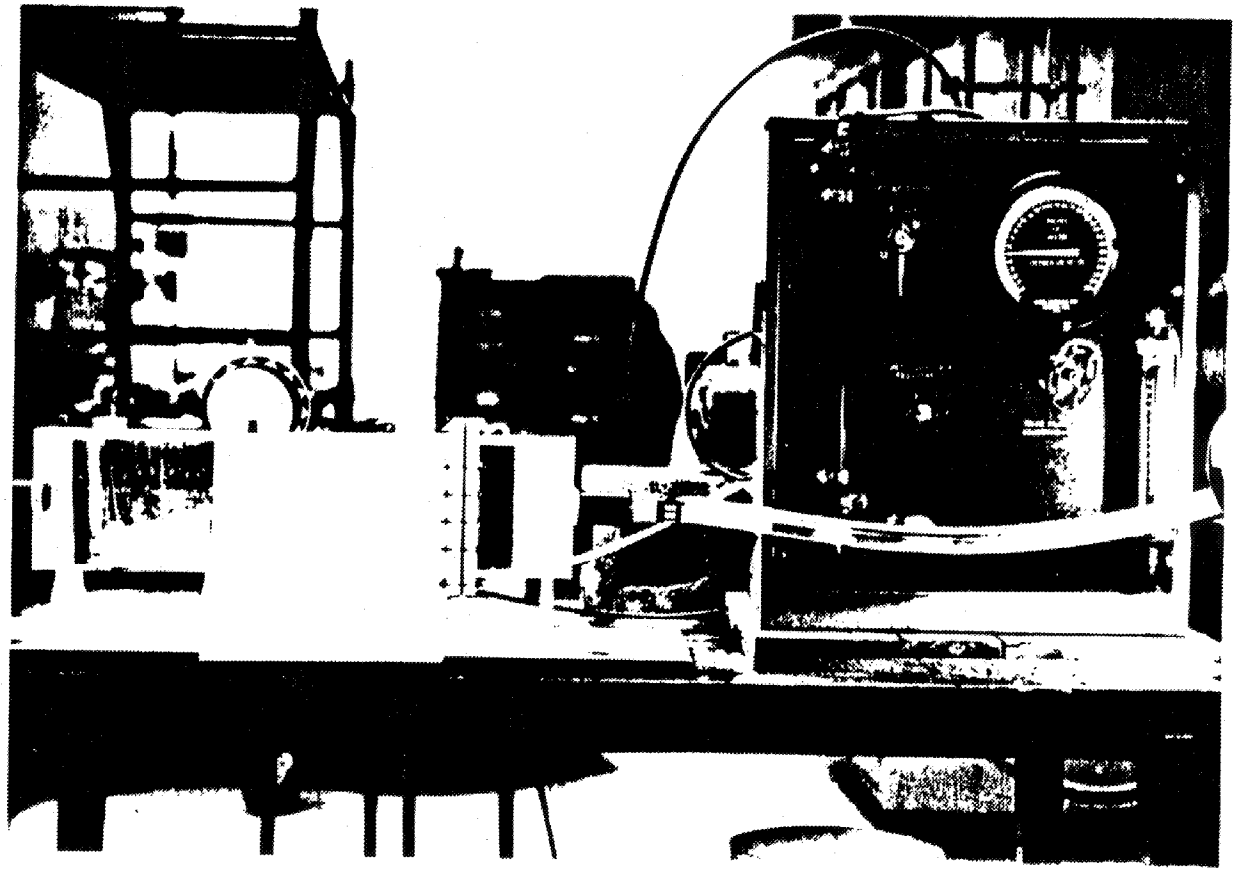

Figure 8. Experimental set-up with the longitudinal test-section

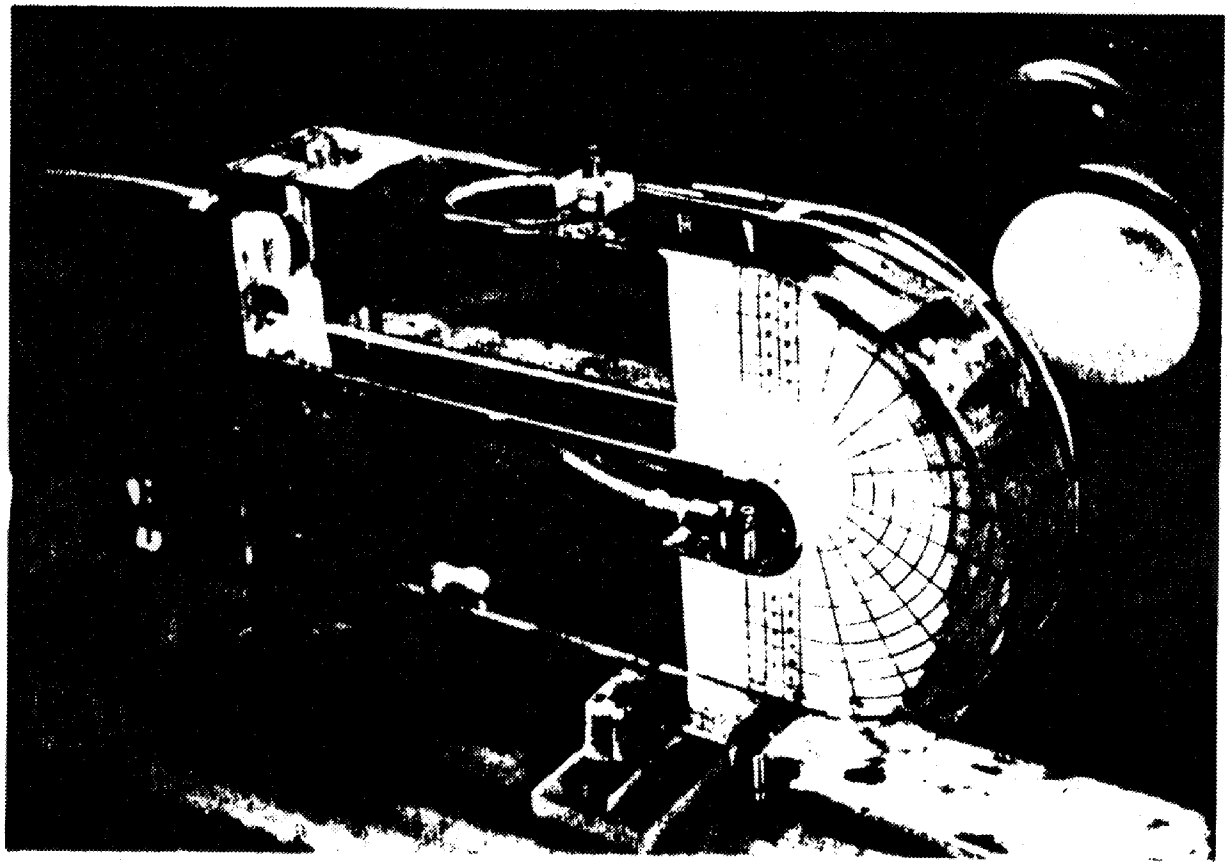

Figure 9. Transverse acceleration test-section

measurements were made, using an existing forward scattering laser anemometer system.

For the non accelerating straight cross flow, it was found that the velocity profile was essentially uniform, and thus there was no acceleration or pressure gradient associated with it. The longitudinal acceleration configuration showed an almost uniform vertical velocity distribution, and an axial distribution which is very well approximated by the axial velocity distribution of a sector of "sink-flow":

$$\bar{U} = \frac{1}{1 - \left(\frac{H_o - H_1}{L}\right)\left(\frac{b_o}{H_o}\right)\bar{x}} \qquad \text{(III-1)}$$

Where $\bar{x} = x/b_o$ and $\bar{V} = V/V_o$.

The local orientation of the longitudinally accelerated flow also behaved like a sector of a "sink-flow" and hence the angle is expressed as :

$$\alpha = \tan^{-1}\left[\frac{\bar{y}}{\left(\frac{H_o}{b_o}\right)\left(\frac{L}{H_o - H_1}\right) - \bar{x}}\right] \qquad \text{(III-2)}$$

Non-dimensionalizing the cross stream pressure with respect to $\rho_s U_o^2$, the associated pressure drop along the channel is

$$\frac{\partial \bar{P}}{\partial \bar{x}} = -\bar{U} \frac{\partial \bar{U}}{\partial \bar{x}} \qquad \text{(III-3)}$$

and across the channel:

$$\frac{\partial \bar{P}}{\partial \bar{y}} = 0 \qquad \text{(III-4)}$$

In the jet coordinates (see figure 8), the pressure gradients along and across the trajectory become:

$$\frac{\partial \bar{P}}{\partial \bar{s}} = \frac{\partial \bar{P}}{\partial \bar{x}} \cos\theta \qquad \text{Longitudinal Acceleration} \qquad \text{(III-5)}$$

$$\frac{\partial \bar{P}}{\partial \bar{n}} = \frac{\partial \bar{P}}{\partial \bar{x}} \sin\theta$$

For the bend, the measurements showed that over the region of interest, namely, in the core of the first half of the bend, the velocity is almost constant azinuthally, and therefore the azimuthal pressure gradient is neglected in the ensuing calculation.

Qualitatively, the velocity variation with radius was found to be vortex like outside the boundary layers, and for convenience

was approximated by a cubic polinomial

$$\bar{U} = a_o + a_1\bar{r} + a_2\bar{r}^2 + a_3\bar{r}^3 \qquad \text{(III-6)}$$

where $\bar{r} = r/R_i$ and for this particular configuration $a_o = 2.4176$; $a_1 = 1.4060$; $a_2 = 0.5004$; $a_3 = 0.0654$.

Far from the wall, the secondary flows resulting from such a bend were hardly detected and therefore could easily be neglected. Approximating the flow direction to be purely azimuthal, the local angle is calculated by:

$$\alpha = \cos^{-1}\left\{\frac{\frac{R_o}{b_o} - \bar{y}}{\left[\left(\frac{R_o}{b_o} - \bar{y}\right)^2 + \bar{x}\right]^{1/2}}\right\} \qquad \text{(III-7)}$$

The associated radial pressure gradient is:

$$\frac{\partial \bar{P}}{\partial \bar{r}} = \frac{\bar{U}^2}{\bar{r}} \qquad \text{(III-8)}$$

and the pressure change across and along the jet path is

$$\frac{\partial \bar{P}}{\partial \bar{n}} = \frac{b_o}{R_i} \frac{\bar{U}^2}{\bar{r}} \cos(\alpha - \theta)$$

$$\frac{\partial \bar{P}}{\partial \bar{s}} = \frac{b_o}{R_i} \frac{\bar{U}^2}{\bar{r}} \sin(\alpha - \theta)$$

Transverse Acceleration (III-9)

where both $\bar{n}$ and $\bar{s}$ are measured in initial jet radius.

III-C. Experimental Set-up and Results

Figure 7 shows a schematic sketch of the experimental set-up. The system can be also seen in Figure 8, a photograph showing the system during testing with the longitudinal acceleration test section. Figure 9 is a photograph of the transverse acceleration section.

Both channels are constructed of clear plastic (Plexiglass) with a flow straightener in the entrance region and a translucent back lighted scaled grid. The Zinc-Bromide solution was dyed by black ink to make the jet visible and was pumped through a calibrated rotameter into the jet injection port. The cross flow is city water, the flow rate of which was monitored by a calibrated orifice run and a differential pressure gage. The fluctuations in the water supply pressure were about ±10% about the mean, which resulted in velocity flactuations in the test section of magnitude of 5% to 7%.

The flow visualization pictures were taken from a distance of about 1/2 meter from the object. The lens focal length was 45 mm,

corresponding to a viewing angle of 45 degrees. Later, when comparisons between experimental and model results are made, the distortion of the scaling due to a non-affine viewing is taken into account.

The results are a series of photographs, the clearest ones of which are compared later with the theoretical results. Four representative photographs (one for each configuration) are shown in figures 10 through 13. Figure 10 shows a jet injected into a constant speed cross flow. The buoyancy effect is clearly seen as the heavier jet sinks after reaching a miximum height. Figure 11 shows a jet injected into a longitudinally accelerating cross flow. It is seen that reattachment of the jet to the bottom of the channel is delayed in this accelerating field. Figure 13 and 14 show a jet injected from the inner and outer walls of the bend respectively. In both cases the gravitational effect is not clearly depicted. The far field of the jets appear to be slightly swept towards the outer wall of the bend.

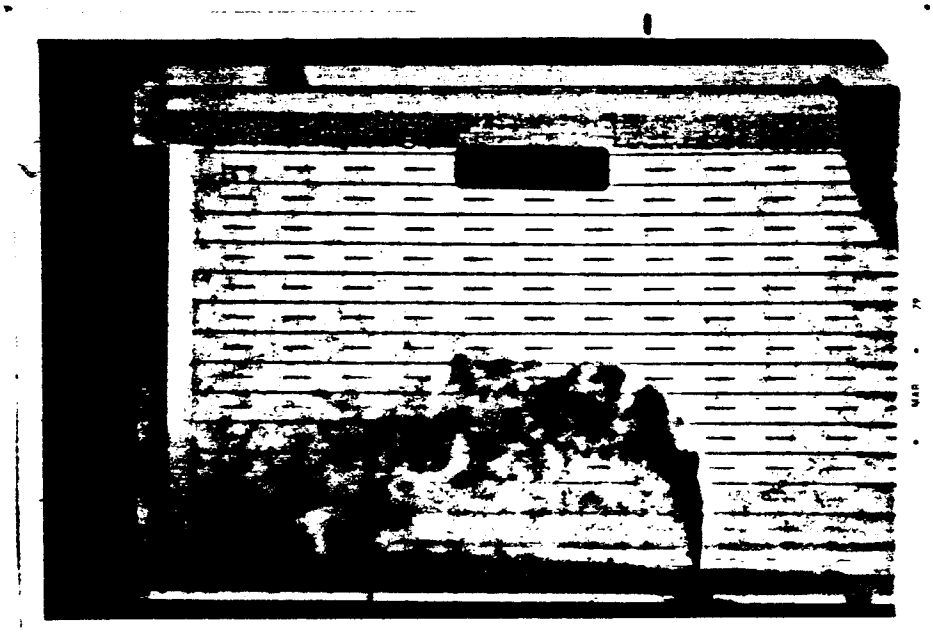

Figure 10. A jet in constant speed cross flow

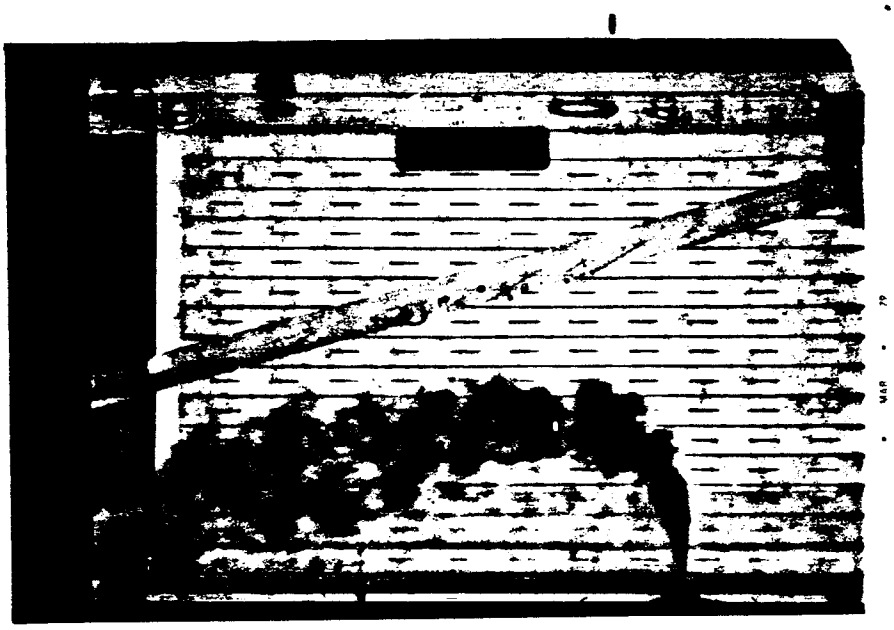

Figure 11. A jet in longitudinally accelerated flow

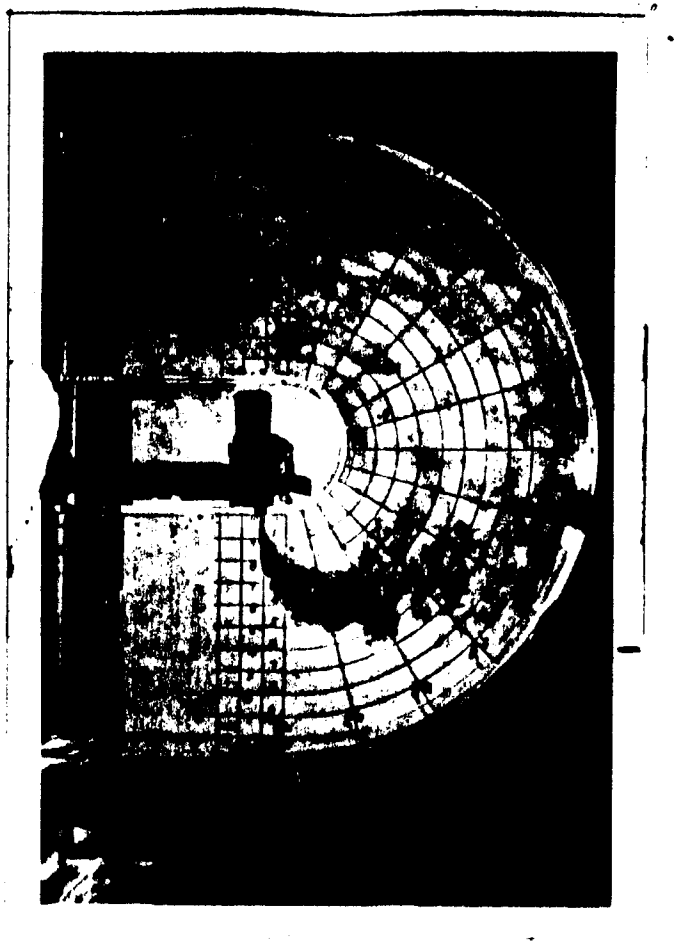

Figure 13. A jet injected from inside the bend

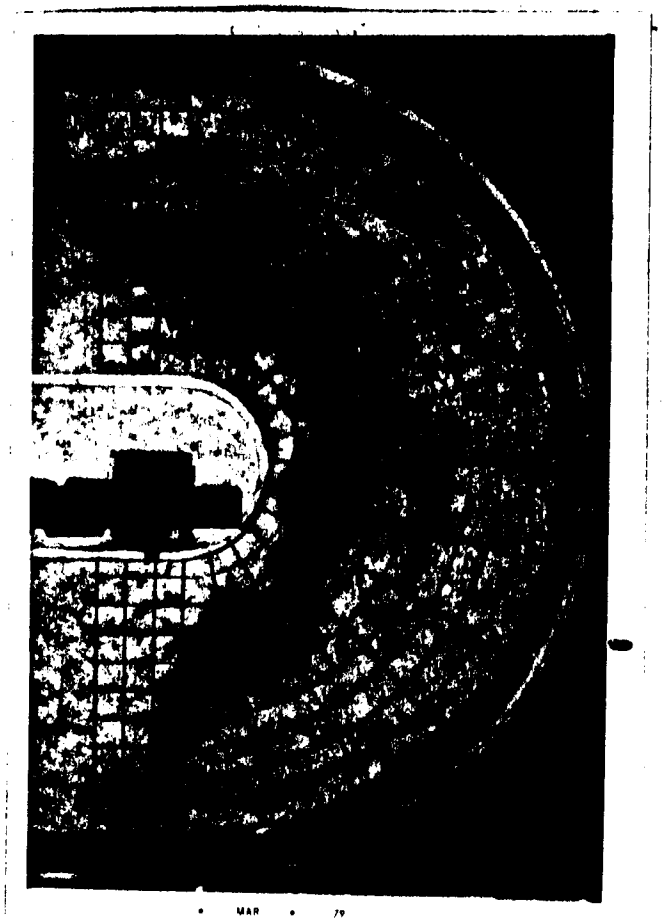

Figure 12. A jet injected from outside the bend

CHAPTER IV

MODELING OF THE SINGLE JET

In this model we consider a single, initially round buoyant jet injected perpendicularly into a bending or longitudinally accelerating cross-flow.

The conceptual geometry of the jet is show in figure 4. Although the figure shows the kidney-like shape which such a jet assumes, the model takes the jet to be every-where circular in cross-section when geometric information is needed. In a standard way, the jet is thought of as a series of slices, each of which is exposed to varying surface and body forces, depending on its location. The model jet and its coordinate system are shown in figure 14.

Because we consider a small jet in a large stream, the interaction is taken as one-way, the stream affects the jet, but the effect of the jet on the stream is neglected.

For calculations, a quasi one-dimensional model is used, the properties of the jet being represented by their average values. The average velocity

$$V \equiv \frac{1}{A_j}\int_{A_j} v \, dA \qquad \text{(IV-1)}$$

and the average density

$$\rho_j \equiv \frac{1}{A_j}\int_{A_j} \rho_{j_{local}} \, dA \qquad \text{(IV-2)}$$

The nominal radius of the jet, b, is defined as the local radius of the circular jet, delivering the local jet flow rate, having flat velocity profile of magnitude V or

$$b \equiv \left[\frac{1}{\pi V} \int_{A_j} v \, dA \right]^{1/2} \qquad \text{(IV-3)}$$

The surface forces which act on the jet, are calculated from the known velocity and pressure fields of the cross flow itself, assuming there is no jet present.

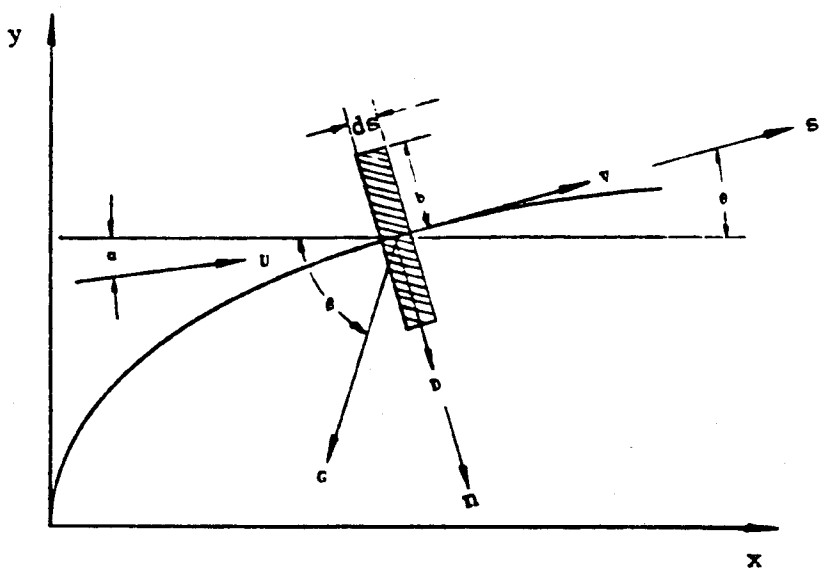

Figure 14. Jet coordinate system

The one dimensional conservation equations for the model circular jet are:

mass

$$\frac{d}{ds}\left(\pi b^2 \rho_j V\right) = \rho_s \frac{dQ}{ds} \qquad \text{(IV-4)}$$

axial momentum

$$\frac{d}{ds}\left(\pi b^2 \rho_j V^2\right) = \rho_s U\cos(\theta - \alpha) \frac{dQ}{ds} - \qquad \text{(IV-5)}$$

$$- \pi b^2 \frac{\partial P}{\partial s} - \cos(\beta - \theta) \frac{dG}{ds}$$

normal momentum

$$\pi b^2 \rho_j V^2 \frac{d\beta}{ds} = -\rho_s U\sin(\theta - \alpha) \frac{dQ}{ds} + \qquad \text{(IV-6)}$$

$$+ \left[\pi b^2 \frac{\partial P}{\partial n} - \frac{dD}{ds} \right] - \sin(\beta - \theta)\frac{dG}{ds}$$

energy

$$\frac{d}{ds}\left[\pi b^2 \rho_j V(h_j + \frac{V^2}{2}) \right] = \qquad \text{(IV-7)}$$

$$(h_s + \frac{U^2}{2})\rho_s \frac{dQ}{ds} - V\cos(\beta - \theta) \frac{dG}{ds}$$

where

$$\frac{dG}{ds} = \pi b^2 g \ (\rho_j - \rho_s) \qquad \text{(IV-8)}$$

Starting with a compressible case, the gas is taken to behave

as an ideal and caloricailly perfect gas, both in the jet and in the cross stream, so that the equation of state is

$$P = \frac{\gamma-1}{\gamma} \rho h \qquad \text{(IV-9)}$$

and

$$h = C_p T \qquad \text{(IV-10)}$$

For liquids, the equation of state can be replaced by the constant volume equation

$$\frac{d}{ds} (\pi b^2 v) = \frac{dQ}{ds} \qquad \text{(IV-11)}$$

and the energy equation is then uncoupled from the mass and momentum equations.

The entrainment rate is a modified expression based on the empirical formula given by eq. (II-5) (Hoult, 1969) and later confirmed by Kamotani and Greber (1972).

The original correlation does not account for a cross stream with varying direction, so a correction is given by introducing the local free stream orientation angle α into the arguments of the trigonometric functions.

$$\frac{dQ}{ds} = 2\pi b \{ A_1[V - U\cos(\theta - \alpha)] + A_2 U|\sin(\theta - \alpha)| \} \qquad \text{(IV-12)}$$

A_1 and A_2 are constants. A_1 is taken as 0.08 in agreement with the results of Albertson et. al. (1950) for a free jet. This value is also consistant with the results of Kamotani and Greber (1972), although a direct numerical comparison cannot be made because their constant is based on a miximum velocity of a complicated velocity distribution. Ricou and Spalding (1961) show that for a free jet, different in density from its surroundings, the entrainment rate will change in proportion to the square root of the surrounding to jet density ratio (eq. II-2).

This effect in not represented here in the same manner because it has not been verified in direct entrainment measurements of a curved jet; whether the density ratio factor should appear requires further investigation.

A_2 is taken as 0.2 after matching with the trajectories of the current experiments. This choice is also consistent with the results of Kamotani and Greber.

In the normal momentum equation (eq. IV-6), the surface forces are represented as a total cross flow drag per unit of jet length by the expression $(\pi b^2 \frac{\partial P}{\partial n} - \frac{dD}{ds})$.

The part associated with an unaccelerating cross flow, $\frac{dD}{ds}$, is approximated as the drag acting on a circular cylinder in a cross stream, whose magnitude is

$$\frac{dD}{ds} = \rho_s U^2 b C_D \sin(\theta - \alpha) \; |\sin(\theta - \alpha)| \qquad \text{(IV-13)}$$

For a solid cylinder of radius b we would expect $C_D \sim 1$. Because the jet is not a uniform slug, its effective radius for drag is greater than b. In the standard way, we observe that a quasi-Gausian velocity distribution suggests a width of $\sqrt{2}$ times that of a uniform distribution. Correspondingly we take $C_D = \sqrt{2}$ for use in eq. (IV-13).

The term $\pi b^2 \frac{\partial P}{\partial n}$ is the cross force associated with the pressure gradients due to acceleration of the cross flow.

The transverse pressure gradient, $\frac{\partial P}{\partial n}$, is taken as the value at the jet center line, consistent with the jet being small in a large stream.

For liquids, the system of equations to be solved is (IV-4,5,6, 8,11,12,13) for the variables $D, G, b, V, \theta, \rho_j$ and h_j (or T_j). A solution may be executed numerically by an explicit forward marching, starting with known initial conditions at the injection port.

Based on the following dimensionless variables, a set of non-dimensional equations was derived from the above equations.

The dimensionless variables are:

$$\bar{x} = x/b_o \ , \quad \bar{y} = y/b_o \ , \quad \bar{s} = s/b_o \ , \quad \bar{n} = n/b_o$$

$$\bar{b} = b/b_o \ , \quad \bar{r} = r/R_i \ , \quad \bar{V} = V/V_o \ , \quad \bar{U} = U/U_o$$

$$\bar{\rho}_j = \rho_j/\rho_{jo} \ , \quad \bar{h} = h_j/h_{jo} \ , \quad \bar{T} = T_j/T_{jo} \qquad \text{(IV-14)}$$

$$\bar{P} = P/\rho_s U_o^2 \ , \quad \bar{Q} = Q/\pi b_o^2 V_o$$

$$\bar{G} = G/\pi b_o^3 g(\rho_{jo} - \rho_s) \ , \quad \bar{D} = D/\pi \rho_s U_o^2 b_o^2 C_D$$

and the set of equations is:

mass conservation

$$\frac{d}{d\bar{s}} (\bar{b}^2 \bar{\rho}_j \bar{V}) = \frac{1}{Dr} \frac{d\bar{Q}}{d\bar{s}} \qquad \text{(IV-15)}$$

longitudinal momentum

$$\frac{d}{d\bar{s}} (\bar{b}^2 \bar{\rho}_j \bar{V}^2) = \frac{\bar{U}\cos(\theta-\alpha)}{\sqrt{Dr \cdot J}} \frac{d\bar{Q}}{d\bar{s}} - \frac{\cos(\beta-\theta)}{Fr} \frac{d\bar{G}}{d\bar{s}} - \frac{\bar{b}^2}{J} \frac{\partial \bar{P}}{\partial \bar{s}} \qquad \text{(IV-16)}$$

normal momentum

$$\bar{b}^2 \bar{\rho}_j \bar{V}^2 \frac{d\theta}{d\bar{s}} = - \frac{\bar{U}\sin(\theta-\alpha)}{\sqrt{Dr \cdot J}} \frac{d\bar{Q}}{d\bar{s}} - \frac{\sin(\beta-\theta)}{Fr} \frac{d\bar{G}}{d\bar{s}} + \frac{1}{J} (\bar{b}^2 \frac{\partial \bar{P}}{\partial \bar{n}} - C_D \frac{d\bar{D}}{d\bar{s}}) \qquad \text{(IV-17)}$$

energy

$$\frac{d}{d\bar{s}} \{ \bar{b}^2 \bar{\rho}_j \bar{V} [\bar{T}_j + (\gamma-1) M_j^2 \frac{\bar{V}}{2}] \} = \qquad \text{(IV-18)}$$

$$[1 + (\gamma-1) M_s^2 \frac{\bar{U}}{2}] \frac{d\bar{Q}}{d\bar{s}} - \frac{(\gamma-1)}{Fr} M_j^2 \bar{V} \cos(\beta-\theta) \frac{d\bar{G}}{d\bar{s}}$$

where

$$\frac{d\bar{G}}{d\bar{s}} = \bar{b}^2 \; (Dr \; \bar{\rho}_j - 1)/(Dr-1) \qquad \text{(IV-19)}$$

the equation of state

$$\bar{P} = \frac{\gamma-1}{\gamma} C_p T_s / U_o^2 \qquad \text{(IV-20)}$$

volume conservation

$$\frac{d}{d\bar{s}} (\bar{b}^2 \bar{V}) = \frac{d\bar{Q}}{d\bar{s}} \qquad \text{(IV-21)}$$

the entrainment correlation

$$\frac{d\bar{Q}}{d\bar{s}} = 2\bar{b}\bar{V}A_1 \{ 1 - \sqrt{Dr/J} \frac{\bar{U}}{\bar{V}} [\cos(\theta-\alpha) \qquad \text{(IV-22)}$$

$$- A_2/A_1 | \sin(\theta-\alpha) |] \}$$

and where

$$\frac{d\bar{D}}{d\bar{s}} = \frac{1}{\pi} \bar{b}\bar{U}^2 \sin(\theta-\alpha) \cdot |\sin(\theta-\alpha)| \qquad \text{(IV-23)}$$

The controlling parameters are J, Fr, Dr, M_j and M_s, along with the two geometric parameters

$$\left(\frac{H_o - H_1}{L}\right)\left(\frac{b_o}{H_o}\right) \text{ - Channel Contraction parameter}$$

$$\left(\frac{b_o}{R_i}\right) \text{ - Channel Curvature parameter}$$

The solution of the above set was performed numerically for various combinations of parameters, by explicit forward marching starting with known initial conditions, represented here by the relevant controlling parameters.

CHAPTER V

EXPERIMENTAL AND MODEL RESULTS - COMPARISON AND DISCUSSION

A representative group of experiments which was chosen to be compared with the model calculations consist of three different parametric conditions for each geometrical configuration: The straight channel, the contracting channel and the bend with jet injected from inner or outer wall.

The parameters controlling each experiment were based on the average speeds of jet and cross stream, as calculated from the measured flow rates. In order to make the numerical simulation proper, the relevant parameters had to be matched.

For a situation where an incompressibility assumption may be used, namely, when the fluid is liquid or the speeds are much lower than the speed of sound, the jet and cross flow Mach numbers become insignificant in describing the flow field.

By omitting the terms which contain M_j and M_s as factors, the dimensionless set degenerates to the set derived from the equations appropriate for liquids, as expected.

Generally, with large injection velocities or with small densities, such as gases, the Froude number becomes very large, and hence, unimportant; then, only J, Dr and the geometric parameters will become the controlling ones.

The most simple case occurs when $Dr \rightarrow 1$, a case for which

only significant parameter is J, along with the geometric constraints.

The calculations simulating the current liquid experiments were performed, consistent with the above discussion, using the incompressible equations with no further simplifications.

Figure 15 through 18 show jet trajectories as obtained from photographs and from the calculations, as discussed before. The wavy lines represent the jet boundaries as traced from the photographs. The dashed lines are the computed center lines, and the solid lines are the computed boundaries of the jet, the radius of which is $\sqrt{2}$ larger than the nominal jet radius b, the reason being that the jet is not a rigid cylinder but consists of a quasi-Gaussian concentration profile.

In figure 15, the experimental and calculated trajectories show height maxima because the jet liquid is denser than water. The agreement between the calculated and observed trajectories is qualitatively good, becoming somewhat poorer with increasing momentum ratio.

Figure 16 shows three different cases of a jet injected into a longitudinally accelerated cross flow. One sees that the acceleration "stretches" the jet, decreases its spreading rate, and consequently delays attachment to the lower wall. Again, agreement between observed and calculated trajectories is encouraging.

Figure 17 shows three different cases of a jet injected through

the outer wall of the bend. The effect of increasing momentum ratio on increasing penetration is clear here as in straight flow.

The calculated trajectories do not agree as well with the observed ones as in straight flow, especially for high momentum ratio. In one case the calculated jet boundary penetrates the inner wall. This is not a mistake; although the calculated jet is affected by the main stream pressure and velocity distribution, there is no wall boundary condition imposed on the jet.

Figure 18 shows three different cases of a jet injected through the inner wall of the bend. Again, the observed and calculated trajectories are similar in appearance, but the agreement is not as good as in straight flow.

In these experiments, the momentum ratios are much higher than those typical of cooling jets in combustors. To compare with low momentum ratio experiments, calculations were done using the conditions of some experiments of Kamotani and Greber. Due to insufficient information in their report, the Froude number could only be determined to ±38%, but this had no detectable effect on the results, due to their high values in the experiments.

The comparison is shown in figure 19. The computed jet boundaries closely bound the measured isotherms, and hence, the agreement between experiments and the model is extended to a wide range of momentum ratio.

Since the calculational model is crude and is intended to

provide merely an overall description of the flow patterns, the good agreement is especially encouraging.

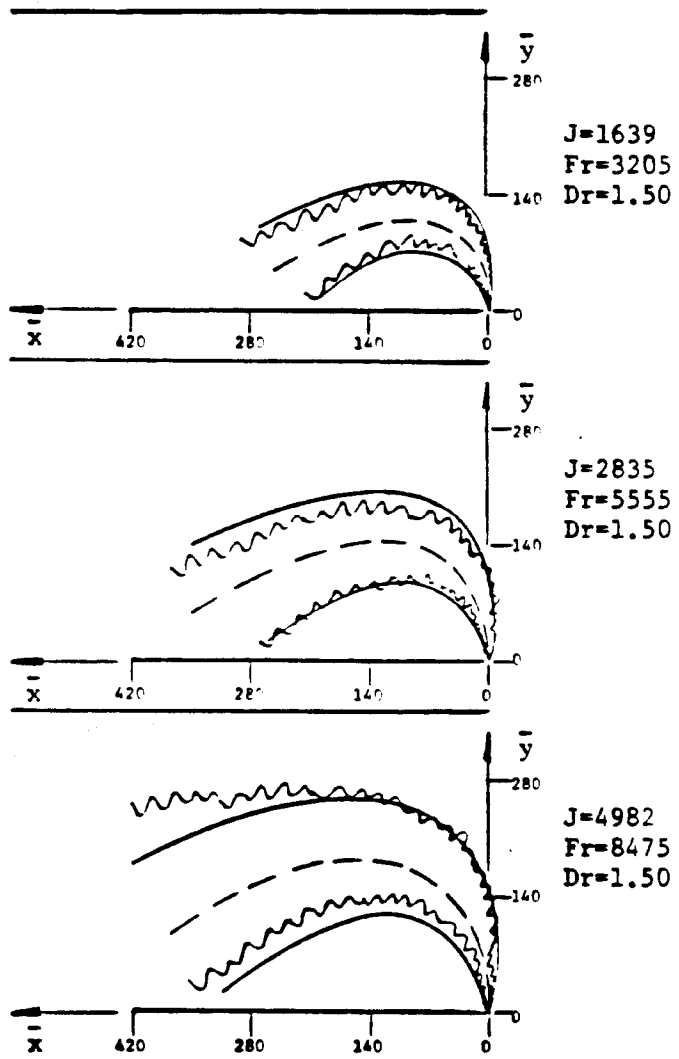

Figure 15. Jets in constant speed cross flow

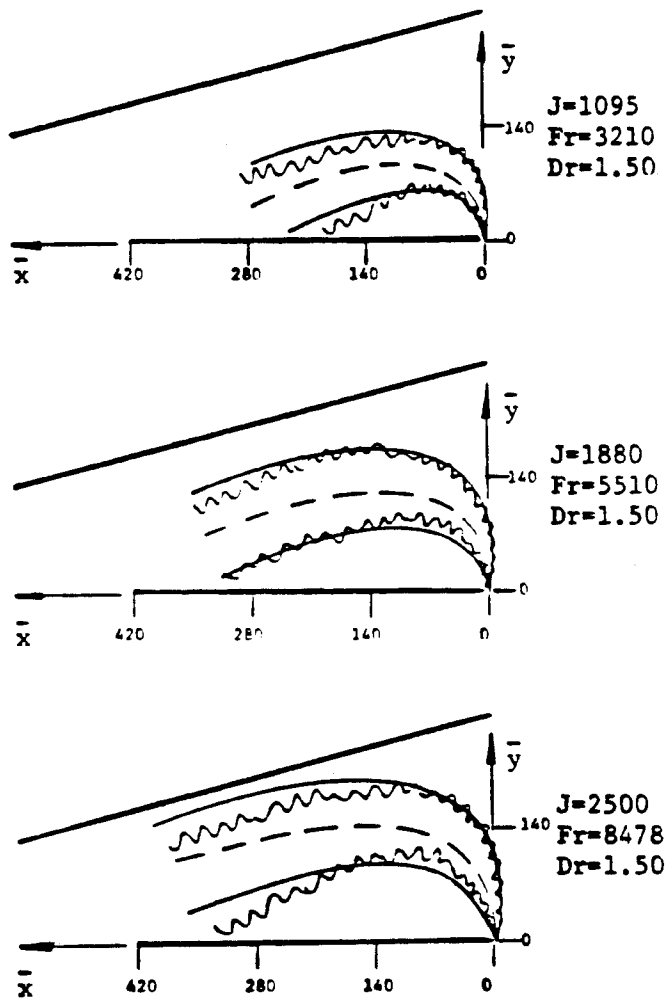

Figure 16. Jets in longitudinally accelerated cross flow

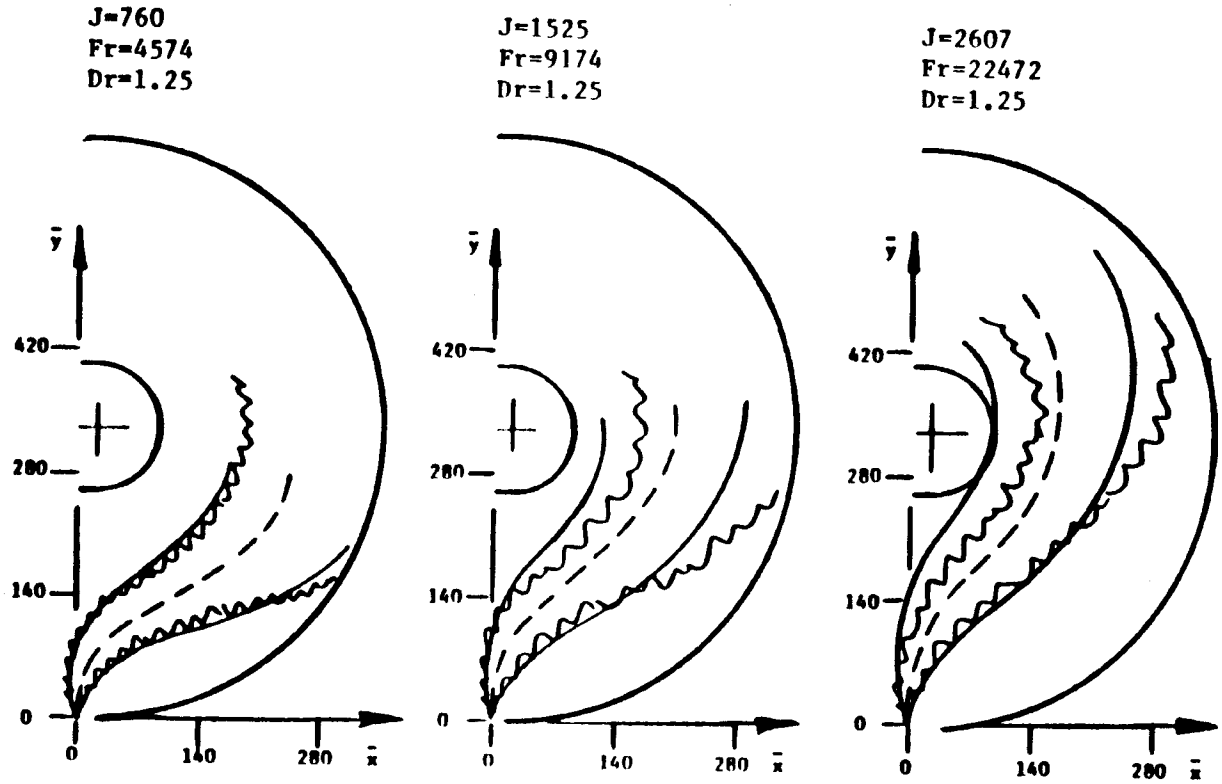

Figure 17. Jets injected from outside the bend

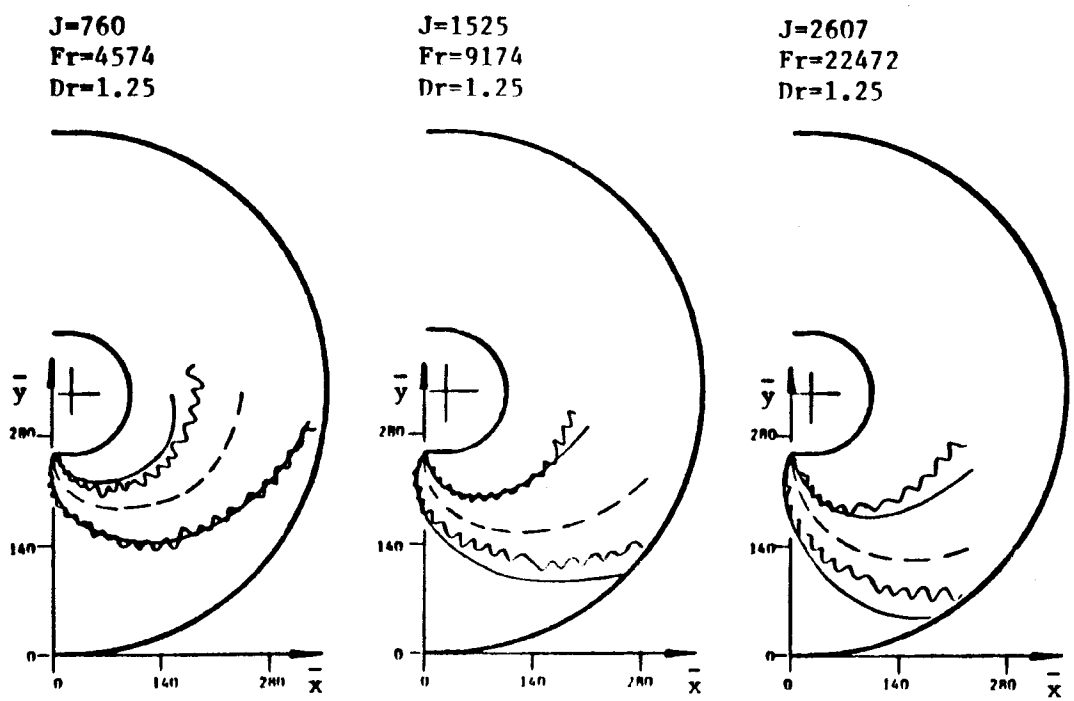

Figure 18. Jets injected from inside the bend

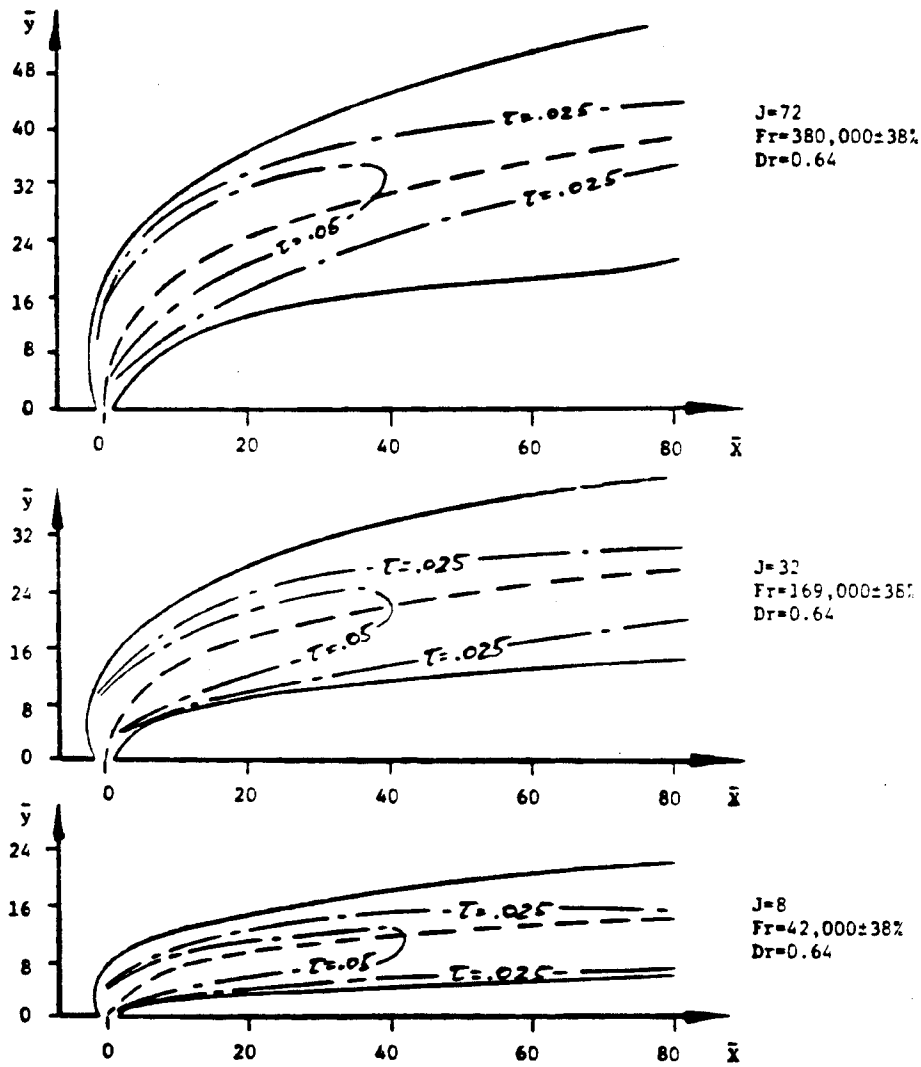

Figure 19. Comparison with experiments reported in ref. 18

CHAPTER VI

EXPERIMENTS IN A REVERSE-FLOW COMBUSTOR

VI-A. The System

As a principal source of information of experimental data, a reverse flow combustion chamber designed and built for this purpose was used.

The characteristic dimensions and shape of the combustor were chosen to be similar to those of a typical operational reverse flow combustor. A sketch of the combustor is shown in figure 20. A schematic sketch and a photograph of the whole rig are shown in figures 21 and 22 respectively.

Due to a flow rate limitation and exhaust considerations, the combustor is a 90 degree sector of a full circle. The flow is driven by a centrifugal blower (1 psig pressure at 2 lbs. of air per sec.) and a low pressure (0.4 psig) natural gas supply source. The aspect ratio of the primary zone (before the turn) is 7.25 and at the exit is 7.8, believed to be large enough to approximate a two dimensional behavior without significant secondary flows in the central region of the combustor.

Just before the turn and in the turn itself, dilution jet injection ports are built in four rows; one "inner" row before the bend, one "outer" row before the bend, and two additional rows in the outer wall of the bend. The spacing ratio of these rows changes

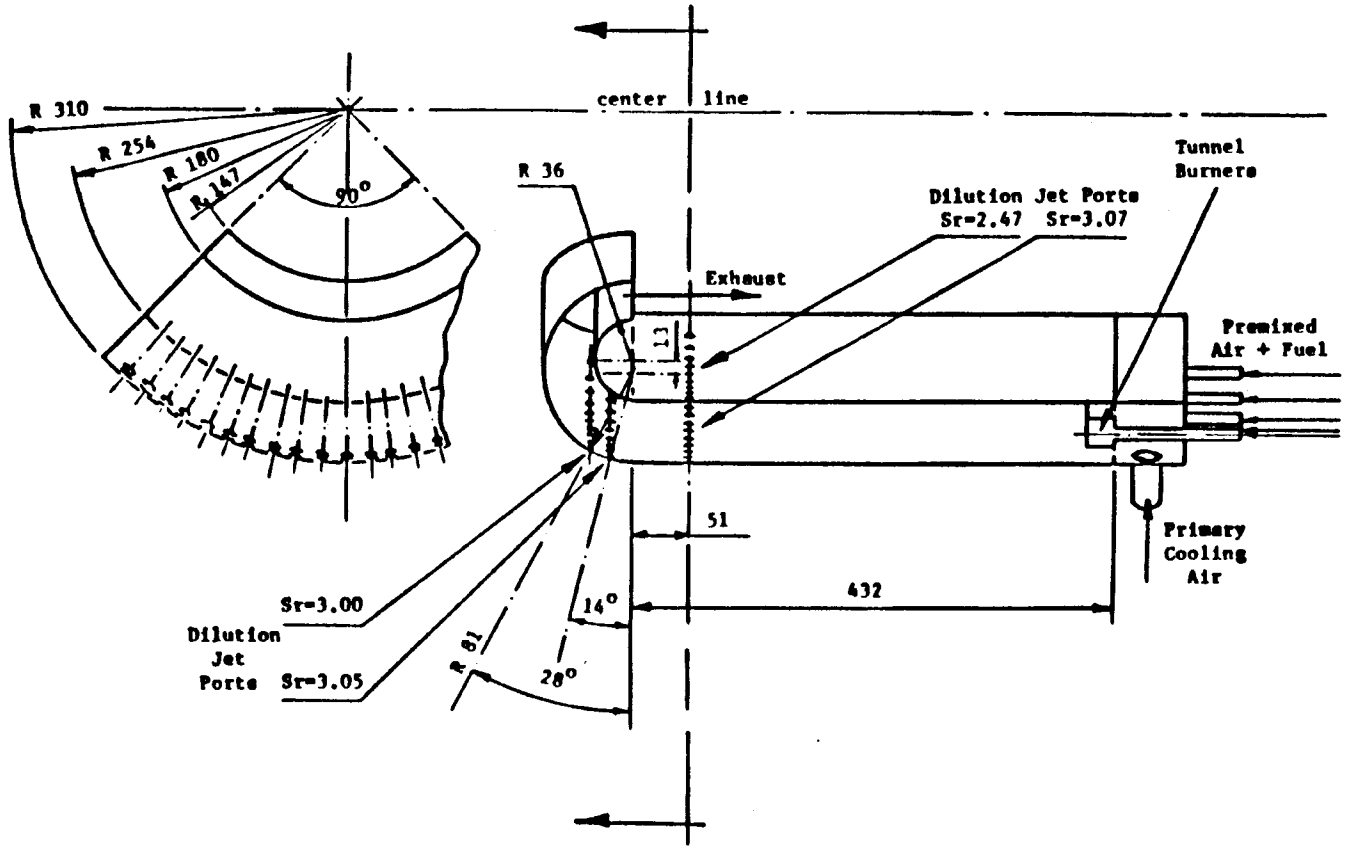

Figure 20. Combustor principal dimensions (in mm)

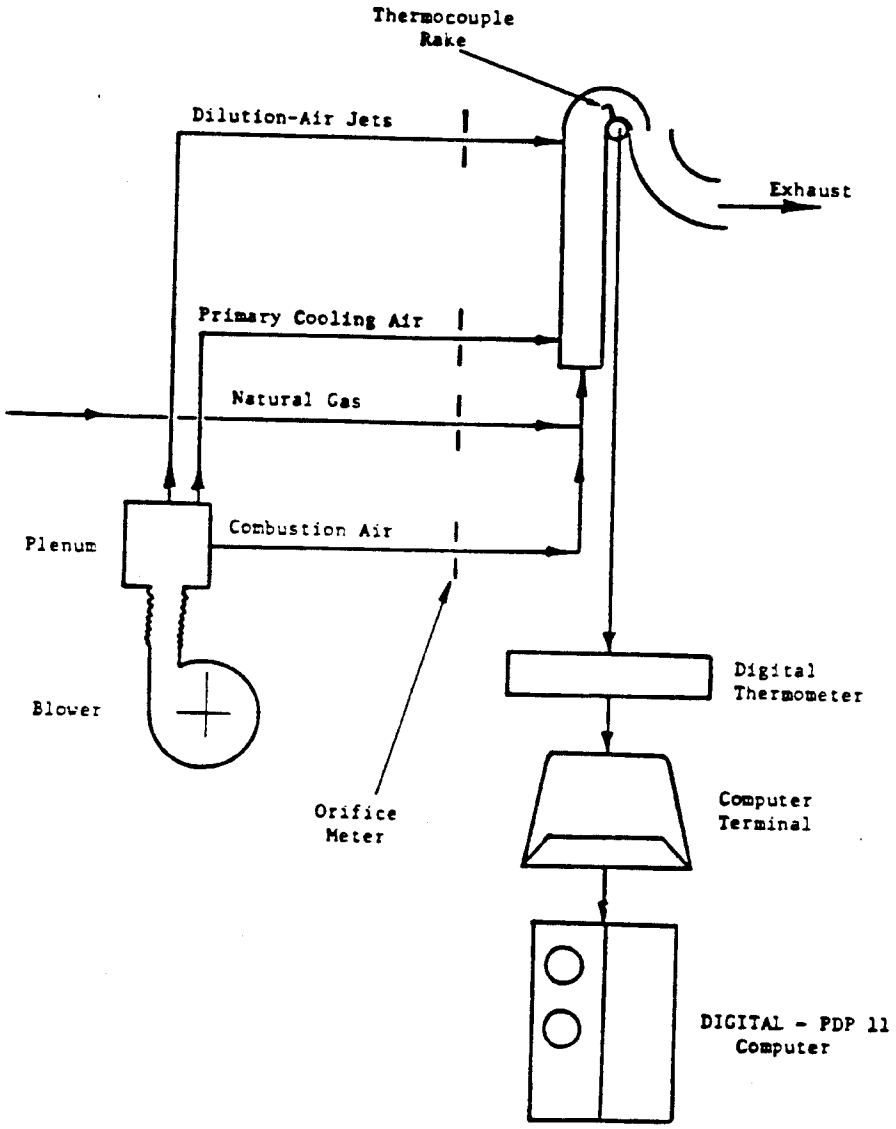

Figure 21. Schematic sketch of experimental rig

from one to another because the ports are arranged along rays extended from the combustor center-line. They all, however, consist of 21 holes of the same diameter, 7.11 mm. The spacing ratio of each row of jets is shown in the sketch. Figure 23 clearly shows the rows of jet ports on the outer wall of the combustor.

The combustor walls are chiefly constructed of Inconell-750 X super alloy, allowing the system to reach a wall temperature of up to 650°C (1200°F) without substantial warpage. This feature is crucial, because a thermocouple rake mounted in a scanning mechanism can remain operational provided the whole system retains its original dimensions and shape within some allowable tolerances.

The combustion is carried out in a series of nine tunnel burners, 430 mm upstream of the bend. Each burner is fed by a nearly stochiometric, slightly rich premixed air natural-gas mixture, and is encircled by a series of small holes through which the primary cooling air is supplied. The combustion gases mix with the cooling air as they approach the turn, the region where the dilution jets are injected through the walls.

The temperature field within the turn is scanned by the thermocouple rake, the data from which is processed by a digital thermometer (Monitor-Lab 9300) and then stored on a DEC PDP 11/40 computer disk. This thermocouple rake, which consists of five thermocouples arranged in a row perpendicular to the cross flow direction, is capable of scanning the whole turn region, azimuthally

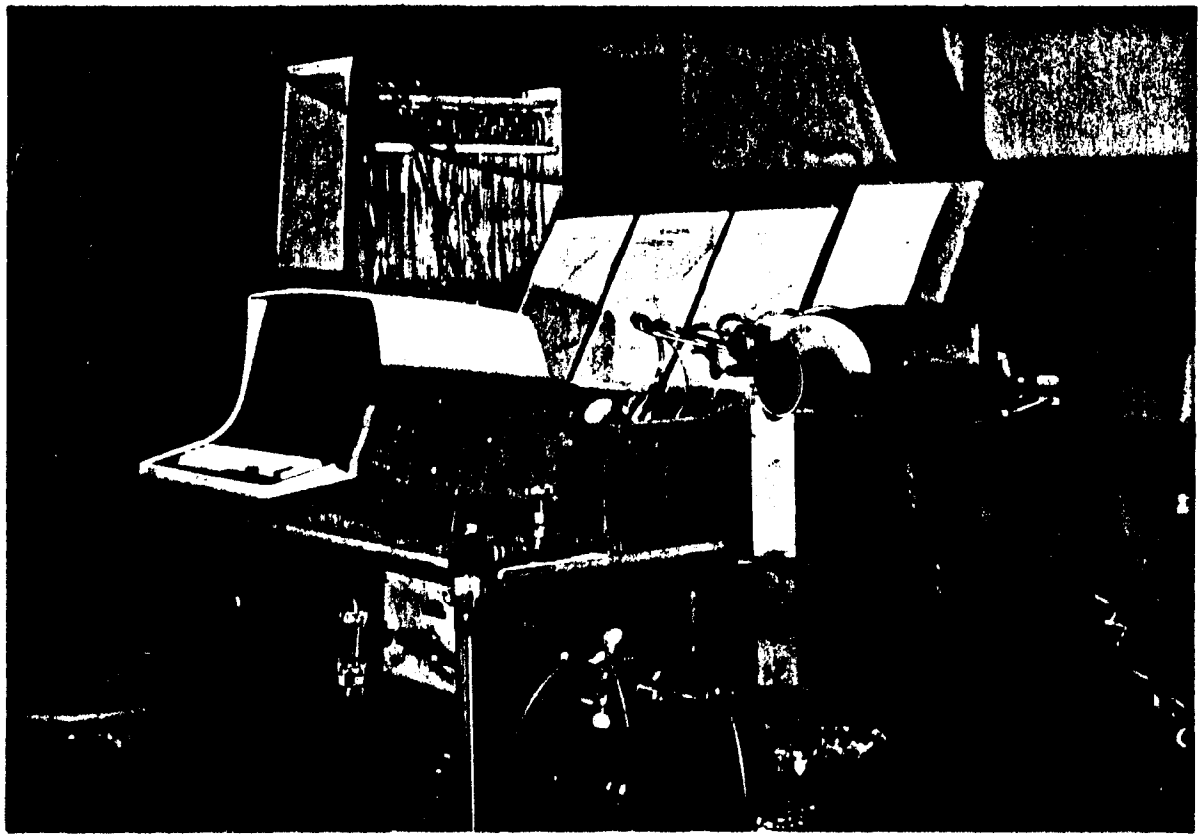

Figure 22. Photograph of experimental rig

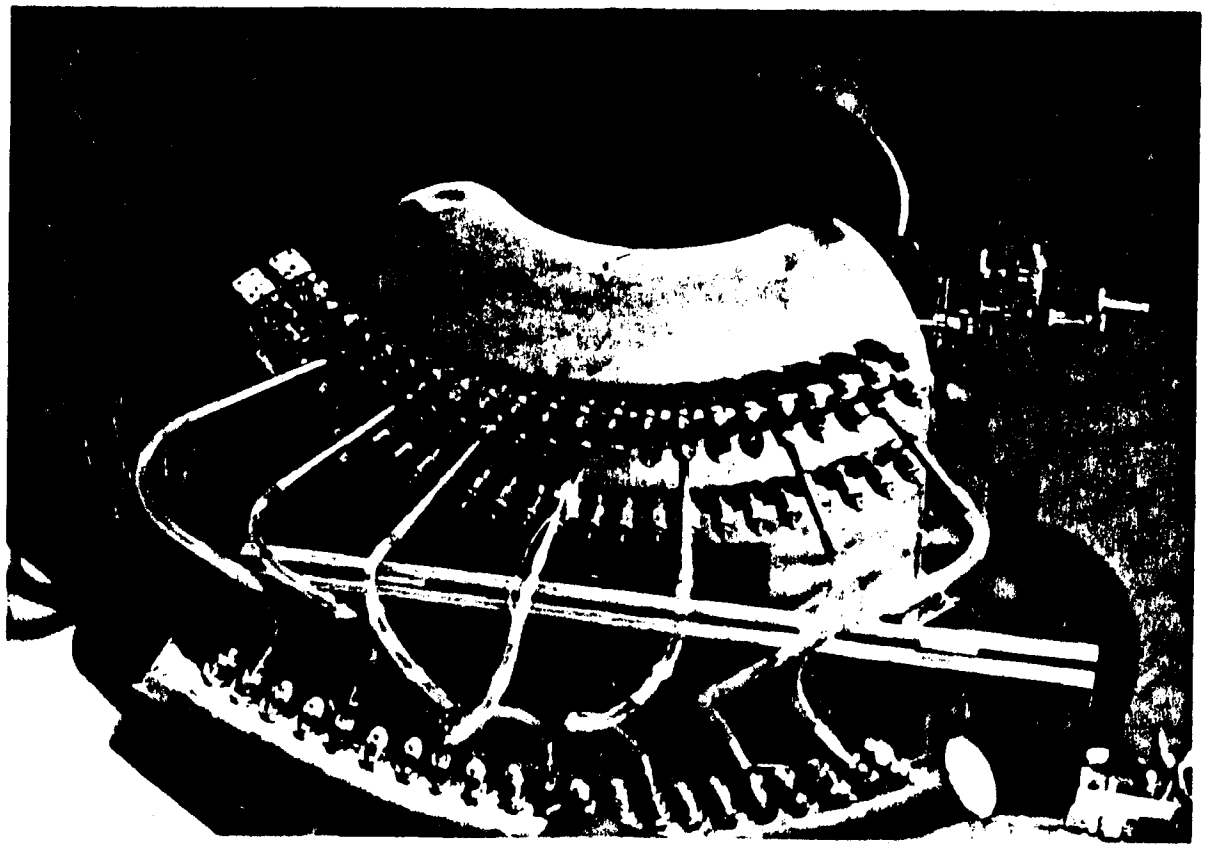

Figure 23. Outer rows of dilution jet ports

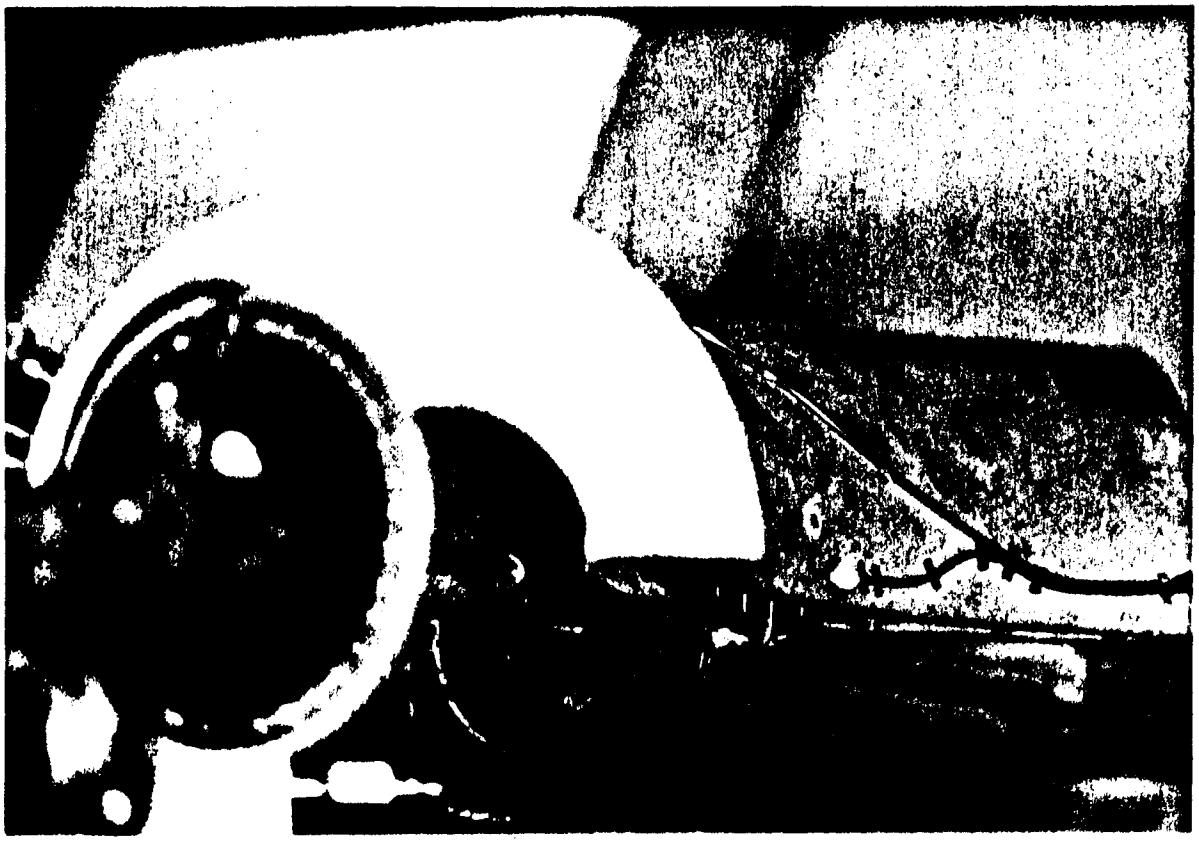

Figure 24. Thermocouple rake and scanning mechanism

and radially, spanning a 50 milimeter (2 inch) wide region in the center of the turn. A photograph showing the thermocouple rake and its scanning mechanism is shown in figure 24.

As shown in figure 21, the flow rates of air and gas to the combustor are measured by means of orifice runs connected to U-tube manometers or calibrated pressure gauges. This arrangement provides overall information for the purpose of calculating the flow conditions inside the combustor, but not a detailed one. For example, it is impossible to directly determine whether all the burners are receiving the same amount of air and gas, and indeed, as will be shown later, a somewhat skewed temperature profile occurs befor the bend, possibly due to this.

In addition to the five thermocouples built into the rake, there are ten more thermocouples fixed in the combustor walls and combustion system for the control of the system operation.

VI-B. Experimental Procedure

The wall temperatures, the gas temperature just prior to the bend, the dilution jet temperature, the combustor pressure and incoming flow rates are all entered into a computer program which after calculation, displays all the relevant variables and parameters on a CRT monitor at the experimental system site. The set of equations which determines the flow conditions is shown in Appendix I. This "on-line" arrangement allows an immediate adjustment of the flow conditions to the desired ones.

The collected data is stored on a disk in a matrix form, one matrix belonging to each experiment.

In the azimuthal and radial directions, the concentration of measured points may be chosen at the experimentor's discretion. For the current experiments, the azimuthal interval was chosen to be twenty degrees, and the radial interval to be 1.56 initial jet radii, producing 76 different probe positions which cover the 180 degree turn from inner to outer wall. The probe, which is consturcted of five thermocouples and spans the lateral width of 50 mm, provides five data points for each probe location, making a grand total of 380 data points for each experiment.

The data batch of each experiment is assigned a file number and can be called from storage for the purpose of processing and plotting.

The processing consists of interpolation of the experimental data and arrangement in order suitable for continuous plotting of temperature profiles. The interpolation procedure is a "cubic-spline" type program (Ref. 4) built into a subroutine (See Appendix II) which takes the matrix of raw data and in turn, comes up with a "fine", larger matrix, constructed of the interpolated values of the original matrix. This "fine" matrix can then be plotted continuously, based on about ten times more points than those belonging to the original data.

Experiments with single jets and rows of jets of different

spacing ratios, issued from differed locations, were run. Each type of configuration was tested for three density ratios. The results and comparisons with the model developed are shown in the following chapters.

CHAPTER VII

SINGLE JET IN A REVERSE FLOW COMBUSTOR

VII-A. Preliminaries

Experiments with three or more different momentum ratios for each of the two density ratios of about 2.14 and 2.74 were conducted.

Each set was carried out for three configurations; a jet injected prior to the bend through the "inner" wall, a jet inject prior to the bend through the "outer" wall, and a jet injected into the bend.

The cross flow speed ranged from about 8 to 12 m/sec, and the jet injection velocity from 10 to 25 m/sec.

The initial jet temperature was about 300 K, and the cross flow temperature was typically about 650 K or 820 K.

Figure 25 shows the combustor coordinate system and a cut-away view of the bent section, where the ten azimuthal measuring stations (every 20 degrees) are numbered from 1 to 10. The measurement locations are not perfectly radial with respect to the center of traversing mechanism because the tips of the thermocouple rake are extended forward into the oncoming flow. These station lines serve as abscissae or "base-lines" for the profiles of normalized temperature τ, measured at these locations. Stations 1 through 5 each consist of 9 radial measuring locations and the rest are devided as follows: station 6 - 8 radial points, station 7 - 7 points,

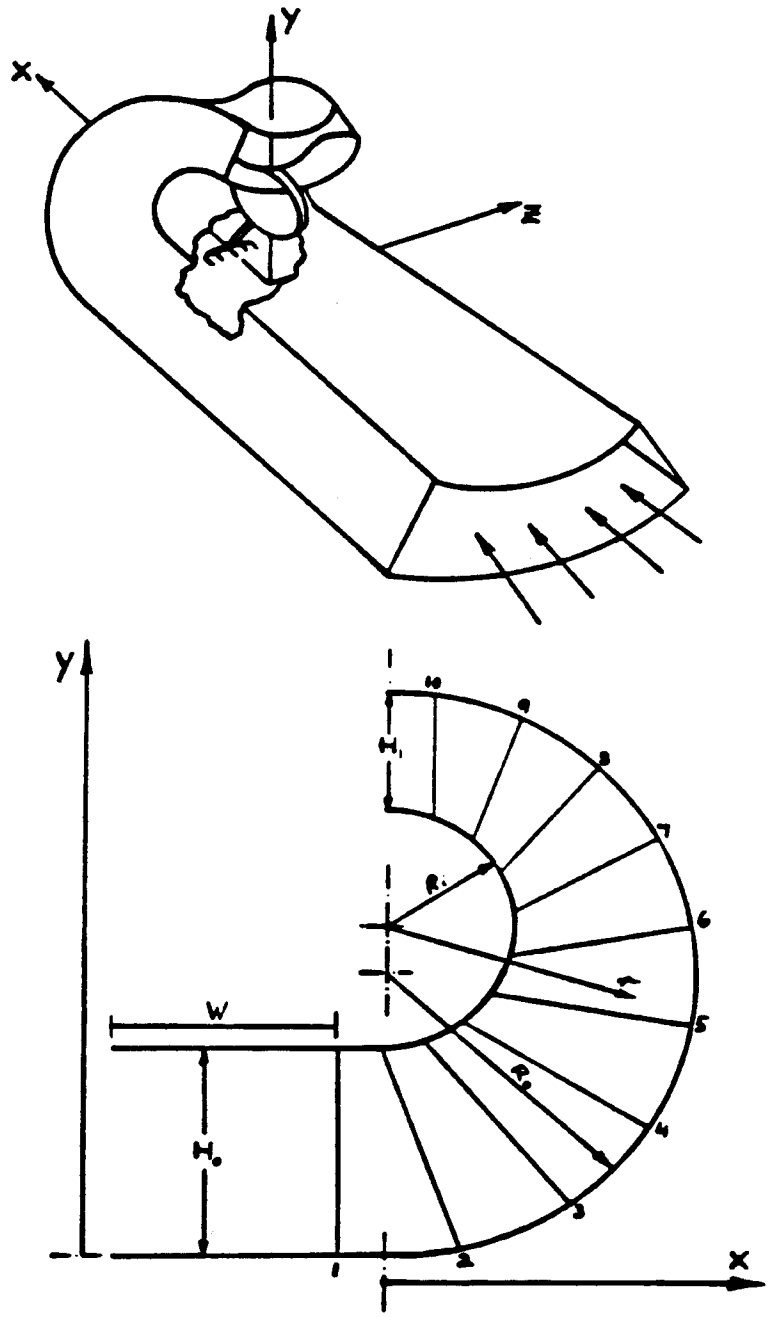

Figure 25. Combustor geometry and a cut-away view of the x-y plane

station 8 - 6 points, station 9 - 5 points and station 10 - 4 measuring points. For each of these points, five readings belonging to the five thermocouples of the rake were recorded producing five "layers" of the complete azimuthal, radial and lateral temperature field. The bar marked by W serves as a scale for τ by showing the weight factor chosen. The full length of the bar corresponds to $\tau = 1$. Figure 25a shows a typical normalized temperature profile at the first azimuthal station with its associated coordinates and scaling.

The dimensions in all figures are measured in initial jet radii (b_o = 3.56 mm).

In order to determine the accuracy of the data taken, a series of numerous temperature measurements, under the same conditions, and for periods of time of 15 minutes were conducted.

The standard deviation was found not to exceed 0.5% of the mean temperature measured in degrees Kelvin.

This error, into which the inaccuracy of the system itself is built, gives rise to an error in τ of $e_\tau = \pm 0.02$ or better.

Figure 26 shows the longitudinal development of the temperature field for a preliminary experiment where no dilution jet was issued. In this figure and all the other similar ones, the "layer" shown is the central one (belonging to the central thermocouple of the rake) unless otherwise indicated.

The temperature profiles are seen to be somewhat uneven,

$$\tau \equiv \frac{T_{j\ local} - T_s}{T_{j_o} - T_s}$$

T_s CROSS STREAM TEMPERATURE

T_{j_o} INITIAL JET TEMPERATURE

$T_{j\ local}$ LOCAL TEMPERATURE

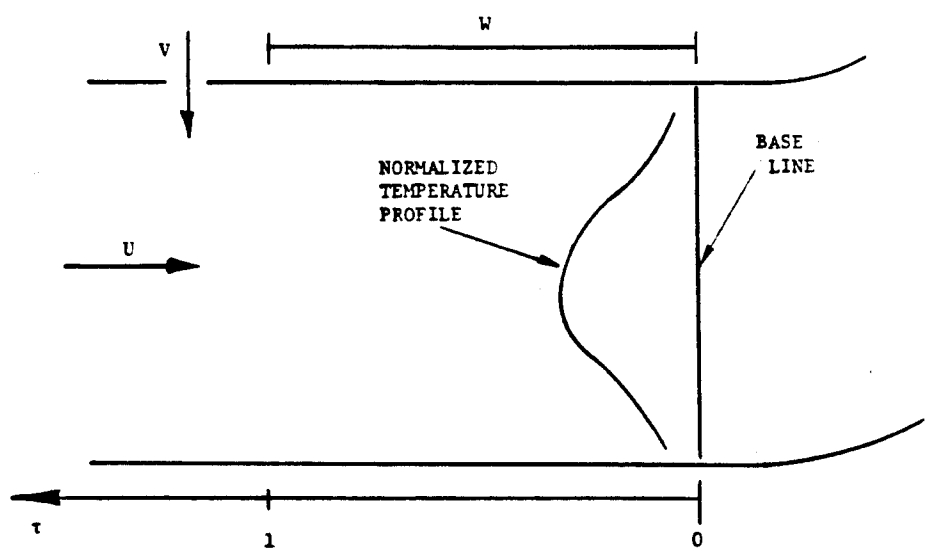

Figure 25a. Normalized temperature profile with coordinates and scaling

deviating from the reference temperature (for which $\tau = 0$) especially near the inner wall.

Figure 27 shows the result of another experiment for which no dilution jet was injected. The lateral temperature distributions at azimuthal station no. 1, for different radial locations are shown. The profiles numbers correspond to the numbers which show the radial location of these points in the small cut-away view.

The error in τ is depicted in Figure 27 by the error bar on profile no. 1, but is not shown in Figure 26 or others. The size of the error bar in the radial temperature profiles is about the size of the circles representing the data points.

The lateral profiles in Figure 27 are somewhat skewed as discussed in the previous chapter.

This lateral skewness, and the uneven radial distribution just before the bend, as seen both in Figure 26 and 27, produce a "pattern factor" defined as

$$P_f = \frac{T_{max} - T_{ave}}{T_{ave} - T_{inlet\ air}} \qquad \text{(VII-1)}$$

which is essentially the value of τ_{max} and is equal to 0.17 near the inner wall. It does not, however, surpass the value of 0.1 for any of the other profiles, which shows a reasonably "flat" oncoming cross flow compared with operational combustors, a typical exit pattern factor of which is 0.2.

The set of experiments reported in this work, have all very low values of Mach numbers and high values of Froude numbers, which, as discussed in chapter V, make them irrelevant in describing the flow conditions, and therefore, are not mentioned hereafter.

VII-B. Radial Temperature Distributions and Jet Trajectories

Figure 28 is a representative plot of consecutive radial temperature distributions produced by a dilution jet injected through the inner wall into the hot cross flow. The density ratio is 2.12 and the momentum ratio is 11.6.

The measured data points, identified by small circles, are connected by an interpolated curve which was produced by a "cubic spline" subroutine. The points marked by x on the base lines are the locations of minimum temperature, corresponding to τ_{max}. These extremum points represent the thermal trajectory of the jets which, as shown by numerous studies, is very close to the velocity center-line of the single jet. The location of injection is $x = 14.28$, $y = 16.77$ and the initial direction $\theta_o = 90°$.

Figure 29 is similar to Figure 28, but here, the cross flow temperature is higher and produces a density ratio of about 2.73.

Figure 30a and 30b show a comparison between jet trajectories at different momentum ratios and the same density ratio, both of which exhibit the known effect of momentum ratio on trajectory. The larger the momentum ratio, the deeper the penetration of the jet into the cross-flow.

For these figures as well as for the following ones, whenever jet trajectories are shown, they should not be considered as exact reproductions of the trajectories themselves. An error in locating the extremum point of the temperature distribution may result from the error in τ itself especially for the flatter distributions. The shown comparisons do however agree with experimental results which are not shown in this work, but which give the redundency needed to confirm the depicted behavior.

Figures 31a and 31b show a comparison between jet trajectories produced by jets of different density ratios but the same momentum ratio. The effect of the density ratio can be seen clearly: the larger Dr, the deeper the penetration. This behavior is also predicted by the model equations.

For injection from the inner wall, increasing density ratios and increasing tranverse acceleration both enchance jet penetration into the cross flow; this is not true for a jet injected from the outer wall.

In all these figures (28 through 31), and as will be seen in the following ones, there is a consistent surprising behavior: the jets, are all swept towards the inner wall of the bend before dissipating into the cross flow, whereas at first, one might expect the denser jets to migrate outward in the turning flow.

This behavior can be accounted for by considering the cross flow development as it progresses from the straight section into the bend.

Starting with an essentially uniform velocity profile, the cross flow accelerates along the inner wall relative to the outer wall as it approaches the turn and during turning. Conservation of mass requires an inward velocity to support this developing skewed distribution. The corresponding combination of increased radial pressure gradient and increased normal velocity of the cross flow with respect to the jet, are sufficient to drive the jet inward.

Figures 32 and 33 are representative pictures of the temperature profiles for jets injected through the outer wall prior to the bend. The injection location is $x = 14.28$, $y = 0$, and the initial direction $\theta_o = 90$ degrees. Here again, the peaks are seen to be swept towards the inner wall as they turn along the bend. Figures 33, 29 and 27, all of which are for the higher density ratio, show clearly that any "cold" or denser fluid which was brought to the vicinity of the outer wall, was trapped there. This behavior is not surprising because the centrifugal force which drives the denser fluid outwards is not substantially counter acted by the drifting effect near the walls (inner or outer), and therefore makes the mixing in the outer region poorer than in the inner one.

In addition, note that for a jet injected from the inner wall the pressure gradient of the cross flow and drag contribution both tend to drive the jet toward the inner wall. However, for a jet injection from the outer wall although the cross flow pressure gradient also drives the jet inward, the drag drives it toward the

outer wall.

Figure 34 shows comparisons of trajectories produced by jets of similar density ratios and different momentum ratios. As before, the penetration rate increases with increasing momentum ratio.

Figure 35 shows comparison between jets having the same momentum ratio but different density ratio. Unlike the results shown in Figure 31, where the jets are injected from the inner wall, here the near and far field effects of the density ratio are opposite in direction. The results, however, show that for this case the near field effect is the dominating one. This is not surprising since the exposure of the jet to the transverse acceleration is very short before it mixes with the cross flow near the inner wall. Figure 36 and 37 are representative central probe temperature distributions for experiments with jets issued through the bent wall. The location of injection is $x = 5.53$, $y = 0.68$ and the initial direction is $\theta_o = 104°$. It is seen that the temperature profile upstream of the jet injection port is not affected by the presence of the jet. There is no meaningful change in the temperature distribution compared with the distributions measured when no dilution jets were present (Figures 26,27). Profile no. 2 is seen to be very strongly skewed with no extremum. This is because its most outward data point is taken very close to the injection port itself. Profile no. 3 is wiggled near the inner wall. This behavior has probably arisen due to the initial unevenness of the oncoming cross flow.

These steep temperature gradients, all however, are "flattened" fast due to the strong mixing. The exit profile is seen to be very even.

Figure 38 shows the variation of trajectory with momentum ratio for a constant density ratio, depicting again that penetration is enchanced with increasing momentum ratio.

Figure 39a and 39b show the influence of the density ratio on the trajectories. As in the case of the jet injected through the outer wall prior to the bend, these trajectories are observed to approach the inner wall as they start to turn along the bend.

Figure 40 through 42 show a comparison between representative experiments and the results of the model previously developed and compared with the liquid experiments.

As discussed in chapter IV, the cross flow velocity field is needed both for the calculation of the associated pressure distribution and its effect on the calculation of the jet trajectory. In the simulation for the liquid experiments, this information was obtained by measuring the water velocity field by a laser anemometer system. In these experiments there is no way to measure it. Instead, the cross flow description is approximated by the average bulk velocity which changes only with the bend azimuthal angle α_b:

$$\bar{U} = \left(\frac{D_o H_o}{D_1 H_1} - 1 \right) \frac{\alpha_b}{\pi} + 1 \qquad \text{(VII-2)}$$

Here, $\frac{D_o H_o}{D_1 H_1}$ is the new longitudinal acceleration parameter which appears due to the three dimensional contraction of the combustor. This crude approximation does not bring any information concerning the "drifting" velocity which is probably responsible for deflecting the jets towards the inner wall. It is also doubtful whether a 2-D inviscid approximate calculation will help because, as H. Rouse points out in his book [29a], there may very well occur a seperation at the entrance region of the outer wall due to the longitudinal unfavorable pressure gradient.

Figures 40 through 42 show a significant discrepancy between experimental and theoretical results. The previous liquid experiments simulations showed that only a well described velocity field of the cross flow gives rise to good agreement with experimental results. In these combustor experiments simulations the cross flow was crudely approximated, resulting in a marked discrepancy which shows the sensitivity of the model calculation to the cross flow velocity field.

Figure 43, 44 and 45 respectively, show representative longitudinal isotherms as found from experiments for the three configurations: a jet injected from the inner wall, the outer wall and the bent outer wall. They all depict the trend of the jet trajectory to be swept towards the inner wall, as described earlier.

For illustrative purposes, Figures 46 and 47 show the three dimensional perspectives of the temperature distributions at the shown azimuthal stations, produced by a jet injected through the

inner wall and outer bent wall respectively. In both pictures, the flattening of temperature profiles due to mixing along the bend is seen clearly.

VII-C. Lateral Temperature Distributions and Isotherms

As mentioned before, the lateral distribution of temperature was measured using fewer sampling locations due to the fixed number and laterally unmovable thermocouples. The thermocouple rake spans the lateral direction from -7.14 to 7.14 (measured in units of b_o) and provided 5 fixed data points, a sparsity requiring caution in interpretation of the results.

Figures 48 and 49 show interpolated distributions of τ versus the z axis. The interpolation was made using cubic splines fitted through the data points.

The temperature profiles are consecutive distributions belonging to the azimuthal stations as numbered, and to the radial locations which correspond to the peak value of τ.

An eye-catching characteristic of these figures is that the peak value decreases with downstream location, but the boundary values remain essentially the same at the same lateral location. This behavior shows that under longitudinal acceleration conditions, as seen also from the liquid experiments, the jet spreading rate is significantly decreased, or, as shown here, almost vanishes; the jet appears to keep a constant lateral width. This may imply that under sufficient longitudinal acceleration the surrounding velocity may

surpass the jet speed, thereby producing a region of velocity defect rather than velocity excess. This transition will cause the normally diverging streamlines of the jet to converge inward towards the jet center-line. It is the authors opinion that this point should be further investigated.

In Figure 49b, profile no. 2 shows two minima from both sides of the high peak. These points are not necessarily real. They were produced by the cubic-spline interpolation procedure. This profile location is very close to the injection port where the temperature gradients are very steep, a fact which is not taken into consideration during the interpolation.

Figure 50 shows typical lateral temperature distributions at different radial location for the same azimuthal station. These particular profiles belong to azimuthal station no. 3 of experiment no. 26.c.

The profiles are numbered from 1 to 9. Starting with the inner most one, τ ascends towards its peak value at profile no. 6, descending towards the crossflow value thereafter.

Figure 51 shows the lateral isotherms obtained by interpolation of the known data points. They are cross plots of τ versus z curves at a single station, a representative figure of which was shown in Figure 50. Here, three typical sets of isotherms, each of which taken from its particular configuration and azimuthal station are shown. Larger figures of these sets are shown in

Figures 52 through 54. Each contour corresponds to its shown τ value, and the peak location is marked by X.

Kamotani and Greber[17] show that as the jet enters a cross flow its shape begins to change because of the nonuniform pressure field created by the flow around it. The jet is deformed into a crescent shape, and the cross flow creates a pair of vortices behind the jet in much the same way as a flow around a cylinder. The vortices acquire axial momentum from the jet, and move along the jet path. Far downstream the original jet disappears, while a pair of antirotating vortices dominate the flow field. Their experiments show a distinct velocity and thermal two-cell structure which results from these two vortices.

The contours of the isotherms shown here, and the lateral temperature distributions, consistently lack the feature of a two-cell structure. Although based on sparse lateral data points, this consistency strongly suggests that the thermal two-cell structure is fused into a one-cell structure. This possible conclusion may be supported by the combination of the following facts:

1. The spreading rate was shown to be significantly decreased, thereby producing a compressed jet which cannot attain its full fledged kidney like shape.

2. As opposed to the experiments reported in reference 17, where the cross flow turbulence level was about 0.3%, the current experiments involved cross flow resulting from a combustion region,

the turbulence level of which is inherently very high. This turbulence level possible excites the jet turbulence intensity to values for which the mixing within the jet itself becomes very efficient, blurring any detailed structure.

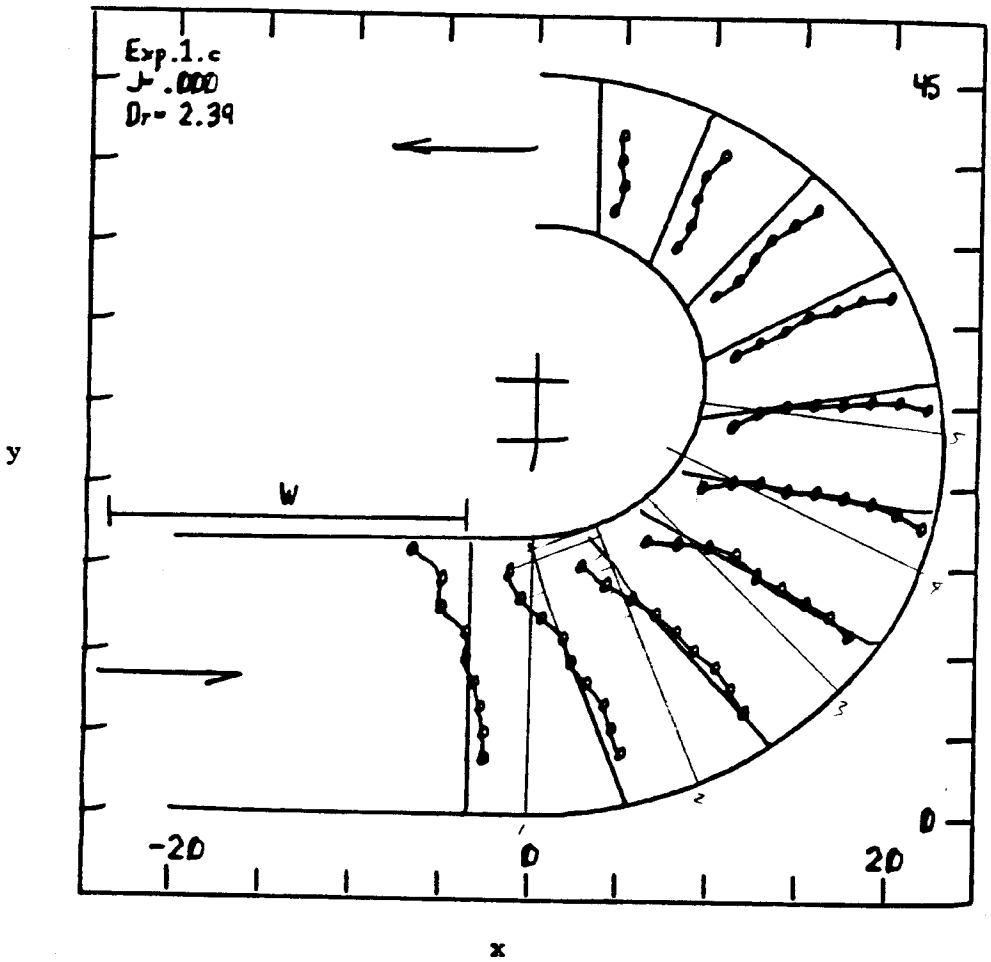

Figure 26. Temperature distribution in the combustor without jet injection

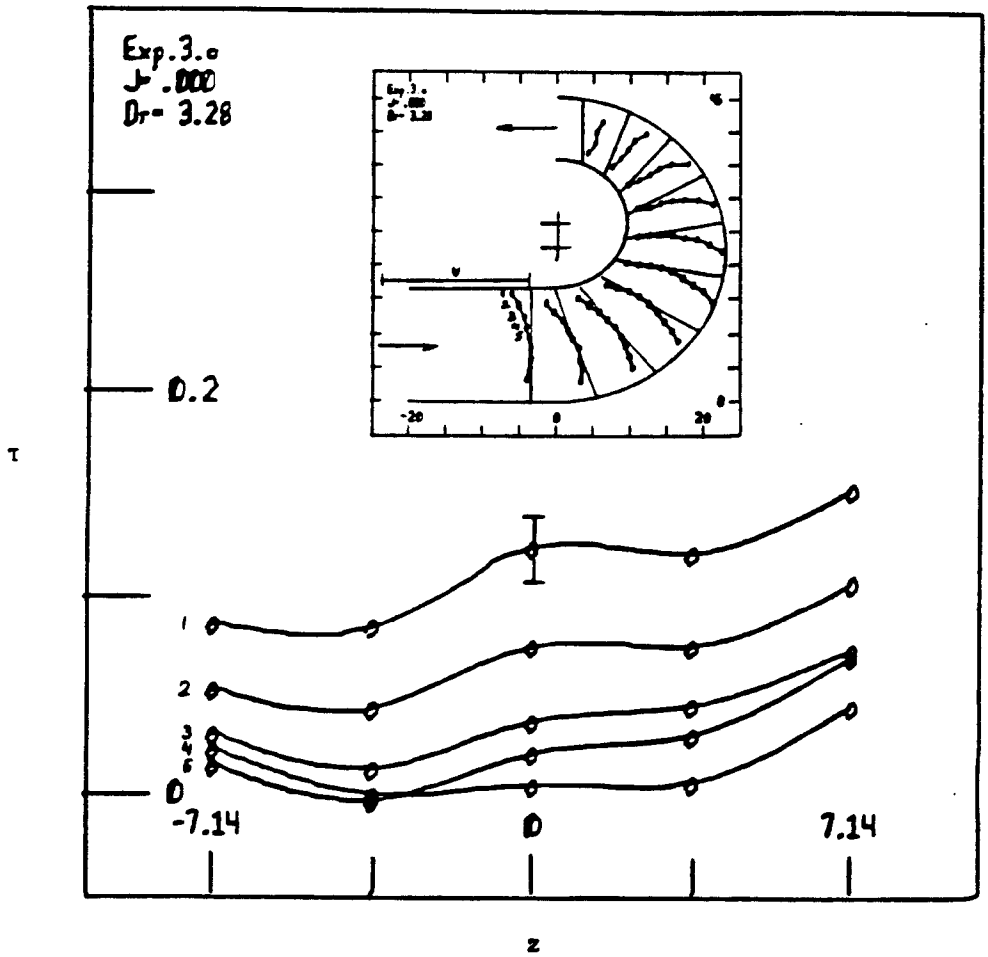

Figure 27. Lateral temperature distribution at azimuthal station no. 1 without jet injection

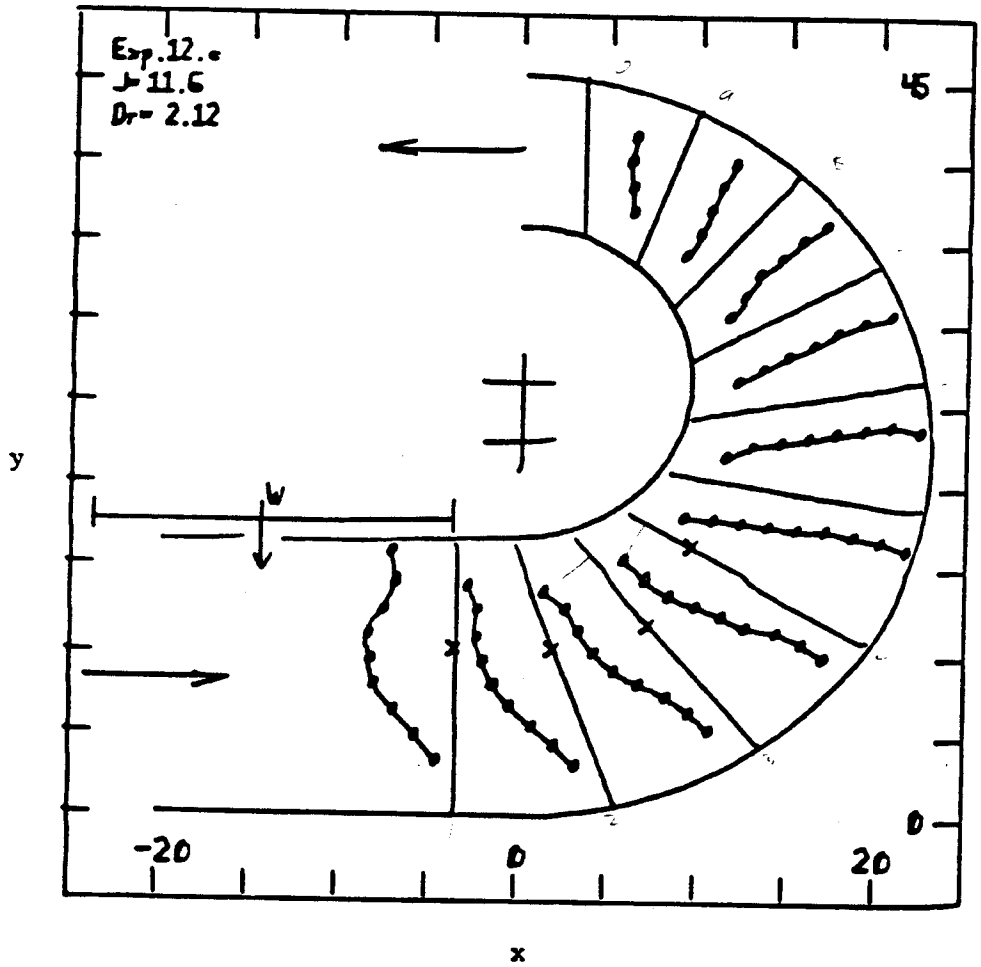

Figure 28. Temperature distribution for a jet injected from the inner wall

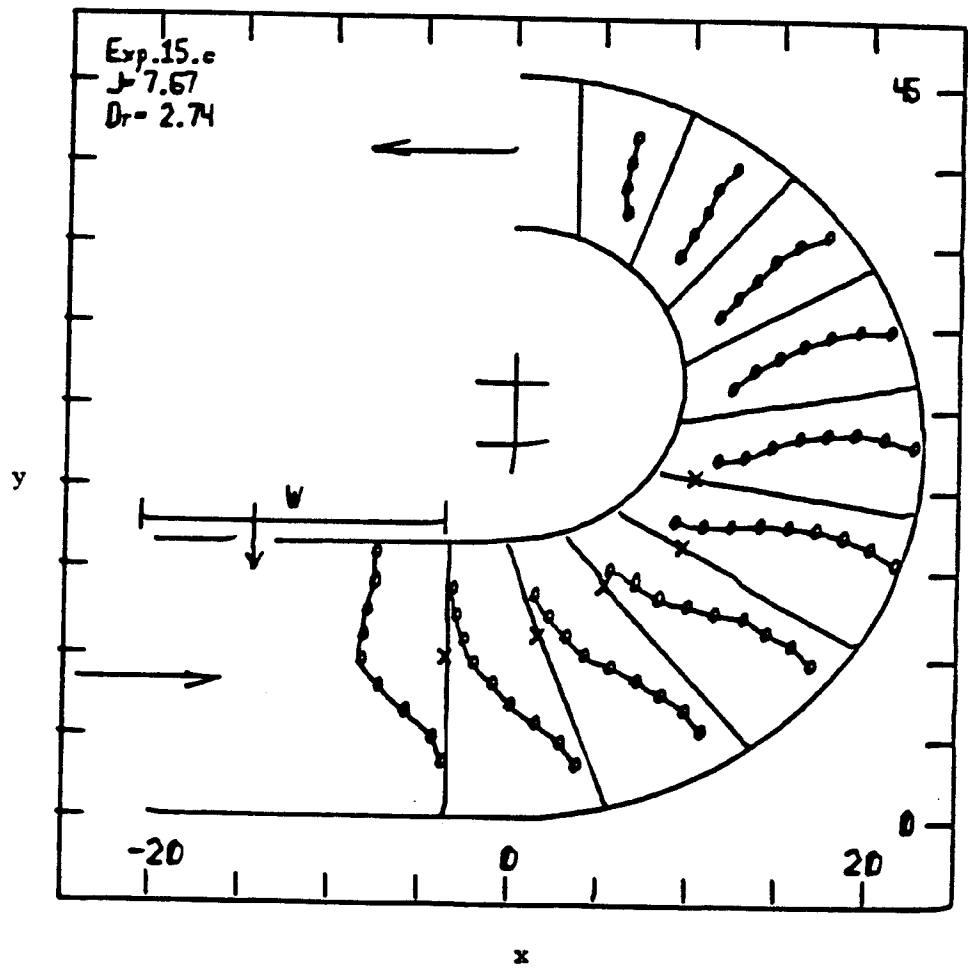

Figure 29. temperature distribution for a jet injected from the inner wall

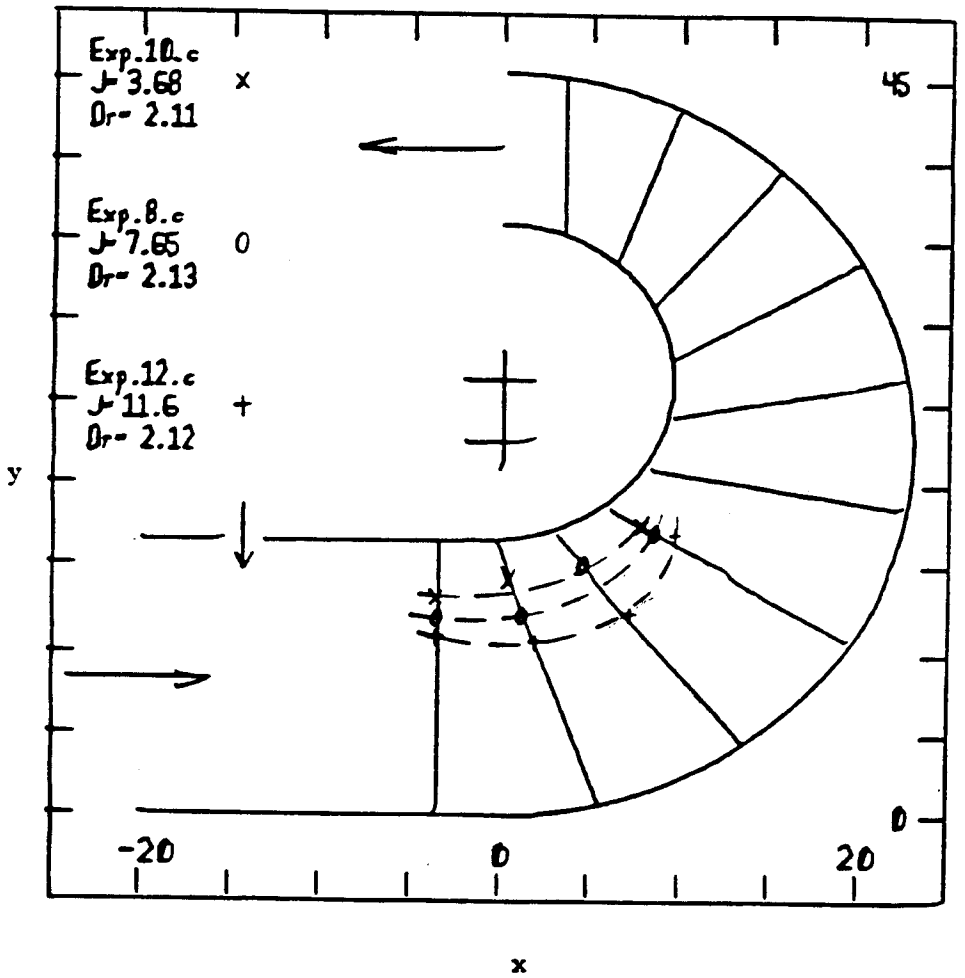

Figure 30a.

Figure 30a-b. Trajectories produced by jets of different J's and the same Dr's

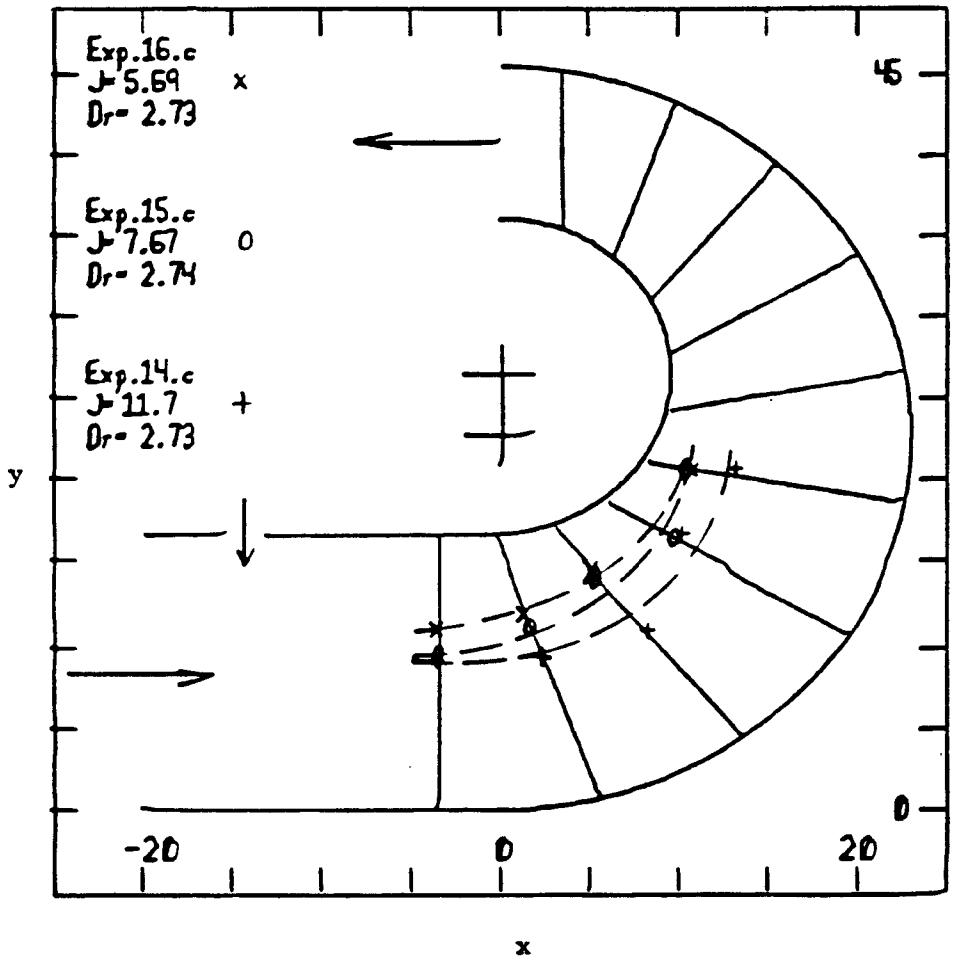
Exp.16.c
J= 5.69
Dr= 2.73
x
Exp.15.c
J= 7.67
Dr= 2.74
o
Exp.14.c
J= 11.7
Dr= 2.73
+
45
0
-20
0
20
y
x

Figure 30b.

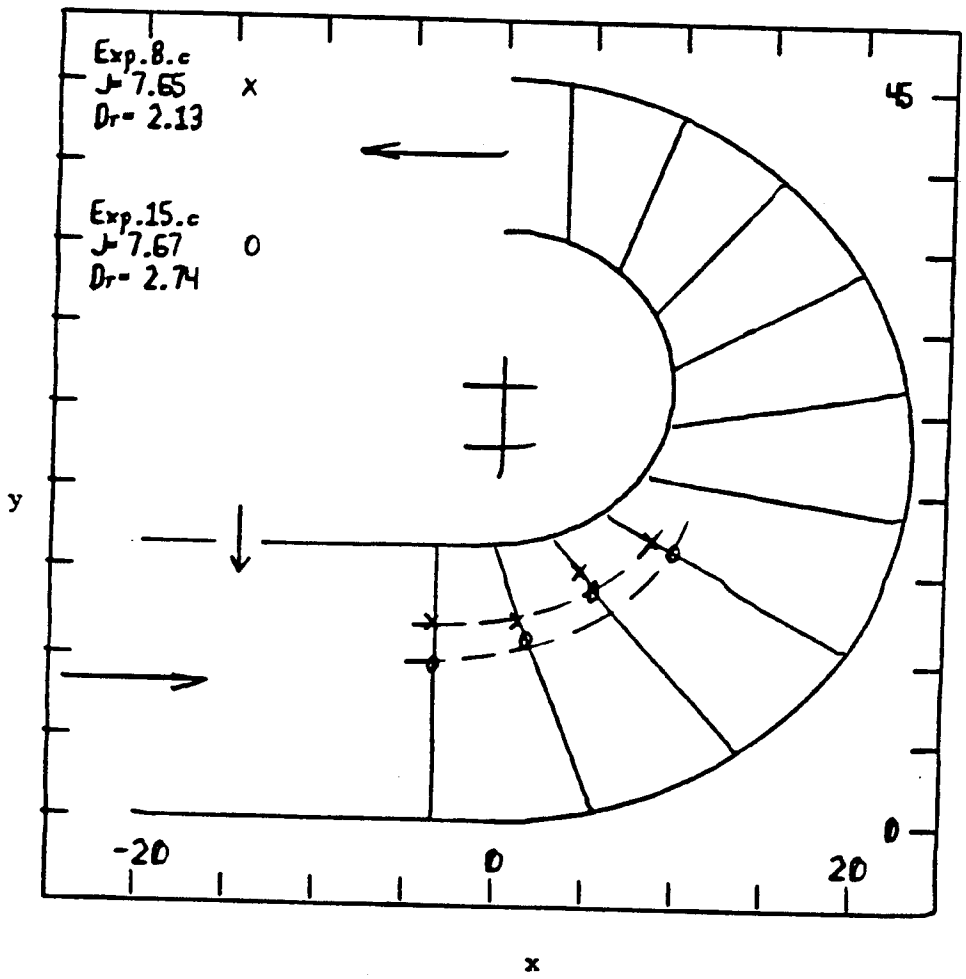

Figure 31a.

Figure 31a-b. Trajectories produced by jets of different Dr's and the same J's

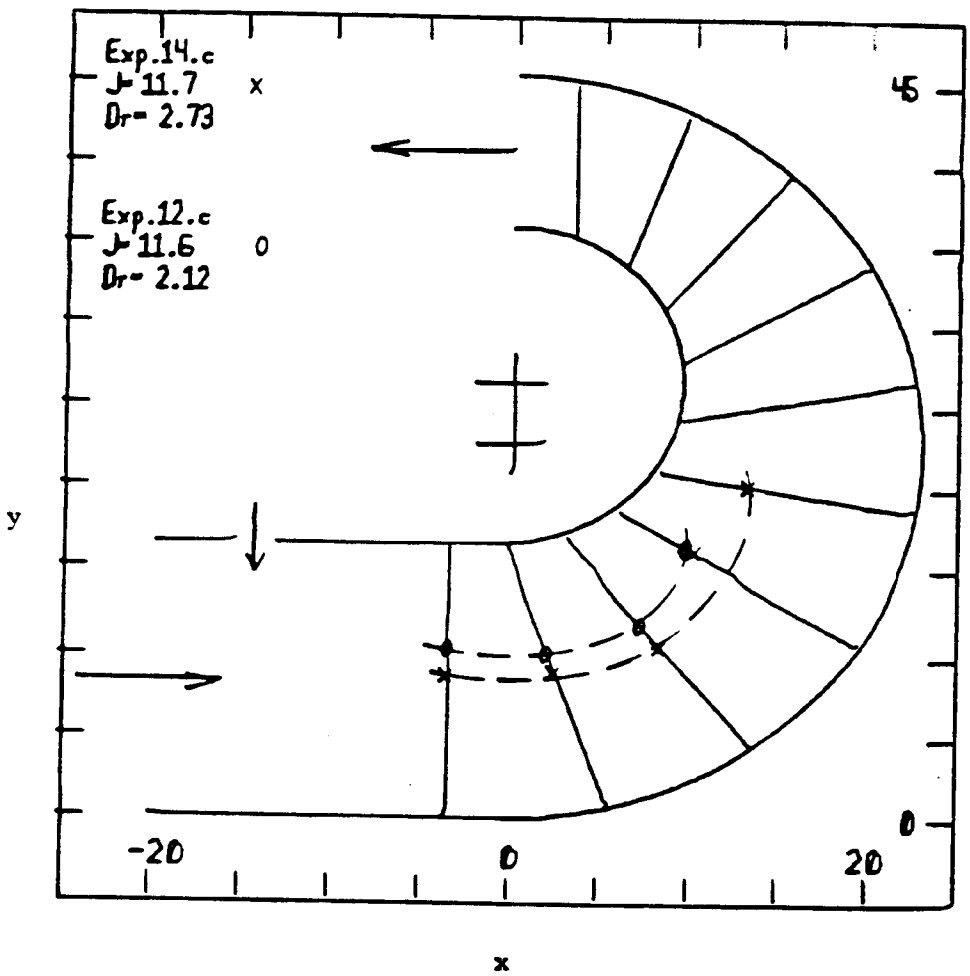

Figure 31b.

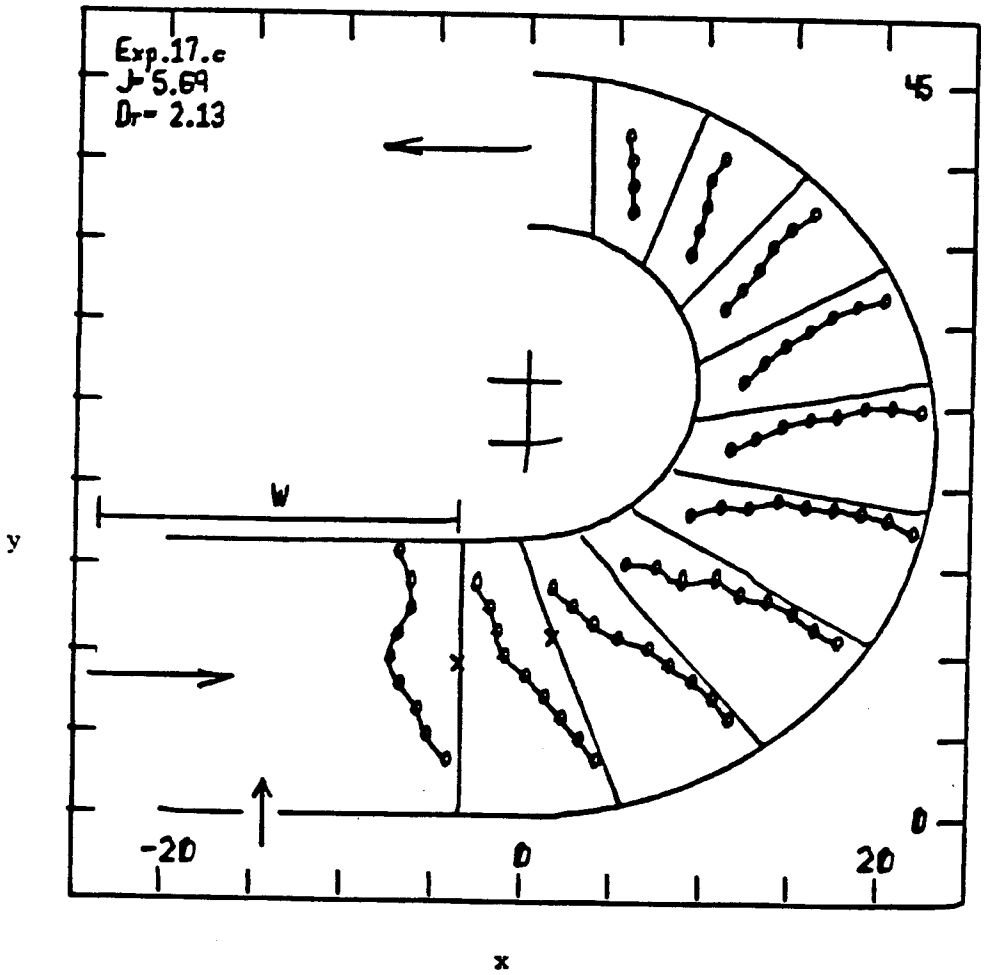

Figure 32. Temperature distribution for a jet injected from the outer wall

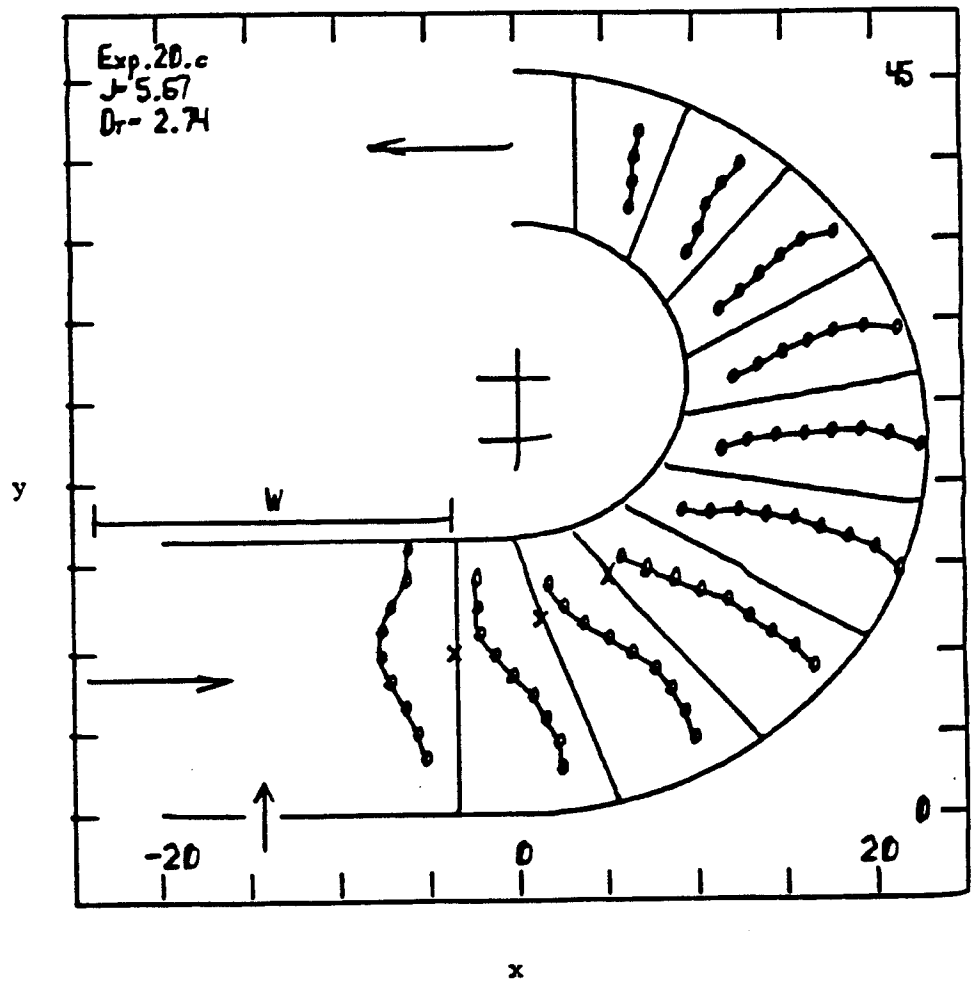

Figure 33. temperature distribution for a jet injected from the outer wall

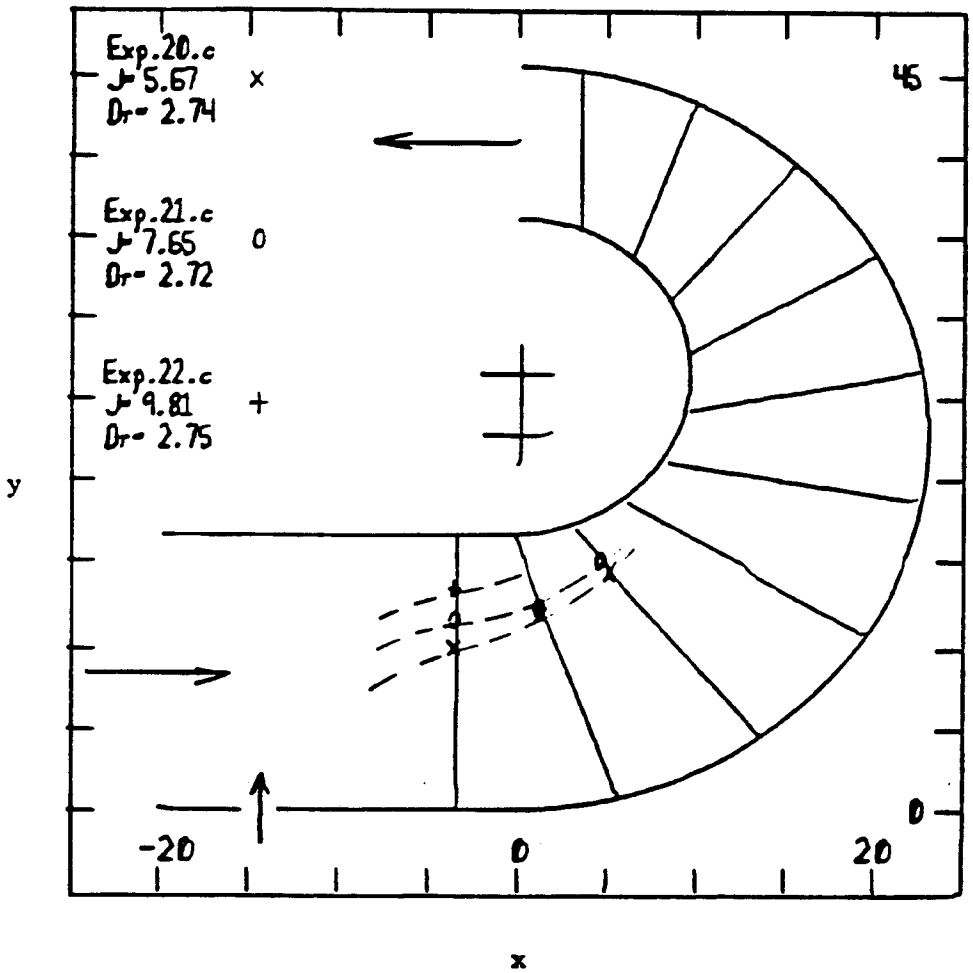

Figure 34. Trajectories produced by jets of different J's and the same Dr's

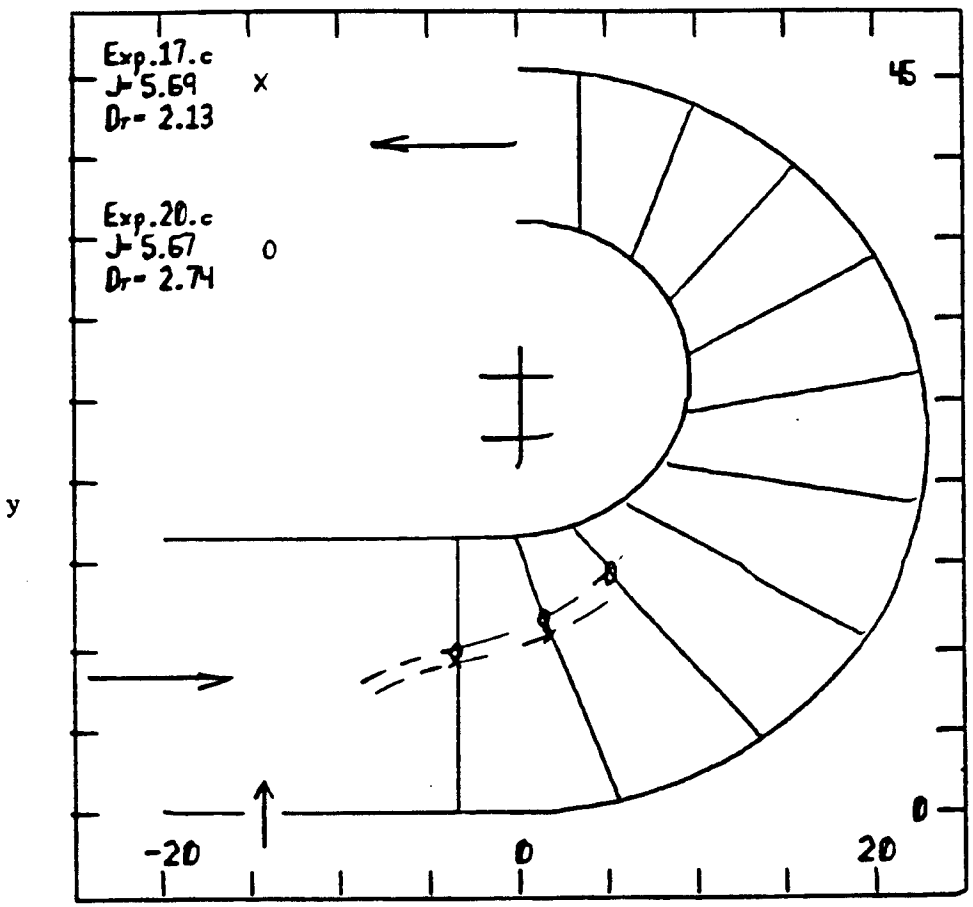

Figure 35. Trajectories produced by jets of different Dr's and the same J's

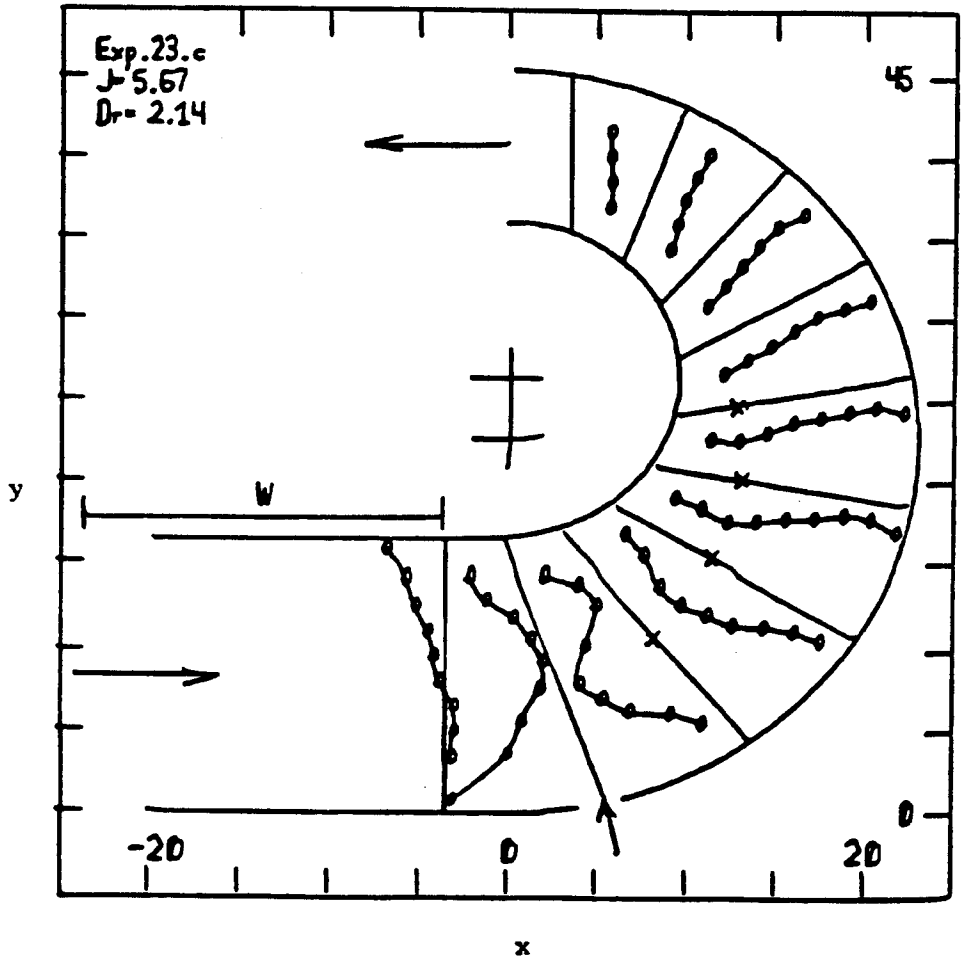

Figure 36. Temperature distribution for a jet injected from the outer bent wall

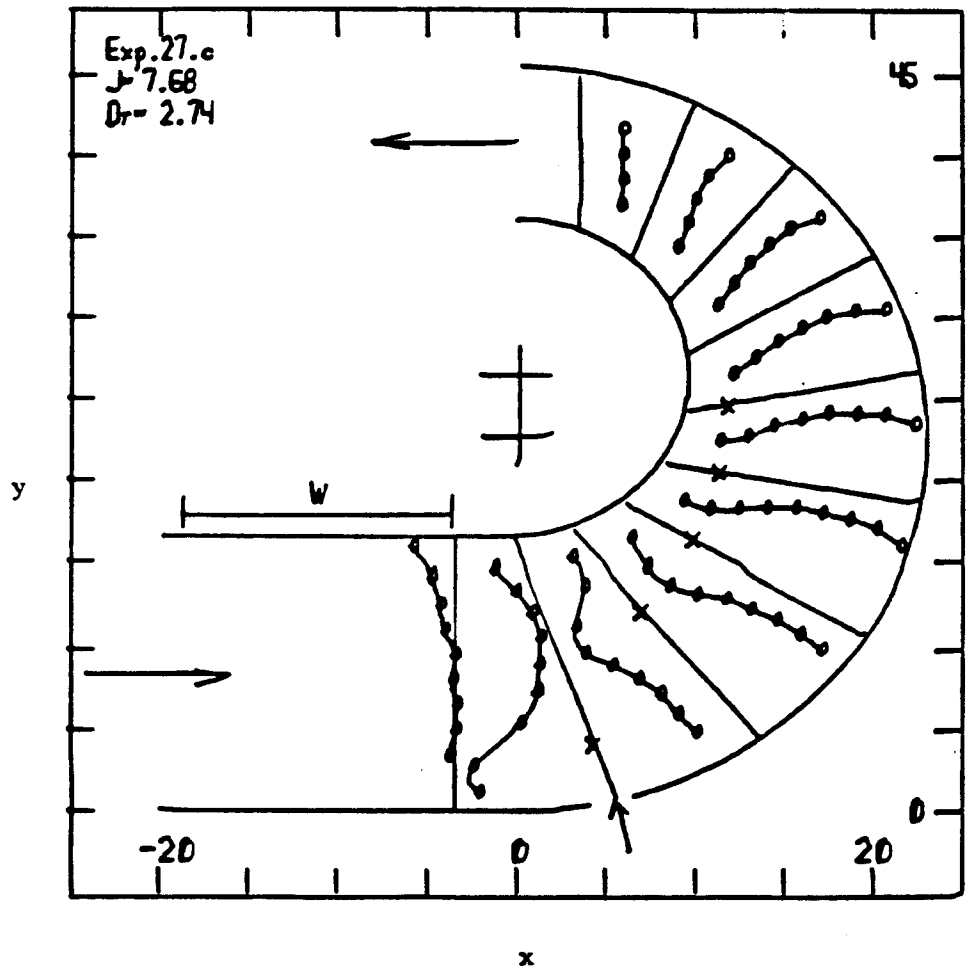

Figure 37. temperature distribution for a jet injected from the outer bent wall

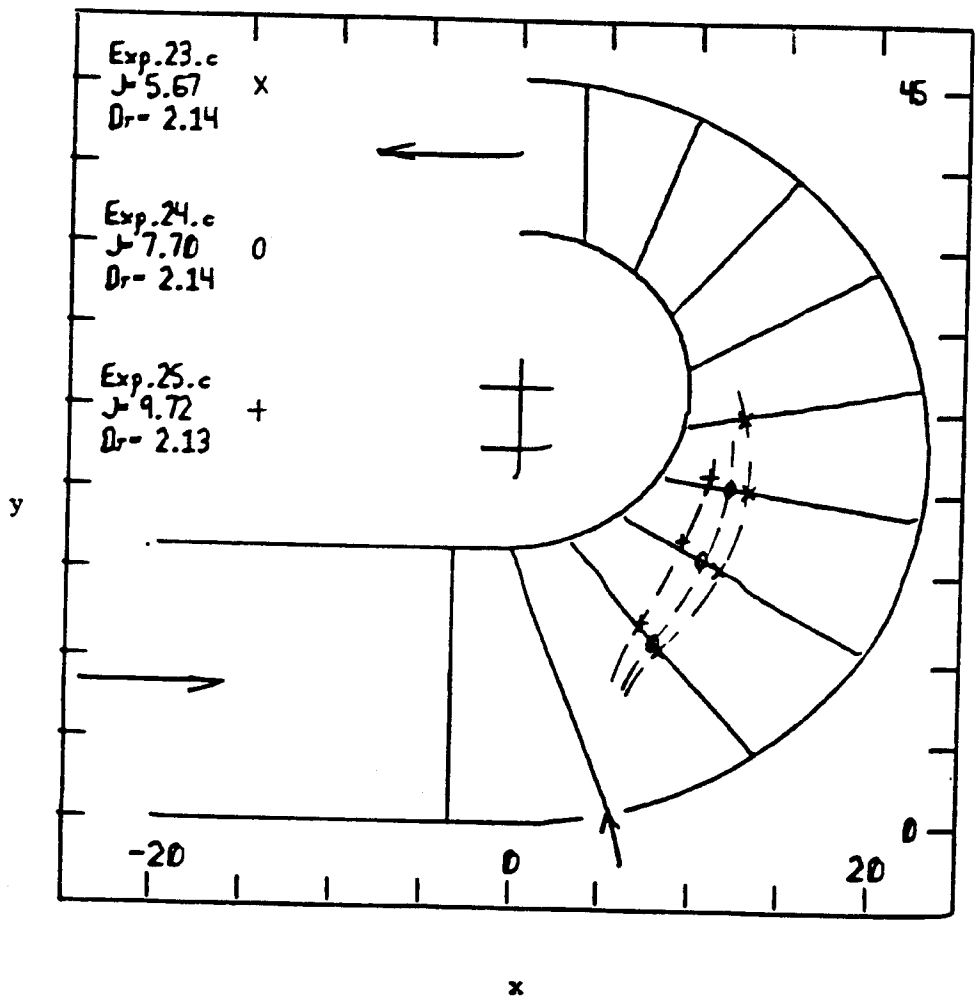

Figure 38. Trajectories produced by jets of different J's and the same Dr's

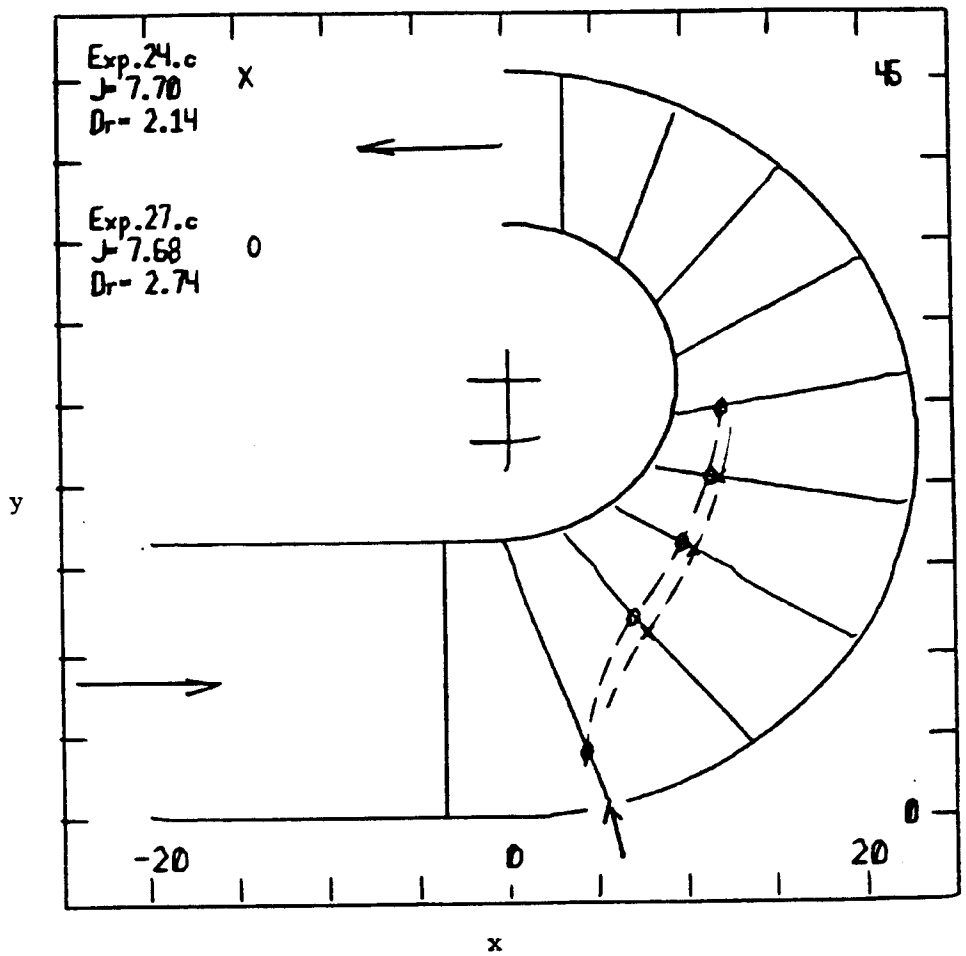

Figure 39a.

Figure 39a-b. Trajectories produced by jets of different Dr's and the same J's

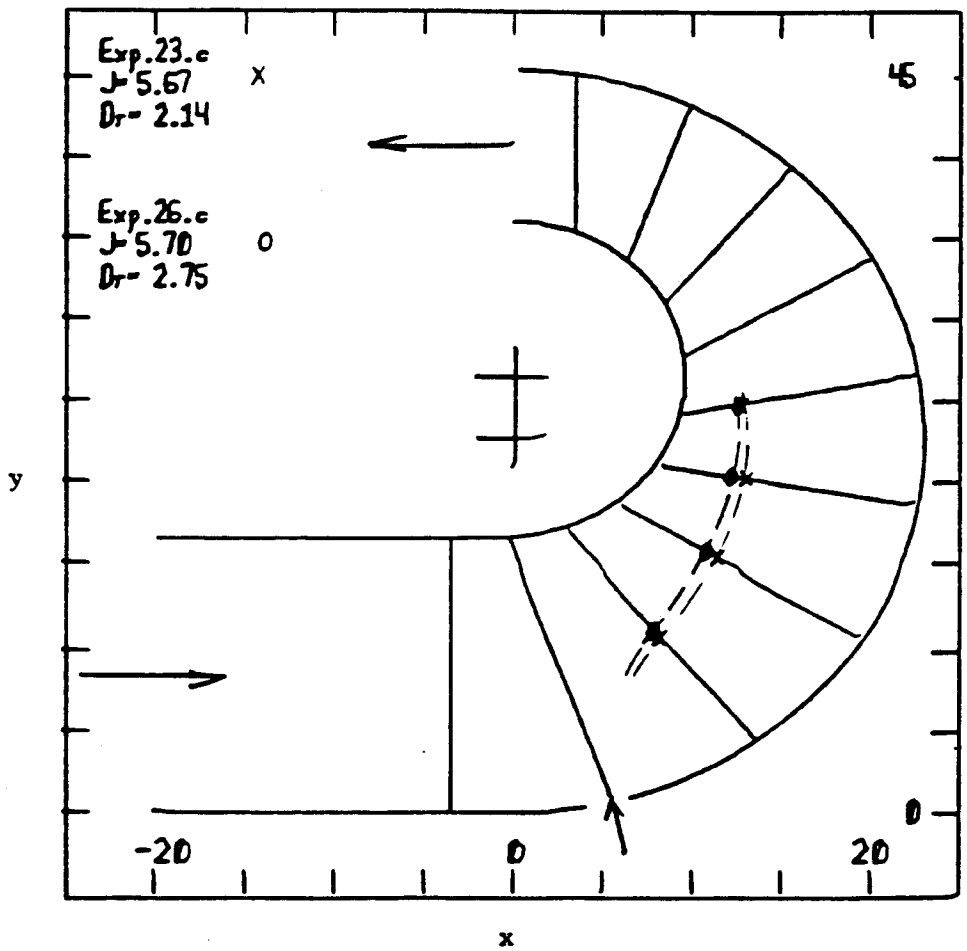

Figure 39b.

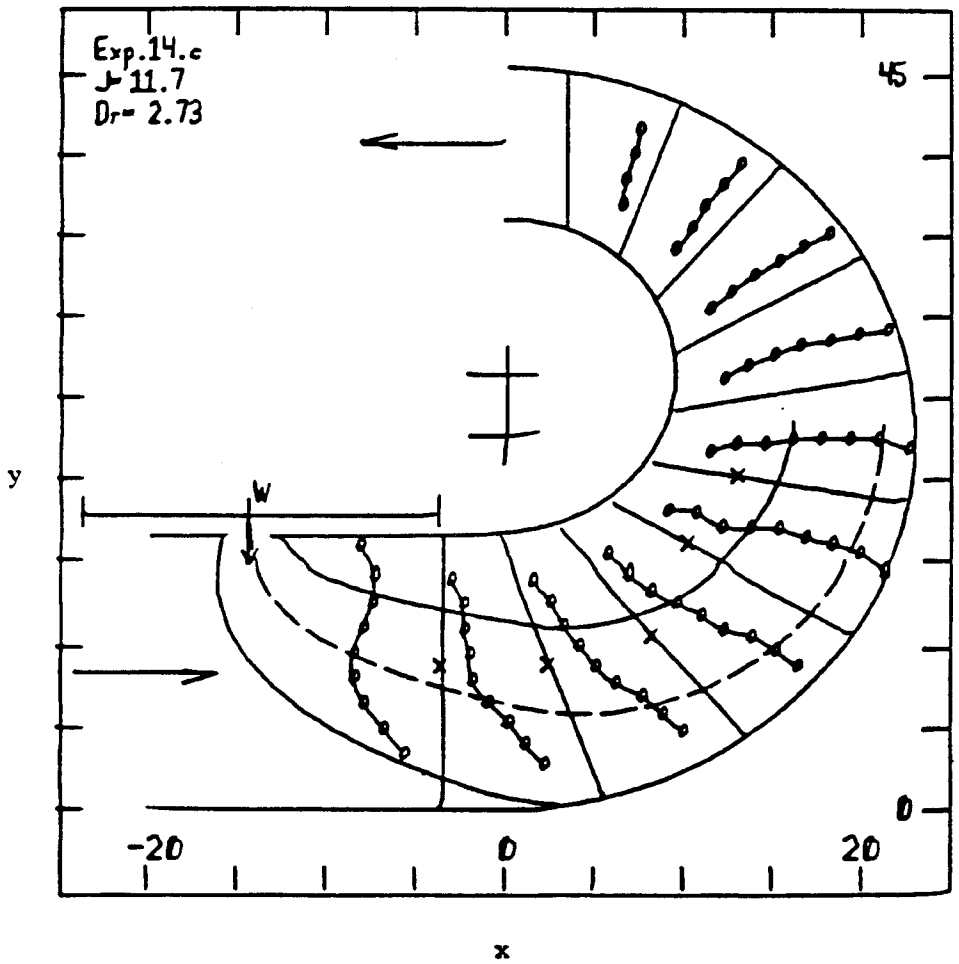

Figure 40. Comparison with model for a jet injected from the inner wall

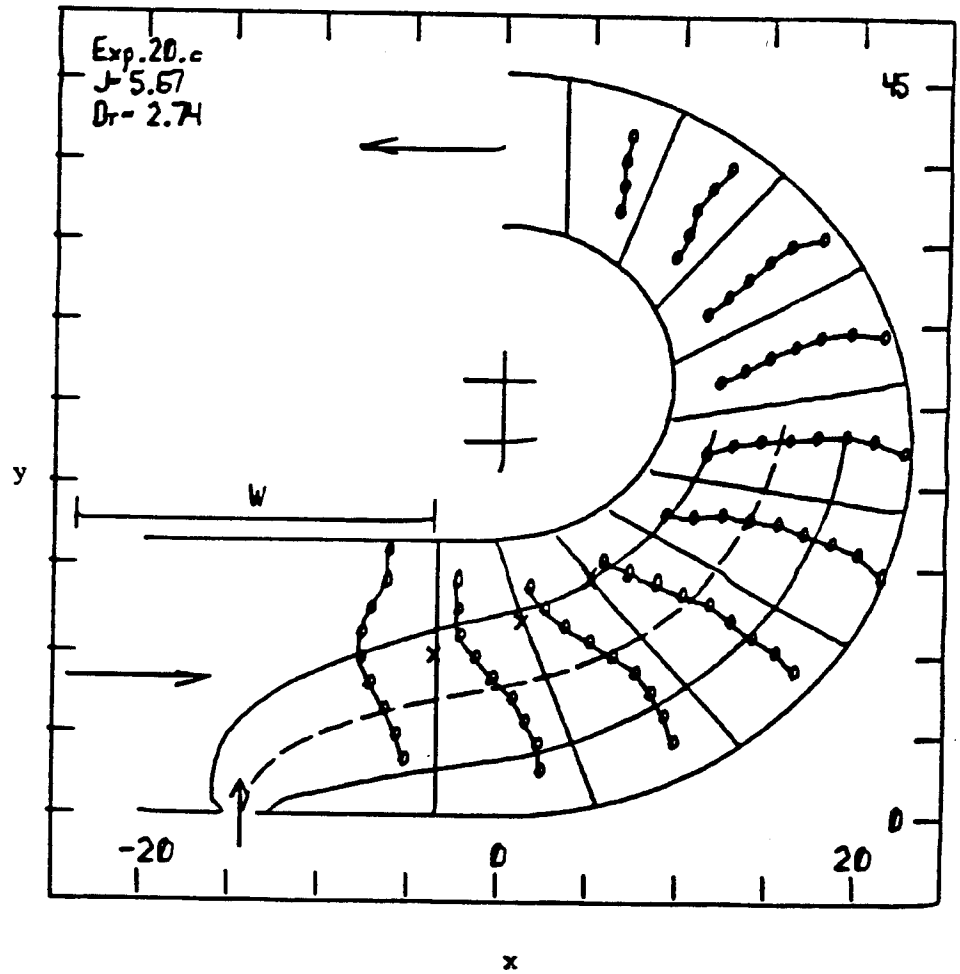

Figure 41. Comparison with model for a jet injected from the outer wall

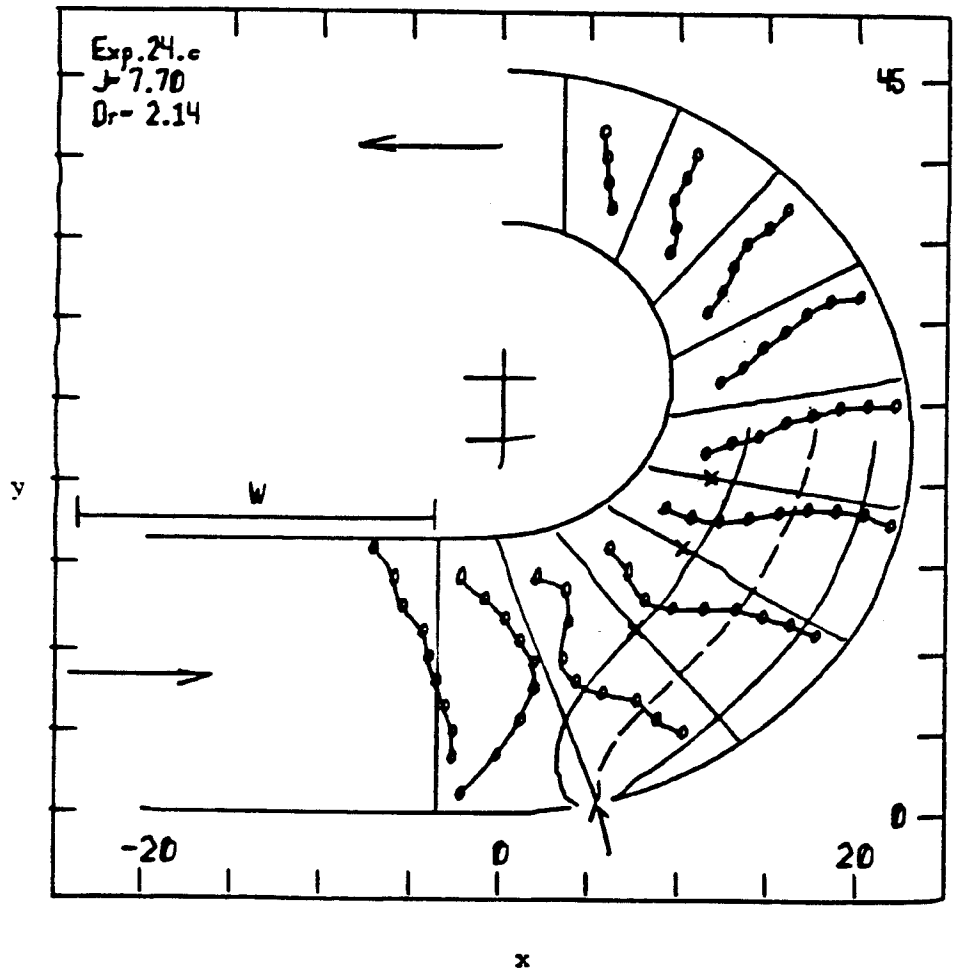

Figure 42. Comparison with model for a jet injected from the outer bent wall

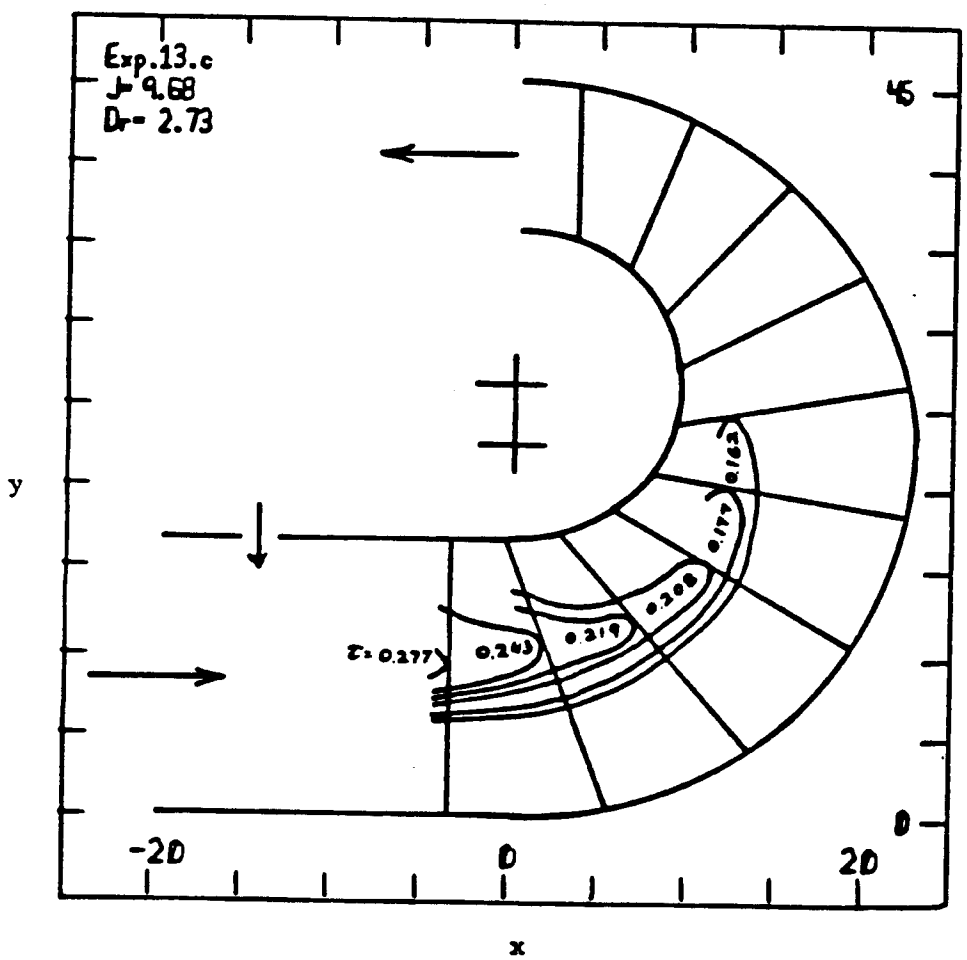

Figure 43. Longitudinal isotherms of a jet injected from the inner wall

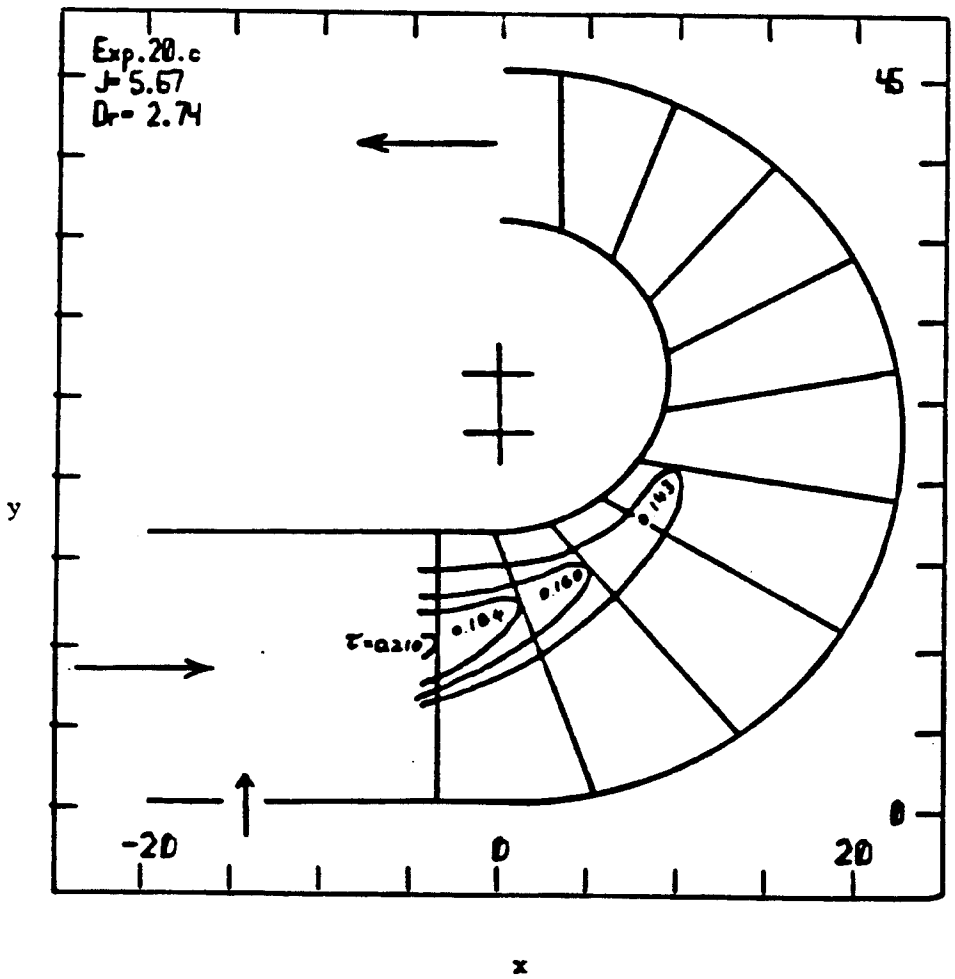

Figure 44. Longitudinal isotherms of a jet injected from the outer wall

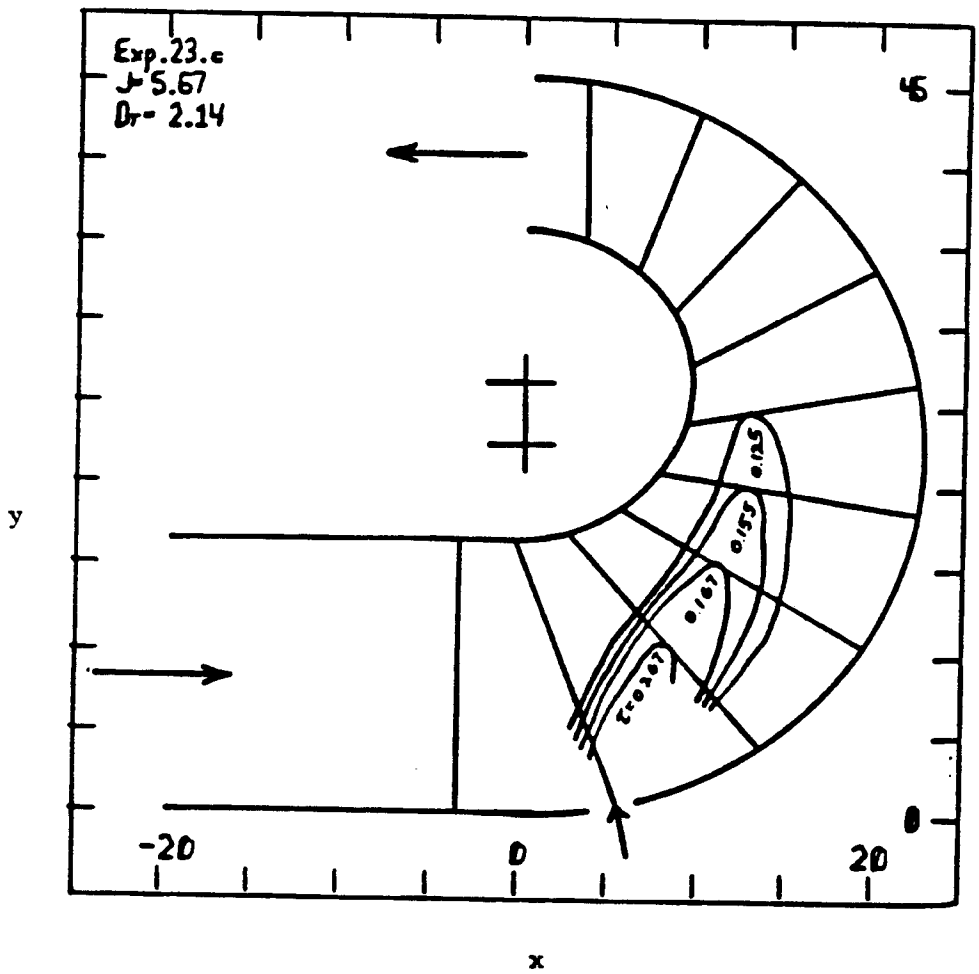

Figure 45. Longitudinal isotherms of a jet injected from the outer bent wall

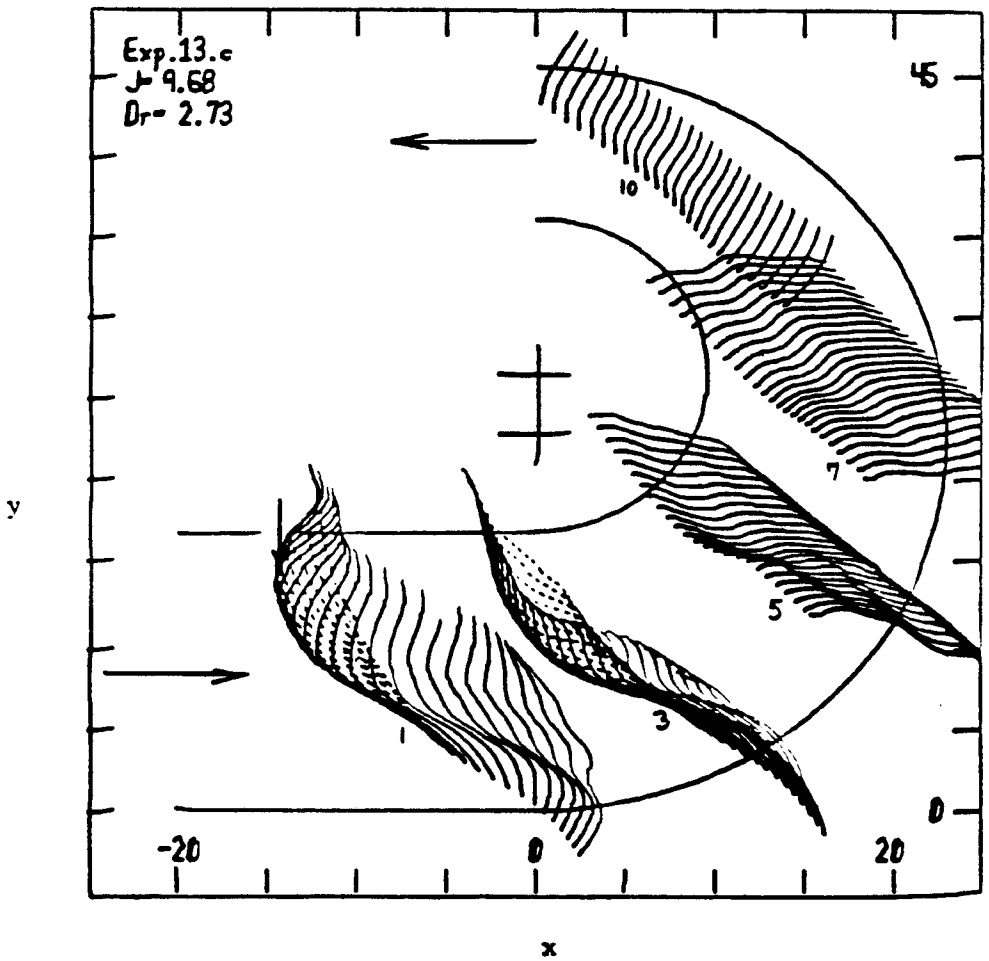

Figure 46. A 3-D view of the temperature field for a jet injected from the inner wall

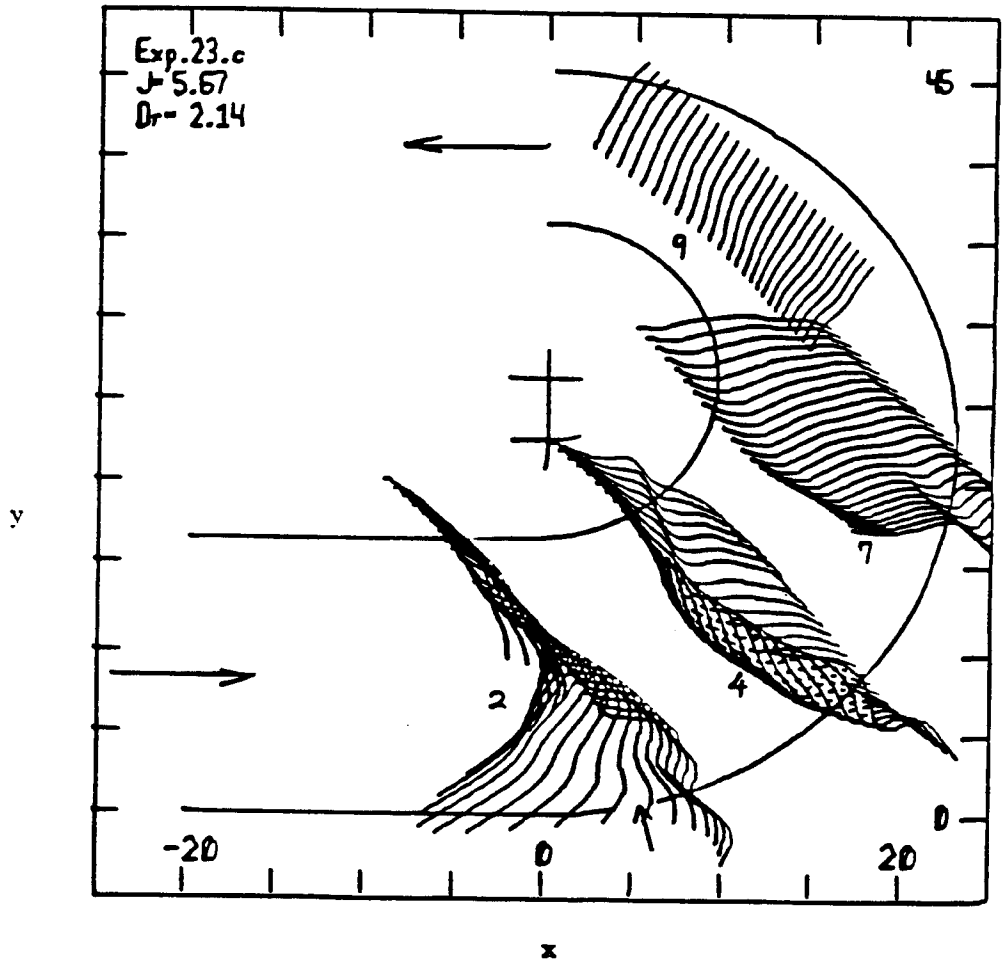

Figure 47. A 3-D view of the temperature field for a jet injected from the outer bent wall

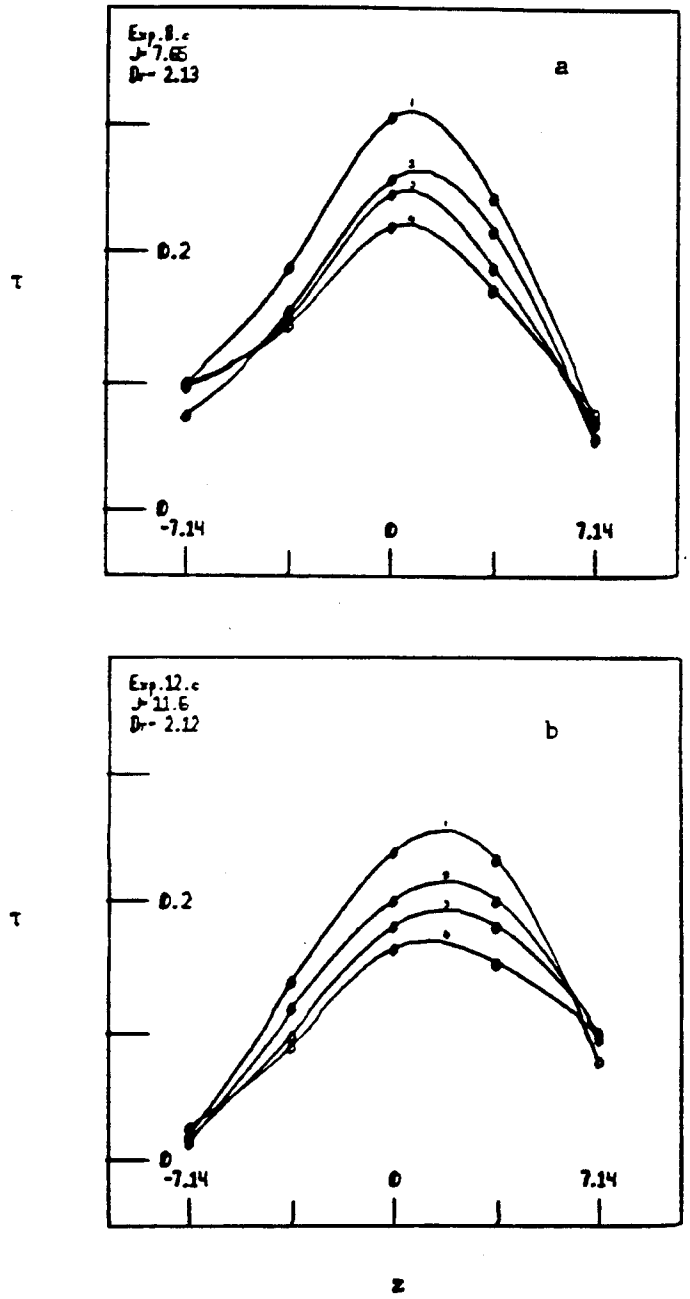

Figure 48a-b. Lateral interpolated temperature distributions of jets injected from the inner wall

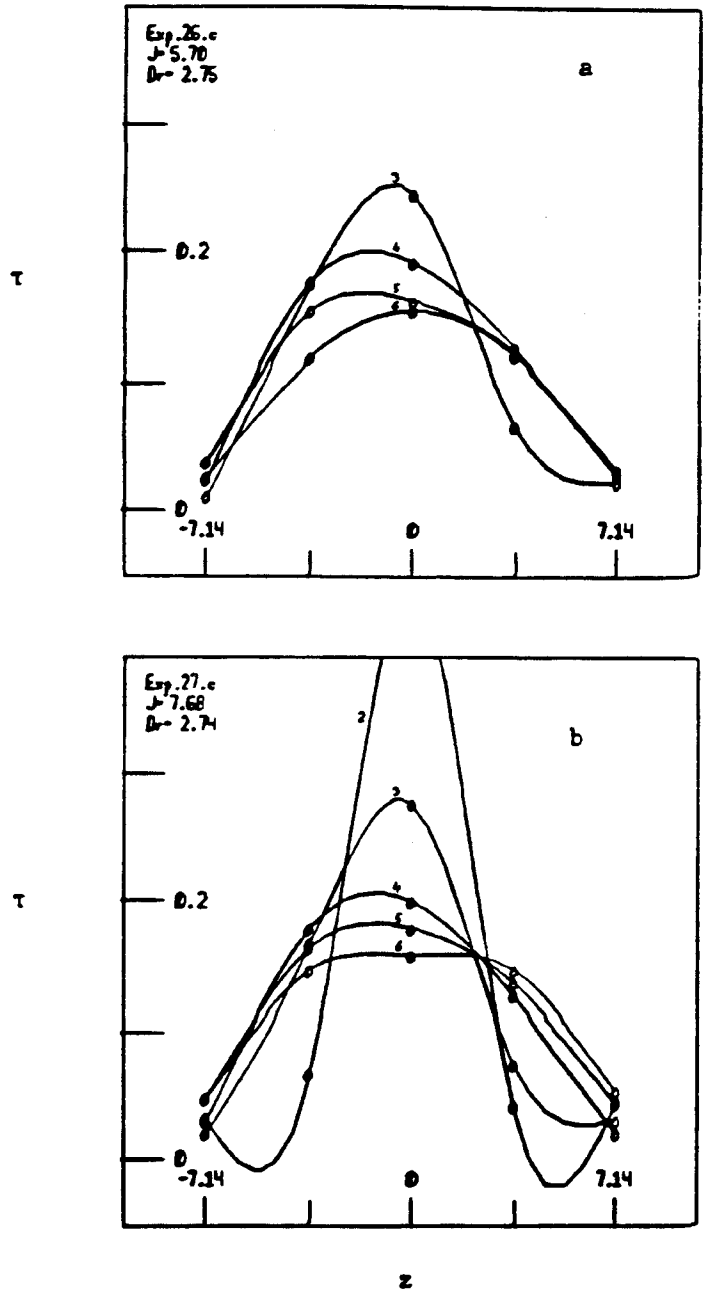

Figure 49a-b. Lateral interpolated temperature distributions of jets injected from the outer bent wall

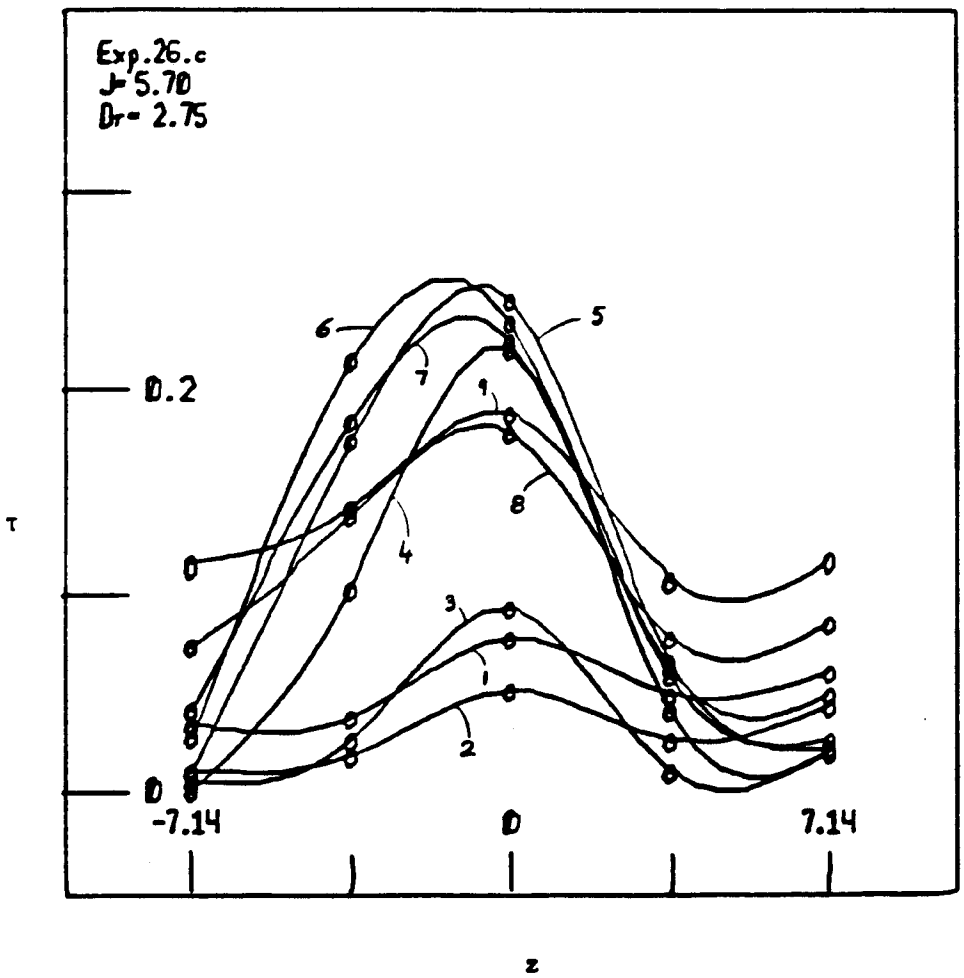

Figure 50. Typical lateral temperature distribution at different radial locations for the same azimuthal station

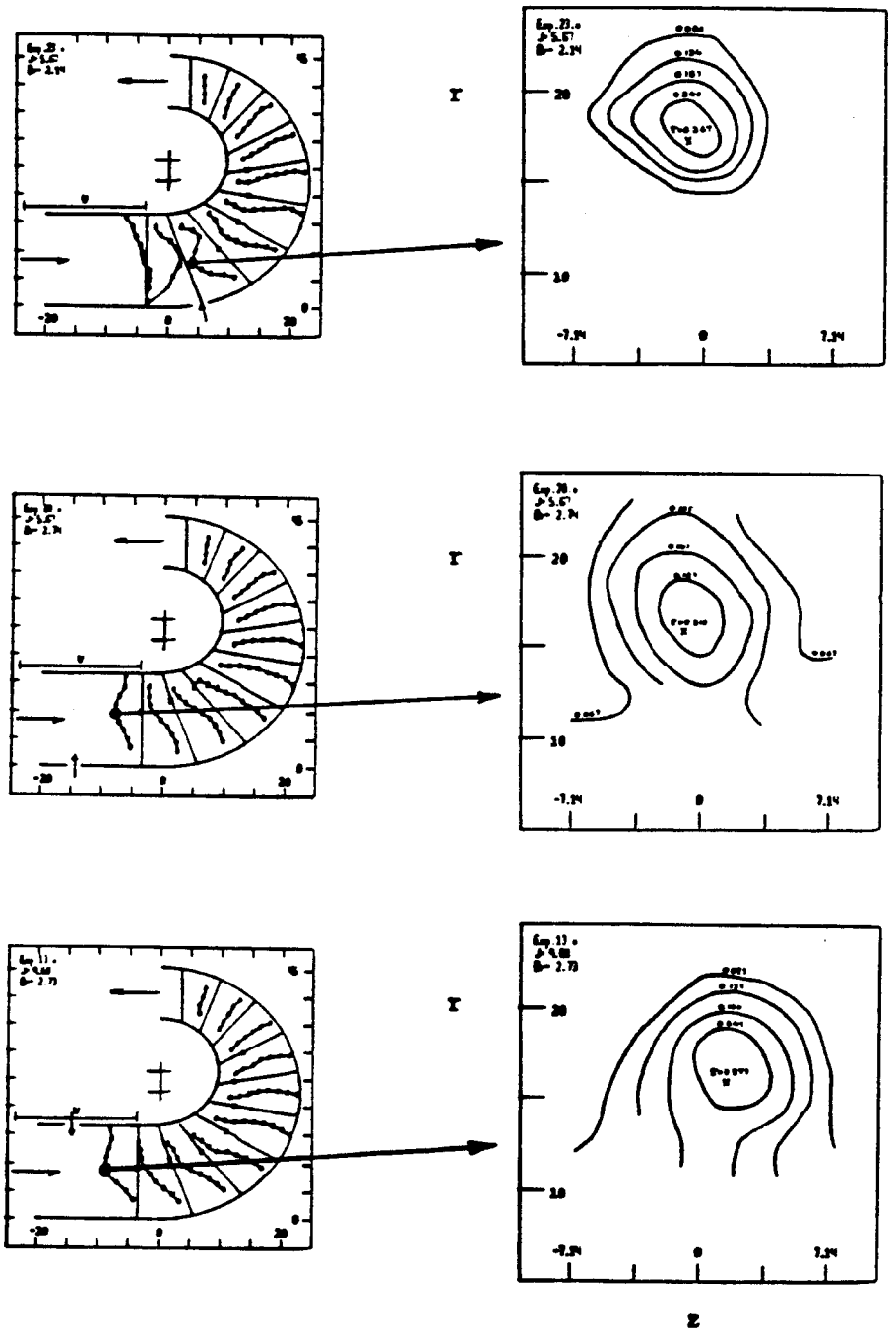

Figure 51. Typical lateral isotherms belonging to the three jet injection configurations

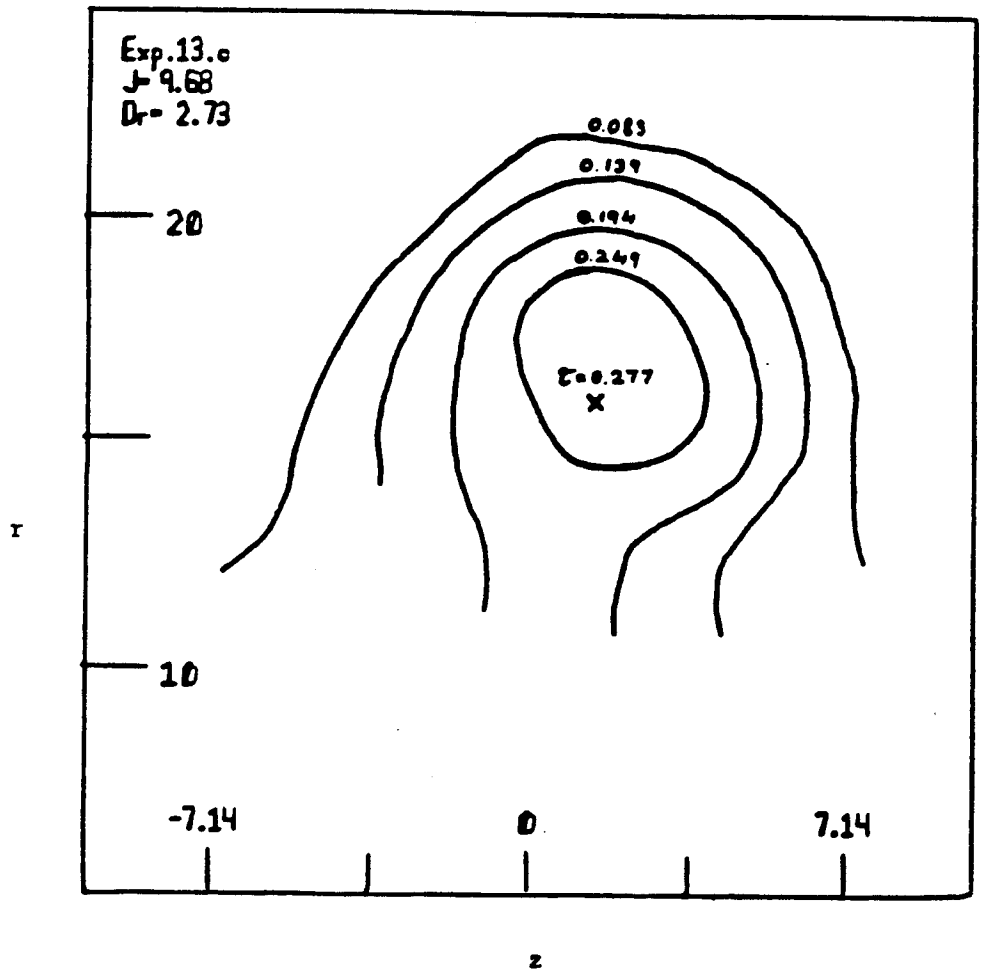

Figure 52. Interpolated lateral isotherms at azimuthal station no. 1 for a jet injected from the inner wall

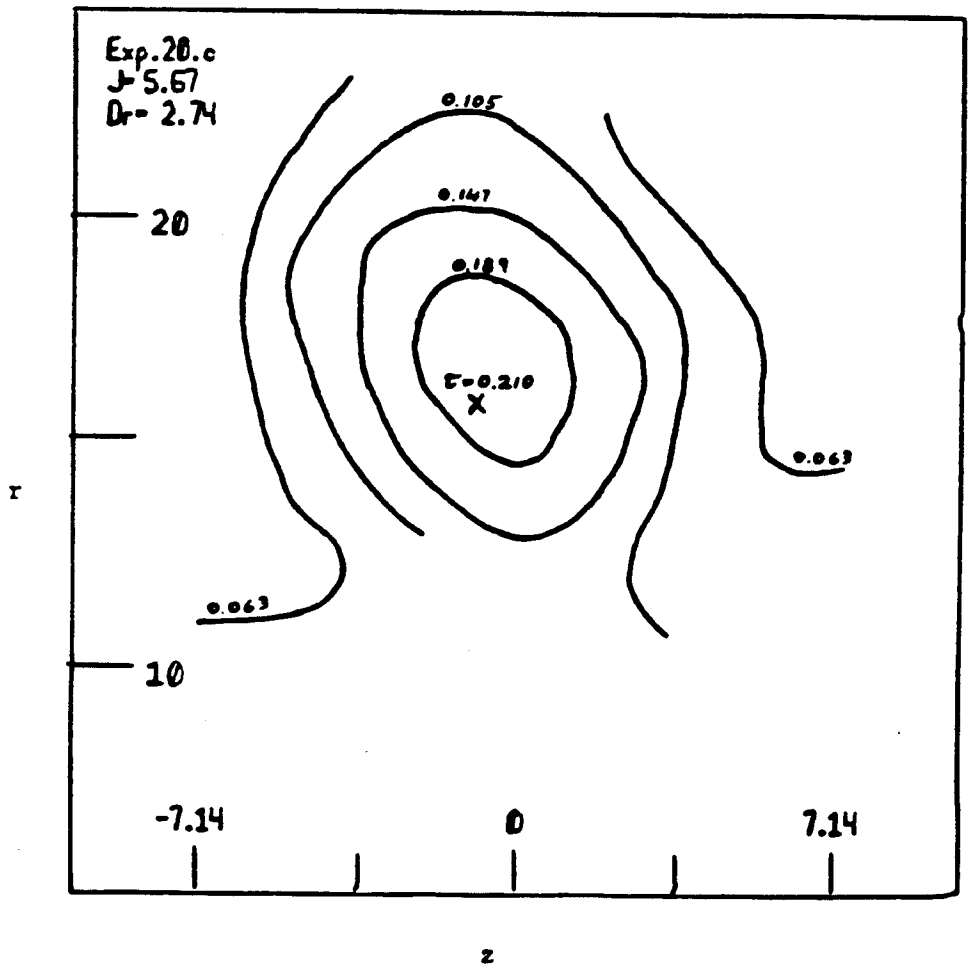

Figure 53. Interpolated lateral isotherms at azimuthal station no. 1 for a jet injected from the outer wall

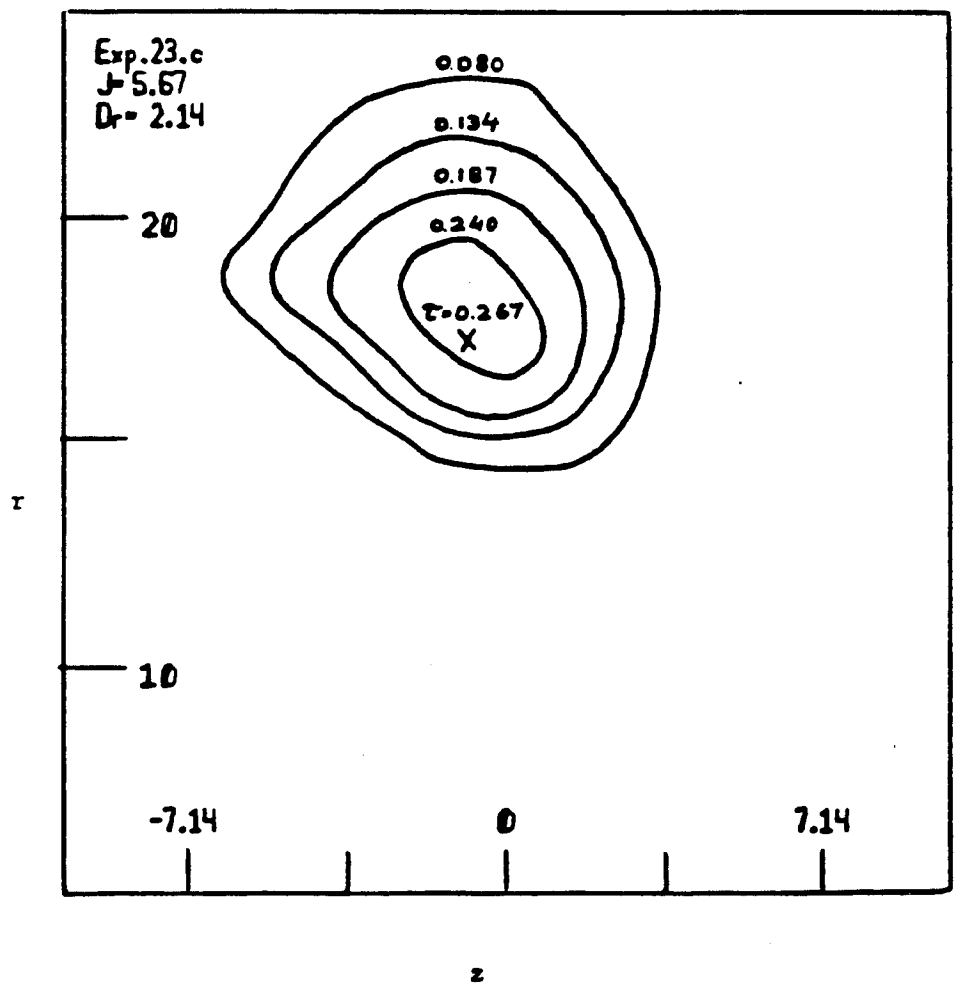

Figure 54. Interpolated lateral isotherms at azimuthal station no. 3 for a jet injected from the outer bent wall

CHAPTER VIII

ROW OF JETS IN A REVERSE FLOW COMBUSTOR

Experiments for row of jets were performed over the same ranges of momentum ratios and density ratios as the ones performed for the single jets. These experiments are also controlled by two additional characteristics: the spacing ratio Sr, and the confinement parameter H_o/b_o.

The spacing ratio varied between 2.67 and 9.21 and the confinement parameter has the value of 16.77 for jets injected prior to the bend and 16.95 for the jets injected into the bead. Each jet injection configuration was tested for three spacing ratios, starting with the smallest Sr possible, and followed by double and then triple that value. As mentioned before, the spacing ratios of the outer row of jets, the inner row of jets and the row of jets injected into the bend differ from each other because the injection ports are arranged along rays extended from the combustor center line.

The sampling of the data points, their location and processing, was carried out in the same way as done for the single jets experiments.

Figures 55 through 58 show results of experiments conducted for single and rows of jets injected from the inner wall, having fixed momentum and density ratios and variable spacing ratios.

Starting with figure 55 which shows the temperature field created by a single jet ($Sr \to \infty$), one can see that the tighter the spacing

ratio, the steeper the temperature gradients near the inner wall become. These sharp gradients are seen to exist as downstream as the exit station for the intermediate and tightest spacings of the jets. This behavior creates a whole region which envelopes the inner wall from entrance to exit and shields it from the hot cross flow. The identification of trajectory for the tight configuration becomes impossible as no extremum points are found within the region of measurements.

As can be seen in Figure 59, the temperature distribution of the closely spaced jet is essentially two-dimensional, a behavior which explains the strong attachment of the tightly spaced row of jets to the inner wall. As mentioned in chapter II, the height of the trajectory of a row of jets does not vary in a monotonic manner with changing spacing ratio. Kamotani and Greber however show [18] that once a tightly spaced row of jets is introduced into a confined cross flow, its trajectory is strongly suppressed by the cross flow which requires space to flow above the 2-D jet that evolved from the merging row of jets. This effect, in conjunction with the drifting across the channel, are probably the mechanisms which keep the closely spaced row of jets attached to the inner wall.

Figure 60 shows a comparison between the trajectories produced by a single jet and two differently spaced row of jets. The single jet trajectory is distinctively higher than those of the row of jets, which although are not of tightest spacing, are still close enough to be subject to the confinement effect.

It should be remembered that these are thermal and not velocity trajectories, which have been shown by Kamotani and Greber to increasingly differ from each other with decreasing spacing ratio due to the strong recirculation zone produced.

Figure 61 shows results of two experiments for closely spaced row of jets, one of which is at low momentum ratio and the other at high momentum ratio. It can be seen that the general behavior is similar, and the change in effect on the outer cross flow appears to be minimal. It does however augment the characteristic thickness of the cool layer in about 25% inspite of the confinement of the cross flow.

Figures 62 through 65 show experimental results for differently spaced row of jets while the momentum and density ratios are kept constant. Figure 62 shows the high trajectory attained by a single jet, as compared with the following ones, which are increasingly suppressed with decreasing spacing ratio. This suppression effect can again be seen in Figure 66, where the single jet trajectory is much higher than either of the row of jet ones. The temperature profiles in Figure 62 through 65 all depict gradients significantly less steep than those produced by the inner row of jets. This shows that the mixing is stronger for the outer injection configuration than for the inner one. Here, there is no clear jet attachment to the outer wall, as the inner jets were attached to the inner wall. The unfavorable pressure gradient along the outer wall, coupled with the drifting effect, appears to overwhelm not only the centrifugal force, but

the confinement effect as well. Only in the case of closely spaced row of jets, the trajectory does not approach the inner wall. The three-dimensional perspective of such a jet is shown in Figure 67, where the two dimensional nature of the flow is depicted clearly. This, as before, explains why the tightly spaced row of jets is suppressed by the outer flow which cannot penetrate through and has to rise above the jet.

Figure 68 shows the 3-D view of the temperature field as measured for an intermediate spacing of the jets. The distribution at azimuthal station no. 1 shows the three dimensional nature of the flow close to the injection location; the distribution is seen to become uniform laterally fairly fast. The corresponding lateral temperature distribution is seen in Figure 69, where the profiles are numbered with respect to their azimuthal location, and are taken at the radial location where τ attains its peak value. Here again, the merging effect of the jets causes the lateral temperature fluctuation not to exceed 5% as early as at azimuthal sataion no. 3.

Starting with a single jet, Figures 70 through 73 show the variation of temperature distributions with spacing ratio for rows of jets injected from the outer bent wall.

The general behavior and mixing characteristics appear to follow those of rows of jets injected from the outer wall prior to the bend. This configuration, however, enables the exit temperature profiles to retain sharper gradients because they are closer to the injection ports. Here, as was also seen for the case of the single jet, the oncoming

cross flow temperature distribution, as measured at azimuthal station no. 1, is not meaningfully changed due to impingement on the jets issued downstream at station no. 2. This absence of upstream influence may be untrue for the velocity field.

Figure 74 shows the variation of trajectory with spacing ratio for fixed momentum and density ratios. Here again, the single jet trajectory is seen to reach the deepest point with respect to the injection port. As before, the row of jets are suppressed towards the outer wall with the tightest row of jets suppressed the most.

Figure 75 is a 3-D view of the temperature field produced by a closely spaced row of jets. The first profile, which was measured very close to the origin, shows the periodic character of these jets, which completely disappears by the next displayed set of profiles.

Figure 76 shows the 3-D view of the temperature distribution for a moderately spaced row of jets. The profiles show that the periodic behavior is retained well into the turn, but as before, smooths out towards the exit.

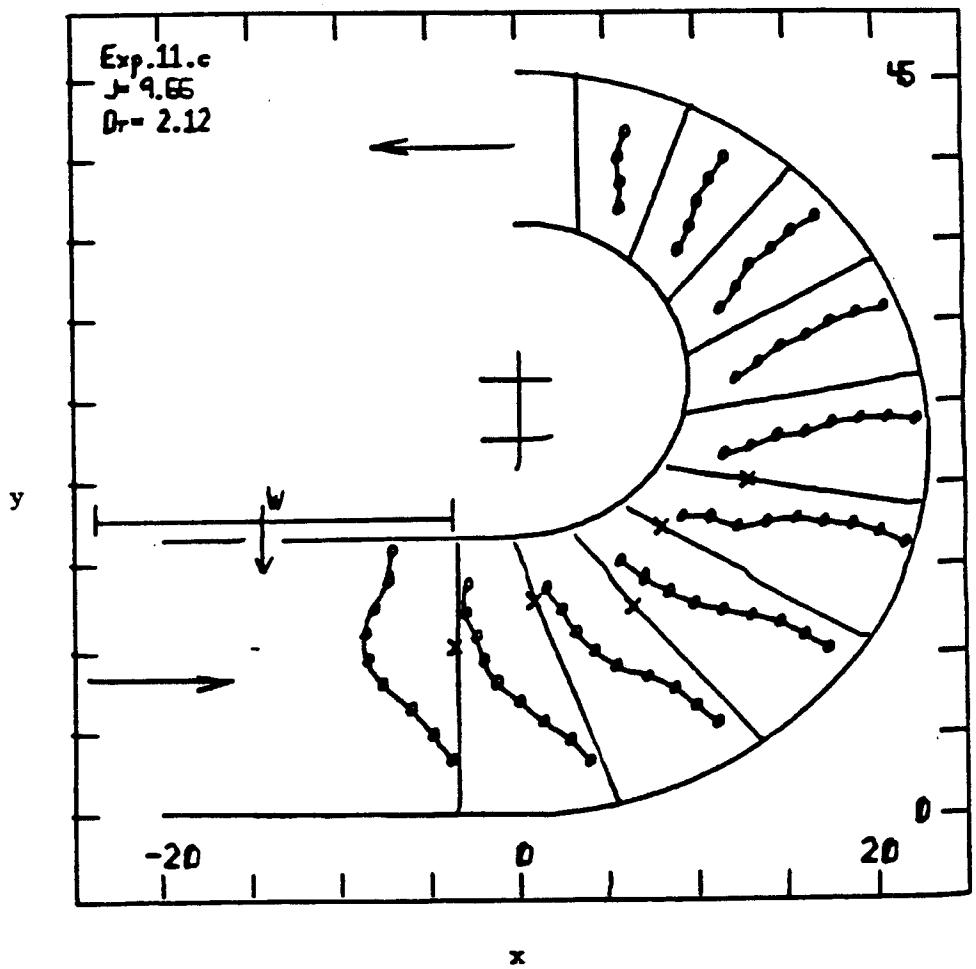

Figure 55. A single jet injected from the inner wall

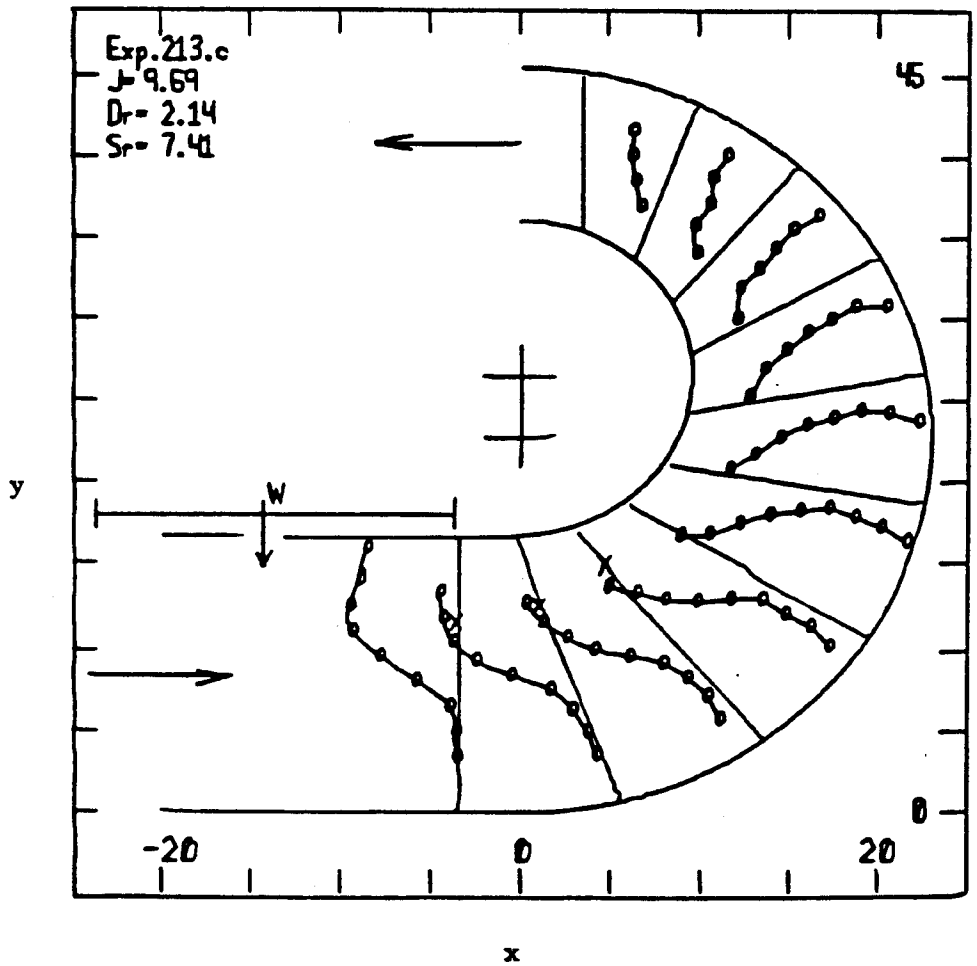

Figure 56. A widely spaced row of jets injected from the inner wall

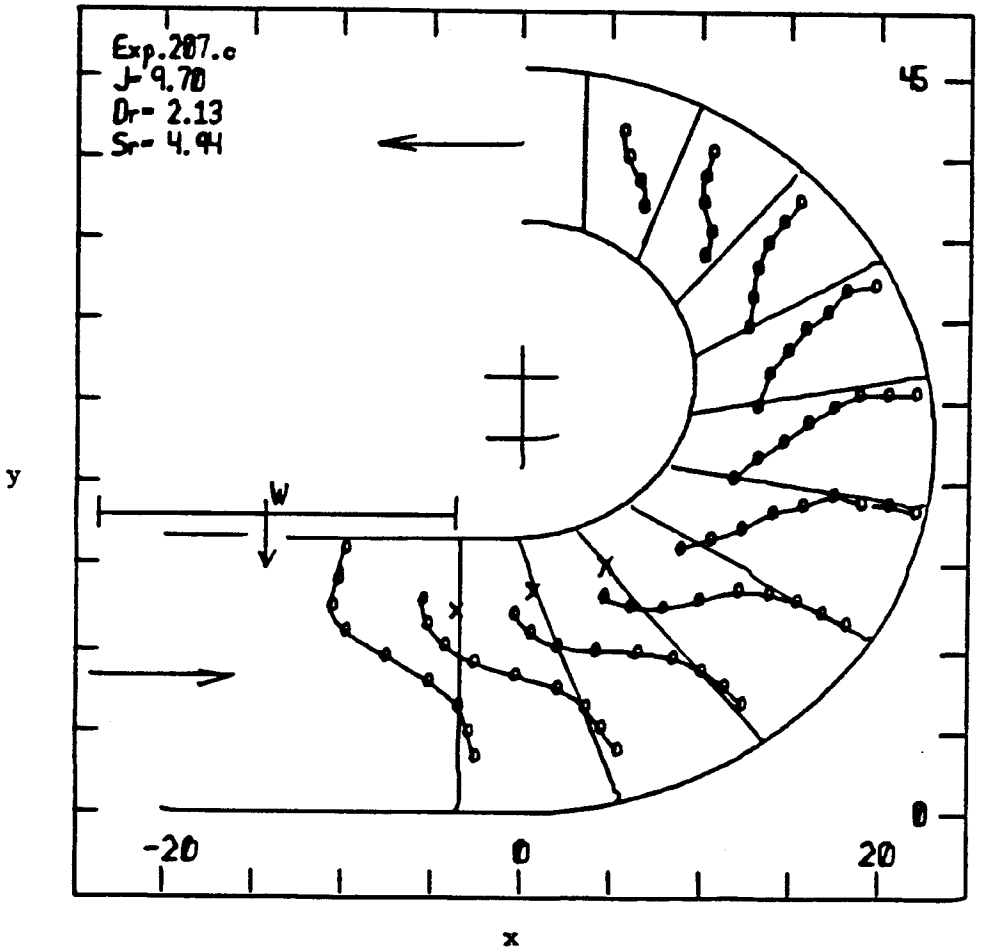

Figure 57. A moderately spaced row of jets injected from the inner wall

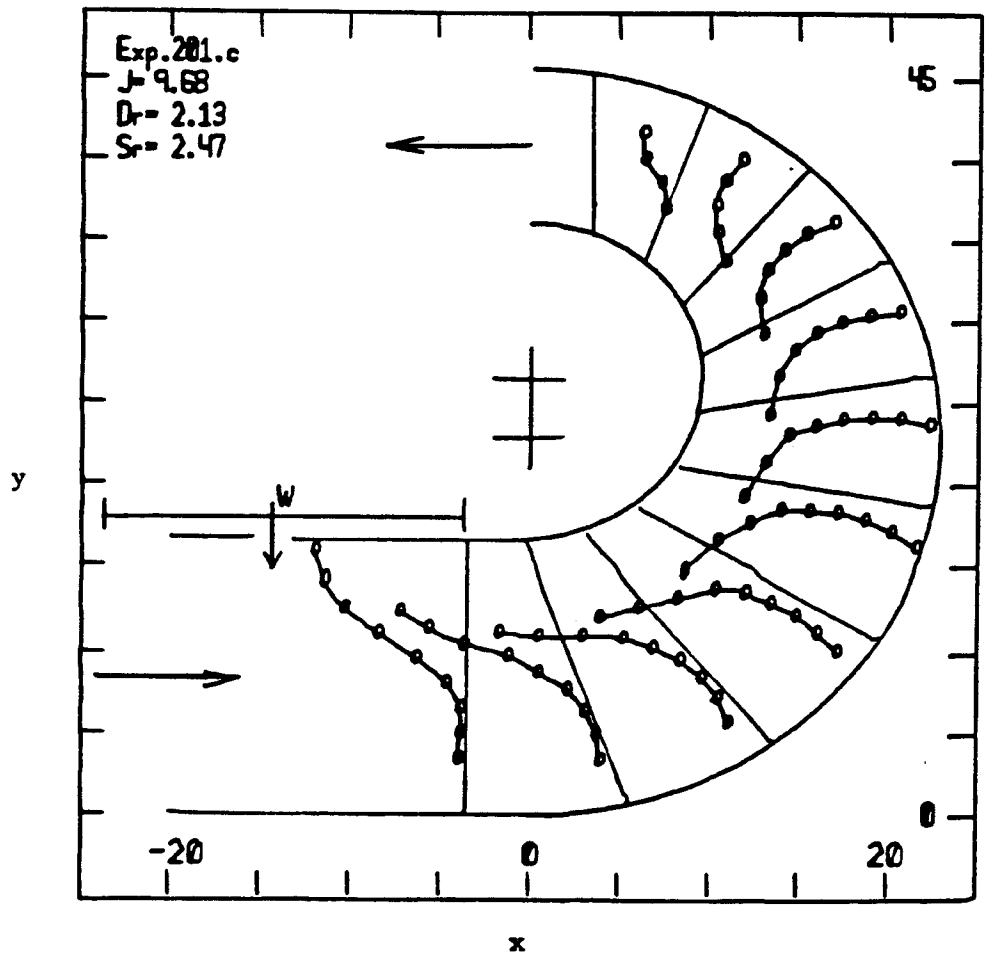

Figure 58. A closely spaced row of jets injected from the inner wall

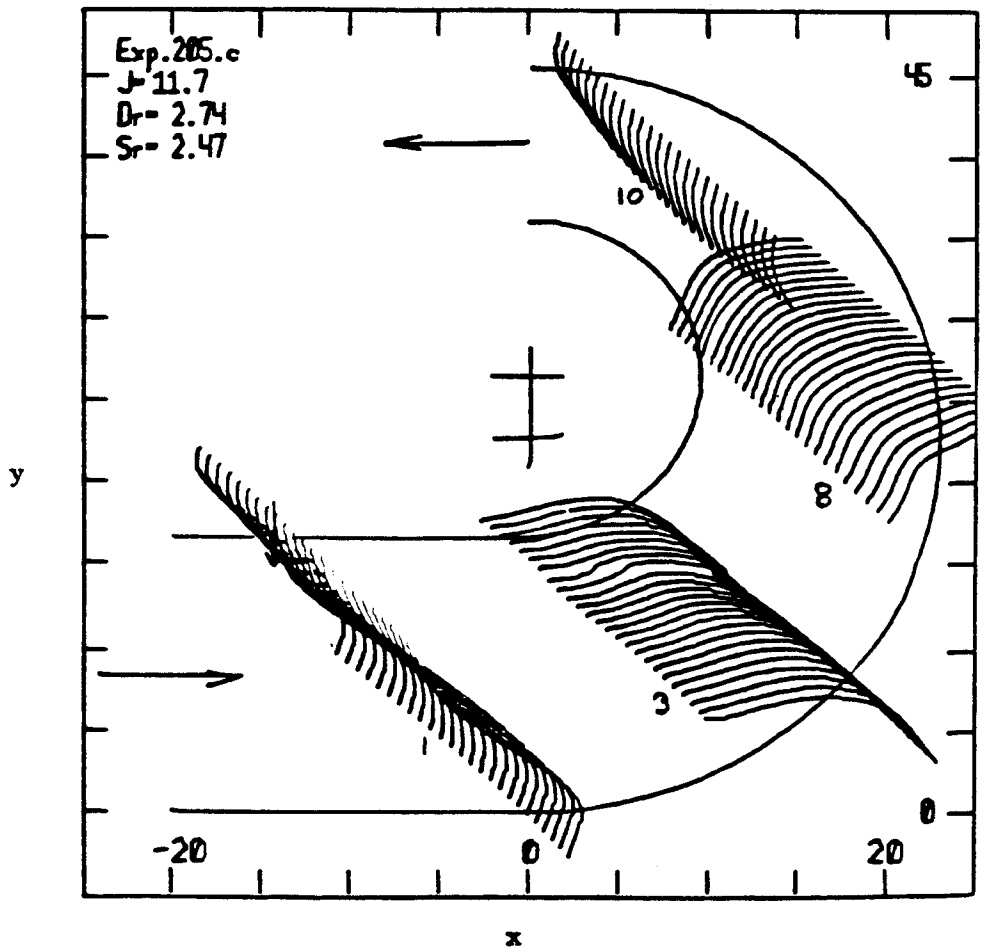

Figure 59. A 3-D view of a closely spaced row of jets injected from the inner wall

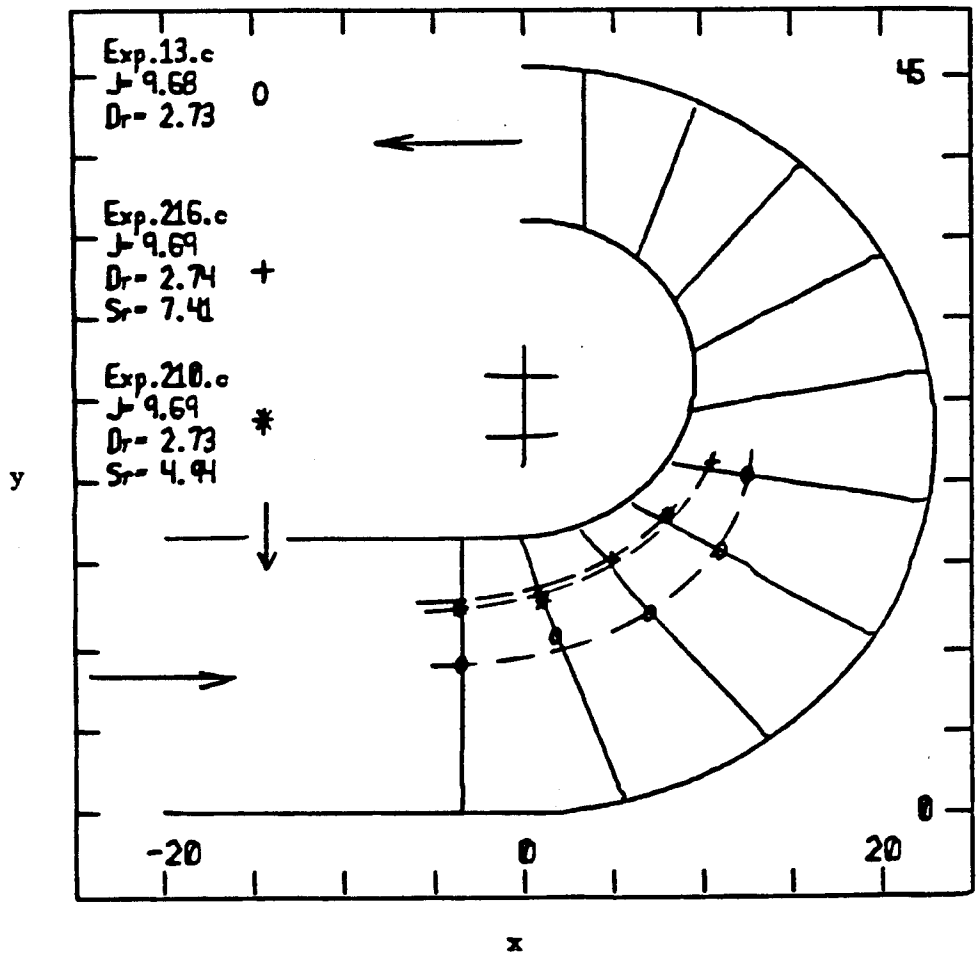

Figure 60. Comparison between trajectories of jets of different spacing ratios

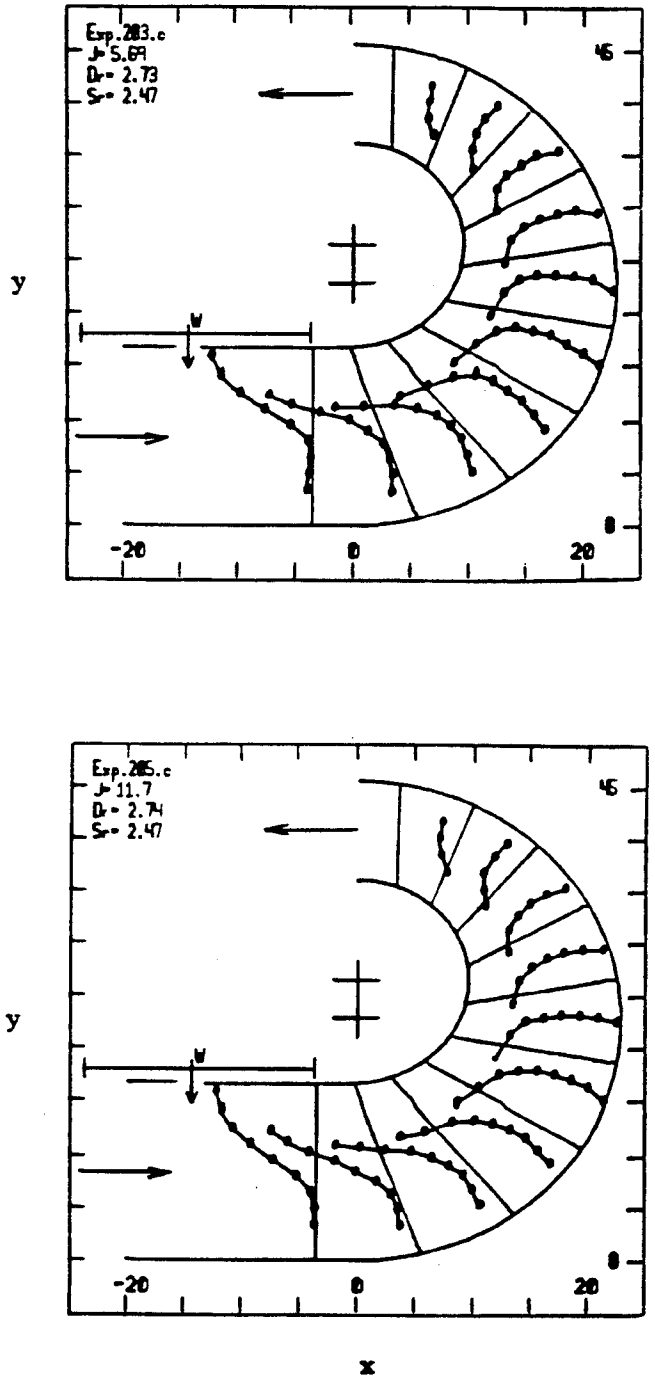

Figure 61. Low and high momentum closely spaced jets

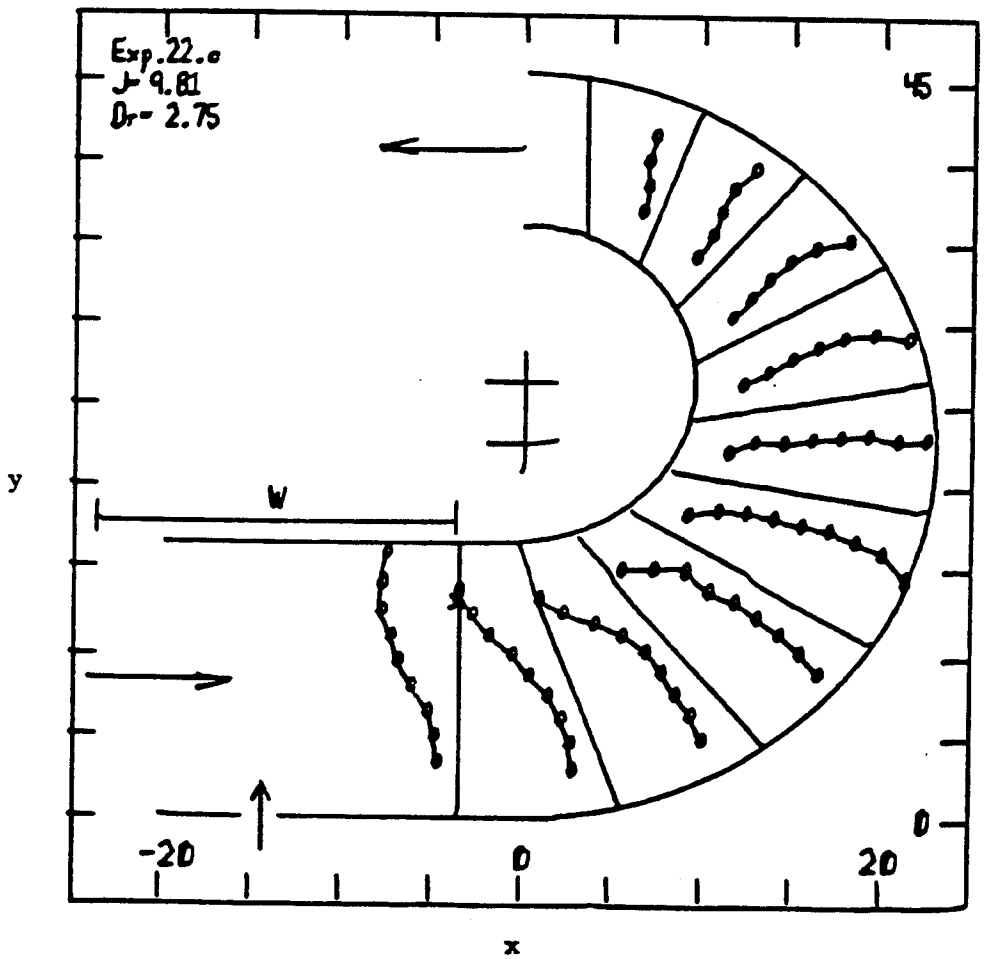

Figure 62. A single jet injected from the outer wall

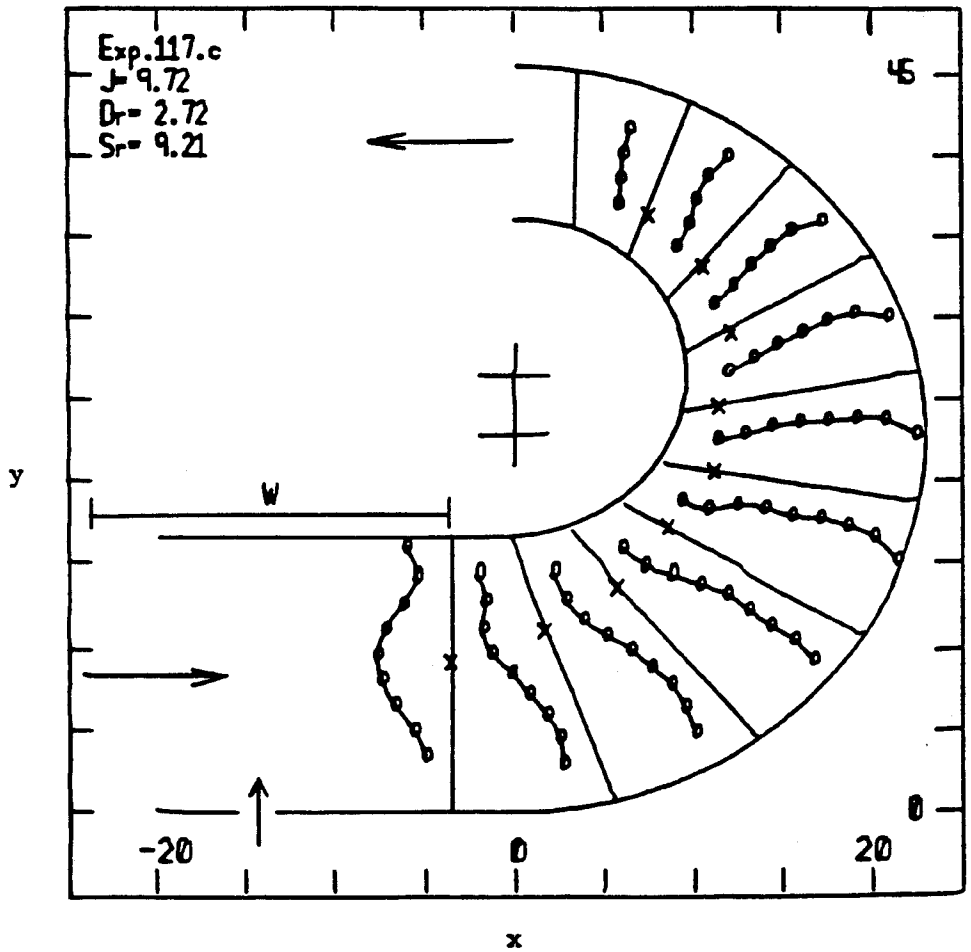

Figure 63. A widely spaced row of jets injected from the outer wall

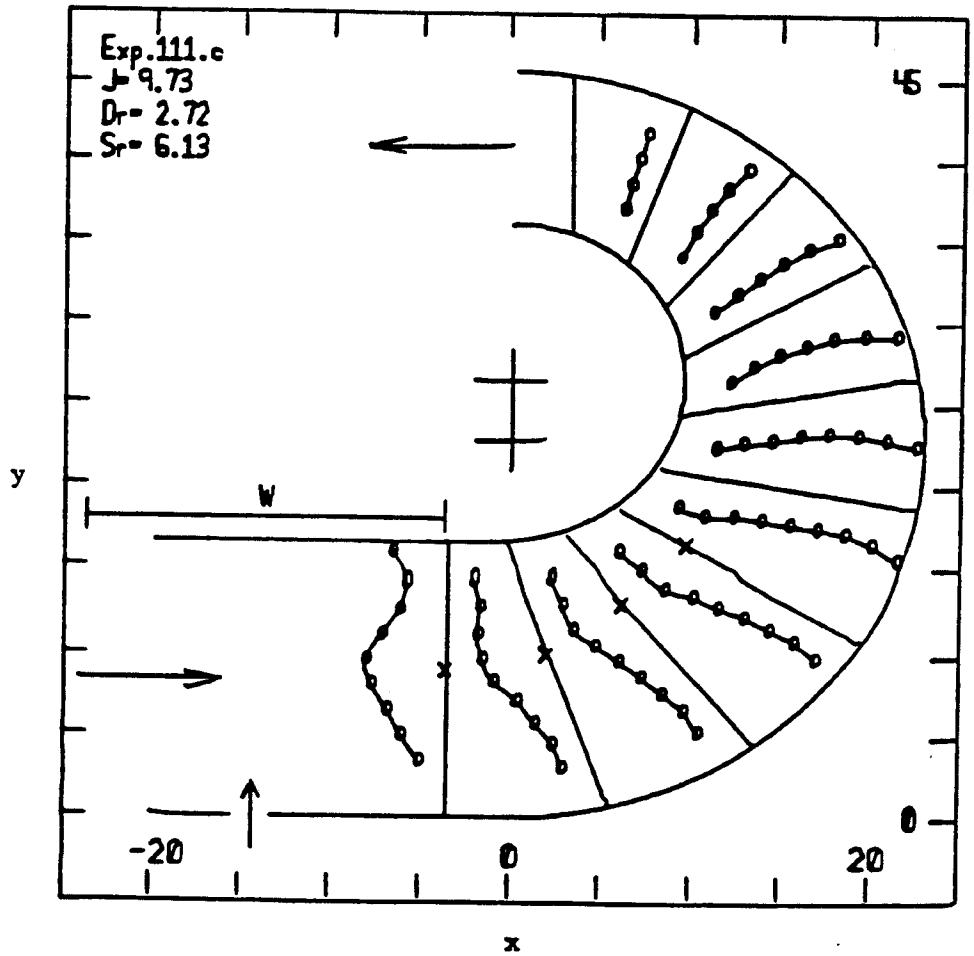

Figure 64. A moderately spaced row of jets injected from the outer wall

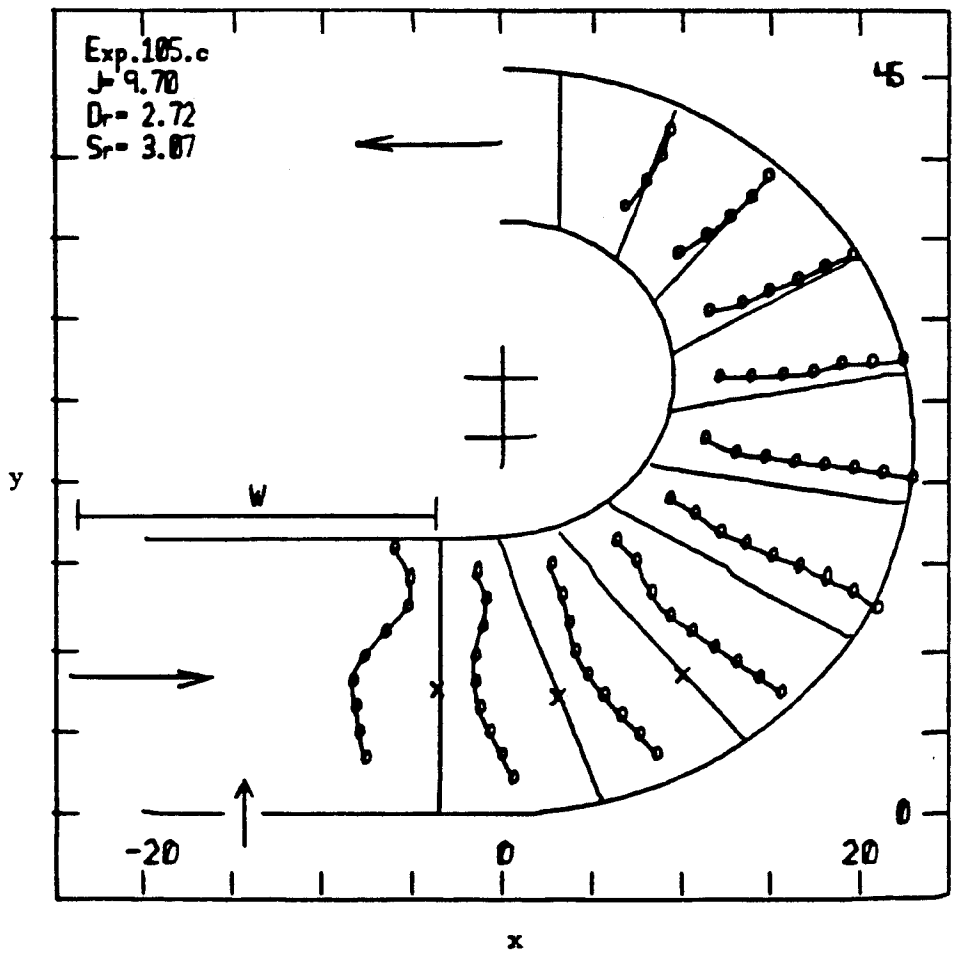

Figure 65. A closely spaced row of jets injected from the outer wall

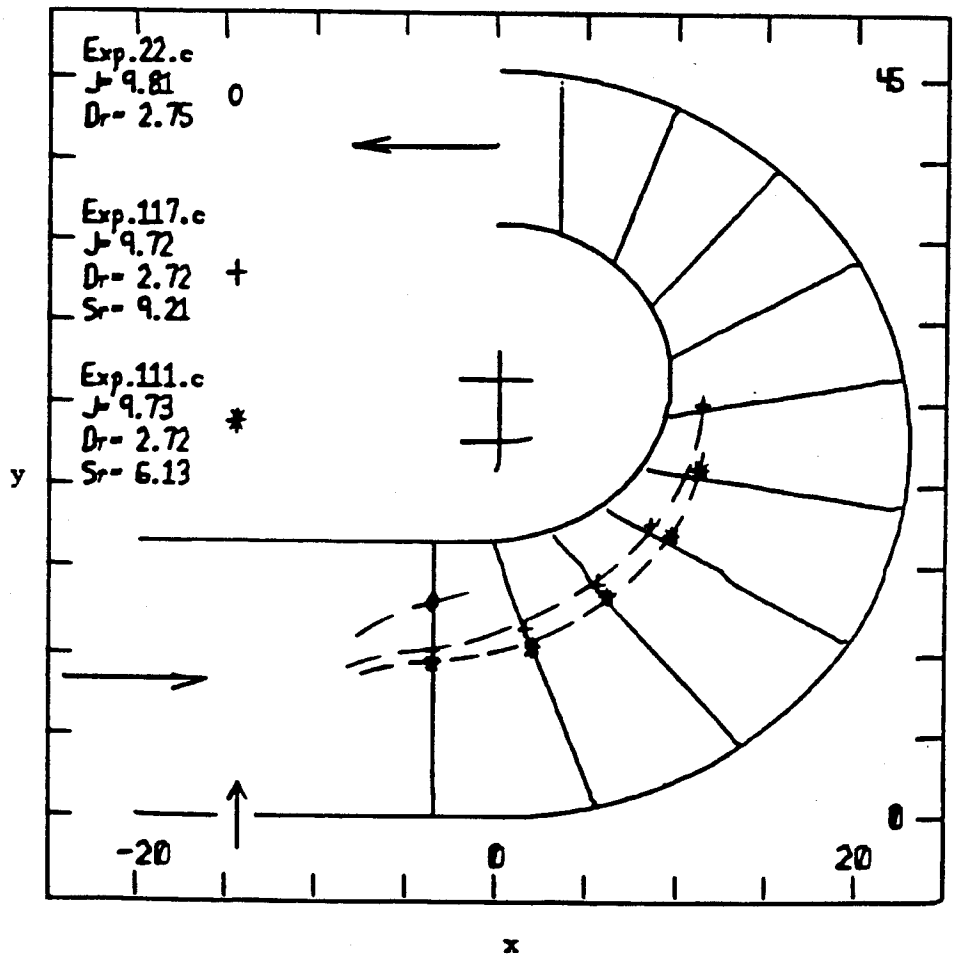

Figure 66. Comparison between trajectories of jets of different spacing ratios

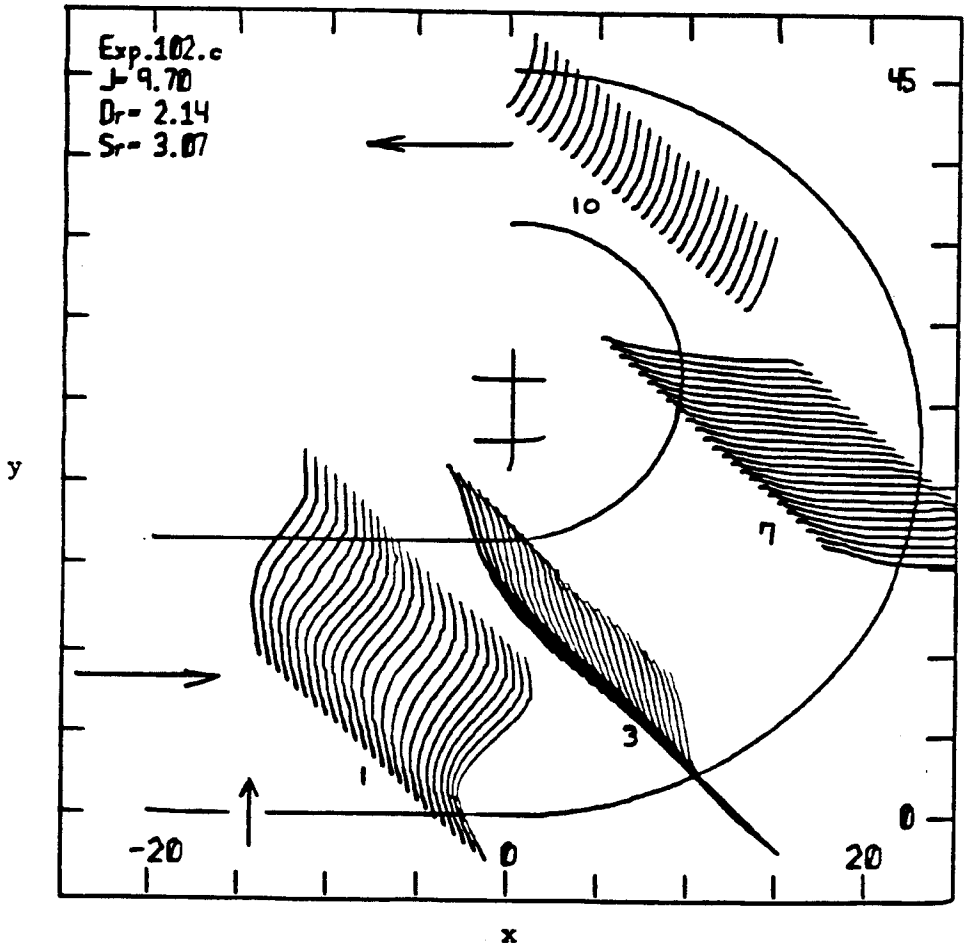

Figure 67. A 3-D view of a closely spaced row of jets injected from the outer wall

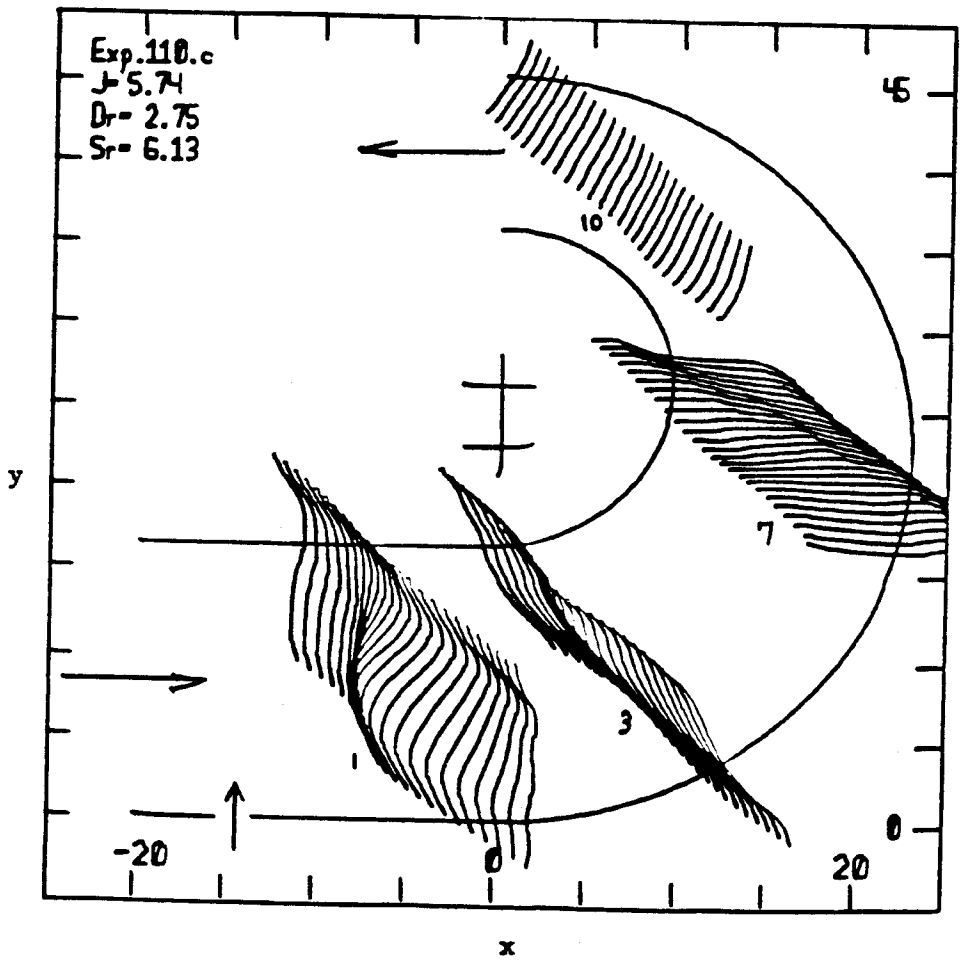

Figure 68. A 3-D view of a moderately spaced row of jets injected from the outer wall

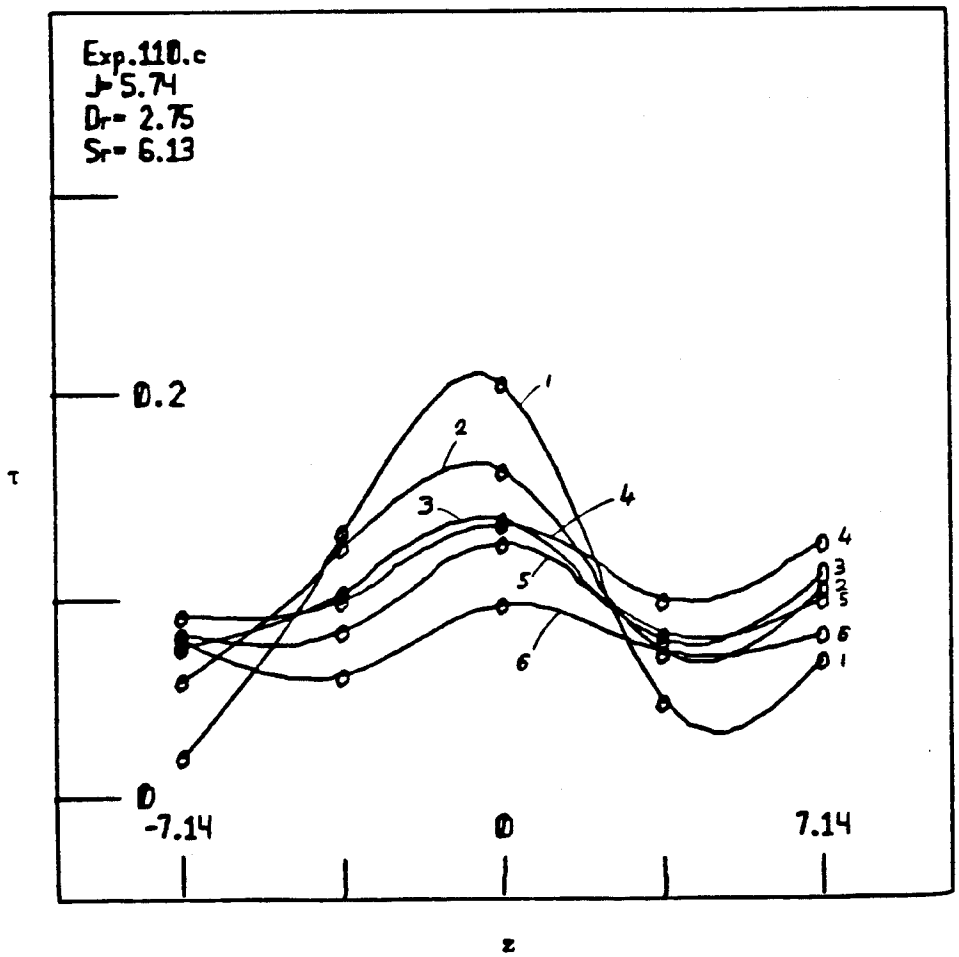

Figure 69. Lateral temperature distributions for a moderately spaced row of jets

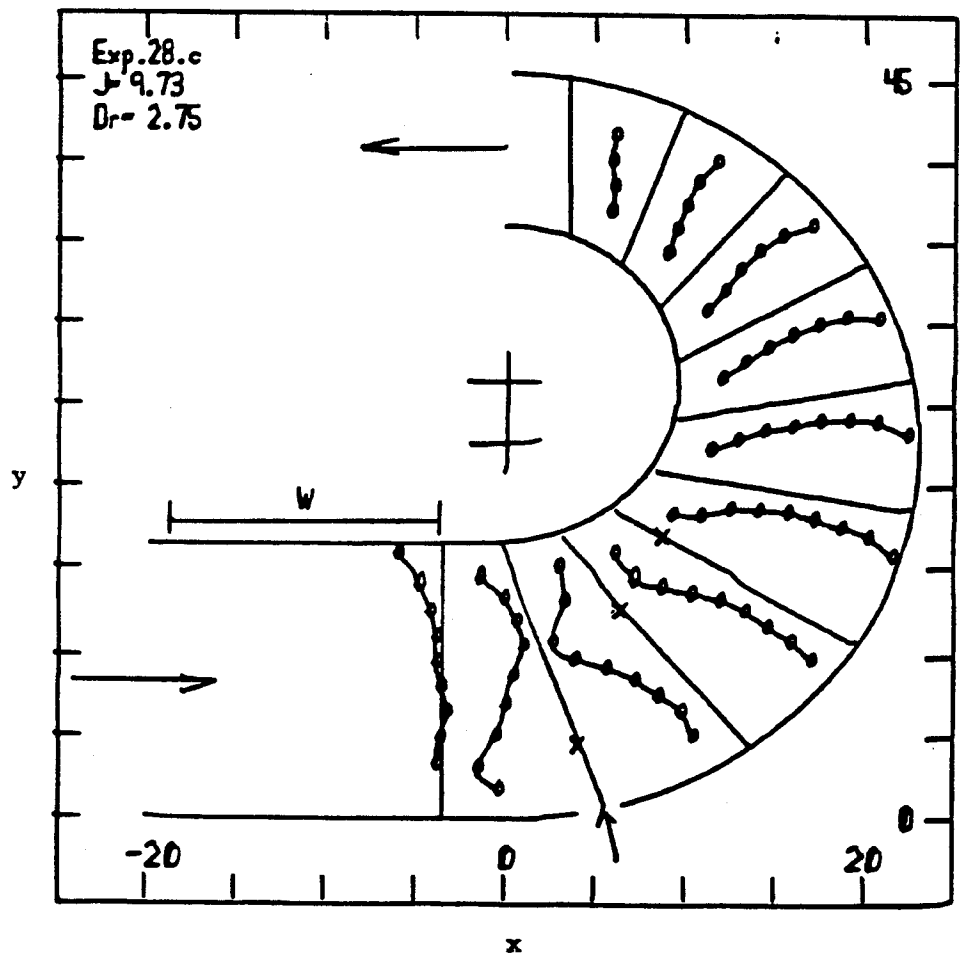

Figure 70. A single jet injected from the outer bent wall

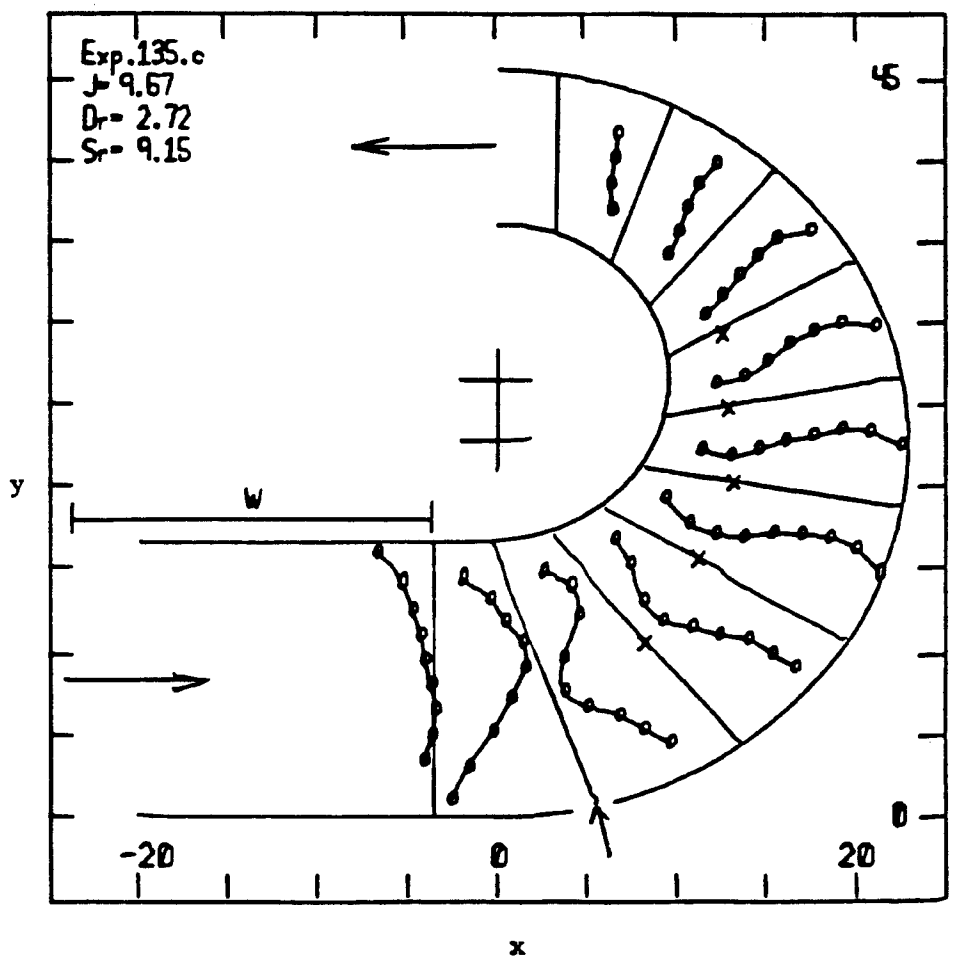

Figure 71. A widely spaced row of jets injected from the outer bent wall

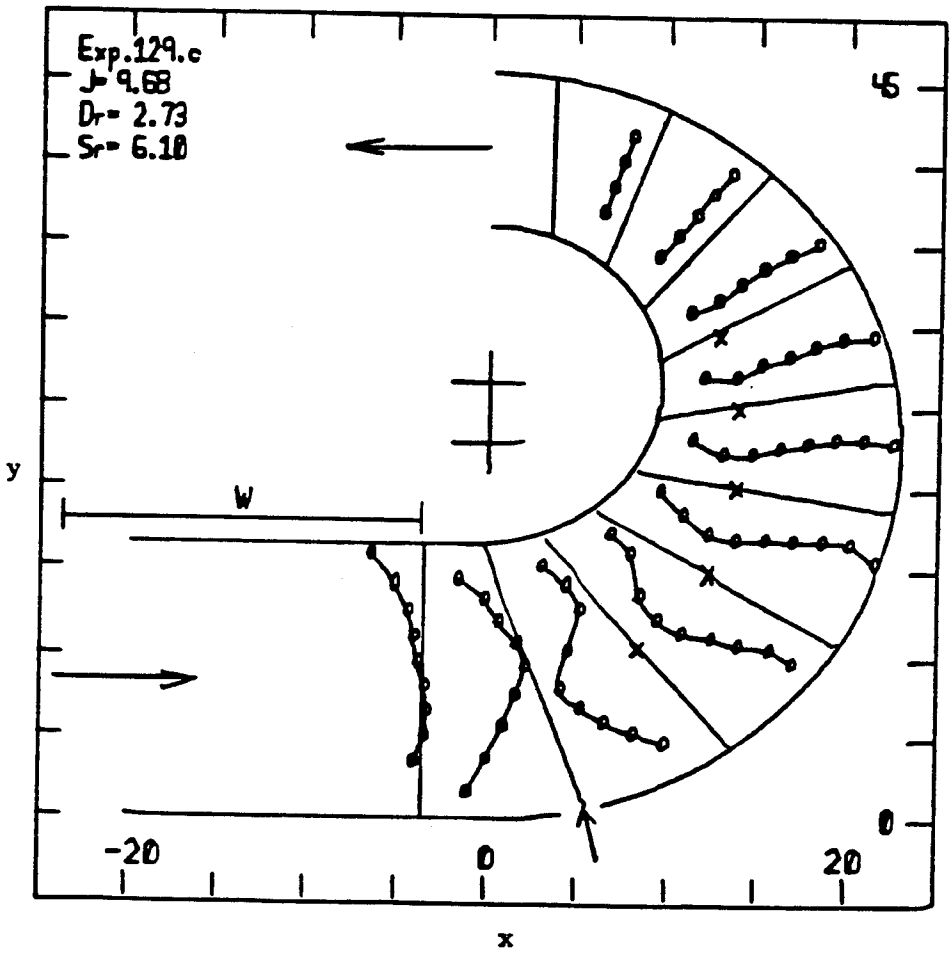

Figure 72. A moderately spaced row of jets injected from the outer bent wall

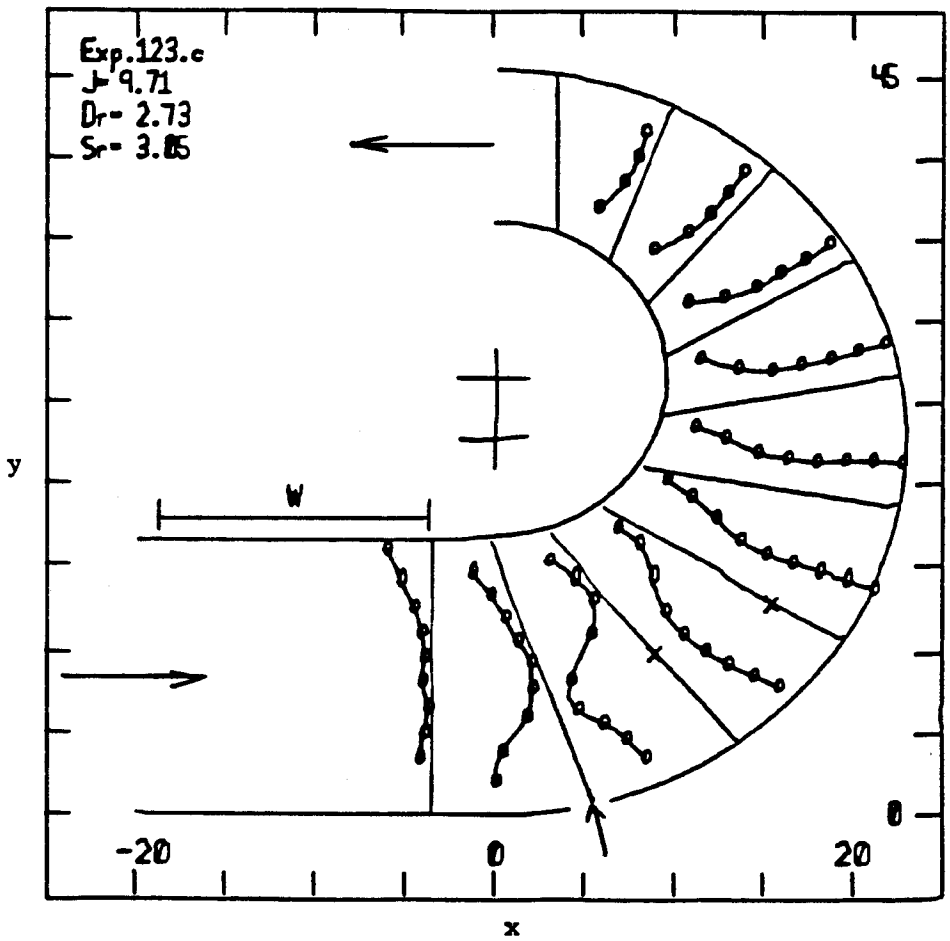

Figure 73. A closely spaced row of jets injected from the outer bent wall

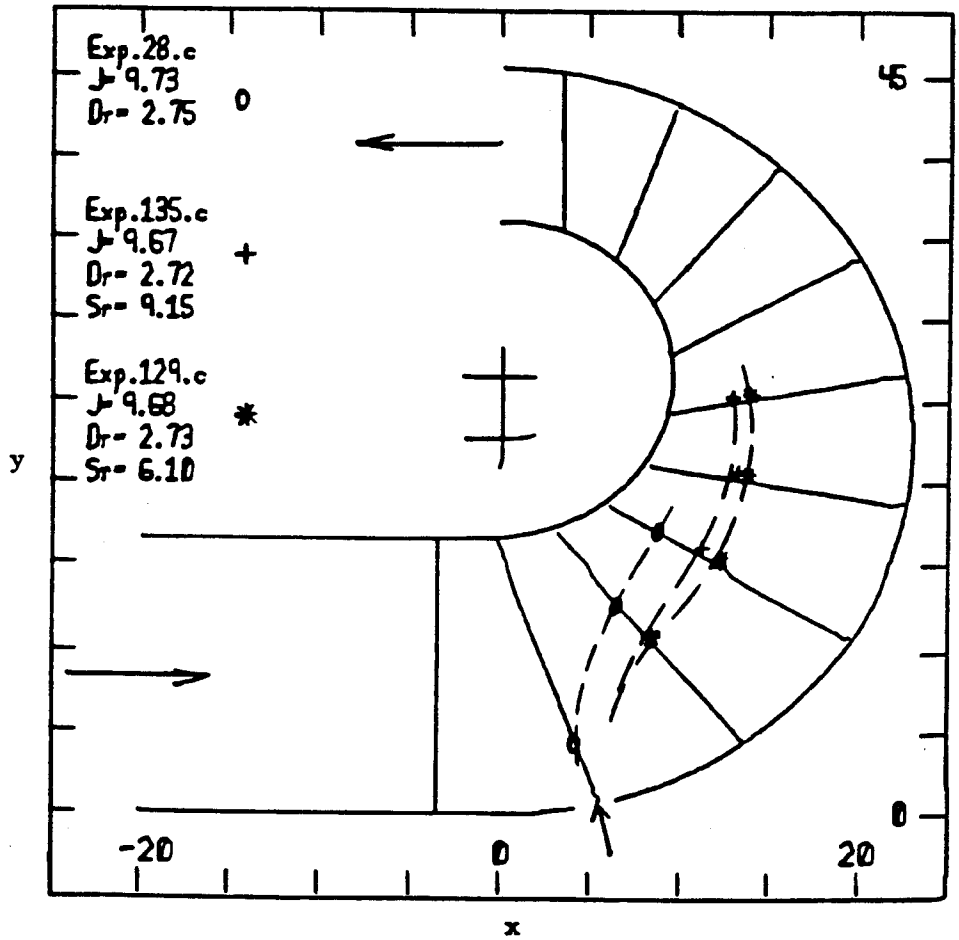

Figure 74. Comparison between trajectories of jets of different spacing ratios

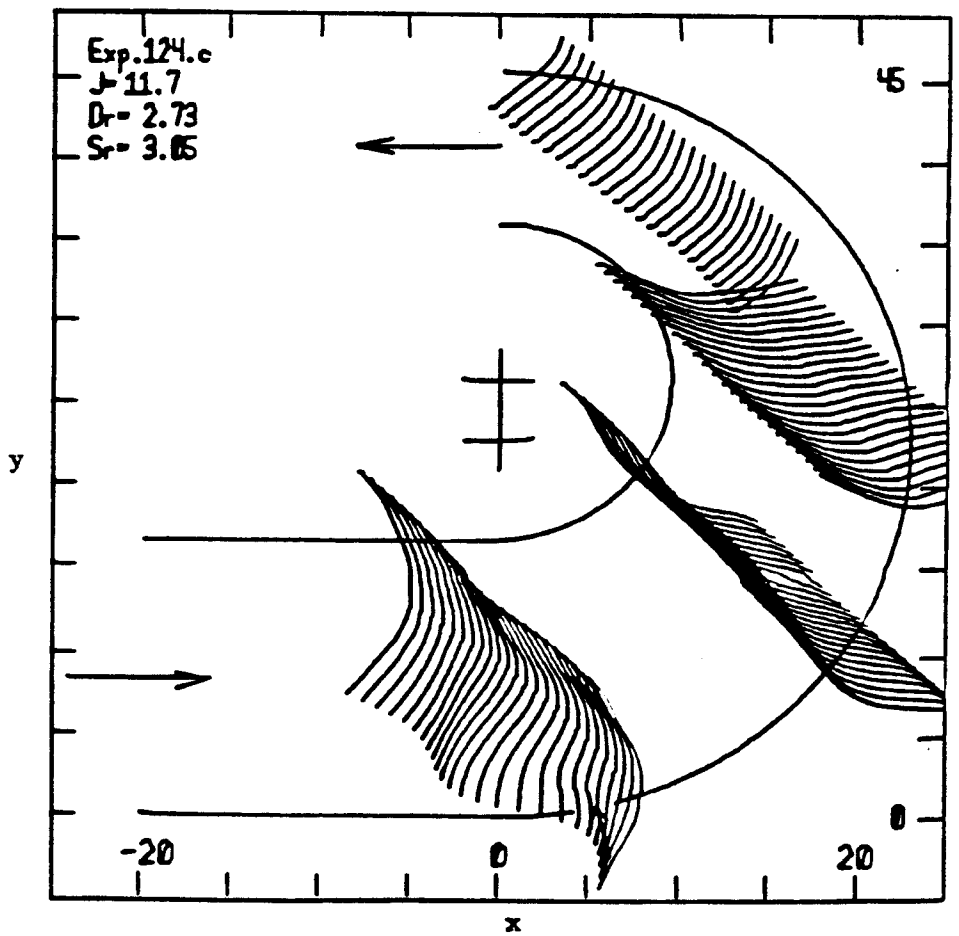

Figure 75. A 3-D view of a closely spaced row of jets injected from the outer bent wall

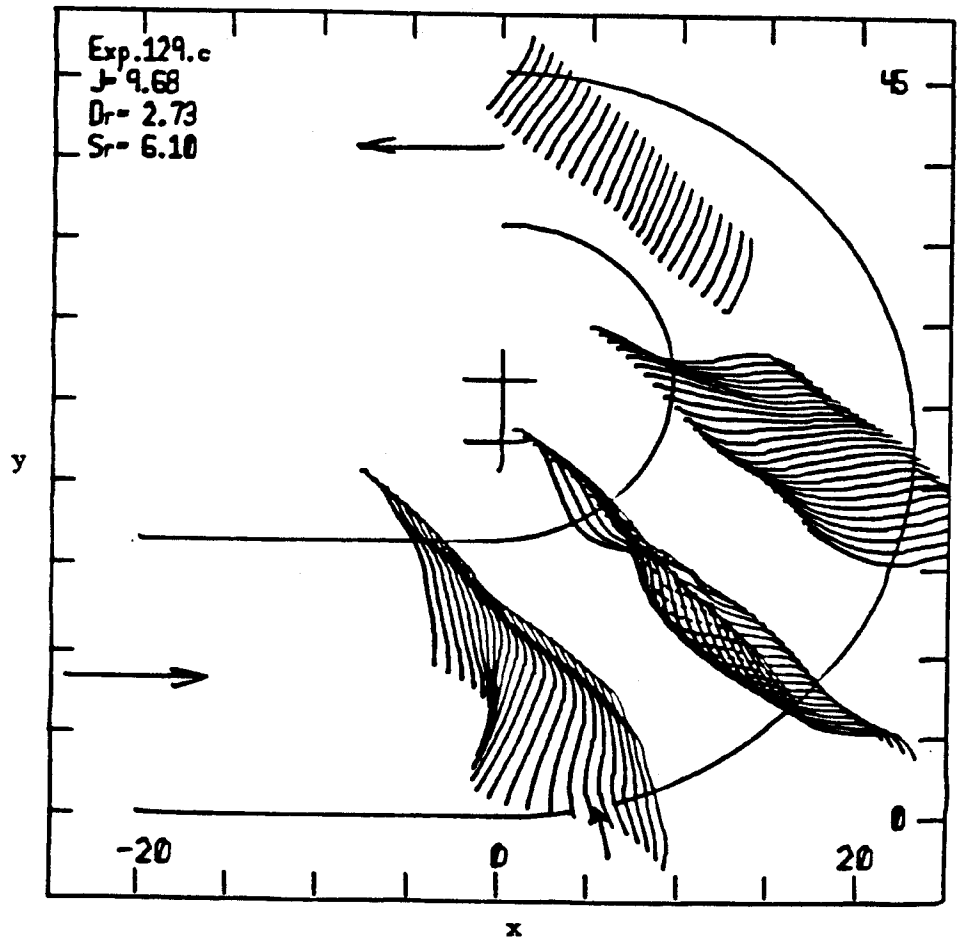

Figure 76. A 3-D view of a moderately spaced row of jets injected from the outer bent wall

CHAPTER IX

CONCLUSIONS

1. The details of the cross flow velocity field are important in shaping the trajectory and spreading rate of a single jet or a row of jets.
2. The model calculations simulating a single jet in an accelerating cross flow are in encouraging agreement with experimental results when the cross flow velocity field is well known. There is a marked discrepancy when the cross flow velocity field is crudely approximated.
3. An increase in the density ratio of the jet gives rise to a deeper penetration of the jet into the cross stream for a given momentum ratio.
4. A drifting phenomenon which consists of an inward transverse velocity component across the combustor due to the developing nature of the flow along it is identified. This effect and its associated pressure gradient is found to be very important in forming the jet trajectory.
5. The longitudinal acceleration suppresses the single jet thermal spreading rate. It is suggested that under sufficient acceleration, the jet thermal spread may become negative.
6. The confinement effect, which is measured by the channel height

relative to the jet characteristic thickness, increasingly suppresses the trajectory with decreasing spacing ratio of the row of jets.

7. For a single jet or a widely spaced row of jets, the flow in the turning section of the reverse flow combustor shows fast smoothing of temperature gradients near the inner wall and the core of the flow. This behavior is not depicted in close proximity to the outer wall.
8. For all injection configurations, with either a single jet or row of widely spaced jets, the smoothing of radial temperature gradients occurs well before the exit.
9. A tightly spaced row of jets, if injected from the inner wall, is kept attached to the inner wall, shielding it thereby from the outer hot stream. If injected from the outer wall, the row of jets penetrates into the core of the flow and is not attached to the outer wall.
10. Conclusion number 7 suggests that the reverse flow combustor outer walls can be cooled by leaking of cool air having low momentum ratio across the outer walls. Conclusion number 9 suggests that the inner wall can be cooled by a tightly spaced row of jets, injected prior to the inner wall of the bend.
11. The combustor experiments show that a proper choice of injection parameters and locations can create a desired temperature distribution at the combustor exit, upstream to the turbine blades.

This work appears to be the first which investigates the behavior of turbulent jets in longitudinally and transversely accelerating velocity fields.

The visualization and modeling of the single jet are integral in nature, but nevertheless bring out the main features and controlling parameters of the problem. With the current generation of computers, it appears to be impractical to perform a detailed numerical calculation of these flows. This is emphasized by examining the only available numerical calculation for a single jet in a non-accelerating cross stream, by Chien and Schetz[11]. These results show no better agreement with experiments than a typical semi-empirical solution, and, despite the simplifying assumptions the solution of which is very lengthy as pointed out by the authors.

It is also recognized that the semi-empirical solution is inherently limited and therefore warants no elaborate development. Perhaps an entirely different approach may be useful, namely, to consider the jet vortex structure which was shown experimentally to be a very important controlling mechanism for a single jet as well as a row of jets.

During the course of this work, it was attempted to model a row of jets in a manner similar to the single jet model, constructing a semi-empirical model based on pieces of phenomenological infromation in conjunction with the integral conservation statements. It was

found that this important information cannot be found in the literature. It is therefore suggested that a series of experiments from which basic information such as entrainment correlations or pressure distributions can be obtained, be constructed.

A natural continuation of the current combustor experiments is the sampling of velocity data along and across the bend. This data, in conjunction with the temperature field information, will allow varification of interpretations made in this work based upon the temperature data alone. It will enhance trajectory and spreading rate information and will help in clarifying the complex behavior of the main flow in such a bend.

APPENDIX I

Calculation of Combustor Flow Conditions

The quantities measured are:

Combustor pressure	P
Cross flow temp. prior to the bend	T_s
Combustion air flow rate	m_c
Cooling air flow rate	m_k
Natural gas flow rate	m_g
Dilution jet temp.	T_{jo}
Dilution jet flow rate	m_j

These values are entered into a computer program which executes the following calculations:

Total mass flow rate of cross flow

$$m = m_c + m_k + m_g \qquad \text{(A-I-1)}$$

Cross flow density

$$\rho_s = \frac{P}{RT_s} \qquad \text{(A-I-2)}$$

Jet density

$$\rho_{jo} = \frac{P}{RT_{jo}} \qquad \text{(A-I-3)}$$

Cross flow average velocity

$$U = m \,/\, (A_{section} \cdot \rho_s) \qquad \text{(A-I-4)}$$

Jet average velocity

$$V = m_j \,/\, (\pi b_o^2 \rho_{jo}) \qquad \text{(A-I-5)}$$

Momentum ratio

$$J = \frac{\rho_{jo} V^2}{\rho_s U^2} \qquad \text{(A-I-6)}$$

Density ratio

$$Dr = \rho_{jo} \,/\, \rho_s \qquad \text{(A-I-7)}$$

Froude number

$$Fr = \frac{\rho_{jo} V_j^2}{(\rho_{jo} - \rho_s) g b_o} \qquad \text{(A-I-8)}$$

APPENDIX II

THE CUBIC SPLINE SCHEME AND SUBROUTINE

Cubic spline functions are the most popular spline functions, for a variety of reasons. They are a smooth function having continuous curvature with which to fit data; and when used for interpolation, they do not have the oscillatory behavior that characterizes high degree polynomial interpolation. Cubic splines are also relatively simple to calculate and use, and do not consume large amounts of computer time. In general, a cubic spline function will follow an elastic spline fitted to pass through a given two dimensional set of points, free from any external bending moment.

This function is constructed of a set of cubic polynomials equal in number to the number of intervals between data points. These polynomials are continuous in their magnitude, skewness and curvature at each data point and have at least two degrees of freedom in determining their coefficients. These degrees of freedom are the first and second derivatives at the end points, which in this work were chosen to be zero curvature at those points. This choice was made for two reasons; one is that this condition implies a minimum of oscillatory behavior, and the other is that it is the weaker constraint possible in the absence of any other end condition.

For a more detailed discussion, including the mathamatical

formulation see Ref. 4.

Following is the subroutine constructed especially for interpolation of the raw data, introduced into the subroutine in a matrix form.

The raw data matrix is a 3 dimensional matrix T(n,m,j) which prescribes the temperature measured as a function of the radius, n, the thermocouple number (one of the five in the rake) m, and the angle, j. The size of this matrix is T(9,5,10) and can be interpolated into a "fine" matrix, TP, of a maximum dimension of TP(100,5,10). As an additional input to the subroutine, one has to come up with a vector of the actual radii R(n), the number of interpolated points wanted within an interval, I, and a weight parameter W which determines the temperature scale for the profiles plotted.

As discussed above, the subroutine "inter", calculates TP, and also RP which is the "fine" vector containing the radii of all the interpolated values. x and y are the transformed values of TP and RP to the plain of plotting. These values are introduced to the plotter for the drawing of the temperature profiles.

APPENDIX III

COMPLETE DATA

KEY TO ABBREVIATIONS

dr -- density ratio, $\frac{roj}{ro}$

j -- momentum ratio, $\frac{roj(vj)^2}{ro(v)^2}$

m -- total mass flow rate of cross flow, mc + mk + mg

mc -- combustion air flow rate

mg -- natural gas flow rate

mk -- cooling air flow rate

msj -- jet mass flow rate

p -- combustor pressure

ro -- density of cross flow

roj -- density of cooling jet

sr -- spacing ratio, $\frac{\text{space between jet centerlines}}{2(\text{nominal jet radius})}$

t -- cross flow temperature

tj -- jet temperature

t5 -- temperature of inner wall at center in the bend

t6 -- temperature of outer wall at the exit

t7 -- temperature of outer wall at center in the bend

t8 -- temperature of straight section of outer wall

t9 -- temperature of side wall at center in the bend

t10 -- temperature of side wall at the exit

t11 -- right probe temperature

t12 -- right-center probe temperature

t13 -- center probe temperature

t14 -- left-center probe temperature

t15 -- left probe temperature

v -- average cross flow velocity

vj -- average jet velocity

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comb. press. - pr (mm water gage) 25.00
cross flow temp. - tr (degree celsius) 380.00
comb. air flow rate - mcr (mm water diff.) 40.00
cool air flow rate - mkr (mm water diff.) 160.00
natural gas flow rate - mgr (mm water diff.) 18.00
natural gas total press. - pgar (psi gage) 0.00
air total press. - psar (mm water gage) 0.00
jet temp. - tjr (degree celsius) 0.00
single jet flow rate - msjr (s.c.f.m.) 0.00
wall temp. - t5 (degree celsius) 270.00
wall temp. - t6 (degree celsius) 238.00
wall temp. - t7 (degree celsius) 235.00
wall temp. - t8 (degree celsius) 305.00
wall temp. - t9 (degree celsius) 235.00
wall temp. - t10 (degree celsius) 235.00

mc = 0.0189737 kg/sec
mk = 0.1189016 kg/sec
mg = 0.001273 kg/sec
m = 0.139148 kg/sec
p = 98345.3 pascal
t = 653 degree kelvin
tj = 273 degree kelvin
t5 = 543 degree kelvin
t6 = 511 degree kelvin
t7 = 508 degree kelvin
t8 = 578 degree kelvin
t9 = 508 degree kelvin
t10= 508 degree kelvin
ro = 0.5248 kg/cubic meter
roj= 1.2552 kg/cubic meter
v = 9.81 meter/sec
msj= 0.0000000 kg/sec
vj = 0.00 meter/sec
dr = 2.39 density ratio
j = 0.0 momentum ratio
fr = 0 froude number
sr = 0.00 spacing ratio

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	599.00	604.00	594.00	601.00	599.00
2	95	20	617.00	625.00	622.00	628.00	625.00
3	95	40	620.00	628.00	622.00	626.00	624.00
4	95	60	612.00	622.00	619.00	627.00	626.00
5	95	80	618.00	628.00	631.00	639.00	637.00
6	95	100	620.00	361.00	634.00	638.00	636.00
7	95	120	616.00	633.00	641.00	648.00	643.00
8	95	140	618.00	632.00	639.00	643.00	642.00
9	95	160	608.00	626.00	635.00	644.00	642.00
10	95	180	612.00	630.00	638.00	645.00	647.00
11	85	0	616.00	624.00	626.00	631.00	627.00
12	85	20	618.00	625.00	626.00	632.00	632.00
13	85	40	623.00	633.00	633.00	636.00	632.00

14	85	60	628.00	635.00	634.00	640.00	640.00
15	85	80	629.00	640.00	643.00	645.00	640.00
16	85	100	630.00	641.00	644.00	645.00	642.00
17	85	120	621.00	632.00	641.00	646.00	643.00
18	85	140	611.00	626.00	633.00	641.00	641.00
19	85	160	606.00	621.00	630.00	639.00	640.00
20	85	180	598.00	615.00	628.00	636.00	636.00
21	75	0	621.00	629.00	626.00	633.00	634.00
22	75	20	631.00	640.00	640.00	645.00	641.00
23	75	40	633.00	642.00	645.00	649.00	647.00
24	75	60	638.00	645.00	648.00	649.00	646.00
25	75	80	632.00	642.00	647.00	651.00	646.00
26	75	100	630.00	642.00	647.00	649.00	647.00
27	75	120	616.00	630.00	640.00	645.00	642.00
28	75	140	612.00	626.00	637.00	642.00	640.00
29	75	160	608.00	624.00	634.00	637.00	637.00
30	75	180	604.00	621.00	630.00	635.00	634.00
31	65	0	645.00	653.00	653.00	656.00	652.00
32	65	20	649.00	657.00	654.00	660.00	655.00
33	65	40	644.00	653.00	653.00	656.00	655.00
34	65	60	648.00	656.00	654.00	657.00	652.00
35	65	80	630.00	640.00	643.00	647.00	645.00
36	65	100	624.00	636.00	645.00	648.00	645.00
37	65	120	621.00	636.00	643.00	645.00	639.00
38	65	140	615.00	630.00	637.00	640.00	637.00
39	65	160	613.00	626.00	635.00	635.00	633.00
40	65	180	611.00	624.00	629.00	633.00	631.00
41	55	0	645.00	656.00	653.00	657.00	654.00
42	55	20	640.00	651.00	652.00	656.00	656.00
43	55	40	642.00	652.00	657.00	658.00	656.00
44	55	60	635.00	645.00	648.00	652.00	653.00
45	55	80	630.00	641.00	647.00	651.00	649.00
46	55	100	622.00	633.00	641.00	644.00	641.00
47	55	120	615.00	628.00	636.00	638.00	635.00
48	55	140	609.00	623.00	630.00	630.00	629.00
49	55	160	607.00	620.00	624.00	624.00	623.00
50	55	180	600.00	612.00	618.00	620.00	620.00
51	45	0	649.00	662.00	662.00	665.00	663.00
52	45	20	648.00	657.00	659.00	662.00	660.00
53	45	40	642.00	652.00	657.00	658.00	657.00
54	45	60	639.00	648.00	651.00	653.00	651.00
55	45	80	627.00	639.00	647.00	648.00	646.00
56	45	100	621.00	633.00	639.00	636.00	632.00
57	45	120	618.00	628.00	633.00	630.00	626.00
58	45	140	615.00	622.00	624.00	623.00	625.00
59	35	0	660.00	671.00	669.00	674.00	670.00
60	35	20	657.00	669.00	668.00	669.00	666.00
61	35	40	648.00	658.00	662.00	662.00	657.00
62	35	60	636.00	646.00	651.00	655.00	653.00
63	35	80	629.00	640.00	645.00	644.00	638.00
64	35	100	621.00	632.00	634.00	630.00	627.00
65	35	120	612.00	620.00	621.00	619.00	617.00
66	25	0	662.00	672.00	673.00	673.00	669.00
67	25	20	657.00	667.00	666.00	668.00	664.00
68	25	40	643.00	654.00	658.00	659.00	654.00
69	25	60	632.00	644.00	650.00	650.00	646.00
70	25	80	627.00	636.00	639.00	636.00	629.00
71	25	100	616.00	622.00	620.00	620.00	617.00
72	15	0	658.00	670.00	673.00	674.00	671.00
73	15	20	649.00	662.00	666.00	664.00	658.00
74	15	40	634.00	646.00	652.00	652.00	649.00
75	15	60	624.00	636.00	640.00	640.00	637.00
76	15	80	609.00	622.00	627.00	623.00	618.00

RDG.1.c

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file requested                    **********
                                     3.c
                                  **********

comb. press. - pr (mm water gage)      15.00
cross flow temp. - tr (degree celsius)    625.00
comb. air flow rate - mcr (mm water diff.)     40.00
cool air flow rate - mkr (mm water diff.)     60.00
natural gas flow rate - mgr (mm water diff.)     18.00
natural gas total press. - pgar (psi gage)      0.00
air total press. - pair (mm water gage)      0.00
jet temp. - tjr (degree celsius)      0.00
single jet flow rate - mjr (s.c.f.m.)      0.00
wall temp. - t5 (degree celsius)    422.00
wall temp. - t6 (degree celsius)    330.00
wall temp. - t7 (degree celsius)    323.00
wall temp. - t8 (degree celsius)    406.00
wall temp. - t9 (degree celsius)    335.00
wall temp. - t10 (degree celsius)    338.00

mc = 0.0189737 kg/sec
mk = 0.0728121 kg/sec
mg = 0.001273 kg/sec
m  = 0.093059 kg/sec
p  = 98247.2 pascal
t  = 898 degree kelvin
tj = 273 degree kelvin
t5 = 695 degree kelvin
t6 = 603 degree kelvin
t7 = 596 degree kelvin
t8 = 679 degree kelvin
t9 = 608 degree kelvin
t10= 611 degree kelvin
ro = 0.3812 kg/cubic meter
roj= 1.2539 kg/cubic meter
v  = 9.03 meter/sec
mgj= 0.0000000 kg/sec
vj = 0.00 meter/sec
dr = 3.29 density ratio
j  = 0.0 momentum ratio
fr =       0 froude number
sr =  0.00 spacing ratio
```

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	844.00	845.00	822.00	824.00	804.00
2	95	20	854.00	863.00	844.00	844.00	828.00
3	95	40	858.00	869.00	855.00	847.00	830.00
4	95	60	863.00	874.00	869.00	863.00	845.00
5	95	80	861.00	880.00	879.00	877.00	859.00
6	95	100	857.00	883.00	888.00	889.00	870.00
7	95	120	860.00	886.00	898.00	896.00	876.00
8	95	140	852.00	881.00	894.00	899.00	881.00
9	95	160	824.00	859.00	880.00	891.00	881.00
10	95	180	819.00	850.00	877.00	896.00	888.00
11	85	0	865.00	871.00	851.00	851.00	831.00
12	85	20	863.00	871.00	863.00	865.00	851.00
13	85	40	875.00	883.00	875.00	871.00	858.00

14	85	60	868.00	882.00	878.00	878.00	861.00
15	85	80	859.00	880.00	882.00	876.00	859.00
16	85	100	854.00	877.00	887.00	858.00	866.00
17	85	120	839.00	868.00	874.00	881.00	863.00
18	85	140	828.00	851.00	873.00	882.00	869.00
19	85	160	806.00	836.00	860.00	876.00	864.00
20	85	180	788.00	818.00	846.00	872.00	877.00
21	75	0	879.00	890.00	875.00	870.00	852.00
22	75	20	882.00	893.00	886.00	881.00	859.00
23	75	40	883.00	896.00	892.00	887.00	865.00
24	75	60	873.00	889.00	890.00	884.00	868.00
25	75	80	583.00	879.00	883.00	880.00	858.00
26	75	100	844.00	871.00	879.00	879.00	62.00
27	75	120	823.00	845.00	869.00	871.00	855.00
28	75	140	801.00	827.00	854.00	868.00	852.00
29	75	160	783.00	815.00	845.00	857.00	841.00
30	75	180	769.00	806.00	841.00	856.00	843.00
31	65	0	889.00	900.00	885.00	879.00	854.00
32	65	20	892.00	905.00	890.00	884.00	871.00
33	65	40	888.00	902.00	895.00	891.00	871.00
34	65	60	870.00	887.00	889.00	885.00	864.00
35	65	80	852.00	871.00	884.00	879.00	858.00
36	65	100	825.00	850.00	870.00	872.00	853.00
37	65	120	799.00	827.00	856.00	869.00	838.00
38	65	140	790.00	818.00	842.00	838.00	817.00
39	65	160	779.00	809.00	834.00	820.00	810.00
40	65	180	764.00	795.00	815.00	816.00	806.00
41	55	0	884.00	898.00	895.00	894.00	870.00
42	55	20	885.00	903.00	895.00	894.00	873.00
43	55	40	881.00	897.00	898.00	892.00	868.00
44	55	60	864.00	880.00	886.00	88[illegible].00	855.00
45	55	80	845.00	862.00	874.00	869.00	845.00
46	55	100	805.00	829.00	848.00	845.00	824.00
47	55	120	791.00	815.00	834.00	828.00	805.00
48	55	140	778.00	803.00	816.00	803.00	788.00
49	55	160	770.00	792.00	798.00	783.00	774.00
50	55	180	758.00	777.00	785.00	777.00	770.00
51	45	0	900.00	913.00	903.00	897.00	882.00
52	45	20	885.00	905.00	907.00	899.00	877.00
53	45	40	869.00	890.00	890.00	88[illegible].00	863.00
54	45	60	846.00	865.00	876.00	865.00	843.00
55	45	80	827.00	843.00	853.00	844.00	821.00
56	45	100	795.00	820.00	834.00	822.00	797.00
57	45	120	781.00	800.00	805.00	786.00	770.00
58	45	140	753.00	760.00	762.00	749.00	748.00
59	35	0	880.00	900.00	902.00	894.00	875.00
60	35	20	867.00	886.00	891.00	884.00	862.00
61	35	40	844.00	866.00	873.00	866.00	849.00
62	35	60	825.00	845.00	853.00	8[illegible].00	819.00
63	35	80	799.00	818.00	827.00	811.00	791.00
64	35	100	787.00	800.00	799.00	781.00	867.00
65	35	120	755.00	754.00	754.00	737.00	732.00
66	25	0	875.00	895.00	898.00	887.00	869.00
67	25	20	858.00	880.00	884.00	875.00	858.00
68	25	40	826.00	848.00	855.00	843.00	825.00
69	25	60	810.00	827.00	832.00	819.00	804.00
70	25	80	790.00	803.00	805.00	790.00	773.00
71	25	100	749.00	754.00	757.00	739.00	732.00
72	15	0	853.00	608.00	886.00	878.00	860.00
73	15	20	819.00	848.00	858.00	844.00	825.00
74	15	40	807.00	825.00	830.00	813.00	793.00
75	15	60	792.00	801.00	799.00	787.00	774.00
76	15	80	689.00	735.00	758.00	743.00	730.00

rdg.3.c

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                                    **********
C       file requested                  4.c
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C

        comb. press. - pr (mm water gage)      24.00
C       cross flow temp. - tr (degree celsius)     456.00
        comb. air flow rate - mcr (mm water diff.)      40.00
        cool air flow rate - mkr (mm water diff.)     120.00
C       natural gas flow rate - mgr (mm water diff.)      18.00
        natural gas total press. - psgr (psi gage)       0.00
        air total press. - psar (mm water gage)       0.00
C       jet temp. - tjr (degree celsius)       0.00
        single jet flow rate - msjr (s.c.f.m.)       0.00
        wall temp. - t5 (degree celsius)     323.00
C       wall temp. - t6 (degree celsius)     265.00
        wall temp. - t7 (degree celsius)     259.00
        wall temp. - t8 (degree celsius)     336.00
C       wall temp. - t9 (degree celsius)     256.00
        wall temp. - t10 (degree celsius)     253.00

C

        mc = 0.0189737 kg/sec
        mk = 0.1029718 kg/sec
        mg = 0.001273 kg/sec
        m  = 0.123218 kg/sec
        p  = 98335.4 pascal
        t  = 729 degree kelvin
        tj = 273 degree kelvin
        t5 = 596 degree kelvin
        t6 = 538 degree kelvin
        t7 = 532 degree kelvin
        t8 = 609 degree kelvin
        t9 = 529 degree kelvin
        t10= 526 degree kelvin
        ro = 0.4700 kg/cubic meter
        roj= 1.2551 kg/cubic meter
        v  = 9.70 meter/sec
        msj= 0.0000000 kg/sec
        vj = 0.00 meter/sec
        dr = 2.67 density ratio
        j  = 0.0 momentum ratio
        fr =        0 froude number
        sr =  0.00 spacing ratio
```

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	670.00	676.00	669.00	673.00	668.00
2	95	20	680.00	687.00	685.00	692.00	689.00
3	95	40	687.00	696.00	698.00	704.00	698.00
4	95	60	690.00	703.00	704.00	708.00	699.00
5	95	80	689.00	704.00	702.00	703.00	695.00
6	95	100	680.00	699.00	711.00	714.00	704.00
7	95	120	685.00	703.00	713.00	721.00	715.00
8	95	140	680.00	698.00	704.00	709.00	707.00
9	95	160	669.00	689.00	706.00	718.00	719.00
10	95	180	664.00	685.00	702.00	716.00	720.00
11	85	0	687.00	698.00	690.00	423.00	690.00
12	85	20	689.00	699.00	701.00	704.00	694.00
13	85	40	695.00	707.00	706.00	707.00	698.00

14	85	60	693.00	705.00	706.00	710.00	701.00	
15	85	80	695.00	709.00	713.00	718.00	710.00	
16	85	100	689.00	700.00	711.00	718.00	714.00	
17	85	120	683.00	696.00	707.00	712.00	708.00	
18	85	140	675.00	693.00	708.00	719.00	717.00	
19	85	160	665.00	683.00	696.00	711.00	713.00	rdg.
20	85	180	656.00	675.00	696.00	710.00	714.00	4.c
21	75	0	706.00	710.00	702.00	708.00	700.00	
22	75	20	716.00	729.00	726.00	725.00	443.00	
23	75	40	707.00	716.00	718.00	720.00	710.00	
24	75	60	710.00	717.00	715.00	718.00	435.00	
25	75	80	701.00	711.00	718.00	720.00	711.00	
26	75	100	688.00	701.00	711.00	714.00	708.00	
27	75	120	675.00	694.00	707.00	714.00	710.00	
28	75	140	668.00	683.00	701.00	710.00	705.00	
29	75	160	659.00	677.00	690.00	698.00	697.00	
30	75	180	649.00	670.00	689.00	699.00	697.00	
31	65	0	708.00	717.00	715.00	720.00	711.00	
32	65	20	723.00	732.00	730.00	732.00	723.00	
33	65	40	720.00	458.00	732.00	731.00	720.00	
34	65	60	710.00	720.00	722.00	723.00	712.00	
35	65	80	703.00	717.00	724.00	728.00	718.00	
36	65	100	681.00	694.00	706.00	711.00	702.00	
37	65	120	663.00	678.00	692.00	694.00	691.00	
38	65	140	662.00	683.00	696.00	692.00	687.00	
39	65	160	658.00	675.00	685.00	685.00	684.00	
40	65	180	655.00	672.00	683.00	685.00	681.00	
41	55	0	721.00	733.00	733.00	734.00	725.00	
42	55	20	718.00	729.00	728.00	731.00	725.00	
43	55	40	718.00	727.00	728.00	728.00	720.00	
44	55	60	707.00	716.00	718.00	718.00	709.00	
45	55	80	690.00	703.00	711.00	712.00	702.00	
46	55	100	676.00	690.00	699.00	700.00	692.00	
47	55	120	666.00	683.00	694.00	692.00	682.00	
48	55	140	660.00	675.00	680.00	674.00	668.00	
49	55	160	656.00	396.00	674.00	669.00	666.00	
50	55	180	646.00	659.00	665.00	664.00	664.00	
51	45	0	736.00	745.00	740.00	742.00	733.00	
52	45	20	725.00	733.00	732.00	458.00	721.00	
53	45	40	721.00	733.00	733.00	728.00	719.00	
54	45	60	702.00	713.00	715.00	715.00	707.00	
55	45	80	688.00	698.00	707.00	707.00	698.00	
56	45	100	670.00	684.00	692.00	686.00	676.00	
57	45	120	663.00	675.00	678.00	672.00	668.00	
58	45	140	650.00	657.00	657.00	651.00	652.00	
59	35	0	730.00	743.00	743.00	743.00	732.00	
60	35	20	723.00	734.00	735.00	732.00	722.00	
61	35	40	712.00	723.00	722.00	721.00	710.00	
62	35	60	696.00	708.00	713.00	709.00	698.00	
63	35	80	679.00	690.00	695.00	689.00	682.00	
64	35	100	662.00	673.00	675.00	669.00	663.00	
65	35	120	645.00	649.00	649.00	643.00	641.00	
66	25	0	723.00	735.00	734.00	733.00	725.00	
67	25	20	716.00	731.00	735.00	730.00	721.00	
68	25	40	699.00	436.00	716.00	715.00	708.00	
69	25	60	686.00	697.00	702.00	697.00	690.00	
70	25	80	669.00	676.00	678.00	673.00	666.00	
71	25	100	648.00	651.00	653.00	645.00	641.00	
72	15	0	718.00	734.00	737.00	733.00	723.00	
73	15	20	703.00	716.00	721.00	715.00	705.00	
74	15	40	688.00	697.00	703.00	695.00	683.00	
75	15	60	672.00	679.00	679.00	400.00	665.00	
76	15	80	622.00	644.00	661.00	657.00	650.00	

file requested

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5.c
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comb. press. - pr (mm water gage) 22.00
cross flow temp. - tr (degree celsius) 505.00
comb. air flow rate - mcr (mm water diff.) 40.00
cool air flow rate - mkr (mm water diff.) 100.00
natural gas flow rate - mgr (mm water diff.) 18.00
natural gas total press. - pggr (psi gage) 0.00
air total press. - pgar (mm water gage) 0.00
jet temp. - tjr (degree celsius) 0.00
single jet flow rate - mgjr (s.c.f.m.) 0.00
wall temp. - t5 (degree celsius) 227.00
wall temp. - t6 (degree celsius) 284.00
wall temp. - t7 (degree celsius) 281.00
wall temp. - t8 (degree celsius) 364.00
wall temp. - t9 (degree celsius) 247.00
wall temp. - t10 (degree celsius) 256.00

mc = 0.0189737 kg/sec
mk = 0.0940000 kg/sec
mg = 0.001273 kg/sec
m = 0.114246 kg/sec
p = 98315.8 pascal
t = 778 degree kelvin
tj = 273 degree kelvin
t5 = 500 degree kelvin
t6 = 557 degree kelvin
t7 = 554 degree kelvin
t8 = 637 degree kelvin
t9 = 520 degree kelvin
t10= 529 degree kelvin
ro = 0.4403 kg/cubic meter
roj= 1.2548 kg/cubic meter
v = 9.60 meter/sec
mgj= 0.0000000 kg/sec
vj = 0.00 meter/sec
dr = 2.85 density ratio
j = 0.0 momentum ratio
fr = 0 froude number
sr = 0.00 spacing ratio

pt	radius	angle	t11	t12	t13	t14	t15
1	80	0	701.00	706.00	695.00	710.00	711.00
2	80	20	714.00	723.00	717.00	731.00	728.00
3	80	40	710.00	721.00	721.00	732.00	732.00
4	80	60	722.00	731.00	724.00	732.00	729.00
5	80	80	724.00	741.00	744.00	750.00	747.00
6	80	100	721.00	742.00	751.00	758.00	754.00
7	80	120	721.00	745.00	754.00	764.00	763.00
8	80	140	722.00	746.00	754.00	769.00	762.00
9	80	160	708.00	730.00	743.00	761.00	766.00
10	80	180	696.00	717.00	734.00	757.00	768.00
11	85	0	724.00	732.00	721.00	734.00	726.00
12	85	20	739.00	747.00	742.00	753.00	748.00
13	85	40	737.00	750.00	749.00	754.00	747.00

14	85	60	739.00	755.00	753.00	762.00	753.00	
15	85	80	742.00	758.00	760.00	766.00	760.00	
16	85	100	734.00	753.00	759.00	768.00	762.00	
17	85	120	726.00	746.00	759.00	769.00	765.00	
18	85	140	705.00	727.00	741.00	758.00	755.00	
19	85	160	703.00	720.00	736.00	752.00	755.00	rdg.
20	85	180	689.00	710.00	728.00	749.00	756.00	5.c
21	75	0	744.00	755.00	746.00	758.00	752.00	
22	75	20	754.00	766.00	761.00	769.00	763.00	
23	75	40	751.00	761.00	761.00	762.00	754.00	
24	75	60	743.00	759.00	763.00	764.00	756.00	
25	75	80	745.00	761.00	767.00	772.00	760.00	
26	75	100	729.00	741.00	751.00	756.00	754.00	
27	75	120	712.00	727.00	740.00	750.00	749.00	
28	75	140	695.00	717.00	736.00	750.00	745.00	
29	75	160	692.00	711.00	729.00	740.00	738.00	
30	75	180	681.00	706.00	723.00	741.00	737.00	
31	65	0	760.00	770.00	765.00	772.00	763.00	
32	65	20	760.00	771.00	768.00	772.00	764.00	
33	65	40	754.00	768.00	767.00	768.00	762.00	
34	65	60	754.00	766.00	766.00	771.00	765.00	
35	65	80	748.00	760.00	766.00	772.00	763.00	
36	65	100	722.00	736.00	750.00	760.00	749.00	
37	65	120	704.00	721.00	741.00	751.00	742.00	
38	65	140	691.00	714.00	731.00	733.00	724.00	
39	65	160	690.00	713.00	727.00	731.00	724.00	
40	65	180	678.00	702.00	717.00	724.00	716.00	
41	55	0	764.00	777.00	778.00	782.00	774.00	
42	55	20	770.00	784.00	778.00	781.00	774.00	
43	55	40	764.00	774.00	774.00	776.00	763.00	
44	55	60	747.00	760.00	765.00	768.00	757.00	
45	55	80	730.00	744.00	753.00	755.00	744.00	
46	55	100	712.00	732.00	746.00	744.00	732.00	
47	55	120	698.00	719.00	733.00	727.00	713.00	
48	55	140	692.00	711.00	719.00	713.00	706.00	
49	55	160	685.00	700.00	706.00	702.00	701.00	
50	55	180	679.00	689.00	693.00	690.00	690.00	
51	45	0	778.00	790.00	784.00	787.00	773.00	
52	45	20	767.00	782.00	781.00	780.00	767.00	
53	45	40	761.00	775.00	776.00	772.00	762.00	
54	45	60	743.00	756.00	764.00	760.00	750.00	
55	45	80	728.00	741.00	749.00	746.00	734.00	
56	45	100	703.00	718.00	728.00	718.00	712.00	
57	45	120	694.00	710.00	716.00	715.00	695.00	
58	45	140	677.00	686.00	692.00	686.00	686.00	
59	35	0	772.00	781.00	784.00	788.00	781.00	
60	35	20	770.00	785.00	786.00	782.00	870.00	
61	35	40	758.00	771.00	775.00	770.00	756.00	
62	35	60	733.00	747.00	752.00	750.00	740.00	
63	35	80	713.00	725.00	731.00	726.00	715.00	
64	35	100	697.00	713.00	718.00	711.00	703.00	
65	35	120	673.00	677.00	682.00	674.00	673.00	
66	25	0	773.00	789.00	786.00	783.00	771.00	
67	25	20	760.00	778.00	782.00	776.00	762.00	
68	25	40	742.00	757.00	764.00	756.00	744.00	
69	25	60	721.00	733.00	742.00	734.00	722.00	
70	25	80	711.00	720.00	722.00	712.00	702.00	
71	25	100	683.00	687.00	688.00	677.00	673.00	
72	15	0	773.00	786.00	785.00	779.00	767.00	
73	15	20	744.00	760.00	767.00	760.00	746.00	
74	15	40	723.00	739.00	745.00	735.00	723.00	
75	15	60	707.00	719.00	723.00	713.00	703.00	
76	15	80	649.00	675.00	692.00	681.00	675.00	

****
file requested 6.c
****

comb. press. - pr (mm water gage) 25.00
cross flow temp. - tr (degree celsius) 415.00
comb. air flow rate - mcr (mm water diff.) 40.00
cool air flow rate - mkr (mm water diff.) 140.00
natural gas flow rate - mgr (mm water diff.) 18.00
natural gas total press. - pggr (psi gage) 0.00
air total press. - pgar (mm water gage) 0.00
jet temp. - tjr (degree celsius) 0.00
single jet flow rate - mgjr (s.c.f.m.) 0.00
wall temp. - t5 (degree celsius) 252.00
wall temp. - t6 (degree celsius) 259.00
wall temp. - t7 (degree celsius) 259.00
wall temp. - t8 (degree celsius) 334.00
wall temp. - t9 (degree celsius) 240.00
wall temp. - t10 (degree celsius) 238.00

mc = 0.0189737 kg/sec
mk = 0.1112223 kg/sec
mg = 0.001273 kg/sec
m = 0.131469 kg/sec
p = 98345.3 pascal
t = 688 degree kelvin
tj = 273 degree kelvin
t5 = 525 degree kelvin
t6 = 532 degree kelvin
t7 = 532 degree kelvin
t8 = 607 degree kelvin
t9 = 513 degree kelvin
t10= 511 degree kelvin
ro = 0.4981 kg/cubic meter
roj= 1.2552 kg/cubic meter
v = 9.77 meter/sec
mgj= 0.0000000 kg/sec
vj = 0.00 meter/sec
dr = 2.52 density ratio
j = 0.0 momentum ratio
fr = 0 froude number
sr = 0.00 spacing ratio

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	634.00	640.00	637.00	644.00	646.00
2	95	20	630.00	638.00	639.00	645.00	649.00
3	95	40	643.00	654.00	649.00	659.00	658.00
4	95	60	637.00	647.00	650.00	659.00	660.00
5	95	80	642.00	657.00	664.00	673.00	673.00
6	95	100	640.00	653.00	662.00	675.00	673.00
7	95	120	642.00	660.00	664.00	674.00	675.00
8	95	140	631.00	649.00	660.00	673.00	677.00
9	95	160	637.00	655.00	666.00	682.00	684.00
10	95	180	632.00	650.00	663.00	679.00	684.00
11	85	0	642.00	650.00	646.00	658.00	661.00
12	85	20	653.00	658.00	654.00	666.00	664.00
13	85	40	660.00	670.00	669.00	677.00	674.00

14	85	60	655.00	663.00	664.00	676.00	675.00	
15	85	80	659.00	672.00	675.00	681.00	676.00	
16	85	100	655.00	666.00	670.00	678.00	678.00	
17	85	120	650.00	663.00	670.00	678.00	679.00	
18	85	140	636.00	653.00	664.00	675.00	676.00	
19	85	160	628.00	647.00	659.00	671.00	674.00	rdg.
20	85	180	625.00	645.00	656.00	670.00	674.00	6.c
21	75	0	657.00	662.00	658.00	668.00	666.00	
22	75	20	660.00	669.00	667.00	679.00	676.00	
23	75	40	663.00	671.00	674.00	681.00	678.00	
24	75	60	655.00	665.00	669.00	675.00	675.00	
25	75	80	666.00	677.00	679.00	685.00	683.00	
26	75	100	651.00	665.00	671.00	678.00	676.00	
27	75	120	642.00	658.00	671.00	679.00	677.00	
28	75	140	635.00	654.00	665.00	676.00	672.00	
29	75	160	628.00	645.00	656.00	667.00	669.00	
30	75	180	627.00	647.00	656.00	665.00	669.00	
31	65	0	672.00	678.00	677.00	688.00	685.00	
32	65	20	677.00	688.00	686.00	694.00	689.00	
33	65	40	666.00	678.00	680.00	688.00	687.00	
34	65	60	672.00	683.00	682.00	689.00	686.00	
35	65	80	661.00	673.00	678.00	685.00	680.00	
36	65	100	649.00	664.00	672.00	680.00	679.00	
37	65	120	638.00	656.00	668.00	676.00	671.00	
38	65	140	632.00	651.00	663.00	669.00	665.00	
39	65	160	630.00	648.00	658.00	660.00	657.00	
40	65	180	626.00	644.00	651.00	656.00	656.00	
41	55	0	674.00	684.00	681.00	690.00	688.00	
42	55	20	670.00	681.00	681.00	688.00	688.00	
43	55	40	662.00	673.00	677.00	684.00	683.00	
44	55	60	668.00	678.00	682.00	687.00	685.00	
45	55	80	662.00	673.00	680.00	685.00	680.00	
46	55	100	649.00	663.00	675.00	676.00	672.00	
47	55	120	634.00	653.00	663.00	666.00	663.00	
48	55	140	637.00	653.00	658.00	657.00	655.00	
49	55	160	637.00	650.00	652.00	649.00	648.00	
50	55	180	629.00	640.00	643.00	644.00	647.00	
51	45	0	685.00	695.00	696.00	699.00	697.00	
52	45	20	688.00	698.00	698.00	702.00	698.00	
53	45	40	678.00	689.00	690.00	696.00	695.00	
54	45	60	670.00	683.00	687.00	690.00	686.00	
55	45	80	657.00	669.00	677.00	680.00	675.00	
56	45	100	645.00	659.00	666.00	670.00	665.00	
57	45	120	641.00	655.00	660.00	657.00	654.00	
58	45	140	628.00	639.00	645.00	644.00	644.00	
59	35	0	690.00	702.00	703.00	707.00	704.00	
60	35	20	683.00	695.00	701.00	703.00	698.00	
61	35	40	682.00	693.00	697.00	697.00	692.00	
62	35	60	667.00	679.00	686.00	686.00	681.00	
63	35	80	652.00	664.00	672.00	672.00	667.00	
64	35	100	643.00	654.00	660.00	658.00	654.00	
65	35	120	627.00	638.00	643.00	641.00	640.00	
66	25	0	692.00	703.00	706.00	708.00	702.00	
67	25	20	681.00	694.00	701.00	702.00	697.00	
68	25	40	666.00	678.00	685.00	683.00	678.00	
69	25	60	654.00	666.00	674.00	675.00	674.00	
70	25	80	645.00	658.00	663.00	659.00	655.00	
71	25	100	628.00	637.00	643.00	640.00	637.00	
72	15	0	684.00	697.00	705.00	710.00	706.00	
73	15	20	679.00	691.00	696.00	693.00	687.00	
74	15	40	665.00	676.00	682.00	678.00	671.00	
75	15	60	650.00	662.00	666.00	663.00	658.00	
76	15	80	625.00	641.00	652.00	648.00	644.00	

file requested **********
7.c
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comb. press. - pr (mm water gage) 18.00
cross flow temp. - tr (degree celsius) 552.00
comb. air flow rate - mcr (mm water diff.) 40.00
cool air flow rate - mkr (mm water diff.) 80.00
natural gas flow rate - mgr (mm water diff.) 18.00
natural gas total press. - pgar (psi gage) 0.00
air total press. - psar (mm water gage) 0.00
jet temp. - tjr (degree celsius) 0.00
single jet flow rate - msjr (s.c.f.m.) 0.00
wall temp. - t5 (degree celsius) 294.00
wall temp. - t6 (degree celsius) 284.00
wall temp. - t7 (degree celsius) 28[illegible].00
wall temp. - t8 (degree celsius) 373.00
wall temp. - t9 (degree celsius) 279.00
wall temp. - t10 (degree celsius) [illegible]0.00

mc = 0.0189737 kg/sec
mk = 0.0840761 kg/sec
mg = 0.001273 kg/sec
m = 0.104323 kg/sec
p = 98276.6 pascal
t = 825 degree kelvin
tj = 273 degree kelvin
t5 = 567 degree kelvin
t6 = 557 degree kelvin
t7 = 559 degree kelvin
t8 = 646 degree kelvin
t9 = 552 degree kelvin
t10= 553 degree kelvin
ro = 0.4151 kg/cubic meter
roj= 1.2543 kg/cubic meter
v = 9.30 meter/sec
msj= 0.0000000 kg/sec
vj = 0.00 meter/sec
dr = 3.02 density ratio
j = 0.0 momentum ratio
fr = 0 froude number
sr = 0.00 spacing ratio

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	750.00	754.00	723.00	730.00	726.00
2	95	20	775.00	778.00	759.00	770.00	765.00
3	95	40	774.00	785.00	770.00	784.00	779.00
4	95	60	778.00	787.00	779.00	791.00	781.00
5	95	80	775.00	788.00	793.00	805.00	789.00
6	95	100	774.00	796.00	801.00	813.00	800.00
7	95	120	774.00	797.00	803.00	814.00	799.00
8	95	140	761.00	789.00	800.00	818.00	810.00
9	95	160	767.00	789.00	800.00	821.00	815.00
10	95	180	747.00	771.00	788.00	802.00	807.00
11	85	0	773.00	780.00	768.00	776.00	769.00
12	85	20	785.00	792.00	781.00	792.00	788.00
13	85	40	798.00	807.00	796.00	802.00	793.00

14	85	60	796.00	807.00	797.00	805.00	793.00	
15	85	80	784.00	799.00	795.00	802.00	792.00	
16	85	100	784.00	804.00	806.00	812.00	802.00	
17	85	120	771.00	794.00	805.00	817.00	807.00	
18	85	140	755.00	772.00	789.00	804.00	801.00	
19	85	160	741.00	761.00	779.00	802.00	799.00	rdg.
20	85	180	729.00	754.00	774.00	797.00	797.00	7.c
21	75	0	796.00	803.00	787.00	793.00	784.00	
22	75	20	803.00	809.00	801.00	807.00	797.00	
23	75	40	803.00	813.00	800.00	806.00	797.00	
24	75	60	802.00	819.00	815.00	815.00	803.00	
25	75	80	790.00	806.00	807.00	816.00	806.00	
26	75	100	768.00	786.00	795.00	802.00	796.00	
27	75	120	758.00	778.00	792.00	803.00	791.00	
28	75	140	735.00	758.00	778.00	787.00	784.00	
29	75	160	730.00	757.00	770.00	784.00	778.00	
30	75	180	715.00	742.00	760.00	777.00	771.00	
31	65	0	815.00	823.00	812.00	815.00	798.00	
32	65	20	813.00	822.00	813.00	809.00	794.00	
33	65	40	808.00	820.00	816.00	817.00	810.00	
34	65	60	807.00	819.00	817.00	815.00	798.00	
35	65	80	781.00	797.00	801.00	805.00	788.00	
36	65	100	756.00	773.00	787.00	794.00	779.00	
37	65	120	740.00	764.00	785.00	786.00	769.00	
38	65	140	732.00	758.00	773.00	771.00	758.00	
39	65	160	722.00	745.00	757.00	754.00	744.00	
40	65	180	712.00	737.00	749.00	749.00	743.00	
41	55	0	815.00	826.00	817.00	821.00	806.00	
42	55	20	816.00	824.00	818.00	816.00	806.00	
43	55	40	815.00	824.00	820.00	820.00	803.00	
44	55	60	801.00	813.00	815.00	810.00	794.00	
45	55	80	766.00	782.00	793.00	795.00	776.00	
46	55	100	749.00	766.00	781.00	781.00	762.00	
47	55	120	733.00	754.00	768.00	762.00	748.00	
48	55	140	727.00	747.00	754.00	739.00	727.00	
49	55	160	714.00	726.00	729.00	719.00	719.00	
50	55	180	707.00	715.00	715.00	712.00	711.00	
51	45	0	823.00	836.00	826.00	829.00	814.00	
52	45	20	820.00	832.00	830.00	829.00	813.00	
53	45	40	809.00	817.00	820.00	815.00	798.00	
54	45	60	783.00	797.00	805.00	802.00	786.00	
55	45	80	761.00	776.00	787.00	785.00	770.00	
56	45	100	734.00	754.00	761.00	749.00	736.00	
57	45	120	730.00	743.00	746.00	730.00	717.00	
58	45	140	709.00	716.00	716.00	703.00	701.00	
59	35	0	828.00	842.00	832.00	829.00	815.00	
60	35	20	816.00	830.00	829.00	821.00	808.00	
61	35	40	790.00	807.00	812.00	806.00	791.00	
62	35	60	767.00	785.00	796.00	784.00	769.00	
63	35	80	744.00	757.00	766.00	754.00	739.00	
64	35	100	730.00	741.00	742.00	724.00	712.00	
65	35	120	705.00	706.00	707.00	693.00	692.00	
66	25	0	826.00	841.00	837.00	829.00	817.00	
67	25	20	804.00	819.00	821.00	813.00	798.00	
68	25	40	774.00	792.00	795.00	789.00	778.00	
69	25	60	759.00	773.00	781.00	771.00	757.00	
70	25	80	735.00	747.00	747.00	731.00	719.00	
71	25	100	701.00	698.00	702.00	688.00	684.00	
72	15	0	818.00	833.00	830.00	825.00	807.00	
73	15	20	773.00	797.00	805.00	794.00	777.00	
74	15	40	758.00	775.00	781.00	769.00	752.00	
75	15	60	748.00	757.00	756.00	742.00	728.00	
76	15	80	703.00	716.00	728.00	714.00	704.00	

****
file requested 8.c
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comb. press. - pr (mm water gage) 26.00
cross flow temp. - tr (degree celsius) 375.00
comb. air flow rate - mcr (mm water diff.) 40.00
cool air flow rate - mkr (mm water diff.) 160.00
natural gas flow rate - mgr (mm water diff.) 18.00
natural gas total press. - pgr (psi gage) 0.00
air total press. - psar (mm water gage) 0.00
jet temp. - tjr (degree celsius) 31.00
single jet flow rate - msjr (s.c.f.m.) 1.58
wall temp. - t5 (degree celsius) 206.00
wall temp. - t6 (degree celsius) 237.00
wall temp. - t7 (degree celsius) 239.00
wall temp. - t8 (degree celsius) 306.00
wall temp. - t9 (degree celsius) 216.00
wall temp. - t10 (degree celsius) 222.00

mc = 0.0189737 kg/sec
mk = 0.1189016 kg/sec
mg = 0.001273 kg/sec
m = 0.139148 kg/sec
p = 98355.1 pascal
t = 648 degree kelvin
tj = 304 degree kelvin
t5 = 479 degree kelvin
t6 = 510 degree kelvin
t7 = 512 degree kelvin
t8 = 579 degree kelvin
t9 = 489 degree kelvin
t10= 495 degree kelvin
ro = 0.5289 kg/cubic meter
roj= 1.1273 kg/cubic meter
v = 9.74 meter/sec
msj= 0.0008263 kg/sec
vj = 18.45 meter/sec
dr = 2.13 density ratio
j = 7.7 momentum ratio
fr = 18384 froude number
sr = 0.00 spacing ratio

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	590.00	590.00	565.00	604.00	615.00
2	95	20	603.00	597.00	571.00	601.00	622.00
3	95	40	598.00	587.00	562.00	591.00	616.00
4	95	60	602.00	594.00	573.00	597.00	620.00
5	95	80	596.00	590.00	569.00	593.00	620.00
6	95	100	609.00	608.00	587.00	600.00	621.00
7	95	120	603.00	606.00	590.00	603.00	623.00
8	95	140	600.00	606.00	600.00	610.00	630.00
9	95	160	586.00	588.00	587.00	583.00	585.00
10	95	180	598.00	607.00	600.00	610.00	626.00
11	85	0	606.00	590.00	559.00	590.00	623.00
12	85	20	610.00	590.00	561.00	585.00	629.00
13	85	40	614.00	597.00	563.00	583.00	624.00

14	85	60	613.00	599.00	572.00	589.00	621.00	
15	85	80	610.00	601.00	579.00	595.00	623.00	
16	85	100	611.00	609.00	590.00	602.00	626.00	
17	85	120	600.00	601.00	598.00	603.00	625.00	
18	85	140	603.00	611.00	603.00	612.00	627.00	
19	85	160	593.00	602.00	601.00	614.00	628.00	rdg.
20	85	180	587.00	600.00	603.00	613.00	626.00	8.c
21	75	0	613.00	583.00	542.00	564.00	623.00	
22	75	20	622.00	595.00	559.00	573.00	628.00	
23	75	40	622.00	601.00	572.00	587.00	626.00	
24	75	60	619.00	603.00	576.00	591.00	625.00	
25	75	80	626.00	616.00	595.00	605.00	630.00	
26	75	100	614.00	613.00	601.00	609.00	627.00	
27	75	120	609.00	615.00	610.00	618.00	631.00	
28	75	140	603.00	611.00	613.00	620.00	629.00	
29	75	160	600.00	610.00	610.00	619.00	630.00	
30	75	180	593.00	605.00	608.00	616.00	627.00	
31	65	0	630.00	603.00	551.00	569.00	637.00	
32	65	20	629.00	611.00	566.00	580.00	631.00	
33	65	40	628.00	613.00	580.00	592.00	631.00	
34	65	60	624.00	615.00	590.00	604.00	631.00	
35	65	80	623.00	620.00	606.00	617.00	635.00	
36	65	100	615.00	619.00	615.00	621.00	633.00	
37	65	120	610.00	619.00	618.00	624.00	632.00	
38	65	140	606.00	616.00	618.00	622.00	627.00	
39	65	160	603.00	613.00	615.00	620.00	628.00	
40	65	180	597.00	611.00	612.00	620.00	627.00	
41	55	0	636.00	617.00	559.00	586.00	647.00	
42	55	20	633.00	621.00	579.00	596.00	640.00	
43	55	40	641.00	630.00	601.00	614.00	643.00	
44	55	60	632.00	628.00	609.00	619.00	641.00	
45	55	80	624.00	626.00	615.00	623.00	637.00	
46	55	100	613.00	620.00	618.00	628.00	637.00	
47	55	120	611.00	619.00	618.00	626.00	633.00	
48	55	140	603.00	613.00	614.00	620.00	628.00	
49	55	160	597.00	606.00	609.00	616.00	625.00	
50	55	180	594.00	603.00	606.00	614.00	620.00	
51	45	0	647.00	643.00	595.00	621.00	658.00	
52	45	20	641.00	638.00	608.00	623.00	652.00	
53	45	40	644.00	642.00	621.00	633.00	654.00	
54	45	60	635.00	636.00	622.00	632.00	647.00	
55	45	80	626.00	630.00	622.00	630.00	640.00	
56	45	100	613.00	620.00	617.00	626.00	632.00	
57	45	120	614.00	621.00	621.00	625.00	627.00	
58	45	140	599.00	608.00	611.00	614.00	619.00	
59	35	0	651.00	654.00	625.00	644.00	665.00	
60	35	20	655.00	658.00	634.00	644.00	661.00	
61	35	40	640.00	645.00	635.00	643.00	655.00	
62	35	60	633.00	639.00	634.00	639.00	645.00	
63	35	80	621.00	628.00	628.00	634.00	637.00	
64	35	100	615.00	621.00	622.00	628.00	630.00	
65	35	120	602.00	608.00	611.00	612.00	615.00	
66	25	0	657.00	666.00	656.00	666.00	672.00	
67	25	20	648.00	657.00	650.00	658.00	665.00	
68	25	40	639.00	647.00	643.00	650.00	655.00	
69	25	60	631.00	639.00	637.00	640.00	643.00	
70	25	80	623.00	629.00	628.00	631.00	633.00	
71	25	100	609.00	613.00	616.00	616.00	617.00	
72	15	0	656.00	666.00	666.00	670.00	674.00	
73	15	20	647.00	657.00	660.00	662.00	663.00	
74	15	40	634.00	645.00	646.00	650.00	650.00	
75	15	60	628.00	636.00	639.00	639.00	641.00	
76	15	80	601.00	612.00	620.00	618.00	620.00	

file requested

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9.c
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comb. press. - pr (mm water gage) 31.00
cross flow temp. - tr (degree celsius) 370.00
comb. air flow rate - mcr (mm water diff.) 40.00
cool air flow rate - mkr (mm water diff.) 170.00
natural gas flow rate - mgr (mm water diff.) 18.00
natural gas total press. - pggr (psi gage) 0.00
air total press. - pgar (mm water gage) 0.00
jet temp. - tjr (degree celsius) 29.00
single jet flow rate - mgjr (s.c.f.m.) 1.40
wall temp. - t5 (degree celsius) 199.00
wall temp. - t6 (degree celsius) 236.00
wall temp. - t7 (degree celsius) 236.00
wall temp. - t8 (degree celsius) 305.00
wall temp. - t9 (degree celsius) 212.00
wall temp. - t10 (degree celsius) 215.00

mc = 0.0189737 kg/sec
mk = 0.1225610 kg/sec
mg = 0.001273 kg/sec
m = 0.142807 kg/sec
p = 98404.1 pascal
t = 643 degree kelvin
tj = 302 degree kelvin
t5 = 472 degree kelvin
t6 = 509 degree kelvin
t7 = 509 degree kelvin
t8 = 578 degree kelvin
t9 = 485 degree kelvin
t10= 488 degree kelvin
ro = 0.5332 kg/cubic meter
roj= 1.1353 kg/cubic meter
v = 9.91 meter/sec
mgj= 0.0007322 kg/sec
vj = 16.23 meter/sec
dr = 2.13 density ratio
j = 5.7 momentum ratio
fr = 14245 froude number
sr = 0.00 spacing ratio

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	580.00	579.00	550.00	588.00	601.00
2	95	20	593.00	588.00	558.00	585.00	609.00
3	95	40	599.00	591.00	560.00	585.00	615.00
4	95	60	601.00	597.00	565.00	586.00	614.00
5	95	80	599.00	596.00	570.00	585.00	612.00
6	95	100	595.00	597.00	575.00	589.00	615.00
7	95	120	596.00	602.00	584.00	593.00	614.00
8	95	140	586.00	596.00	590.00	597.00	616.00
9	95	160	591.00	600.00	595.00	603.00	619.00
10	95	180	591.00	604.00	602.00	607.00	620.00
11	85	0	598.00	587.00	545.00	573.00	617.00
12	85	20	609.00	594.00	556.00	577.00	621.00
13	85	40	611.00	598.00	564.00	582.00	621.00

14	85	60	614.00	605.00	571.00	585.00	616.00	
15	85	80	609.00	605.00	583.00	594.00	621.00	
16	85	100	606.00	607.00	587.00	595.00	617.00	
17	85	120	605.00	610.00	603.00	607.00	621.00	
18	85	140	601.00	607.00	603.00	610.00	622.00	
19	85	160	596.00	604.00	601.00	609.00	620.00	
20	85	180	582.00	594.00	597.00	609.00	621.00	rdg.
21	75	0	616.00	591.00	536.00	562.00	623.00	9.c
22	75	20	611.00	594.00	545.00	567.00	621.00	
23	75	40	620.00	608.00	566.00	580.00	620.00	
24	75	60	619.00	609.00	579.00	591.00	621.00	
25	75	80	615.00	611.00	592.00	604.00	626.00	
26	75	100	611.00	616.00	605.00	610.00	624.00	
27	75	120	607.00	611.00	608.00	613.00	626.00	
28	75	140	596.00	608.00	609.00	615.00	624.00	
29	75	160	595.00	606.00	608.00	616.00	623.00	
30	75	180	591.00	604.00	606.00	613.00	621.00	
31	65	0	620.00	607.00	545.00	569.00	630.00	
32	65	20	632.00	621.00	568.00	584.00	631.00	
33	65	40	626.00	617.00	583.00	596.00	632.00	
34	65	60	628.00	625.00	603.00	610.00	631.00	
35	65	80	622.00	624.00	610.00	615.00	630.00	
36	65	100	609.00	617.00	613.00	621.00	632.00	
37	65	120	603.00	614.00	613.00	619.00	628.00	
38	65	140	598.00	609.00	610.00	616.00	624.00	
39	65	160	596.00	608.00	609.00	614.00	621.00	
40	65	180	594.00	607.00	612.00	617.00	621.00	
41	55	0	635.00	629.00	570.00	599.00	643.00	
42	55	20	639.00	636.00	599.00	611.00	643.00	
43	55	40	631.00	629.00	602.00	614.00	640.00	
44	55	60	632.00	635.00	619.00	625.00	640.00	
45	55	80	624.00	627.00	620.00	628.00	636.00	
46	55	100	613.00	620.00	620.00	626.00	630.00	
47	55	120	605.00	615.00	614.00	621.00	625.00	
48	55	140	601.00	614.00	617.00	618.00	621.00	
49	55	160	597.00	607.00	611.00	614.00	618.00	
50	55	180	591.00	601.00	603.00	607.00	615.00	
51	45	0	640.00	644.00	608.00	629.00	651.00	
52	45	20	645.00	649.00	624.00	634.00	654.00	
53	45	40	637.00	642.00	627.00	636.00	649.00	
54	45	60	633.00	637.00	626.00	634.00	644.00	
55	45	80	620.00	628.00	624.00	632.00	636.00	
56	45	100	611.00	621.00	622.00	626.00	627.00	
57	45	120	604.00	615.00	617.00	619.00	620.00	
58	45	140	595.00	604.00	608.00	611.00	613.00	
59	35	0	645.00	653.00	644.00	656.00	662.00	
60	35	20	640.00	647.00	641.00	650.00	659.00	
61	35	40	637.00	644.00	638.00	646.00	651.00	
62	35	60	632.00	639.00	637.00	641.00	644.00	
63	35	80	618.00	626.00	622.00	630.00	634.00	
64	35	100	610.00	619.00	621.00	623.00	623.00	
65	35	120	597.00	605.00	609.00	609.00	611.00	
66	25	0	651.00	661.00	660.00	666.00	669.00	
67	25	20	643.00	653.00	651.00	656.00	658.00	
68	25	40	630.00	640.00	641.00	648.00	651.00	
69	25	60	623.00	634.00	635.00	637.00	638.00	
70	25	80	615.00	622.00	624.00	626.00	629.00	
71	25	100	602.00	609.00	614.00	613.00	614.00	
72	15	0	650.00	659.00	662.00	666.00	665.00	
73	15	20	640.00	650.00	654.00	656.00	655.00	
74	15	40	631.00	639.00	643.00	644.00	642.00	
75	15	60	616.00	626.00	627.00	628.00	628.00	
76	15	80	595.00	607.00	613.00	613.00	611.00	

file requested

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10.c
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comb. press. - pr (mm water gage) 30.00
cross flow temp. - tr (degree celsius) 370.00
comb. air flow rate - mcr (mm water diff.) 40.00
cool air flow rate - mkr (mm water diff.) 170.00
natural gas flow rate - mgr (mm water diff.) 18.00
natural gas total press. - pggr (psi gage) 0.00
air total press. - psar (mm water gage) 0.00
jet temp. - tjr (degree celsius) 31.00
single jet flow rate - msjr (s.c.f.m.) 1.12
wall temp. - t5 (degree celsius) 199.00
wall temp. - t6 (degree celsius) 236.00
wall temp. - t7 (degree celsius) 236.00
wall temp. - t8 (degree celsius) 305.00
wall temp. - t9 (degree celsius) 212.00
wall temp. - t10 (degree celsius) 215.00

mc = 0.0189737 kg/sec
mk = 0.1225610 kg/sec
mg = 0.001273 kg/sec
m = 0.142807 kg/sec
p = 98394.3 pascal
t = 643 degree kelvin
tj = 304 degree kelvin
t5 = 472 degree kelvin
t6 = 509 degree kelvin
t7 = 509 degree kelvin
t8 = 578 degree kelvin
t9 = 485 degree kelvin
t10= 488 degree kelvin
ro = 0.5332 kg/cubic meter
roj= 1.1278 kg/cubic meter
v = 9.91 meter/sec
msj= 0.0005858 kg/sec
vj = 13.07 meter/sec
dr = 2.12 density ratio
j = 3.7 momentum ratio
fr = 9294 froude number
sr = 0.00 spacing ratio

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	579.00	577.00	636.00	579.00	600.00
2	95	20	592.00	586.00	545.00	580.00	611.00
3	95	40	597.00	593.00	558.00	584.00	617.00
4	95	60	595.00	591.00	560.00	585.00	615.00
5	95	80	598.00	600.00	573.00	586.00	613.00
6	95	100	590.00	598.00	575.00	588.00	611.00
7	95	120	587.00	594.00	580.00	591.00	612.00
8	95	140	591.00	602.00	595.00	603.00	616.00
9	95	160	594.00	607.00	605.00	613.00	622.00
10	95	180	588.00	600.00	601.00	610.00	623.00
11	85	0	597.00	589.00	533.00	570.00	614.00
12	85	20	607.00	598.00	547.00	573.00	621.00
13	85	40	613.00	605.00	564.00	584.00	622.00

14	85	60	604.00	598.00	564.00	586.00	617.00	
15	85	80	609.00	609.00	586.00	594.00	619.00	
16	85	100	600.00	605.00	593.00	600.00	618.00	
17	85	120	601.00	610.00	603.00	608.00	623.00	
18	85	140	599.00	608.00	608.00	616.00	624.00	rdg.10.c
19	85	160	594.00	604.00	606.00	618.00	621.00	
20	85	180	586.00	599.00	608.00	617.00	625.00	
21	75	0	608.00	599.00	536.00	575.00	624.00	
22	75	20	623.00	616.00	565.00	586.00	633.00	
23	75	40	616.00	611.00	576.00	595.00	627.00	
24	75	60	618.00	619.00	592.00	604.00	629.00	
25	75	80	619.00	620.00	606.00	613.00	630.00	
26	75	100	612.00	621.00	614.00	620.00	629.00	
27	75	120	607.00	616.00	616.00	622.00	630.00	
28	75	140	603.00	616.00	619.00	624.00	628.00	
29	75	160	597.00	609.00	611.00	617.00	621.00	
30	75	180	587.00	602.00	610.00	616.00	621.00	
31	65	0	623.00	619.00	559.00	594.00	632.00	
32	65	20	628.00	629.00	588.00	608.00	639.00	
33	65	40	627.00	629.00	607.00	617.00	638.00	
34	65	60	623.00	626.00	612.00	622.00	637.00	
35	65	80	621.00	624.00	616.00	625.00	634.00	
36	65	100	611.00	619.00	619.00	626.00	632.00	
37	65	120	604.00	615.00	617.00	626.00	630.00	
38	65	140	600.00	613.00	619.00	623.00	626.00	
39	65	160	594.00	606.00	609.00	616.00	624.00	
40	65	180	595.00	607.00	612.00	619.00	625.00	
41	55	0	636.00	640.00	603.00	629.00	650.00	
42	55	20	641.00	645.00	622.00	638.00	654.00	
43	55	40	636.00	640.00	628.00	638.00	649.00	
44	55	60	632.00	640.00	630.00	640.00	374.00	
45	55	80	630.00	638.00	635.00	639.00	642.00	
46	55	100	615.00	625.00	630.00	637.00	637.00	
47	55	120	611.00	623.00	629.00	631.00	633.00	
48	55	140	606.00	618.00	621.00	623.00	626.00	
49	55	160	601.00	611.00	613.00	615.00	618.00	
50	55	180	592.00	602.00	606.00	610.00	615.00	
51	45	0	644.00	650.00	638.00	650.00	658.00	
52	45	20	643.00	652.00	645.00	653.00	657.00	
53	45	40	638.00	645.00	639.00	646.00	652.00	
54	45	60	633.00	642.00	638.00	644.00	646.00	
55	45	80	623.00	632.00	636.00	640.00	641.00	
56	45	100	614.00	624.00	626.00	629.00	629.00	
57	45	120	610.00	621.00	623.00	623.00	622.00	
58	45	140	598.00	607.00	612.00	614.00	618.00	
59	35	0	647.00	657.00	653.00	664.00	667.00	
60	35	20	652.00	660.00	661.00	667.00	666.00	
61	35	40	644.00	652.00	653.00	657.00	656.00	
62	35	60	630.00	641.00	644.00	649.00	648.00	
63	35	80	621.00	631.00	635.00	639.00	642.00	
64	35	100	615.00	624.00	625.00	626.00	626.00	
65	35	120	602.00	611.00	614.00	615.00	617.00	
66	25	0	652.00	662.00	664.00	669.00	669.00	
67	25	20	646.00	657.00	660.00	663.00	663.00	
68	25	40	636.00	646.00	651.00	654.00	653.00	
69	25	60	625.00	636.00	641.00	643.00	642.00	
70	25	80	620.00	629.00	633.00	633.00	631.00	
71	25	100	605.00	613.00	616.00	615.00	615.00	
72	15	0	654.00	665.00	666.00	670.00	670.00	
73	15	20	641.00	654.00	660.00	661.00	659.00	
74	15	40	636.00	647.00	652.00	650.00	647.00	
75	15	60	625.00	634.00	638.00	636.00	634.00	
76	15	80	603.00	616.00	623.00	620.00	619.00	

file requested

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11.c
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comb. press. - pr (mm water gage) 20.00
cross flow temp. - tr (degree celsius) 372.00
comb. air flow rate - mcr (mm water diff.) 20.00
cool air flow rate - mkr (mm water diff.) 110.00
natural gas flow rate - msr (mm water diff.) 10.00
natural gas total press. - pssr (psi gage) 0.00
air total press. - psar (mm water gage) 0.00
jet temp. - tjr (degree celsius) 30.00
single jet flow rate - msjr (s.c.f.m.) 1.44
wall temp. - t5 (degree celsius) 196.00
wall temp. - t6 (degree celsius) 234.00
wall temp. - t7 (degree celsius) 230.00
wall temp. - t8 (degree celsius) 287.00
wall temp. - t9 (degree celsius) 202.00
wall temp. - t10 (degree celsius) 208.00

mc = 0.0134164 kg/sec
mk = 0.0985880 kg/sec
ms = 0.000949 kg/sec
m = 0.112953 kg/sec
p = 98296.2 pascal
t = 645 degree kelvin
tj = 303 degree kelvin
t5 = 469 degree kelvin
t6 = 507 degree kelvin
t7 = 503 degree kelvin
t8 = 560 degree kelvin
t9 = 475 degree kelvin
t10= 481 degree kelvin
ro = 0.5310 kg/cubic meter
roj= 1.1303 kg/cubic meter
v = 7.87 meter/sec
msj= 0.0007531 kg/sec
vj = 16.77 meter/sec
dr = 2.13 density ratio
j = 9.7 momentum ratio
fr = 15207 froude number
sr = 0.00 spacing ratio

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	625.00	617.00	585.00	609.00	613.00
2	95	20	628.00	615.00	588.00	607.00	619.00
3	95	40	628.00	615.00	590.00	604.00	619.00
4	95	60	628.00	615.00	589.00	599.00	615.00
5	95	80	631.00	619.00	590.00	599.00	614.00
6	95	100	626.00	618.00	594.00	597.00	610.00
7	95	120	630.00	623.00	602.00	604.00	613.00
8	95	140	624.00	619.00	604.00	605.00	614.00
9	95	160	626.00	621.00	607.00	609.00	616.00
10	95	180	629.00	623.00	607.00	608.00	613.00
11	85	0	630.00	611.00	581.00	602.00	613.00
12	85	20	630.00	608.00	577.00	591.00	618.00
13	85	40	635.00	613.00	587.00	595.00	617.00

14	85	60	630.00	613.00	589.00	594.00	615.00	
15	85	80	635.00	618.00	594.00	597.00	613.00	
16	85	100	632.00	619.00	597.00	598.00	611.00	
17	85	120	630.00	623.00	605.00	604.00	612.00	
18	85	140	629.00	623.00	607.00	606.00	614.00	rdg.
19	85	160	625.00	621.00	605.00	604.00	611.00	lle
20	85	180	619.00	615.00	606.00	605.00	611.00	
21	75	0	638.00	600.00	567.00	577.00	619.00	
22	75	20	638.00	607.00	578.00	581.00	617.00	
23	75	40	637.00	611.00	582.00	585.00	612.00	
24	75	60	638.00	618.00	590.00	592.00	610.00	
25	75	80	627.00	612.00	589.00	591.00	607.00	
26	75	100	631.00	622.00	603.00	604.00	615.00	
27	75	120	630.00	624.00	609.00	607.00	615.00	
28	75	140	625.00	621.00	612.00	609.00	615.00	
29	75	160	619.00	615.00	607.00	607.00	613.00	
30	75	180	618.00	615.00	608.00	608.00	611.00	
31	65	0	641.00	600.00	559.00	562.00	618.00	
32	65	20	641.00	610.00	576.00	576.00	612.00	
33	65	40	641.00	614.00	583.00	586.00	612.00	
34	65	60	642.00	621.00	592.00	595.00	614.00	
35	65	80	634.00	620.00	599.00	600.00	612.00	
36	65	100	627.00	620.00	602.00	603.00	614.00	
37	65	120	623.00	619.00	607.00	605.00	610.00	
38	65	140	618.00	614.00	607.00	606.00	611.00	
39	65	160	614.00	611.00	604.00	605.00	609.00	
40	65	180	613.00	609.00	601.00	603.00	608.00	
41	55	0	644.00	610.00	561.00	568.00	620.00	
42	55	20	646.00	618.00	579.00	583.00	617.00	
43	55	40	640.00	619.00	588.00	591.00	614.00	
44	55	60	639.00	625.00	599.00	600.00	615.00	
45	55	80	631.00	622.00	607.00	608.00	616.00	
46	55	100	625.00	620.00	608.00	607.00	612.00	
47	55	120	619.00	617.00	607.00	607.00	610.00	
48	55	140	613.00	609.00	605.00	604.00	606.00	
49	55	160	609.00	603.00	599.00	600.00	602.00	
50	55	180	603.00	597.00	593.00	597.00	601.00	
51	45	0	650.00	625.00	575.00	587.00	633.00	
52	45	20	648.00	630.00	593.00	596.00	625.00	
53	45	40	644.00	629.00	603.00	604.00	621.00	
54	45	60	636.00	627.00	608.00	610.00	620.00	
55	45	80	627.00	621.00	608.00	608.00	613.00	
56	45	100	621.00	616.00	608.00	607.00	608.00	
57	45	120	612.00	608.00	604.00	605.00	607.00	
58	45	140	607.00	600.00	597.00	596.00	597.00	
59	35	0	657.00	645.00	602.00	611.00	642.00	
60	35	20	648.00	637.00	607.00	612.00	633.00	
61	35	40	647.00	637.00	615.00	615.00	625.00	
62	35	60	632.00	628.00	615.00	615.00	619.00	
63	35	80	623.00	619.00	610.00	609.00	612.00	
64	35	100	614.00	610.00	604.00	605.00	607.00	
65	35	120	605.00	600.00	596.00	597.00	596.00	
66	25	0	650.00	645.00	623.00	630.00	643.00	
67	25	20	648.00	642.00	624.00	626.00	636.00	
68	25	40	636.00	633.00	619.00	621.00	626.00	
69	25	60	625.00	623.00	615.00	614.00	617.00	
70	25	80	616.00	612.00	607.00	605.00	606.00	
71	25	100	602.00	599.00	597.00	593.00	593.00	
72	15	0	650.00	652.00	641.00	645.00	644.00	
73	15	20	639.00	642.00	634.00	635.00	636.00	
74	15	40	628.00	629.00	623.00	621.00	620.00	
75	15	60	614.00	616.00	614.00	612.00	613.00	
76	15	80	595.00	598.00	599.00	598.00	598.00	

file requested

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12.c
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comb. press. - pr (mm water gage) 20.00
cross flow temp. - tr (degree celsius) 375.00
comb. air flow rate - mcr (mm water diff.) 20.00
cool air flow rate - mkr (mm water diff.) 110.00
natural gas flow rate - mgr (mm water diff.) 10.50
natural gas total press. - pgar (psi gage) 0.00
air total press. - psar (mm water gage) 0.00
jet temp. - tjr (degree celsius) 32.00
single jet flow rate - msjr (s.c.f.m.) 1.58
wall temp. - t5 (degree celsius) 197.00
wall temp. - t6 (degree celsius) 235.00
wall temp. - t7 (degree celsius) 231.00
wall temp. - t8 (degree celsius) 288.00
wall temp. - t9 (degree celsius) 202.00
wall temp. - t10 (degree celsius) 207.00

mc = 0.0134164 kg/sec
mk = 0.0985880 kg/sec
mg = 0.000972 kg/sec
m = 0.112977 kg/sec
p = 98296.2 pascal
t = 648 degree kelvin
tj = 305 degree kelvin
t5 = 470 degree kelvin
t6 = 508 degree kelvin
t7 = 504 degree kelvin
t8 = 561 degree kelvin
t9 = 475 degree kelvin
t10= 480 degree kelvin
ro = 0.5285 kg/cubic meter
roj= 1.1229 kg/cubic meter
v = 7.91 meter/sec
msj= 0.0008263 kg/sec
vj = 18.52 meter/sec
dr = 2.12 density ratio
j = 11.7 momentum ratio
fr = 18582 froude number
sr = 0.00 spacing ratio

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	624.00	615.00	588.00	609.00	612.00
2	95	20	624.00	613.00	592.00	611.00	621.00
3	95	40	633.00	618.00	590.00	605.00	618.00
4	95	60	632.00	618.00	597.00	605.00	616.00
5	95	80	633.00	620.00	596.00	604.00	615.00
6	95	100	629.00	619.00	599.00	606.00	618.00
7	95	120	633.00	625.00	607.00	611.00	619.00
8	95	140	626.00	619.00	601.00	604.00	615.00
9	95	160	626.00	620.00	608.00	610.00	618.00
10	95	180	622.00	616.00	603.00	605.00	614.00
11	85	0	636.00	618.00	592.00	612.00	625.00
12	85	20	638.00	617.00	593.00	605.00	626.00
13	85	40	636.00	615.00	595.00	603.00	620.00

14	85	60	633.00	614.00	593.00	600.00	618.00	
15	85	80	635.00	619.00	599.00	606.00	620.00	
16	85	100	638.00	626.00	605.00	606.00	617.00	
17	85	120	631.00	622.00	606.00	607.00	615.00	
18	85	140	627.00	620.00	605.00	606.00	615.00	rdg.
19	85	160	628.00	620.00	604.00	606.00	614.00	12.c
20	85	180	619.00	614.00	604.00	606.00	614.00	
21	75	0	641.00	605.00	581.00	590.00	625.00	
22	75	20	636.00	606.00	582.00	587.00	620.00	
23	75	40	637.00	612.00	589.00	590.00	614.00	
24	75	60	639.00	617.00	592.00	596.00	614.00	
25	75	80	636.00	621.00	601.00	602.00	615.00	
26	75	100	632.00	622.00	605.00	605.00	615.00	
27	75	120	629.00	621.00	606.00	606.00	613.00	
28	75	140	626.00	621.00	609.00	607.00	615.00	
29	75	160	618.00	613.00	603.00	604.00	611.00	
30	75	180	618.00	615.00	605.00	605.00	611.00	
31	65	0	641.00	601.00	566.00	568.00	621.00	
32	65	20	643.00	608.00	579.00	579.00	615.00	
33	65	40	642.00	614.00	586.00	586.00	613.00	
34	65	60	638.00	618.00	596.00	597.00	614.00	
35	65	80	637.00	623.00	602.00	600.00	610.00	
36	65	100	631.00	621.00	605.00	604.00	612.00	
37	65	120	624.00	618.00	604.00	604.00	612.00	
38	65	140	619.00	614.00	604.00	603.00	610.00	
39	65	160	613.00	608.00	602.00	604.00	608.00	
40	65	180	613.00	608.00	601.00	605.00	611.00	
41	55	0	649.00	608.00	568.00	567.00	620.00	
42	55	20	648.00	616.00	580.00	580.00	616.00	
43	55	40	643.00	618.00	588.00	590.00	610.00	
44	55	60	638.00	622.00	599.00	599.00	614.00	
45	55	80	631.00	620.00	603.00	604.00	613.00	
46	55	100	624.00	618.00	605.00	605.00	613.00	
47	55	120	620.00	615.00	605.00	605.00	610.00	
48	55	140	615.00	608.00	602.00	604.00	606.00	
49	55	160	609.00	603.00	598.00	600.00	604.00	
50	55	180	608.00	598.00	594.00	598.00	602.00	
51	45	0	653.00	621.00	572.00	578.00	628.00	
52	45	20	647.00	621.00	587.00	590.00	618.00	
53	45	40	643.00	622.00	597.00	599.00	618.00	
54	45	60	636.00	621.00	601.00	603.00	615.00	
55	45	80	627.00	620.00	607.00	608.00	614.00	
56	45	100	620.00	614.00	605.00	606.00	609.00	
57	45	120	613.00	608.00	602.00	604.00	606.00	
58	45	140	605.00	597.00	595.00	596.00	599.00	
59	35	0	653.00	635.00	590.00	598.00	636.00	
60	35	20	648.00	631.00	600.00	603.00	628.00	
61	35	40	641.00	629.00	609.00	610.00	623.00	
62	35	60	634.00	626.00	611.00	611.00	618.00	
63	35	80	622.00	616.00	606.00	607.00	611.00	
64	35	100	615.00	611.00	605.00	606.00	607.00	
65	35	120	604.00	597.00	595.00	321.00	596.00	
66	25	0	652.00	642.00	611.00	620.00	642.00	
67	25	20	648.00	638.00	614.00	618.00	635.00	
68	25	40	637.00	630.00	615.00	616.00	623.00	
69	25	60	629.00	624.00	613.00	611.00	615.00	
70	25	80	617.00	612.00	605.00	605.00	607.00	
71	25	100	601.00	596.00	594.00	591.00	592.00	
72	15	0	649.00	647.00	631.00	638.00	644.00	
73	15	20	638.00	637.00	625.00	627.00	632.00	
74	15	40	629.00	628.00	618.00	618.00	620.00	
75	15	60	618.00	616.00	610.00	610.00	611.00	
76	15	80	595.00	598.00	600.00	599.00	599.00	

file requested **********
13.c
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comb. press. - pr (mm water gage) 20.00
cross flow temp. - tr (degree celsius) 557.00
comb. air flow rate - mcr (mm water diff.) 40.00
cool air flow rate - mkr (mm water diff.) 80.00
natural gas flow rate - mgr (mm water diff.) 18.00
natural gas total press. - pggr (psi gage) 0.00
air total press. - pgar (mm water gage) 0.00
jet temp. - tjr (degree celsius) 30.00
single jet flow rate - mgjr (s.c.f.m.) 1.51
wall temp. - t5 (degree celsius) 275.00
wall temp. - t6 (degree celsius) 291.00
wall temp. - t7 (degree celsius) 300.00
wall temp. - t8 (degree celsius) 375.00
wall temp. - t9 (degree celsius) 272.00
wall temp. - t10 (degree celsius) 279.00

mc = 0.0189737 kg/sec
mk = 0.0840761 kg/sec
mg = 0.001273 kg/sec
m = 0.104323 kg/sec
p = 98296.2 pascal
t = 830 degree kelvin
tj = 303 degree kelvin
t5 = 548 degree kelvin
t6 = 564 degree kelvin
t7 = 573 degree kelvin
t8 = 648 degree kelvin
t9 = 545 degree kelvin
t10= 552 degree kelvin
ro = 0.4126 kg/cubic meter
roj= 1.1303 kg/cubic meter
v = 9.35 meter/sec
mgj= 0.0007897 kg/sec
vj = 17.59 meter/sec
dr = 2.74 density ratio
j = 9.7 momentum ratio
fr = 13964 froude number
sr = 0.00 spacing ratio

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	766.00	764.00	714.00	751.00	756.00
2	95	20	781.00	775.00	728.00	751.00	770.00
3	95	40	785.00	775.00	738.00	760.00	787.00
4	95	60	779.00	772.00	734.00	751.00	775.00
5	95	80	780.00	774.00	744.00	750.00	770.00
6	95	100	777.00	779.00	751.00	757.00	779.00
7	95	120	782.00	780.00	753.00	754.00	775.00
8	95	140	774.00	780.00	756.00	759.00	781.00
9	95	160	768.00	774.00	756.00	756.00	778.00
10	95	180	758.00	769.00	756.00	759.00	778.00
11	85	0	787.00	764.00	720.00	750.00	778.00
12	85	20	796.00	769.00	724.00	741.00	782.00
13	85	40	801.00	779.00	740.00	745.00	781.00

14	85	60	798.00	774.00	735.00	738.00	771.00	
15	85	80	794.00	778.00	743.00	746.00	773.00	
16	85	100	789.00	761.00	748.00	750.00	766.00	
17	85	120	776.00	779.00	757.00	757.00	772.00	
18	85	140	763.00	768.00	757.00	755.00	768.00	
19	85	160	745.00	761.00	752.00	752.00	768.00	rdg.
20	85	180	735.00	755.00	757.00	761.00	774.00	13.c
21	75	0	805.00	757.00	709.00	719.00	790.00	
22	75	20	809.00	760.00	716.00	715.00	776.00	
23	75	40	803.00	764.00	727.00	726.00	769.00	
24	75	60	803.00	772.00	729.00	730.00	765.00	
25	75	80	791.00	774.00	742.00	743.00	768.00	
26	75	100	777.00	774.00	753.00	752.00	768.00	
27	75	120	757.00	763.00	750.00	749.00	759.00	
28	75	140	740.00	755.00	752.00	751.00	758.00	
29	75	160	724.00	743.00	742.00	746.00	759.00	
30	75	180	721.00	741.00	741.00	747.00	759.00	
31	65	0	817.00	754.00	699.00	695.00	779.00	
32	65	20	821.00	766.00	712.00	711.00	773.00	
33	65	40	812.00	770.00	721.00	724.00	770.00	
34	65	60	790.00	763.00	727.00	730.00	766.00	
35	65	80	788.00	778.00	753.00	753.00	767.00	
36	65	100	767.00	773.00	758.00	754.00	765.00	
37	65	120	747.00	761.00	757.00	755.00	761.00	
38	65	140	734.00	749.00	745.00	747.00	753.00	
39	65	160	726.00	740.00	738.00	741.00	749.00	
40	65	180	714.00	729.00	731.00	739.00	743.00	
41	55	0	837.00	768.00	695.00	700.00	791.00	
42	55	20	828.00	783.00	723.00	723.00	777.00	
43	55	40	816.00	781.00	733.00	731.00	773.00	
44	55	60	803.00	789.00	750.00	751.00	770.00	
45	55	80	774.00	776.00	757.00	755.00	764.00	
46	55	100	757.00	767.00	758.00	752.00	753.00	
47	55	120	738.00	753.00	747.00	742.00	742.00	
48	55	140	730.00	740.00	734.00	733.00	735.00	
49	55	160	717.00	724.00	721.00	722.00	728.00	
50	45	180	705.00	713.00	710.00	713.00	718.00	
51	45	0	836.00	786.00	704.00	718.00	804.00	
52	45	20	828.00	794.00	733.00	738.00	792.00	
53	45	40	813.00	792.00	752.00	752.00	778.00	
54	45	60	789.00	785.00	757.00	757.00	772.00	
55	45	80	764.00	773.00	760.00	758.00	762.00	
56	45	100	749.00	760.00	748.00	744.00	742.00	
57	45	120	737.00	742.00	733.00	729.00	727.00	
58	45	140	719.00	721.00	714.00	710.00	710.00	
59	35	0	847.00	826.00	744.00	753.00	816.00	
60	35	20	829.00	810.00	758.00	761.00	796.00	
61	35	40	803.00	799.00	767.00	768.00	783.00	
62	35	60	780.00	785.00	766.00	763.00	768.00	
63	35	80	765.00	771.00	755.00	747.00	744.00	
64	35	100	746.00	746.00	736.00	730.00	725.00	
65	35	120	720.00	719.00	711.00	703.00	705.00	
66	25	0	844.00	839.00	785.00	798.00	829.00	
67	25	20	818.00	819.00	782.00	782.00	798.00	
68	25	40	795.00	799.00	776.00	771.00	773.00	
69	25	60	773.00	779.00	763.00	757.00	754.00	
70	25	80	754.00	755.00	744.00	734.00	729.00	
71	25	100	729.00	728.00	717.00	701.00	697.00	
72	15	0	827.00	838.00	814.00	819.00	816.00	
73	15	20	797.00	811.00	795.00	794.00	787.00	
74	15	40	782.00	794.00	781.00	772.00	762.00	
75	15	60	765.00	767.00	756.00	745.00	737.00	
76	15	80	718.00	728.00	726.00	711.00	702.00	

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                                    **********
file requested                         14.c
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comb. press. - pr (mm water gage)      16.00
cross flow temp. - tr (degree celsius)     565.00
comb. air flow rate - mcr (mm water diff.)      30.00
cool air flow rate - mkr (mm water diff.)      60.00
natural gas flow rate - mgr (mm water diff.)      14.00
natural gas total press. - psgr (psi gage)       0.00
air total press. - psar (mm water gage)       0.00
jet temp. - tjr (degree celsius)      33.00
single jet flow rate - msjr (s.c.f.m.)       1.44
wall temp. - t5 (degree celsius)     275.00
wall temp. - t6 (degree celsius)     292.00
wall temp. - t7 (degree celsius)     300.00
wall temp. - t8 (degree celsius)     371.00
wall temp. - t9 (degree celsius)     271.00
wall temp. - t10 (degree celsius)     279.00


mc = 0.0164317 kg/sec
mk = 0.0728121 kg/sec
mg = 0.001122 kg/sec
m  = 0.090366 kg/sec
p  = 98257 pascal
t  = 838 degree kelvin
tj = 306 degree kelvin
t5 = 549 degree kelvin
t6 = 565 degree kelvin
t7 = 573 degree kelvin
t8 = 644 degree kelvin
t9 = 544 degree kelvin
t10= 552 degree kelvin
ro = 0.4085 kg/cubic meter
roj= 1.1188 kg/cubic meter
v  = 8.18 meter/sec
msj= 0.0007531 kg/sec
vj = 16.94 meter/sec
dr = 2.74 density ratio
j  = 11.7 momentum ratio
fr =   12964 froude number
sr =  0.00 spacing ratio
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pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	775.00	774.00	719.00	752.00	759.00
2	95	20	796.00	791.00	747.00	771.00	783.00
3	95	40	795.00	789.00	754.00	770.00	787.00
4	95	60	797.00	787.00	756.00	772.00	786.00
5	95	80	791.00	784.00	755.00	764.00	777.00
6	95	100	790.00	786.00	756.00	765.00	779.00
7	95	120	784.00	786.00	764.00	767.00	783.00
8	95	140	796.00	792.00	767.00	769.00	785.00
9	95	160	784.00	783.00	764.00	769.00	787.00
10	95	180	761.00	776.00	758.00	764.00	785.00
11	85	0	809.00	784.00	740.00	768.00	787.00
12	85	20	812.00	789.00	752.00	769.00	798.00
13	85	40	809.00	788.00	755.00	764.00	795.00

14	85	60	799.00	784.00	748.00	756.00	779.00	
15	85	80	799.00	788.00	759.00	760.00	778.00	
16	85	100	791.00	787.00	761.00	764.00	780.00	
17	85	120	783.00	783.00	764.00	768.00	782.00	
18	85	140	773.00	776.00	761.00	760.00	772.00	rdg. 14.c
19	85	160	751.00	765.00	754.00	760.00	778.00	
20	85	180	745.00	760.00	754.00	762.00	779.00	
21	75	0	821.00	775.00	738.00	747.00	795.00	
22	75	20	813.00	771.00	739.00	742.00	788.00	
23	75	40	810.00	780.00	744.00	742.00	773.00	
24	75	60	802.00	775.00	744.00	745.00	773.00	
25	75	80	797.00	772.00	743.00	741.00	761.00	
26	75	100	777.00	776.00	754.00	756.00	766.00	
27	75	120	762.00	769.00	759.00	758.00	769.00	
28	75	140	758.00	765.00	753.00	751.00	765.00	
29	75	160	735.00	751.00	748.00	754.00	769.00	
30	75	180	724.00	744.00	741.00	751.00	765.00	
31	65	0	824.00	759.00	724.00	718.00	794.00	
32	65	20	819.00	768.00	732.00	727.00	774.00	
33	65	40	814.00	774.00	740.00	736.00	767.00	
34	65	60	798.00	776.00	746.00	746.00	767.00	
35	65	80	786.00	774.00	749.00	750.00	765.00	
36	65	100	761.00	768.00	754.00	753.00	761.00	
37	65	120	747.00	762.00	754.00	749.00	758.00	
38	65	140	734.00	747.00	740.00	744.00	756.00	
39	65	160	727.00	738.00	735.00	743.00	750.00	
40	65	180	717.00	732.00	732.00	743.00	753.00	
41	55	0	834.00	764.00	709.00	705.00	784.00	
42	55	20	815.00	763.00	721.00	721.00	768.00	
43	55	40	809.00	776.00	737.00	740.00	771.00	
44	55	60	794.00	778.00	748.00	750.00	767.00	
45	55	80	776.00	773.00	754.00	753.00	762.00	
46	55	100	751.00	762.00	748.00	745.00	751.00	
47	55	120	740.00	750.00	739.00	739.00	745.00	
48	55	140	730.00	735.00	728.00	730.00	734.00	
49	55	160	719.00	722.00	721.00	723.00	729.00	
50	55	180	710.00	713.00	711.00	717.00	725.00	
51	45	0	839.00	775.00	710.00	716.00	792.00	
52	45	20	827.00	782.00	730.00	730.00	775.00	
53	45	40	802.00	777.00	741.00	740.00	767.00	
54	45	60	782.00	771.00	744.00	743.00	756.00	
55	45	80	765.00	766.00	748.00	745.00	749.00	
56	45	100	750.00	755.00	741.00	738.00	739.00	
57	45	120	737.00	737.00	727.00	728.00	728.00	
58	45	140	722.00	719.00	712.00	708.00	712.00	
59	35	0	844.00	802.00	724.00	734.00	810.00	
60	35	20	819.00	793.00	748.00	748.00	782.00	
61	35	40	796.00	788.00	758.00	758.00	769.00	
62	35	60	775.00	775.00	755.00	751.00	754.00	
63	35	80	757.00	760.00	744.00	738.00	737.00	
64	35	100	746.00	746.00	733.00	727.00	725.00	
65	35	120	725.00	720.00	711.00	702.00	703.00	
66	25	0	835.00	819.00	754.00	763.00	810.00	
67	25	20	814.00	801.00	759.00	762.00	784.00	
68	25	40	786.00	785.00	763.00	763.00	766.00	
69	25	60	767.00	770.00	753.00	749.00	745.00	
70	25	80	755.00	754.00	738.00	730.00	725.00	
71	25	100	724.00	720.00	711.00	698.00	696.00	
72	15	0	821.00	827.00	784.00	794.00	805.00	
73	15	20	786.00	796.00	774.00	772.00	777.00	
74	15	40	775.00	780.00	767.00	760.00	754.00	
75	15	60	758.00	756.00	747.00	738.00	732.00	
76	15	80	696.00	712.00	719.00	705.00	698.00	

file requested **********
15.c
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comb. press. - pr (mm water gage) 20.00
cross flow temp. - tr (degree celsius) 560.00
comb. air flow rate - mcr (mm water diff.) 40.00
cool air flow rate - mkr (mm water diff.) 80.00
natural gas flow rate - mgr (mm water diff.) 18.00
natural gas total press. - pggr (psi gage) 0.00
air total press. - pgar (mm water gage) 0.00
jet temp. - tjr (degree celsius) 31.00
single jet flow rate - mgjr (s.c.f.m.) 1.35
wall temp. - t5 (degree celsius) 282.00
wall temp. - t6 (degree celsius) 290.00
wall temp. - t7 (degree celsius) 302.00
wall temp. - t8 (degree celsius) 373.00
wall temp. - t9 (degree celsius) 276.00
wall temp. - t10 (degree celsius) 282.00

mc = 0.0189737 kg/sec
mk = 0.0840761 kg/sec
mg = 0.001273 kg/sec
m = 0.104323 kg/sec
p = 98296.2 pascal
t = 833 degree kelvin
tj = 304 degree kelvin
t5 = 555 degree kelvin
t6 = 563 degree kelvin
t7 = 575 degree kelvin
t8 = 646 degree kelvin
t9 = 549 degree kelvin
t10= 555 degree kelvin
ro = 0.4112 kg/cubic meter
roj= 1.1266 kg/cubic meter
v = 9.39 meter/sec
mgj= 0.0007034 kg/sec
vj = 15.72 meter/sec
dr = 2.74 density ratio
j = 7.7 momentum ratio
fr = 11150 froude number
sr = 0.00 spacing ratio

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	760.00	762.00	711.00	748.00	749.00
2	95	20	768.00	765.00	718.00	749.00	771.00
3	95	40	778.00	770.00	724.00	735.00	765.00
4	95	60	776.00	766.00	721.00	735.00	763.00
5	95	80	786.00	780.00	733.00	743.00	773.00
6	95	100	774.00	773.00	739.00	737.00	761.00
7	95	120	771.00	778.00	747.00	746.00	768.00
8	95	140	765.00	775.00	753.00	747.00	768.00
9	95	160	765.00	776.00	757.00	755.00	770.00
10	95	180	751.00	764.00	749.00	753.00	774.00
11	85	0	784.00	762.00	709.00	733.00	771.00
12	85	20	794.00	767.00	709.00	719.00	775.00
13	85	40	792.00	767.00	717.00	719.00	763.00

14	85	60	789.00	770.00	728.00	728.00	765.00	
15	85	80	787.00	774.00	734.00	735.00	760.00	
16	85	100	777.00	772.00	737.00	740.00	764.00	
17	85	120	771.00	777.00	757.00	755.00	772.00	
18	85	140	752.00	763.00	754.00	752.00	767.00	
19	85	160	740.00	756.00	752.00	752.00	769.00	
20	85	180	729.00	746.00	753.00	758.00	768.00	rdg.
21	75	0	806.00	753.00	696.00	705.00	777.00	15.c
22	75	20	805.00	759.00	705.00	705.00	770.00	
23	75	40	805.00	769.00	717.00	719.00	769.00	
24	75	60	799.00	776.00	727.00	728.00	764.00	
25	75	80	793.00	779.00	742.00	739.00	761.00	
26	75	100	773.00	772.00	749.00	748.00	766.00	
27	75	120	760.00	769.00	757.00	753.00	763.00	
28	75	140	736.00	752.00	750.00	752.00	760.00	
29	75	160	727.00	744.00	745.00	751.00	751.00	
30	75	180	716.00	737.00	745.00	751.00	759.00	
31	65	0	814.00	758.00	690.00	689.00	782.00	
32	65	20	818.00	773.00	706.00	708.00	771.00	
33	65	40	806.00	774.00	717.00	723.00	771.00	
34	65	60	802.00	785.00	741.00	744.00	773.00	
35	65	80	783.00	779.00	754.00	752.00	769.00	
36	65	100	761.00	768.00	758.00	750.00	759.00	
37	65	120	746.00	759.00	758.00	754.00	758.00	
38	65	140	731.00	748.00	750.00	747.00	750.00	
39	65	160	722.00	739.00	742.00	742.00	745.00	
40	65	180	717.00	736.00	734.00	738.00	741.00	
41	55	0	824.00	778.00	687.00	697.00	787.00	
42	55	20	826.00	794.00	723.00	723.00	782.00	
43	55	40	817.00	792.00	737.00	738.00	775.00	
44	55	60	801.00	791.00	753.00	753.00	771.00	
45	55	80	770.00	774.00	759.00	758.00	766.00	
46	55	100	752.00	762.00	756.00	754.00	754.00	
47	55	120	737.00	752.00	749.00	745.00	742.00	
48	55	140	727.00	738.00	738.00	733.00	731.00	
49	55	160	718.00	724.00	725.00	721.00	722.00	
50	55	180	705.00	713.00	712.00	712.00	716.00	
51	45	0	839.00	807.00	717.00	735.00	808.00	
52	45	20	831.00	806.00	740.00	746.00	790.00	
53	45	40	810.00	798.00	756.00	760.00	785.00	
54	45	60	790.00	792.00	771.00	769.00	777.00	
55	45	80	765.00	772.00	762.00	758.00	758.00	
56	45	100	742.00	754.00	750.00	745.00	743.00	
57	45	120	733.00	739.00	734.00	727.00	723.00	
58	45	140	713.00	716.00	712.00	707.00	704.00	
59	35	0	839.00	835.00	763.00	776.00	821.00	
60	35	20	828.00	820.00	769.00	776.00	802.00	
61	35	40	802.00	803.00	771.00	772.00	782.00	
62	35	60	781.00	788.00	767.00	766.00	767.00	
63	35	80	760.00	768.00	758.00	751.00	745.00	
64	35	100	743.00	744.00	734.00	725.00	718.00	
65	35	120	715.00	714.00	707.00	696.00	694.00	
66	25	0	841.00	849.00	810.00	819.00	826.00	
67	25	20	815.00	819.00	796.00	794.00	802.00	
68	25	40	790.00	801.00	783.00	781.00	778.00	
69	25	60	765.00	779.00	768.00	760.00	752.00	
70	25	80	752.00	755.00	745.00	736.00	727.00	
71	25	100	719.00	718.00	709.00	697.00	692.00	
72	15	0	826.00	842.00	828.00	824.00	812.00	
73	15	20	794.00	816.00	809.00	805.00	790.00	
74	15	40	770.00	786.00	780.00	769.00	754.00	
75	15	60	757.00	763.00	752.00	739.00	728.00	
76	15	80	714.00	725.00	724.00	708.00	701.00	

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file requested                       16.c
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comb. press. - pr (mm water gage)      19.00
cross flow temp. - tr (degree celsius)     573.00
comb. air flow rate - mcr (mm water diff.)      40.00
cool air flow rate - mkr (mm water diff.)      77.00
natural gas flow rate - mgr (mm water diff.)      18.00
natural gas total press. - psgr (psi gage)       0.00
air total press. - psar (mm water gage)       0.00
jet temp. - tjr (degree celsius)      36.00
single jet flow rate - msjr (s.c.f.m.)       1.14
wall temp. - t5 (degree celsius)     285.00
wall temp. - t6 (degree celsius)     298.00
wall temp. - t7 (degree celsius)     309.00
wall temp. - t8 (degree celsius)     384.00
wall temp. - t9 (degree celsius)     286.00
wall temp. - t10 (degree celsius)     297.00


mc = 0.0189737 kg/sec
mk = 0.0824847 kg/sec
mg = 0.001273 kg/sec
m  = 0.102731 kg/sec
p  = 98286.4 pascal
t  = 846 degree kelvin
tj = 309 degree kelvin
t5 = 558 degree kelvin
t6 = 571 degree kelvin
t7 = 582 degree kelvin
t8 = 657 degree kelvin
t9 = 559 degree kelvin
t10= 570 degree kelvin
ro = 0.4048 kg/cubic meter
roj= 1.1083 kg/cubic meter
v  = 9.39 meter/sec
msj= 0.0005962 kg/sec
vj = 13.54 meter/sec
dr = 2.74 density ratio
j  = 5.7 momentum ratio
fr =    8281 froude number
sr =  0.00 spacing ratio
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pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	775.00	778.00	704.00	758.00	766.00
2	95	20	779.00	777.00	715.00	746.00	775.00
3	95	40	797.00	791.00	732.00	745.00	785.00
4	95	60	799.00	794.00	738.00	748.00	781.00
5	95	80	798.00	803.00	751.00	749.00	779.00
6	95	100	799.00	804.00	756.00	753.00	781.00
7	95	120	796.00	803.00	765.00	762.00	786.00
8	95	140	782.00	802.00	773.00	767.00	787.00
9	95	160	774.00	794.00	778.00	775.00	789.00
10	95	180	766.00	790.00	776.00	772.00	791.00
11	85	0	798.00	784.00	706.00	735.00	783.00
12	85	20	811.00	787.00	716.00	723.00	784.00
13	85	40	809.00	785.00	723.00	725.00	774.00

14	85	60	812.00	799.00	739.00	737.00	780.00	
15	85	80	812.00	803.00	751.00	747.00	779.00	
16	85	100	802.00	803.00	767.00	761.00	784.00	
17	85	120	789.00	799.00	774.00	766.00	782.00	rdg.
18	85	140	776.00	794.00	782.00	774.00	783.00	16.c
19	85	160	762.00	777.00	771.00	773.00	785.00	
20	85	180	740.00	765.00	767.00	773.00	785.00	
21	75	0	825.00	781.00	699.00	708.00	792.00	
22	75	20	825.00	788.00	707.00	715.00	784.00	
23	75	40	825.00	800.00	731.00	733.00	786.00	
24	75	60	812.00	799.00	743.00	747.00	786.00	
25	75	80	808.00	803.00	759.00	755.00	783.00	
26	75	100	793.00	797.00	779.00	771.00	783.00	
27	75	120	771.00	782.00	777.00	774.00	784.00	
28	75	140	749.00	769.00	770.00	773.00	781.00	
29	75	160	746.00	771.00	765.00	767.00	774.00	
30	75	180	728.00	752.00	762.00	765.00	773.00	
31	65	0	836.00	799.00	695.00	703.00	798.00	
32	65	20	834.00	805.00	720.00	721.00	789.00	
33	65	40	833.00	811.00	746.00	747.00	794.00	
34	65	60	822.00	809.00	755.00	758.00	788.00	
35	65	80	807.00	809.00	774.00	774.00	788.00	
36	65	100	783.00	793.00	785.00	778.00	781.00	
37	65	120	755.00	775.00	775.00	770.00	772.00	
38	65	140	741.00	762.00	767.00	766.00	766.00	
39	65	160	734.00	752.00	757.00	753.00	753.00	
40	65	180	720.00	744.00	753.00	752.00	757.00	
41	55	0	838.00	819.00	712.00	727.00	815.00	
42	55	20	838.00	820.00	741.00	749.00	804.00	
43	55	40	829.00	821.00	771.00	773.00	804.00	
44	55	60	816.00	814.00	780.00	777.00	793.00	
45	55	80	792.00	798.00	784.00	781.00	786.00	
46	55	100	767.00	780.00	780.00	775.00	770.00	
47	55	120	752.00	771.00	768.00	763.00	758.00	
48	55	140	740.00	755.00	755.00	747.00	739.00	
49	55	160	724.00	736.00	737.00	732.00	734.00	
50	55	180	716.00	726.00	726.00	725.00	729.00	
51	45	0	853.00	845.00	757.00	784.00	836.00	
52	45	20	848.00	840.00	782.00	788.00	823.00	
53	45	40	829.00	830.00	790.00	793.00	810.00	
54	45	60	804.00	811.00	793.00	791.00	795.00	
55	45	80	781.00	795.00	783.00	781.00	778.00	
56	45	100	759.00	773.00	770.00	763.00	754.00	
57	45	120	742.00	750.00	749.00	740.00	734.00	
58	45	140	726.00	727.00	723.00	712.00	711.00	
59	35	0	855.00	857.00	804.00	819.00	840.00	
60	35	20	836.00	843.00	809.00	812.00	822.00	
61	35	40	815.00	823.00	803.00	800.00	802.00	
62	35	60	790.00	803.00	793.00	789.00	782.00	
63	35	80	776.00	785.00	777.00	770.00	758.00	
64	35	100	750.00	759.00	752.00	743.00	731.00	
65	35	120	725.00	728.00	724.00	712.00	708.00	
66	25	0	853.00	866.00	843.00	847.00	842.00	
67	25	20	827.00	841.00	826.00	825.00	818.00	
68	25	40	798.00	815.00	808.00	802.00	794.00	
69	25	60	780.00	793.00	786.00	775.00	761.00	
70	25	80	757.00	765.00	760.00	748.00	736.00	
71	25	100	732.00	731.00	726.00	712.00	704.00	
72	15	0	831.00	848.00	843.00	835.00	823.00	
73	15	20	801.00	823.00	824.00	815.00	797.00	
74	15	40	786.00	800.00	797.00	781.00	766.00	
75	15	60	769.00	779.00	771.00	758.00	746.00	
76	15	80	714.00	724.00	731.00	714.00	704.00	

file requested **********
17.c
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comb. press. - pr (mm water gage) 30.00
cross flow temp. - tr (degree celsius) 370.00
comb. air flow rate - mcr (mm water diff.) 40.00
cool air flow rate - mkr (mm water diff.) 170.00
natural gas flow rate - mgr (mm water diff.) 18.00
natural gas total press. - pggr (psi gage) 0.00
air total press. - pgar (mm water gage) 0.00
jet temp. - tjr (degree celsius) 28.00
single jet flow rate - mgjr (s.c.f.m.) 1.40
wall temp. - t5 (degree celsius) 210.00
wall temp. - t6 (degree celsius) 234.00
wall temp. - t7 (degree celsius) 240.00
wall temp. - t8 (degree celsius) 298.00
wall temp. - t9 (degree celsius) 218.00
wall temp. - t10 (degree celsius) 218.00

mc = 0.0189737 kg/sec
mk = 0.1225610 kg/sec
mg = 0.001273 kg/sec
m = 0.142807 kg/sec
p = 98394.3 pascal
t = 643 degree kelvin
tj = 301 degree kelvin
t5 = 483 degree kelvin
t6 = 507 degree kelvin
t7 = 513 degree kelvin
t8 = 571 degree kelvin
t9 = 491 degree kelvin
t10= 491 degree kelvin
ro = 0.5332 kg/cubic meter
roj= 1.1390 kg/cubic meter
v = 9.91 meter/sec
mgj= 0.0007322 kg/sec
vj = 16.18 meter/sec
dr = 2.14 density ratio
j = 5.7 momentum ratio
fr = 14112 froude number
sr = 0.00 spacing ratio

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	583.00	589.00	585.00	597.00	599.00
2	95	20	586.00	593.00	590.00	602.00	607.00
3	95	40	594.00	596.00	589.00	602.00	612.00
4	95	60	589.00	591.00	586.00	599.00	606.00
5	95	80	592.00	597.00	594.00	603.00	610.00
6	95	100	593.00	601.00	601.00	611.00	619.00
7	95	120	590.00	598.00	601.00	608.00	611.00
8	95	140	595.00	607.00	610.00	620.00	623.00
9	95	160	590.00	601.00	604.00	613.00	617.00
10	95	180	589.00	600.00	605.00	614.00	620.00
11	85	0	599.00	603.00	596.00	610.00	611.00
12	85	20	608.00	604.00	595.00	613.00	621.00
13	85	40	598.00	595.00	593.00	608.00	621.00

14	85	60	605.00	604.00	598.00	607.00	620.00	
15	85	80	605.00	608.00	608.00	612.00	620.00	
16	85	100	597.00	606.00	609.00	614.00	618.00	
17	85	120	599.00	606.00	609.00	614.00	617.00	
18	85	140	595.00	605.00	611.00	622.00	624.00	
19	85	160	589.00	598.00	607.00	618.00	622.00	
20	85	180	586.00	596.00	605.00	618.00	621.00	rdg.
21	75	0	610.00	607.00	597.00	621.00	628.00	17.c
22	75	20	610.00	600.00	593.00	616.00	632.00	
23	75	40	607.00	597.00	596.00	610.00	627.00	
24	75	60	603.00	601.00	602.00	608.00	620.00	
25	75	80	600.00	605.00	612.00	615.00	622.00	
26	75	100	601.00	609.00	617.00	621.00	624.00	
27	75	120	596.00	606.00	615.00	622.00	623.00	
28	75	140	589.00	599.00	612.00	619.00	622.00	
29	75	160	587.00	599.00	609.00	617.00	620.00	
30	75	180	577.00	591.00	606.00	616.00	620.00	
31	65	0	618.00	601.00	585.00	618.00	636.00	
32	65	20	614.00	597.00	591.00	611.00	635.00	
33	65	40	610.00	602.00	605.00	613.00	630.00	
34	65	60	611.00	614.00	620.00	624.00	632.00	
35	65	80	608.00	615.00	624.00	628.00	631.00	
36	65	100	602.00	610.00	621.00	626.00	627.00	
37	65	120	595.00	603.00	617.00	623.00	645.00	
38	65	140	593.00	606.00	617.00	622.00	626.00	
39	65	160	588.00	601.00	615.00	620.00	621.00	
40	65	180	582.00	596.00	609.00	614.00	618.00	
41	55	0	622.00	595.00	578.00	618.00	641.00	
42	55	20	621.00	603.00	603.00	618.00	642.00	
43	55	40	619.00	616.00	620.00	626.00	641.00	
44	55	60	608.00	612.00	620.00	626.00	636.00	
45	55	80	605.00	613.00	623.00	630.00	632.00	
46	55	100	600.00	609.00	620.00	626.00	628.00	
47	55	120	592.00	606.00	620.00	624.00	623.00	
48	55	140	592.00	607.00	617.00	620.00	621.00	
49	55	160	585.00	599.00	610.00	614.00	618.00	
50	55	180	584.00	596.00	605.00	611.00	613.00	
51	45	0	631.00	595.00	587.00	623.00	652.00	
52	45	20	625.00	608.00	612.00	627.00	649.00	
53	45	40	617.00	617.00	624.00	630.00	643.00	
54	45	60	615.00	620.00	628.00	633.00	640.00	
55	45	80	607.00	614.00	626.00	632.00	635.00	
56	45	100	597.00	610.00	624.00	628.00	627.00	
57	45	120	595.00	608.00	618.00	621.00	622.00	
58	45	140	589.00	600.00	611.00	614.00	616.00	
59	35	0	639.00	606.00	604.00	636.00	659.00	
60	35	20	628.00	616.00	620.00	636.00	653.00	
61	35	40	623.00	625.00	630.00	639.00	646.00	
62	35	60	613.00	619.00	630.00	639.00	642.00	
63	35	80	604.00	615.00	626.00	632.00	633.00	
64	35	100	597.00	609.00	620.00	623.00	621.00	
65	35	120	586.00	598.00	612.00	616.00	618.00	
66	25	0	635.00	612.00	613.00	644.00	660.00	
67	25	20	628.00	622.00	628.00	644.00	656.00	
68	25	40	620.00	623.00	633.00	644.00	647.00	
69	25	60	607.00	613.00	625.00	634.00	636.00	
70	25	80	600.00	611.00	624.00	629.00	629.00	
71	25	100	588.00	600.00	611.00	614.00	615.00	
72	15	0	641.00	632.00	632.00	655.00	660.00	
73	15	20	631.00	629.00	636.00	650.00	653.00	
74	15	40	617.00	620.00	631.00	641.00	643.00	
75	15	60	604.00	611.00	625.00	632.00	633.00	
76	15	80	589.00	600.00	615.00	619.00	617.00	

file requested **********
18.c
****

comb. press. - pr (mm water gage) 28.00
cross flow temp. - tr (degree celsius) 372.00
comb. air flow rate - mcr (mm water diff.) 40.00
cool air flow rate - mkr (mm water diff.) 170.00
natural gas flow rate - mgr (mm water diff.) 18.00
natural gas total press. - pggr (psi gage) 0.00
air total press. - pgar (mm water gage) 0.00
jet temp. - tjr (degree celsius) 28.00
single jet flow rate - mgjr (s.c.f.m.) 1.63
wall temp. - t5 (degree celsius) 206.00
wall temp. - t6 (degree celsius) 239.00
wall temp. - t7 (degree celsius) 245.00
wall temp. - t8 (degree celsius) 303.00
wall temp. - t9 (degree celsius) 224.00
wall temp. - t10 (degree celsius) 223.00

mc = 0.0189737 kg/sec
mk = 0.1225610 kg/sec
mg = 0.001273 kg/sec
m = 0.142807 kg/sec
p = 98374.7 pascal
t = 645 degree kelvin
tj = 301 degree kelvin
t5 = 479 degree kelvin
t6 = 512 degree kelvin
t7 = 518 degree kelvin
t8 = 576 degree kelvin
t9 = 497 degree kelvin
t10= 496 degree kelvin
ro = 0.5314 kg/cubic meter
roj= 1.1388 kg/cubic meter
v = 9.94 meter/sec
mgj= 0.0008525 kg/sec
vj = 18.84 meter/sec
dr = 2.14 density ratio
j = 7.7 momentum ratio
fr = 19086 froude number
sr = 0.00 spacing ratio

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	592.00	597.00	588.00	604.00	609.00
2	95	20	594.00	596.00	586.00	602.00	611.00
3	95	40	595.00	596.00	592.00	606.00	619.00
4	95	60	597.00	597.00	592.00	601.00	614.00
5	95	80	594.00	597.00	595.00	603.00	613.00
6	95	100	593.00	603.00	603.00	607.00	609.00
7	95	120	594.00	605.00	608.00	614.00	614.00
8	95	140	595.00	607.00	610.00	617.00	616.00
9	95	160	596.00	607.00	613.00	623.00	623.00
10	95	180	585.00	598.00	604.00	612.00	617.00
11	85	0	598.00	596.00	590.00	611.00	618.00
12	85	20	603.00	598.00	588.00	607.00	623.00
13	85	40	605.00	600.00	597.00	610.00	627.00

14	85	60	607.00	607.00	605.00	611.00	620.00	
15	85	80	601.00	609.00	612.00	615.00	619.00	
16	85	100	596.00	604.00	614.00	618.00	620.00	
17	85	120	602.00	611.00	616.00	618.00	619.00	
18	85	140	597.00	608.00	614.00	625.00	624.00	
19	85	160	593.00	603.00	612.00	622.00	623.00	rdg.
20	85	180	597.00	597.00	605.00	617.00	623.00	18.c
21	75	0	612.00	598.00	583.00	611.00	624.00	
22	75	20	607.00	593.00	589.00	607.00	627.00	
23	75	40	604.00	596.00	595.00	605.00	623.00	
24	75	60	607.00	611.00	615.00	615.00	624.00	
25	75	80	604.00	611.00	616.00	616.00	618.00	
26	75	100	603.00	613.00	621.00	625.00	625.00	
27	75	120	598.00	609.00	619.00	628.00	628.00	
28	75	140	594.00	603.00	616.00	623.00	625.00	
29	75	160	587.00	599.00	613.00	620.00	623.00	
30	75	180	582.00	596.00	610.00	619.00	622.00	
31	65	0	616.00	594.00	580.00	610.00	636.00	
32	65	20	618.00	600.00	597.00	612.00	639.00	
33	65	40	608.00	607.00	612.00	614.00	631.00	
34	65	60	609.00	617.00	623.00	620.00	628.00	
35	65	80	607.00	614.00	624.00	626.00	628.00	
36	65	100	604.00	612.00	620.00	627.00	629.00	
37	65	120	592.00	604.00	619.00	624.00	626.00	
38	65	140	591.00	605.00	620.00	623.00	625.00	
39	65	160	586.00	601.00	617.00	621.00	624.00	
40	65	180	588.00	602.00	614.00	619.00	622.00	
41	55	0	624.00	595.00	582.00	611.00	643.00	
42	55	20	620.00	607.00	608.00	617.00	641.00	
43	55	40	610.00	611.00	619.00	622.00	637.00	
44	55	60	607.00	613.00	625.00	626.00	633.00	
45	55	80	609.00	616.00	627.00	631.00	632.00	
46	55	100	601.00	610.00	624.00	629.00	629.00	
47	55	120	599.00	611.00	624.00	627.00	627.00	
48	55	140	592.00	607.00	618.00	621.00	624.00	
49	55	160	586.00	598.00	612.00	617.00	622.00	
50	55	180	580.00	592.00	604.00	613.00	619.00	
51	45	0	634.00	602.00	601.00	624.00	654.00	
52	45	20	626.00	616.00	622.00	633.00	649.00	
53	45	40	625.00	626.00	632.00	639.00	647.00	
54	45	60	620.00	625.00	633.00	639.00	643.00	
55	45	80	610.00	617.00	629.00	634.00	635.00	
56	45	100	602.00	613.00	626.00	630.00	630.00	
57	45	120	595.00	609.00	621.00	623.00	622.00	
58	45	140	590.00	601.00	612.00	615.00	616.00	
59	35	0	636.00	612.00	617.00	641.00	662.00	
60	35	20	629.00	625.00	631.00	641.00	655.00	
61	35	40	626.00	630.00	637.00	645.00	650.00	
62	35	60	616.00	622.00	631.00	639.00	644.00	
63	35	80	607.00	616.00	627.00	634.00	636.00	
64	35	100	598.00	610.00	624.00	626.00	626.00	
65	35	120	590.00	598.00	609.00	610.00	613.00	
66	25	0	641.00	626.00	631.00	655.00	668.00	
67	25	20	635.00	633.00	636.00	652.00	661.00	
68	25	40	624.00	629.00	637.00	649.00	653.00	
69	25	60	612.00	620.00	631.00	639.00	640.00	
70	25	80	605.00	614.00	627.00	631.00	630.00	
71	25	100	589.00	600.00	614.00	617.00	617.00	
72	15	0	642.00	639.00	640.00	660.00	666.00	
73	15	20	636.00	637.00	644.00	657.00	661.00	
74	15	40	620.00	624.00	635.00	645.00	645.00	
75	15	60	610.00	618.00	631.00	637.00	635.00	
76	15	80	592.00	602.00	619.00	621.00	621.00	

file requested **********
19.c
****

comb. press. - pr (mm water gage) 18.00
cross flow temp. - tr (degree celsius) 372.00
comb. air flow rate - mcr (mm water diff.) 20.00
cool air flow rate - mkr (mm water diff.) 106.00
natural gas flow rate - mgr (mm water diff.) 10.00
natural gas total press. - pggr (psi gage) 0.00
air total press. - psar (mm water gage) 0.00
jet temp. - tjr (degree celsius) 28.00
single jet flow rate - msjr (s.c.f.m.) 1.42
wall temp. - t5 (degree celsius) 202.00
wall temp. - t6 (degree celsius) 238.00
wall temp. - t7 (degree celsius) 242.00
wall temp. - t8 (degree celsius) 287.00
wall temp. - t9 (degree celsius) 214.00
wall temp. - t10 (degree celsius) 215.00

mc = 0.0134164 kg/sec
mk = 0.0967789 kg/sec
mg = 0.000949 kg/sec
m = 0.111144 kg/sec
p = 98276.6 pascal
t = 645 degree kelvin
tj = 301 degree kelvin
t5 = 475 degree kelvin
t6 = 511 degree kelvin
t7 = 515 degree kelvin
t8 = 560 degree kelvin
t9 = 487 degree kelvin
t10= 488 degree kelvin
ro = 0.5309 kg/cubic meter
roj= 1.1376 kg/cubic meter
v = 7.75 meter/sec
msj= 0.0007453 kg/sec
vj = 16.49 meter/sec
dr = 2.14 density ratio
j = 9.7 momentum ratio
fr = 14616 froude number
sr = 0.00 spacing ratio

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	613.00	605.00	590.00	602.00	607.00
2	95	20	618.00	603.00	588.00	604.00	616.00
3	95	40	614.00	599.00	586.00	600.00	613.00
4	95	60	610.00	597.00	588.00	596.00	606.00
5	95	80	613.00	607.00	601.00	607.00	608.00
6	95	100	610.00	607.00	605.00	610.00	609.00
7	95	120	609.00	608.00	606.00	611.00	608.00
8	95	140	608.00	607.00	609.00	615.00	613.00
9	95	160	614.00	613.00	611.00	619.00	617.00
10	95	180	612.00	610.00	608.00	616.00	616.00
11	85	0	628.00	608.00	587.00	608.00	621.00
12	85	20	621.00	598.00	583.00	598.00	616.00
13	85	40	614.00	598.00	591.00	599.00	615.00

14	85	60	615.00	605.00	599.00	602.00	612.00	
15	85	80	609.00	604.00	604.00	607.00	611.00	
16	85	100	618.00	614.00	613.00	618.00	616.00	
17	85	120	618.00	616.00	614.00	618.00	615.00	
18	85	140	611.00	610.00	612.00	618.00	617.00	
19	85	160	615.00	612.00	611.00	621.00	621.00	
20	85	180	614.00	610.00	607.00	617.00	619.00	rdg.
21	75	0	620.00	591.00	573.00	600.00	620.00	19.0
22	75	20	626.00	598.00	587.00	600.00	620.00	
23	75	40	622.00	604.00	599.00	603.00	617.00	
24	75	60	617.00	610.00	612.00	612.00	616.00	
25	75	80	622.00	618.00	617.00	618.00	618.00	
26	75	100	617.00	614.00	614.00	616.00	615.00	
27	75	120	619.00	617.00	616.00	620.00	619.00	
28	75	140	619.00	615.00	614.00	619.00	618.00	
29	75	160	612.00	610.00	610.00	613.00	615.00	
30	75	180	612.00	609.00	608.00	614.00	616.00	
31	65	0	632.00	595.00	580.00	600.00	631.00	
32	65	20	625.00	601.00	595.00	603.00	625.00	
33	65	40	621.00	610.00	612.00	612.00	622.00	
34	65	60	622.00	619.00	621.00	621.00	624.00	
35	65	80	622.00	620.00	620.00	621.00	622.00	
36	65	100	625.00	621.00	621.00	625.00	625.00	
37	65	120	616.00	615.00	617.00	620.00	620.00	
38	65	140	615.00	613.00	614.00	618.00	617.00	
39	65	160	610.00	608.00	611.00	613.00	615.00	
40	65	180	609.00	606.00	608.00	611.00	613.00	
41	55	0	629.00	592.00	584.00	602.00	632.00	
42	55	20	633.00	611.00	608.00	614.00	632.00	
43	55	40	631.00	622.00	620.00	623.00	630.00	
44	55	60	630.00	625.00	624.00	624.00	626.00	
45	55	80	624.00	620.00	620.00	625.00	625.00	
46	55	100	611.00	612.00	617.00	620.00	619.00	
47	55	120	615.00	613.00	615.00	616.00	616.00	
48	55	140	610.00	609.00	610.00	611.00	611.00	
49	55	160	605.00	602.00	605.00	607.00	609.00	
50	55	180	602.00	599.00	600.00	604.00	607.00	
51	45	0	637.00	605.00	599.00	615.00	640.00	
52	45	20	636.00	620.00	619.00	626.00	638.00	
53	45	40	636.00	628.00	626.00	630.00	636.00	
54	45	60	629.00	625.00	624.00	627.00	628.00	
55	45	80	624.00	620.00	621.00	625.00	624.00	
56	45	100	616.00	613.00	617.00	619.00	618.00	
57	45	120	611.00	610.00	613.00	614.00	613.00	
58	45	140	604.00	599.00	602.00	601.00	603.00	
59	35	0	629.00	612.00	613.00	629.00	646.00	
60	35	20	623.00	620.00	623.00	634.00	641.00	
61	35	40	633.00	627.00	626.00	632.00	634.00	
62	35	60	625.00	622.00	623.00	629.00	629.00	
63	35	80	617.00	614.00	618.00	621.00	620.00	
64	35	100	610.00	608.00	612.00	612.00	613.00	
65	35	120	604.00	598.00	601.00	600.00	601.00	
66	25	0	645.00	629.00	624.00	641.00	648.00	
67	25	20	640.00	633.00	629.00	636.00	640.00	
68	25	40	633.00	629.00	627.00	633.00	635.00	
69	25	60	622.00	619.00	621.00	626.00	626.00	
70	25	80	612.00	610.00	615.00	617.00	615.00	
71	25	100	604.00	600.00	604.00	603.00	602.00	
72	15	0	645.00	638.00	634.00	644.00	644.00	
73	15	20	633.00	629.00	628.00	633.00	634.00	
74	15	40	624.00	621.00	622.00	626.00	627.00	
75	15	60	612.00	611.00	615.00	617.00	616.00	
76	15	80	595.00	596.00	607.00	607.00	606.00	

file requested **********
20.c
****

comb. press. - pr (mm water gage) 15.00
cross flow temp. - tr (degree celsius) 552.00
comb. air flow rate - mcr (mm water diff.) 30.00
cool air flow rate - mkr (mm water diff.) 62.00
natural gas flow rate - mgr (mm water diff.) 14.00
natural gas total press. - pggr (psi gage) 0.00
air total press. - psar (mm water gage) 0.00
jet temp. - tjr (degree celsius) 28.00
single jet flow rate - mgjr (s.c.f.m.) 1.01
wall temp. - t5 (degree celsius) 270.00
wall temp. - t6 (degree celsius) 301.00
wall temp. - t7 (degree celsius) 302.00
wall temp. - t8 (degree celsius) 364.00
wall temp. - t9 (degree celsius) 275.00
wall temp. - t10 (degree celsius) 278.00

mc = 0.0164317 kg/sec
mk = 0.0740157 kg/sec
mg = 0.001122 kg/sec
m = 0.091570 kg/sec
p = 98247.2 pascal
t = 825 degree kelvin
tj = 301 degree kelvin
t5 = 543 degree kelvin
t6 = 574 degree kelvin
t7 = 575 degree kelvin
t8 = 637 degree kelvin
t9 = 548 degree kelvin
t10= 551 degree kelvin
ro = 0.4149 kg/cubic meter
roj= 1.1373 kg/cubic meter
v = 8.17 meter/sec
mgj= 0.0005308 kg/sec
vj = 11.75 meter/sec
dr = 2.74 density ratio
j = 5.7 momentum ratio
fr = 6230 froude number
sr = 0.00 spacing ratio

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	790.00	783.00	757.00	771.00	768.00
2	95	20	797.00	783.00	753.00	776.00	779.00
3	95	40	795.00	772.00	745.00	767.00	778.00
4	95	60	801.00	770.00	744.00	764.00	778.00
5	95	80	792.00	768.00	750.00	766.00	778.00
6	95	100	791.00	768.00	753.00	768.00	780.00
7	95	120	798.00	773.00	759.00	774.00	777.00
8	95	140	798.00	776.00	761.00	778.00	787.00
9	95	160	789.00	772.00	751.00	770.00	786.00
10	95	180	788.00	767.00	750.00	769.00	783.00
11	85	0	803.00	787.00	754.00	781.00	779.00
12	85	20	798.00	766.00	740.00	770.00	789.00
13	85	40	800.00	761.00	741.00	764.00	790.00

14	85	60	797.00	762.00	749.00	762.00	786.00	
15	85	80	792.00	766.00	753.00	760.00	774.00	
16	85	100	789.00	768.00	759.00	774.00	782.00	
17	85	120	790.00	771.00	757.00	775.00	785.00	
18	85	140	793.00	771.00	755.00	777.00	787.00	
19	85	160	778.00	762.00	747.00	772.00	787.00	rdg.
20	85	180	775.00	758.00	744.00	770.00	788.00	20.c
21	75	0	804.00	770.00	732.00	776.00	789.00	
22	75	20	797.00	751.00	729.00	762.00	795.00	
23	75	40	800.00	758.00	746.00	761.00	790.00	
24	75	60	787.00	762.00	759.00	764.00	783.00	
25	75	80	786.00	768.00	764.00	773.00	785.00	
26	75	100	788.00	771.00	759.00	778.00	784.00	
27	75	120	781.00	767.00	757.00	777.00	784.00	
28	75	140	774.00	756.00	750.00	772.00	786.00	
29	75	160	766.00	750.00	750.00	773.00	781.00	
30	75	180	764.00	745.00	742.00	768.00	783.00	
31	65	0	810.00	754.00	718.00	773.00	803.00	
32	65	20	799.00	747.00	738.00	762.00	795.00	
33	65	40	793.00	759.00	758.00	763.00	786.00	
34	65	60	787.00	764.00	764.00	770.00	784.00	
35	65	80	786.00	769.00	763.00	779.00	782.00	
36	65	100	780.00	764.00	755.00	777.00	778.00	
37	65	120	767.00	753.00	753.00	776.00	777.00	
38	65	140	753.00	740.00	747.00	764.00	767.00	
39	65	160	737.00	731.00	740.00	753.00	759.00	
40	65	180	736.00	727.00	734.00	751.00	760.00	
41	55	0	809.00	744.00	717.00	766.00	804.00	
42	55	20	799.00	752.00	750.00	768.00	803.00	
43	55	40	795.00	768.00	768.00	778.00	792.00	
44	55	60	792.00	774.00	772.00	786.00	794.00	
45	55	80	780.00	767.00	764.00	781.00	785.00	
46	55	100	766.00	749.00	752.00	769.00	767.00	
47	55	120	750.00	741.00	749.00	759.00	756.00	
48	55	140	737.00	729.00	739.00	742.00	740.00	
49	55	160	730.00	718.00	725.00	728.00	732.00	
50	55	180	725.00	707.00	708.00	718.00	726.00	
51	45	0	809.00	740.00	731.00	779.00	820.00	
52	45	20	801.00	765.00	767.00	784.00	802.00	
53	45	40	795.00	778.00	777.00	793.00	799.00	
54	45	60	785.00	770.00	765.00	781.00	781.00	
55	45	80	766.00	752.00	756.00	774.00	770.00	
56	45	100	744.00	735.00	747.00	753.00	749.00	
57	45	120	734.00	726.00	734.00	733.00	727.00	
58	45	140	723.00	705.00	711.00	712.00	713.00	
59	35	0	817.00	755.00	752.00	795.00	815.00	
60	35	20	797.00	773.00	771.00	793.00	802.00	
61	35	40	793.00	777.00	773.00	789.00	789.00	
62	35	60	767.00	757.00	758.00	774.00	769.00	
63	35	80	749.00	739.00	748.00	754.00	747.00	
64	35	100	735.00	725.00	732.00	731.00	725.00	
65	35	120	714.00	700.00	705.00	700.00	701.00	
66	25	0	808.00	773.00	769.00	809.00	814.00	
67	25	20	797.00	782.00	776.00	799.00	797.00	
68	25	40	773.00	765.00	764.00	778.00	773.00	
69	25	60	756.00	746.00	754.00	763.00	756.00	
70	25	80	733.00	728.00	738.00	736.00	729.00	
71	25	100	714.00	701.00	707.00	699.00	694.00	
72	15	0	801.00	790.00	781.00	806.00	794.00	
73	15	20	772.00	768.00	766.00	780.00	771.00	
74	15	40	748.00	746.00	748.00	758.00	753.00	
75	15	60	733.00	729.00	739.00	737.00	731.00	
76	15	80	696.00	694.00	712.00	705.00	699.00	

****
file requested 21.c
****

comb. press. - pr (mm water gage) 15.00
cross flow temp. - tr (degree celsius) 553.00
comb. air flow rate - mcr (mm water diff.) 30.00
cool air flow rate - mkr (mm water diff.) 60.00
natural gas flow rate - mgr (mm water diff.) 14.00
natural gas total press. - pggr (psi gage) 0.00
air total press. - pgar (mm water gage) 0.00
jet temp. - tjr (degree celsius) 30.00
single jet flow rate - mgjr (s.c.f.m.) 1.16
wall temp. - t5 (degree celsius) 275.00
wall temp. - t6 (degree celsius) 302.00
wall temp. - t7 (degree celsius) 304.00
wall temp. - t8 (degree celsius) 365.00
wall temp. - t9 (degree celsius) 275.00
wall temp. - t10 (degree celsius) 280.00

mc = 0.0164317 kg/sec
mk = 0.0728121 kg/sec
mg = 0.001122 kg/sec
m = 0.090366 kg/sec
p = 98247.2 pascal
t = 826 degree kelvin
tj = 303 degree kelvin
t5 = 548 degree kelvin
t6 = 575 degree kelvin
t7 = 577 degree kelvin
t8 = 638 degree kelvin
t9 = 548 degree kelvin
t10= 553 degree kelvin
ro = 0.4144 kg/cubic meter
roj= 1.1298 kg/cubic meter
v = 8.07 meter/sec
mgj= 0.0006067 kg/sec
vj = 13.52 meter/sec
dr = 2.73 density ratio
j = 7.7 momentum ratio
fr = 8272 froude number
sr = 0.00 spacing ratio

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	782.00	767.00	736.00	753.00	752.00
2	95	20	796.00	769.00	738.00	758.00	768.00
3	95	40	793.00	759.00	734.00	759.00	776.00
4	95	60	790.00	763.00	744.00	760.00	778.00
5	95	80	783.00	760.00	746.00	758.00	767.00
6	95	100	778.00	766.00	759.00	775.00	775.00
7	95	120	779.00	763.00	756.00	770.00	773.00
8	95	140	785.00	769.00	758.00	774.00	778.00
9	95	160	785.00	766.00	753.00	771.00	780.00
10	95	180	781.00	762.00	747.00	767.00	777.00
11	85	0	801.00	770.00	737.00	770.00	779.00
12	85	20	799.00	754.00	730.00	760.00	784.00
13	85	40	790.00	750.00	736.00	754.00	781.00

14	85	60	778.00	754.00	749.00	756.00	772.00	
15	85	80	780.00	760.00	754.00	762.00	770.00	
16	85	100	787.00	767.00	761.00	773.00	777.00	
17	85	120	786.00	769.00	757.00	774.00	776.00	
18	85	140	784.00	765.00	753.00	774.00	783.00	
19	85	160	776.00	763.00	749.00	775.00	785.00	
20	85	180	776.00	759.00	744.00	768.00	781.00	rdg.
21	75	0	805.00	754.00	717.00	759.00	787.00	21.c
22	75	20	795.00	743.00	729.00	750.00	786.00	
23	75	40	786.00	754.00	755.00	759.00	781.00	
24	75	60	783.00	764.00	762.00	763.00	776.00	
25	75	80	784.00	768.00	764.00	773.00	780.00	
26	75	100	784.00	769.00	760.00	775.00	778.00	
27	75	120	778.00	761.00	755.00	776.00	783.00	
28	75	140	771.00	759.00	753.00	777.00	783.00	
29	75	160	765.00	747.00	747.00	771.00	780.00	
30	75	180	754.00	741.00	742.00	764.00	774.00	
31	65	0	804.00	741.00	718.00	754.00	799.00	
32	65	20	793.00	745.00	743.00	755.00	789.00	
33	65	40	790.00	763.00	766.00	765.00	787.00	
34	65	60	788.00	770.00	770.00	774.00	785.00	
35	65	80	783.00	768.00	762.00	770.00	773.00	
36	65	100	781.00	764.00	758.00	781.00	782.00	
37	65	120	769.00	754.00	753.00	770.00	771.00	
38	65	140	753.00	739.00	746.00	764.00	771.00	
39	65	160	747.00	733.00	739.00	753.00	761.00	
40	65	180	739.00	726.00	731.00	747.00	754.00	
41	55	0	806.00	735.00	722.00	757.00	805.00	
42	55	20	795.00	755.00	758.00	767.00	799.00	
43	55	40	791.00	773.00	772.00	780.00	797.00	
44	55	60	787.00	774.00	767.00	779.00	785.00	
45	55	80	780.00	768.00	762.00	783.00	785.00	
46	55	100	764.00	750.00	754.00	769.00	766.00	
47	55	120	752.00	737.00	744.00	756.00	752.00	
48	55	140	739.00	729.00	735.00	740.00	741.00	
49	55	160	727.00	712.00	718.00	725.00	730.00	
50	55	180	723.00	709.00	709.00	717.00	726.00	
51	45	0	810.00	746.00	745.00	773.00	712.00	
52	45	20	801.00	774.00	773.00	786.00	800.00	
53	45	40	792.00	777.00	776.00	788.00	789.00	
54	45	60	781.00	770.00	767.00	785.00	784.00	
55	45	80	767.00	755.00	758.00	773.00	769.00	
56	45	100	747.00	740.00	749.00	751.00	746.00	
57	45	120	735.00	725.00	733.00	735.00	730.00	
58	45	140	724.00	706.00	711.00	711.00	711.00	
59	35	0	815.00	770.00	770.00	797.00	815.00	
60	35	20	799.00	778.00	777.00	793.00	798.00	
61	35	40	795.00	781.00	774.00	788.00	786.00	
62	35	60	773.00	762.00	762.00	775.00	767.00	
63	35	80	756.00	747.00	752.00	758.00	754.00	
64	35	100	736.00	726.00	734.00	731.00	726.00	
65	35	120	713.00	701.00	704.00	699.00	699.00	
66	25	0	809.00	788.00	779.00	806.00	811.00	
67	25	20	797.00	786.00	781.00	800.00	800.00	
68	25	40	773.00	768.00	765.00	780.00	774.00	
69	25	60	753.00	745.00	753.00	762.00	753.00	
70	25	80	733.00	728.00	738.00	736.00	728.00	
71	25	100	717.00	704.00	709.00	702.00	697.00	
72	15	0	801.00	796.00	786.00	807.00	804.00	
73	15	20	776.00	774.00	774.00	783.00	775.00	
74	15	40	753.00	751.00	752.00	761.00	753.00	
75	15	60	736.00	731.00	741.00	739.00	731.00	
76	15	80	699.00	697.00	714.00	706.00	699.00	

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file requested 22.c
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comb. press. - pr (mm water gage) 14.00
cross flow temp. - tr (degree celsius) 555.00
comb. air flow rate - mcr (mm water diff.) 30.00
cool air flow rate - mkr (mm water diff.) 60.00
natural gas flow rate - mgr (mm water diff.) 14.00
natural gas total press. - pggr (psi gage) 0.00
air total press. - psar (mm water gage) 0.00
jet temp. - tjr (degree celsius) 28.00
single jet flow rate - msjr (s.c.f.m.) 1.32
wall temp. - t5 (degree celsius) 269.00
wall temp. - t6 (degree celsius) 285.00
wall temp. - t7 (degree celsius) 291.00
wall temp. - t8 (degree celsius) 358.00
wall temp. - t9 (degree celsius) 265.00
wall temp. - t10 (degree celsius) 278.00

mc = 0.0164317 kg/sec
mk = 0.0728121 kg/sec
mg = 0.001122 kg/sec
m = 0.090366 kg/sec
p = 98237.3 pascal
t = 828 degree kelvin
tj = 301 degree kelvin
t5 = 542 degree kelvin
t6 = 558 degree kelvin
t7 = 564 degree kelvin
t8 = 631 degree kelvin
t9 = 541 degree kelvin
t10= 551 degree kelvin
ro = 0.4134 kg/cubic meter
roj= 1.1372 kg/cubic meter
v = 8.09 meter/sec
msj= 0.0006904 kg/sec
vj = 15.28 meter/sec
dr = 2.75 density ratio
j = 9.8 momentum ratio
fr = 10517 froude number
sr = 0.00 spacing ratio

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	755.00	747.00	725.00	750.00	758.00
2	95	20	769.00	744.00	723.00	745.00	760.00
3	95	40	759.00	740.00	725.00	742.00	757.00
4	95	60	756.00	742.00	734.00	744.00	748.00
5	95	80	760.00	755.00	753.00	766.00	757.00
6	95	100	755.00	759.00	759.00	774.00	768.00
7	95	120	752.00	760.00	760.00	773.00	768.00
8	95	140	769.00	765.00	757.00	775.00	775.00
9	95	160	757.00	760.00	755.00	777.00	784.00
10	95	180	759.00	755.00	748.00	771.00	783.00
11	85	0	775.00	746.00	718.00	751.00	766.00
12	85	20	776.00	745.00	730.00	747.00	774.00
13	85	40	770.00	746.00	737.00	747.00	764.00

85

14	85	60	762.00	755.00	758.00	758.00	762.00	
15	85	80	763.00	763.00	768.00	775.00	768.00	
16	85	100	762.00	768.00	769.00	782.00	773.00	
17	85	120	755.00	759.00	758.00	777.00	771.00	
18	85	140	758.00	759.00	755.00	783.00	784.00	
19	85	160	745.00	746.00	745.00	768.00	775.00	
20	85	180	732.00	735.00	741.00	771.00	781.00	rdg.
21	75	0	788.00	741.00	718.00	748.00	766.00	22.c
22	75	20	776.00	744.00	742.00	750.00	782.00	
23	75	40	774.00	755.00	761.00	759.00	776.00	
24	75	60	774.00	773.00	780.00	780.00	787.00	
25	75	80	772.00	770.00	772.00	777.00	778.00	
26	75	100	763.00	761.00	761.00	778.00	777.00	
27	75	120	761.00	758.00	759.00	780.00	778.00	
28	75	140	744.00	743.00	755.00	782.00	781.00	
29	75	160	723.00	731.00	746.00	768.00	773.00	
30	75	180	722.00	725.00	740.00	764.00	769.00	
31	65	0	792.00	741.00	731.00	751.00	792.00	
32	65	20	786.00	753.00	762.00	764.00	793.00	
33	65	40	784.00	774.00	781.00	779.00	788.00	
34	65	60	784.00	775.00	776.00	783.00	788.00	
35	65	80	775.00	775.00	771.00	783.00	782.00	
36	65	100	760.00	758.00	760.00	784.00	782.00	
37	65	120	738.00	464.00	756.00	772.00	770.00	
38	65	140	721.00	730.00	750.00	763.00	760.00	
39	65	160	713.00	725.00	742.00	751.00	754.00	
40	65	180	703.00	716.00	730.00	741.00	750.00	
41	55	0	797.00	741.00	743.00	761.00	703.00	
42	55	20	794.00	770.00	775.00	775.00	796.00	
43	55	40	790.00	784.00	790.00	793.00	798.00	
44	55	60	783.00	783.00	781.00	791.00	788.00	
45	55	80	765.00	760.00	766.00	781.00	778.00	
46	55	100	740.00	739.00	756.00	770.00	763.00	
47	55	120	727.00	732.00	751.00	757.00	750.00	
48	55	140	710.00	723.00	737.00	738.00	736.00	
49	55	160	702.00	712.00	722.00	451.00	725.00	
50	55	180	692.00	695.00	705.00	711.00	718.00	
51	45	0	808.00	760.00	762.00	780.00	804.00	
52	45	20	800.00	787.00	790.00	799.00	802.00	
53	45	40	790.00	785.00	786.00	795.00	795.00	
54	45	60	778.00	774.00	776.00	787.00	782.00	
55	45	80	752.00	749.00	765.00	773.00	764.00	
56	45	100	725.00	733.00	752.00	753.00	744.00	
57	45	120	721.00	722.00	734.00	730.00	728.00	
58	45	140	702.00	701.00	707.00	704.00	706.00	
59	35	0	816.00	786.00	785.00	804.00	715.00	
60	35	20	805.00	797.00	795.00	804.00	801.00	
61	35	40	784.00	777.00	778.00	789.00	783.00	
62	35	60	764.00	761.00	769.00	780.00	770.00	
63	35	80	737.00	737.00	754.00	756.00	744.00	
64	35	100	713.00	723.00	736.00	728.00	720.00	
65	35	120	692.00	696.00	703.00	698.00	699.00	
66	25	0	820.00	806.00	796.00	814.00	809.00	
67	25	20	801.00	797.00	794.00	803.00	796.00	
68	25	40	770.00	769.00	773.00	780.00	771.00	
69	25	60	746.00	747.00	758.00	761.00	750.00	
70	25	80	725.00	727.00	743.00	736.00	725.00	
71	25	100	691.00	692.00	731.00	693.00	690.00	
72	15	0	810.00	804.00	800.00	813.00	804.00	
73	15	20	771.00	777.00	782.00	783.00	774.00	
74	15	40	745.00	752.00	760.00	763.00	754.00	
75	15	60	719.00	727.00	741.00	735.00	726.00	
76	15	80	678.00	690.00	711.00	702.00	694.00	

file requested **********
23.c
****

comb. press. - pr (mm water gage) 26.00
cross flow temp. - tr (degree celsius) 372.00
comb. air flow rate - mcr (mm water diff.) 30.00
cool air flow rate - mkr (mm water diff.) 150.00
natural gas flow rate - mgr (mm water diff.) 14.00
natural gas total press. - pggr (psi gage) 0.00
air total press. - psar (mm water gage) 0.00
jet temp. - tjr (degree celsius) 28.00
single jet flow rate - msjr (s.c.f.m.) 1.30
wall temp. - t5 (degree celsius) 204.00
wall temp. - t6 (degree celsius) 240.00
wall temp. - t7 (degree celsius) 249.00
wall temp. - t8 (degree celsius) 297.00
wall temp. - t9 (degree celsius) 225.00
wall temp. - t10 (degree celsius) 226.00

mc = 0.0164317 kg/sec
mk = 0.1151260 kg/sec
mg = 0.001122 kg/sec
m = 0.132680 kg/sec
p = 98355.1 pascal
t = 645 degree kelvin
tj = 301 degree kelvin
t5 = 477 degree kelvin
t6 = 513 degree kelvin
t7 = 522 degree kelvin
t8 = 570 degree kelvin
t9 = 498 degree kelvin
t10= 499 degree kelvin
ro = 0.5313 kg/cubic meter
roj= 1.1385 kg/cubic meter
v = 9.24 meter/sec
msj= 0.0006799 kg/sec
vj = 15.03 meter/sec
dr = 2.14 density ratio
j = 5.7 momentum ratio
fr = 12145 froude number
sr = 0.00 spacing ratio

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	615.00	609.00	590.00	600.00	603.00
2	95	20	614.00	613.00	602.00	608.00	608.00
3	95	40	600.00	606.00	602.00	612.00	613.00
4	95	60	624.00	624.00	620.00	625.00	622.00
5	95	80	630.00	623.00	610.00	621.00	621.00
6	95	100	630.00	623.00	609.00	621.00	629.00
7	95	120	627.00	616.00	607.00	616.00	623.00
8	95	140	629.00	620.00	609.00	616.00	627.00
9	95	160	626.00	617.00	607.00	613.00	623.00
10	95	180	625.00	616.00	609.00	617.00	626.00
11	85	0	606.00	615.00	609.00	620.00	618.00
12	85	20	603.00	611.00	609.00	619.00	623.00
13	85	40	627.00	626.00	622.00	630.00	629.00

14	85	60	631.00	624.00	610.00	623.00	626.00	
15	85	80	632.00	613.00	603.00	618.00	629.00	
16	85	100	626.00	609.00	602.00	610.00	626.00	
17	85	120	628.00	614.00	608.00	613.00	627.00	
18	85	140	623.00	614.00	610.00	614.00	626.00	
19	85	160	626.00	617.00	610.00	614.00	623.00	
20	85	180	622.00	612.00	607.00	610.00	619.00	rdg.
21	75	0	633.00	631.00	618.00	625.00	623.00	23.c
22	75	20	637.00	637.00	628.00	634.00	631.00	
23	75	40	644.00	639.00	622.00	641.00	641.00	
24	75	60	639.00	613.00	594.00	618.00	630.00	
25	75	80	618.00	597.00	593.00	608.00	627.00	
26	75	100	625.00	609.00	606.00	609.00	628.00	
27	75	120	626.00	613.00	608.00	609.00	623.00	
28	75	140	622.00	615.00	611.00	612.00	623.00	
29	75	160	618.00	612.00	612.00	615.00	621.00	
30	75	180	614.00	609.00	608.00	614.00	620.00	
31	65	0	643.00	643.00	630.00	635.00	633.00	
32	65	20	641.00	642.00	636.00	639.00	636.00	
33	65	40	639.00	620.00	586.00	631.00	639.00	
34	65	60	640.00	599.00	588.00	614.00	639.00	
35	65	80	626.00	600.00	598.00	606.00	629.00	
36	65	100	627.00	613.00	612.00	614.00	627.00	
37	65	120	619.00	612.00	612.00	614.00	623.00	
38	65	140	617.00	612.00	612.00	615.00	622.00	
39	65	160	615.00	609.00	610.00	613.00	619.00	
40	65	180	613.00	609.00	608.00	613.00	616.00	
41	55	0	642.00	642.00	636.00	641.00	639.00	
42	55	20	646.00	646.00	639.00	646.00	644.00	
43	55	40	641.00	593.00	556.00	624.00	639.00	
44	55	60	630.00	593.00	591.00	607.00	633.00	
45	55	80	627.00	606.00	605.00	612.00	630.00	
46	55	100	620.00	612.00	613.00	617.00	626.00	
47	55	120	619.00	613.00	614.00	619.00	621.00	
48	55	140	615.00	610.00	612.00	614.00	616.00	
49	55	160	610.00	606.00	607.00	610.00	612.00	
50	55	180	609.00	600.00	601.00	606.00	609.00	
51	45	0	638.00	645.00	641.00	647.00	646.00	
52	45	20	636.00	637.00	626.00	647.00	649.00	
53	45	40	625.00	572.00	563.00	619.00	639.00	
54	45	60	614.00	592.00	594.00	619.00	635.00	
55	45	80	608.00	605.00	611.00	625.00	630.00	
56	45	100	598.00	604.00	614.00	618.00	620.00	
57	45	120	593.00	602.00	609.00	612.00	611.00	
58	45	140	587.00	594.00	601.00	603.00	603.00	
59	35	0	653.00	656.00	655.00	656.00	654.00	
60	35	20	646.00	633.00	597.00	645.00	647.00	
61	35	40	642.00	588.00	574.00	632.00	641.00	
62	35	60	630.00	609.00	607.00	626.00	636.00	
63	35	80	623.00	616.00	619.00	624.00	623.00	
64	35	100	616.00	612.00	615.00	617.00	617.00	
65	35	120	603.00	599.00	604.00	607.00	608.00	
66	25	0	653.00	655.00	655.00	656.00	656.00	
67	25	20	651.00	634.00	572.00	646.00	647.00	
68	25	40	638.00	609.00	602.00	640.00	642.00	
69	25	60	628.00	616.00	617.00	631.00	633.00	
70	25	80	619.00	615.00	620.00	625.00	625.00	
71	25	100	609.00	602.00	605.00	606.00	607.00	
72	15	0	651.00	654.00	653.00	652.00	651.00	
73	15	20	637.00	622.00	505.00	636.00	642.00	
74	15	40	633.00	624.00	619.00	635.00	634.00	
75	15	60	620.00	616.00	621.00	627.00	624.00	
76	15	80	605.00	601.00	610.00	613.00	613.00	

****
file requested 24.c
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comb. press. - pr (mm water gage) 23.00
cross flow temp. - tr (degree celsius) 368.00
comb. air flow rate - mcr (mm water diff.) 30.00
cool air flow rate - mkr (mm water diff.) 142.00
natural gas flow rate - msr (mm water diff.) 14.00
natural gas total press. - pssr (psi gage) 0.00
air total press. - psar (mm water gage) 0.00
jet temp. - tjr (degree celsius) 26.00
single jet flow rate - msjr (s.c.f.m.) 1.48
wall temp. - t5 (degree celsius) 200.00
wall temp. - t6 (degree celsius) 227.00
wall temp. - t7 (degree celsius) 235.00
wall temp. - t8 (degree celsius) 288.00
wall temp. - t9 (degree celsius) 213.00
wall temp. - t10 (degree celsius) 216.00

mc = 0.0164317 kg/sec
mk = 0.1120139 kg/sec
mg = 0.001122 kg/sec
m = 0.129568 kg/sec
p = 98325.6 pascal
t = 641 degree kelvin
tj = 299 degree kelvin
t5 = 473 degree kelvin
t6 = 500 degree kelvin
t7 = 508 degree kelvin
t8 = 561 degree kelvin
t9 = 486 degree kelvin
t10= 489 degree kelvin
ro = 0.5345 kg/cubic meter
roj= 1.1458 kg/cubic meter
v = 8.97 meter/sec
msj= 0.0007740 kg/sec
vj = 17.00 meter/sec
dr = 2.14 density ratio
j = 7.7 momentum ratio
fr = 15536 froude number
sr = 0.00 spacing ratio

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	582.00	587.00	581.00	597.00	599.00
2	95	20	591.00	599.00	596.00	611.00	618.00
3	95	40	596.00	602.00	597.00	608.00	612.00
4	95	60	595.00	602.00	600.00	618.00	622.00
5	95	80	606.00	604.00	596.00	614.00	624.00
6	95	100	599.00	598.00	591.00	603.00	616.00
7	95	120	593.00	596.00	595.00	605.00	619.00
8	95	140	586.00	593.00	596.00	605.00	619.00
9	95	160	587.00	594.00	596.00	603.00	612.00
10	95	180	585.00	594.00	597.00	607.00	618.00
11	85	0	595.00	603.00	601.00	615.00	618.00
12	85	20	606.00	613.00	612.00	625.00	626.00
13	85	40	608.00	617.00	612.00	625.00	628.00

14	85	60	608.00	598.00	590.00	617.00	626.00	
15	85	80	607.00	593.00	590.00	607.00	626.00	
16	85	100	605.00	596.00	597.00	603.00	622.00	
17	85	120	597.00	595.00	597.00	604.00	621.00	
18	85	140	591.00	594.00	600.00	608.00	618.00	
19	85	160	589.00	595.00	600.00	610.00	621.00	rdg.
20	85	180	586.00	595.00	600.00	608.00	616.00	24.0
21	75	0	607.00	614.00	609.00	623.00	627.00	
22	75	20	614.00	621.00	623.00	635.00	635.00	
23	75	40	618.00	614.00	592.00	631.00	635.00	
24	75	60	612.00	587.00	577.00	606.00	629.00	
25	75	80	605.00	588.00	591.00	599.00	628.00	
26	75	100	602.00	597.00	600.00	601.00	620.00	
27	75	120	598.00	599.00	605.00	608.00	623.00	
28	75	140	594.00	600.00	608.00	614.00	623.00	
29	75	160	591.00	601.00	612.00	617.00	626.00	
30	75	180	579.00	591.00	602.00	610.00	618.00	
31	65	0	619.00	629.00	629.00	639.00	640.00	
32	65	20	619.00	627.00	629.00	639.00	640.00	
33	65	40	621.00	598.00	563.00	623.00	635.00	
34	65	60	618.00	582.00	582.00	610.00	638.00	
35	65	80	603.00	592.00	599.00	603.00	627.00	
36	65	100	603.00	604.00	610.00	613.00	626.00	
37	65	120	596.00	601.00	609.00	612.00	623.00	
38	65	140	592.00	603.00	614.00	619.00	623.00	
39	65	160	586.00	600.00	609.00	613.00	622.00	
40	65	180	581.00	594.00	604.00	613.00	619.00	
41	55	0	629.00	638.00	634.00	643.00	643.00	
42	55	20	629.00	637.00	633.00	646.00	647.00	
43	55	40	623.00	570.00	557.00	624.00	644.00	
44	55	60	615.00	588.00	597.00	612.00	639.00	
45	55	80	607.00	602.00	610.00	619.00	634.00	
46	55	100	597.00	602.00	613.00	617.00	625.00	
47	55	120	595.00	605.00	616.00	620.00	625.00	
48	55	140	587.00	599.00	609.00	614.00	618.00	
49	55	160	588.00	600.00	608.00	612.00	614.00	
50	55	180	579.00	589.00	599.00	607.00	612.00	
51	45	0	640.00	647.00	642.00	649.00	648.00	
52	45	20	630.00	634.00	624.00	648.00	652.00	
53	45	40	625.00	574.00	569.00	627.00	644.00	
54	45	60	615.00	605.00	612.00	629.00	640.00	
55	45	80	608.00	609.00	618.00	628.00	633.00	
56	45	100	598.00	607.00	617.00	623.00	625.00	
57	45	120	597.00	609.00	617.00	619.00	619.00	
58	45	140	590.00	599.00	608.00	611.00	611.00	
59	35	0	639.00	650.00	650.00	656.00	656.00	
60	35	20	637.00	629.00	600.00	649.00	651.00	
61	35	40	625.00	592.00	589.00	635.00	647.00	
62	35	60	616.00	612.00	618.00	633.00	639.00	
63	35	80	606.00	611.00	622.00	629.00	630.00	
64	35	100	594.00	605.00	615.00	619.00	620.00	
65	35	120	589.00	596.00	607.00	609.00	612.00	
66	25	0	648.00	657.00	658.00	661.00	658.00	
67	25	20	634.00	617.00	566.00	645.00	655.00	
68	25	40	629.00	607.00	592.00	637.00	644.00	
69	25	60	617.00	615.00	624.00	637.00	638.00	
70	25	80	606.00	612.00	623.00	625.00	624.00	
71	25	100	592.00	599.00	611.00	612.00	611.00	
72	15	0	642.00	652.00	657.00	661.00	658.00	
73	15	20	630.00	620.00	520.00	640.00	648.00	
74	15	40	622.00	612.00	602.00	636.00	640.00	
75	15	60	610.00	613.00	626.00	633.00	631.00	
76	15	80	591.00	601.00	616.00	617.00	615.00	

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                                    **********
file requested                         25.c
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comb. press. - pr (mm water gage)      23.00
cross flow temp. - tr (degree celsius)    370.00
comb. air flow rate - mcr (mm water diff.)     30.00
cool air flow rate - mkr (mm water diff.)    142.00
natural gas flow rate - mgr (mm water diff.)     14.00
natural gas total press. - psgr (psi gage)      0.00
air total press. - psar (mm water gage)      0.00
jet temp. - tjr (degree celsius)     28.00
single jet flow rate - msjr (s.c.f.m.)      1.66
wall temp. - t5 (degree celsius)    200.00
wall temp. - t6 (degree celsius)    235.00
wall temp. - t7 (degree celsius)    241.00
wall temp. - t8 (degree celsius)    296.00
wall temp. - t9 (degree celsius)    222.00
wall temp. - t10 (degree celsius)    220.00


mc = 0.0164317 kg/sec
mk = 0.1120139 kg/sec
mg = 0.001122 kg/sec
m  = 0.129568 kg/sec
p  = 98325.6 pascal
t  = 643 degree kelvin
tj = 301 degree kelvin
t5 = 473 degree kelvin
t6 = 508 degree kelvin
t7 = 514 degree kelvin
t8 = 569 degree kelvin
t9 = 495 degree kelvin
t10= 493 degree kelvin
ro = 0.5328 kg/cubic meter
roj= 1.1382 kg/cubic meter
v  = 9.00 meter/sec
msj= 0.0008682 kg/sec
vj = 19.20 meter/sec
dr = 2.14 density ratio
j  = 9.7 momentum ratio
fr =   19868 froude number
sr =  0.00 spacing ratio
```

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	590.00	598.00	591.00	608.00	613.00
2	95	20	592.00	598.00	598.00	610.00	616.00
3	95	40	594.00	602.00	596.00	608.00	610.00
4	95	60	602.00	600.00	591.00	615.00	622.00
5	95	80	599.00	595.00	588.00	608.00	622.00
6	95	100	592.00	591.00	590.00	598.00	616.00
7	95	120	596.00	596.00	596.00	602.00	613.00
8	95	140	588.00	594.00	596.00	601.00	609.00
9	95	160	592.00	597.00	600.00	608.00	613.00
10	95	180	587.00	593.00	597.00	607.00	615.00
11	85	0	599.00	607.00	600.00	613.00	619.00
12	85	20	602.00	609.00	610.00	624.00	626.00
13	85	40	607.00	611.00	599.00	620.00	623.00

14	85	60	609.00	589.00	579.00	610.00	628.00	
15	85	80	605.00	586.00	586.00	599.00	623.00	
16	85	100	599.00	592.00	598.00	598.00	618.00	
17	85	120	595.00	595.00	602.00	606.00	620.00	
18	85	140	595.00	596.00	603.00	607.00	617.00	
19	85	160	585.00	591.00	601.00	608.00	616.00	
20	85	180	588.00	596.00	601.00	611.00	617.00	
21	75	0	610.00	619.00	613.00	627.00	630.00	rdg. 25.c
22	75	20	617.00	627.00	625.00	635.00	637.00	
23	75	40	625.00	606.00	573.00	630.00	638.00	
24	75	60	612.00	581.00	579.00	604.00	632.00	
25	75	80	606.00	588.00	596.00	599.00	629.00	
26	75	100	603.00	597.00	606.00	605.00	623.00	
27	75	120	602.00	604.00	610.00	612.00	624.00	
28	75	140	592.00	599.00	608.00	609.00	620.00	
29	75	160	585.00	595.00	609.00	613.00	622.00	
30	75	180	584.00	595.00	604.00	610.00	618.00	
31	65	0	620.00	627.00	626.00	637.00	636.00	
32	65	20	623.00	630.00	628.00	641.00	643.00	
33	65	40	627.00	586.00	548.00	626.00	643.00	
34	65	60	613.00	583.00	589.00	604.00	636.00	
35	65	80	606.00	596.00	606.00	605.00	627.00	
36	65	100	601.00	603.00	612.00	615.00	630.00	
37	65	120	598.00	603.00	616.00	620.00	629.00	
38	65	140	591.00	601.00	611.00	614.00	621.00	
39	65	160	589.00	600.00	611.00	616.00	622.00	
40	65	180	586.00	599.00	608.00	613.00	620.00	
41	55	0	627.00	637.00	638.00	646.00	646.00	
42	55	20	362.00	359.00	616.00	643.00	646.00	
43	55	40	627.00	568.00	559.00	622.00	644.00	
44	55	60	614.00	593.00	601.00	614.00	638.00	
45	55	80	612.00	607.00	616.00	621.00	634.00	
46	55	100	602.00	607.00	618.00	623.00	631.00	
47	55	120	594.00	605.00	617.00	621.00	625.00	
48	55	140	599.00	606.00	615.00	619.00	622.00	
49	55	160	597.00	603.00	611.00	614.00	616.00	
50	55	180	586.00	595.00	604.00	610.00	615.00	
51	45	0	630.00	638.00	639.00	649.00	653.00	
52	45	20	637.00	630.00	606.00	645.00	650.00	
53	45	40	627.00	580.00	578.00	630.00	648.00	
54	45	60	620.00	606.00	612.00	628.00	641.00	
55	45	80	607.00	610.00	620.00	627.00	633.00	
56	45	100	599.00	608.00	620.00	625.00	625.00	
57	45	120	596.00	609.00	617.00	618.00	617.00	
58	45	140	589.00	598.00	608.00	611.00	612.00	
59	35	0	641.00	651.00	655.00	659.00	658.00	
60	35	20	635.00	618.00	576.00	642.00	655.00	
61	35	40	631.00	602.00	591.00	637.00	647.00	
62	35	60	618.00	614.00	620.00	636.00	641.00	
63	35	80	606.00	611.00	623.00	631.00	633.00	
64	35	100	596.00	607.00	618.00	622.00	622.00	
65	35	120	599.00	602.00	610.00	614.00	615.00	
66	25	0	644.00	654.00	655.00	659.00	660.00	
67	25	20	357.00	339.00	546.00	641.00	652.00	
68	25	40	629.00	623.00	620.00	645.00	644.00	
69	25	60	616.00	618.00	628.00	638.00	637.00	
70	25	80	601.00	610.00	623.00	625.00	624.00	
71	25	100	589.00	597.00	609.00	608.00	608.00	
72	15	0	639.00	651.00	655.00	659.00	658.00	
73	15	20	634.00	622.00	534.00	641.00	646.00	
74	15	40	623.00	612.00	604.00	635.00	638.00	
75	15	60	609.00	613.00	625.00	631.00	628.00	
76	15	80	590.00	598.00	611.00	611.00	609.00	

file requested **********
26.c
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comb. press. - pr (mm water gage) 16.00
cross flow temp. - tr (degree celsius) 545.00
comb. air flow rate - mcr (mm water diff.) 30.00
cool air flow rate - mkr (mm water diff.) 65.00
natural gas flow rate - mgr (mm water diff.) 15.00
natural gas total press. - pggr (psi gage) 0.00
air total press. - pgar (mm water gage) 0.00
jet temp. - tjr (degree celsius) 24.00
single jet flow rate - mgjr (s.c.f.m.) 1.04
wall temp. - t5 (degree celsius) 272.00
wall temp. - t6 (degree celsius) 296.00
wall temp. - t7 (degree celsius) 298.00
wall temp. - t8 (degree celsius) 357.00
wall temp. - t9 (degree celsius) 271.00
wall temp. - t10 (degree celsius) 279.00

mc = 0.0164317 kg/sec
mk = 0.0757852 kg/sec
mg = 0.001162 kg/sec
m = 0.093379 kg/sec
p = 98257 pascal
t = 818 degree kelvin
tj = 297 degree kelvin
t5 = 545 degree kelvin
t6 = 569 degree kelvin
t7 = 571 degree kelvin
t8 = 630 degree kelvin
t9 = 544 degree kelvin
t10= 552 degree kelvin
ro = 0.4185 kg/cubic meter
roj= 1.1527 kg/cubic meter
v = 8.26 meter/sec
mgj= 0.0005439 kg/sec
vj = 11.88 meter/sec
dr = 2.75 density ratio
j = 5.7 momentum ratio
fr = 6349 froude number
sr = 0.00 spacing ratio

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	783.00	771.00	743.00	749.00	746.00
2	95	20	796.00	787.00	762.00	769.00	768.00
3	95	40	800.00	798.00	777.00	792.00	786.00
4	95	60	800.00	803.00	784.00	796.00	790.00
5	95	80	806.00	792.00	764.00	793.00	800.00
6	95	100	811.00	782.00	751.00	778.00	805.00
7	95	120	804.00	772.00	748.00	768.00	799.00
8	95	140	809.00	775.00	746.00	763.00	794.00
9	95	160	806.00	776.00	751.00	767.00	795.00
10	95	180	795.00	766.00	745.00	764.00	789.00
11	85	0	796.00	795.00	776.00	787.00	777.00
12	85	20	805.00	804.00	786.00	794.00	787.00
13	85	40	812.00	808.00	791.00	804.00	795.00

14	85	60	812.00	785.00	752.00	796.00	809.00	
15	85	80	803.00	758.00	735.00	768.00	795.00	
16	85	100	804.00	757.00	738.00	756.00	801.00	
17	85	120	799.00	761.00	744.00	757.00	795.00	
18	85	140	793.00	765.00	749.00	766.00	796.00	
19	85	160	777.00	757.00	742.00	760.00	786.00	
20	85	180	780.00	761.00	742.00	764.00	785.00	rdg.
21	75	0	807.00	803.00	788.00	801.00	794.00	26.c
22	75	20	810.00	813.00	801.00	808.00	803.00	
23	75	40	815.00	804.00	769.00	812.00	807.00	
24	75	60	803.00	744.00	719.00	764.00	702.00	
25	75	80	798.00	738.00	734.00	755.00	802.00	
26	75	100	792.00	753.00	750.00	755.00	794.00	
27	75	120	790.00	759.00	748.00	760.00	788.00	
28	75	140	773.00	752.00	744.00	761.00	782.00	
29	75	160	768.00	751.00	746.00	768.00	783.00	
30	75	180	759.00	743.00	738.00	763.00	779.00	
31	65	0	818.00	819.00	805.00	814.00	814.00	
32	65	20	821.00	822.00	811.00	818.00	808.00	
33	65	40	817.00	764.00	703.00	796.00	807.00	
34	65	60	805.00	726.00	718.00	753.00	803.00	
35	65	80	792.00	744.00	746.00	755.00	795.00	
36	65	100	785.00	754.00	750.00	765.00	788.00	
37	65	120	774.00	750.00	748.00	769.00	780.00	
38	65	140	758.00	745.00	751.00	771.00	774.00	
39	65	160	746.00	734.00	741.00	757.00	764.00	
40	65	180	744.00	729.00	734.00	754.00	763.00	
41	55	0	821.00	823.00	813.00	823.00	815.00	
42	55	20	821.00	818.00	801.00	816.00	809.00	
43	55	40	812.00	727.00	690.00	783.00	806.00	
44	55	60	793.00	722.00	728.00	758.00	795.00	
45	55	80	780.00	745.00	747.00	767.00	784.00	
46	55	100	764.00	744.00	748.00	769.00	773.00	
47	55	120	738.00	735.00	747.00	760.00	757.00	
48	55	140	740.00	728.00	733.00	741.00	739.00	
49	55	160	730.00	717.00	724.00	728.00	730.00	
50	55	180	724.00	706.00	706.00	717.00	722.00	
51	45	0	813.00	819.00	815.00	821.00	811.00	
52	45	20	813.00	810.00	784.00	815.00	812.00	
53	45	40	803.00	706.00	696.00	787.00	804.00	
54	45	60	789.00	740.00	740.00	777.00	789.00	
55	45	80	769.00	746.00	751.00	772.00	773.00	
56	45	100	749.00	735.00	744.00	754.00	751.00	
57	45	120	737.00	726.00	734.00	735.00	730.00	
58	45	140	720.00	703.00	704.00	708.00	710.00	
59	35	0	817.00	825.00	821.00	824.00	817.00	
60	35	20	805.00	792.00	741.00	807.00	802.00	
61	35	40	796.00	722.00	701.00	785.00	792.00	
62	35	60	778.00	751.00	747.00	774.00	769.00	
63	35	80	755.00	742.00	753.00	762.00	752.00	
64	35	100	736.00	727.00	738.00	735.00	726.00	
65	35	120	717.00	699.00	708.00	705.00	705.00	
66	25	0	805.00	812.00	814.00	813.00	807.00	
67	25	20	797.00	788.00	686.00	800.00	794.00	
68	25	40	779.00	747.00	725.00	777.00	773.00	
69	25	60	761.00	746.00	753.00	767.00	753.00	
70	25	80	737.00	730.00	740.00	736.00	726.00	
71	25	100	714.00	698.00	705.00	698.00	693.00	
72	15	0	791.00	802.00	804.00	803.00	794.00	
73	15	20	769.00	761.00	618.00	770.00	768.00	
74	15	40	759.00	745.00	720.00	762.00	758.00	
75	15	60	745.00	736.00	744.00	746.00	735.00	
76	15	80	695.00	690.00	713.00	708.00	701.00	

file requested

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27.c
****

comb. press. - pr (mm water gage) 16.00
cross flow temp. - tr (degree celsius) 540.00
comb. air flow rate - mcr (mm water diff.) 30.00
cool air flow rate - mkr (mm water diff.) 65.00
natural gas flow rate - mgr (mm water diff.) 14.00
natural gas total press. - pggr (psi gage) 0.00
air total press. - pgar (mm water gage) 0.00
jet temp. - tjr (degree celsius) 23.00
single jet flow rate - mgjr (s.c.f.m.) 1.21
wall temp. - t5 (degree celsius) 261.00
wall temp. - t6 (degree celsius) 290.00
wall temp. - t7 (degree celsius) 291.00
wall temp. - t8 (degree celsius) 356.00
wall temp. - t9 (degree celsius) 264.00
wall temp. - t10 (degree celsius) 274.00

mc = 0.0164317 kg/sec
mk = 0.0757852 kg/sec
mg = 0.001122 kg/sec
m = 0.093339 kg/sec
p = 98257 pascal
t = 813 degree kelvin
tj = 296 degree kelvin
t5 = 534 degree kelvin
t6 = 563 degree kelvin
t7 = 564 degree kelvin
t8 = 629 degree kelvin
t9 = 537 degree kelvin
t10= 547 degree kelvin
ro = 0.4211 kg/cubic meter
roj= 1.1566 kg/cubic meter
v = 8.20 meter/sec
mgj= 0.0006302 kg/sec
vj = 13.71 meter/sec
dr = 2.75 density ratio
j = 7.7 momentum ratio
fr = 8480 froude number
sr = 0.00 spacing ratio

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	777.00	766.00	737.00	749.00	746.00
2	95	20	783.00	777.00	757.00	769.00	768.00
3	95	40	793.00	789.00	772.00	785.00	784.00
4	95	60	796.00	780.00	749.00	783.00	785.00
5	95	80	796.00	761.00	731.00	764.00	792.00
6	95	100	794.00	752.00	732.00	749.00	781.00
7	95	120	793.00	754.00	731.00	747.00	777.00
8	95	140	785.00	752.00	735.00	751.00	773.00
9	95	160	787.00	753.00	736.00	756.00	771.00
10	95	180	786.00	753.00	734.00	753.00	769.00
11	85	0	794.00	793.00	772.00	786.00	774.00
12	85	20	800.00	801.00	784.00	791.00	783.00
13	85	40	800.00	790.00	757.00	784.00	781.00

14	85	60	803.00	750.00	717.00	764.00	795.00	
15	85	80	788.00	729.00	721.00	743.00	790.00	
16	85	100	788.00	738.00	732.00	738.00	785.00	
17	85	120	785.00	744.00	738.00	741.00	774.00	
18	85	140	784.00	758.00	741.00	754.00	774.00	
19	85	160	780.00	751.00	737.00	754.00	772.00	
20	85	180	772.00	750.00	731.00	754.00	769.00	rdg.
21	75	0	799.00	802.00	789.00	798.00	790.00	27.0
22	75	20	807.00	807.00	798.00	806.00	797.00	
23	75	40	802.00	762.00	690.00	785.00	799.00	
24	75	60	797.00	721.00	710.00	748.00	802.00	
25	75	80	782.00	724.00	733.00	737.00	787.00	
26	75	100	784.00	747.00	746.00	745.00	782.00	
27	75	120	781.00	754.00	745.00	757.00	781.00	
28	75	140	769.00	751.00	744.00	763.00	783.00	
29	75	160	761.00	743.00	740.00	758.00	773.00	
30	75	180	753.00	734.00	731.00	755.00	773.00	
31	65	0	812.00	812.00	798.00	806.00	797.00	
32	65	20	810.00	808.00	795.00	806.00	798.00	
33	65	40	802.00	727.00	670.00	774.00	797.00	
34	65	60	793.00	712.00	721.00	738.00	795.00	
35	65	80	782.00	738.00	744.00	747.00	784.00	
36	65	100	779.00	752.00	749.00	762.00	780.00	
37	65	120	768.00	749.00	746.00	765.00	776.00	
38	65	140	753.00	737.00	740.00	759.00	767.00	
39	65	160	739.00	725.00	734.00	752.00	760.00	
40	65	180	742.00	728.00	730.00	747.00	750.00	
41	55	0	819.00	823.00	818.00	817.00	807.00	
42	55	20	810.00	803.00	774.00	802.00	798.00	
43	55	40	802.00	705.00	692.00	764.00	801.00	
44	55	60	791.00	729.00	742.00	757.00	795.00	
45	55	80	784.00	758.00	754.00	770.00	787.00	
46	55	100	770.00	751.00	753.00	771.00	772.00	
47	55	120	749.00	734.00	744.00	756.00	753.00	
48	55	140	739.00	726.00	732.00	739.00	739.00	
49	55	160	723.00	710.00	713.00	721.00	726.00	
50	55	180	722.00	704.00	703.00	714.00	721.00	
51	45	0	818.00	823.00	813.00	819.00	814.00	
52	45	20	811.00	800.00	750.00	810.00	808.00	
53	45	40	797.00	710.00	711.00	775.00	791.00	
54	45	60	784.00	751.00	747.00	774.00	783.00	
55	45	80	768.00	749.00	752.00	769.00	767.00	
56	45	100	742.00	731.00	742.00	752.00	745.00	
57	45	120	728.00	720.00	727.00	728.00	721.00	
58	45	140	717.00	699.00	704.00	706.00	708.00	
59	35	0	820.00	826.00	821.00	825.00	814.00	
60	35	20	799.00	772.00	695.00	790.00	796.00	
61	35	40	790.00	742.00	723.00	784.00	788.00	
62	35	60	778.00	757.00	752.00	777.00	773.00	
63	35	80	752.00	736.00	747.00	755.00	746.00	
64	35	100	729.00	721.00	730.00	725.00	720.00	
65	35	120	709.00	693.00	700.00	701.00	700.00	
66	25	0	805.00	819.00	819.00	822.00	811.00	
67	25	20	796.00	778.00	578.00	791.00	789.00	
68	25	40	779.00	756.00	722.00	775.00	769.00	
69	25	60	752.00	741.00	749.00	758.00	748.00	
70	25	80	735.00	728.00	737.00	734.00	725.00	
71	25	100	711.00	693.00	700.00	691.00	686.00	
72	15	0	792.00	805.00	807.00	801.00	791.00	
73	15	20	770.00	767.00	570.00	774.00	768.00	
74	15	40	755.00	743.00	724.00	754.00	744.00	
75	15	60	736.00	728.00	740.00	739.00	727.00	
76	15	80	697.00	690.00	709.00	703.00	696.00	

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file requested 28.c
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comb. press. - pr (mm water gage) 16.00
cross flow temp. - tr (degree celsius) 545.00
comb. air flow rate - mcr (mm water diff.) 30.00
cool air flow rate - mkr (mm water diff.) 64.00
natural gas flow rate - mgr (mm water diff.) 14.00
natural gas total press. - pgsr (psi gage) 0.00
air total press. - psar (mm water gage) 0.00
jet temp. - tjr (degree celsius) 24.00
single jet flow rate - msjr (s.c.f.m.) 1.35
wall temp. - t5 (degree celsius) 253.00
wall temp. - t6 (degree celsius) 276.00
wall temp. - t7 (degree celsius) 276.00
wall temp. - t8 (degree celsius) 340.00
wall temp. - t9 (degree celsius) 248.00
wall temp. - t10 (degree celsius) 265.00

mc = 0.0164317 kg/sec
mk = 0.0752000 kg/sec
mg = 0.001122 kg/sec
m = 0.092754 kg/sec
p = 98257 pascal
t = 818 degree kelvin
tj = 297 degree kelvin
t5 = 526 degree kelvin
t6 = 549 degree kelvin
t7 = 549 degree kelvin
t8 = 613 degree kelvin
t9 = 521 degree kelvin
t10= 538 degree kelvin
ro = 0.4185 kg/cubic meter
roj= 1.1527 kg/cubic meter
v = 8.20 meter/sec
msj= 0.0007061 kg/sec
vj = 15.42 meter/sec
dr = 2.75 density ratio
j = 9.7 momentum ratio
fr = 10699 froude number
sr = 0.00 spacing ratio

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	786.00	775.00	736.00	752.00	750.00
2	95	20	787.00	777.00	757.00	766.00	766.00
3	95	40	803.00	798.00	771.00	790.00	785.00
4	95	60	802.00	768.00	732.00	777.00	782.00
5	95	80	794.00	743.00	721.00	749.00	785.00
6	95	100	797.00	746.00	733.00	745.00	786.00
7	95	120	790.00	749.00	741.00	751.00	773.00
8	95	140	789.00	751.00	743.00	759.00	767.00
9	95	160	788.00	754.00	742.00	761.00	771.00
10	95	180	782.00	754.00	739.00	758.00	768.00
11	85	0	804.00	800.00	778.00	790.00	782.00
12	85	20	807.00	806.00	789.00	799.00	794.00
13	85	40	809.00	793.00	740.00	791.00	797.00

14	85	60	808.00	738.00	712.00	754.00	802.00	
15	85	80	793.00	726.00	728.00	737.00	794.00	
16	85	100	797.00	744.00	744.00	742.00	780.00	
17	85	120	791.00	748.00	748.00	751.00	775.00	
18	85	140	790.00	757.00	745.00	759.00	776.00	
19	85	160	787.00	757.00	745.00	766.00	778.00	
20	85	180	779.00	754.00	734.00	755.00	767.00	rdg.
21	75	0	817.00	815.00	800.00	804.00	796.00	28.c
22	75	20	811.00	810.00	795.00	802.00	793.00	
23	75	40	546.00	751.00	666.00	780.00	799.00	
24	75	60	803.00	717.00	726.00	739.00	800.00	
25	75	80	792.00	733.00	750.00	742.00	795.00	
26	75	100	793.00	755.00	755.00	758.00	787.00	
27	75	120	790.00	763.00	753.00	768.00	790.00	
28	75	140	785.00	758.00	750.00	769.00	786.00	
29	75	160	768.00	748.00	745.00	763.00	780.00	
30	75	180	764.00	745.00	737.00	762.00	778.00	
31	65	0	825.00	825.00	811.00	817.00	807.00	
32	65	20	818.00	811.00	790.00	810.00	805.00	
33	65	40	815.00	715.00	675.00	769.00	803.00	
34	65	60	799.00	723.00	745.00	744.00	801.00	
35	65	80	792.00	755.00	759.00	759.00	792.00	
36	65	100	785.00	759.00	755.00	772.00	791.00	
37	65	120	779.00	756.00	754.00	775.00	786.00	
38	65	140	757.00	743.00	748.00	764.00	772.00	
39	65	160	749.00	732.00	741.00	755.00	764.00	
40	65	180	741.00	728.00	730.00	747.00	755.00	
41	55	0	823.00	827.00	812.00	819.00	812.00	
42	55	20	817.00	798.00	748.00	811.00	816.00	
43	55	40	813.00	709.00	711.00	768.00	804.00	
44	55	60	801.00	756.00	761.00	772.00	798.00	
45	55	80	790.00	767.00	764.00	782.00	788.00	
46	55	100	777.00	757.00	757.00	780.00	777.00	
47	55	120	755.00	740.00	747.00	758.00	755.00	
48	55	140	740.00	730.00	735.00	743.00	742.00	
49	55	160	731.00	715.00	720.00	727.00	730.00	
50	55	180	726.00	706.00	703.00	714.00	722.00	
51	45	0	823.00	825.00	820.00	825.00	816.00	
52	45	20	817.00	790.00	713.00	807.00	812.00	
53	45	40	810.00	736.00	735.00	787.00	806.00	
54	45	60	798.00	774.00	765.00	790.00	791.00	
55	45	80	776.00	757.00	758.00	779.00	773.00	
56	45	100	753.00	740.00	750.00	757.00	748.00	
57	45	120	737.00	726.00	735.00	734.00	729.00	
58	45	140	723.00	704.00	705.00	706.00	710.00	
59	35	0	823.00	835.00	832.00	836.00	828.00	
60	35	20	810.00	778.00	673.00	796.00	801.00	
61	35	40	798.00	770.00	749.00	789.00	786.00	
62	35	60	781.00	765.00	758.00	778.00	770.00	
63	35	80	756.00	742.00	750.00	758.00	750.00	
64	35	100	734.00	724.00	735.00	736.00	727.00	
65	35	120	715.00	697.00	700.00	698.00	699.00	
66	25	0	809.00	822.00	818.00	820.00	810.00	
67	25	20	796.00	773.00	617.00	790.00	788.00	
68	25	40	782.00	776.00	761.00	781.00	771.00	
69	25	60	754.00	743.00	753.00	760.00	750.00	
70	25	80	738.00	729.00	740.00	737.00	729.00	
71	25	100	711.00	690.00	698.00	690.00	688.00	
72	15	0	800.00	813.00	812.00	809.00	797.00	
73	15	20	775.00	768.00	638.00	781.00	775.00	
74	15	40	751.00	744.00	745.00	760.00	751.00	
75	15	60	733.00	726.00	739.00	737.00	729.00	
76	15	80	679.00	680.00	707.00	698.00	692.00	

file requested **********
101.c
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comb. press. - pr (mm water gage) 25.00
cross flow temp. - tr (degree celsius) 374.00
comb. air flow rate - mcr (mm water diff.) 30.00
cool air flow rate - mkr (mm water diff.) 155.00
natural gas flow rate - mgr (mm water diff.) 15.00
natural gas total press. - pggr (psi gage) 0.00
air total press. - pgar (mm water gage) 0.00
jet temp. - tjr (degree celsius) 29.00
single jet flow rate - mgjr (s.c.f.m.) 1.32
wall temp. - t5 (degree celsius) 196.00
wall temp. - t6 (degree celsius) 219.00
wall temp. - t7 (degree celsius) 211.00
wall temp. - t8 (degree celsius) 298.00
wall temp. - t9 (degree celsius) 220.00
wall temp. - t10 (degree celsius) 220.00

mc = 0.0164317 kg/sec
mk = 0.1170290 kg/sec
mg = 0.001162 kg/sec
m = 0.134623 kg/sec
p = 98345.3 pascal
t = 647 degree kelvin
tj = 302 degree kelvin
t5 = 469 degree kelvin
t6 = 492 degree kelvin
t7 = 484 degree kelvin
t8 = 571 degree kelvin
t9 = 493 degree kelvin
t10= 493 degree kelvin
ro = 0.5296 kg/cubic meter
roj= 1.1347 kg/cubic meter
v = 9.40 meter/sec
mgj= 0.0006904 kg/sec
vj = 15.31 meter/sec
dr = 2.14 density ratio
j = 5.7 momentum ratio
fr = 12610 froude number
sr = 3.07 spacing ratio

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	590.00	601.00	601.00	611.00	613.00
2	95	20	595.00	605.00	608.00	618.00	621.00
3	95	40	594.00	605.00	609.00	619.00	619.00
4	95	60	600.00	610.00	612.00	620.00	621.00
5	95	80	594.00	606.00	611.00	621.00	624.00
6	95	100	586.00	601.00	608.00	619.00	620.00
7	95	120	581.00	596.00	604.00	613.00	621.00
8	95	140	577.00	591.00	598.00	611.00	618.00
9	95	160	574.00	585.00	595.00	610.00	618.00
10	95	180	566.00	578.00	591.00	604.00	616.00
11	85	0	608.00	617.00	615.00	627.00	627.00
12	85	20	607.00	617.00	619.00	629.00	628.00
13	85	40	602.00	613.00	617.00	624.00	623.00

14	85	60	595.00	606.00	611.00	619.00	620.00	
15	85	80	589.00	601.00	606.00	614.00	617.00	
16	85	100	581.00	593.00	599.00	609.00	612.00	
17	85	120	572.00	585.00	592.00	601.00	607.00	
18	85	140	568.00	580.00	588.00	598.00	603.00	rdg.
19	85	160	562.00	576.00	585.00	595.00	605.00	101.c
20	85	180	553.00	568.00	578.00	591.00	602.00	
21	75	0	606.00	618.00	619.00	630.00	630.00	
22	75	20	600.00	614.00	618.00	625.00	622.00	
23	75	40	595.00	608.00	613.00	618.00	618.00	
24	75	60	585.00	598.00	605.00	610.00	612.00	
25	75	80	580.00	591.00	598.00	604.00	608.00	
26	75	100	574.00	587.00	593.00	600.00	604.00	
27	75	120	565.00	578.00	587.00	594.00	599.00	
28	75	140	560.00	573.00	583.00	593.00	599.00	
29	75	160	555.00	568.00	578.00	587.00	594.00	
30	75	180	550.00	566.00	577.00	587.00	595.00	
31	65	0	606.00	624.00	622.00	631.00	630.00	
32	65	20	590.00	608.00	609.00	615.00	614.00	
33	65	40	583.00	596.00	602.00	605.00	607.00	
34	65	60	578.00	589.00	597.00	600.00	601.00	
35	65	80	575.00	586.00	592.00	596.00	597.00	
36	65	100	585.00	590.00	592.00	593.00	594.00	
37	65	120	580.00	585.00	588.00	588.00	590.00	
38	65	140	576.00	580.00	581.00	584.00	588.00	
39	65	160	572.00	576.00	580.00	585.00	589.00	
40	65	180	569.00	574.00	578.00	583.00	590.00	
41	55	0	602.00	622.00	612.00	617.00	615.00	
42	55	20	590.00	604.00	602.00	602.00	600.00	
43	55	40	587.00	595.00	596.00	596.00	595.00	
44	55	60	573.00	584.00	591.00	593.00	321.00	
45	55	80	569.00	580.00	588.00	591.00	590.00	
46	55	100	564.00	575.00	582.00	585.00	586.00	
47	55	120	560.00	571.00	578.00	581.00	583.00	
48	55	140	554.00	567.00	575.00	579.00	583.00	
49	55	160	552.00	568.00	576.00	580.00	583.00	
50	55	180	549.00	564.00	575.00	581.00	584.00	
51	45	0	563.00	593.00	588.00	592.00	596.00	
52	45	20	574.00	588.00	590.00	590.00	591.00	
53	45	40	578.00	586.00	589.00	588.00	589.00	
54	45	60	579.00	585.00	588.00	588.00	586.00	
55	45	80	578.00	583.00	585.00	584.00	581.00	
56	45	100	575.00	578.00	579.00	577.00	576.00	
57	45	120	571.00	572.00	573.00	575.00	577.00	
58	45	140	554.00	564.00	571.00	574.00	577.00	
59	35	0	556.00	581.00	582.00	578.00	585.00	
60	35	20	566.00	578.00	584.00	583.00	586.00	
61	35	40	569.00	579.00	585.00	586.00	584.00	
62	35	60	570.00	579.00	584.00	584.00	580.00	
63	35	80	565.00	575.00	579.00	577.00	574.00	
64	35	100	559.00	568.00	570.00	570.00	570.00	
65	35	120	552.00	561.00	565.00	568.00	570.00	
66	25	0	561.00	574.00	579.00	575.00	580.00	
67	25	20	572.00	580.00	585.00	585.00	584.00	
68	25	40	573.00	581.00	586.00	586.00	582.00	
69	25	60	571.00	580.00	583.00	580.00	576.00	
70	25	80	563.00	570.00	573.00	570.00	567.00	
71	25	100	554.00	559.00	562.00	561.00	562.00	
72	15	0	585.00	585.00	588.00	585.00	588.00	
73	15	20	579.00	585.00	589.00	589.00	587.00	
74	15	40	576.00	583.00	586.00	585.00	580.00	
75	15	60	567.00	575.00	578.00	574.00	569.00	
76	15	80	545.00	555.00	562.00	558.00	558.00	

file requested

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102.c
****

comb. press. - pr (mm water gage) 24.00
cross flow temp. - tr (degree celsius) 376.00
comb. air flow rate - mcr (mm water diff.) 20.00
cool air flow rate - mkr (mm water diff.) 114.00
natural gas flow rate - mgr (mm water diff.) 10.00
natural gas total press. - pggr (psi gage) 0.00
air total press. - pgar (mm water gage) 0.00
jet temp. - tjr (degree celsius) 30.00
single jet flow rate - mgjr (s.c.f.m.) 1.47
wall temp. - t5 (degree celsius) 194.00
wall temp. - t6 (degree celsius) 221.00
wall temp. - t7 (degree celsius) 210.00
wall temp. - t8 (degree celsius) 290.00
wall temp. - t9 (degree celsius) 220.00
wall temp. - t10 (degree celsius) 220.00

mc = 0.0134164 kg/sec
mk = 0.1003645 kg/sec
mg = 0.000949 kg/sec
m = 0.114730 kg/sec
p = 98335.4 pascal
t = 649 degree kelvin
tj = 303 degree kelvin
t5 = 467 degree kelvin
t6 = 494 degree kelvin
t7 = 483 degree kelvin
t8 = 563 degree kelvin
t9 = 493 degree kelvin
t10= 493 degree kelvin
ro = 0.5279 kg/cubic meter
roj= 1.1308 kg/cubic meter
v = 8.04 meter/sec
mgj= 0.0007688 kg/sec
vj = 17.11 meter/sec
dr = 2.14 density ratio
j = 9.7 momentum ratio
fr = 15748 froude number
sr = 3.07 spacing ratio

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	621.00	622.00	613.00	624.00	623.00
2	95	20	624.00	627.00	620.00	627.00	624.00
3	95	40	623.00	625.00	618.00	622.00	621.00
4	95	60	620.00	623.00	619.00	624.00	622.00
5	95	80	612.00	616.00	611.00	617.00	617.00
6	95	100	610.00	613.00	609.00	614.00	615.00
7	95	120	605.00	609.00	603.00	607.00	610.00
8	95	140	602.00	605.00	601.00	606.00	610.00
9	95	160	596.00	600.00	597.00	602.00	608.00
10	95	180	590.00	594.00	593.00	599.00	609.00
11	85	0	626.00	628.00	619.00	626.00	624.00
12	85	20	621.00	626.00	619.00	626.00	622.00
13	85	40	612.00	618.00	614.00	617.00	615.00

14	85	60	607.00	610.00	608.00	611.00	610.00	
15	85	80	601.00	605.00	603.00	605.00	607.00	
16	85	100	598.00	599.00	597.00	599.00	601.00	
17	85	120	590.00	595.00	592.00	595.00	598.00	
18	85	140	586.00	589.00	588.00	590.00	595.00	
19	85	160	582.00	585.00	583.00	587.00	595.00	rdg.
20	85	180	578.00	582.00	579.00	585.00	593.00	102.c
21	75	0	622.00	628.00	617.00	625.00	623.00	
22	75	20	602.00	612.00	607.00	610.00	608.00	
23	75	40	597.00	604.00	602.00	603.00	603.00	
24	75	60	592.00	597.00	596.00	596.00	595.00	
25	75	80	588.00	591.00	592.00	593.00	594.00	
26	75	100	585.00	588.00	588.00	589.00	591.00	
27	75	120	582.00	585.00	584.00	585.00	587.00	
28	75	140	578.00	581.00	581.00	584.00	587.00	
29	75	160	574.00	577.00	577.00	580.00	586.00	
30	75	180	570.00	573.00	573.00	578.00	584.00	
31	65	0	598.00	615.00	603.00	611.00	609.00	
32	65	20	583.00	596.00	593.00	594.00	594.00	
33	65	40	581.00	590.00	592.00	590.00	591.00	
34	65	60	581.00	587.00	588.00	588.00	587.00	
35	65	80	579.00	583.00	585.00	586.00	586.00	
36	65	100	578.00	582.00	583.00	583.00	582.00	
37	65	120	574.00	578.00	577.00	577.00	578.00	
38	65	140	570.00	574.00	573.00	575.00	579.00	
39	65	160	566.00	569.00	571.00	575.00	581.00	
40	65	180	563.00	567.00	569.00	575.00	581.00	
41	55	0	573.00	596.00	583.00	590.00	590.00	
42	55	20	572.00	585.00	582.00	581.00	583.00	
43	55	40	573.00	580.00	583.00	582.00	582.00	
44	55	60	573.00	580.00	583.00	583.00	582.00	
45	55	80	574.00	579.00	581.00	581.00	578.00	
46	55	100	573.00	577.00	577.00	575.00	574.00	
47	55	120	569.00	571.00	570.00	569.00	570.00	
48	55	140	564.00	567.00	567.00	570.00	574.00	
49	55	160	562.00	564.00	566.00	571.00	576.00	
50	55	180	558.00	562.00	567.00	573.00	577.00	
51	45	0	558.00	582.00	573.00	574.00	576.00	
52	45	20	567.00	577.00	578.00	578.00	579.00	
53	45	40	573.00	578.00	580.00	580.00	580.00	
54	45	60	573.00	578.00	580.00	579.00	577.00	
55	45	80	574.00	578.00	578.00	576.00	572.00	
56	45	100	569.00	572.00	572.00	568.00	567.00	
57	45	120	565.00	565.00	564.00	564.00	566.00	
58	45	140	559.00	560.00	561.00	565.00	568.00	
59	35	0	561.00	574.00	574.00	573.00	574.00	
60	35	20	570.00	576.00	578.00	577.00	576.00	
61	35	40	574.00	578.00	580.00	580.00	577.00	
62	35	60	575.00	579.00	580.00	578.00	574.00	
63	35	80	573.00	576.00	576.00	572.00	567.00	
64	35	100	567.00	569.00	566.00	563.00	563.00	
65	35	120	560.00	560.00	558.00	559.00	562.00	
66	25	0	572.00	575.00	579.00	576.00	577.00	
67	25	20	577.00	579.00	581.00	580.00	578.00	
68	25	40	578.00	581.00	582.00	582.00	578.00	
69	25	60	576.00	580.00	580.00	576.00	570.00	
70	25	80	571.00	573.00	571.00	565.00	561.00	
71	25	100	561.00	559.00	557.00	553.00	554.00	
72	15	0	584.00	581.00	585.00	583.00	581.00	
73	15	20	584.00	585.00	587.00	585.00	582.00	
74	15	40	581.00	584.00	584.00	582.00	577.00	
75	15	60	575.00	577.00	577.00	571.00	565.00	
76	15	80	556.00	560.00	563.00	556.00	552.00	

file requested **********
103.c
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comb. press. - pr (mm water gage) 20.00
cross flow temp. - tr (degree celsius) 376.00
comb. air flow rate - mcr (mm water diff.) 15.00
cool air flow rate - mkr (mm water diff.) 95.00
natural gas flow rate - mgr (mm water diff.) 8.00
natural gas total press. - pggr (psi gage) 0.00
air total press. - pgar (mm water gage) 0.00
jet temp. - tjr (degree celsius) 30.00
single jet flow rate - mgjr (s.c.f.m.) 1.47
wall temp. - t5 (degree celsius) 185.00
wall temp. - t6 (degree celsius) 215.00
wall temp. - t7 (degree celsius) 201.00
wall temp. - t8 (degree celsius) 280.00
wall temp. - t9 (degree celsius) 214.00
wall temp. - t10 (degree celsius) 216.00

mc = 0.0116189 kg/sec
mk = 0.0916199 kg/sec
mg = 0.000849 kg/sec
m = 0.104087 kg/sec
p = 98296.2 pascal
t = 649 degree kelvin
tj = 303 degree kelvin
t5 = 458 degree kelvin
t6 = 488 degree kelvin
t7 = 474 degree kelvin
t8 = 553 degree kelvin
t9 = 487 degree kelvin
t10= 489 degree kelvin
ro = 0.5277 kg/cubic meter
roj= 1.1303 kg/cubic meter
v = 7.30 meter/sec
mgj= 0.0007688 kg/sec
vj = 17.12 meter/sec
dr = 2.14 density ratio
j = 11.8 momentum ratio
fr = 15761 froude number
sr = 3.07 spacing ratio

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	630.00	628.00	617.00	624.00	624.00
2	95	20	631.00	631.00	619.00	623.00	620.00
3	95	40	625.00	627.00	618.00	623.00	618.00
4	95	60	620.00	622.00	615.00	617.00	616.00
5	95	80	617.00	618.00	612.00	616.00	611.00
6	95	100	612.00	614.00	607.00	609.00	609.00
7	95	120	608.00	609.00	602.00	606.00	608.00
8	95	140	602.00	604.00	596.00	599.00	604.00
9	95	160	600.00	600.00	593.00	597.00	601.00
10	95	180	592.00	593.00	590.00	595.00	602.00
11	85	0	631.00	633.00	622.00	630.00	627.00
12	85	20	621.00	623.00	613.00	619.00	615.00
13	85	40	610.00	614.00	608.00	610.00	605.00

14	85	60	604.00	607.00	605.00	605.00	604.00	
15	85	80	601.00	602.00	599.00	600.00	599.00	
16	85	100	595.00	597.00	594.00	594.00	595.00	
17	85	120	594.00	595.00	590.00	591.00	593.00	
18	85	140	589.00	592.00	588.00	588.00	591.00	rdg. 103.c
19	85	160	585.00	587.00	582.00	584.00	589.00	
20	85	180	581.00	581.00	578.00	582.00	587.00	
21	75	0	616.00	625.00	611.00	617.00	613.00	
22	75	20	599.00	608.00	601.00	603.00	597.00	
23	75	40	591.00	597.00	594.00	593.00	591.00	
24	75	60	590.00	593.00	593.00	592.00	591.00	
25	75	80	588.00	590.00	589.00	589.00	589.00	
26	75	100	584.00	586.00	584.00	584.00	584.00	
27	75	120	582.00	585.00	583.00	582.00	582.00	
28	75	140	578.00	581.00	578.00	579.00	581.00	
29	75	160	575.00	575.00	572.00	575.00	581.00	
30	75	180	570.00	571.00	569.00	573.00	580.00	
31	65	0	588.00	606.00	590.00	597.00	594.00	
32	65	20	583.00	593.00	589.00	589.00	588.00	
33	65	40	579.00	585.00	586.00	584.00	582.00	
34	65	60	578.00	581.00	582.00	580.00	579.00	
35	65	80	580.00	582.00	581.00	580.00	578.00	
36	65	100	577.00	580.00	579.00	577.00	575.00	
37	65	120	574.00	576.00	575.00	573.00	573.00	
38	65	140	572.00	573.00	570.00	570.00	573.00	
39	65	160	568.00	567.00	566.00	568.00	575.00	
40	65	180	564.00	564.00	564.00	569.00	575.00	
41	55	0	569.00	590.00	578.00	580.00	577.00	
42	55	20	573.00	583.00	581.00	578.00	578.00	
43	55	40	577.00	582.00	581.00	578.00	577.00	
44	55	60	577.00	580.00	580.00	578.00	575.00	
45	55	80	577.00	580.00	579.00	577.00	573.00	
46	55	100	575.00	577.00	576.00	572.00	568.00	
47	55	120	572.00	572.00	569.00	567.00	567.00	
48	55	140	569.00	566.00	564.00	565.00	568.00	
49	55	160	562.00	561.00	563.00	566.00	570.00	
50	55	180	560.00	560.00	561.00	566.00	571.00	
51	45	0	561.00	578.00	571.00	571.00	571.00	
52	45	20	569.00	574.00	575.00	573.00	572.00	
53	45	40	574.00	577.00	578.00	576.00	573.00	
54	45	60	576.00	579.00	579.00	576.00	571.00	
55	45	80	575.00	577.00	575.00	571.00	565.00	
56	45	100	563.00	564.00	561.00	557.00	555.00	
57	45	120	558.00	556.00	554.00	554.00	556.00	
58	45	140	552.00	549.00	551.00	554.00	557.00	
59	35	0	558.00	564.00	564.00	561.00	562.00	
60	35	20	564.00	568.00	569.00	567.00	566.00	
61	35	40	568.00	571.00	571.00	569.00	565.00	
62	35	60	568.00	570.00	569.00	566.00	561.00	
63	35	80	566.00	567.00	564.00	558.00	554.00	
64	35	100	560.00	558.00	554.00	550.00	550.00	
65	35	120	551.00	547.00	546.00	548.00	550.00	
66	25	0	568.00	568.00	570.00	566.00	564.00	
67	25	20	572.00	573.00	573.00	571.00	568.00	
68	25	40	572.00	574.00	572.00	570.00	565.00	
69	25	60	569.00	570.00	568.00	563.00	557.00	
70	25	80	563.00	563.00	559.00	553.00	549.00	
71	25	100	553.00	549.00	547.00	543.00	544.00	
72	15	0	581.00	575.00	577.00	574.00	571.00	
73	15	20	580.00	579.00	578.00	575.00	571.00	
74	15	40	575.00	576.00	574.00	571.00	565.00	
75	15	60	568.00	568.00	565.00	559.00	552.00	
76	15	80	547.00	549.00	550.00	543.00	541.00	

file requested **********
104.c
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comb. press. - pr (mm water gage) 18.00
cross flow temp. - tr (degree celsius) 558.00
comb. air flow rate - mcr (mm water diff.) 30.00
cool air flow rate - mkr (mm water diff.) 65.00
natural gas flow rate - mgr (mm water diff.) 15.00
natural gas total press. - pggr (psi gage) 0.00
air total press. - pgar (mm water gage) 0.00
jet temp. - tjr (degree celsius) 29.00
single jet flow rate - mgjr (s.c.f.m.) 1.04
wall temp. - t5 (degree celsius) 269.00
wall temp. - t6 (degree celsius) 299.00
wall temp. - t7 (degree celsius) 290.00
wall temp. - t8 (degree celsius) 373.00
wall temp. - t9 (degree celsius) 279.00
wall temp. - t10 (degree celsius) 290.00

mc = 0.0164317 kg/sec
mk = 0.0757852 kg/sec
mg = 0.001162 kg/sec
m = 0.093379 kg/sec
p = 98276.6 pascal
t = 831 degree kelvin
tj = 302 degree kelvin
t5 = 542 degree kelvin
t6 = 572 degree kelvin
t7 = 563 degree kelvin
t8 = 646 degree kelvin
t9 = 552 degree kelvin
t10= 563 degree kelvin
ro = 0.4121 kg/cubic meter
roj= 1.1339 kg/cubic meter
v = 8.38 meter/sec
mgj= 0.0005439 kg/sec
vj = 12.07 meter/sec
dr = 2.75 density ratio
j = 5.7 momentum ratio
fr = 6566 froude number
sr = 3.07 spacing ratio

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	792.00	788.00	766.00	774.00	767.00
2	95	20	808.00	809.00	791.00	794.00	786.00
3	95	40	810.00	808.00	796.00	802.00	794.00
4	95	60	808.00	810.00	795.00	800.00	795.00
5	95	80	805.00	806.00	798.00	803.00	796.00
6	95	100	799.00	802.00	793.00	799.00	796.00
7	95	120	790.00	795.00	783.00	785.00	783.00
8	95	140	788.00	787.00	774.00	782.00	786.00
9	95	160	771.00	774.00	761.00	771.00	785.00
10	95	180	761.00	758.00	755.00	768.00	786.00
11	85	0	812.00	808.00	790.00	796.00	791.00
12	85	20	809.00	813.00	805.00	810.00	799.00
13	85	40	798.00	806.00	800.00	802.00	796.00

14	85	60	792.00	796.00	790.00	791.00	787.00	
15	85	80	779.00	785.00	777.00	779.00	779.00	
16	85	100	764.00	768.00	763.00	764.00	764.00	
17	85	120	755.00	760.00	755.00	753.00	756.00	
18	85	140	742.00	746.00	743.00	745.00	756.00	rdg.
19	85	160	736.00	735.00	731.00	734.00	749.00	104.c
20	85	180	722.00	722.00	719.00	729.00	748.00	
21	75	0	807.00	811.00	796.00	803.00	801.00	
22	75	20	786.00	799.00	789.00	789.00	785.00	
23	75	40	764.00	778.00	774.00	771.00	767.00	
24	75	60	758.00	769.00	765.00	760.00	757.00	
25	75	80	745.00	755.00	756.00	753.00	751.00	
26	75	100	732.00	742.00	740.00	739.00	739.00	
27	75	120	726.00	730.00	729.00	729.00	730.00	
28	75	140	709.00	717.00	714.00	717.00	723.00	
29	75	160	699.00	702.00	705.00	714.00	725.00	
30	75	180	697.00	698.00	698.00	710.00	728.00	
31	65	0	785.00	807.00	790.00	796.00	786.00	
32	65	20	750.00	773.00	766.00	765.00	763.00	
33	65	40	737.00	754.00	755.00	751.00	751.00	
34	65	60	727.00	739.00	742.00	737.00	732.00	
35	65	80	722.00	732.00	732.00	728.00	722.00	
36	65	100	714.00	720.00	722.00	718.00	716.00	
37	65	120	703.00	710.00	711.00	707.00	704.00	
38	65	140	692.00	696.00	698.00	700.00	704.00	
39	65	160	682.00	686.00	690.00	697.00	708.00	
40	65	180	682.00	682.00	687.00	698.00	711.00	
41	55	0	465.00	508.00	757.00	764.00	760.00	
42	55	20	718.00	746.00	743.00	737.00	732.00	
43	55	40	711.00	729.00	732.00	726.00	721.00	
44	55	60	711.00	724.00	726.00	721.00	713.00	
45	55	80	708.00	718.00	718.00	712.00	702.00	
46	55	100	702.00	706.00	708.00	702.00	694.00	
47	55	120	689.00	694.00	690.00	685.00	685.00	
48	55	140	677.00	679.00	680.00	682.00	690.00	
49	55	160	671.00	673.00	677.00	681.00	689.00	
50	55	180	666.00	665.00	671.00	681.00	692.00	
51	45	0	695.00	749.00	727.00	723.00	724.00	
52	45	20	702.00	726.00	728.00	720.00	714.00	
53	45	40	705.00	721.00	723.00	714.00	704.00	
54	45	60	700.00	714.00	717.00	710.00	699.00	
55	45	80	697.00	707.00	708.00	702.00	689.00	
56	45	100	686.00	693.00	690.00	681.00	675.00	
57	45	120	674.00	675.00	675.00	672.00	672.00	
58	45	140	663.00	662.00	663.00	667.00	673.00	
59	35	0	685.00	727.00	716.00	710.00	711.00	
60	35	20	699.00	715.00	720.00	710.00	701.00	
61	35	40	702.00	714.00	717.00	708.00	696.00	
62	35	60	697.00	707.00	708.00	701.00	687.00	
63	35	80	690.00	698.00	696.00	687.00	676.00	
64	35	100	677.00	679.00	677.00	667.00	664.00	
65	35	120	657.00	657.00	658.00	656.00	659.00	
66	25	0	688.00	708.00	710.00	702.00	700.00	
67	25	20	702.00	712.00	715.00	708.00	701.00	
68	25	40	700.00	711.00	712.00	704.00	691.00	
69	25	60	694.00	702.00	702.00	691.00	677.00	
70	25	80	681.00	686.00	683.00	672.00	663.00	
71	25	100	660.00	660.00	658.00	650.00	649.00	
72	15	0	709.00	715.00	718.00	712.00	705.00	
73	15	20	707.00	716.00	721.00	715.00	706.00	
74	15	40	702.00	712.00	711.00	702.00	689.00	
75	15	60	691.00	697.00	693.00	679.00	666.00	
76	15	80	627.00	644.00	660.00	649.00	644.00	

file requested **********
105.c
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comb. press. - pr (mm water gage) 20.00
cross flow temp. - tr (degree celsius) 556.00
comb. air flow rate - mcr (mm water diff.) 30.00
cool air flow rate - mkr (mm water diff.) 65.00
natural gas flow rate - mgr (mm water diff.) 15.00
natural gas total press. - pggr (psi gage) 0.00
air total press. - pgar (mm water gage) 0.00
jet temp. - tjr (degree celsius) 31.00
single jet flow rate - mgjr (s.c.f.m.) 1.35
wall temp. - t5 (degree celsius) 265.00
wall temp. - t6 (degree celsius) 288.00
wall temp. - t7 (degree celsius) 276.00
wall temp. - t8 (degree celsius) 374.00
wall temp. - t9 (degree celsius) 286.00
wall temp. - t10 (degree celsius) 295.00

mc = 0.0164317 kg/sec
mk = 0.0757852 kg/sec
mg = 0.001162 kg/sec
m = 0.093379 kg/sec
p = 98296.2 pascal
t = 829 degree kelvin
tj = 304 degree kelvin
t5 = 538 degree kelvin
t6 = 561 degree kelvin
t7 = 549 degree kelvin
t8 = 647 degree kelvin
t9 = 559 degree kelvin
t10= 568 degree kelvin
ro = 0.4131 kg/cubic meter
roj= 1.1266 kg/cubic meter
v = 8.36 meter/sec
mgj= 0.0007061 kg/sec
vj = 15.77 meter/sec
dr = 2.73 density ratio
j = 9.7 momentum ratio
fr = 11264 froude number
sr = 3.07 spacing ratio

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	799.00	794.00	766.00	778.00	775.00
2	95	20	806.00	803.00	782.00	787.00	785.00
3	95	40	799.00	800.00	784.00	788.00	781.00
4	95	60	792.00	793.00	779.00	783.00	779.00
5	95	80	783.00	789.00	774.00	775.00	770.00
6	95	100	781.00	788.00	775.00	781.00	779.00
7	95	120	772.00	779.00	765.00	772.00	769.00
8	95	140	763.00	773.00	758.00	762.00	767.00
9	95	160	754.00	758.00	747.00	756.00	767.00
10	95	180	738.00	744.00	738.00	745.00	758.00
11	85	0	805.00	804.00	788.00	791.00	784.00
12	85	20	787.00	798.00	783.00	788.00	780.00
13	85	40	768.00	783.00	772.00	770.00	763.00

14	85	60	764.00	774.00	765.00	766.00	763.00	
15	85	80	752.00	761.00	756.00	755.00	754.00	
16	85	100	743.00	749.00	744.00	743.00	741.00	
17	85	120	734.00	745.00	741.00	739.00	742.00	rdg.
18	85	140	723.00	733.00	729.00	732.00	737.00	105.c
19	85	160	719.00	727.00	719.00	723.00	727.00	
20	85	180	714.00	718.00	711.00	720.00	731.00	
21	75	0	784.00	803.00	785.00	792.00	783.00	
22	75	20	750.00	772.00	762.00	762.00	756.00	
23	75	40	738.00	756.00	751.00	747.00	740.00	
24	75	60	729.00	742.00	741.00	735.00	732.00	
25	75	80	719.00	732.00	734.00	728.00	724.00	
26	75	100	717.00	727.00	729.00	724.00	720.00	
27	75	120	708.00	719.00	720.00	716.00	714.00	
28	75	140	704.00	712.00	711.00	707.00	708.00	
29	75	160	691.00	699.00	696.00	698.00	705.00	
30	75	180	687.00	691.00	688.00	694.00	703.00	
31	65	0	742.00	782.00	753.00	761.00	758.00	
32	65	20	717.00	743.00	736.00	732.00	728.00	
33	65	40	711.00	729.00	729.00	722.00	720.00	
34	65	60	710.00	723.00	723.00	719.00	715.00	
35	65	80	708.00	719.00	722.00	716.00	710.00	
36	65	100	703.00	713.00	714.00	706.00	699.00	
37	65	120	694.00	704.00	702.00	696.00	691.00	
38	65	140	685.00	692.00	691.00	689.00	691.00	
39	65	160	676.00	679.00	678.00	680.00	689.00	
40	65	180	671.00	675.00	675.00	684.00	695.00	
41	55	0	696.00	748.00	722.00	722.00	718.00	
42	55	20	698.00	723.00	722.00	716.00	712.00	
43	55	40	697.00	712.00	718.00	711.00	706.00	
44	55	60	703.00	715.00	718.00	711.00	702.00	
45	55	80	697.00	709.00	709.00	704.00	695.00	
46	55	100	691.00	702.00	702.00	694.00	682.00	
47	55	120	687.00	696.00	693.00	682.00	678.00	
48	55	140	674.00	679.00	674.00	672.00	677.00	
49	55	160	663.00	667.00	666.00	671.00	678.00	
50	55	180	659.00	663.00	662.00	671.00	680.00	
51	45	0	678.00	724.00	706.00	702.00	703.00	
52	45	20	690.00	710.00	713.00	706.00	699.00	
53	45	40	698.00	709.00	714.00	707.00	699.00	
54	45	60	699.00	711.00	712.00	706.00	695.00	
55	45	80	694.00	702.00	701.00	692.00	678.00	
56	45	100	683.00	692.00	689.00	676.00	667.00	
57	45	120	679.00	680.00	672.00	664.00	665.00	
58	45	140	661.00	662.00	657.00	657.00	662.00	
59	35	0	686.00	711.00	710.00	704.00	700.00	
60	35	20	697.00	711.00	714.00	706.00	698.00	
61	35	40	702.00	711.00	712.00	707.00	696.00	
62	35	60	699.00	708.00	708.00	700.00	685.00	
63	35	80	692.00	698.00	694.00	681.00	666.00	
64	35	100	680.00	682.00	674.00	661.00	655.00	
65	35	120	662.00	660.00	654.00	649.00	653.00	
66	25	0	698.00	708.00	715.00	706.00	701.00	
67	25	20	704.00	713.00	718.00	710.00	701.00	
68	25	40	706.00	715.00	713.00	707.00	693.00	
69	25	60	699.00	705.00	702.00	692.00	678.00	
70	25	80	688.00	692.00	684.00	669.00	657.00	
71	25	100	665.00	665.00	658.00	645.00	642.00	
72	15	0	713.00	714.00	724.00	715.00	708.00	
73	15	20	711.00	718.00	721.00	714.00	705.00	
74	15	40	704.00	713.00	712.00	702.00	688.00	
75	15	60	692.00	699.00	696.00	680.00	665.00	
76	15	80	648.00	658.00	663.00	650.00	643.00	

file requested **********
106.c
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comb. press. - pr (mm water gage) 12.00
cross flow temp. - tr (degree celsius) 560.00
comb. air flow rate - mcr (mm water diff.) 20.00
cool air flow rate - mkr (mm water diff.) 41.00
natural gas flow rate - msr (mm water diff.) 10.00
natural gas total press. - psgr (psi gage) 0.00
air total press. - psar (mm water gage) 0.00
jet temp. - tjr (degree celsius) 32.00
single jet flow rate - msjr (s.c.f.m.) 1.18
wall temp. - t5 (degree celsius) 261.00
wall temp. - t6 (degree celsius) 292.00
wall temp. - t7 (degree celsius) 274.00
wall temp. - t8 (degree celsius) 365.00
wall temp. - t9 (degree celsius) 284.00
wall temp. - t10 (degree celsius) 297.00

mc = 0.0134164 kg/sec
mk = 0.0601894 kg/sec
ms = 0.000949 kg/sec
m = 0.074554 kg/sec
p = 98217.7 pascal
t = 833 degree kelvin
tj = 305 degree kelvin
t5 = 534 degree kelvin
t6 = 565 degree kelvin
t7 = 547 degree kelvin
t8 = 638 degree kelvin
t9 = 557 degree kelvin
t10= 570 degree kelvin
ro = 0.4108 kg/cubic meter
roj= 1.1220 kg/cubic meter
v = 6.71 meter/sec
msj= 0.0006198 kg/sec
vj = 13.90 meter/sec
dr = 2.73 density ratio
j = 11.7 momentum ratio
fr = 8742 froude number
sr = 3.07 spacing ratio

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	825.00	818.00	788.00	794.00	782.00
2	95	20	825.00	822.00	798.00	806.00	793.00
3	95	40	810.00	813.00	795.00	798.00	788.00
4	95	60	794.00	801.00	791.00	796.00	789.00
5	95	80	794.00	799.00	785.00	785.00	776.00
6	95	100	787.00	792.00	778.00	784.00	777.00
7	95	120	778.00	785.00	769.00	774.00	773.00
8	95	140	768.00	777.00	765.00	769.00	771.00
9	95	160	750.00	762.00	753.00	759.00	768.00
10	95	180	746.00	753.00	745.00	755.00	763.00
11	85	0	819.00	823.00	802.00	810.00	800.00
12	85	20	791.00	806.00	785.00	783.00	776.00
13	85	40	771.00	786.00	776.00	774.00	765.00

14	85	60	764.00	779.00	769.00	763.00	757.00	
15	85	80	755.00	765.00	762.00	758.00	755.00	
16	85	100	744.00	756.00	755.00	752.00	748.00	
17	85	120	735.00	748.00	745.00	744.00	741.00	
18	85	140	726.00	740.00	736.00	735.00	737.00	rdg.
19	85	160	717.00	730.00	725.00	729.00	738.00	106.c
20	85	180	710.00	722.00	718.00	727.00	738.00	
21	75	0	785.00	807.00	782.00	790.00	780.00	
22	75	20	751.00	775.00	763.00	756.00	746.00	
23	75	40	736.00	754.00	750.00	743.00	738.00	
24	75	60	732.00	747.00	747.00	739.00	730.00	
25	75	80	726.00	740.00	742.00	735.00	731.00	
26	75	100	721.00	733.00	733.00	729.00	724.00	
27	75	120	715.00	727.00	726.00	722.00	718.00	
28	75	140	704.00	716.00	715.00	712.00	715.00	
29	75	160	696.00	705.00	704.00	707.00	714.00	
30	75	180	691.00	697.00	697.00	706.00	718.00	
31	65	0	732.00	776.00	748.00	753.00	748.00	
32	65	20	714.00	743.00	740.00	733.00	724.00	
33	65	40	713.00	732.00	733.00	724.00	717.00	
34	65	60	716.00	730.00	732.00	722.00	715.00	
35	65	80	710.00	722.00	726.00	719.00	710.00	
36	65	100	708.00	719.00	719.00	713.00	705.00	
37	65	120	701.00	714.00	712.00	704.00	699.00	
38	65	140	688.00	701.00	701.00	698.00	699.00	
39	65	160	683.00	689.00	689.00	690.00	698.00	
40	65	180	678.00	682.00	684.00	694.00	705.00	
41	55	0	698.00	744.00	721.00	722.00	716.00	
42	55	20	700.00	725.00	725.00	718.00	708.00	
43	55	40	704.00	720.00	725.00	716.00	709.00	
44	55	60	701.00	716.00	721.00	714.00	705.00	
45	55	80	704.00	714.00	716.00	709.00	697.00	
46	55	100	696.00	709.00	708.00	700.00	691.00	
47	55	120	687.00	696.00	696.00	686.00	683.00	
48	55	140	679.00	684.00	680.00	680.00	684.00	
49	55	160	667.00	674.00	675.00	679.00	687.00	
50	55	180	664.00	668.00	672.00	682.00	692.00	
51	45	0	685.00	723.00	711.00	707.00	702.00	
52	45	20	695.00	714.00	715.00	710.00	701.00	
53	45	40	701.00	715.00	718.00	712.00	701.00	
54	45	60	703.00	714.00	715.00	709.00	697.00	
55	45	80	700.00	709.00	708.00	700.00	687.00	
56	45	100	691.00	698.00	694.00	682.00	673.00	
57	45	120	677.00	681.00	676.00	670.00	672.00	
58	45	140	666.00	670.00	666.00	668.00	676.00	
59	35	0	695.00	713.00	715.00	708.00	702.00	
60	35	20	700.00	713.00	717.00	712.00	701.00	
61	35	40	703.00	714.00	717.00	711.00	699.00	
62	35	60	704.00	713.00	713.00	704.00	691.00	
63	35	80	697.00	706.00	701.00	689.00	676.00	
64	35	100	685.00	692.00	683.00	669.00	663.00	
65	35	120	667.00	666.00	662.00	656.00	660.00	
66	25	0	702.00	712.00	717.00	710.00	704.00	
67	25	20	705.00	715.00	719.00	715.00	706.00	
68	25	40	708.00	717.00	717.00	709.00	697.00	
69	25	60	702.00	711.00	709.00	697.00	684.00	
70	25	80	692.00	696.00	690.00	675.00	666.00	
71	25	100	667.00	666.00	663.00	651.00	650.00	
72	15	0	723.00	725.00	731.00	723.00	714.00	
73	15	20	716.00	724.00	729.00	722.00	711.00	
74	15	40	706.00	715.00	714.00	707.00	693.00	
75	15	60	695.00	703.00	698.00	685.00	672.00	
76	15	80	646.00	660.00	669.00	657.00	648.00	

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file requested                         107.c
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comb. press. - pr (mm water gage)      25.00
cross flow temp. - tr (degree celsius)    373.00
comb. air flow rate - mcr (mm water diff.)      30.00
cool air flow rate - mkr (mm water diff.)    150.00
natural gas flow rate - mgr (mm water diff.)      15.00
natural gas total press. - psgr (psi gage)       0.00
air total press. - psar (mm water gage)       0.00
jet temp. - tjr (degree celsius)      28.00
single jet flow rate - msjr (s.c.f.m.)       1.31
wall temp. - t5 (degree celsius)     205.00
wall temp. - t6 (degree celsius)     234.00
wall temp. - t7 (degree celsius)     240.00
wall temp. - t8 (degree celsius)     303.00
wall temp. - t9 (degree celsius)     221.00
wall temp. - t10 (degree celsius)     219.00


mc = 0.0164317 kg/sec
mk = 0.1151260 kg/sec
mg = 0.001162 kg/sec
m  = 0.132720 kg/sec
p  = 98345.3 pascal
t  = 646 degree kelvin
tj = 301 degree kelvin
t5 = 478 degree kelvin
t6 = 507 degree kelvin
t7 = 513 degree kelvin
t8 = 576 degree kelvin
t9 = 494 degree kelvin
t10= 492 degree kelvin
ro = 0.5304 kg/cubic meter
roj= 1.1384 kg/cubic meter
v  = 9.26 meter/sec
msj= 0.0006851 kg/sec
vj = 15.15 meter/sec
dr = 2.15 density ratio
j  = 5.7 momentum ratio
fr =   12318 froude number
sr =  6.13 spacing ratio
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pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	604.00	608.00	602.00	611.00	613.00
2	95	20	616.00	618.00	615.00	621.00	624.00
3	95	40	619.00	621.00	617.00	624.00	624.00
4	95	60	624.00	626.00	615.00	623.00	623.00
5	95	80	613.00	616.00	615.00	627.00	625.00
6	95	100	593.00	610.00	615.00	627.00	627.00
7	95	120	590.00	605.00	613.00	625.00	625.00
8	95	140	583.00	602.00	611.00	621.00	621.00
9	95	160	581.00	599.00	609.00	620.00	621.00
10	95	180	608.00	614.00	616.00	622.00	624.00
11	85	0	622.00	624.00	618.00	627.00	626.00
12	85	20	631.00	631.00	624.00	632.00	630.00
13	85	40	611.00	617.00	615.00	628.00	628.00

14	85	60	625.00	625.00	620.00	631.00	629.00	
15	85	80	597.00	609.00	610.00	623.00	623.00	
16	85	100	615.00	622.00	620.00	625.00	622.00	
17	85	120	588.00	607.00	614.00	620.00	619.00	
18	85	140	583.00	605.00	613.00	619.00	619.00	
19	85	160	579.00	598.00	606.00	614.00	613.00	rdg.
20	85	180	576.00	595.00	604.00	616.00	616.00	107.c
21	75	0	632.00	632.00	627.00	635.00	633.00	
22	75	20	615.00	618.00	615.00	634.00	635.00	
23	75	40	608.00	612.00	611.00	629.00	627.00	
24	75	60	600.00	610.00	611.00	624.00	622.00	
25	75	80	608.00	617.00	615.00	622.00	617.00	
26	75	100	612.00	622.00	621.00	622.00	616.00	
27	75	120	605.00	614.00	612.00	614.00	612.00	
28	75	140	584.00	601.00	607.00	610.00	608.00	
29	75	160	582.00	597.00	601.00	606.00	606.00	
30	75	180	574.00	589.00	599.00	605.00	605.00	
31	65	0	621.00	625.00	618.00	638.00	636.00	
32	65	20	612.00	608.00	600.00	626.00	627.00	
33	65	40	605.00	608.00	606.00	623.00	618.00	
34	65	60	597.00	608.00	610.00	618.00	613.00	
35	65	80	591.00	608.00	611.00	614.00	609.00	
36	65	100	586.00	604.00	610.00	609.00	606.00	
37	65	120	604.00	614.00	614.00	611.00	608.00	
38	65	140	590.00	601.00	606.00	605.00	604.00	
39	65	160	598.00	603.00	605.00	605.00	603.00	
40	65	180	596.00	600.00	601.00	602.00	600.00	
41	55	0	640.00	624.00	601.00	638.00	640.00	
42	55	20	631.00	613.00	600.00	628.00	626.00	
43	55	40	607.00	609.00	610.00	623.00	616.00	
44	55	60	604.00	614.00	615.00	618.00	611.00	
45	55	80	609.00	619.00	620.00	616.00	609.00	
46	55	100	589.00	605.00	610.00	608.00	607.00	
47	55	120	586.00	598.00	605.00	605.00	603.00	
48	55	140	581.00	593.00	600.00	601.00	601.00	
49	55	160	581.00	591.00	596.00	595.00	595.00	
50	55	180	572.00	585.00	591.00	592.00	593.00	
51	45	0	629.00	604.00	586.00	638.00	639.00	
52	45	20	614.00	604.00	602.00	628.00	622.00	
53	45	40	602.00	609.00	612.00	620.00	614.00	
54	45	60	598.00	612.00	618.00	614.00	608.00	
55	45	80	598.00	612.00	614.00	610.00	606.00	
56	45	100	591.00	604.00	607.00	604.00	603.00	
57	45	120	586.00	597.00	600.00	598.00	597.00	
58	45	140	583.00	591.00	594.00	594.00	593.00	
59	35	0	634.00	601.00	589.00	638.00	639.00	
60	35	20	619.00	612.00	613.00	631.00	621.00	
61	35	40	608.00	612.00	617.00	622.00	616.00	
62	35	60	604.00	616.00	621.00	616.00	609.00	
63	35	80	597.00	610.00	613.00	609.00	605.00	
64	35	100	595.00	602.00	602.00	600.00	600.00	
65	35	120	588.00	591.00	592.00	591.00	590.00	
66	25	0	633.00	602.00	596.00	640.00	643.00	
67	25	20	625.00	617.00	621.00	637.00	628.00	
68	25	40	619.00	622.00	628.00	629.00	622.00	
69	25	60	608.00	615.00	620.00	614.00	610.00	
70	25	80	599.00	608.00	608.00	605.00	604.00	
71	25	100	593.00	596.00	595.00	593.00	318.00	
72	15	0	640.00	617.00	618.00	650.00	645.00	
73	15	20	631.00	623.00	627.00	644.00	638.00	
74	15	40	619.00	618.00	626.00	630.00	622.00	
75	15	60	609.00	614.00	621.00	614.00	608.00	
76	15	80	593.00	599.00	604.00	598.00	597.00	

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                                   **********
file requested                        108.c
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comb. press. - pr (mm water gage)      20.00
cross flow temp. - tr (degree celsius)    370.00
comb. air flow rate - mcr (mm water diff.)      20.00
cool air flow rate - mkr (mm water diff.)     116.00
natural gas flow rate - mgr (mm water diff.)      10.00
natural gas total press. - pggr (psi gage)       0.00
air total press. - psar (mm water gage)       0.00
jet temp. - tjr (degree celsius)      26.00
single jet flow rate - msjr (s.c.f.m.)       1.49
wall temp. - t5 (degree celsius)     192.00
wall temp. - t6 (degree celsius)     232.00
wall temp. - t7 (degree celsius)     234.00
wall temp. - t8 (degree celsius)     288.00
wall temp. - t9 (degree celsius)     217.00
wall temp. - t10 (degree celsius)     219.00


mc = 0.0134164 kg/sec
mk = 0.1012411 kg/sec
mg = 0.000949 kg/sec
m  = 0.115606 kg/sec
p  = 98296.2 pascal
t  = 643 degree kelvin
tj = 299 degree kelvin
t5 = 465 degree kelvin
t6 = 505 degree kelvin
t7 = 507 degree kelvin
t8 = 561 degree kelvin
t9 = 490 degree kelvin
t10= 492 degree kelvin
ro = 0.5327 kg/cubic meter
roj= 1.1455 kg/cubic meter
v  = 8.03 meter/sec
msj= 0.0007767 kg/sec
vj = 17.07 meter/sec
dr = 2.15 density ratio
j  = 9.7 momentum ratio
fr =   15608 froude number
sr =  6.13 spacing ratio
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pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	587.00	597.00	595.00	608.00	609.00
2	95	20	583.00	595.00	596.00	610.00	611.00
3	95	40	608.00	608.00	601.00	612.00	612.00
4	95	60	608.00	609.00	599.00	611.00	611.00
5	95	80	605.00	608.00	599.00	610.00	611.00
6	95	100	598.00	607.00	601.00	610.00	608.00
7	95	120	598.00	608.00	605.00	613.00	612.00
8	95	140	596.00	605.00	604.00	610.00	609.00
9	95	160	593.00	604.00	603.00	609.00	608.00
10	95	180	594.00	603.00	603.00	608.00	607.00
11	85	0	615.00	617.00	609.00	619.00	618.00
12	85	20	617.00	615.00	603.00	618.00	616.00
13	85	40	614.00	610.00	599.00	615.00	614.00

14	85	60	607.00	606.00	597.00	610.00	611.00	
15	85	80	600.00	603.00	598.00	606.00	604.00	
16	85	100	598.00	607.00	604.00	608.00	605.00	
17	85	120	596.00	606.00	606.00	608.00	605.00	
18	85	140	581.00	595.00	600.00	604.00	600.00	
19	85	160	568.00	582.00	592.00	601.00	602.00	rdg. 108.c
20	85	180	564.00	581.00	590.00	598.00	599.00	
21	75	0	602.00	607.00	599.00	621.00	621.00	
22	75	20	596.00	598.00	592.00	618.00	619.00	
23	75	40	605.00	602.00	594.00	612.00	612.00	
24	75	60	604.00	606.00	600.00	610.00	606.00	
25	75	80	601.00	609.00	606.00	609.00	604.00	
26	75	100	600.00	610.00	609.00	609.00	604.00	
27	75	120	599.00	607.00	609.00	608.00	603.00	
28	75	140	598.00	605.00	606.00	605.00	600.00	
29	75	160	597.00	602.00	602.00	602.00	599.00	
30	75	180	594.00	599.00	598.00	600.00	597.00	
31	65	0	629.00	616.00	594.00	628.00	629.00	
32	65	20	622.00	606.00	590.00	619.00	618.00	
33	65	40	608.00	604.00	598.00	611.00	608.00	
34	65	60	605.00	608.00	607.00	609.00	604.00	
35	65	80	603.00	610.00	611.00	608.00	602.00	
36	65	100	601.00	610.00	611.00	607.00	603.00	
37	65	120	600.00	606.00	607.00	604.00	601.00	
38	65	140	600.00	604.00	604.00	602.00	598.00	
39	65	160	598.00	600.00	600.00	599.00	596.00	
40	65	180	597.00	598.00	597.00	597.00	593.00	
41	55	0	626.00	603.00	579.00	624.00	628.00	
42	55	20	617.00	603.00	595.00	616.00	615.00	
43	55	40	602.00	606.00	608.00	613.00	608.00	
44	55	60	606.00	613.00	614.00	612.00	605.00	
45	55	80	604.00	612.00	614.00	607.00	603.00	
46	55	100	605.00	611.00	610.00	604.00	601.00	
47	55	120	603.00	608.00	606.00	601.00	596.00	
48	55	140	600.00	601.00	600.00	596.00	593.00	
49	55	160	595.00	593.00	594.00	591.00	589.00	
50	55	180	590.00	589.00	588.00	588.00	588.00	
51	45	0	630.00	595.00	579.00	622.00	626.00	
52	45	20	618.00	604.00	602.00	618.00	614.00	
53	45	40	610.00	611.00	612.00	614.00	610.00	
54	45	60	609.00	616.00	617.00	612.00	608.00	
55	45	80	610.00	616.00	615.00	608.00	605.00	
56	45	100	606.00	611.00	608.00	603.00	600.00	
57	45	120	604.00	604.00	601.00	598.00	594.00	
58	45	140	597.00	594.00	592.00	589.00	587.00	
59	35	0	636.00	601.00	594.00	627.00	625.00	
60	35	20	626.00	610.00	610.00	624.00	620.00	
61	35	40	620.00	620.00	621.00	621.00	615.00	
62	35	60	612.00	618.00	619.00	613.00	608.00	
63	35	80	609.00	615.00	614.00	607.00	604.00	
64	35	100	607.00	607.00	602.00	598.00	595.00	
65	35	120	600.00	594.00	590.00	588.00	586.00	
66	25	0	640.00	608.00	604.00	633.00	636.00	
67	25	20	635.00	622.00	621.00	631.00	628.00	
68	25	40	625.00	622.00	623.00	623.00	618.00	
69	25	60	622.00	622.00	620.00	614.00	609.00	
70	25	80	614.00	615.00	610.00	603.00	601.00	
71	25	100	605.00	602.00	598.00	592.00	590.00	
72	15	0	644.00	628.00	624.00	645.00	643.00	
73	15	20	638.00	628.00	627.00	638.00	634.00	
74	15	40	628.00	623.00	625.00	628.00	620.00	
75	15	60	617.00	616.00	618.00	610.00	604.00	
76	15	80	598.00	599.00	601.00	595.00	590.00	

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file requested 109.c
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comb. press. - pr (mm water gage) 18.00
cross flow temp. - tr (degree celsius) 365.00
comb. air flow rate - mcr (mm water diff.) 15.00
cool air flow rate - mkr (mm water diff.) 97.00
natural gas flow rate - mgr (mm water diff.) 8.00
natural gas total press. - pggr (psi gage) 0.00
air total press. - pgar (mm water gage) 0.00
jet temp. - tjr (degree celsius) 25.00
single jet flow rate - msjr (s.c.f.m.) 1.48
wall temp. - t5 (degree celsius) 183.00
wall temp. - t6 (degree celsius) 220.00
wall temp. - t7 (degree celsius) 222.00
wall temp. - t8 (degree celsius) 271.00
wall temp. - t9 (degree celsius) 205.00
wall temp. - t10 (degree celsius) 201.00

mc = 0.0116189 kg/sec
mk = 0.0925793 kg/sec
mg = 0.000849 kg/sec
m = 0.105047 kg/sec
p = 98276.6 pascal
t = 638 degree kelvin
tj = 298 degree kelvin
t5 = 456 degree kelvin
t6 = 493 degree kelvin
t7 = 495 degree kelvin
t8 = 544 degree kelvin
t9 = 478 degree kelvin
t10= 474 degree kelvin
ro = 0.5367 kg/cubic meter
roj= 1.1491 kg/cubic meter
v = 7.24 meter/sec
msj= 0.0007740 kg/sec
vj = 16.95 meter/sec
dr = 2.14 density ratio
j = 11.7 momentum ratio
fr = 15465 froude number
sr = 6.13 spacing ratio

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	596.00	595.00	587.00	594.00	593.00
2	95	20	600.00	600.00	589.00	598.00	597.00
3	95	40	598.00	598.00	587.00	596.00	595.00
4	95	60	596.00	596.00	584.00	595.00	591.00
5	95	80	591.00	594.00	585.00	593.00	593.00
6	95	100	584.00	590.00	584.00	590.00	588.00
7	95	120	587.00	592.00	587.00	592.00	589.00
8	95	140	582.00	589.00	587.00	591.00	589.00
9	95	160	585.00	590.00	584.00	588.00	586.00
10	95	180	581.00	587.00	584.00	588.00	586.00
11	85	0	605.00	603.00	590.00	600.00	599.00
12	85	20	601.00	597.00	584.00	601.00	597.00
13	85	40	593.00	590.00	577.00	592.00	591.00

14	85	60	592.00	591.00	580.00	593.00	590.00	
15	85	80	587.00	590.00	582.00	589.00	585.00	
16	85	100	584.00	589.00	586.00	591.00	586.00	
17	85	120	582.00	588.00	585.00	587.00	583.00	
18	85	140	583.00	589.00	588.00	589.00	585.00	
19	85	160	583.00	589.00	586.00	588.00	583.00	rdg.
20	85	180	581.00	586.00	582.00	584.00	582.00	109.c
21	75	0	608.00	600.00	581.00	606.00	605.00	
22	75	20	600.00	588.00	575.00	596.00	595.00	
23	75	40	593.00	585.00	575.00	589.00	585.00	
24	75	60	587.00	588.00	581.00	589.00	586.00	
25	75	80	585.00	588.00	585.00	587.00	583.00	
26	75	100	584.00	589.00	588.00	586.00	581.00	
27	75	120	585.00	590.00	589.00	586.00	581.00	
28	75	140	584.00	588.00	587.00	586.00	581.00	
29	75	160	582.00	584.00	581.00	582.00	578.00	
30	75	180	579.00	582.00	579.00	579.00	576.00	
31	65	0	613.00	594.00	570.00	606.00	608.00	
32	65	20	604.00	590.00	576.00	598.00	597.00	
33	65	40	595.00	590.00	584.00	592.00	588.00	
34	65	60	590.00	592.00	589.00	590.00	586.00	
35	65	80	591.00	595.00	594.00	592.00	585.00	
36	65	100	588.00	592.00	591.00	586.00	582.00	
37	65	120	587.00	590.00	589.00	584.00	580.00	
38	65	140	588.00	589.00	586.00	582.00	577.00	
39	65	160	583.00	583.00	581.00	579.00	576.00	
40	65	180	578.00	580.00	576.00	577.00	574.00	
41	55	0	610.00	583.00	559.00	598.00	602.00	
42	55	20	599.00	586.00	578.00	595.00	593.00	
43	55	40	593.00	591.00	587.00	592.00	587.00	
44	55	60	590.00	593.00	591.00	589.00	584.00	
45	55	80	590.00	595.00	595.00	589.00	586.00	
46	55	100	588.00	591.00	589.00	584.00	581.00	
47	55	120	588.00	588.00	586.00	581.00	577.00	
48	55	140	584.00	583.00	580.00	577.00	573.00	
49	55	160	580.00	577.00	576.00	572.00	570.00	
50	55	180	575.00	572.00	569.00	570.00	568.00	
51	45	0	609.00	577.00	564.00	598.00	600.00	
52	45	20	600.00	586.00	582.00	594.00	593.00	
53	45	40	595.00	596.00	595.00	594.00	588.00	
54	45	60	593.00	597.00	597.00	591.00	587.00	
55	45	80	591.00	595.00	593.00	586.00	583.00	
56	45	100	587.00	590.00	585.00	581.00	577.00	
57	45	120	586.00	584.00	579.00	576.00	573.00	
58	45	140	579.00	573.00	571.00	568.00	567.00	
59	35	0	615.00	582.00	573.00	600.00	604.00	
60	35	20	607.00	598.00	594.00	600.00	597.00	
61	35	40	600.00	600.00	599.00	598.00	593.00	
62	35	60	595.00	599.00	596.00	590.00	586.00	
63	35	80	592.00	595.00	591.00	584.00	582.00	
64	35	100	586.00	586.00	581.00	577.00	574.00	
65	35	120	583.00	576.00	572.00	568.00	567.00	
66	25	0	623.00	596.00	589.00	610.00	610.00	
67	25	20	614.00	604.00	601.00	607.00	604.00	
68	25	40	607.00	606.00	604.00	602.00	597.00	
69	25	60	599.00	600.00	598.00	591.00	588.00	
70	25	80	596.00	596.00	590.00	583.00	580.00	
71	25	100	587.00	580.00	575.00	569.00	568.00	
72	15	0	628.00	611.00	605.00	622.00	617.00	
73	15	20	620.00	611.00	607.00	615.00	611.00	
74	15	40	610.00	604.00	604.00	604.00	598.00	
75	15	60	603.00	599.00	599.00	592.00	586.00	
76	15	80	580.00	580.00	581.00	574.00	571.00	

file requested **********
110.c
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comb. press. - pr (mm water gage) 18.00
cross flow temp. - tr (degree celsius) 547.00
comb. air flow rate - mcr (mm water diff.) 30.00
cool air flow rate - mkr (mm water diff.) 74.00
natural gas flow rate - mgr (mm water diff.) 15.00
natural gas total press. - pggr (psi gage) 0.00
air total press. - pgar (mm water gage) 0.00
jet temp. - tjr (degree celsius) 25.00
single jet flow rate - msjr (s.c.f.m.) 1.10
wall temp. - t5 (degree celsius) 268.00
wall temp. - t6 (degree celsius) 299.00
wall temp. - t7 (degree celsius) 308.00
wall temp. - t8 (degree celsius) 369.00
wall temp. - t9 (degree celsius) 266.00
wall temp. - t10 (degree celsius) 271.00

mc = 0.0164317 kg/sec
mk = 0.0808619 kg/sec
mg = 0.001162 kg/sec
m = 0.098455 kg/sec
p = 98276.6 pascal
t = 820 degree kelvin
tj = 298 degree kelvin
t5 = 541 degree kelvin
t6 = 572 degree kelvin
t7 = 581 degree kelvin
t8 = 642 degree kelvin
t9 = 539 degree kelvin
t10= 544 degree kelvin
ro = 0.4176 kg/cubic meter
roj= 1.1491 kg/cubic meter
v = 8.72 meter/sec
msj= 0.0005753 kg/sec
vj = 12.60 meter/sec
dr = 2.75 density ratio
j = 5.7 momentum ratio
fr = 7152 froude number
sr = 6.13 spacing ratio

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	782.00	775.00	749.00	756.00	749.00
2	95	20	792.00	788.00	770.00	777.00	772.00
3	95	40	798.00	793.00	773.00	782.00	782.00
4	95	60	798.00	796.00	774.00	786.00	779.00
5	95	80	798.00	796.00	776.00	792.00	782.00
6	95	100	779.00	788.00	769.00	782.00	777.00
7	95	120	779.00	793.00	771.00	783.00	776.00
8	95	140	769.00	786.00	768.00	780.00	780.00
9	95	160	758.00	776.00	761.00	774.00	776.00
10	95	180	758.00	775.00	759.00	776.00	777.00
11	85	0	792.00	790.00	776.00	782.00	769.00
12	85	20	801.00	797.00	778.00	793.00	787.00
13	85	40	801.00	794.00	774.00	792.00	783.00

14	85	60	791.00	787.00	767.00	787.00	782.00	
15	85	80	777.00	776.00	755.00	777.00	768.00	
16	85	100	765.00	780.00	762.00	775.00	766.00	
17	85	120	759.00	776.00	761.00	776.00	763.00	
18	85	140	748.00	769.00	753.00	762.00	752.00	rdg.
19	85	160	741.00	760.00	748.00	757.00	747.00	110.c
20	85	180	737.00	754.00	745.00	756.00	752.00	
21	75	0	812.00	810.00	790.00	801.00	793.00	
22	75	20	806.00	793.00	767.00	797.00	789.00	
23	75	40	792.00	777.00	755.00	784.00	771.00	
24	75	60	772.00	768.00	750.00	768.00	755.00	
25	75	80	761.00	768.00	755.00	768.00	747.00	
26	75	100	754.00	771.00	761.00	765.00	[illegible]	
27	75	120	744.00	762.00	756.00	758.00	[illegible]	
28	75	140	736.00	753.00	747.00	749.00	731.00	
29	75	160	734.00	747.00	733.00	737.00	729.00	
30	75	180	725.00	738.00	725.00	735.00	727.00	
31	65	0	810.00	798.00	771.00	803.00	798.00	
32	65	20	800.00	771.00	744.00	785.00	774.00	
33	65	40	780.00	766.00	749.00	779.00	762.00	
34	65	60	762.00	762.00	753.00	768.00	748.00	
35	65	80	756.00	765.00	760.00	761.00	[illegible]	
36	65	100	745.00	762.00	757.00	748.00	[illegible]	
37	65	120	738.00	753.00	749.00	740.00	[illegible]	
38	65	140	734.00	744.00	734.00	727.00	718.00	
39	65	160	726.00	732.00	722.00	720.00	715.00	
40	65	180	718.00	721.00	713.00	716.00	714.00	
41	55	0	810.00	775.00	733.00	801.00	796.00	
42	55	20	789.00	756.00	736.00	782.00	765.00	
43	55	40	771.00	760.00	750.00	771.00	744.00	
44	55	60	760.00	765.00	760.00	762.00	735.00	
45	55	80	749.00	764.00	761.00	749.00	722.00	
46	55	100	741.00	754.00	752.00	733.00	718.00	
47	55	120	732.00	742.00	731.00	719.00	[illegible]	
48	55	140	728.00	727.00	715.00	708.00	[illegible]	
49	55	160	718.00	713.00	703.00	700.00	700.00	
50	55	180	710.00	703.00	692.00	693.00	691.00	
51	45	0	809.00	752.00	713.00	795.00	784.00	
52	45	20	788.00	752.00	742.00	782.00	757.00	
53	45	40	769.00	759.00	757.00	766.00	739.00	
54	45	60	757.00	761.00	762.00	751.00	726.00	
55	45	80	751.00	758.00	754.00	731.00	719.00	
56	45	100	741.00	748.00	736.00	717.00	710.00	
57	45	120	727.00	727.00	712.00	701.00	699.00	
58	45	140	716.00	708.00	693.00	688.00	689.00	
59	35	0	804.00	737.00	715.00	793.00	782.00	
60	35	20	786.00	751.00	745.00	780.00	757.00	
61	35	40	770.00	759.00	757.00	763.00	739.00	
62	35	60	758.00	757.00	756.00	744.00	723.00	
63	35	80	747.00	750.00	744.00	720.00	707.00	
64	35	100	733.00	735.00	719.00	701.00	697.00	
65	35	120	719.00	706.00	688.00	679.00	682.00	
66	25	0	806.00	747.00	732.00	794.00	782.00	
67	25	20	792.00	764.00	760.00	784.00	764.00	
68	25	40	776.00	761.00	761.00	765.00	741.00	
69	25	60	757.00	750.00	754.00	739.00	718.00	
70	25	80	741.00	738.00	731.00	706.00	698.00	
71	25	100	720.00	704.00	691.00	668.00	664.00	
72	15	0	803.00	767.00	750.00	799.00	792.00	
73	15	20	791.00	771.00	768.00	793.00	779.00	
74	15	40	763.00	750.00	755.00	763.00	739.00	
75	15	60	748.00	738.00	750.00	736.00	708.00	
76	15	80	707.00	701.00	715.00	688.00	674.00	

file requested **********
111.c
****

comb. press. - pr (mm water gage) 18.00
cross flow temp. - tr (degree celsius) 545.00
comb. air flow rate - mcr (mm water diff.) 30.00
cool air flow rate - mkr (mm water diff.) 72.00
natural gas flow rate - mgr (mm water diff.) 15.00
natural gas total press. - pggr (psi gage) 0.00
air total press. - pgar (mm water gage) 0.00
jet temp. - tjr (degree celsius) 27.00
single jet flow rate - mgjr (s.c.f.m.) 1.41
wall temp. - t5 (degree celsius) 262.00
wall temp. - t6 (degree celsius) 297.00
wall temp. - t7 (degree celsius) 301.00
wall temp. - t8 (degree celsius) 364.00
wall temp. - t9 (degree celsius) 273.00
wall temp. - t10 (degree celsius) 281.00

mc = 0.0164317 kg/sec
mk = 0.0797616 kg/sec
mg = 0.001162 kg/sec
m = 0.097355 kg/sec
p = 98276.6 pascal
t = 818 degree kelvin
tj = 300 degree kelvin
t5 = 535 degree kelvin
t6 = 570 degree kelvin
t7 = 574 degree kelvin
t8 = 637 degree kelvin
t9 = 546 degree kelvin
t10= 554 degree kelvin
ro = 0.4186 kg/cubic meter
roj= 1.1414 kg/cubic meter
v = 8.60 meter/sec
mgj= 0.0007374 kg/sec
vj = 16.26 meter/sec
dr = 2.73 density ratio
j = 9.7 momentum ratio
fr = 11972 froude number
sr = 6.13 spacing ratio

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	776.00	769.00	742.00	752.00	750.00
2	95	20	785.00	778.00	756.00	771.00	768.00
3	95	40	789.00	782.00	759.00	772.00	765.00
4	95	60	781.00	779.00	754.00	773.00	761.00
5	95	80	771.00	775.00	756.00	775.00	764.00
6	95	100	761.00	775.00	755.00	771.00	764.00
7	95	120	752.00	770.00	752.00	765.00	758.00
8	95	140	745.00	770.00	759.00	771.00	760.00
9	95	160	745.00	764.00	750.00	761.00	756.00
10	95	180	740.00	757.00	749.00	764.00	757.00
11	85	0	793.00	787.00	762.00	777.00	768.00
12	85	20	786.00	778.00	752.00	781.00	776.00
13	85	40	780.00	771.00	748.00	775.00	766.00

14	85	60	774.00	770.00	747.00	772.00	761.00	
15	85	80	762.00	765.00	748.00	765.00	753.00	
16	85	100	748.00	767.00	756.00	767.00	750.00	
17	85	120	741.00	765.00	756.00	763.00	743.00	rdg.
18	85	140	737.00	760.00	751.00	760.00	739.00	lll.c
19	85	160	732.00	754.00	744.00	757.00	742.00	
20	85	180	730.00	749.00	740.00	748.00	740.00	
21	75	0	796.00	782.00	752.00	791.00	792.00	
22	75	20	786.00	763.00	734.00	778.00	771.00	
23	75	40	767.00	754.00	734.00	763.00	752.00	
24	75	60	755.00	757.00	744.00	759.00	747.00	
25	75	80	751.00	763.00	755.00	759.00	737.00	
26	75	100	742.00	759.00	753.00	754.00	734.00	
27	75	120	737.00	755.00	754.00	752.00	733.00	
28	75	140	734.00	749.00	743.00	744.00	728.00	
29	75	160	729.00	742.00	736.00	737.00	724.00	
30	75	180	725.00	737.00	728.00	733.00	720.00	
31	65	0	797.00	764.00	727.00	786.00	779.00	
32	65	20	777.00	749.00	726.00	769.00	762.00	
33	65	40	760.00	751.00	742.00	763.00	743.00	
34	65	60	753.00	758.00	755.00	759.00	738.00	
35	65	80	742.00	757.00	756.00	748.00	728.00	
36	65	100	737.00	756.00	754.00	747.00	730.00	
37	65	120	734.00	749.00	747.00	735.00	721.00	
38	65	140	732.00	742.00	734.00	729.00	718.00	
39	65	160	728.00	733.00	725.00	720.00	710.00	
40	65	180	719.00	726.00	717.00	716.00	708.00	
41	55	0	793.00	747.00	704.00	776.00	775.00	
42	55	20	773.00	739.00	729.00	763.00	751.00	
43	55	40	756.00	480.00	752.00	762.00	742.00	
44	55	60	748.00	757.00	759.00	751.00	730.00	
45	55	80	740.00	755.00	756.00	744.00	727.00	
46	55	100	738.00	752.00	750.00	734.00	721.00	
47	55	120	734.00	745.00	738.00	722.00	716.00	
48	55	140	717.00	726.00	720.00	708.00	701.00	
49	55	160	717.00	717.00	707.00	702.00	699.00	
50	55	180	710.00	704.00	693.00	690.00	689.00	
51	45	0	796.00	730.00	712.00	776.00	770.00	
52	45	20	774.00	751.00	751.00	774.00	755.00	
53	45	40	755.00	755.00	760.00	759.00	738.00	
54	45	60	748.00	760.00	765.00	752.00	735.00	
55	45	80	748.00	759.00	757.00	738.00	725.00	
56	45	100	741.00	749.00	741.00	722.00	713.00	
57	45	120	732.00	733.00	720.00	707.00	701.00	
58	45	140	718.00	715.00	699.00	690.00	690.00	
59	35	0	796.00	736.00	734.00	787.00	778.00	
60	35	20	779.00	758.00	763.00	782.00	760.00	
61	35	40	765.00	763.00	766.00	764.00	748.00	
62	35	60	760.00	762.00	766.00	752.00	737.00	
63	35	80	751.00	755.00	755.00	734.00	719.00	
64	35	100	738.00	740.00	726.00	707.00	699.00	
65	35	120	724.00	715.00	697.00	684.00	685.00	
66	25	0	808.00	758.00	755.00	804.00	787.00	
67	25	20	800.00	776.00	776.00	795.00	780.00	
68	25	40	777.00	768.00	772.00	774.00	754.00	
69	25	60	765.00	760.00	766.00	753.00	734.00	
70	25	80	747.00	746.00	745.00	723.00	709.00	
71	25	100	729.00	719.00	709.00	685.00	677.00	
72	15	0	809.00	785.00	780.00	815.00	802.00	
73	15	20	794.00	778.00	776.00	798.00	785.00	
74	15	40	772.00	759.00	766.00	774.00	754.00	
75	15	60	755.00	748.00	756.00	746.00	721.00	
76	15	80	723.00	715.00	728.00	703.00	684.00	

file requested **********
112.c
****

comb. press. - pr (mm water gage) 20.00
cross flow temp. - tr (degree celsius) 545.00
comb. air flow rate - mcr (mm water diff.) 30.00
cool air flow rate - mkr (mm water diff.) 72.00
natural gas flow rate - mgr (mm water diff.) 15.00
natural gas total press. - pggr (psi gage) 0.00
air total press. - pgar (mm water gage) 0.00
jet temp. - tjr (degree celsius) 27.00
single jet flow rate - mgjr (s.c.f.m.) 1.54
wall temp. - t5 (degree celsius) 266.00
wall temp. - t6 (degree celsius) 305.00
wall temp. - t7 (degree celsius) 312.00
wall temp. - t8 (degree celsius) 370.00
wall temp. - t9 (degree celsius) 279.00
wall temp. - t10 (degree celsius) 284.00

mc = 0.0164317 kg/sec
mk = 0.0797616 kg/sec
mg = 0.001162 kg/sec
m = 0.097355 kg/sec
p = 98296.2 pascal
t = 818 degree kelvin
tj = 300 degree kelvin
t5 = 539 degree kelvin
t6 = 578 degree kelvin
t7 = 585 degree kelvin
t8 = 643 degree kelvin
t9 = 552 degree kelvin
t10= 557 degree kelvin
ro = 0.4187 kg/cubic meter
roj= 1.1417 kg/cubic meter
v = 8.60 meter/sec
mgj= 0.0008080 kg/sec
vj = 17.81 meter/sec
dr = 2.73 density ratio
j = 11.7 momentum ratio
fr = 14368 froude number
sr = 6.13 spacing ratio

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	740.00	750.00	751.00	754.00	749.00
2	95	20	782.00	779.00	753.00	771.00	765.00
3	95	40	777.00	774.00	747.00	768.00	760.00
4	95	60	769.00	767.00	744.00	763.00	756.00
5	95	80	761.00	768.00	744.00	766.00	762.00
6	95	100	752.00	770.00	752.00	766.00	758.00
7	95	120	746.00	770.00	754.00	766.00	755.00
8	95	140	742.00	765.00	757.00	766.00	751.00
9	95	160	738.00	758.00	747.00	758.00	745.00
10	95	180	734.00	755.00	747.00	757.00	747.00
11	85	0	788.00	784.00	761.00	781.00	773.00
12	85	20	779.00	767.00	740.00	775.00	767.00
13	85	40	771.00	760.00	736.00	767.00	760.00

14	85	60	760.00	760.00	740.00	761.00	750.00	
15	85	80	756.00	762.00	745.00	757.00	744.00	
16	85	100	743.00	761.00	751.00	756.00	740.00	
17	85	120	736.00	756.00	746.00	753.00	735.00	rdg.
18	85	140	736.00	755.00	750.00	754.00	737.00	112.c
19	85	160	732.00	749.00	744.00	750.00	734.00	
20	85	180	729.00	745.00	738.00	744.00	730.00	
21	75	0	799.00	776.00	737.00	788.00	779.00	
22	75	20	778.00	758.00	730.00	772.00	763.00	
23	75	40	759.00	749.00	733.00	758.00	748.00	
24	75	60	751.00	751.00	741.00	755.00	740.00	
25	75	80	744.00	757.00	754.00	755.00	736.00	
26	75	100	736.00	754.00	754.00	750.00	729.00	
27	75	120	734.00	752.00	752.00	748.00	727.00	
28	75	140	733.00	747.00	744.00	741.00	726.00	
29	75	160	729.00	741.00	729.00	732.00	722.00	
30	75	180	723.00	736.00	726.00	731.00	719.00	
31	65	0	788.00	749.00	713.00	779.00	776.00	
32	65	20	775.00	741.00	724.00	763.00	753.00	
33	65	40	756.00	749.00	743.00	757.00	742.00	
34	65	60	746.00	755.00	753.00	751.00	733.00	
35	65	80	739.00	754.00	758.00	750.00	732.00	
36	65	100	738.00	753.00	756.00	744.00	727.00	
37	65	120	737.00	749.00	745.00	736.00	720.00	
38	65	140	730.00	740.00	734.00	729.00	715.00	
39	65	160	727.00	733.00	724.00	720.00	710.00	
40	65	180	719.00	723.00	716.00	716.00	707.00	
41	55	0	788.00	737.00	708.00	776.00	777.00	
42	55	20	764.00	738.00	730.00	759.00	748.00	
43	55	40	749.00	751.00	751.00	754.00	738.00	
44	55	60	746.00	758.00	760.00	752.00	734.00	
45	55	80	744.00	758.00	761.00	746.00	732.00	
46	55	100	736.00	747.00	747.00	735.00	724.00	
47	55	120	734.00	743.00	735.00	725.00	716.00	
48	55	140	728.00	731.00	720.00	710.00	704.00	
49	55	160	717.00	715.00	706.00	701.00	697.00	
50	55	180	712.00	708.00	698.00	696.00	694.00	
51	45	0	794.00	731.00	718.00	776.00	768.00	
52	45	20	771.00	748.00	750.00	769.00	752.00	
53	45	40	758.00	763.00	768.00	761.00	745.00	
54	45	60	751.00	762.00	765.00	752.00	736.00	
55	45	80	747.00	758.00	757.00	739.00	728.00	
56	45	100	738.00	747.00	740.00	722.00	714.00	
57	45	120	730.00	734.00	721.00	709.00	701.00	
58	45	140	720.00	716.00	699.00	690.00	688.00	
59	35	0	797.00	744.00	742.00	788.00	778.00	
60	35	20	781.00	763.00	765.00	775.00	760.00	
61	35	40	767.00	770.00	770.00	764.00	750.00	
62	35	60	760.00	765.00	766.00	751.00	735.00	
63	35	80	749.00	754.00	754.00	736.00	725.00	
64	35	100	740.00	742.00	732.00	714.00	706.00	
65	35	120	726.00	720.00	703.00	688.00	686.00	
66	25	0	805.00	762.00	762.00	702.00	788.00	
67	25	20	797.00	780.00	778.00	791.00	778.00	
68	25	40	778.00	772.00	774.00	771.00	755.00	
69	25	60	764.00	760.00	763.00	751.00	731.00	
70	25	80	747.00	746.00	744.00	722.00	710.00	
71	25	100	728.00	719.00	710.00	684.00	677.00	
72	15	0	808.00	786.00	782.00	814.00	800.00	
73	15	20	789.00	777.00	776.00	793.00	778.00	
74	15	40	775.00	764.00	771.00	776.00	757.00	
75	15	60	761.00	751.00	758.00	746.00	721.00	
76	15	80	718.00	710.00	725.00	699.00	684.00	

file requested **********
113.c
****

comb. press. - pr (mm water gage) 26.00
cross flow temp. - tr (degree celsius) 365.00
comb. air flow rate - mcr (mm water diff.) 30.00
cool air flow rate - mkr (mm water diff.) 155.00
natural gas flow rate - mgr (mm water diff.) 15.00
natural gas total press. - pggr (psi gage) 0.00
air total press. - pgar (mm water gage) 0.00
jet temp. - tjr (degree celsius) 26.00
single jet flow rate - mgjr (s.c.f.m.) 1.32
wall temp. - t5 (degree celsius) 200.00
wall temp. - t6 (degree celsius) 236.00
wall temp. - t7 (degree celsius) 240.00
wall temp. - t8 (degree celsius) 296.00
wall temp. - t9 (degree celsius) 217.00
wall temp. - t10 (degree celsius) 215.00

mc = 0.0164317 kg/sec
mk = 0.1170290 kg/sec
mg = 0.001162 kg/sec
m = 0.134623 kg/sec
p = 98355.1 pascal
t = 638 degree kelvin
tj = 299 degree kelvin
t5 = 473 degree kelvin
t6 = 509 degree kelvin
t7 = 513 degree kelvin
t8 = 569 degree kelvin
t9 = 490 degree kelvin
t10= 488 degree kelvin
ro = 0.5371 kg/cubic meter
roj= 1.1462 kg/cubic meter
v = 9.27 meter/sec
mgj= 0.0006904 kg/sec
vj = 15.16 meter/sec
dr = 2.13 density ratio
j = 5.7 momentum ratio
fr = 12402 froude number
sr = 9.21 spacing ratio

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	607.00	605.00	592.00	603.00	604.00
2	95	20	611.00	610.00	603.00	610.00	609.00
3	95	40	615.00	616.00	608.00	615.00	614.00
4	95	60	613.00	613.00	608.00	616.00	617.00
5	95	80	614.00	612.00	605.00	613.00	615.00
6	95	100	608.00	608.00	606.00	614.00	619.00
7	95	120	580.00	595.00	596.00	607.00	614.00
8	95	140	610.00	612.00	609.00	618.00	622.00
9	95	160	608.00	614.00	611.00	616.00	619.00
10	95	180	607.00	614.00	610.00	616.00	618.00
11	85	0	612.00	613.00	606.00	613.00	612.00
12	85	20	623.00	622.00	615.00	622.00	620.00
13	85	40	620.00	616.00	610.00	620.00	620.00

14	85	60	598.00	601.00	600.00	613.00	617.00	
15	85	80	608.00	606.00	602.00	612.00	618.00	
16	85	100	616.00	613.00	609.00	613.00	618.00	
17	85	120	613.00	614.00	610.00	614.00	615.00	
18	85	140	613.00	616.00	612.00	616.00	615.00	rdg.
19	85	160	609.00	613.00	609.00	614.00	612.00	113.c
20	85	180	608.00	613.00	609.00	612.00	612.00	
21	75	0	621.00	621.00	616.00	626.00	625.00	
22	75	20	624.00	616.00	607.00	620.00	624.00	
23	75	40	602.00	600.00	597.00	614.00	622.00	
24	75	60	618.00	611.00	604.00	611.00	621.00	
25	75	80	616.00	611.00	606.00	611.00	617.00	
26	75	100	616.00	614.00	611.00	614.00	617.00	
27	75	120	609.00	610.00	610.00	613.00	612.00	
28	75	140	610.00	612.00	611.00	613.00	608.00	
29	75	160	604.00	608.00	607.00	610.00	603.00	
30	75	180	575.00	592.00	599.00	603.00	598.00	
31	65	0	608.00	610.00	603.00	623.00	625.00	
32	65	20	624.00	610.00	599.00	621.00	630.00	
33	65	40	621.00	607.00	598.00	613.00	625.00	
34	65	60	619.00	611.00	606.00	612.00	622.00	
35	65	80	617.00	614.00	610.00	614.00	616.00	
36	65	100	614.00	611.00	612.00	616.00	614.00	
37	65	120	609.00	610.00	610.00	611.00	605.00	
38	65	140	605.00	608.00	610.00	608.00	599.00	
39	65	160	603.00	605.00	604.00	602.00	595.00	
40	65	180	599.00	602.00	601.00	599.00	593.00	
41	55	0	633.00	613.00	594.00	625.00	634.00	
42	55	20	629.00	605.00	592.00	616.00	633.00	
43	55	40	618.00	607.00	603.00	615.00	627.00	
44	55	60	622.00	614.00	614.00	618.00	626.00	
45	55	80	618.00	615.00	615.00	619.00	618.00	
46	55	100	596.00	604.00	611.00	614.00	605.00	
47	55	120	586.00	598.00	608.00	605.00	598.00	
48	55	140	600.00	603.00	605.00	601.00	594.00	
49	55	160	600.00	600.00	599.00	592.00	588.00	
50	55	180	597.00	594.00	591.00	589.00	586.00	
51	45	0	636.00	603.00	581.00	629.00	644.00	
52	45	20	629.00	603.00	594.00	617.00	633.00	
53	45	40	628.00	614.00	611.00	622.00	632.00	
54	45	60	621.00	615.00	615.00	621.00	622.00	
55	45	80	600.00	605.00	612.00	617.00	614.00	
56	45	100	592.00	600.00	610.00	609.00	600.00	
57	45	120	603.00	604.00	607.00	599.00	589.00	
58	45	140	600.00	596.00	596.00	592.00	587.00	
59	35	0	637.00	598.00	581.00	626.00	643.00	
60	35	20	632.00	609.00	606.00	625.00	636.00	
61	35	40	626.00	615.00	615.00	624.00	631.00	
62	35	60	622.00	616.00	617.00	623.00	625.00	
63	35	80	619.00	615.00	617.00	621.00	615.00	
64	35	100	608.00	607.00	610.00	609.00	602.00	
65	35	120	604.00	598.00	601.00	595.00	589.00	
66	25	0	640.00	602.00	593.00	633.00	644.00	
67	25	20	636.00	618.00	614.00	631.00	640.00	
68	25	40	628.00	619.00	618.00	627.00	631.00	
69	25	60	617.00	612.00	615.00	620.00	621.00	
70	25	80	612.00	609.00	613.00	614.00	607.00	
71	25	100	602.00	595.00	601.00	598.00	595.00	
72	15	0	641.00	617.00	608.00	637.00	643.00	
73	15	20	625.00	617.00	618.00	634.00	636.00	
74	15	40	621.00	614.00	616.00	625.00	628.00	
75	15	60	613.00	608.00	612.00	617.00	616.00	
76	15	80	594.00	594.00	603.00	605.00	604.00	

file requested **********
114.c
****

comb. press. - pr (mm water gage) 26.00
cross flow temp. - tr (degree celsius) 365.00
comb. air flow rate - mcr (mm water diff.) 30.00
cool air flow rate - mkr (mm water diff.) 155.00
natural gas flow rate - mgr (mm water diff.) 15.00
natural gas total press. - pggr (psi gage) 0.00
air total press. - pgar (mm water gage) 0.00
jet temp. - tjr (degree celsius) 26.00
single jet flow rate - mgjr (s.c.f.m.) 1.72
wall temp. - t5 (degree celsius) 200.00
wall temp. - t6 (degree celsius) 235.00
wall temp. - t7 (degree celsius) 241.00
wall temp. - t8 (degree celsius) 295.00
wall temp. - t9 (degree celsius) 217.00
wall temp. - t10 (degree celsius) 216.00

mc = 0.0164317 kg/sec
mk = 0.1170290 kg/sec
mg = 0.001162 kg/sec
m = 0.134623 kg/sec
p = 98355.1 pascal
t = 638 degree kelvin
tj = 299 degree kelvin
t5 = 473 degree kelvin
t6 = 508 degree kelvin
t7 = 514 degree kelvin
t8 = 568 degree kelvin
t9 = 490 degree kelvin
t10= 489 degree kelvin
ro = 0.5371 kg/cubic meter
roj= 1.1462 kg/cubic meter
v = 9.27 meter/sec
mgj= 0.0008996 kg/sec
vj = 19.75 meter/sec
dr = 2.13 density ratio
j = 9.7 momentum ratio
fr = 21057 froude number
sr = 9.21 spacing ratio

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	582.00	593.00	592.00	601.00	601.00
2	95	20	588.00	597.00	596.00	610.00	612.00
3	95	40	611.00	607.00	597.00	605.00	607.00
4	95	60	612.00	607.00	597.00	609.00	614.00
5	95	80	611.00	608.00	600.00	607.00	613.00
6	95	100	611.00	610.00	602.00	608.00	613.00
7	95	120	609.00	608.00	605.00	608.00	610.00
8	95	140	603.00	609.00	607.00	611.00	614.00
9	95	160	602.00	610.00	608.00	612.00	612.00
10	95	180	600.00	606.00	604.00	611.00	611.00
11	85	0	616.00	615.00	607.00	616.00	614.00
12	85	20	618.00	609.00	598.00	611.00	615.00
13	85	40	613.00	603.00	594.00	609.00	618.00

14	85	60	613.00	603.00	597.00	608.00	616.00	
15	85	80	610.00	604.00	601.00	607.00	616.00	
16	85	100	610.00	608.00	608.00	610.00	613.00	
17	85	120	582.00	598.00	603.00	607.00	609.00	
18	85	140	571.00	594.00	601.00	608.00	606.00	rdg.
19	85	160	570.00	591.00	600.00	609.00	606.00	114.c
20	85	180	563.00	587.00	598.00	607.00	606.00	
21	75	0	615.00	609.00	596.00	615.00	618.00	
22	75	20	618.00	601.00	590.00	611.00	624.00	
23	75	40	601.00	592.00	588.00	602.00	617.00	
24	75	60	593.00	593.00	594.00	603.00	615.00	
25	75	80	588.00	597.00	602.00	607.00	613.00	
26	75	100	585.00	598.00	605.00	610.00	610.00	
27	75	120	580.00	595.00	604.00	610.00	605.00	
28	75	140	576.00	595.00	606.00	609.00	601.00	
29	75	160	572.00	590.00	601.00	605.00	599.00	
30	75	180	567.00	585.00	596.00	602.00	598.00	
31	65	0	621.00	603.00	586.00	618.00	625.00	
32	65	20	619.00	596.00	587.00	609.00	625.00	
33	65	40	616.00	600.00	597.00	607.00	623.00	
34	65	60	617.00	611.00	611.00	613.00	619.00	
35	65	80	613.00	610.00	612.00	614.00	616.00	
36	65	100	613.00	613.00	613.00	614.00	611.00	
37	65	120	608.00	611.00	613.00	613.00	603.00	
38	65	140	605.00	607.00	608.00	606.00	597.00	
39	65	160	604.00	606.00	608.00	603.00	595.00	
40	65	180	596.00	601.00	600.00	598.00	594.00	
41	55	0	626.00	594.00	574.00	618.00	634.00	
42	55	20	623.00	598.00	593.00	610.00	630.00	
43	55	40	604.00	603.00	607.00	612.00	623.00	
44	55	60	601.00	605.00	610.00	615.00	619.00	
45	55	80	594.00	603.00	612.00	615.00	613.00	
46	55	100	591.00	600.00	610.00	612.00	604.00	
47	55	120	603.00	606.00	610.00	607.00	598.00	
48	55	140	599.00	602.00	604.00	599.00	593.00	
49	55	160	599.00	600.00	599.00	594.00	588.00	
50	55	180	597.00	594.00	593.00	589.00	585.00	
51	45	0	631.00	589.00	577.00	616.00	637.00	
52	45	20	629.00	607.00	604.00	618.00	634.00	
53	45	40	626.00	615.00	616.00	621.00	629.00	
54	45	60	621.00	616.00	619.00	623.00	624.00	
55	45	80	619.00	617.00	618.00	620.00	614.00	
56	45	100	591.00	600.00	611.00	610.00	603.00	
57	45	120	588.00	599.00	605.00	599.00	592.00	
58	45	140	579.00	588.00	593.00	590.00	587.00	
59	35	0	621.00	588.00	588.00	623.00	638.00	
60	35	20	630.00	611.00	613.00	627.00	637.00	
61	35	40	625.00	619.00	620.00	627.00	631.00	
62	35	60	623.00	619.00	620.00	624.00	624.00	
63	35	80	617.00	614.00	617.00	620.00	616.00	
64	35	100	610.00	608.00	611.00	608.00	600.00	
65	35	120	603.00	598.00	600.00	597.00	593.00	
66	25	0	642.00	610.00	605.00	633.00	645.00	
67	25	20	638.00	625.00	623.00	635.00	640.00	
68	25	40	630.00	623.00	624.00	631.00	633.00	
69	25	60	625.00	620.00	621.00	626.00	625.00	
70	25	80	598.00	603.00	611.00	614.00	611.00	
71	25	100	590.00	595.00	603.00	602.00	596.00	
72	15	0	642.00	628.00	623.00	644.00	647.00	
73	15	20	632.00	626.00	626.00	637.00	639.00	
74	15	40	625.00	618.00	620.00	627.00	629.00	
75	15	60	614.00	611.00	617.00	620.00	619.00	
76	15	80	591.00	590.00	605.00	605.00	601.00	

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file requested                         115.c
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comb. press. - pr (mm water gage)      26.00
cross flow temp. - tr (degree celsius)    365.00
comb. air flow rate - mcr (mm water diff.)      30.00
cool air flow rate - mkr (mm water diff.)    155.00
natural gas flow rate - msr (mm water diff.)      15.00
natural gas total press. - psgr (psi gage)       0.00
air total press. - psar (mm water gage)       0.00
jet temp. - tjr (degree celsius)      26.00
single jet flow rate - msjr (s.c.f.m.)       1.89
wall temp. - t5 (degree celsius)     200.00
wall temp. - t6 (degree celsius)     235.00
wall temp. - t7 (degree celsius)     240.00
wall temp. - t8 (degree celsius)     297.00
wall temp. - t9 (degree celsius)     217.00
wall temp. - t10 (degree celsius)     213.00

mc = 0.0164317 kg/sec
mk = 0.1170290 kg/sec
mg = 0.001162 kg/sec
m  = 0.134623 kg/sec
p  = 98355.1 pascal
t  = 638 degree kelvin
tj = 299 degree kelvin
t5 = 473 degree kelvin
t6 = 508 degree kelvin
t7 = 513 degree kelvin
t8 = 570 degree kelvin
t9 = 490 degree kelvin
t10= 486 degree kelvin
ro = 0.5371 kg/cubic meter
roj= 1.1462 kg/cubic meter
v  = 9.27 meter/sec
msj= 0.0009885 kg/sec
vj = 21.71 meter/sec
dr = 2.13 density ratio
j  = 11.7 momentum ratio
fr =   25425 froude number
sr =  9.21 spacing ratio
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pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	579.00	589.00	585.00	596.00	599.00
2	95	20	611.00	606.00	596.00	612.00	615.00
3	95	40	602.00	596.00	586.00	598.00	606.00
4	95	60	606.00	599.00	591.00	602.00	609.00
5	95	80	608.00	602.00	595.00	601.00	608.00
6	95	100	589.00	596.00	596.00	602.00	607.00
7	95	120	606.00	607.00	606.00	610.00	611.00
8	95	140	588.00	603.00	604.00	607.00	608.00
9	95	160	598.00	606.00	603.00	610.00	610.00
10	95	180	600.00	610.00	611.00	614.00	610.00
11	85	0	617.00	613.00	603.00	616.00	615.00
12	85	20	619.00	605.00	591.00	609.00	618.00
13	85	40	612.00	598.00	589.00	606.00	617.00

14	85	60	589.00	589.00	588.00	598.00	611.00	
15	85	80	585.00	594.00	598.00	603.00	611.00	
16	85	100	579.00	593.00	600.00	605.00	608.00	
17	85	120	571.00	592.00	600.00	605.00	604.00	
18	85	140	567.00	591.00	600.00	606.00	603.00	rdg.
19	85	160	561.00	586.00	598.00	606.00	603.00	115.c
20	85	180	596.00	605.00	607.00	613.00	608.00	
21	75	0	600.00	594.00	585.00	612.00	620.00	
22	75	20	614.00	594.00	585.00	606.00	623.00	
23	75	40	613.00	596.00	591.00	604.00	620.00	
24	75	60	615.00	606.00	603.00	606.00	616.00	
25	75	80	600.00	604.00	605.00	605.00	610.00	
26	75	100	585.00	600.00	605.00	609.00	609.00	
27	75	120	575.00	592.00	603.00	608.00	603.00	
28	75	140	574.00	593.00	606.00	609.00	601.00	
29	75	160	572.00	592.00	601.00	332.00	325.00	
30	75	180	566.00	585.00	597.00	601.00	595.00	
31	65	0	601.00	583.00	570.00	604.00	621.00	
32	65	20	599.00	583.00	582.00	604.00	623.00	
33	65	40	598.00	595.00	595.00	602.00	616.00	
34	65	60	594.00	600.00	605.00	607.00	614.00	
35	65	80	590.00	602.00	608.00	611.00	612.00	
36	65	100	584.00	599.00	608.00	611.00	606.00	
37	65	120	578.00	595.00	605.00	606.00	599.00	
38	65	140	575.00	592.00	604.00	601.00	601.00	
39	65	160	576.00	592.00	601.00	598.00	591.00	
40	65	180	572.00	588.00	596.00	596.00	592.00	
41	55	0	610.00	580.00	570.00	609.00	631.00	
42	55	20	601.00	589.00	592.00	607.00	626.00	
43	55	40	601.00	601.00	606.00	612.00	624.00	
44	55	60	612.00	612.00	614.00	613.00	616.00	
45	55	80	594.00	604.00	611.00	614.00	610.00	
46	55	100	604.00	609.00	614.00	614.00	607.00	
47	55	120	610.00	613.00	615.00	610.00	599.00	
48	55	140	601.00	603.00	603.00	601.00	597.00	
49	55	160	584.00	595.00	597.00	591.00	586.00	
50	55	180	595.00	594.00	592.00	591.00	587.00	
51	45	0	618.00	584.00	583.00	617.00	637.00	
52	45	20	610.00	600.00	605.00	617.00	632.00	
53	45	40	609.00	609.00	615.00	621.00	627.00	
54	45	60	621.00	619.00	619.00	622.00	622.00	
55	45	80	617.00	616.00	620.00	620.00	615.00	
56	45	100	609.00	609.00	614.00	612.00	605.00	
57	45	120	608.00	607.00	609.00	605.00	599.00	
58	45	140	602.00	598.00	599.00	595.00	589.00	
59	35	0	639.00	602.00	599.00	627.00	643.00	
60	35	20	631.00	617.00	617.00	629.00	638.00	
61	35	40	626.00	622.00	623.00	628.00	633.00	
62	35	60	622.00	620.00	620.00	625.00	626.00	
63	35	80	618.00	616.00	619.00	621.00	615.00	
64	35	100	612.00	610.00	614.00	611.00	604.00	
65	35	120	589.00	594.00	601.00	596.00	590.00	
66	25	0	635.00	614.00	611.00	635.00	644.00	
67	25	20	625.00	620.00	625.00	635.00	638.00	
68	25	40	614.00	615.00	621.00	629.00	630.00	
69	25	60	604.00	608.00	618.00	624.00	621.00	
70	25	80	610.00	610.00	616.00	617.00	613.00	
71	25	100	602.00	597.00	603.00	603.00	598.00	
72	15	0	641.00	630.00	626.00	643.00	642.00	
73	15	20	635.00	629.00	627.00	636.00	636.00	
74	15	40	623.00	618.00	622.00	629.00	628.00	
75	15	60	615.00	612.00	617.00	620.00	618.00	
76	15	80	586.00	591.00	605.00	606.00	603.00	

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file requested 116.c
****

comb. press. - pr (mm water gage) 15.00
cross flow temp. - tr (degree celsius) 550.00
comb. air flow rate - mcr (mm water diff.) 30.00
cool air flow rate - mkr (mm water diff.) 70.00
natural gas flow rate - msr (mm water diff.) 15.00
natural gas total press. - pssr (psi gage) 0.00
air total press. - psar (mm water gage) 0.00
jet temp. - tjr (degree celsius) 27.00
single jet flow rate - msjr (s.c.f.m.) 1.07
wall temp. - t5 (degree celsius) 270.00
wall temp. - t6 (degree celsius) 298.00
wall temp. - t7 (degree celsius) 297.00
wall temp. - t8 (degree celsius) 362.00
wall temp. - t9 (degree celsius) 262.00
wall temp. - t10 (degree celsius) 272.00

mc = 0.0164317 kg/sec
mk = 0.0786460 kg/sec
ms = 0.001162 kg/sec
m = 0.096240 kg/sec
p = 98247.2 pascal
t = 823 degree kelvin
tj = 300 degree kelvin
t5 = 543 degree kelvin
t6 = 571 degree kelvin
t7 = 570 degree kelvin
t8 = 635 degree kelvin
t9 = 535 degree kelvin
t10= 545 degree kelvin
ro = 0.4159 kg/cubic meter
roj= 1.1411 kg/cubic meter
v = 8.56 meter/sec
msj= 0.0005596 kg/sec
vj = 12.34 meter/sec
dr = 2.74 density ratio
j = 5.7 momentum ratio
fr = 6874 froude number
sr = 9.21 spacing ratio

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	781.00	778.00	750.00	763.00	753.00
2	95	20	799.00	796.00	776.00	781.00	779.00
3	95	40	805.00	798.00	776.00	787.00	782.00
4	95	60	806.00	798.00	779.00	794.00	794.00
5	95	80	803.00	791.00	771.00	794.00	801.00
6	95	100	808.00	794.00	769.00	789.00	800.00
7	95	120	800.00	790.00	768.00	785.00	797.00
8	95	140	795.00	795.00	768.00	784.00	799.00
9	95	160	789.00	787.00	761.00	776.00	794.00
10	95	180	777.00	783.00	764.00	781.00	796.00
11	85	0	807.00	805.00	784.00	793.00	780.00
12	85	20	813.00	805.00	779.00	797.00	794.00
13	85	40	802.00	788.00	765.00	787.00	794.00

14	85	60	800.00	779.00	759.00	778.00	792.00	
15	85	80	799.00	777.00	757.00	775.00	791.00	
16	85	100	798.00	778.00	763.00	780.00	796.00	
17	85	120	794.00	780.00	761.00	778.00	793.00	
18	85	140	780.00	775.00	757.00	776.00	786.00	
19	85	160	775.00	780.00	761.00	778.00	786.00	rdg. 116.c
20	85	180	760.00	775.00	755.00	773.00	774.00	
21	75	0	814.00	807.00	782.00	802.00	798.00	
22	75	20	807.00	783.00	758.00	793.00	804.00	
23	75	40	803.00	770.00	752.00	777.00	797.00	
24	75	60	801.00	771.00	757.00	774.00	795.00	
25	75	80	797.00	773.00	762.00	778.00	797.00	
26	75	100	795.00	777.00	763.00	779.00	785.00	
27	75	120	784.00	772.00	760.00	779.00	775.00	
28	75	140	772.00	773.00	763.00	782.00	761.00	
29	75	160	764.00	761.00	755.00	767.00	747.00	
30	75	180	750.00	755.00	751.00	764.00	739.00	
31	65	0	812.00	789.00	756.00	800.00	804.00	
32	65	20	807.00	766.00	741.00	786.00	809.00	
33	65	40	800.00	764.00	751.00	773.00	800.00	
34	65	60	793.00	764.00	762.00	772.00	792.00	
35	65	80	791.00	772.00	767.00	782.00	789.00	
36	65	100	789.00	771.00	766.00	782.00	773.00	
37	65	120	779.00	766.00	763.00	781.00	751.00	
38	65	140	767.00	756.00	762.00	771.00	732.00	
39	65	160	756.00	750.00	754.00	749.00	718.00	
40	65	180	746.00	745.00	743.00	739.00	713.00	
41	55	0	817.00	771.00	726.00	797.00	812.00	
42	55	20	805.00	755.00	739.00	778.00	806.00	
43	55	40	798.00	764.00	759.00	776.00	795.00	
44	55	60	794.00	772.00	766.00	781.00	789.00	
45	55	80	783.00	766.00	763.00	781.00	781.00	
46	55	100	780.00	758.00	759.00	778.00	756.00	
47	55	120	761.00	747.00	759.00	759.00	727.00	
48	55	140	747.00	739.00	750.00	738.00	709.00	
49	55	160	743.00	732.00	738.00	721.00	700.00	
50	55	180	736.00	721.00	718.00	710.00	695.00	
51	45	0	817.00	747.00	720.00	796.00	814.00	
52	45	20	802.00	758.00	752.00	783.00	804.00	
53	45	40	791.00	767.00	764.00	779.00	791.00	
54	45	60	787.00	768.00	766.00	788.00	786.00	
55	45	80	780.00	757.00	759.00	775.00	765.00	
56	45	100	766.00	748.00	756.00	764.00	737.00	
57	45	120	747.00	734.00	750.00	738.00	711.00	
58	45	140	738.00	716.00	725.00	712.00	695.00	
59	35	0	812.00	745.00	732.00	799.00	813.00	
60	35	20	802.00	767.00	765.00	797.00	803.00	
61	35	40	791.00	772.00	770.00	791.00	794.00	
62	35	60	783.00	765.00	765.00	782.00	780.00	
63	35	80	762.00	746.00	756.00	773.00	757.00	
64	35	100	744.00	731.00	745.00	747.00	726.00	
65	35	120	728.00	704.00	718.00	710.00	697.00	
66	25	0	814.00	760.00	755.00	810.00	813.00	
67	25	20	802.00	777.00	773.00	799.00	799.00	
68	25	40	780.00	767.00	768.00	783.00	782.00	
69	25	60	764.00	748.00	756.00	770.00	767.00	
70	25	80	746.00	735.00	747.00	752.00	739.00	
71	25	100	719.00	701.00	716.00	709.00	700.00	
72	15	0	799.00	780.00	771.00	811.00	802.00	
73	15	20	780.00	771.00	769.00	788.00	779.00	
74	15	40	759.00	748.00	752.00	761.00	755.00	
75	15	60	744.00	734.00	746.00	750.00	744.00	
76	15	80	700.00	693.00	716.00	713.00	709.00	

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file requested 117.c
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comb. press. - pr (mm water gage) 16.00
cross flow temp. - tr (degree celsius) 553.00
comb. air flow rate - mcr (mm water diff.) 30.00
cool air flow rate - mkr (mm water diff.) 66.00
natural gas flow rate - msr (mm water diff.) 15.00
natural gas total press. - pgsr (psi gage) 0.00
air total press. - psar (mm water gage) 0.00
jet temp. - tjr (degree celsius) 30.00
single jet flow rate - msjr (s.c.f.m.) 1.36
wall temp. - t5 (degree celsius) 270.00
wall temp. - t6 (degree celsius) 298.00
wall temp. - t7 (degree celsius) 298.00
wall temp. - t8 (degree celsius) 360.00
wall temp. - t9 (degree celsius) 261.00
wall temp. - t10 (degree celsius) 272.00

mc = 0.0164317 kg/sec
mk = 0.0763660 kg/sec
ms = 0.001162 kg/sec
m = 0.093960 kg/sec
p = 98257 pascal
t = 826 degree kelvin
tj = 303 degree kelvin
t5 = 543 degree kelvin
t6 = 571 degree kelvin
t7 = 571 degree kelvin
t8 = 633 degree kelvin
t9 = 534 degree kelvin
t10= 545 degree kelvin
ro = 0.4145 kg/cubic meter
roj= 1.1299 kg/cubic meter
v = 8.39 meter/sec
msj= 0.0007113 kg/sec
vj = 15.84 meter/sec
dr = 2.73 density ratio
j = 9.7 momentum ratio
fr = 11368 froude number
sr = 9.21 spacing ratio

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	791.00	789.00	762.00	775.00	763.00
2	95	20	799.00	790.00	764.00	780.00	780.00
3	95	40	803.00	790.00	765.00	786.00	792.00
4	95	60	803.00	783.00	759.00	779.00	688.00
5	95	80	807.00	787.00	764.00	782.00	791.00
6	95	100	802.00	789.00	767.00	777.00	789.00
7	95	120	797.00	790.00	768.00	779.00	792.00
8	95	140	791.00	788.00	769.00	782.00	792.00
9	95	160	778.00	785.00	767.00	781.00	790.00
10	95	180	771.00	783.00	766.00	783.00	793.00
11	85	0	808.00	800.00	777.00	794.00	788.00
12	85	20	812.00	786.00	760.00	786.00	795.00
13	85	40	808.00	774.00	753.00	783.00	802.00

14	85	60	801.00	770.00	753.00	771.00	792.00	
15	85	80	797.00	769.00	757.00	769.00	788.00	
16	85	100	797.00	775.00	768.00	775.00	789.00	
17	85	120	789.00	781.00	767.00	784.00	791.00	
18	85	140	779.00	782.00	766.00	783.00	783.00	rdg.
19	85	160	769.00	778.00	762.00	780.00	777.00	117.c
20	85	180	759.00	777.00	763.00	782.00	776.00	
21	75	0	809.00	787.00	757.00	798.00	804.00	
22	75	20	810.00	766.00	741.00	779.00	798.00	
23	75	40	806.00	764.00	751.00	771.00	798.00	
24	75	60	796.00	768.00	764.00	771.00	794.00	
25	75	80	793.00	772.00	771.00	780.00	795.00	
26	75	100	795.00	778.00	773.00	786.00	789.00	
27	75	120	783.00	777.00	769.00	788.00	776.00	
28	75	140	772.00	772.00	767.00	786.00	765.00	
29	75	160	764.00	769.00	766.00	781.00	756.00	
30	75	180	756.00	766.00	759.00	769.00	745.00	
31	65	0	816.00	769.00	732.00	793.00	812.00	
32	65	20	808.00	756.00	739.00	774.00	806.00	
33	65	40	802.00	766.00	761.00	772.00	800.00	
34	65	60	797.00	771.00	772.00	775.00	792.00	
35	65	80	793.00	776.00	773.00	784.00	789.00	
36	65	100	789.00	776.00	773.00	788.00	779.00	
37	65	120	778.00	768.00	768.00	786.00	755.00	
38	65	140	768.00	761.00	764.00	771.00	737.00	
39	65	160	761.00	755.00	762.00	758.00	725.00	
40	65	180	754.00	752.00	750.00	748.00	720.00	
41	55	0	818.00	749.00	720.00	789.00	818.00	
42	55	20	807.00	756.00	755.00	779.00	813.00	
43	55	40	798.00	770.00	773.00	782.00	802.00	
44	55	60	798.00	781.00	780.00	792.00	798.00	
45	55	80	791.00	774.00	768.00	782.00	779.00	
46	55	100	781.00	766.00	769.00	786.00	762.00	
47	55	120	768.00	754.00	766.00	770.00	735.00	
48	55	140	759.00	748.00	758.00	745.00	715.00	
49	55	160	748.00	738.00	746.00	732.00	712.00	
50	55	180	743.00	730.00	727.00	720.00	703.00	
51	45	0	814.00	740.00	727.00	786.00	818.00	
52	45	20	805.00	765.00	768.00	790.00	808.00	
53	45	40	801.00	777.00	777.00	788.00	799.00	
54	45	60	794.00	777.00	774.00	790.00	789.00	
55	45	80	785.00	770.00	771.00	791.00	778.00	
56	45	100	771.00	754.00	765.00	772.00	747.00	
57	45	120	757.00	745.00	757.00	748.00	721.00	
58	45	140	741.00	723.00	734.00	719.00	700.00	
59	35	0	816.00	751.00	745.00	796.00	821.00	
60	35	20	810.00	781.00	781.00	802.00	808.00	
61	35	40	800.00	783.00	782.00	801.00	802.00	
62	35	60	785.00	768.00	768.00	786.00	783.00	
63	35	80	771.00	755.00	766.00	776.00	763.00	
64	35	100	755.00	741.00	756.00	757.00	737.00	
65	35	120	734.00	713.00	728.00	721.00	706.00	
66	25	0	822.00	777.00	773.00	819.00	823.00	
67	25	20	805.00	787.00	786.00	809.00	804.00	
68	25	40	789.00	775.00	774.00	790.00	788.00	
69	25	60	770.00	758.00	765.00	780.00	774.00	
70	25	80	751.00	740.00	755.00	760.00	750.00	
71	25	100	731.00	711.00	725.00	720.00	711.00	
72	15	0	810.00	798.00	790.00	817.00	808.00	
73	15	20	786.00	778.00	776.00	794.00	785.00	
74	15	40	764.00	757.00	760.00	771.00	768.00	
75	15	60	751.00	740.00	751.00	756.00	752.00	
76	15	80	707.00	699.00	725.00	722.00	715.00	

file requested **********
118.c
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comb. press. - pr (mm water gage) 16.00
cross flow temp. - tr (degree celsius) 560.00
comb. air flow rate - mcr (mm water diff.) 30.00
cool air flow rate - mkr (mm water diff.) 66.00
natural gas flow rate - msr (mm water diff.) 15.00
natural gas total press. - pgsr (psi gage) 0.00
air total press. - psar (mm water gage) 0.00
jet temp. - tjr (degree celsius) 31.00
single jet flow rate - msjr (s.c.f.m.) 1.50
wall temp. - t5 (degree celsius) 274.00
wall temp. - t6 (degree celsius) 311.00
wall temp. - t7 (degree celsius) 310.00
wall temp. - t8 (degree celsius) 375.00
wall temp. - t9 (degree celsius) 277.00
wall temp. - t10 (degree celsius) 283.00

mc = 0.0164317 kg/sec
mk = 0.0763660 kg/sec
mg = 0.001162 kg/sec
m = 0.093960 kg/sec
p = 98257 pascal
t = 833 degree kelvin
tj = 304 degree kelvin
t5 = 547 degree kelvin
t6 = 584 degree kelvin
t7 = 583 degree kelvin
t8 = 648 degree kelvin
t9 = 550 degree kelvin
t10= 556 degree kelvin
ro = 0.4110 kg/cubic meter
roj= 1.1262 kg/cubic meter
v = 8.46 meter/sec
msj= 0.0007819 kg/sec
vj = 17.48 meter/sec
dr = 2.74 density ratio
j = 11.7 momentum ratio
fr = 13786 froude number
sr = 9.21 spacing ratio

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	788.00	783.00	761.00	770.00	764.00
2	95	20	804.00	788.00	760.00	777.00	778.00
3	95	40	806.00	784.00	757.00	779.00	788.00
4	95	60	800.00	772.00	750.00	771.00	785.00
5	95	80	793.00	772.00	754.00	769.00	782.00
6	95	100	793.00	776.00	762.00	771.00	780.00
7	95	120	787.00	777.00	764.00	781.00	791.00
8	95	140	767.00	775.00	764.00	780.00	782.00
9	95	160	766.00	780.00	768.00	782.00	785.00
10	95	180	756.00	777.00	762.00	777.00	784.00
11	85	0	808.00	790.00	760.00	788.00	787.00
12	85	20	806.00	774.00	745.00	781.00	795.00
13	85	40	800.00	763.00	745.00	768.00	789.00

14	85	60	800.00	768.00	754.00	769.00	795.00	
15	85	80	795.00	769.00	763.00	768.00	783.00	
16	85	100	788.00	771.00	765.00	774.00	780.00	
17	85	120	783.00	773.00	766.00	779.00	783.00	
18	85	140	768.00	777.00	767.00	782.00	776.00	rdg.
19	85	160	762.00	776.00	763.00	778.00	771.00	118.c
20	85	180	749.00	772.00	762.00	780.00	773.00	
21	75	0	812.00	774.00	737.00	786.00	797.00	
22	75	20	804.00	755.00	734.00	770.00	802.00	
23	75	40	798.00	757.00	749.00	765.00	795.00	
24	75	60	793.00	763.00	765.00	768.00	786.00	
25	75	80	791.00	773.00	772.00	775.00	784.00	
26	75	100	785.00	775.00	770.00	780.00	779.00	
27	75	120	780.00	774.00	768.00	782.00	770.00	
28	75	140	771.00	772.00	766.00	777.00	758.00	
29	75	160	763.00	769.00	767.00	779.00	748.00	
30	75	180	752.00	762.00	757.00	770.00	741.00	
31	65	0	814.00	753.00	720.00	779.00	808.00	
32	65	20	803.00	750.00	740.00	767.00	802.00	
33	65	40	794.00	761.00	761.00	770.00	797.00	
34	65	60	793.00	772.00	774.00	779.00	794.00	
35	65	80	787.00	775.00	777.00	783.00	782.00	
36	65	100	783.00	775.00	772.00	785.00	772.00	
37	65	120	774.00	770.00	770.00	781.00	754.00	
38	65	140	768.00	762.00	765.00	770.00	737.00	
39	65	160	757.00	751.00	759.00	766.00	726.00	
40	65	180	748.00	751.00	751.00	746.00	720.00	
41	55	0	813.00	739.00	719.00	780.00	813.00	
42	55	20	804.00	757.00	758.00	779.00	810.00	
43	55	40	795.00	770.00	773.00	782.00	797.00	
44	55	60	791.00	776.00	776.00	785.00	792.00	
45	55	80	788.00	777.00	772.00	786.00	782.00	
46	55	100	779.00	764.00	769.00	783.00	761.00	
47	55	120	769.00	757.00	769.00	771.00	739.00	
48	55	140	757.00	746.00	756.00	747.00	720.00	
49	55	160	753.00	742.00	746.00	733.00	711.00	
50	55	180	741.00	731.00	728.00	718.00	702.00	
51	45	0	811.00	739.00	737.00	784.00	816.00	
52	45	20	804.00	766.00	770.00	789.00	813.00	
53	45	40	798.00	778.00	779.00	795.00	801.00	
54	45	60	795.00	779.00	776.00	790.00	789.00	
55	45	80	786.00	768.00	772.00	787.00	774.00	
56	45	100	769.00	754.00	764.00	771.00	747.00	
57	45	120	757.00	744.00	752.00	746.00	722.00	
58	45	140	741.00	721.00	730.00	722.00	703.00	
59	35	0	811.00	757.00	759.00	806.00	825.00	
60	35	20	809.00	784.00	783.00	804.00	810.00	
61	35	40	801.00	784.00	783.00	799.00	796.00	
62	35	60	780.00	766.00	768.00	786.00	783.00	
63	35	80	769.00	752.00	762.00	773.00	761.00	
64	35	100	754.00	741.00	753.00	749.00	731.00	
65	35	120	733.00	714.00	727.00	723.00	708.00	
66	25	0	814.00	780.00	777.00	817.00	818.00	
67	25	20	805.00	789.00	784.00	801.00	802.00	
68	25	40	791.00	778.00	776.00	790.00	788.00	
69	25	60	770.00	756.00	762.00	774.00	771.00	
70	25	80	754.00	742.00	757.00	762.00	751.00	
71	25	100	733.00	712.00	724.00	722.00	713.00	
72	15	0	808.00	799.00	793.00	822.00	811.00	
73	15	20	789.00	783.00	782.00	795.00	786.00	
74	15	40	766.00	759.00	764.00	773.00	767.00	
75	15	60	749.00	741.00	755.00	758.00	752.00	
76	15	80	700.00	694.00	722.00	721.00	716.00	

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file requested                         119.c
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comb. press. - pr (mm water gage)      30.00
cross flow temp. - tr (degree celsius)    373.00
comb. air flow rate - mcr (mm water diff.)      30.00
cool air flow rate - mkr (mm water diff.)    155.00
natural gas flow rate - mgr (mm water diff.)      15.00
natural gas total press. - psgr (psi gage)       0.00
air total press. - psar (mm water gage)       0.00
jet temp. - tjr (degree celsius)      28.00
single jet flow rate - msjr (s.c.f.m.)       1.32
wall temp. - t5 (degree celsius)     205.00
wall temp. - t6 (degree celsius)     229.00
wall temp. - t7 (degree celsius)     233.00
wall temp. - t8 (degree celsius)     302.00
wall temp. - t9 (degree celsius)     217.00
wall temp. - t10 (degree celsius)     219.00


mc = 0.0164317 kg/sec
mk = 0.1170290 kg/sec
mg = 0.001162 kg/sec
m  = 0.134623 kg/sec
p  = 98394.3 pascal
t  = 646 degree kelvin
tj = 301 degree kelvin
t5 = 478 degree kelvin
t6 = 502 degree kelvin
t7 = 506 degree kelvin
t8 = 575 degree kelvin
t9 = 490 degree kelvin
t10= 492 degree kelvin
ro = 0.5307 kg/cubic meter
roj= 1.1390 kg/cubic meter
v  = 9.39 meter/sec
msj= 0.0006904 kg/sec
vj = 15.26 meter/sec
dr = 2.15 density ratio
j  = 5.7 momentum ratio
fr =   12494 froude number
sr =  3.05 spacing ratio
```

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	608.00	606.00	596.00	601.00	603.00
2	95	20	613.00	614.00	610.00	614.00	611.00
3	95	40	620.00	620.00	616.00	621.00	618.00
4	95	60	620.00	619.00	615.00	618.00	617.00
5	95	80	620.00	624.00	623.00	628.00	624.00
6	95	100	614.00	619.00	618.00	624.00	623.00
7	95	120	614.00	618.00	616.00	624.00	621.00
8	95	140	581.00	592.00	601.00	614.00	618.00
9	95	160	596.00	599.00	602.00	614.00	622.00
10	95	180	584.00	588.00	596.00	608.00	614.00
11	85	0	591.00	599.00	598.00	611.00	612.00
12	85	20	592.00	602.00	605.00	616.00	616.00
13	85	40	601.00	612.00	616.00	625.00	625.00

14	85	60	601.00	612.00	615.00	622.00	624.00	
15	85	80	594.00	608.00	612.00	622.00	621.00	
16	85	100	602.00	608.00	610.00	618.00	618.00	
17	85	120	596.00	599.00	603.00	612.00	614.00	
18	85	140	593.00	593.00	598.00	605.00	606.00	
19	85	160	586.00	586.00	590.00	597.00	603.00	rdg.
20	85	180	582.00	582.00	586.00	595.00	601.00	119.c
21	75	0	604.00	613.00	612.00	624.00	623.00	
22	75	20	610.00	621.00	623.00	630.00	629.00	
23	75	40	613.00	622.00	624.00	632.00	629.00	
24	75	60	598.00	614.00	617.00	627.00	628.00	
25	75	80	580.00	595.00	604.00	616.00	619.00	
26	75	100	568.00	580.00	594.00	606.00	605.00	
27	75	120	555.00	567.00	584.00	595.00	596.00	
28	75	140	549.00	561.00	576.00	588.00	593.00	
29	75	160	547.00	560.00	573.00	584.00	590.00	
30	75	180	542.00	556.00	568.00	580.00	590.00	
31	65	0	611.00	622.00	622.00	631.00	631.00	
32	65	20	616.00	626.00	626.00	634.00	633.00	
33	65	40	607.00	625.00	624.00	633.00	633.00	
34	65	60	575.00	597.00	601.00	613.00	615.00	
35	65	80	560.00	576.00	589.00	600.00	600.00	
36	65	100	553.00	566.00	579.00	589.00	586.00	
37	65	120	547.00	561.00	574.00	582.00	582.00	
38	65	140	543.00	556.00	570.00	576.00	580.00	
39	65	160	542.00	556.00	568.00	575.00	581.00	
40	65	180	540.00	556.00	566.00	573.00	580.00	
41	55	0	618.00	627.00	626.00	634.00	633.00	
42	55	20	624.00	634.00	635.00	640.00	637.00	
43	55	40	566.00	611.00	600.00	618.00	626.00	
44	55	60	550.00	574.00	580.00	587.00	591.00	
45	55	80	549.00	564.00	574.00	581.00	578.00	
46	55	100	543.00	557.00	570.00	574.00	571.00	
47	55	120	543.00	556.00	566.00	570.00	572.00	
48	55	140	543.00	557.00	566.00	568.00	572.00	
49	55	160	543.00	556.00	564.00	569.00	574.00	
50	55	180	553.00	559.00	564.00	569.00	574.00	
51	45	0	631.00	641.00	642.00	648.00	645.00	
52	45	20	632.00	641.00	644.00	649.00	645.00	
53	45	40	534.00	585.00	568.00	574.00	597.00	
54	45	60	542.00	560.00	567.00	567.00	571.00	
55	45	80	547.00	559.00	566.00	569.00	565.00	
56	45	100	546.00	557.00	564.00	565.00	564.00	
57	45	120	545.00	555.00	563.00	563.00	565.00	
58	45	140	543.00	555.00	560.00	563.00	568.00	
59	35	0	648.00	652.00	650.00	654.00	651.00	
60	35	20	640.00	642.00	633.00	644.00	643.00	
61	35	40	539.00	569.00	546.00	541.00	563.00	
62	35	60	557.00	565.00	562.00	561.00	561.00	
63	35	80	560.00	564.00	565.00	565.00	563.00	
64	35	100	559.00	562.00	562.00	561.00	560.00	
65	35	120	553.00	556.00	558.00	558.00	560.00	
66	25	0	640.00	649.00	649.00	651.00	647.00	
67	25	20	616.00	621.00	597.00	627.00	627.00	
68	25	40	550.00	555.00	552.00	546.00	558.00	
69	25	60	556.00	561.00	560.00	559.00	559.00	
70	25	80	555.00	560.00	561.00	562.00	561.00	
71	25	100	547.00	553.00	557.00	555.00	555.00	
72	15	0	640.00	649.00	650.00	651.00	646.00	
73	15	20	562.00	608.00	556.00	586.00	567.00	
74	15	40	572.00	567.00	559.00	559.00	559.00	
75	15	60	568.00	568.00	564.00	563.00	563.00	
76	15	80	557.00	558.00	559.00	558.00	558.00	

file requested **********
120.c
****

comb. press. - pr (mm water gage) 16.00
cross flow temp. - tr (degree celsius) 372.00
comb. air flow rate - mcr (mm water diff.) 15.00
cool air flow rate - mkr (mm water diff.) 90.00
natural gas flow rate - mgr (mm water diff.) 8.00
natural gas total press. - pggr (psi gage) 0.00
air total press. - pgar (mm water gage) 0.00
jet temp. - tjr (degree celsius) 28.00
single jet flow rate - msjr (s.c.f.m.) 1.30
wall temp. - t5 (degree celsius) 198.00
wall temp. - t6 (degree celsius) 211.00
wall temp. - t7 (degree celsius) 213.00
wall temp. - t8 (degree celsius) 284.00
wall temp. - t9 (degree celsius) 209.00
wall temp. - t10 (degree celsius) 214.00

mc = 0.0116189 kg/sec
mk = 0.0891762 kg/sec
mg = 0.000849 kg/sec
m = 0.101644 kg/sec
p = 98257 pascal
t = 645 degree kelvin
tj = 301 degree kelvin
t5 = 471 degree kelvin
t6 = 484 degree kelvin
t7 = 486 degree kelvin
t8 = 557 degree kelvin
t9 = 482 degree kelvin
t10= 487 degree kelvin
ro = 0.5308 kg/cubic meter
roj= 1.1374 kg/cubic meter
v = 7.09 meter/sec
msj= 0.0006799 kg/sec
vj = 15.05 meter/sec
dr = 2.14 density ratio
j = 9.7 momentum ratio
fr = 12169 froude number
sr = 3.03 spacing ratio

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	614.00	612.00	599.00	611.00	611.00
2	95	20	620.00	620.00	610.00	618.00	618.00
3	95	40	628.00	628.00	620.00	628.00	627.00
4	95	60	630.00	632.00	627.00	632.00	629.00
5	95	80	626.00	628.00	622.00	628.00	627.00
6	95	100	627.00	628.00	623.00	630.00	628.00
7	95	120	616.00	620.00	619.00	627.00	625.00
8	95	140	614.00	613.00	612.00	618.00	620.00
9	95	160	607.00	605.00	605.00	612.00	620.00
10	95	180	600.00	599.00	599.00	610.00	618.00
11	85	0	630.00	629.00	615.00	625.00	622.00
12	85	20	632.00	632.00	626.00	630.00	629.00
13	85	40	633.00	634.00	627.00	632.00	628.00

14	85	60	629.00	633.00	628.00	633.00	627.00	
15	85	80	612.00	619.00	618.00	624.00	621.00	
16	85	100	605.00	607.00	610.00	618.00	616.00	
17	85	120	594.00	595.00	598.00	606.00	608.00	
18	85	140	588.00	585.00	588.00	596.00	602.00	rdg.
19	85	160	582.00	580.00	584.00	591.00	598.00	120.c
20	85	180	577.00	575.00	577.00	586.00	596.00	
21	75	0	635.00	635.00	627.00	634.00	630.00	
22	75	20	636.00	637.00	630.00	633.00	629.00	
23	75	40	635.00	638.00	633.00	635.00	632.00	
24	75	60	604.00	617.00	613.00	623.00	623.00	
25	75	80	586.00	595.00	597.00	605.00	604.00	
26	75	100	576.00	581.00	586.00	594.00	590.00	
27	75	120	572.00	575.00	580.00	586.00	585.00	
28	75	140	568.00	567.00	571.00	577.00	580.00	
29	75	160	566.00	565.00	569.00	574.00	580.00	
30	75	180	566.00	564.00	568.00	574.00	580.00	
31	65	0	639.00	642.00	636.00	641.00	638.00	
32	65	20	642.00	644.00	640.00	643.00	638.00	
33	65	40	609.00	634.00	621.00	629.00	630.00	
34	65	60	575.00	592.00	588.00	598.00	599.00	
35	65	80	566.00	575.00	579.00	583.00	582.00	
36	65	100	563.00	567.00	573.00	576.00	573.00	
37	65	120	564.00	567.00	570.00	572.00	571.00	
38	65	140	561.00	563.00	566.00	567.00	570.00	
39	65	160	557.00	558.00	562.00	565.00	571.00	
40	65	180	558.00	558.00	562.00	567.00	574.00	
41	55	0	643.00	644.00	638.00	644.00	641.00	
42	55	20	647.00	650.00	645.00	647.00	642.00	
43	55	40	551.00	606.00	573.00	590.00	607.00	
44	55	60	551.00	573.00	567.00	568.00	575.00	
45	55	80	557.00	564.00	565.00	565.00	563.00	
46	55	100	556.00	560.00	564.00	561.00	559.00	
47	55	120	557.00	559.00	561.00	561.00	561.00	
48	55	140	554.00	555.00	557.00	557.00	562.00	
49	55	160	553.00	553.00	556.00	558.00	564.00	
50	55	180	550.00	550.00	555.00	560.00	566.00	
51	45	0	648.00	649.00	643.00	646.00	642.00	
52	45	20	647.00	648.00	640.00	643.00	639.00	
53	45	40	544.00	584.00	551.00	551.00	575.00	
54	45	60	550.00	560.00	558.00	554.00	557.00	
55	45	80	554.00	558.00	558.00	558.00	554.00	
56	45	100	555.00	557.00	557.00	55[illegible].00	554.00	
57	45	120	552.00	553.00	554.00	55[illegible].00	553.00	
58	45	140	549.00	549.00	550.00	55[illegible].00	556.00	
59	35	0	647.00	649.00	645.00	64[illegible].00	640.00	
60	35	20	636.00	633.00	617.00	6[illegible].00	633.00	
61	35	40	543.00	555.00	539.00	53[illegible].00	547.00	
62	35	60	552.00	555.00	551.00	55[illegible].00	550.00	
63	35	80	282.00	557.00	554.00	55[illegible].00	550.00	
64	35	100	552.00	552.00	552.00	550.00	548.00	
65	35	120	547.00	546.00	547.00	544.00	547.00	
66	25	0	645.00	646.00	640.00	641.00	640.00	
67	25	20	604.00	613.00	566.00	599.00	598.00	
68	25	40	556.00	552.00	542.00	543.00	545.00	
69	25	60	559.00	558.00	552.00	55[illegible].00	551.00	
70	25	80	558.00	556.00	552.00	550.00	549.00	
71	25	100	551.00	548.00	547.00	544.00	543.00	
72	15	0	638.00	640.00	638.00	638.00	634.00	
73	15	20	584.00	604.00	549.00	564.00	551.00	
74	15	40	571.00	561.00	549.00	554.00	550.00	
75	15	60	565.00	562.00	555.00	558.00	555.00	
76	15	80	546.00	546.00	547.00	54[illegible].00	544.00	

****
file requested 121.c
****

comb. press. - pr (mm water gage) 16.00
cross flow temp. - tr (degree celsius) 372.00
comb. air flow rate - mcr (mm water diff.) 15.00
cool air flow rate - mkr (mm water diff.) 90.00
natural gas flow rate - mgr (mm water diff.) 8.00
natural gas total press. - pgar (psi gage) 0.00
air total press. - pgar (mm water gage) 0.00
jet temp. - tjr (degree celsius) 28.00
single jet flow rate - mgjr (s.c.f.m.) 1.43
wall temp. - t5 (degree celsius) 193.00
wall temp. - t6 (degree celsius) 211.00
wall temp. - t7 (degree celsius) 211.00
wall temp. - t8 (degree celsius) 281.00
wall temp. - t9 (degree celsius) 207.00
wall temp. - t10 (degree celsius) 213.00

mc = 0.0116189 kg/sec
mk = 0.0891762 kg/sec
mg = 0.000849 kg/sec
m = 0.101644 kg/sec
p = 98257 pascal
t = 645 degree kelvin
tj = 301 degree kelvin
t5 = 466 degree kelvin
t6 = 484 degree kelvin
t7 = 484 degree kelvin
t8 = 554 degree kelvin
t9 = 480 degree kelvin
t10= 486 degree kelvin
ro = 0.5308 kg/cubic meter
roj= 1.1374 kg/cubic meter
v = 7.09 meter/sec
mgj= 0.0007479 kg/sec
vj = 16.55 meter/sec
dr = 2.14 density ratio
j = 11.7 momentum ratio
fr = 14725 froude number
sr = 3.05 spacing ratio

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	615.00	616.00	610.00	615.00	611.00
2	95	20	617.00	617.00	611.00	617.00	616.00
3	95	40	626.00	626.00	620.00	626.00	624.00
4	95	60	627.00	630.00	624.00	629.00	628.00
5	95	80	625.00	627.00	621.00	629.00	627.00
6	95	100	610.00	614.00	613.00	622.00	620.00
7	95	120	610.00	613.00	612.00	621.00	620.00
8	95	140	604.00	604.00	604.00	611.00	615.00
9	95	160	600.00	596.00	598.00	609.00	616.00
10	95	180	590.00	586.00	590.00	601.00	609.00
11	85	0	627.00	626.00	616.00	624.00	620.00
12	85	20	629.00	630.00	624.00	629.00	628.00
13	85	40	630.00	632.00	628.00	632.00	628.00

14	85	60	622.00	629.00	624.00	631.00	628.00	
15	85	80	607.00	613.00	612.00	622.00	621.00	
16	85	100	592.00	596.00	601.00	610.00	608.00	
17	85	120	585.00	588.00	591.00	599.00	600.00	
18	85	140	578.00	579.00	584.00	591.00	596.00	rdg.
19	85	160	573.00	572.00	575.00	581.00	588.00	121.c
20	85	180	572.00	567.00	572.00	581.00	589.00	
21	75	0	636.00	637.00	628.00	634.00	631.00	
22	75	20	636.00	638.00	632.00	636.00	631.00	
23	75	40	630.00	637.00	631.00	633.00	630.00	
24	75	60	586.00	602.00	601.00	611.00	614.00	
25	75	80	574.00	583.00	586.00	594.00	591.00	
26	75	100	568.00	573.00	579.00	585.00	582.00	
27	75	120	563.00	566.00	572.00	577.00	577.00	
28	75	140	561.00	562.00	566.00	571.00	574.00	
29	75	160	560.00	559.00	563.00	568.00	574.00	
30	75	180	557.00	557.00	560.00	566.00	573.00	
31	65	0	637.00	638.00	627.00	634.00	632.00	
32	65	20	637.00	640.00	636.00	640.00	637.00	
33	65	40	585.00	618.00	601.00	616.00	619.00	
34	65	60	555.00	574.00	[illegible]	579.00	583.00	
35	65	80	554.00	564.00	[illegible]	570.00	569.00	
36	65	100	555.00	561.00	564.00	567.00	564.00	
37	65	120	553.00	557.00	562.00	563.00	562.00	
38	65	140	553.00	556.00	559.00	559.00	562.00	
39	65	160	551.00	552.00	556.00	559.00	563.00	
40	65	180	551.00	551.00	555.00	559.00	567.00	
41	55	0	640.00	641.00	635.00	641.00	639.00	
42	55	20	642.00	643.00	639.00	641.00	636.00	
43	55	40	523.00	578.00	546.00	564.00	581.00	
44	55	60	543.00	559.00	556.00	554.00	561.00	
45	55	80	548.00	556.00	557.00	557.00	556.00	
46	55	100	550.00	554.00	556.00	556.00	554.00	
47	55	120	550.00	553.00	555.00	554.00	553.00	
48	55	140	547.00	549.00	551.00	551.00	554.00	
49	55	160	545.00	546.00	548.00	551.00	557.00	
50	55	180	545.00	545.00	549.00	554.00	560.00	
51	45	0	641.00	644.00	638.00	643.00	639.00	
52	45	20	638.00	639.00	632.00	638.00	635.00	
53	45	40	520.00	555.00	526.00	526.00	548.00	
54	45	60	541.00	551.00	546.00	543.00	547.00	
55	45	80	547.00	551.00	550.00	550.00	549.00	
56	45	100	550.00	552.00	552.00	550.00	548.00	
57	45	120	548.00	549.00	549.00	547.00	548.00	
58	45	140	544.00	544.00	545.00	546.00	549.00	
59	35	0	644.00	646.00	639.00	643.00	639.00	
60	35	20	635.00	629.00	610.00	629.00	630.00	
61	35	40	541.00	550.00	536.00	529.00	540.00	
62	35	60	549.00	552.00	546.00	545.00	545.00	
63	35	80	551.00	552.00	550.00	548.00	547.00	
64	35	100	550.00	550.00	548.00	546.00	544.00	
65	35	120	544.00	544.00	545.00	543.00	544.00	
66	25	0	641.00	644.00	638.00	640.00	638.00	
67	25	20	628.00	614.00	579.00	611.00	616.00	
68	25	40	558.00	551.00	544.00	545.00	546.00	
69	25	60	558.00	557.00	551.00	551.00	550.00	
70	25	80	558.00	556.00	551.00	549.00	548.00	
71	25	100	548.00	545.00	544.00	542.00	540.00	
72	15	0	634.00	636.00	631.00	633.00	632.00	
73	15	20	560.00	602.00	533.00	546.00	537.00	
74	15	40	572.00	562.00	548.00	555.00	549.00	
75	15	60	567.00	562.00	555.00	555.00	553.00	
76	15	80	548.00	547.00	547.00	545.00	544.00	

file requested

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122.c
****

comb. press. - pr (mm water gage) 20.00
cross flow temp. - tr (degree celsius) 550.00
comb. air flow rate - mcr (mm water diff.) 30.00
cool air flow rate - mkr (mm water diff.) 76.00
natural gas flow rate - msr (mm water diff.) 15.00
natural gas total press. - pssr (psi gage) 0.00
air total press. - psar (mm water gage) 0.00
jet temp. - tjr (degree celsius) 26.00
single jet flow rate - msjr (s.c.f.m.) 1.11
wall temp. - t5 (degree celsius) 270.00
wall temp. - t6 (degree celsius) 273.00
wall temp. - t7 (degree celsius) 286.00
wall temp. - t8 (degree celsius) 368.00
wall temp. - t9 (degree celsius) 263.00
wall temp. - t10 (degree celsius) 275.00

mc = 0.0164317 kg/sec
mk = 0.0819473 kg/sec
ms = 0.001162 kg/sec
m = 0.099541 kg/sec
p = 98296.2 pascal
t = 823 degree kelvin
tj = 299 degree kelvin
t5 = 543 degree kelvin
t6 = 546 degree kelvin
t7 = 559 degree kelvin
t8 = 641 degree kelvin
t9 = 536 degree kelvin
t10= 548 degree kelvin
ro = 0.4162 kg/cubic meter
roj= 1.1455 kg/cubic meter
v = 8.85 meter/sec
msj= 0.0005805 kg/sec
vj = 12.76 meter/sec
dr = 2.75 density ratio
j = 5.7 momentum ratio
fr = 7327 froude number
sr = 3.05 spacing ratio

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	775.00	766.00	741.00	751.00	744.00
2	95	20	783.00	778.00	759.00	769.00	765.00
3	95	40	789.00	791.00	781.00	788.00	781.00
4	95	60	796.00	795.00	782.00	791.00	787.00
5	95	80	802.00	803.00	795.00	795.00	790.00
6	95	100	802.00	803.00	798.00	806.00	796.00
7	95	120	795.00	798.00	792.00	802.00	798.00
8	95	140	788.00	785.00	781.00	789.00	788.00
9	95	160	780.00	771.00	766.00	779.00	788.00
10	95	180	768.00	754.00	751.00	766.00	785.00
11	85	0	790.00	791.00	775.00	783.00	778.00
12	85	20	806.00	806.00	792.00	795.00	789.00
13	85	40	803.00	806.00	800.00	803.00	793.00

14	85	60	800.00	808.00	802.00	807.00	793.00	
15	85	80	792.00	795.00	786.00	795.00	792.00	
16	85	100	770.00	773.00	771.00	785.00	778.00	
17	85	120	756.00	753.00	747.00	761.00	765.00	
18	85	140	741.00	731.00	727.00	743.00	757.00	rdg.
19	85	160	732.00	717.00	716.00	729.00	747.00	122.c
20	85	180	723.00	708.00	709.00	722.00	743.00	
21	75	0	802.00	803.00	786.00	792.00	783.00	
22	75	20	805.00	809.00	799.00	803.00	790.00	
23	75	40	809.00	811.00	803.00	808.00	798.00	
24	75	60	783.00	790.00	780.00	790.00	784.00	
25	75	80	748.00	760.00	754.00	763.00	765.00	
26	75	100	726.00	725.00	727.00	742.00	739.00	
27	75	120	712.00	708.00	713.00	720.00	719.00	
28	75	140	696.00	691.00	697.00	709.00	714.00	
29	75	160	688.00	682.00	687.00	695.00	707.00	
30	75	180	687.00	676.00	679.00	689.00	704.00	
31	65	0	809.00	810.00	802.00	808.00	792.00	
32	65	20	809.00	814.00	809.00	809.00	796.00	
33	65	40	785.00	802.00	789.00	799.00	794.00	
34	65	60	733.00	758.00	743.00	758.00	757.00	
35	65	80	705.00	719.00	718.00	726.00	722.00	
36	65	100	686.00	691.00	698.00	707.00	698.00	
37	65	120	682.00	682.00	686.00	688.00	685.00	
38	65	140	673.00	671.00	677.00	678.00	681.00	
39	65	160	667.00	662.00	668.00	673.00	684.00	
40	65	180	664.00	656.00	665.00	671.00	683.00	
41	55	0	812.00	819.00	817.00	820.00	807.00	
42	55	20	810.00	814.00	812.00	809.00	800.00	
43	55	40	694.00	763.00	724.00	752.00	761.00	
44	55	60	678.00	702.00	698.00	703.00	711.00	
45	55	80	672.00	686.00	688.00	690.00	679.00	
46	55	100	666.00	673.00	678.00	676.00	664.00	
47	55	120	663.00	665.00	668.00	663.00	660.00	
48	55	140	655.00	656.00	660.00	655.00	662.00	
49	55	160	651.00	648.00	650.00	653.00	660.00	
50	55	180	646.00	643.00	648.00	654.00	663.00	
51	45	0	820.00	822.00	809.00	813.00	805.00	
52	45	20	808.00	812.00	808.00	809.00	798.00	
53	45	40	619.00	712.00	656.00	666.00	706.00	
54	45	60	660.00	680.00	674.00	666.00	670.00	
55	45	80	664.00	672.00	671.00	668.00	656.00	
56	45	100	660.00	663.00	662.00	656.00	647.00	
57	45	120	653.00	654.00	653.00	646.00	645.00	
58	45	140	644.00	640.00	641.00	638.00	643.00	
59	35	0	811.00	824.00	817.00	820.00	812.00	
60	35	20	794.00	794.00	779.00	795.00	786.00	
61	35	40	366.00	682.00	648.00	632.00	662.00	
62	35	60	659.00	668.00	663.00	656.00	651.00	
63	35	80	662.00	667.00	662.00	654.00	644.00	
64	35	100	653.00	654.00	653.00	645.00	638.00	
65	35	120	642.00	639.00	638.00	632.00	632.00	
66	25	0	809.00	816.00	808.00	808.00	799.00	
67	25	20	777.00	500.00	734.00	768.00	761.00	
68	25	40	663.00	668.00	660.00	643.00	652.00	
69	25	60	669.00	670.00	659.00	653.00	646.00	
70	25	80	662.00	661.00	654.00	645.00	638.00	
71	25	100	642.00	637.00	636.00	627.00	624.00	
72	15	0	788.00	802.00	801.00	795.00	782.00	
73	15	20	652.00	745.00	655.00	664.00	645.00	
74	15	40	689.00	679.00	664.00	658.00	651.00	
75	15	60	673.00	671.00	660.00	653.00	647.00	
76	15	80	645.00	647.00	644.00	636.00	632.00	

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file requested 123.c
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comb. press. - pr (mm water gage) 21.00
cross flow temp. - tr (degree celsius) 550.00
comb. air flow rate - mcr (mm water diff.) 30.00
cool air flow rate - mkr (mm water diff.) 77.00
natural gas flow rate - mgr (mm water diff.) 15.00
natural gas total press. - pggr (psi gage) 0.00
air total press. - psar (mm water gage) 0.00
jet temp. - tjr (degree celsius) 28.00
single jet flow rate - mgjr (s.c.f.m.) 1.45
wall temp. - t5 (degree celsius) 264.00
wall temp. - t6 (degree celsius) 273.00
wall temp. - t7 (degree celsius) 284.00
wall temp. - t8 (degree celsius) 365.00
wall temp. - t9 (degree celsius) 364.00
wall temp. - t10 (degree celsius) 276.00

mc = 0.0164317 kg/sec
mk = 0.0824847 kg/sec
mg = 0.001162 kg/sec
m = 0.100078 kg/sec
p = 98306 pascal
t = 823 degree kelvin
tj = 301 degree kelvin
t5 = 537 degree kelvin
t6 = 546 degree kelvin
t7 = 557 degree kelvin
t8 = 638 degree kelvin
t9 = 637 degree kelvin
t10= 549 degree kelvin
ro = 0.4162 kg/cubic meter
roj= 1.1380 kg/cubic meter
v = 8.90 meter/sec
mgj= 0.0007584 kg/sec
vj = 16.77 meter/sec
dr = 2.73 density ratio
j = 9.7 momentum ratio
fr = 12717 froude number
sr = 3.05 spacing ratio

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	772.00	764.00	739.00	753.00	751.00
2	95	20	788.00	784.00	768.00	773.00	771.00
3	95	40	799.00	797.00	780.00	787.00	782.00
4	95	60	801.00	800.00	792.00	801.00	795.00
5	95	80	799.00	805.00	796.00	806.00	797.00
6	95	100	784.00	784.00	780.00	793.00	790.00
7	95	120	786.00	787.00	785.00	793.00	794.00
8	95	140	775.00	770.00	767.00	782.00	784.00
9	95	160	762.00	750.00	751.00	770.00	779.00
10	95	180	752.00	737.00	745.00	762.00	779.00
11	85	0	791.00	786.00	767.00	772.00	767.00
12	85	20	803.00	808.00	789.00	797.00	788.00
13	85	40	801.00	804.00	800.00	805.00	796.00

14	85	60	786.00	796.00	783.00	796.00	789.00	
15	85	80	763.00	772.00	767.00	782.00	777.00	
16	85	100	742.00	745.00	746.00	757.00	752.00	
17	85	120	728.00	725.00	730.00	741.00	742.00	
18	85	140	715.00	710.00	718.00	730.00	733.00	
19	85	160	707.00	697.00	703.00	712.00	721.00	rdg.
20	85	180	703.00	691.00	696.00	707.00	720.00	123.c
21	75	0	805.00	807.00	793.00	798.00	785.00	
22	75	20	807.00	809.00	799.00	804.00	793.00	
23	75	40	799.00	810.00	801.00	809.00	798.00	
24	75	60	730.00	756.00	743.00	760.00	756.00	
25	75	80	708.00	724.00	447.00	735.00	734.00	
26	75	100	691.00	698.00	706.00	713.00	706.00	
27	75	120	684.00	690.00	695.00	700.00	692.00	
28	75	140	676.00	676.00	685.00	688.00	687.00	
29	75	160	671.00	669.00	676.00	680.00	682.00	
30	75	180	671.00	662.00	668.00	674.00	684.00	
31	65	0	810.00	814.00	807.00	811.00	800.00	
32	65	20	810.00	815.00	805.00	810.00	799.00	
33	65	40	725.00	783.00	751.00	777.00	779.00	
34	65	60	680.00	710.00	696.00	710.00	720.00	
35	65	80	671.00	687.00	692.00	694.00	689.00	
36	65	100	668.00	677.00	682.00	684.00	674.00	
37	65	120	664.00	671.00	677.00	675.00	666.00	
38	65	140	662.00	665.00	669.00	665.00	662.00	
39	65	160	657.00	655.00	659.00	657.00	662.00	
40	65	180	655.00	650.00	654.00	657.00	667.00	
41	55	0	819.00	822.00	813.00	812.00	802.00	
42	55	20	813.00	819.00	814.00	813.00	802.00	
43	55	40	627.00	720.00	655.00	680.00	714.00	
44	55	60	654.00	679.00	671.00	667.00	677.00	
45	55	80	659.00	672.00	672.00	667.00	662.00	
46	55	100	659.00	666.00	666.00	662.00	651.00	
47	55	120	656.00	660.00	660.00	654.00	647.00	
48	55	140	651.00	651.00	651.00	646.00	646.00	
49	55	160	645.00	643.00	645.00	643.00	647.00	
50	55	180	643.00	637.00	639.00	642.00	650.00	
51	45	0	814.00	820.00	810.00	817.00	804.00	
52	45	20	808.00	810.00	796.00	806.00	795.00	
53	45	40	610.00	689.00	626.00	628.00	663.00	
54	45	60	656.00	669.00	661.00	650.00	653.00	
55	45	80	659.00	667.00	662.00	655.00	647.00	
56	45	100	658.00	662.00	659.00	652.00	643.00	
57	45	120	650.00	651.00	647.00	637.00	633.00	
58	45	140	643.00	639.00	637.00	631.00	634.00	
59	35	0	818.00	824.00	819.00	818.00	804.00	
60	35	20	793.00	797.00	766.00	786.00	780.00	
61	35	40	653.00	670.00	645.00	632.00	647.00	
62	35	60	662.00	666.00	658.00	651.00	646.00	
63	35	80	664.00	666.00	658.00	652.00	644.00	
64	35	100	659.00	657.00	648.00	639.00	631.00	
65	35	120	642.00	637.00	635.00	627.00	626.00	
66	25	0	809.00	817.00	812.00	810.00	798.00	
67	25	20	743.00	767.00	695.00	736.00	726.00	
68	25	40	679.00	670.00	659.00	651.00	646.00	
69	25	60	672.00	672.00	661.00	657.00	649.00	
70	25	80	668.00	664.00	654.00	647.00	641.00	
71	25	100	650.00	643.00	636.00	627.00	622.00	
72	15	0	794.00	806.00	803.00	798.00	784.00	
73	15	20	695.00	748.00	661.00	689.00	665.00	
74	15	40	700.00	680.00	661.00	660.00	650.00	
75	15	60	682.00	678.00	665.00	657.00	650.00	
76	15	80	652.00	651.00	647.00	638.00	634.00	

file requested

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124.c
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comb. press. - pr (mm water gage) 14.00
cross flow temp. - tr (degree celsius) 553.00
comb. air flow rate - mcr (mm water diff.) 20.00
cool air flow rate - mkr (mm water diff.) 49.00
natural gas flow rate - msr (mm water diff.) 10.00
natural gas total press. - pssr (psi gage) 0.00
air total press. - psar (mm water gage) 0.00
jet temp. - tjr (degree celsius) 29.00
single jet flow rate - msjr (s.c.f.m.) 1.27
wall temp. - t5 (degree celsius) 263.00
wall temp. - t6 (degree celsius) 272.00
wall temp. - t7 (degree celsius) 277.00
wall temp. - t8 (degree celsius) 358.00
wall temp. - t9 (degree celsius) 255.00
wall temp. - t10 (degree celsius) 272.00

mc = 0.0134164 kg/sec
mk = 0.0658000 kg/sec
ms = 0.000949 kg/sec
m = 0.080165 kg/sec
p = 98237.3 pascal
t = 826 degree kelvin
tj = 302 degree kelvin
t5 = 536 degree kelvin
t6 = 545 degree kelvin
t7 = 550 degree kelvin
t8 = 631 degree kelvin
t9 = 528 degree kelvin
t10= 545 degree kelvin
ro = 0.4144 kg/cubic meter
roj= 1.1334 kg/cubic meter
v = 7.16 meter/sec
msj= 0.0006668 kg/sec
vj = 14.81 meter/sec
dr = 2.74 density ratio
j = 11.7 momentum ratio
fr = 9910 froude number
sr = 3.05 spacing ratio

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	784.00	776.00	745.00	760.00	754.00
2	95	20	791.00	786.00	772.00	779.00	775.00
3	95	40	801.00	800.00	785.00	789.00	784.00
4	95	60	804.00	807.00	790.00	798.00	789.00
5	95	80	796.00	802.00	793.00	808.00	802.00
6	95	100	786.00	789.00	787.00	803.00	792.00
7	95	120	776.00	778.00	778.00	794.00	791.00
8	95	140	766.00	762.00	763.00	783.00	782.00
9	95	160	753.00	744.00	746.00	761.00	772.00
10	95	180	743.00	727.00	738.00	760.00	775.00
11	85	0	801.00	797.00	779.00	787.00	778.00
12	85	20	801.00	804.00	791.00	796.00	789.00
13	85	40	805.00	811.00	803.00	804.00	795.00

14	85	60	782.00	793.00	780.00	797.00	792.00	
15	85	80	745.00	758.00	759.00	778.00	775.00	
16	85	100	724.00	732.00	742.00	761.00	755.00	
17	85	120	715.00	716.00	722.00	743.00	743.00	
18	85	140	705.00	702.00	710.00	725.00	726.00	
19	85	160	693.00	688.00	700.00	715.00	725.00	rdg.
20	85	180	692.00	682.00	690.00	711.00	728.00	124.c
21	75	0	811.00	809.00	795.00	805.00	795.00	
22	75	20	804.00	809.00	801.00	804.00	795.00	
23	75	40	789.00	809.00	796.00	804.00	795.00	
24	75	60	712.00	746.00	735.00	765.00	767.00	
25	75	80	692.00	711.00	715.00	729.00	722.00	
26	75	100	679.00	689.00	701.00	708.00	702.00	
27	75	120	673.00	679.00	691.00	700.00	689.00	
28	75	140	670.00	672.00	681.00	689.00	688.00	
29	75	160	665.00	665.00	675.00	680.00	683.00	
30	75	180	666.00	658.00	666.00	676.00	685.00	
31	65	0	812.00	815.00	802.00	804.00	794.00	
32	65	20	810.00	816.00	805.00	809.00	796.00	
33	65	40	704.00	766.00	734.00	764.00	770.00	
34	65	60	667.00	703.00	691.00	704.00	710.00	
35	65	80	661.00	679.00	683.00	686.00	683.00	
36	65	100	659.00	672.00	678.00	679.00	671.00	
37	65	120	656.00	664.00	670.00	672.00	667.00	
38	65	140	653.00	657.00	665.00	663.00	662.00	
39	65	160	651.00	653.00	661.00	662.00	665.00	
40	65	180	649.00	647.00	654.00	659.00	668.00	
41	55	0	816.00	821.00	809.00	812.00	796.00	
42	55	20	809.00	815.00	807.00	806.00	796.00	
43	55	40	615.00	705.00	644.00	673.00	701.00	
44	55	60	644.00	669.00	664.00	662.00	669.00	
45	55	80	649.00	663.00	664.00	662.00	659.00	
46	55	100	649.00	658.00	661.00	659.00	651.00	
47	55	120	650.00	657.00	659.00	655.00	648.00	
48	55	140	646.00	648.00	650.00	646.00	646.00	
49	55	160	642.00	640.00	645.00	642.00	649.00	
50	55	180	638.00	635.00	641.00	643.00	651.00	
51	45	0	807.00	804.00	531.00	805.00	794.00	
52	45	20	794.00	797.00	782.00	794.00	784.00	
53	45	40	618.00	670.00	626.00	620.00	650.00	
54	45	60	640.00	660.00	651.00	642.00	645.00	
55	45	80	650.00	657.00	654.00	649.00	644.00	
56	45	100	649.00	654.00	651.00	645.00	638.00	
57	45	120	644.00	645.00	643.00	637.00	634.00	
58	45	140	634.00	633.00	634.00	628.00	632.00	
59	35	0	803.00	812.00	807.00	805.00	793.00	
60	35	20	769.00	766.00	724.00	758.00	760.00	
61	35	40	647.00	655.00	639.00	625.00	636.00	
62	35	60	653.00	658.00	650.00	646.00	642.00	
63	35	80	656.00	658.00	650.00	644.00	637.00	
64	35	100	647.00	648.00	644.00	638.00	632.00	
65	35	120	633.00	630.00	631.00	624.00	625.00	
66	25	0	797.00	804.00	797.00	798.00	786.00	
67	25	20	724.00	756.00	673.00	719.00	707.00	
68	25	40	667.00	657.00	647.00	643.00	638.00	
69	25	60	663.00	662.00	652.00	649.00	644.00	
70	25	80	658.00	656.00	647.00	642.00	638.00	
71	25	100	640.00	634.00	630.00	625.00	622.00	
72	15	0	776.00	788.00	787.00	783.00	770.00	
73	15	20	685.00	740.00	646.00	671.00	639.00	
74	15	40	689.00	674.00	653.00	659.00	645.00	
75	15	60	674.00	669.00	657.00	652.00	646.00	
76	15	80	639.00	639.00	638.00	633.00	631.00	

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file requested                         125.c
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comb. press. - pr (mm water gage)      26.00
cross flow temp. - tr (degree celsius)    368.00
comb. air flow rate - mcr (mm water diff.)      30.00
cool air flow rate - mkr (mm water diff.)    154.00
natural gas flow rate - mgr (mm water diff.)      15.00
natural gas total press. - psgr (psi gage)       0.00
air total press. - psar (mm water gage)       0.00
jet temp. - tjr (degree celsius)      25.00
single jet flow rate - msjr (s.c.f.m.)       1.32
wall temp. - t5 (degree celsius)     190.00
wall temp. - t6 (degree celsius)     223.00
wall temp. - t7 (degree celsius)     229.00
wall temp. - t8 (degree celsius)     284.00
wall temp. - t9 (degree celsius)     197.00
wall temp. - t10 (degree celsius)     204.00


mc = 0.0164317 kg/sec
mk = 0.1166509 kg/sec
mg = 0.001162 kg/sec
m  = 0.134244 kg/sec
p  = 98355.1 pascal
t  = 641 degree kelvin
tj = 298 degree kelvin
t5 = 463 degree kelvin
t6 = 496 degree kelvin
t7 = 502 degree kelvin
t8 = 557 degree kelvin
t9 = 470 degree kelvin
t10= 477 degree kelvin
ro = 0.5346 kg/cubic meter
roj= 1.1500 kg/cubic meter
v  = 9.29 meter/sec
msj= 0.0006904 kg/sec
vj = 15.11 meter/sec
dr = 2.15 density ratio
j  = 5.7 momentum ratio
fr =   12232 froude number
sr =  6.10 spacing ratio
```

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	603.00	599.00	586.00	595.00	595.00
2	95	20	616.00	615.00	605.00	612.00	612.00
3	95	40	616.00	618.00	613.00	620.00	618.00
4	95	60	614.00	616.00	614.00	619.00	617.00
5	95	80	620.00	622.00	618.00	621.00	621.00
6	95	100	615.00	620.00	617.00	626.00	623.00
7	95	120	615.00	622.00	618.00	628.00	626.00
8	95	140	615.00	620.00	616.00	626.00	624.00
9	95	160	614.00	620.00	614.00	624.00	626.00
10	95	180	610.00	615.00	612.00	620.00	623.00
11	85	0	619.00	618.00	608.00	616.00	615.00
12	85	20	624.00	625.00	620.00	625.00	624.00
13	85	40	624.00	625.00	622.00	627.00	625.00

14	85	60	626.00	626.00	624.00	631.00	628.00	
15	85	80	628.00	627.00	622.00	633.00	628.00	
16	85	100	621.00	622.00	615.00	627.00	624.00	
17	85	120	602.00	610.00	607.00	617.00	615.00	
18	85	140	608.00	615.00	610.00	619.00	616.00	rdg.
19	85	160	603.00	611.00	608.00	614.00	615.00	125.c
20	85	180	604.00	609.00	606.00	613.00	613.00	
21	75	0	629.00	630.00	620.00	625.00	625.00	
22	75	20	632.00	633.00	629.00	633.00	631.00	
23	75	40	637.00	637.00	633.00	637.00	635.00	
24	75	60	634.00	629.00	621.00	633.00	628.00	
25	75	80	619.00	617.00	609.00	625.00	617.00	
26	75	100	606.00	611.00	606.00	618.00	608.00	
27	75	120	603.00	612.00	609.00	614.00	607.00	
28	75	140	599.00	606.00	604.00	606.00	603.00	
29	75	160	601.00	607.00	602.00	605.00	604.00	
30	75	180	597.00	601.00	599.00	604.00	605.00	
31	65	0	633.00	633.00	626.00	632.00	629.00	
32	65	20	638.00	640.00	640.00	643.00	640.00	
33	65	40	642.00	641.00	633.00	641.00	636.00	
34	65	60	626.00	615.00	609.00	633.00	621.00	
35	65	80	610.00	607.00	600.00	610.00	604.00	
36	65	100	600.00	610.00	607.00	611.00	598.00	
37	65	120	597.00	606.00	605.00	603.00	599.00	
38	65	140	599.00	604.00	602.00	601.00	599.00	
39	65	160	595.00	598.00	597.00	597.00	598.00	
40	65	180	594.00	596.00	596.00	598.00	599.00	
41	55	0	642.00	645.00	642.00	647.00	645.00	
42	55	20	644.00	646.00	643.00	647.00	644.00	
43	55	40	638.00	616.00	600.00	642.00	638.00	
44	55	60	619.00	599.00	594.00	628.00	605.00	
45	55	80	600.00	602.00	601.00	613.00	595.00	
46	55	100	596.00	607.00	607.00	602.00	595.00	
47	55	120	599.00	607.00	604.00	598.00	594.00	
48	55	140	596.00	600.00	597.00	595.00	596.00	
49	55	160	594.00	595.00	592.00	591.00	591.00	
50	55	180	591.00	591.00	590.00	590.00	591.00	
51	45	0	650.00	651.00	646.00	649.00	645.00	
52	45	20	652.00	653.00	651.00	654.00	648.00	
53	45	40	641.00	587.00	570.00	641.00	626.00	
54	45	60	613.00	590.00	590.00	622.00	594.00	
55	45	80	601.00	606.00	606.00	606.00	590.00	
56	45	100	596.00	605.00	605.00	598.00	596.00	
57	45	120	598.00	604.00	600.00	595.00	595.00	
58	45	140	597.00	596.00	590.00	587.00	589.00	
59	35	0	652.00	658.00	655.00	657.00	652.00	
60	35	20	651.00	644.00	637.00	651.00	648.00	
61	35	40	642.00	576.00	571.00	638.00	613.00	
62	35	60	618.00	601.00	603.00	621.00	594.00	
63	35	80	607.00	610.00	611.00	603.00	595.00	
64	35	100	600.00	606.00	603.00	596.00	595.00	
65	35	120	602.00	600.00	593.00	590.00	591.00	
66	25	0	657.00	660.00	655.00	657.00	654.00	
67	25	20	635.00	618.00	605.00	644.00	645.00	
68	25	40	640.00	588.00	578.00	636.00	616.00	
69	25	60	625.00	606.00	610.00	622.00	603.00	
70	25	80	612.00	610.00	612.00	605.00	598.00	
71	25	100	605.00	603.00	600.00	589.00	587.00	
72	15	0	655.00	659.00	657.00	656.00	652.00	
73	15	20	641.00	613.00	573.00	638.00	641.00	
74	15	40	637.00	609.00	601.00	635.00	622.00	
75	15	60	629.00	617.00	621.00	623.00	608.00	
76	15	80	608.00	600.00	609.00	603.00	596.00	

file requested **********
126.c
****

comb. press. - pr (mm water gage) 28.00
cross flow temp. - tr (degree celsius) 371.00
comb. air flow rate - mcr (mm water diff.) 30.00
cool air flow rate - mkr (mm water diff.) 158.00
natural gas flow rate - mgr (mm water diff.) 15.00
natural gas total press. - pggr (psi gage) 0.00
air total press. - pgar (mm water gage) 0.00
jet temp. - tjr (degree celsius) 27.00
single jet flow rate - mgjr (s.c.f.m.) 1.74
wall temp. - t5 (degree celsius) 206.00
wall temp. - t6 (degree celsius) 235.00
wall temp. - t7 (degree celsius) 246.00
wall temp. - t8 (degree celsius) 300.00
wall temp. - t9 (degree celsius) 216.00
wall temp. - t10 (degree celsius) 215.00

mc = 0.0164317 kg/sec
mk = 0.1181562 kg/sec
mg = 0.001162 kg/sec
m = 0.135750 kg/sec
p = 98374.7 pascal
t = 644 degree kelvin
tj = 300 degree kelvin
t5 = 479 degree kelvin
t6 = 508 degree kelvin
t7 = 519 degree kelvin
t8 = 573 degree kelvin
t9 = 489 degree kelvin
t10= 488 degree kelvin
ro = 0.5322 kg/cubic meter
roj= 1.1426 kg/cubic meter
v = 9.44 meter/sec
mgj= 0.0009100 kg/sec
vj = 20.05 meter/sec
dr = 2.15 density ratio
j = 9.7 momentum ratio
fr = 21571 froude number
sr = 6.10 spacing ratio

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	604.00	601.00	593.00	602.00	602.00
2	95	20	611.00	609.00	601.00	606.00	605.00
3	95	40	615.00	614.00	611.00	617.00	619.00
4	95	60	616.00	618.00	610.00	617.00	618.00
5	95	80	614.00	615.00	610.00	620.00	619.00
6	95	100	613.00	618.00	611.00	624.00	619.00
7	95	120	608.00	616.00	610.00	620.00	615.00
8	95	140	602.00	611.00	607.00	616.00	614.00
9	95	160	579.00	596.00	598.00	609.00	612.00
10	95	180	595.00	603.00	603.00	610.00	610.00
11	85	0	614.00	613.00	603.00	608.00	608.00
12	85	20	620.00	619.00	615.00	622.00	621.00
13	85	40	625.00	626.00	620.00	625.00	622.00

14	85	60	621.00	620.00	615.00	627.00	623.00	
15	85	80	611.00	610.00	602.00	617.00	611.00	
16	85	100	603.00	609.00	602.00	616.00	610.00	
17	85	120	571.00	590.00	592.00	605.00	600.00	
18	85	140	577.00	594.00	595.00	601.00	599.00	rdg.
19	85	160	594.00	600.00	597.00	603.00	601.00	126.c
20	85	180	589.00	596.00	596.00	603.00	602.00	
21	75	0	628.00	628.00	621.00	626.00	623.00	
22	75	20	634.00	635.00	629.00	632.00	630.00	
23	75	40	633.00	631.00	624.00	635.00	631.00	
24	75	60	621.00	611.00	601.00	626.00	616.00	
25	75	80	600.00	601.00	594.00	615.00	601.00	
26	75	100	567.00	589.00	592.00	604.00	594.00	
27	75	120	563.00	583.00	592.00	598.00	594.00	
28	75	140	567.00	585.00	593.00	595.00	592.00	
29	75	160	567.00	583.00	590.00	595.00	595.00	
30	75	180	585.00	592.00	590.00	593.00	593.00	
31	65	0	631.00	632.00	625.00	632.00	631.00	
32	65	20	637.00	638.00	633.00	639.00	635.00	
33	65	40	631.00	615.00	597.00	633.00	626.00	
34	65	60	608.00	591.00	584.00	621.00	598.00	
35	65	80	588.00	591.00	590.00	608.00	588.00	
36	65	100	588.00	599.00	599.00	600.00	590.00	
37	65	120	589.00	597.00	597.00	595.00	591.00	
38	65	140	590.00	596.00	597.00	594.00	591.00	
39	65	160	591.00	595.00	594.00	592.00	591.00	
40	65	180	589.00	591.00	588.00	588.00	588.00	
41	55	0	638.00	640.00	636.00	643.00	640.00	
42	55	20	639.00	640.00	636.00	640.00	637.00	
43	55	40	631.00	588.00	563.00	632.00	619.00	
44	55	60	604.00	583.00	581.00	614.00	587.00	
45	55	80	588.00	591.00	592.00	600.00	587.00	
46	55	100	587.00	599.00	600.00	594.00	592.00	
47	55	120	590.00	598.00	597.00	591.00	589.00	
48	55	140	595.00	596.00	593.00	588.00	585.00	
49	55	160	589.00	591.00	589.00	586.00	586.00	
50	55	180	586.00	585.00	582.00	583.00	584.00	
51	45	0	643.00	645.00	641.00	645.00	643.00	
52	45	20	642.00	639.00	631.00	643.00	640.00	
53	45	40	631.00	567.00	557.00	626.00	607.00	
54	45	60	603.00	587.00	589.00	611.00	585.00	
55	45	80	593.00	600.00	603.00	599.00	591.00	
56	45	100	592.00	601.00	601.00	592.00	591.00	
57	45	120	594.00	600.00	596.00	590.00	589.00	
58	45	140	590.00	590.00	587.00	586.00	586.00	
59	35	0	646.00	650.00	648.00	652.00	649.00	
60	35	20	641.00	621.00	602.00	642.00	643.00	
61	35	40	635.00	571.00	568.00	626.00	602.00	
62	35	60	606.00	596.00	598.00	609.00	592.00	
63	35	80	602.00	608.00	609.00	602.00	596.00	
64	35	100	598.00	605.00	601.00	594.00	593.00	
65	35	120	594.00	592.00	589.00	586.00	586.00	
66	25	0	652.00	655.00	650.00	651.00	647.00	
67	25	20	641.00	613.00	570.00	638.00	644.00	
68	25	40	640.00	600.00	586.00	631.00	613.00	
69	25	60	626.00	615.00	615.00	617.00	603.00	
70	25	80	613.00	612.00	611.00	604.00	601.00	
71	25	100	602.00	601.00	597.00	591.00	588.00	
72	15	0	646.00	650.00	649.00	650.00	645.00	
73	15	20	640.00	616.00	540.00	630.00	634.00	
74	15	40	634.00	616.00	608.00	634.00	626.00	
75	15	60	623.00	615.00	617.00	621.00	613.00	
76	15	80	607.00	602.00	608.00	603.00	596.00	

****
file requested 127.c
****

comb. press. - pr (mm water gage) 28.00
cross flow temp. - tr (degree celsius) 370.00
comb. air flow rate - mcr (mm water diff.) 30.00
cool air flow rate - mkr (mm water diff.) 158.00
natural gas flow rate - mgr (mm water diff.) 15.00
natural gas total press. - pgsr (psi gage) 0.00
air total press. - psar (mm water gage) 0.00
jet temp. - tjr (degree celsius) 27.00
single jet flow rate - msjr (s.c.f.m.) 1.91
wall temp. - t5 (degree celsius) 200.00
wall temp. - t6 (degree celsius) 232.00
wall temp. - t7 (degree celsius) 244.00
wall temp. - t8 (degree celsius) 299.00
wall temp. - t9 (degree celsius) 218.00
wall temp. - t10 (degree celsius) 217.00

mc = 0.0164317 kg/sec
mk = 0.1181562 kg/sec
mg = 0.001162 kg/sec
m = 0.135750 kg/sec
p = 98374.7 pascal
t = 643 degree kelvin
tj = 300 degree kelvin
t5 = 473 degree kelvin
t6 = 505 degree kelvin
t7 = 517 degree kelvin
t8 = 572 degree kelvin
t9 = 491 degree kelvin
t10= 490 degree kelvin
ro = 0.5331 kg/cubic meter
roj= 1.1426 kg/cubic meter
v = 9.42 meter/sec
msj= 0.0009989 kg/sec
vj = 22.01 meter/sec
dr = 2.14 density ratio
j = 11.7 momentum ratio
fr = 26027 froude number
sr = 6.10 spacing ratio

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	606.00	603.00	591.00	597.00	600.00
2	95	20	609.00	606.00	598.00	606.00	609.00
3	95	40	619.00	620.00	612.00	616.00	618.00
4	95	60	618.00	616.00	609.00	616.00	616.00
5	95	80	616.00	619.00	615.00	623.00	621.00
6	95	100	605.00	613.00	606.00	618.00	615.00
7	95	120	605.00	615.00	608.00	618.00	613.00
8	95	140	600.00	609.00	603.00	613.00	610.00
9	95	160	597.00	606.00	605.00	614.00	613.00
10	95	180	594.00	603.00	601.00	609.00	610.00
11	85	0	617.00	616.00	608.00	617.00	616.00
12	85	20	619.00	621.00	613.00	618.00	619.00
13	85	40	606.00	615.00	615.00	625.00	626.00

14	85	60	603.00	609.00	608.00	624.00	620.00	
15	85	80	609.00	611.00	602.00	622.00	612.00	
16	85	100	597.00	606.00	600.00	615.00	605.00	
17	85	120	593.00	604.00	601.00	609.00	601.00	
18	85	140	595.00	605.00	601.00	608.00	602.00	rdg.
19	85	160	593.00	600.00	598.00	602.00	599.00	127.c
20	85	180	589.00	597.00	596.00	600.00	599.00	
21	75	0	625.00	625.00	616.00	624.00	622.00	
22	75	20	628.00	631.00	627.00	633.00	632.00	
23	75	40	634.00	630.00	622.00	636.00	633.00	
24	75	60	616.00	606.00	597.00	626.00	609.00	
25	75	80	598.00	600.00	595.00	616.00	598.00	
26	75	100	588.00	599.00	597.00	607.00	592.00	
27	75	120	587.00	598.00	598.00	599.00	593.00	
28	75	140	590.00	599.00	598.00	598.00	594.00	
29	75	160	590.00	597.00	597.00	596.00	593.00	
30	75	180	588.00	594.00	591.00	593.00	591.00	
31	65	0	631.00	631.00	625.00	631.00	630.00	
32	65	20	631.00	635.00	632.00	636.00	634.00	
33	65	40	635.00	609.00	587.00	635.00	626.00	
34	65	60	606.00	589.00	584.00	620.00	593.00	
35	65	80	591.00	596.00	594.00	606.00	588.00	
36	65	100	585.00	597.00	600.00	599.00	590.00	
37	65	120	587.00	595.00	598.00	595.00	592.00	
38	65	140	591.00	596.00	596.00	593.00	592.00	
39	65	160	591.00	593.00	594.00	592.00	592.00	
40	65	180	586.00	587.00	589.00	588.00	588.00	
41	55	0	637.00	641.00	635.00	639.00	636.00	
42	55	20	643.00	644.00	638.00	641.00	637.00	
43	55	40	630.00	578.00	556.00	629.00	611.00	
44	55	60	599.00	583.00	585.00	613.00	585.00	
45	55	80	588.00	596.00	599.00	600.00	587.00	
46	55	100	585.00	596.00	601.00	594.00	592.00	
47	55	120	591.00	596.00	599.00	593.00	591.00	
48	55	140	593.00	596.00	594.00	589.00	588.00	
49	55	160	588.00	590.00	588.00	586.00	587.00	
50	55	180	587.00	588.00	583.00	583.00	585.00	
51	45	0	646.00	648.00	644.00	647.00	644.00	
52	45	20	643.00	642.00	635.00	647.00	644.00	
53	45	40	631.00	567.00	559.00	625.00	602.00	
54	45	60	592.00	581.00	588.00	607.00	583.00	
55	45	80	595.00	602.00	605.00	598.00	591.00	
56	45	100	596.00	606.00	603.00	594.00	592.00	
57	45	120	594.00	598.00	596.00	590.00	590.00	
58	45	140	590.00	591.00	587.00	585.00	585.00	
59	35	0	651.00	653.00	647.00	651.00	650.00	
60	35	20	639.00	620.00	603.00	640.00	643.00	
61	35	40	635.00	571.00	569.00	627.00	608.00	
62	35	60	617.00	606.00	608.00	614.00	596.00	
63	35	80	600.00	606.00	609.00	601.00	598.00	
64	35	100	598.00	605.00	604.00	598.00	598.00	
65	35	120	596.00	594.00	591.00	588.00	589.00	
66	25	0	652.00	656.00	652.00	653.00	649.00	
67	25	20	646.00	615.00	579.00	636.00	641.00	
68	25	40	641.00	606.00	591.00	635.00	615.00	
69	25	60	624.00	615.00	617.00	618.00	608.00	
70	25	80	611.00	613.00	611.00	604.00	601.00	
71	25	100	605.00	602.00	598.00	591.00	589.00	
72	15	0	650.00	653.00	652.00	652.00	649.00	
73	15	20	640.00	618.00	539.00	636.00	641.00	
74	15	40	637.00	623.00	615.00	637.00	631.00	
75	15	60	629.00	621.00	623.00	622.00	612.00	
76	15	80	611.00	604.00	609.00	603.00	596.00	

file requested

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128.c
****

comb. press. - pr (mm water gage) 16.00
cross flow temp. - tr (degree celsius) 545.00
comb. air flow rate - mcr (mm water diff.) 30.00
cool air flow rate - mkr (mm water diff.) 71.00
natural gas flow rate - mgr (mm water diff.) 15.00
natural gas total press. - pggr (psi gage) 0.00
air total press. - psar (mm water gage) 0.00
jet temp. - tjr (degree celsius) 25.00
single jet flow rate - msjr (s.c.f.m.) 1.08
wall temp. - t5 (degree celsius) 259.00
wall temp. - t6 (degree celsius) 283.00
wall temp. - t7 (degree celsius) 292.00
wall temp. - t8 (degree celsius) 349.00
wall temp. - t9 (degree celsius) 246.00
wall temp. - t10 (degree celsius) 262.00

mc = 0.0164317 kg/sec
mk = 0.0792058 kg/sec
mg = 0.001162 kg/sec
m = 0.096799 kg/sec
p = 98257 pascal
t = 818 degree kelvin
tj = 298 degree kelvin
t5 = 532 degree kelvin
t6 = 556 degree kelvin
t7 = 565 degree kelvin
t8 = 622 degree kelvin
t9 = 519 degree kelvin
t10= 535 degree kelvin
ro = 0.4185 kg/cubic meter
roj= 1.1489 kg/cubic meter
v = 8.56 meter/sec
msj= 0.0005648 kg/sec
vj = 12.37 meter/sec
dr = 2.74 density ratio
j = 5.7 momentum ratio
fr = 6907 froude number
sr = 6.10 spacing ratio

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	771.00	763.00	737.00	745.00	743.00
2	95	20	793.00	789.00	772.00	781.00	778.00
3	95	40	798.00	795.00	781.00	791.00	781.00
4	95	60	804.00	806.00	797.00	805.00	800.00
5	95	80	806.00	811.00	796.00	807.00	802.00
6	95	100	799.00	807.00	790.00	807.00	808.00
7	95	120	793.00	804.00	783.00	802.00	797.00
8	95	140	784.00	795.00	770.00	795.00	802.00
9	95	160	774.00	785.00	762.00	784.00	787.00
10	95	180	757.00	773.00	755.00	777.00	793.00
11	85	0	799.00	797.00	780.00	786.00	778.00
12	85	20	802.00	803.00	788.00	794.00	787.00
13	85	40	803.00	805.00	796.00	803.00	793.00

S-4

14	85	60	807.00	809.00	798.00	805.00	796.00	
15	85	80	798.00	798.00	787.00	810.00	800.00	
16	85	100	781.00	783.00	764.00	797.00	786.00	
17	85	120	760.00	775.00	752.00	775.00	769.00	
18	85	140	748.00	768.00	750.00	773.00	768.00	
19	85	160	741.00	759.00	740.00	758.00	757.00	
20	85	180	733.00	749.00	733.00	755.00	758.00	rdg.
21	75	0	816.00	815.00	796.00	802.00	791.00	128.c
22	75	20	813.00	815.00	805.00	808.00	799.00	
23	75	40	813.00	816.00	804.00	810.00	801.00	
24	75	60	799.00	787.00	773.00	809.00	798.00	
25	75	80	775.00	767.00	749.00	795.00	773.00	
26	75	100	742.00	754.00	741.00	768.00	742.00	
27	75	120	732.00	755.00	743.00	755.00	734.00	
28	75	140	726.00	747.00	738.00	744.00	731.00	
29	75	160	724.00	739.00	727.00	733.00	727.00	
30	75	180	720.00	733.00	718.00	726.00	728.00	
31	65	0	811.00	815.00	808.00	814.00	804.00	
32	65	20	814.00	819.00	816.00	822.00	812.00	
33	65	40	807.00	798.00	780.00	815.00	804.00	
34	65	60	781.00	753.00	735.00	79[illegible].00	[illegible]9.00	
35	65	80	746.00	742.00	731.00	77[illegible].00	[illegible].00	
36	65	100	725.00	747.00	743.00	752.00	718.00	
37	65	120	720.00	742.00	739.00	731.00	710.00	
38	65	140	720.00	732.00	724.00	715.00	709.00	
39	65	160	717.00	726.00	713.00	7[illegible]2.00	[illegible]5.00	
40	65	180	712.00	717.00	704.00	769.00	[illegible]4.00	
41	55	0	816.00	821.00	816.00	821.00	814.00	
42	55	20	817.00	822.00	814.00	815.00	804.00	
43	55	40	527.00	749.00	712.00	803.00	788.00	
44	55	60	756.00	725.00	715.00	779.00	728.00	
45	55	80	729.00	732.00	732.00	754.00	705.00	
46	55	100	718.00	739.00	740.00	721.00	698.00	
47	55	120	718.00	733.00	725.00	707.00	698.00	
48	55	140	718.00	725.00	707.00	697.00	702.00	
49	55	160	710.00	710.00	696.00	695.00	702.00	
50	55	180	704.00	700.00	686.00	689.00	698.00	
51	45	0	821.00	826.00	819.00	822.00	814.00	
52	45	20	817.00	820.00	812.00	819.00	808.00	
53	45	40	800.00	701.00	685.00	796.00	759.00	
54	45	60	746.00	718.00	720.00	770.00	703.00	
55	45	80	729.00	739.00	742.00	733.00	695.00	
56	45	100	720.00	737.00	735.00	706.00	692.00	
57	45	120	719.00	726.00	709.00	693.00	695.00	
58	45	140	707.00	707.00	687.00	678.00	686.00	
59	35	0	815.00	825.00	822.00	826.00	816.00	
60	35	20	806.00	792.00	777.00	805.00	796.00	
61	35	40	789.00	696.00	691.00	785.00	733.00	
62	35	60	753.00	729.00	734.00	7[illegible]0.00	700.00	
63	35	80	735.00	740.00	749.00	723.00	695.00	
64	35	100	726.00	735.00	729.00	700.00	693.00	
65	35	120	715.00	711.00	695.00	676.00	683.00	
66	25	0	815.00	825.00	821.00	819.00	809.00	
67	25	20	792.00	760.00	723.00	789.00	786.00	
68	25	40	789.00	716.00	700.00	782.00	730.00	
69	25	60	770.00	742.00	750.00	755.00	706.00	
70	25	80	744.00	736.00	747.00	719.00	694.00	
71	25	100	722.00	711.00	714.00	681.00	668.00	
72	15	0	796.00	811.00	811.00	807.00	793.00	
73	15	20	771.00	748.00	695.00	769.00	766.00	
74	15	40	777.00	750.00	736.00	770.00	747.00	
75	15	60	757.00	735.00	750.00	752.00	717.00	
76	15	80	708.00	693.00	725.00	704.00	674.00	

file requested **********
129.c
****

comb. press. - pr (mm water gage) 17.00
cross flow temp. - tr (degree celsius) 547.00
comb. air flow rate - mcr (mm water diff.) 30.00
cool air flow rate - mkr (mm water diff.) 71.00
natural gas flow rate - msr (mm water diff.) 15.00
natural gas total press. - pgsr (psi gage) 0.00
air total press. - psar (mm water gage) 0.00
jet temp. - tjr (degree celsius) 27.00
single jet flow rate - msjr (s.c.f.m.) 1.40
wall temp. - t5 (degree celsius) 274.00
wall temp. - t6 (degree celsius) 302.00
wall temp. - t7 (degree celsius) 315.00
wall temp. - t8 (degree celsius) 368.00
wall temp. - t9 (degree celsius) 266.00
wall temp. - t10 (degree celsius) 276.00

mc = 0.0164317 kg/sec
mk = 0.0792058 kg/sec
ms = 0.001162 kg/sec
m = 0.096799 kg/sec
p = 98266.8 pascal
t = 820 degree kelvin
tj = 300 degree kelvin
t5 = 547 degree kelvin
t6 = 573 degree kelvin
t7 = 588 degree kelvin
t8 = 641 degree kelvin
t9 = 539 degree kelvin
t10= 549 degree kelvin
ro = 0.4176 kg/cubic meter
roj= 1.1413 kg/cubic meter
v = 8.58 meter/sec
msj= 0.0007322 kg/sec
vj = 16.15 meter/sec
dr = 2.73 density ratio
j = 9.7 momentum ratio
fr = 11788 froude number
sr = 6.10 spacing ratio

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	780.00	772.00	745.00	755.00	750.00
2	95	20	792.00	787.00	770.00	779.00	773.00
3	95	40	799.00	799.00	786.00	794.00	789.00
4	95	60	806.00	808.00	794.00	806.00	797.00
5	95	80	800.00	806.00	789.00	808.00	798.00
6	95	100	789.00	801.00	776.00	796.00	788.00
7	95	120	774.00	792.00	767.00	796.00	793.00
8	95	140	762.00	787.00	763.00	787.00	791.00
9	95	160	753.00	775.00	753.00	781.00	783.00
10	95	180	747.00	765.00	749.00	770.00	776.00
11	85	0	800.00	801.00	779.00	787.00	780.00
12	85	20	811.00	808.00	795.00	799.00	793.00
13	85	40	806.00	807.00	797.00	803.00	800.00

14	85	60	800.00	795.00	781.00	807.00	799.00	
15	85	80	778.00	780.00	757.00	798.00	784.00	
16	85	100	750.00	767.00	745.00	780.00	764.00	
17	85	120	740.00	766.00	744.00	770.00	753.00	
18	85	140	733.00	761.00	745.00	763.00	750.00	
19	85	160	732.00	752.00	739.00	753.00	745.00	
20	85	180	729.00	749.00	736.00	752.00	748.00	rdg.
21	75	0	811.00	812.00	800.00	805.00	798.00	129.c
22	75	20	811.00	813.00	803.00	804.00	798.00	
23	75	40	809.00	802.00	790.00	807.00	799.00	
24	75	60	779.00	760.00	739.00	796.00	772.00	
25	75	80	748.00	748.00	733.00	780.00	747.00	
26	75	100	726.00	748.00	738.00	759.00	728.00	
27	75	120	724.00	749.00	743.00	748.00	724.00	
28	75	140	722.00	742.00	738.00	738.00	723.00	
29	75	160	723.00	737.00	726.00	729.00	720.00	
30	75	180	718.00	732.00	722.00	726.00	721.00	
31	65	0	816.00	816.00	808.00	817.00	807.00	
32	65	20	818.00	825.00	816.00	817.00	806.00	
33	65	40	809.00	771.00	734.00	812.00	795.00	
34	65	60	760.00	731.00	719.00	784.00	738.00	
35	65	80	726.00	735.00	730.00	759.00	713.00	
36	65	100	716.00	740.00	740.00	741.00	711.00	
37	65	120	714.00	734.00	734.00	728.00	710.00	
38	65	140	722.00	735.00	729.00	720.00	708.00	
39	65	160	718.00	724.00	715.00	710.00	706.00	
40	65	180	714.00	720.00	708.00	707.00	708.00	
41	55	0	820.00	823.00	814.00	821.00	812.00	
42	55	20	813.00	820.00	814.00	820.00	809.00	
43	55	40	798.00	714.00	686.00	799.00	765.00	
44	55	60	737.00	714.00	717.00	767.00	710.00	
45	55	80	720.00	733.00	738.00	744.00	704.00	
46	55	100	718.00	737.00	740.00	724.00	706.00	
47	55	120	722.00	734.00	731.00	714.00	701.00	
48	55	140	717.00	724.00	714.00	701.00	697.00	
49	55	160	714.00	714.00	701.00	694.00	696.00	
50	55	180	708.00	704.00	690.00	688.00	694.00	
51	45	0	821.00	828.00	824.00	829.00	821.00	
52	45	20	811.00	803.00	785.00	811.00	804.00	
53	45	40	795.00	690.00	689.00	792.00	740.00	
54	45	60	744.00	724.00	732.00	767.00	703.00	
55	45	80	730.00	741.00	743.00	734.00	708.00	
56	45	100	721.00	737.00	740.00	717.00	706.00	
57	45	120	723.00	731.00	722.00	700.00	696.00	
58	45	140	712.00	710.00	696.00	681.00	687.00	
59	35	0	821.00	829.00	828.00	830.00	818.00	
60	35	20	805.00	779.00	751.00	799.00	797.00	
61	35	40	803.00	705.00	700.00	785.00	730.00	
62	35	60	763.00	737.00	741.00	761.00	712.00	
63	35	80	742.00	747.00	750.00	731.00	709.00	
64	35	100	731.00	739.00	733.00	710.00	700.00	
65	35	120	721.00	714.00	703.00	680.00	684.00	
66	25	0	818.00	828.00	824.00	819.00	805.00	
67	25	20	800.00	766.00	710.00	789.00	788.00	
68	25	40	801.00	748.00	721.00	791.00	743.00	
69	25	60	784.00	756.00	759.00	762.00	723.00	
70	25	80	755.00	746.00	752.00	729.00	707.00	
71	25	100	729.00	717.00	720.00	691.00	676.00	
72	15	0	800.00	813.00	809.00	803.00	794.00	
73	15	20	782.00	764.00	666.00	775.00	773.00	
74	15	40	777.00	759.00	745.00	776.00	762.00	
75	15	60	765.00	745.00	756.00	760.00	728.00	
76	15	80	726.00	706.00	730.00	712.00	681.00	

file requested

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130.c
****

comb. press. - pr (mm water gage) 17.00
cross flow temp. - tr (degree celsius) 550.00
comb. air flow rate - mcr (mm water diff.) 30.00
cool air flow rate - mkr (mm water diff.) 71.00
natural gas flow rate - mgr (mm water diff.) 15.00
natural gas total press. - pggr (psi gage) 0.00
air total press. - psar (mm water gage) 0.00
jet temp. - tjr (degree celsius) 28.00
single jet flow rate - msjr (s.c.f.m.) 1.53
wall temp. - t5 (degree celsius) 259.00
wall temp. - t6 (degree celsius) 304.00
wall temp. - t7 (degree celsius) 317.00
wall temp. - t8 (degree celsius) 370.00
wall temp. - t9 (degree celsius) 270.00
wall temp. - t10 (degree celsius) 280.00

mc = 0.0164317 kg/sec
mk = 0.0792058 kg/sec
mg = 0.001162 kg/sec
m = 0.096799 kg/sec
p = 98266.8 pascal
t = 823 degree kelvin
tj = 301 degree kelvin
t5 = 532 degree kelvin
t6 = 577 degree kelvin
t7 = 590 degree kelvin
t8 = 643 degree kelvin
t9 = 543 degree kelvin
t10= 553 degree kelvin
ro = 0.4160 kg/cubic meter
roj= 1.1375 kg/cubic meter
v = 8.61 meter/sec
msj= 0.0008028 kg/sec
vj = 17.76 meter/sec
dr = 2.73 density ratio
j = 11.6 momentum ratio
fr = 14264 froude number
sr = 6.10 spacing ratio

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	775.00	767.00	742.00	757.00	754.00
2	95	20	791.00	786.00	767.00	779.00	775.00
3	95	40	799.00	797.00	782.00	788.00	785.00
4	95	60	794.00	795.00	783.00	798.00	791.00
5	95	80	785.00	791.00	772.00	795.00	785.00
6	95	100	772.00	790.00	765.00	789.00	783.00
7	95	120	762.00	786.00	756.00	785.00	777.00
8	95	140	755.00	780.00	757.00	783.00	781.00
9	95	160	742.00	768.00	751.00	773.00	774.00
10	95	180	737.00	757.00	744.00	768.00	772.00
11	85	0	798.00	795.00	775.00	785.00	778.00
12	85	20	804.00	803.00	789.00	798.00	789.00
13	85	40	805.00	809.00	799.00	806.00	797.00

14	85	60	791.00	785.00	764.00	803.00	785.00	
15	85	80	764.00	768.00	745.00	791.00	769.00	
16	85	100	738.00	763.00	743.00	777.00	754.00	
17	85	120	733.00	760.00	745.00	765.00	740.00	
18	85	140	727.00	753.00	740.00	757.00	737.00	
19	85	160	727.00	750.00	736.00	750.00	738.00	
20	85	180	722.00	739.00	728.00	743.00	738.00	rdg.
21	75	0	808.00	807.00	795.00	805.00	799.00	130.c
22	75	20	815.00	815.00	808.00	812.00	804.00	
23	75	40	808.00	792.00	768.00	807.00	798.00	
24	75	60	766.00	745.00	726.00	789.00	759.00	
25	75	80	737.00	741.00	728.00	769.00	727.00	
26	75	100	721.00	745.00	739.00	757.00	722.00	
27	75	120	718.00	743.00	742.00	746.00	719.00	
28	75	140	722.00	741.00	737.00	738.00	719.00	
29	75	160	725.00	738.00	728.00	456.00	717.00	
30	75	180	717.00	729.00	719.00	724.00	716.00	
31	65	0	813.00	816.00	803.00	812.00	800.00	
32	65	20	816.00	818.00	811.00	818.00	806.00	
33	65	40	804.00	754.00	706.00	804.00	786.00	
34	65	60	748.00	719.00	711.00	775.00	723.00	
35	65	80	717.00	729.00	733.00	753.00	706.00	
36	65	100	713.00	734.00	737.00	733.00	710.00	
37	65	120	719.00	734.00	735.00	727.00	708.00	
38	65	140	722.00	730.00	726.00	716.00	705.00	
39	65	160	718.00	725.00	717.00	711.00	703.00	
40	65	180	715.00	721.00	709.00	708.00	705.00	
41	55	0	818.00	822.00	812.00	815.00	808.00	
42	55	20	818.00	819.00	806.00	820.00	809.00	
43	55	40	794.00	698.00	675.00	788.00	756.00	
44	55	60	733.00	715.00	721.00	763.00	703.00	
45	55	80	717.00	730.00	741.00	743.00	704.00	
46	55	100	718.00	738.00	743.00	725.00	709.00	
47	55	120	720.00	732.00	731.00	714.00	704.00	
48	55	140	721.00	724.00	715.00	701.00	696.00	
49	55	160	716.00	717.00	703.00	695.00	695.00	
50	55	180	707.00	707.00	693.00	687.00	690.00	
51	45	0	825.00	834.00	824.00	828.00	819.00	
52	45	20	813.00	805.00	787.00	815.00	806.00	
53	45	40	796.00	692.00	695.00	787.00	730.00	
54	45	60	745.00	724.00	734.00	755.00	701.00	
55	45	80	725.00	740.00	748.00	730.00	707.00	
56	45	100	724.00	739.00	738.00	718.00	707.00	
57	45	120	723.00	729.00	721.00	702.00	698.00	
58	45	140	715.00	710.00	698.00	683.00	686.00	
59	35	0	813.00	821.00	818.00	821.00	813.00	
60	35	20	801.00	765.00	710.00	792.00	791.00	
61	35	40	795.00	704.00	701.00	783.00	728.00	
62	35	60	763.00	746.00	749.00	757.00	714.00	
63	35	80	739.00	746.00	750.00	727.00	712.00	
64	35	100	728.00	733.00	729.00	707.00	696.00	
65	35	120	719.00	714.00	704.00	682.00	682.00	
66	25	0	809.00	817.00	814.00	811.00	800.00	
67	25	20	796.00	765.00	671.00	787.00	785.00	
68	25	40	793.00	757.00	730.00	790.00	749.00	
69	25	60	775.00	752.00	757.00	759.00	729.00	
70	25	80	751.00	743.00	745.00	728.00	710.00	
71	25	100	726.00	713.00	714.00	689.00	674.00	
72	15	0	798.00	811.00	811.00	806.00	790.00	
73	15	20	780.00	768.00	630.00	773.00	770.00	
74	15	40	780.00	761.00	750.00	775.00	761.00	
75	15	60	761.00	743.00	753.00	753.00	726.00	
76	15	80	719.00	704.00	729.00	713.00	684.00	

file requested **********
131.c
****

comb. press. - pr (mm water gage) 30.00
cross flow temp. - tr (degree celsius) 365.00
comb. air flow rate - mcr (mm water diff.) 30.00
cool air flow rate - mkr (mm water diff.) 156.00
natural gas flow rate - mgr (mm water diff.) 15.00
natural gas total press. - pggr (psi gage) 0.00
air total press. - pgar (mm water gage) 0.00
jet temp. - tjr (degree celsius) 25.00
single jet flow rate - mgjr (s.c.f.m.) 1.33
wall temp. - t5 (degree celsius) 155.00
wall temp. - t6 (degree celsius) 213.00
wall temp. - t7 (degree celsius) 217.00
wall temp. - t8 (degree celsius) 272.00
wall temp. - t9 (degree celsius) 180.00
wall temp. - t10 (degree celsius) 192.00

mc = 0.0164317 kg/sec
mk = 0.1174060 kg/sec
mg = 0.001162 kg/sec
m = 0.135000 kg/sec
p = 98394.3 pascal
t = 638 degree kelvin
tj = 298 degree kelvin
t5 = 428 degree kelvin
t6 = 486 degree kelvin
t7 = 490 degree kelvin
t8 = 545 degree kelvin
t9 = 453 degree kelvin
t10= 465 degree kelvin
ro = 0.5374 kg/cubic meter
roj= 1.1505 kg/cubic meter
v = 9.30 meter/sec
mgj= 0.0006956 kg/sec
vj = 15.22 meter/sec
dr = 2.14 density ratio
j = 5.7 momentum ratio
fr = 12459 froude number
sr = 9.15 spacing ratio

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	614.00	612.00	600.00	606.00	603.00
2	95	20	621.00	621.00	611.00	617.00	614.00
3	95	40	624.00	623.00	615.00	620.00	616.00
4	95	60	609.00	616.00	613.00	620.00	619.00
5	95	80	595.00	606.00	608.00	617.00	616.00
6	95	100	623.00	625.00	617.00	627.00	625.00
7	95	120	623.00	622.00	612.00	624.00	625.00
8	95	140	588.00	600.00	599.00	613.00	621.00
9	95	160	584.00	598.00	596.00	612.00	620.00
10	95	180	610.00	613.00	606.00	615.00	622.00
11	85	0	604.00	611.00	604.00	612.00	608.00
12	85	20	622.00	624.00	617.00	623.00	620.00
13	85	40	630.00	631.00	624.00	626.00	622.00

14	85	60	632.00	631.00	626.00	629.00	623.00	
15	85	80	631.00	624.00	614.00	626.00	625.00	
16	85	100	627.00	615.00	605.00	620.00	625.00	
17	85	120	625.00	615.00	605.00	616.00	622.00	
18	85	140	619.00	614.00	606.00	614.00	618.00	
19	85	160	612.00	611.00	605.00	610.00	615.00	rdg.
20	85	180	608.00	610.00	604.00	611.00	613.00	131.c
21	75	0	631.00	632.00	622.00	627.00	623.00	
22	75	20	637.00	636.00	630.00	631.00	626.00	
23	75	40	637.00	637.00	631.00	633.00	627.00	
24	75	60	636.00	622.00	613.00	[illegible]	627.00	
25	75	80	632.00	609.00	601.00	620.00	628.00	
26	75	100	624.00	606.00	599.00	614.00	622.00	
27	75	120	620.00	610.00	605.00	614.00	618.00	
28	75	140	613.00	608.00	605.00	610.00	606.00	
29	75	160	582.00	594.00	598.00	603.00	599.00	
30	75	180	572.00	588.00	594.00	599.00	598.00	
31	65	0	619.00	627.00	622.00	628.00	625.00	
32	65	20	623.00	631.00	628.00	633.00	628.00	
33	65	40	622.00	617.00	615.00	633.00	629.00	
34	65	60	622.00	592.00	588.00	623.00	629.00	
35	65	80	622.00	598.00	592.00	615.00	625.00	
36	65	100	619.00	604.00	599.00	612.00	617.00	
37	65	120	615.00	608.00	605.00	612.00	604.00	
38	65	140	608.00	605.00	606.00	606.00	593.00	
39	65	160	604.00	604.00	604.00	599.00	591.00	
40	65	180	601.00	601.00	599.00	596.00	591.00	
41	55	0	644.00	646.00	639.00	639.00	634.00	
42	55	20	644.00	643.00	636.00	637.00	632.00	
43	55	40	639.00	597.00	580.00	630.00	630.00	
44	55	60	629.00	585.00	581.00	618.00	627.00	
45	55	80	621.00	600.00	597.00	614.00	622.00	
46	55	100	620.00	610.00	607.00	615.00	608.00	
47	55	120	594.00	599.00	606.00	605.00	592.00	
48	55	140	588.00	598.00	602.00	595.00	587.00	
49	55	160	586.00	594.00	596.00	588.00	584.00	
50	55	180	582.00	589.00	588.00	585.00	585.00	
51	45	0	637.00	644.00	643.00	644.00	640.00	
52	45	20	649.00	648.00	641.00	643.00	637.00	
53	45	40	640.00	574.00	564.00	631.00	632.00	
54	45	60	631.00	590.00	587.00	622.00	630.00	
55	45	80	623.00	608.00	605.00	620.00	621.00	
56	45	100	618.00	608.00	612.00	615.00	600.00	
57	45	120	614.00	609.00	612.00	606.00	591.00	
58	45	140	605.00	600.00	602.00	591.00	585.00	
59	35	0	655.00	655.00	650.00	649.00	643.00	
60	35	20	648.00	631.00	620.00	639.00	636.00	
61	35	40	639.00	568.00	564.00	630.00	632.00	
62	35	60	628.00	601.00	598.00	623.00	625.00	
63	35	80	623.00	609.00	611.00	621.00	617.00	
64	35	100	614.00	607.00	611.00	611.00	598.00	
65	35	120	605.00	599.00	603.00	596.00	586.00	
66	25	0	652.00	653.00	649.00	645.00	639.00	
67	25	20	642.00	612.00	587.00	632.00	632.00	
68	25	40	633.00	582.00	572.00	625.00	625.00	
69	25	60	624.00	604.00	607.00	621.00	619.00	
70	25	80	612.00	604.00	609.00	613.00	608.00	
71	25	100	601.00	591.00	597.00	594.00	587.00	
72	15	0	647.00	648.00	644.00	640.00	635.00	
73	15	20	361.00	335.00	544.00	623.00	623.00	
74	15	40	626.00	602.00	596.00	618.00	616.00	
75	15	60	614.00	603.00	609.00	611.00	610.00	
76	15	80	597.00	590.00	599.00	597.00	594.00	

file requested **********
132.c
****

comb. press. - pr (mm water gage) 27.00
cross flow temp. - tr (degree celsius) 368.00
comb. air flow rate - mcr (mm water diff.) 30.00
cool air flow rate - mkr (mm water diff.) 160.00
natural gas flow rate - msr (mm water diff.) 15.00
natural gas total press. - pssr (psi gage) 0.00
air total press. - psar (mm water gage) 0.00
jet temp. - tjr (degree celsius) 25.00
single jet flow rate - msjr (s.c.f.m.) 1.75
wall temp. - t5 (degree celsius) 209.00
wall temp. - t6 (degree celsius) 243.00
wall temp. - t7 (degree celsius) 250.00
wall temp. - t8 (degree celsius) 301.00
wall temp. - t9 (degree celsius) 218.00
wall temp. - t10 (degree celsius) 214.00

mc = 0.0164317 kg/sec
mk = 0.1189016 kg/sec
ms = 0.001162 kg/sec
m = 0.136495 kg/sec
p = 98364.9 pascal
t = 641 degree kelvin
tj = 298 degree kelvin
t5 = 482 degree kelvin
t6 = 516 degree kelvin
t7 = 523 degree kelvin
t8 = 574 degree kelvin
t9 = 491 degree kelvin
t10= 487 degree kelvin
ro = 0.5347 kg/cubic meter
roj= 1.1501 kg/cubic meter
v = 9.45 meter/sec
msj= 0.0009153 kg/sec
vj = 20.03 meter/sec
dr = 2.15 density ratio
j = 9.7 momentum ratio
fr = 21496 froude number
sr = 9.15 spacing ratio

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	608.00	605.00	596.00	602.00	602.00
2	95	20	612.00	609.00	600.00	604.00	605.00
3	95	40	619.00	618.00	613.00	618.00	618.00
4	95	60	617.00	617.00	610.00	617.00	617.00
5	95	80	614.00	614.00	608.00	619.00	618.00
6	95	100	620.00	616.00	608.00	620.00	622.00
7	95	120	617.00	613.00	603.00	611.00	614.00
8	95	140	614.00	613.00	607.00	616.00	623.00
9	95	160	609.00	610.00	606.00	613.00	619.00
10	95	180	609.00	614.00	610.00	616.00	623.00
11	85	0	617.00	616.00	610.00	618.00	616.00
12	85	20	624.00	625.00	618.00	626.00	623.00
13	85	40	624.00	623.00	620.00	625.00	623.00

14	85	60	628.00	622.00	611.00	627.00	626.00	
15	85	80	624.00	606.00	598.00	616.00	625.00	
16	85	100	620.00	606.00	599.00	613.00	627.00	
17	85	120	619.00	607.00	603.00	609.00	617.00	
18	85	140	610.00	609.00	606.00	612.00	617.00	
19	85	160	609.00	612.00	608.00	613.00	616.00	rdg.
20	85	180	603.00	609.00	607.00	614.00	611.00	132.c
21	75	0	627.00	628.00	624.00	630.00	628.00	
22	75	20	629.00	630.00	625.00	631.00	628.00	
23	75	40	630.00	626.00	615.00	629.00	627.00	
24	75	60	631.00	606.00	595.00	626.00	634.00	
25	75	80	624.00	600.00	596.00	614.00	631.00	
26	75	100	616.00	601.00	599.00	610.00	623.00	
27	75	120	615.00	607.00	608.00	612.00	616.00	
28	75	140	609.00	609.00	609.00	611.00	609.00	
29	75	160	605.00	610.00	610.00	611.00	603.00	
30	75	180	601.00	608.00	606.00	608.00	601.00	
31	65	0	630.00	630.00	627.00	635.00	632.00	
32	65	20	638.00	641.00	638.00	642.00	638.00	
33	65	40	638.00	609.00	586.00	637.00	639.00	
34	65	60	613.00	581.00	581.00	613.00	632.00	
35	65	80	619.00	596.00	597.00	609.00	627.00	
36	65	100	615.00	606.00	606.00	612.00	618.00	
37	65	120	616.00	614.00	614.00	616.00	610.00	
38	65	140	605.00	608.00	610.00	609.00	602.00	
39	65	160	606.00	609.00	609.00	607.00	597.00	
40	65	180	603.00	606.00	605.00	601.00	593.00	
41	55	0	640.00	642.00	638.00	641.00	637.00	
42	55	20	643.00	643.00	639.00	645.00	643.00	
43	55	40	634.00	581.00	559.00	624.00	635.00	
44	55	60	627.00	588.00	590.00	615.00	636.00	
45	55	80	619.00	602.00	606.00	616.00	625.00	
46	55	100	619.00	614.00	613.00	618.00	615.00	
47	55	120	609.00	609.00	612.00	612.00	604.00	
48	55	140	609.00	608.00	610.00	604.00	596.00	
49	55	160	606.00	604.00	604.00	598.00	590.00	
50	55	180	604.00	601.00	598.00	594.00	588.00	
51	45	0	644.00	645.00	642.00	647.00	645.00	
52	45	20	643.00	638.00	629.00	643.00	642.00	
53	45	40	637.00	570.00	563.00	626.00	639.00	
54	45	60	629.00	598.00	602.00	621.00	634.00	
55	45	80	622.00	608.00	612.00	620.00	626.00	
56	45	100	616.00	612.00	615.00	618.00	610.00	
57	45	120	610.00	608.00	612.00	609.00	600.00	
58	45	140	602.00	601.00	603.00	601.00	596.00	
59	35	0	646.00	649.00	645.00	648.00	645.00	
60	35	20	641.00	619.00	592.00	637.00	644.00	
61	35	40	641.00	582.00	575.00	627.00	638.00	
62	35	60	631.00	611.00	611.00	626.00	633.00	
63	35	80	623.00	614.00	617.00	625.00	623.00	
64	35	100	614.00	609.00	613.00	615.00	609.00	
65	35	120	611.00	604.00	607.00	603.00	594.00	
66	25	0	653.00	656.00	652.00	652.00	648.00	
67	25	20	646.00	615.00	559.00	636.00	642.00	
68	25	40	636.00	606.00	592.00	631.00	637.00	
69	25	60	626.00	613.00	614.00	626.00	629.00	
70	25	80	622.00	614.00	616.00	621.00	621.00	
71	25	100	610.00	602.00	607.00	606.00	602.00	
72	15	0	647.00	649.00	649.00	649.00	647.00	
73	15	20	641.00	618.00	538.00	634.00	637.00	
74	15	40	634.00	622.00	615.00	631.00	630.00	
75	15	60	623.00	615.00	618.00	624.00	624.00	
76	15	80	608.00	601.00	609.00	611.00	609.00	

file requested **********
133.c
****

comb. press. - pr (mm water gage) 28.00
cross flow temp. - tr (degree celsius) 368.00
comb. air flow rate - mcr (mm water diff.) 30.00
cool air flow rate - mkr (mm water diff.) 160.00
natural gas flow rate - msr (mm water diff.) 15.00
natural gas total press. - psgr (psi gage) 0.00
air total press. - psar (mm water gage) 0.00
jet temp. - tjr (degree celsius) 26.00
single jet flow rate - msjr (s.c.f.m.) 1.92
wall temp. - t5 (degree celsius) 197.00
wall temp. - t6 (degree celsius) 243.00
wall temp. - t7 (degree celsius) 251.00
wall temp. - t8 (degree celsius) 303.00
wall temp. - t9 (degree celsius) 215.00
wall temp. - t10 (degree celsius) 214.00

mc = 0.0164317 kg/sec
mk = 0.1189016 kg/sec
ms = 0.001162 kg/sec
m = 0.136495 kg/sec
p = 98374.7 pascal
t = 641 degree kelvin
tj = 299 degree kelvin
t5 = 470 degree kelvin
t6 = 516 degree kelvin
t7 = 524 degree kelvin
t8 = 576 degree kelvin
t9 = 488 degree kelvin
t10= 487 degree kelvin
ro = 0.5347 kg/cubic meter
roj= 1.1464 kg/cubic meter
v = 9.44 meter/sec
msj= 0.0010042 kg/sec
vj = 22.05 meter/sec
dr = 2.14 density ratio
j = 11.7 momentum ratio
fr = 26120 froude number
sr = 9.15 spacing ratio

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	603.00	604.00	592.00	604.00	606.00
2	95	20	589.00	596.00	596.00	607.00	610.00
3	95	40	619.00	620.00	610.00	615.00	616.00
4	95	60	616.00	615.00	606.00	613.00	614.00
5	95	80	619.00	616.00	606.00	618.00	621.00
6	95	100	623.00	615.00	606.00	620.00	625.00
7	95	120	614.00	608.00	601.00	611.00	620.00
8	95	140	610.00	609.00	605.00	614.00	623.00
9	95	160	609.00	612.00	605.00	613.00	621.00
10	95	180	601.00	610.00	607.00	614.00	618.00
11	85	0	618.00	618.00	608.00	616.00	615.00
12	85	20	629.00	630.00	624.00	630.00	628.00
13	85	40	627.00	626.00	619.00	625.00	627.00

14	85	60	633.00	619.00	607.00	626.00	626.00	
15	85	80	622.00	605.00	596.00	612.00	621.00	
16	85	100	622.00	605.00	601.00	613.00	629.00	
17	85	120	616.00	608.00	605.00	612.00	621.00	
18	85	140	613.00	611.00	611.00	613.00	616.00	
19	85	160	606.00	612.00	608.00	612.00	614.00	rdg.
20	85	180	599.00	606.00	603.00	609.00	611.00	133.c
21	75	0	630.00	629.00	622.00	630.00	627.00	
22	75	20	630.00	631.00	627.00	632.00	630.00	
23	75	40	632.00	622.00	609.00	635.00	635.00	
24	75	60	627.00	595.00	588.00	617.00	630.00	
25	75	80	624.00	597.00	595.00	610.00	627.00	
26	75	100	619.00	603.00	605.00	609.00	624.00	
27	75	120	611.00	605.00	609.00	608.00	614.00	
28	75	140	610.00	612.00	613.00	615.00	611.00	
29	75	160	603.00	608.00	608.00	610.00	604.00	
30	75	180	602.00	609.00	609.00	610.00	601.00	
31	65	0	634.00	636.00	632.00	639.00	634.00	
32	65	20	630.00	635.00	629.00	636.00	634.00	
33	65	40	629.00	592.00	567.00	627.00	634.00	
34	65	60	629.00	584.00	584.00	610.00	633.00	
35	65	80	622.00	594.00	599.00	609.00	627.00	
36	65	100	612.00	603.00	607.00	608.00	617.00	
37	65	120	611.00	610.00	613.00	614.00	605.00	
38	65	140	584.00	598.00	605.00	606.00	596.00	
39	65	160	573.00	591.00	600.00	599.00	594.00	
40	65	180	575.00	590.00	597.00	595.00	588.00	
41	55	0	621.00	630.00	630.00	636.00	634.00	
42	55	20	635.00	635.00	629.00	638.00	637.00	
43	55	40	618.00	564.00	550.00	621.00	635.00	
44	55	60	621.00	582.00	589.00	608.00	628.00	
45	55	80	617.00	601.00	607.00	611.00	622.00	
46	55	100	610.00	606.00	609.00	612.00	611.00	
47	55	120	608.00	608.00	610.00	609.00	603.00	
48	55	140	605.00	606.00	607.00	603.00	595.00	
49	55	160	599.00	600.00	600.00	597.00	590.00	
50	55	180	595.00	595.00	595.00	593.00	589.00	
51	45	0	641.00	644.00	642.00	646.00	642.00	
52	45	20	643.00	629.00	613.00	641.00	642.00	
53	45	40	636.00	569.00	569.00	624.00	638.00	
54	45	60	627.00	602.00	605.00	620.00	633.00	
55	45	80	621.00	640.00	611.00	617.00	624.00	
56	45	100	621.00	616.00	618.00	619.00	608.00	
57	45	120	612.00	611.00	612.00	608.00	598.00	
58	45	140	605.00	602.00	603.00	601.00	596.00	
59	35	0	646.00	648.00	645.00	648.00	648.00	
60	35	20	642.00	616.00	576.00	635.00	641.00	
61	35	40	638.00	589.00	584.00	627.00	639.00	
62	35	60	630.00	613.00	613.00	626.00	632.00	
63	35	80	625.00	617.00	618.00	625.00	623.00	
64	35	100	618.00	613.00	617.00	619.00	611.00	
65	35	120	610.00	603.00	607.00	605.00	598.00	
66	25	0	651.00	654.00	652.00	652.00	648.00	
67	25	20	643.00	615.00	554.00	637.00	644.00	
68	25	40	643.00	619.00	604.00	635.00	638.00	
69	25	60	630.00	619.00	618.00	627.00	629.00	
70	25	80	622.00	616.00	618.00	623.00	620.00	
71	25	100	610.00	603.00	607.00	608.00	604.00	
72	15	0	646.00	650.00	650.00	650.00	648.00	
73	15	20	640.00	618.00	539.00	632.00	635.00	
74	15	40	633.00	623.00	618.00	632.00	630.00	
75	15	60	624.00	616.00	618.00	624.00	623.00	
76	15	80	610.00	603.00	609.00	611.00	608.00	

****
file requested 134.c
****

comb. press. - pr (mm water gage) 17.00
cross flow temp. - tr (degree celsius) 534.00
comb. air flow rate - mcr (mm water diff.) 30.00
cool air flow rate - mkr (mm water diff.) 79.00
natural gas flow rate - mgr (mm water diff.) 15.00
natural gas total press. - pggr (psi gage) 0.00
air total press. - pgar (mm water gage) 0.00
jet temp. - tjr (degree celsius) 23.00
single jet flow rate - mgjr (s.c.f.m.) 1.12
wall temp. - t5 (degree celsius) 260.00
wall temp. - t6 (degree celsius) 293.00
wall temp. - t7 (degree celsius) 295.00
wall temp. - t8 (degree celsius) 359.00
wall temp. - t9 (degree celsius) 256.00
wall temp. - t10 (degree celsius) 260.00

mc = 0.0164317 kg/sec
mk = 0.0835490 kg/sec
mg = 0.001162 kg/sec
m = 0.101143 kg/sec
p = 98266.8 pascal
t = 807 degree kelvin
tj = 296 degree kelvin
t5 = 533 degree kelvin
t6 = 566 degree kelvin
t7 = 568 degree kelvin
t8 = 632 degree kelvin
t9 = 529 degree kelvin
t10= 533 degree kelvin
ro = 0.4243 kg/cubic meter
roj= 1.1567 kg/cubic meter
v = 8.82 meter/sec
mgj= 0.0005858 kg/sec
vj = 12.75 meter/sec
dr = 2.73 density ratio
j = 5.7 momentum ratio
fr = 7356 froude number
sr = 9.15 spacing ratio

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	763.00	755.00	730.00	738.00	734.00
2	95	20	778.00	772.00	753.00	762.00	760.00
3	95	40	784.00	784.00	773.00	780.00	776.00
4	95	60	780.00	784.00	771.00	778.00	778.00
5	95	80	786.00	792.00	781.00	792.00	785.00
6	95	100	789.00	786.00	769.00	786.00	782.00
7	95	120	794.00	786.00	761.00	787.00	798.00
8	95	140	788.00	778.00	751.00	774.00	793.00
9	95	160	784.00	771.00	746.00	769.00	791.00
10	95	180	769.00	769.00	745.00	767.00	791.00
11	85	0	781.00	779.00	763.00	774.00	767.00
12	85	20	787.00	787.00	775.00	786.00	781.00
13	85	40	789.00	793.00	782.00	790.00	788.00

14	85	60	795.00	792.00	783.00	795.00	789.00	
15	85	80	789.00	777.00	764.00	785.00	784.00	
16	85	100	789.00	765.00	743.00	766.00	780.00	
17	85	120	782.00	758.00	735.00	762.00	788.00	
18	85	140	774.00	758.00	738.00	759.00	775.00	
19	85	160	764.00	753.00	732.00	753.00	765.00	
20	85	180	759.00	753.00	736.00	756.00	763.00	rdg.
21	75	0	794.00	796.00	785.00	791.00	783.00	134.c
22	75	20	799.00	801.00	794.00	802.00	792.00	
23	75	40	798.00	799.00	792.00	795.00	789.00	
24	75	60	794.00	773.00	754.00	790.00	790.00	
25	75	80	791.00	751.00	730.00	768.00	788.00	
26	75	100	785.00	747.00	729.00	760.00	784.00	
27	75	120	776.00	747.00	735.00	756.00	767.00	
28	75	140	764.00	748.00	738.00	757.00	748.00	
29	75	160	753.00	742.00	738.00	754.00	735.00	
30	75	180	740.00	741.00	736.00	745.00	727.00	
31	65	0	803.00	807.00	798.00	805.00	797.00	
32	65	20	799.00	803.00	799.00	801.00	796.00	
33	65	40	800.00	786.00	765.00	799.00	794.00	
34	65	60	794.00	742.00	726.00	780.00	791.00	
35	65	80	784.00	734.00	723.00	761.00	786.00	
36	65	100	770.00	738.00	731.00	753.00	764.00	
37	65	120	760.00	740.00	738.00	759.00	739.00	
38	65	140	750.00	735.00	742.00	748.00	711.00	
39	65	160	736.00	727.00	737.00	733.00	700.00	
40	65	180	729.00	725.00	728.00	718.00	692.00	
41	55	0	807.00	812.00	805.00	810.00	800.00	
42	55	20	809.00	811.00	801.00	805.00	798.00	
43	55	40	799.00	740.00	705.00	793.00	790.00	
44	55	60	782.00	715.00	707.00	761.00	783.00	
45	55	80	773.00	729.00	725.00	759.00	777.00	
46	55	100	765.00	737.00	736.00	759.00	748.00	
47	55	120	750.00	730.00	740.00	751.00	711.00	
48	55	140	737.00	723.00	736.00	726.00	692.00	
49	55	160	729.00	716.00	722.00	707.00	684.00	
50	55	180	719.00	708.00	708.00	695.00	679.00	
51	45	0	812.00	816.00	811.00	815.00	806.00	
52	45	20	805.00	806.00	797.00	806.00	796.00	
53	45	40	792.00	696.00	676.00	778.00	785.00	
54	45	60	768.00	714.00	713.00	762.00	773.00	
55	45	80	758.00	730.00	733.00	757.00	757.00	
56	45	100	750.00	730.00	739.00	754.00	729.00	
57	45	120	734.00	716.00	731.00	729.00	699.00	
58	45	140	722.00	703.00	712.00	702.00	679.00	
59	35	0	812.00	819.00	811.00	813.00	801.00	
60	35	20	791.00	776.00	758.00	790.00	753.00	
61	35	40	781.00	691.00	680.00	769.00	773.00	
62	35	60	765.00	455.00	725.00	761.00	764.00	
63	35	80	747.00	725.00	733.00	750.00	742.00	
64	35	100	738.00	717.00	728.00	736.00	717.00	
65	35	120	716.00	692.00	707.00	705.00	686.00	
66	25	0	803.00	812.00	811.00	807.00	793.00	
67	25	20	781.00	752.00	704.00	774.00	770.00	
68	25	40	774.00	716.00	697.00	763.00	757.00	
69	25	60	750.00	725.00	730.00	749.00	745.00	
70	25	80	732.00	715.00	725.00	734.00	727.00	
71	25	100	711.00	687.00	697.00	421.00	688.00	
72	15	0	789.00	804.00	800.00	796.00	783.00	
73	15	20	493.00	475.00	360.00	486.00	752.00	
74	15	40	753.00	731.00	712.00	747.00	736.00	
75	15	60	733.00	719.00	724.00	728.00	720.00	
76	15	80	704.00	688.00	700.00	699.00	694.00	

file requested **********
135.c
****

comb. press. - pr (mm water gage) 18.00
cross flow temp. - tr (degree celsius) 542.00
comb. air flow rate - mcr (mm water diff.) 30.00
cool air flow rate - mkr (mm water diff.) 79.00
natural gas flow rate - msr (mm water diff.) 15.00
natural gas total press. - pgsr (psi gage) 0.00
air total press. - psar (mm water gage) 0.00
jet temp. - tjr (degree celsius) 26.00
single jet flow rate - msjr (s.c.f.m.) 1.46
wall temp. - t5 (degree celsius) 268.00
wall temp. - t6 (degree celsius) 296.00
wall temp. - t7 (degree celsius) 308.00
wall temp. - t8 (degree celsius) 365.00
wall temp. - t9 (degree celsius) 263.00
wall temp. - t10 (degree celsius) 266.00

mc = 0.0164317 kg/sec
mk = 0.0835490 kg/sec
mg = 0.001162 kg/sec
m = 0.101143 kg/sec
p = 98276.6 pascal
t = 813 degree kelvin
tj = 299 degree kelvin
t5 = 541 degree kelvin
t6 = 569 degree kelvin
t7 = 581 degree kelvin
t8 = 638 degree kelvin
t9 = 536 degree kelvin
t10= 539 degree kelvin
ro = 0.4202 kg/cubic meter
roj= 1.1452 kg/cubic meter
v = 8.91 meter/sec
msj= 0.0007636 kg/sec
vj = 16.78 meter/sec
dr = 2.73 density ratio
j = 9.7 momentum ratio
fr = 12753 froude number
sr = 9.15 spacing ratio

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	774.00	764.00	736.00	751.00	751.00
2	95	20	783.00	777.00	756.00	764.00	759.00
3	95	40	785.00	780.00	766.00	773.00	767.00
4	95	60	791.00	792.00	776.00	784.00	782.00
5	95	80	797.00	787.00	767.00	786.00	781.00
6	95	100	795.00	776.00	749.00	784.00	794.00
7	95	120	791.00	773.00	746.00	771.00	796.00
8	95	140	783.00	771.00	744.00	768.00	790.00
9	95	160	771.00	767.00	743.00	763.00	790.00
10	95	180	756.00	765.00	740.00	758.00	778.00
11	85	0	789.00	788.00	771.00	781.00	772.00
12	85	20	797.00	796.00	784.00	791.00	782.00
13	85	40	797.00	801.00	786.00	797.00	789.00

14	85	60	795.00	776.00	753.00	792.00	793.00	
15	85	80	796.00	753.00	734.00	772.00	794.00	
16	85	100	788.00	750.00	732.00	755.00	788.00	
17	85	120	785.00	755.00	735.00	754.00	782.00	
18	85	140	767.00	761.00	744.00	761.00	780.00	
19	85	160	761.00	760.00	741.00	759.00	766.00	rdg.
20	85	180	744.00	761.00	742.00	763.00	763.00	135.c
21	75	0	797.00	798.00	786.00	795.00	789.00	
22	75	20	803.00	804.00	793.00	800.00	518.00	
23	75	40	804.00	790.00	766.00	801.00	792.00	
24	75	60	798.00	738.00	721.00	775.00	792.00	
25	75	80	786.00	730.00	723.00	753.00	787.00	
26	75	100	783.00	738.00	735.00	754.00	788.00	
27	75	120	771.00	748.00	738.00	750.00	761.00	
28	75	140	759.00	751.00	746.00	759.00	748.00	
29	75	160	749.00	748.00	743.00	756.00	738.00	
30	75	180	735.00	743.00	736.00	746.00	723.00	
31	65	0	808.00	810.00	798.00	801.00	795.00	
32	65	20	809.00	815.00	805.00	808.00	799.00	
33	65	40	798.00	746.00	705.00	792.00	792.00	
34	65	60	791.00	711.00	707.00	763.00	793.00	
35	65	80	777.00	724.00	726.00	747.00	781.00	
36	65	100	778.00	745.00	742.00	760.00	773.00	
37	65	120	766.00	746.00	746.00	763.00	739.00	
38	65	140	754.00	472.00	476.00	754.00	718.00	
39	65	160	742.00	736.00	740.00	739.00	703.00	
40	65	180	735.00	733.00	732.00	728.00	697.00	
41	55	0	808.00	814.00	804.00	808.00	799.00	
42	55	20	812.00	810.00	794.00	801.00	795.00	
43	55	40	796.00	698.00	672.00	774.00	787.00	
44	55	60	783.00	711.00	719.00	756.00	789.00	
45	55	80	777.00	735.00	739.00	756.00	774.00	
46	55	100	766.00	743.00	743.00	758.00	747.00	
47	55	120	759.00	740.00	747.00	757.00	719.00	
48	55	140	744.00	732.00	743.00	736.00	702.00	
49	55	160	732.00	720.00	727.00	718.00	693.00	
50	55	180	726.00	714.00	714.00	704.00	684.00	
51	45	0	814.00	819.00	813.00	821.00	811.00	
52	45	20	801.00	785.00	758.00	799.00	793.00	
53	45	40	791.00	680.00	681.00	775.00	787.00	
54	45	60	779.00	727.00	728.00	763.00	777.00	
55	45	80	773.00	745.00	744.00	767.00	766.00	
56	45	100	762.00	737.00	746.00	762.00	736.00	
57	45	120	745.00	728.00	739.00	736.00	707.00	
58	45	140	725.00	706.00	714.00	710.00	689.00	
59	35	0	812.00	819.00	819.00	81[illegible].00	805.00	
60	35	20	800.00	770.00	715.00	794.00	793.00	
61	35	40	788.00	714.00	707.00	772.00	783.00	
62	35	60	775.00	743.00	743.00	77[illegible].00	770.00	
63	35	80	762.00	738.00	746.00	76[illegible].00	754.00	
64	35	100	744.00	724.00	735.00	742.00	724.00	
65	35	120	726.00	701.00	710.00	709.00	693.00	
66	25	0	806.00	817.00	814.00	810.00	797.00	
67	25	20	786.00	754.00	663.00	777.00	778.00	
68	25	40	781.00	749.00	720.00	775.00	768.00	
69	25	60	759.00	738.00	740.00	759.00	752.00	
70	25	80	743.00	725.00	735.00	739.00	732.00	
71	25	100	723.00	699.00	707.00	705.00	698.00	
72	15	0	787.00	801.00	802.00	794.00	782.00	
73	15	20	773.00	761.00	722.00	764.00	759.00	
74	15	40	757.00	749.00	736.00	755.00	741.00	
75	15	60	743.00	729.00	737.00	73[illegible].00	731.00	
76	15	80	707.00	692.00	706.00	706.00	703.00	

file requested **********
136.c
****

comb. press. - pr (mm water gage) 18.00
cross flow temp. - tr (degree celsius) 540.00
comb. air flow rate - mcr (mm water diff.) 30.00
cool air flow rate - mkr (mm water diff.) 78.00
natural gas flow rate - mgr (mm water diff.) 15.00
natural gas total press. - pggr (psi gage) 0.00
air total press. - psar (mm water gage) 0.00
jet temp. - tjr (degree celsius) 23.00
single jet flow rate - msjr (s.c.f.m.) 1.61
wall temp. - t5 (degree celsius) 265.00
wall temp. - t6 (degree celsius) 299.00
wall temp. - t7 (degree celsius) 301.00
wall temp. - t8 (degree celsius) 363.00
wall temp. - t9 (degree celsius) 262.00
wall temp. - t10 (degree celsius) 267.00

mc = 0.0164317 kg/sec
mk = 0.0830185 kg/sec
mg = 0.001162 kg/sec
m = 0.100612 kg/sec
p = 98276.6 pascal
t = 813 degree kelvin
tj = 296 degree kelvin
t5 = 538 degree kelvin
t6 = 572 degree kelvin
t7 = 574 degree kelvin
t8 = 636 degree kelvin
t9 = 535 degree kelvin
t10= 540 degree kelvin
ro = 0.4212 kg/cubic meter
roj= 1.1568 kg/cubic meter
v = 8.84 meter/sec
msj= 0.0008394 kg/sec
vj = 18.26 meter/sec
dr = 2.75 density ratio
j = 11.7 momentum ratio
fr = 15038 froude number
sr = 9.15 spacing ratio

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	766.00	756.00	726.00	742.00	739.00
2	95	20	777.00	769.00	753.00	761.00	762.00
3	95	40	784.00	781.00	767.00	776.00	775.00
4	95	60	790.00	786.00	766.00	780.00	768.00
5	95	80	792.00	771.00	752.00	782.00	781.00
6	95	100	786.00	764.00	737.00	765.00	787.00
7	95	120	786.00	761.00	736.00	760.00	784.00
8	95	140	763.00	758.00	736.00	754.00	782.00
9	95	160	752.00	755.00	735.00	755.00	779.00
10	95	180	741.00	754.00	737.00	756.00	771.00
11	85	0	781.00	779.00	756.00	768.00	761.00
12	85	20	793.00	791.00	780.00	785.00	780.00
13	85	40	792.00	794.00	778.00	792.00	786.00

14	85	60	793.00	762.00	739.00	787.00	790.00	
15	85	80	786.00	737.00	721.00	759.00	784.00	
16	85	100	785.00	737.00	728.00	748.00	786.00	
17	85	120	775.00	744.00	735.00	748.00	775.00	
18	85	140	757.00	749.00	741.00	751.00	767.00	
19	85	160	744.00	748.00	733.00	750.00	760.00	
20	85	180	729.00	747.00	733.00	750.00	751.00	rdg.
21	75	0	797.00	795.00	779.00	786.00	780.00	136.c
22	75	20	798.00	800.00	791.00	800.00	793.00	
23	75	40	793.00	767.00	730.00	789.00	787.00	
24	75	60	787.00	718.00	706.00	760.00	789.00	
25	75	80	780.00	719.00	720.00	747.00	789.00	
26	75	100	777.00	733.00	740.00	747.00	776.00	
27	75	120	766.00	745.00	743.00	753.00	760.00	
28	75	140	754.00	750.00	745.00	760.00	745.00	
29	75	160	745.00	747.00	744.00	755.00	732.00	
30	75	180	733.00	742.00	736.00	748.00	720.00	
31	65	0	803.00	805.00	797.00	803.00	793.00	
32	65	20	803.00	806.00	796.00	807.00	795.00	
33	65	40	797.00	720.00	674.00	785.00	792.00	
34	65	60	786.00	704.00	712.00	747.00	789.00	
35	65	80	773.00	721.00	734.00	744.00	5[illegible]5.00	
36	65	100	774.00	744.00	749.00	763.00	771.00	
37	65	120	761.00	746.00	746.00	759.00	739.00	
38	65	140	746.00	741.00	748.00	756.00	719.00	
39	65	160	739.00	735.00	741.00	740.00	706.00	
40	65	180	732.00	730.00	732.00	729.00	700.00	
41	55	0	801.00	806.00	797.00	801.00	793.00	
42	55	20	804.00	799.00	778.00	805.00	798.00	
43	55	40	794.00	683.00	675.00	767.00	792.00	
44	55	60	781.00	711.00	726.00	749.00	785.00	
45	55	80	778.00	739.00	743.00	760.00	777.00	
46	55	100	765.00	743.00	746.00	762.00	747.00	
47	55	120	755.00	739.00	749.00	758.00	724.00	
48	55	140	740.00	731.00	741.00	735.00	705.00	
49	55	160	733.00	721.00	725.00	719.00	695.00	
50	55	180	723.00	711.00	711.00	705.00	687.00	
51	45	0	811.00	816.00	809.00	813.00	803.00	
52	45	20	801.00	777.00	739.00	795.00	794.00	
53	45	40	791.00	687.00	694.00	768.00	790.00	
54	45	60	778.00	735.00	737.00	765.00	779.00	
55	45	80	771.00	744.00	748.00	771.00	769.00	
56	45	100	754.00	736.00	746.00	759.00	737.00	
57	45	120	743.00	729.00	738.00	738.00	711.00	
58	45	140	733.00	713.00	719.00	715.00	693.00	
59	35	0	806.00	814.00	814.00	814.00	804.00	
60	35	20	796.00	762.00	726.00	789.00	789.00	
61	35	40	787.00	716.00	701.00	777.00	779.00	
62	35	60	779.00	750.00	749.00	775.00	772.00	
63	35	80	758.00	739.00	747.00	765.00	755.00	
64	35	100	745.00	726.00	737.00	742.00	725.00	
65	35	120	723.00	700.00	711.00	708.00	695.00	
66	25	0	801.00	811.00	810.00	808.00	797.00	
67	25	20	783.00	745.00	668.00	775.00	778.00	
68	25	40	783.00	760.00	732.00	777.00	768.00	
69	25	60	762.00	746.00	745.00	760.00	755.00	
70	25	80	742.00	727.00	737.00	744.00	738.00	
71	25	100	719.00	696.00	705.00	703.00	699.00	
72	15	0	789.00	800.00	798.00	791.00	780.00	
73	15	20	769.00	758.00	618.00	761.00	757.00	
74	15	40	756.00	744.00	741.00	756.00	746.00	
75	15	60	741.00	726.00	735.00	737.00	729.00	
76	15	80	702.00	689.00	705.00	702.00	698.00	

file requested **********
200.c
****

comb. press. - pr (mm water gage) 21.00
cross flow temp. - tr (degree celsius) 380.00
comb. air flow rate - mcr (mm water diff.) 20.00
cool air flow rate - mkr (mm water diff.) 111.00
natural gas flow rate - mgr (mm water diff.) 10.00
natural gas total press. - pggr (psi gage) 0.00
air total press. - pgar (mm water gage) 0.00
jet temp. - tjr (degree celsius) 32.00
single jet flow rate - msjr (s.c.f.m.) 1.11
wall temp. - t5 (degree celsius) 185.00
wall temp. - t6 (degree celsius) 240.00
wall temp. - t7 (degree celsius) 236.00
wall temp. - t8 (degree celsius) 283.00
wall temp. - t9 (degree celsius) 213.00
wall temp. - t10 (degree celsius) 211.00

mc = 0.0134164 kg/sec
mk = 0.0990351 kg/sec
mg = 0.000949 kg/sec
m = 0.113400 kg/sec
p = 98306 pascal
t = 653 degree kelvin
tj = 305 degree kelvin
t5 = 458 degree kelvin
t6 = 513 degree kelvin
t7 = 509 degree kelvin
t8 = 556 degree kelvin
t9 = 486 degree kelvin
t10= 484 degree kelvin
ro = 0.5245 kg/cubic meter
roj= 1.1230 kg/cubic meter
v = 8.00 meter/sec
msj= 0.0005805 kg/sec
vj = 13.01 meter/sec
dr = 2.14 density ratio
j = 5.7 momentum ratio
fr = 9107 froude number
sr = 2.47 spacing ratio

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	505.00	514.00	512.00	517.00	516.00
2	95	20	520.00	525.00	520.00	527.00	529.00
3	95	40	532.00	534.00	530.00	537.00	538.00
4	95	60	542.00	546.00	545.00	549.00	548.00
5	95	80	553.00	561.00	561.00	561.00	556.00
6	95	100	561.00	571.00	573.00	575.00	567.00
7	95	120	565.00	577.00	580.00	580.00	569.00
8	95	140	569.00	585.00	588.00	589.00	576.00
9	95	160	574.00	589.00	591.00	592.00	576.00
10	95	180	579.00	593.00	597.00	598.00	580.00
11	85	0	528.00	539.00	529.00	532.00	536.00
12	85	20	554.00	561.00	551.00	556.00	560.00
13	85	40	574.00	580.00	573.00	577.00	577.00

14	85	60	583.00	589.00	583.00	587.00	586.00	
15	85	80	595.00	602.00	598.00	599.00	593.00	
16	85	100	598.00	608.00	607.00	607.00	598.00	
17	85	120	600.00	613.00	613.00	614.00	602.00	
18	85	140	603.00	613.00	615.00	613.00	602.00	
19	85	160	605.00	613.00	612.00	617.00	604.00	rdg.
20	85	180	600.00	608.00	609.00	614.00	602.00	200.c
21	75	0	564.00	578.00	557.00	564.00	573.00	
22	75	20	594.00	602.00	589.00	596.00	600.00	
23	75	40	612.00	617.00	608.00	611.00	611.00	
24	75	60	614.00	621.00	616.00	618.00	614.00	
25	75	80	619.00	627.00	623.00	624.00	618.00	
26	75	100	619.00	626.00	625.00	626.00	617.00	
27	75	120	620.00	627.00	626.00	626.00	618.00	
28	75	140	617.00	622.00	624.00	624.00	617.00	
29	75	160	613.00	617.00	618.00	621.00	612.00	
30	75	180	611.00	616.00	616.00	618.00	611.00	
31	65	0	609.00	620.00	597.00	335.00	616.00	
32	65	20	628.00	633.00	621.00	627.00	628.00	
33	65	40	631.00	637.00	631.00	634.00	633.00	
34	65	60	631.00	636.00	633.00	636.00	632.00	
35	65	80	627.00	633.00	630.00	630.00	626.00	
36	65	100	629.00	632.00	629.00	630.00	625.00	
37	65	120	623.00	626.00	627.00	627.00	619.00	
38	65	140	617.00	619.00	623.00	622.00	613.00	
39	65	160	612.00	616.00	616.00	616.00	608.00	
40	65	180	608.00	611.00	612.00	612.00	604.00	
41	55	0	638.00	643.00	628.00	637.00	638.00	
42	55	20	645.00	649.00	640.00	644.00	641.00	
43	55	40	642.00	646.00	641.00	643.00	639.00	
44	55	60	643.00	645.00	640.00	639.00	634.00	
45	55	80	637.00	640.00	636.00	637.00	633.00	
46	55	100	627.00	628.00	629.00	629.00	624.00	
47	55	120	620.00	622.00	624.00	621.00	615.00	
48	55	140	615.00	616.00	616.00	612.00	606.00	
49	55	160	610.00	610.00	608.00	604.00	600.00	
50	55	180	604.00	603.00	602.00	599.00	597.00	
51	45	0	654.00	656.00	648.00	652.00	648.00	
52	45	20	653.00	655.00	650.00	650.00	646.00	
53	45	40	650.00	651.00	647.00	646.00	641.00	
54	45	60	644.00	645.00	642.00	640.00	635.00	
55	45	80	636.00	636.00	634.00	634.00	628.00	
56	45	100	625.00	624.00	623.00	622.00	617.00	
57	45	120	615.00	616.00	615.00	611.00	607.00	
58	45	140	607.00	605.00	604.00	600.00	597.00	
59	35	0	658.00	659.00	653.00	654.00	649.00	
60	35	20	656.00	657.00	652.00	650.00	645.00	
61	35	40	649.00	650.00	646.00	644.00	639.00	
62	35	60	638.00	639.00	637.00	635.00	629.00	
63	35	80	629.00	627.00	627.00	625.00	620.00	
64	35	100	618.00	617.00	617.00	615.00	610.00	
65	35	120	609.00	605.00	605.00	600.00	598.00	
66	25	0	659.00	660.00	653.00	651.00	645.00	
67	25	20	653.00	654.00	650.00	647.00	642.00	
68	25	40	643.00	643.00	640.00	638.00	633.00	
69	25	60	633.00	633.00	633.00	630.00	623.00	
70	25	80	620.00	621.00	620.00	616.00	611.00	
71	25	100	608.00	605.00	605.00	600.00	596.00	
72	15	0	653.00	655.00	651.00	647.00	640.00	
73	15	20	644.00	648.00	645.00	638.00	632.00	
74	15	40	630.00	631.00	632.00	626.00	621.00	
75	15	60	618.00	620.00	620.00	615.00	610.00	
76	15	80	604.00	604.00	607.00	601.00	597.00	

file requested **********
201.c
****

comb. press. - pr (mm water gage) 21.00
cross flow temp. - tr (degree celsius) 383.00
comb. air flow rate - mcr (mm water diff.) 20.00
cool air flow rate - mkr (mm water diff.) 111.00
natural gas flow rate - mgr (mm water diff.) 10.00
natural gas total press. - pggr (psi gage) 0.00
air total press. - pgar (mm water gage) 0.00
jet temp. - tjr (degree celsius) 34.00
single jet flow rate - mgjr (s.c.f.m.) 1.45
wall temp. - t5 (degree celsius) 185.00
wall temp. - t6 (degree celsius) 239.00
wall temp. - t7 (degree celsius) 235.00
wall temp. - t8 (degree celsius) 284.00
wall temp. - t9 (degree celsius) 213.00
wall temp. - t10 (degree celsius) 210.00

mc = 0.0134164 kg/sec
mk = 0.0990351 kg/sec
mg = 0.000949 kg/sec
m = 0.113400 kg/sec
p = 98306 pascal
t = 656 degree kelvin
tj = 307 degree kelvin
t5 = 458 degree kelvin
t6 = 512 degree kelvin
t7 = 508 degree kelvin
t8 = 557 degree kelvin
t9 = 486 degree kelvin
t10= 483 degree kelvin
ro = 0.5221 kg/cubic meter
roj= 1.1157 kg/cubic meter
v = 8.04 meter/sec
mgj= 0.0007584 kg/sec
vj = 17.11 meter/sec
dr = 2.14 density ratio
j = 9.7 momentum ratio
fr = 15772 froude number
sr = 2.47 spacing ratio

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	500.00	509.00	511.00	515.00	517.00
2	95	20	513.00	520.00	518.00	522.00	521.00
3	95	40	523.00	528.00	526.00	529.00	531.00
4	95	60	532.00	539.00	538.00	538.00	537.00
5	95	80	540.00	547.00	545.00	545.00	543.00
6	95	100	546.00	558.00	558.00	556.00	548.00
7	95	120	551.00	567.00	569.00	564.00	553.00
8	95	140	553.00	569.00	575.00	572.00	558.00
9	95	160	562.00	580.00	583.00	580.00	563.00
10	95	180	565.00	582.00	587.00	583.00	565.00
11	85	0	512.00	522.00	520.00	520.00	524.00
12	85	20	533.00	542.00	538.00	537.00	542.00
13	85	40	547.00	557.00	553.00	550.00	554.00

14	85	60	562.00	572.00	567.00	563.00	563.00	
15	85	80	572.00	585.00	580.00	575.00	570.00	
16	85	100	580.00	594.00	591.00	588.00	579.00	
17	85	120	584.00	600.00	600.00	594.00	582.00	
18	85	140	586.00	601.00	603.00	599.00	586.00	
19	85	160	589.00	598.00	601.00	602.00	589.00	rdg.
20	85	180	565.00	583.00	590.00	592.00	580.00	201.c
21	75	0	535.00	548.00	539.00	533.00	545.00	
22	75	20	564.00	574.00	564.00	559.00	570.00	
23	75	40	583.00	593.00	586.00	578.00	583.00	
24	75	60	590.00	601.00	594.00	590.00	588.00	
25	75	80	596.00	609.00	604.00	598.00	593.00	
26	75	100	605.00	618.00	616.00	611.00	604.00	
27	75	120	605.00	615.00	616.00	612.00	605.00	
28	75	140	605.00	614.00	616.00	613.00	603.00	
29	75	160	604.00	336.00	612.00	611.00	602.00	
30	75	180	601.00	604.00	606.00	605.00	597.00	
31	65	0	571.00	588.00	572.00	564.00	584.00	
32	65	20	600.00	609.00	600.00	595.00	603.00	
33	65	40	612.00	623.00	615.00	610.00	611.00	
34	65	60	614.00	626.00	620.00	614.00	613.00	
35	65	80	617.00	629.00	623.00	619.00	614.00	
36	65	100	615.00	624.00	621.00	618.00	613.00	
37	65	120	613.00	620.00	622.00	618.00	610.00	
38	65	140	612.00	616.00	618.00	614.00	607.00	
39	65	160	608.00	612.00	613.00	608.00	601.00	
40	65	180	603.00	608.00	608.00	606.00	600.00	
41	55	0	612.00	624.00	609.00	604.00	617.00	
42	55	20	625.00	632.00	622.00	619.00	624.00	
43	55	40	630.00	638.00	630.00	625.00	625.00	
44	55	60	629.00	638.00	632.00	627.00	624.00	
45	55	80	624.00	630.00	627.00	623.00	619.00	
46	55	100	620.00	625.00	624.00	621.00	616.00	
47	55	120	615.00	618.00	620.00	615.00	610.00	
48	55	140	611.00	613.00	613.00	607.00	603.00	
49	55	160	604.00	606.00	605.00	600.00	597.00	
50	55	180	600.00	600.00	597.00	594.00	589.00	
51	45	0	644.00	649.00	638.00	639.00	641.00	
52	45	20	646.00	649.00	642.00	640.00	639.00	
53	45	40	645.00	649.00	642.00	638.00	635.00	
54	45	60	637.00	640.00	635.00	632.00	628.00	
55	45	80	629.00	632.00	630.00	628.00	622.00	
56	45	100	618.00	621.00	621.00	617.00	612.00	
57	45	120	613.00	613.00	613.00	608.00	604.00	
58	45	140	605.00	604.00	601.00	596.00	593.00	
59	35	0	655.00	657.00	652.00	653.00	650.00	
60	35	20	654.00	655.00	650.00	648.00	644.00	
61	35	40	646.00	649.00	646.00	642.00	638.00	
62	35	60	637.00	639.00	636.00	634.00	629.00	
63	35	80	627.00	627.00	627.00	623.00	618.00	
64	35	100	618.00	617.00	615.00	611.00	606.00	
65	35	120	605.00	603.00	602.00	597.00	595.00	
66	25	0	657.00	660.00	652.00	651.00	646.00	
67	25	20	654.00	656.00	652.00	648.00	643.00	
68	25	40	646.00	647.00	644.00	640.00	634.00	
69	25	60	631.00	631.00	630.00	626.00	621.00	
70	25	80	622.00	620.00	619.00	615.00	611.00	
71	25	100	608.00	605.00	604.00	598.00	596.00	
72	15	0	652.00	654.00	650.00	647.00	642.00	
73	15	20	644.00	648.00	646.00	641.00	634.00	
74	15	40	632.00	634.00	634.00	629.00	623.00	
75	15	60	622.00	623.00	622.00	616.00	612.00	
76	15	80	603.00	605.00	607.00	602.00	598.00	

85 %

****
file requested 202.c
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comb. press. - pr (mm water gage) 22.00
cross flow temp. - tr (degree celsius) 383.00
comb. air flow rate - mcr (mm water diff.) 20.00
cool air flow rate - mkr (mm water diff.) 111.00
natural gas flow rate - mgr (mm water diff.) 10.00
natural gas total press. - pgar (psi gage) 0.00
air total press. - psar (mm water gage) 0.00
jet temp. - tjr (degree celsius) 34.00
single jet flow rate - msjr (s.c.f.m.) 1.60
wall temp. - t5 (degree celsius) 182.00
wall temp. - t6 (degree celsius) 236.00
wall temp. - t7 (degree celsius) 236.00
wall temp. - t8 (degree celsius) 285.00
wall temp. - t9 (degree celsius) 213.00
wall temp. - t10 (degree celsius) 210.00

mc = 0.0134164 kg/sec
mk = 0.0990351 kg/sec
mg = 0.000949 kg/sec
m = 0.113400 kg/sec
p = 98315.8 pascal
t = 656 degree kelvin
tj = 307 degree kelvin
t5 = 455 degree kelvin
t6 = 509 degree kelvin
t7 = 509 degree kelvin
t8 = 558 degree kelvin
t9 = 486 degree kelvin
t10= 483 degree kelvin
ro = 0.5222 kg/cubic meter
roj= 1.1158 kg/cubic meter
v = 8.03 meter/sec
msj= 0.0008342 kg/sec
vj = 18.82 meter/sec
dr = 2.14 density ratio
j = 11.7 momentum ratio
fr = 19081 froude number
sr = 2.47 spacing ratio

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	502.00	511.00	514.00	517.00	518.00
2	95	20	511.00	518.00	515.00	519.00	522.00
3	95	40	519.00	525.00	523.00	526.00	527.00
4	95	60	530.00	537.00	532.00	532.00	533.00
5	95	80	537.00	545.00	545.00	543.00	539.00
6	95	100	545.00	557.00	558.00	552.00	545.00
7	95	120	548.00	563.00	566.00	561.00	551.00
8	95	140	552.00	570.00	574.00	568.00	555.00
9	95	160	559.00	577.00	582.00	575.00	559.00
10	95	180	562.00	579.00	582.00	578.00	563.00
11	85	0	507.00	518.00	517.00	517.00	520.00
12	85	20	528.00	537.00	534.00	532.00	535.00
13	85	40	545.00	555.00	550.00	545.00	547.00

14	85	60	556.00	566.00	562.00	557.00	557.00	
15	85	80	567.00	579.00	575.00	568.00	563.00	
16	85	100	575.00	590.00	588.00	579.00	572.00	
17	85	120	579.00	596.00	595.00	587.00	577.00	
18	85	140	584.00	598.00	600.00	593.00	579.00	
19	85	160	586.00	597.00	598.00	594.00	583.00	
20	85	180	585.00	595.00	595.00	594.00	583.00	rdg.
21	75	0	526.00	538.00	533.00	526.00	537.00	202.c
22	75	20	555.00	568.00	559.00	551.00	560.00	
23	75	40	571.00	580.00	573.00	564.00	569.00	
24	75	60	583.00	596.00	588.00	580.00	580.00	
25	75	80	590.00	605.00	600.00	590.00	585.00	
26	75	100	593.00	607.00	605.00	599.00	592.00	
27	75	120	598.00	612.00	611.00	605.00	596.00	
28	75	140	600.00	609.00	611.00	607.00	597.00	
29	75	160	601.00	609.00	611.00	605.00	596.00	
30	75	180	595.00	602.00	604.00	604.00	595.00	
31	65	0	560.00	577.00	562.00	552.00	574.00	
32	65	20	589.00	603.00	592.00	580.00	592.00	
33	65	40	600.00	612.00	604.00	596.00	601.00	
34	65	60	609.00	621.00	615.00	606.00	603.00	
35	65	80	613.00	625.00	618.00	612.00	607.00	
36	65	100	611.00	622.00	621.00	615.00	610.00	
37	65	120	611.00	619.00	618.00	613.00	607.00	
38	65	140	608.00	615.00	615.00	610.00	603.00	
39	65	160	607.00	610.00	611.00	605.00	599.00	
40	65	180	603.00	605.00	605.00	603.00	597.00	
41	55	0	602.00	617.00	601.00	590.00	609.00	
42	55	20	619.00	629.00	619.00	610.00	619.00	
43	55	40	623.00	634.00	626.00	616.00	618.00	
44	55	60	624.00	633.00	626.00	620.00	617.00	
45	55	80	622.00	631.00	627.00	622.00	618.00	
46	55	100	617.00	623.00	623.00	618.00	613.00	
47	55	120	612.00	616.00	615.00	610.00	604.00	
48	55	140	609.00	612.00	611.00	605.00	600.00	
49	55	160	604.00	604.00	603.00	596.00	592.00	
50	55	180	599.00	598.00	596.00	591.00	588.00	
51	45	0	635.00	640.00	625.00	622.00	632.00	
52	45	20	643.00	648.00	636.00	631.00	635.00	
53	45	40	643.00	648.00	637.00	633.00	632.00	
54	45	60	637.00	642.00	636.00	630.00	627.00	
55	45	80	628.00	632.00	628.00	624.00	620.00	
56	45	100	619.00	621.00	620.00	615.00	611.00	
57	45	120	610.00	611.00	611.00	606.00	601.00	
58	45	140	606.00	603.00	602.00	596.00	593.00	
59	35	0	658.00	659.00	651.00	648.00	647.00	
60	35	20	655.00	657.00	649.00	646.00	644.00	
61	35	40	647.00	648.00	645.00	640.00	636.00	
62	35	60	638.00	639.00	636.00	632.00	628.00	
63	35	80	628.00	629.00	627.00	624.00	619.00	
64	35	100	616.00	617.00	615.00	610.00	605.00	
65	35	120	603.00	601.00	600.00	595.00	593.00	
66	25	0	660.00	662.00	655.00	652.00	649.00	
67	25	20	657.00	657.00	651.00	648.00	643.00	
68	25	40	646.00	647.00	644.00	639.00	634.00	
69	25	60	632.00	633.00	631.00	628.00	623.00	
70	25	80	620.00	619.00	618.00	613.00	609.00	
71	25	100	610.00	607.00	606.00	601.00	597.00	
72	15	0	656.00	658.00	654.00	651.00	643.00	
73	15	20	649.00	651.00	648.00	644.00	636.00	
74	15	40	632.00	635.00	635.00	630.00	623.00	
75	15	60	622.00	622.00	622.00	616.00	611.00	
76	15	80	606.00	605.00	607.00	602.00	598.00	

file requested **********
203.c
****

comb. press. - pr (mm water gage) 18.00
cross flow temp. - tr (degree celsius) 570.00
comb. air flow rate - mcr (mm water diff.) 30.00
cool air flow rate - mkr (mm water diff.) 64.00
natural gas flow rate - mgr (mm water diff.) 15.00
natural gas total press. - pgar (psi gage) 0.00
air total press. - psar (mm water gage) 0.00
jet temp. - tjr (degree celsius) 35.00
single jet flow rate - msjr (s.c.f.m.) 1.03
wall temp. - t5 (degree celsius) 249.00
wall temp. - t6 (degree celsius) 297.00
wall temp. - t7 (degree celsius) 303.00
wall temp. - t8 (degree celsius) 357.00
wall temp. - t9 (degree celsius) 277.00
wall temp. - t10 (degree celsius) 282.00

mc = 0.0164317 kg/sec
mk = 0.0752000 kg/sec
mg = 0.001162 kg/sec
m = 0.092794 kg/sec
p = 98276.6 pascal
t = 843 degree kelvin
tj = 308 degree kelvin
t5 = 522 degree kelvin
t6 = 570 degree kelvin
t7 = 576 degree kelvin
t8 = 630 degree kelvin
t9 = 550 degree kelvin
t10= 555 degree kelvin
ro = 0.4062 kg/cubic meter
roj= 1.1118 kg/cubic meter
v = 8.45 meter/sec
msj= 0.0005387 kg/sec
vj = 12.20 meter/sec
dr = 2.74 density ratio
j = 5.7 momentum ratio
fr = 6719 froude number
sr = 2.47 spacing ratio

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	617.00	624.00	611.00	612.00	607.00
2	95	20	642.00	642.00	629.00	635.00	631.00
3	95	40	662.00	662.00	647.00	651.00	650.00
4	95	60	675.00	678.00	667.00	669.00	664.00
5	95	80	691.00	694.00	685.00	683.00	673.00
6	95	100	701.00	711.00	706.00	706.00	693.00
7	95	120	707.00	724.00	723.00	721.00	700.00
8	95	140	714.00	738.00	740.00	737.00	710.00
9	95	160	723.00	745.00	745.00	740.00	713.00
10	95	180	727.00	749.00	751.00	748.00	716.00
11	85	0	650.00	659.00	633.00	635.00	635.00
12	85	20	690.00	695.00	669.00	673.00	677.00
13	85	40	720.00	720.00	700.00	701.00	700.00

14	85	60	732.00	735.00	724.00	728.00	728.00	
15	85	80	750.00	753.00	739.00	735.00	725.00	
16	85	100	755.00	770.00	759.00	756.00	743.00	
17	85	120	759.00	775.00	767.00	763.00	745.00	
18	85	140	762.00	774.00	774.00	771.00	747.00	
19	85	160	757.00	766.00	762.00	768.00	751.00	
20	85	180	758.00	763.00	764.00	771.00	749.00	rdg.
21	75	0	704.00	718.00	677.00	685.00	702.00	203.c
22	75	20	753.00	756.00	725.00	729.00	739.00	
23	75	40	774.00	774.00	756.00	758.00	762.00	
24	75	60	782.00	784.00	770.00	768.00	765.00	
25	75	80	785.00	791.00	779.00	778.00	767.00	
26	75	100	787.00	793.00	785.00	785.00	773.00	
27	75	120	783.00	787.00	780.00	783.00	771.00	
28	75	140	776.00	778.00	781.00	784.00	769.00	
29	75	160	768.00	765.00	768.00	773.00	757.00	
30	75	180	755.00	757.00	759.00	767.00	757.00	
31	65	0	770.00	774.00	735.00	746.00	756.00	
32	65	20	802.00	802.00	781.00	786.00	788.00	
33	65	40	804.00	804.00	792.00	792.00	787.00	
34	65	60	811.00	814.00	801.00	798.00	791.00	
35	65	80	810.00	811.00	798.00	796.00	785.00	
36	65	100	794.00	794.00	791.00	796.00	786.00	
37	65	120	784.00	783.00	779.00	782.00	773.00	
38	65	140	773.00	769.00	771.00	773.00	760.00	
39	65	160	761.00	757.00	763.00	766.00	752.00	
40	65	180	755.00	751.00	756.00	758.00	748.00	
41	55	0	819.00	821.00	794.00	806.00	807.00	
42	55	20	834.00	835.00	812.00	817.00	813.00	
43	55	40	834.00	834.00	815.00	814.00	809.00	
44	55	60	823.00	822.00	811.00	811.00	799.00	
45	55	80	805.00	803.00	796.00	796.00	788.00	
46	55	100	788.00	786.00	783.00	784.00	775.00	
47	55	120	771.00	769.00	770.00	769.00	758.00	
48	55	140	760.00	756.00	761.00	754.00	741.00	
49	55	160	748.00	741.00	746.00	738.00	728.00	
50	55	180	745.00	729.00	724.00	721.00	717.00	
51	45	0	853.00	852.00	834.00	839.00	829.00	
52	45	20	841.00	843.00	835.00	830.00	819.00	
53	45	40	831.00	832.00	823.00	820.00	811.00	
54	45	60	816.00	815.00	807.00	805.00	796.00	
55	45	80	801.00	794.00	794.00	792.00	779.00	
56	45	100	768.00	769.00	773.00	770.00	759.00	
57	45	120	760.00	756.00	758.00	748.00	736.00	
58	45	140	747.00	732.00	728.00	722.00	716.00	
59	35	0	847.00	851.00	840.00	835.00	824.00	
60	35	20	843.00	843.00	835.00	828.00	816.00	
61	35	40	825.00	828.00	820.00	817.00	805.00	
62	35	60	803.00	804.00	811.00	796.00	786.00	
63	35	80	780.00	778.00	777.00	773.00	763.00	
64	35	100	764.00	758.00	757.00	747.00	737.00	
65	35	120	739.00	726.00	725.00	714.00	711.00	
66	25	0	843.00	843.00	837.00	834.00	822.00	
67	25	20	829.00	835.00	828.00	819.00	809.00	
68	25	40	803.00	807.00	803.00	798.00	784.00	
69	25	60	788.00	788.00	783.00	775.00	762.00	
70	25	80	766.00	763.00	760.00	750.00	737.00	
71	25	100	740.00	723.00	720.00	705.00	697.00	
72	15	0	829.00	838.00	832.00	824.00	811.00	
73	15	20	794.00	804.00	811.00	794.00	780.00	
74	15	40	774.00	783.00	764.00	772.00	756.00	
75	15	60	764.00	764.00	763.00	752.00	738.00	
76	15	80	738.00	735.00	739.00	723.00	710.00	

file requested **********
204.c
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comb. press. - pr (mm water gage) 17.00
cross flow temp. - tr (degree celsius) 580.00
comb. air flow rate - mcr (mm water diff.) 31.00
cool air flow rate - mkr (mm water diff.) 59.00
natural gas flow rate - mgr (mm water diff.) 15.00
natural gas total press. - pggr (psi gage) 0.00
air total press. - pgar (mm water gage) 0.00
jet temp. - tjr (degree celsius) 38.00
single jet flow rate - mgjr (s.c.f.m.) 1.30
wall temp. - t5 (degree celsius) 260.00
wall temp. - t6 (degree celsius) 308.00
wall temp. - t7 (degree celsius) 316.00
wall temp. - t8 (degree celsius) 366.00
wall temp. - t9 (degree celsius) 295.00
wall temp. - t10 (degree celsius) 298.00

mc = 0.0167033 kg/sec
mk = 0.0722028 kg/sec
mg = 0.001162 kg/sec
m = 0.090068 kg/sec
p = 98266.8 pascal
t = 853 degree kelvin
tj = 311 degree kelvin
t5 = 533 degree kelvin
t6 = 581 degree kelvin
t7 = 589 degree kelvin
t8 = 639 degree kelvin
t9 = 568 degree kelvin
t10= 571 degree kelvin
ro = 0.4014 kg/cubic meter
roj= 1.1009 kg/cubic meter
v = 8.30 meter/sec
mgj= 0.0006825 kg/sec
vj = 15.60 meter/sec
dr = 2.74 density ratio
j = 9.7 momentum ratio
fr = 10986 froude number
sr = 2.47 spacing ratio

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	623.00	630.00	620.00	622.00	616.00
2	95	20	638.00	642.00	631.00	632.00	630.00
3	95	40	657.00	661.00	647.00	645.00	642.00
4	95	60	673.00	677.00	667.00	660.00	655.00
5	95	80	691.00	700.00	690.00	680.00	669.00
6	95	100	699.00	716.00	709.00	698.00	685.00
7	95	120	710.00	728.00	724.00	716.00	692.00
8	95	140	711.00	733.00	733.00	719.00	696.00
9	95	160	718.00	740.00	737.00	724.00	699.00
10	95	180	722.00	746.00	746.00	736.00	709.00
11	85	0	646.00	654.00	640.00	635.00	631.00
12	85	20	674.00	677.00	658.00	649.00	652.00
13	85	40	429.00	706.00	690.00	682.00	684.00

14	85	60	713.00	722.00	712.00	701.00	698.00	
15	85	80	709.00	748.00	738.00	722.00	710.00	
16	85	100	739.00	760.00	756.00	741.00	723.00	
17	85	120	748.00	769.00	763.00	752.00	734.00	
18	85	140	752.00	770.00	766.00	758.00	734.00	
19	85	160	753.00	768.00	763.00	757.00	735.00	
20	85	180	748.00	762.00	763.00	764.00	743.00	rdg.
21	75	0	675.00	690.00	667.00	657.00	669.00	204.c
22	75	20	723.00	732.00	709.00	697.00	707.00	
23	75	40	750.00	756.00	737.00	725.00	728.00	
24	75	60	761.00	775.00	762.00	746.00	740.00	
25	75	80	775.00	790.00	779.00	762.00	751.00	
26	75	100	774.00	789.00	782.00	773.00	758.00	
27	75	120	774.00	786.00	781.00	773.00	760.00	
28	75	140	772.00	780.00	777.00	774.00	760.00	
29	75	160	766.00	769.00	769.00	770.00	754.00	
30	75	180	758.00	764.00	764.00	766.00	749.00	
31	65	0	731.00	749.00	716.00	705.00	728.00	
32	65	20	770.00	778.00	756.00	743.00	758.00	
33	65	40	788.00	796.00	781.00	767.00	772.00	
34	65	60	798.00	804.00	78[illegible].00	775.00	771.00	
35	65	80	799.00	808.00	79[illegible].00	787.00	777.00	
36	65	100	784.00	791.00	791.00	784.00	772.00	
37	65	120	782.00	785.00	784.00	783.00	769.00	
38	65	140	774.00	776.00	777.00	771.00	757.00	
39	65	160	763.00	764.00	767.00	761.00	749.00	
40	65	180	758.00	758.00	761.00	759.00	742.00	
41	55	0	797.00	808.00	773.00	765.00	786.00	
42	55	20	814.00	816.00	794.00	786.00	794.00	
43	55	40	819.00	824.00	810.00	798.00	796.00	
44	55	60	821.00	824.00	812.00	801.00	794.00	
45	55	80	803.00	808.00	798.00	793.00	786.00	
46	55	100	790.00	794.00	792.00	787.00	775.00	
47	55	120	779.00	777.00	779.00	773.00	758.00	
48	55	140	766.00	764.00	766.00	757.00	746.00	
49	55	160	757.00	754.00	754.00	741.00	731.00	
50	55	180	752.00	744.00	737.00	731.00	723.00	
51	45	0	853.00	851.00	824.00	824.00	829.00	
52	45	20	844.00	841.00	828.00	819.00	818.00	
53	45	40	834.00	837.00	829.00	820.00	819.00	
54	45	60	824.00	830.00	817.00	808.00	800.00	
55	45	80	802.00	803.00	798.00	793.00	784.00	
56	45	100	787.00	784.00	780.00	776.00	764.00	
57	45	120	771.00	765.00	765.00	754.00	742.00	
58	45	140	756.00	742.00	740.00	729.00	722.00	
59	35	0	861.00	859.00	845.00	848.00	839.00	
60	35	20	847.00	850.00	841.00	841.00	832.00	
61	35	40	837.00	841.00	834.00	825.00	815.00	
62	35	60	813.00	815.00	806.00	801.00	793.00	
63	35	80	789.00	787.00	785.00	778.00	769.00	
64	35	100	770.00	765.00	761.00	752.00	740.00	
65	35	120	753.00	738.00	734.00	721.00	714.00	
66	25	0	862.00	862.00	853.00	854.00	839.00	
67	25	20	834.00	840.00	839.00	833.00	821.00	
68	25	40	814.00	818.00	815.00	807.00	795.00	
69	25	60	792.00	794.00	794.00	785.00	772.00	
70	25	80	777.00	776.00	769.00	759.00	748.00	
71	25	100	747.00	737.00	734.00	715.00	708.00	
72	15	0	843.00	852.00	848.00	841.00	826.00	
73	15	20	811.00	824.00	826.00	813.00	794.00	
74	15	40	785.00	793.00	796.00	786.00	770.00	
75	15	60	775.00	778.00	775.00	761.00	745.00	
76	15	80	738.00	737.00	745.00	729.00	717.00	

859

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file requested                       205.c
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comb. press. - pr (mm water gage)      18.00
cross flow temp. - tr (degree celsius)     580.00
comb. air flow rate - mcr (mm water diff.)      31.00
cool air flow rate - mkr (mm water diff.)      59.00
natural gas flow rate - mgr (mm water diff.)      15.00
natural gas total press. - psgr (psi gage)       0.00
air total press. - psar (mm water gage)       0.00
jet temp. - tjr (degree celsius)      38.00
single jet flow rate - msjr (s.c.f.m.)       1.43
wall temp. - t5 (degree celsius)     241.00
wall temp. - t6 (degree celsius)     301.00
wall temp. - t7 (degree celsius)     311.00
wall temp. - t8 (degree celsius)     366.00
wall temp. - t9 (degree celsius)     299.00
wall temp. - t10 (degree celsius)     300.00


mc = 0.0167033 kg/sec
mk = 0.0722028 kg/sec
mg = 0.001162 kg/sec
m  = 0.090068 kg/sec
p  = 98276.6 pascal
t  = 853 degree kelvin
tj = 311 degree kelvin
t5 = 514 degree kelvin
t6 = 574 degree kelvin
t7 = 584 degree kelvin
t8 = 639 degree kelvin
t9 = 572 degree kelvin
t10= 573 degree kelvin
ro = 0.4014 kg/cubic meter
roj= 1.1011 kg/cubic meter
v  = 8.30 meter/sec
msj= 0.0007505 kg/sec
vj = 17.16 meter/sec
dr = 2.74 density ratio
j  = 11.7 momentum ratio
fr =   13281 froude number
sr =  2.47 spacing ratio
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pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	620.00	629.00	620.00	623.00	621.00
2	95	20	637.00	642.00	631.00	631.00	625.00
3	95	40	651.00	657.00	644.00	640.00	634.00
4	95	60	662.00	669.00	661.00	656.00	646.00
5	95	80	680.00	692.00	682.00	674.00	663.00
6	95	100	686.00	702.00	700.00	688.00	672.00
7	95	120	699.00	717.00	716.00	700.00	680.00
8	95	140	701.00	720.00	726.00	710.00	687.00
9	95	160	711.00	733.00	732.00	720.00	692.00
10	95	180	718.00	741.00	739.00	724.00	696.00
11	85	0	633.00	643.00	633.00	625.00	620.00
12	85	20	667.00	674.00	659.00	652.00	653.00
13	85	40	690.00	700.00	685.00	672.00	673.00

14	85	60	702.00	714.00	700.00	686.00	681.00	
15	85	80	724.00	738.00	726.00	708.00	695.00	
16	85	100	733.00	757.00	749.00	730.00	713.00	
17	85	120	727.00	757.00	759.00	736.00	715.00	
18	85	140	745.00	766.00	762.00	747.00	729.00	
19	85	160	742.00	756.00	752.00	744.00	723.00	rdg.
20	85	180	742.00	757.00	752.00	748.00	727.00	205.c
21	75	0	659.00	674.00	658.00	643.00	653.00	
22	75	20	699.00	711.00	696.00	680.00	694.00	
23	75	40	735.00	744.00	726.00	709.00	712.00	
24	75	60	745.00	762.00	754.00	734.00	725.00	
25	75	80	759.00	778.00	768.00	748.00	736.00	
26	75	100	759.00	781.00	778.00	760.00	747.00	
27	75	120	761.00	776.00	775.00	760.00	746.00	
28	75	140	757.00	770.00	769.00	763.00	749.00	
29	75	160	759.00	765.00	766.00	761.00	744.00	
30	75	180	752.00	760.00	758.00	757.00	742.00	
31	65	0	711.00	732.00	701.00	679.00	707.00	
32	65	20	755.00	767.00	746.00	725.00	743.00	
33	65	40	775.00	785.00	770.00	747.00	752.00	
34	65	60	780.00	795.00	783.00	763.00	758.00	
35	65	80	785.00	797.00	785.00	768.00	756.00	
36	65	100	777.00	787.00	781.00	771.00	763.00	
37	65	120	766.00	775.00	777.00	770.00	756.00	
38	65	140	763.00	767.00	769.00	761.00	747.00	
39	65	160	753.00	757.00	758.00	752.00	740.00	
40	65	180	748.00	751.00	751.00	749.00	735.00	
41	55	0	771.00	788.00	753.00	732.00	756.00	
42	55	20	795.00	802.00	781.00	758.00	773.00	
43	55	40	804.00	809.00	796.00	777.00	776.00	
44	55	60	801.00	813.00	799.00	784.00	779.00	
45	55	80	791.00	801.00	795.00	783.00	774.00	
46	55	100	780.00	784.00	781.00	771.00	761.00	
47	55	120	763.00	770.00	770.00	761.00	747.00	
48	55	140	760.00	758.00	756.00	747.00	737.00	
49	55	160	744.00	746.00	742.00	729.00	718.00	
50	55	180	741.00	735.00	726.00	720.00	713.00	
51	45	0	830.00	831.00	808.00	796.00	810.00	
52	45	20	833.00	837.00	818.00	804.00	809.00	
53	45	40	823.00	827.00	813.00	800.00	799.00	
54	45	60	813.00	819.00	806.00	793.00	786.00	
55	45	80	793.00	797.00	792.00	781.00	773.00	
56	45	100	772.00	773.00	772.00	763.00	752.00	
57	45	120	763.00	759.00	756.00	743.00	734.00	
58	45	140	749.00	740.00	731.00	720.00	713.00	
59	35	0	860.00	858.00	841.00	838.00	834.00	
60	35	20	852.00	854.00	839.00	831.00	826.00	
61	35	40	832.00	834.00	823.00	813.00	807.00	
62	35	60	811.00	808.00	805.00	793.00	783.00	
63	35	80	783.00	784.00	784.00	773.00	760.00	
64	35	100	740.00	768.00	760.00	750.00	737.00	
65	35	120	752.00	737.00	732.00	721.00	711.00	
66	25	0	855.00	863.00	851.00	849.00	840.00	
67	25	20	836.00	844.00	841.00	834.00	824.00	
68	25	40	819.00	823.00	815.00	808.00	800.00	
69	25	60	793.00	794.00	790.00	782.00	771.00	
70	25	80	778.00	776.00	772.00	760.00	746.00	
71	25	100	752.00	744.00	741.00	725.00	714.00	
72	15	0	842.00	851.00	850.00	840.00	829.00	
73	15	20	816.00	827.00	831.00	818.00	799.00	
74	15	40	796.00	804.00	803.00	790.00	774.00	
75	15	60	775.00	779.00	776.00	762.00	749.00	
76	15	80	745.00	742.00	746.00	731.00	720.00	

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file requested 206.c
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comb. press. - pr (mm water gage) 23.00
cross flow temp. - tr (degree celsius) 380.00
comb. air flow rate - mcr (mm water diff.) 30.00
cool air flow rate - mkr (mm water diff.) 140.00
natural gas flow rate - msr (mm water diff.) 15.00
natural gas total press. - pssr (psi gage) 0.00
air total press. - psar (mm water gage) 0.00
jet temp. - tjr (degree celsius) 32.00
single jet flow rate - msjr (s.c.f.m.) 1.46
wall temp. - t5 (degree celsius) 199.00
wall temp. - t6 (degree celsius) 258.00
wall temp. - t7 (degree celsius) 257.00
wall temp. - t8 (degree celsius) 315.00
wall temp. - t9 (degree celsius) 222.00
wall temp. - t10 (degree celsius) 221.00

mc = 0.0164317 kg/sec
mk = 0.1112223 kg/sec
ms = 0.001162 kg/sec
m = 0.128816 kg/sec
p = 98325.6 pascal
t = 653 degree kelvin
tj = 305 degree kelvin
t5 = 472 degree kelvin
t6 = 531 degree kelvin
t7 = 530 degree kelvin
t8 = 588 degree kelvin
t9 = 495 degree kelvin
t10= 494 degree kelvin
ro = 0.5247 kg/cubic meter
roj= 1.1233 kg/cubic meter
v = 9.08 meter/sec
msj= 0.0007636 kg/sec
vj = 17.11 meter/sec
dr = 2.14 density ratio
j = 7.6 momentum ratio
fr = 15750 froude number
sr = 4.94 spacing ratio

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	567.00	564.00	536.00	582.00	589.00
2	95	20	566.00	563.00	537.00	308.00	591.00
3	95	40	565.00	567.00	542.00	583.00	590.00
4	95	60	564.00	573.00	548.00	581.00	587.00
5	95	80	564.00	577.00	559.00	586.00	591.00
6	95	100	563.00	579.00	568.00	590.00	593.00
7	95	120	563.00	580.00	576.00	593.00	595.00
8	95	140	562.00	583.00	587.00	599.00	601.00
9	95	160	565.00	583.00	590.00	603.00	605.00
10	95	180	566.00	587.00	596.00	608.00	610.00
11	85	0	580.00	555.00	530.00	582.00	589.00
12	85	20	596.00	572.00	541.00	588.00	595.00
13	85	40	601.00	588.00	556.00	593.00	599.00

14	85	60	597.00	592.00	565.00	594.00	599.00	
15	85	80	602.00	601.00	581.00	605.00	605.00	
16	85	100	604.00	606.00	598.00	340.00	608.00	
17	85	120	587.00	598.00	600.00	612.00	611.00	
18	85	140	584.00	598.00	608.00	616.00	618.00	
19	85	160	585.00	599.00	607.00	616.00	618.00	rdg.
20	85	180	583.00	601.00	610.00	618.00	623.00	206.c
21	75	0	590.00	563.00	531.00	592.00	602.00	
22	75	20	597.00	582.00	556.00	606.00	618.00	
23	75	40	601.00	593.00	571.00	608.00	617.00	
24	75	60	600.00	603.00	591.00	617.00	618.00	
25	75	80	598.00	605.00	601.00	621.00	621.00	
26	75	100	602.00	613.00	616.00	628.00	625.00	
27	75	120	598.00	611.00	618.00	628.00	628.00	
28	75	140	596.00	612.00	624.00	629.00	630.00	
29	75	160	595.00	611.00	620.00	626.00	629.00	
30	75	180	587.00	608.00	616.00	624.00	630.00	
31	65	0	626.00	598.00	561.00	622.00	632.00	
32	65	20	635.00	617.00	591.00	633.00	641.00	
33	65	40	635.00	626.00	608.00	636.00	641.00	
34	65	60	633.00	629.00	619.00	638.00	640.00	
35	65	80	631.00	631.00	627.00	641.00	639.00	
36	65	100	630.00	634.00	635.00	642.00	641.00	
37	65	120	627.00	634.00	637.00	640.00	641.00	
38	65	140	624.00	632.00	636.00	639.00	642.00	
39	65	160	621.00	630.00	634.00	637.00	638.00	
40	65	180	618.00	628.00	629.00	632.00	634.00	
41	55	0	628.00	623.00	602.00	642.00	651.00	
42	55	20	629.00	632.00	621.00	650.00	659.00	
43	55	40	631.00	636.00	631.00	654.00	659.00	
44	55	60	642.00	645.00	639.00	656.00	657.00	
45	55	80	622.00	634.00	637.00	651.00	650.00	
46	55	100	612.00	628.00	636.00	644.00	644.00	
47	55	120	609.00	626.00	637.00	643.00	645.00	
48	55	140	606.00	627.00	637.00	641.00	644.00	
49	55	160	604.00	622.00	630.00	634.00	638.00	
50	55	180	596.00	615.00	622.00	628.00	635.00	
51	45	0	634.00	640.00	632.00	659.00	667.00	
52	45	20	636.00	645.00	644.00	665.00	672.00	
53	45	40	635.00	646.00	646.00	664.00	670.00	
54	45	60	630.00	643.00	647.00	661.00	663.00	
55	45	80	622.00	636.00	643.00	655.00	655.00	
56	45	100	628.00	640.00	644.00	651.00	650.00	
57	45	120	626.00	636.00	642.00	647.00	647.00	
58	45	140	620.00	630.00	636.00	639.00	641.00	
59	35	0	654.00	661.00	663.00	675.00	680.00	
60	35	20	655.00	664.00	666.00	678.00	684.00	
61	35	40	651.00	659.00	662.00	672.00	677.00	
62	35	60	646.00	654.00	658.00	668.00	671.00	
63	35	80	637.00	647.00	654.00	662.00	664.00	
64	35	100	619.00	636.00	644.00	651.00	653.00	
65	35	120	612.00	628.00	636.00	640.00	644.00	
66	25	0	647.00	663.00	668.00	683.00	690.00	
67	25	20	644.00	660.00	667.00	680.00	688.00	
68	25	40	638.00	655.00	665.00	676.00	680.00	
69	25	60	633.00	649.00	659.00	669.00	670.00	
70	25	80	624.00	640.00	652.00	660.00	661.00	
71	25	100	613.00	631.00	639.00	642.00	643.00	
72	15	0	652.00	668.00	676.00	688.00	694.00	
73	15	20	648.00	663.00	672.00	683.00	688.00	
74	15	40	642.00	655.00	664.00	670.00	672.00	
75	15	60	634.00	646.00	655.00	661.00	663.00	
76	15	80	618.00	632.00	644.00	648.00	648.00	

file requested **********
207.c
****

comb. press. - pr (mm water gage) 30.00
cross flow temp. - tr (degree celsius) 375.00
comb. air flow rate - mcr (mm water diff.) 30.00
cool air flow rate - mkr (mm water diff.) 148.00
natural gas flow rate - mgr (mm water diff.) 15.00
natural gas total press. - pggr (psi gage) 0.00
air total press. - pgar (mm water gage) 0.00
jet temp. - tjr (degree celsius) 30.00
single jet flow rate - mgjr (s.c.f.m.) 1.69
wall temp. - t5 (degree celsius) 201.00
wall temp. - t6 (degree celsius) 251.00
wall temp. - t7 (degree celsius) 259.00
wall temp. - t8 (degree celsius) 312.00
wall temp. - t9 (degree celsius) 220.00
wall temp. - t10 (degree celsius) 216.00

mc = 0.0164317 kg/sec
mk = 0.1143559 kg/sec
mg = 0.001162 kg/sec
m = 0.131949 kg/sec
p = 98394.3 pascal
t = 648 degree kelvin
tj = 303 degree kelvin
t5 = 474 degree kelvin
t6 = 524 degree kelvin
t7 = 532 degree kelvin
t8 = 585 degree kelvin
t9 = 493 degree kelvin
t10= 489 degree kelvin
ro = 0.5291 kg/cubic meter
roj= 1.1315 kg/cubic meter
v = 9.23 meter/sec
mgj= 0.0008839 kg/sec
vj = 19.66 meter/sec
dr = 2.14 density ratio
j = 9.7 momentum ratio
fr = 20818 froude number
sr = 4.94 spacing ratio

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	581.00	575.00	540.00	579.00	586.00
2	95	20	579.00	570.00	542.00	577.00	583.00
3	95	40	577.00	573.00	548.00	576.00	583.00
4	95	60	577.00	578.00	555.00	580.00	584.00
5	95	80	576.00	580.00	558.00	580.00	582.00
6	95	100	577.00	584.00	570.00	587.00	587.00
7	95	120	554.00	572.00	570.00	588.00	587.00
8	95	140	555.00	573.00	578.00	591.00	592.00
9	95	160	583.00	590.00	589.00	596.00	595.00
10	95	180	586.00	593.00	593.00	600.00	601.00
11	85	0	582.00	554.00	533.00	574.00	574.00
12	85	20	585.00	561.00	538.00	577.00	581.00
13	85	40	587.00	574.00	548.00	583.00	586.00

14	85	60	587.00	580.00	559.00	586.00	586.00	
15	85	80	590.00	589.00	573.00	591.00	589.00	
16	85	100	592.00	594.00	587.00	599.00	594.00	
17	85	120	592.00	596.00	595.00	602.00	597.00	
18	85	140	577.00	589.00	595.00	604.00	604.00	
19	85	160	577.00	589.00	593.00	604.00	606.00	
20	85	180	571.00	587.00	595.00	604.00	608.00	rdg.
21	75	0	576.00	548.00	527.00	582.00	587.00	207.c
22	75	20	583.00	567.00	546.00	593.00	601.00	
23	75	40	584.00	578.00	558.00	597.00	601.00	
24	75	60	585.00	585.00	573.00	600.00	601.00	
25	75	80	586.00	593.00	589.00	607.00	604.00	
26	75	100	587.00	597.00	600.00	610.00	608.00	
27	75	120	587.00	599.00	607.00	617.00	615.00	
28	75	140	586.00	600.00	611.00	616.00	618.00	
29	75	160	584.00	601.00	610.00	616.00	622.00	
30	75	180	580.00	599.00	608.00	615.00	620.00	
31	65	0	598.00	568.00	540.00	602.00	611.00	
32	65	20	600.00	587.00	566.00	613.00	623.00	
33	65	40	601.00	597.00	583.00	616.00	622.00	
34	65	60	600.00	604.00	598.00	620.00	620.00	
35	65	80	600.00	609.00	611.00	626.00	622.00	
36	65	100	596.00	610.00	616.00	624.00	624.00	
37	65	120	594.00	609.00	619.00	623.00	625.00	
38	65	140	593.00	611.00	621.00	626.00	628.00	
39	65	160	592.00	609.00	618.00	623.00	628.00	
40	65	180	586.00	605.00	613.00	619.00	624.00	
41	55	0	615.00	601.00	579.00	630.00	639.00	
42	55	20	616.00	612.00	598.00	635.00	644.00	
43	55	40	613.00	616.00	612.00	639.00	642.00	
44	55	60	628.00	629.00	625.00	643.00	644.00	
45	55	80	616.00	624.00	624.00	639.00	638.00	
46	55	100	605.00	620.00	628.00	636.00	637.00	
47	55	120	601.00	616.00	624.00	631.00	633.00	
48	55	140	597.00	616.00	624.00	629.00	634.00	
49	55	160	595.00	613.00	620.00	623.00	627.00	
50	55	180	587.00	605.00	613.00	619.00	625.00	
51	45	0	626.00	629.00	620.00	653.00	661.00	
52	45	20	629.00	635.00	632.00	655.00	662.00	
53	45	40	626.00	635.00	635.00	654.00	659.00	
54	45	60	625.00	634.00	637.00	651.00	652.00	
55	45	80	630.00	636.00	640.00	376.00	647.00	
56	45	100	625.00	632.00	637.00	642.00	642.00	
57	45	120	619.00	629.00	635.00	637.00	637.00	
58	45	140	614.00	621.00	626.00	629.00	631.00	
59	35	0	638.00	648.00	649.00	668.00	674.00	
60	35	20	636.00	648.00	650.00	666.00	674.00	
61	35	40	629.00	643.00	647.00	662.00	667.00	
62	35	60	624.00	636.00	644.00	656.00	660.00	
63	35	80	614.00	630.00	637.00	647.00	649.00	
64	35	100	608.00	626.00	633.00	639.00	640.00	
65	35	120	602.00	617.00	626.00	628.00	632.00	
66	25	0	638.00	653.00	659.00	674.00	682.00	
67	25	20	634.00	649.00	657.00	670.00	678.00	
68	25	40	628.00	643.00	653.00	665.00	671.00	
69	25	60	620.00	637.00	646.00	657.00	659.00	
70	25	80	614.00	630.00	639.00	645.00	648.00	
71	25	100	603.00	618.00	629.00	632.00	635.00	
72	15	0	638.00	655.00	666.00	679.00	686.00	
73	15	20	634.00	653.00	664.00	675.00	679.00	
74	15	40	626.00	645.00	654.00	663.00	667.00	
75	15	60	619.00	636.00	646.00	654.00	656.00	
76	15	80	613.00	626.00	636.00	640.00	640.00	

file requested

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208.c
****

comb. press. - pr (mm water gage) 20.00
cross flow temp. - tr (degree celsius) 371.00
comb. air flow rate - mcr (mm water diff.) 20.00
cool air flow rate - mkr (mm water diff.) 100.00
natural gas flow rate - mgr (mm water diff.) 10.00
natural gas total press. - pggr (psi gage) 0.00
air total press. - pgar (mm water gage) 0.00
jet temp. - tjr (degree celsius) 28.00
single jet flow rate - mgjr (s.c.f.m.) 1.52
wall temp. - t5 (degree celsius) 201.00
wall temp. - t6 (degree celsius) 244.00
wall temp. - t7 (degree celsius) 252.00
wall temp. - t8 (degree celsius) 299.00
wall temp. - t9 (degree celsius) 218.00
wall temp. - t10 (degree celsius) 215.00

mc = 0.0134164 kg/sec
mk = 0.0940000 kg/sec
mg = 0.000949 kg/sec
m = 0.108365 kg/sec
p = 98296.2 pascal
t = 644 degree kelvin
tj = 301 degree kelvin
t5 = 474 degree kelvin
t6 = 517 degree kelvin
t7 = 525 degree kelvin
t8 = 572 degree kelvin
t9 = 491 degree kelvin
t10= 488 degree kelvin
ro = 0.5318 kg/cubic meter
roj= 1.1379 kg/cubic meter
v = 7.54 meter/sec
mgj= 0.0007976 kg/sec
vj = 17.64 meter/sec
dr = 2.14 density ratio
j = 11.7 momentum ratio
fr = 16755 froude number
sr = 4.94 spacing ratio

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	572.00	573.00	548.00	585.00	593.00
2	95	20	563.00	565.00	548.00	582.00	589.00
3	95	40	561.00	567.00	549.00	579.00	585.00
4	95	60	563.00	570.00	553.00	580.00	584.00
5	95	80	557.00	569.00	557.00	578.00	582.00
6	95	100	577.00	586.00	572.00	588.00	589.00
7	95	120	580.00	589.00	580.00	592.00	592.00
8	95	140	583.00	591.00	586.00	596.00	595.00
9	95	160	586.00	594.00	590.00	598.00	597.00
10	95	180	588.00	594.00	593.00	600.00	600.00
11	85	0	583.00	563.00	541.00	578.00	581.00
12	85	20	567.00	559.00	542.00	578.00	583.00
13	85	40	568.00	566.00	547.00	580.00	583.00

14	85	60	568.00	572.00	559.00	585.00	587.00	
15	85	80	567.00	576.00	566.00	587.00	589.00	
16	85	100	570.00	583.00	580.00	596.00	592.00	
17	85	120	571.00	584.00	588.00	598.00	594.00	
18	85	140	574.00	586.00	594.00	601.00	603.00	
19	85	160	593.00	602.00	604.00	611.00	609.00	
20	85	180	597.00	605.00	604.00	610.00	611.00	rdg.
21	75	0	597.00	558.00	539.00	583.00	583.00	208.c
22	75	20	602.00	574.00	553.00	595.00	598.00	
23	75	40	605.00	589.00	566.00	598.00	601.00	
24	75	60	605.00	598.00	581.00	607.00	605.00	
25	75	80	605.00	603.00	592.00	607.00	604.00	
26	75	100	608.00	610.00	607.00	614.00	607.00	
27	75	120	589.00	601.00	609.00	617.00	613.00	
28	75	140	595.00	606.00	614.00	618.00	617.00	
29	75	160	609.00	615.00	616.00	621.00	624.00	
30	75	180	601.00	610.00	613.00	617.00	623.00	
31	65	0	600.00	566.00	541.00	601.00	603.00	
32	65	20	611.00	589.00	567.00	613.00	617.00	
33	65	40	603.00	599.00	585.00	617.00	618.00	
34	65	60	602.00	606.00	596.00	623.00	617.00	
35	65	80	602.00	609.00	608.00	624.00	618.00	
36	65	100	600.00	612.00	619.00	626.00	623.00	
37	65	120	596.00	610.00	617.00	623.00	625.00	
38	65	140	597.00	614.00	624.00	626.00	631.00	
39	65	160	595.00	613.00	619.00	623.00	630.00	
40	65	180	592.00	610.00	616.00	621.00	629.00	
41	55	0	618.00	597.00	570.00	625.00	636.00	
42	55	20	619.00	608.00	592.00	633.00	639.00	
43	55	40	620.00	618.00	609.00	636.00	639.00	
44	55	60	630.00	628.00	623.00	643.00	640.00	
45	55	80	627.00	630.00	630.00	641.00	639.00	
46	55	100	624.00	631.00	634.00	639.00	635.00	
47	55	120	613.00	625.00	632.00	633.00	635.00	
48	55	140	605.00	622.00	630.00	631.00	636.00	
49	55	160	601.00	618.00	624.00	625.00	633.00	
50	55	180	609.00	617.00	620.00	624.00	628.00	
51	45	0	646.00	635.00	617.00	657.00	663.00	
52	45	20	646.00	640.00	629.00	657.00	663.00	
53	45	40	642.00	641.00	636.00	657.00	660.00	
54	45	60	638.00	641.00	639.00	654.00	652.00	
55	45	80	630.00	637.00	638.00	646.00	645.00	
56	45	100	625.00	634.00	638.00	644.00	641.00	
57	45	120	621.00	630.00	636.00	637.00	639.00	
58	45	140	616.00	624.00	629.00	630.00	635.00	
59	35	0	653.00	655.00	648.00	668.00	676.00	
60	35	20	651.00	653.00	649.00	667.00	675.00	
61	35	40	646.00	652.00	652.00	665.00	668.00	
62	35	60	641.00	646.00	649.00	660.00	660.00	
63	35	80	635.00	642.00	647.00	653.00	653.00	
64	35	100	625.00	635.00	639.00	643.00	643.00	
65	35	120	617.00	627.00	633.00	635.00	639.00	
66	25	0	646.00	659.00	663.00	680.00	687.00	
67	25	20	641.00	655.00	662.00	678.00	684.00	
68	25	40	634.00	648.00	655.00	395.00	674.00	
69	25	60	627.00	641.00	650.00	659.00	662.00	
70	25	80	622.00	637.00	643.00	650.00	651.00	
71	25	100	609.00	622.00	632.00	633.00	636.00	
72	15	0	644.00	663.00	670.00	682.00	691.00	
73	15	20	636.00	655.00	666.00	678.00	684.00	
74	15	40	629.00	647.00	658.00	666.00	669.00	
75	15	60	627.00	641.00	650.00	659.00	661.00	
76	15	80	609.00	626.00	639.00	641.00	642.00	

file requested **********
209.c
****

comb. press. - pr (mm water gage) 18.00
cross flow temp. - tr (degree celsius) 570.00
comb. air flow rate - mcr (mm water diff.) 30.00
cool air flow rate - mkr (mm water diff.) 59.00
natural gas flow rate - mgr (mm water diff.) 16.50
natural gas total press. - pggr (psi gage) 0.00
air total press. - pgar (mm water gage) 0.00
jet temp. - tjr (degree celsius) 35.00
single jet flow rate - mgjr (s.c.f.m.) 1.00
wall temp. - t5 (degree celsius) 295.00
wall temp. - t6 (degree celsius) 339.00
wall temp. - t7 (degree celsius) 349.00
wall temp. - t8 (degree celsius) 377.00
wall temp. - t9 (degree celsius) 304.00
wall temp. - t10 (degree celsius) 311.00

mc = 0.0164317 kg/sec
mk = 0.0722028 kg/sec
mg = 0.001219 kg/sec
m = 0.089853 kg/sec
p = 98276.6 pascal
t = 843 degree kelvin
tj = 308 degree kelvin
t5 = 568 degree kelvin
t6 = 612 degree kelvin
t7 = 622 degree kelvin
t8 = 650 degree kelvin
t9 = 577 degree kelvin
t10= 584 degree kelvin
ro = 0.4062 kg/cubic meter
roj= 1.1118 kg/cubic meter
v = 8.18 meter/sec
mgj= 0.0005230 kg/sec
vj = 11.84 meter/sec
dr = 2.74 density ratio
j = 5.7 momentum ratio
fr = 6333 froude number
sr = 4.94 spacing ratio

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	783.00	760.00	656.00	718.00	721.00
2	95	20	773.00	753.00	670.00	727.00	730.00
3	95	40	773.00	763.00	680.00	728.00	735.00
4	95	60	772.00	773.00	694.00	735.00	741.00
5	95	80	766.00	776.00	704.00	731.00	738.00
6	95	100	765.00	784.00	727.00	751.00	747.00
7	95	120	770.00	785.00	738.00	753.00	745.00
8	95	140	771.00	787.00	756.00	766.00	755.00
9	95	160	772.00	786.00	764.00	773.00	761.00
10	95	180	777.00	786.00	755.00	758.00	765.00
11	85	0	786.00	730.00	651.00	726.00	727.00
12	85	20	784.00	739.00	664.00	736.00	745.00
13	85	40	792.00	755.00	688.00	748.00	753.00

14	85	60	789.00	772.00	712.00	759.00	759.00	
15	85	80	783.00	784.00	734.00	766.00	757.00	
16	85	100	795.00	797.00	756.00	778.00	764.00	
17	85	120	790.00	795.00	776.00	786.00	768.00	
18	85	140	789.00	795.00	785.00	792.00	776.00	
19	85	160	785.00	789.00	781.00	787.00	782.00	
20	85	180	776.00	784.00	777.00	787.00	784.00	rdg.
21	75	0	799.00	731.00	650.00	750.00	753.00	209.c
22	75	20	813.00	761.00	689.00	766.00	776.00	
23	75	40	815.00	782.00	721.00	779.00	787.00	
24	75	60	807.00	793.00	748.00	786.00	791.00	
25	75	80	803.00	799.00	769.00	795.00	791.00	
26	75	100	800.00	800.00	788.00	804.00	793.00	
27	75	120	794.00	800.00	794.00	810.00	800.00	
28	75	140	784.00	790.00	796.00	803.00	794.00	
29	75	160	776.00	788.00	793.00	799.00	799.00	
30	75	180	771.00	786.00	791.00	799.00	795.00	
31	65	0	832.00	776.00	694.00	792.00	798.00	
32	65	20	831.00	799.00	747.00	809.00	819.00	
33	65	40	827.00	810.00	773.00	814.00	821.00	
34	65	60	828.00	819.00	796.00	827.00	826.00	
35	65	80	812.00	815.00	806.00	825.00	820.00	
36	65	100	804.00	809.00	811.00	823.00	821.00	
37	65	120	793.00	529.00	810.00	820.00	812.00	
38	65	140	783.00	797.00	807.00	816.00	815.00	
39	65	160	778.00	793.00	800.00	810.00	808.00	
40	65	180	772.00	786.00	799.00	808.00	804.00	
41	55	0	845.00	826.00	777.00	836.00	842.00	
42	55	20	841.00	832.00	809.00	847.00	856.00	
43	55	40	837.00	832.00	820.00	845.00	854.00	
44	55	60	826.00	829.00	825.00	849.00	848.00	
45	55	80	811.00	817.00	824.00	843.00	840.00	
46	55	100	794.00	803.00	815.00	832.00	834.00	
47	55	120	786.00	799.00	809.00	821.00	821.00	
48	55	140	777.00	792.00	804.00	812.00	817.00	
49	55	160	771.00	788.00	796.00	805.00	809.00	
50	55	180	763.00	775.00	783.00	789.00	794.00	
51	45	0	848.00	847.00	835.00	860.00	866.00	
52	45	20	837.00	848.00	844.00	870.00	874.00	
53	45	40	829.00	839.00	848.00	866.00	872.00	
54	45	60	819.00	830.00	838.00	855.00	862.00	
55	45	80	799.00	813.00	824.00	841.00	846.00	
56	45	100	785.00	800.00	817.00	830.00	829.00	
57	45	120	776.00	794.00	809.00	817.00	819.00	
58	45	140	768.00	784.00	797.00	800.00	805.00	
59	35	0	852.00	864.00	868.00	882.00	885.00	
60	35	20	841.00	857.00	861.00	876.00	890.00	
61	35	40	821.00	839.00	851.00	866.00	876.00	
62	35	60	800.00	816.00	828.00	846.00	853.00	
63	35	80	782.00	803.00	819.00	833.00	833.00	
64	35	100	772.00	794.00	807.00	818.00	817.00	
65	35	120	760.00	772.00	788.00	792.00	792.00	
66	25	0	836.00	859.00	867.00	885.00	900.00	
67	25	20	816.00	835.00	851.00	864.00	877.00	
68	25	40	796.00	820.00	838.00	853.00	861.00	
69	25	60	780.00	798.00	820.00	832.00	836.00	
70	25	80	779.00	797.00	810.00	818.00	823.00	
71	25	100	757.00	776.00	795.00	796.00	798.00	
72	15	0	821.00	843.00	858.00	873.00	886.00	
73	15	20	782.00	814.00	838.00	851.00	856.00	
74	15	40	771.00	792.00	815.00	829.00	835.00	
75	15	60	767.00	519.00	809.00	819.00	823.00	
76	15	80	751.00	778.00	796.00	802.00	806.00	

file requested

****
210.c
****

comb. press. - pr (mm water gage) 19.00
cross flow temp. - tr (degree celsius) 565.00
comb. air flow rate - mcr (mm water diff.) 29.00
cool air flow rate - mkr (mm water diff.) 56.00
natural gas flow rate - msr (mm water diff.) 16.00
natural gas total press. - pssr (psi gage) 0.00
air total press. - psar (mm water gage) 0.00
jet temp. - tjr (degree celsius) 33.00
single jet flow rate - msjr (s.c.f.m.) 1.27
wall temp. - t5 (degree celsius) 267.00
wall temp. - t6 (degree celsius) 341.00
wall temp. - t7 (degree celsius) 343.00
wall temp. - t8 (degree celsius) 373.00
wall temp. - t9 (degree celsius) 302.00
wall temp. - t10 (degree celsius) 308.00

mc = 0.0161555 kg/sec
mk = 0.0703432 kg/sec
ms = 0.001200 kg/sec
m = 0.087699 kg/sec
p = 98286.4 pascal
t = 838 degree kelvin
tj = 306 degree kelvin
t5 = 540 degree kelvin
t6 = 614 degree kelvin
t7 = 616 degree kelvin
t8 = 646 degree kelvin
t9 = 575 degree kelvin
t10= 581 degree kelvin
ro = 0.4087 kg/cubic meter
roj= 1.1192 kg/cubic meter
v = 7.94 meter/sec
msj= 0.0006642 kg/sec
vj = 14.94 meter/sec
dr = 2.74 density ratio
j = 9.7 momentum ratio
fr = 10078 froude number
sr = 4.94 spacing ratio

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	779.00	768.00	679.00	735.00	743.00
2	95	20	763.00	754.00	688.00	731.00	740.00
3	95	40	760.00	753.00	696.00	728.00	728.00
4	95	60	760.00	757.00	704.00	732.00	730.00
5	95	80	755.00	758.00	710.00	737.00	732.00
6	95	100	755.00	762.00	720.00	745.00	733.00
7	95	120	757.00	768.00	735.00	752.00	738.00
8	95	140	763.00	772.00	747.00	757.00	743.00
9	95	160	762.00	770.00	750.00	765.00	755.00
10	95	180	765.00	770.00	742.00	766.00	758.00
11	85	0	768.00	733.00	675.00	727.00	728.00
12	85	20	766.00	731.00	684.00	731.00	733.00
13	85	40	767.00	743.00	697.00	742.00	740.00

14	85	60	765.00	750.00	705.00	742.00	738.00	
15	85	80	765.00	755.00	717.00	751.00	738.00	
16	85	100	764.00	764.00	738.00	761.00	745.00	
17	85	120	769.00	770.00	750.00	765.00	747.00	
18	85	140	766.00	772.00	767.00	766.00	755.00	
19	85	160	769.00	769.00	764.00	769.00	762.00	rdg.
20	85	180	762.00	768.00	761.00	770.00	764.00	210.c
21	75	0	777.00	704.00	658.00	729.00	725.00	
22	75	20	787.00	731.00	685.00	746.00	749.00	
23	75	40	783.00	747.00	703.00	753.00	753.00	
24	75	60	782.00	762.00	725.00	767.00	764.00	
25	75	80	785.00	773.00	748.00	774.00	762.00	
26	75	100	784.00	781.00	770.00	786.00	763.00	
27	75	120	782.00	781.00	778.00	785.00	771.00	
28	75	140	775.00	779.00	785.00	782.00	773.00	
29	75	160	767.00	775.00	780.00	783.00	784.00	
30	75	180	763.00	772.00	779.00	780.00	782.00	
31	65	0	803.00	727.00	671.00	761.00	771.00	
32	65	20	806.00	754.00	702.00	775.00	787.00	
33	65	40	803.00	773.00	734.00	790.00	792.00	
34	65	60	797.00	781.00	755.00	793.00	790.00	
35	65	80	792.00	790.00	774.00	800.00	789.00	
36	65	100	782.00	785.00	787.00	807.00	793.00	
37	65	120	778.00	788.00	796.00	803.00	796.00	
38	65	140	769.00	781.00	789.00	793.00	794.00	
39	65	160	767.00	782.00	791.00	793.00	796.00	
40	65	180	757.00	770.00	779.00	785.00	791.00	
41	55	0	823.00	772.00	716.00	801.00	816.00	
42	55	20	823.00	792.00	758.00	816.00	826.00	
43	55	40	809.00	793.00	775.00	817.00	820.00	
44	55	60	803.00	799.00	792.00	823.00	819.00	
45	55	80	797.00	799.00	797.00	820.00	813.00	
46	55	100	778.00	787.00	797.00	810.00	807.00	
47	55	120	771.00	785.00	794.00	805.00	804.00	
48	55	140	765.00	785.00	794.00	797.00	799.00	
49	55	160	758.00	776.00	786.00	788.00	793.00	
50	55	180	757.00	768.00	773.00	778.00	786.00	
51	45	0	834.00	812.00	779.00	842.00	852.00	
52	45	20	828.00	819.00	801.00	844.00	861.00	
53	45	40	818.00	815.00	808.00	845.00	850.00	
54	45	60	805.00	808.00	808.00	837.00	836.00	
55	45	80	784.00	797.00	809.00	823.00	819.00	
56	45	100	776.00	789.00	800.00	813.00	811.00	
57	45	120	767.00	783.00	794.00	800.00	804.00	
58	45	140	756.00	768.00	778.00	782.00	788.00	
59	35	0	839.00	846.00	864.00	864.00	875.00	
60	35	20	831.00	843.00	842.00	868.00	875.00	
61	35	40	812.00	822.00	829.00	851.00	861.00	
62	35	60	797.00	807.00	819.00	840.00	843.00	
63	35	80	779.00	796.00	809.00	823.00	824.00	
64	35	100	770.00	788.00	802.00	815.00	816.00	
65	35	120	759.00	777.00	789.00	793.00	797.00	
66	25	0	828.00	847.00	855.00	875.00	887.00	
67	25	20	814.00	834.00	851.00	868.00	882.00	
68	25	40	802.00	823.00	837.00	853.00	860.00	
69	25	60	783.00	803.00	815.00	829.00	836.00	
70	25	80	773.00	794.00	807.00	817.00	820.00	
71	25	100	754.00	771.00	785.00	790.00	796.00	
72	15	0	810.00	833.00	851.00	872.00	884.00	
73	15	20	796.00	826.00	847.00	856.00	860.00	
74	15	40	771.00	799.00	826.00	838.00	844.00	
75	15	60	771.00	792.00	807.00	818.00	825.00	
76	15	80	747.00	775.00	793.00	800.00	804.00	

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file requested 211.c
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comb. press. - pr (mm water gage) 19.00
cross flow temp. - tr (degree celsius) 565.00
comb. air flow rate - mcr (mm water diff.) 29.00
cool air flow rate - mkr (mm water diff.) 56.00
natural gas flow rate - mgr (mm water diff.) 16.00
natural gas total press. - pggr (psi gage) 0.00
air total press. - pgar (mm water gage) 0.00
jet temp. - tjr (degree celsius) 33.00
single jet flow rate - msjr (s.c.f.m.) 1.39
wall temp. - t5 (degree celsius) 265.00
wall temp. - t6 (degree celsius) 345.00
wall temp. - t7 (degree celsius) 342.00
wall temp. - t8 (degree celsius) 374.00
wall temp. - t9 (degree celsius) 300.00
wall temp. - t10 (degree celsius) 307.00

mc = 0.0161555 kg/sec
mk = 0.0703432 kg/sec
mg = 0.001200 kg/sec
m = 0.087699 kg/sec
p = 98286.4 pascal
t = 838 degree kelvin
tj = 306 degree kelvin
t5 = 538 degree kelvin
t6 = 618 degree kelvin
t7 = 615 degree kelvin
t8 = 647 degree kelvin
t9 = 573 degree kelvin
t10= 580 degree kelvin
ro = 0.4087 kg/cubic meter
roj= 1.1192 kg/cubic meter
v = 7.94 meter/sec
msj= 0.0007296 kg/sec
vj = 16.41 meter/sec
dr = 2.74 density ratio
j = 11.7 momentum ratio
fr = 12159 froude number
sr = 4.94 spacing ratio

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	502.00	764.00	683.00	731.00	739.00
2	95	20	753.00	744.00	685.00	718.00	719.00
3	95	40	755.00	742.00	693.00	724.00	723.00
4	95	60	745.00	744.00	698.00	723.00	724.00
5	95	80	746.00	752.00	709.00	731.00	724.00
6	95	100	744.00	753.00	719.00	739.00	731.00
7	95	120	747.00	758.00	731.00	744.00	730.00
8	95	140	750.00	758.00	736.00	744.00	736.00
9	95	160	753.00	759.00	741.00	748.00	741.00
10	95	180	749.00	754.00	739.00	756.00	750.00
11	85	0	760.00	717.00	674.00	715.00	713.00
12	85	20	755.00	720.00	686.00	726.00	722.00
13	85	40	754.00	730.00	693.00	728.00	724.00

14	85	60	756.00	741.00	701.00	738.00	728.00	
15	85	80	752.00	746.00	715.00	744.00	730.00	
16	85	100	756.00	753.00	728.00	745.00	727.00	
17	85	120	761.00	760.00	746.00	758.00	737.00	
18	85	140	759.00	762.00	757.00	759.00	749.00	
19	85	160	762.00	767.00	762.00	763.00	759.00	rdg.
20	85	180	756.00	763.00	760.00	769.00	763.00	211.c
21	75	0	773.00	708.00	673.00	728.00	719.00	
22	75	20	777.00	728.00	688.00	742.00	742.00	
23	75	40	774.00	743.00	699.00	749.00	747.00	
24	75	60	771.00	753.00	721.00	756.00	745.00	
25	75	80	769.00	762.00	737.00	769.00	751.00	
26	75	100	770.00	770.00	761.00	775.00	756.00	
27	75	120	773.00	503.00	501.00	778.00	766.00	
28	75	140	768.00	774.00	779.00	779.00	778.00	
29	75	160	765.00	773.00	775.00	776.00	773.00	
30	75	180	757.00	768.00	772.00	778.00	780.00	
31	65	0	801.00	721.00	674.00	750.00	753.00	
32	65	20	801.00	750.00	703.00	769.00	776.00	
33	65	40	799.00	762.00	725.00	782.00	779.00	
34	65	60	790.00	774.00	749.00	788.00	777.00	
35	65	80	789.00	784.00	771.00	795.00	781.00	
36	65	100	777.00	781.00	779.00	792.00	779.00	
37	65	120	772.00	782.00	791.00	795.00	787.00	
38	65	140	769.00	779.00	787.00	788.00	792.00	
39	65	160	763.00	776.00	785.00	787.00	791.00	
40	65	180	756.00	770.00	777.00	785.00	793.00	
41	55	0	822.00	759.00	705.00	791.00	796.00	
42	55	20	821.00	782.00	743.00	810.00	818.00	
43	55	40	818.00	793.00	769.00	815.00	812.00	
44	55	60	804.00	797.00	783.00	817.00	809.00	
45	55	80	791.00	793.00	792.00	811.00	800.00	
46	55	100	772.00	782.00	794.00	809.00	802.00	
47	55	120	769.00	780.00	790.00	797.00	797.00	
48	55	140	761.00	778.00	790.00	792.00	798.00	
49	55	160	759.00	774.00	780.00	784.00	789.00	
50	55	180	752.00	762.00	770.00	772.00	776.00	
51	45	0	837.00	807.00	774.00	846.00	854.00	
52	45	20	831.00	816.00	792.00	840.00	854.00	
53	45	40	823.00	815.00	801.00	838.00	839.00	
54	45	60	803.00	802.00	805.00	831.00	822.00	
55	45	80	787.00	797.00	806.00	827.00	818.00	
56	45	100	771.00	787.00	802.00	812.00	810.00	
57	45	120	764.00	784.00	795.00	798.00	796.00	
58	45	140	754.00	767.00	778.00	780.00	789.00	
59	35	0	833.00	838.00	823.00	861.00	872.00	
60	35	20	829.00	835.00	823.00	857.00	871.00	
61	35	40	814.00	823.00	823.00	851.00	858.00	
62	35	60	796.00	806.00	814.00	837.00	836.00	
63	35	80	778.00	793.00	806.00	820.00	819.00	
64	35	100	770.00	787.00	797.00	805.00	804.00	
65	35	120	755.00	772.00	782.00	789.00	791.00	
66	25	0	838.00	851.00	850.00	875.00	886.00	
67	25	20	816.00	834.00	844.00	867.00	880.00	
68	25	40	800.00	819.00	833.00	850.00	857.00	
69	25	60	778.00	798.00	816.00	832.00	840.00	
70	25	80	772.00	791.00	805.00	817.00	821.00	
71	25	100	750.00	766.00	779.00	781.00	786.00	
72	15	0	813.00	839.00	851.00	870.00	884.00	
73	15	20	792.00	825.00	844.00	857.00	861.00	
74	15	40	775.00	806.00	825.00	837.00	837.00	
75	15	60	774.00	795.00	807.00	821.00	826.00	
76	15	80	751.00	774.00	792.00	801.00	803.00	

file requested **********
212.c
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comb. press. - pr (mm water gage) 27.00
cross flow temp. - tr (degree celsius) 380.00
comb. air flow rate - mcr (mm water diff.) 30.00
cool air flow rate - mkr (mm water diff.) 145.00
natural gas flow rate - msr (mm water diff.) 15.00
natural gas total press. - pssr (psi gage) 0.00
air total press. - psar (mm water gage) 0.00
jet temp. - tjr (degree celsius) 32.00
single jet flow rate - msjr (s.c.f.m.) 1.28
wall temp. - t5 (degree celsius) 158.00
wall temp. - t6 (degree celsius) 234.00
wall temp. - t7 (degree celsius) 235.00
wall temp. - t8 (degree celsius) 292.00
wall temp. - t9 (degree celsius) 208.00
wall temp. - t10 (degree celsius) 210.00

mc = 0.0164317 kg/sec
mk = 0.1131910 kg/sec
ms = 0.001162 kg/sec
m = 0.130785 kg/sec
p = 98364.9 pascal
t = 653 degree kelvin
tj = 305 degree kelvin
t5 = 431 degree kelvin
t6 = 507 degree kelvin
t7 = 508 degree kelvin
t8 = 565 degree kelvin
t9 = 481 degree kelvin
t10= 483 degree kelvin
ro = 0.5249 kg/cubic meter
roj= 1.1237 kg/cubic meter
v = 9.22 meter/sec
msj= 0.0006694 kg/sec
vj = 14.99 meter/sec
dr = 2.14 density ratio
j = 5.7 momentum ratio
fr = 12096 froude number
sr = 7.41 spacing ratio

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	624.00	599.00	553.00	602.00	620.00
2	95	20	628.00	597.00	560.00	603.00	628.00
3	95	40	631.00	600.00	564.00	601.00	626.00
4	95	60	632.00	605.00	572.00	602.00	629.00
5	95	80	630.00	608.00	579.00	604.00	626.00
6	95	100	630.00	618.00	594.00	608.00	627.00
7	95	120	607.00	609.00	594.00	606.00	622.00
8	95	140	620.00	621.00	605.00	613.00	623.00
9	95	160	626.00	627.00	613.00	618.00	625.00
10	95	180	618.00	625.00	617.00	621.00	625.00
11	85	0	630.00	578.00	549.00	601.00	631.00
12	85	20	619.00	583.00	554.00	598.00	632.00
13	85	40	611.00	586.00	560.00	597.00	629.00

14	85	60	618.00	601.00	575.00	605.00	633.00	
15	85	80	629.00	614.00	594.00	614.00	632.00	
16	85	100	610.00	611.00	602.00	615.00	627.00	
17	85	120	632.00	630.00	618.00	624.00	630.00	
18	85	140	627.00	627.00	620.00	627.00	629.00	
19	85	160	594.00	605.00	604.00	617.00	623.00	
20	85	180	587.00	599.00	607.00	617.00	621.00	rdg.
21	75	0	627.00	581.00	549.00	606.00	638.00	212.c
22	75	20	626.00	598.00	571.00	614.00	640.00	
23	75	40	624.00	607.00	587.00	618.00	638.00	
24	75	60	623.00	613.00	599.00	622.00	636.00	
25	75	80	622.00	623.00	615.00	628.00	634.00	
26	75	100	619.00	622.00	621.00	632.00	634.00	
27	75	120	610.00	619.00	621.00	629.00	630.00	
28	75	140	600.00	612.00	620.00	627.00	628.00	
29	75	160	595.00	608.00	615.00	624.00	624.00	
30	75	180	592.00	607.00	614.00	621.00	620.00	
31	65	0	652.00	617.00	580.00	634.00	649.00	
32	65	20	652.00	629.00	605.00	637.00	649.00	
33	65	40	654.00	640.00	620.00	640.00	647.00	
34	65	60	652.00	644.00	631.00	643.00	647.00	
35	65	80	627.00	630.00	627.00	637.00	639.00	
36	65	100	616.00	623.00	626.00	634.00	633.00	
37	65	120	609.00	621.00	626.00	632.00	630.00	
38	65	140	603.00	616.00	624.00	628.00	624.00	
39	65	160	601.00	613.00	618.00	621.00	618.00	
40	65	180	594.00	608.00	614.00	618.00	614.00	
41	55	0	644.00	636.00	616.00	647.00	652.00	
42	55	20	642.00	640.00	628.00	648.00	652.00	
43	55	40	640.00	640.00	633.00	645.00	648.00	
44	55	60	639.00	640.00	637.00	646.00	646.00	
45	55	80	623.00	630.00	632.00	638.00	637.00	
46	55	100	612.00	620.00	627.00	633.00	630.00	
47	55	120	604.00	616.00	622.00	626.00	622.00	
48	55	140	601.00	614.00	618.00	616.00	613.00	
49	55	160	600.00	609.00	611.00	609.00	605.00	
50	55	180	591.00	601.00	604.00	604.00	602.00	
51	45	0	646.00	651.00	642.00	655.00	653.00	
52	45	20	643.00	648.00	644.00	652.00	649.00	
53	45	40	640.00	645.00	642.00	647.00	644.00	
54	45	60	632.00	639.00	639.00	642.00	640.00	
55	45	80	638.00	638.00	636.00	637.00	634.00	
56	45	100	626.00	627.00	627.00	627.00	623.00	
57	45	120	614.00	618.00	620.00	616.00	611.00	
58	45	140	596.00	604.00	607.00	602.00	601.00	
59	35	0	651.00	658.00	656.00	660.00	655.00	
60	35	20	656.00	659.00	654.00	654.00	649.00	
61	35	40	653.00	655.00	651.00	649.00	644.00	
62	35	60	647.00	646.00	643.00	641.00	636.00	
63	35	80	631.00	632.00	631.00	631.00	627.00	
64	35	100	622.00	621.00	620.00	614.00	610.00	
65	35	120	611.00	608.00	607.00	602.00	599.00	
66	25	0	664.00	667.00	659.00	658.00	652.00	
67	25	20	660.00	661.00	656.00	651.00	644.00	
68	25	40	649.00	649.00	647.00	643.00	638.00	
69	25	60	636.00	635.00	635.00	631.00	626.00	
70	25	80	625.00	624.00	623.00	620.00	615.00	
71	25	100	612.00	608.00	607.00	602.00	599.00	
72	15	0	660.00	663.00	657.00	654.00	646.00	
73	15	20	650.00	653.00	651.00	645.00	637.00	
74	15	40	636.00	638.00	637.00	631.00	625.00	
75	15	60	624.00	625.00	625.00	619.00	614.00	
76	15	80	607.00	605.00	607.00	603.00	599.00	

file requested **********
213.c
****

comb. press. - pr (mm water gage) 27.00
cross flow temp. - tr (degree celsius) 380.00
comb. air flow rate - mcr (mm water diff.) 30.00
cool air flow rate - mkr (mm water diff.) 145.00
natural gas flow rate - mgr (mm water diff.) 15.00
natural gas total press. - pggr (psi gage) 0.00
air total press. - pgar (mm water gage) 0.00
jet temp. - tjr (degree celsius) 32.00
single jet flow rate - mgjr (s.c.f.m.) 1.67
wall temp. - t5 (degree celsius) 159.00
wall temp. - t6 (degree celsius) 239.00
wall temp. - t7 (degree celsius) 237.00
wall temp. - t8 (degree celsius) 294.00
wall temp. - t9 (degree celsius) 209.00
wall temp. - t10 (degree celsius) 211.00

mc = 0.0164317 kg/sec
mk = 0.1131910 kg/sec
mg = 0.001162 kg/sec
m = 0.130785 kg/sec
p = 98364.9 pascal
t = 653 degree kelvin
tj = 305 degree kelvin
t5 = 432 degree kelvin
t6 = 512 degree kelvin
t7 = 510 degree kelvin
t8 = 567 degree kelvin
t9 = 482 degree kelvin
t10= 484 degree kelvin
ro = 0.5249 kg/cubic meter
roj= 1.1237 kg/cubic meter
v = 9.22 meter/sec
mgj= 0.0008760 kg/sec
vj = 19.62 meter/sec
dr = 2.14 density ratio
j = 9.7 momentum ratio
fr = 20713 froude number
sr = 7.41 spacing ratio

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	598.00	590.00	567.00	609.00	622.00
2	95	20	605.00	588.00	566.00	601.00	627.00
3	95	40	607.00	589.00	569.00	598.00	625.00
4	95	60	605.00	590.00	570.00	597.00	623.00
5	95	80	608.00	596.00	575.00	598.00	622.00
6	95	100	605.00	600.00	583.00	600.00	622.00
7	95	120	600.00	599.00	586.00	603.00	621.00
8	95	140	596.00	604.00	593.00	604.00	620.00
9	95	160	593.00	603.00	599.00	608.00	617.00
10	95	180	584.00	599.00	598.00	607.00	616.00
11	85	0	611.00	574.00	560.00	596.00	631.00
12	85	20	611.00	575.00	560.00	592.00	630.00
13	85	40	617.00	587.00	569.00	599.00	633.00

14	85	60	620.00	596.00	578.00	602.00	629.00	
15	85	80	612.00	598.00	581.00	604.00	625.00	
16	85	100	616.00	608.00	594.00	609.00	622.00	
17	85	120	607.00	609.00	603.00	613.00	621.00	
18	85	140	623.00	624.00	612.00	619.00	623.00	
19	85	160	612.00	615.00	611.00	618.00	621.00	rdg.
20	85	180	592.00	602.00	603.00	613.00	616.00	213.c
21	75	0	616.00	289.00	551.00	592.00	637.00	
22	75	20	619.00	576.00	560.00	596.00	635.00	
23	75	40	621.00	593.00	576.00	603.00	634.00	
24	75	60	617.00	602.00	586.00	609.00	629.00	
25	75	80	617.00	608.00	597.00	614.00	630.00	
26	75	100	607.00	609.00	608.00	620.00	628.00	
27	75	120	601.00	607.00	610.00	621.00	624.00	
28	75	140	596.00	605.00	611.00	619.00	617.00	
29	75	160	589.00	601.00	605.00	612.00	612.00	
30	75	180	585.00	599.00	606.00	613.00	612.00	
31	65	0	625.00	572.00	553.00	601.00	640.00	
32	65	20	625.00	592.00	574.00	611.00	639.00	
33	65	40	623.00	603.00	588.00	615.00	636.00	
34	65	60	623.00	612.00	600.00	621.00	635.00	
35	65	80	617.00	617.00	612.00	626.00	633.00	
36	65	100	608.00	613.00	616.00	625.00	628.00	
37	65	120	601.00	609.00	616.00	623.00	621.00	
38	65	140	594.00	606.00	613.00	619.00	615.00	
39	65	160	594.00	607.00	612.00	613.00	609.00	
40	65	180	590.00	602.00	605.00	609.00	605.00	
41	55	0	638.00	603.00	580.00	627.00	649.00	
42	55	20	637.00	616.00	600.00	631.00	647.00	
43	55	40	629.00	620.00	609.00	629.00	641.00	
44	55	60	625.00	623.00	618.00	630.00	637.00	
45	55	80	618.00	622.00	621.00	630.00	631.00	
46	55	100	607.00	615.00	619.00	626.00	624.00	
47	55	120	601.00	611.00	617.00	620.00	614.00	
48	55	140	597.00	608.00	613.00	612.00	607.00	
49	55	160	594.00	605.00	607.00	605.00	601.00	
50	55	180	587.00	597.00	598.00	597.00	597.00	
51	45	0	652.00	635.00	615.00	646.00	654.00	
52	45	20	655.00	644.00	631.00	645.00	649.00	
53	45	40	638.00	636.00	629.00	640.00	643.00	
54	45	60	641.00	638.00	633.00	638.00	638.00	
55	45	80	635.00	633.00	629.00	631.00	629.00	
56	45	100	625.00	624.00	623.00	624.00	618.00	
57	45	120	617.00	618.00	617.00	614.00	608.00	
58	45	140	609.00	606.00	604.00	600.00	598.00	
59	35	0	663.00	660.00	647.00	658.00	654.00	
60	35	20	645.00	646.00	643.00	651.00	648.00	
61	35	40	637.00	640.00	637.00	643.00	641.00	
62	35	60	626.00	632.00	631.00	635.00	634.00	
63	35	80	614.00	622.00	624.00	626.00	622.00	
64	35	100	604.00	611.00	615.00	612.00	607.00	
65	35	120	596.00	601.00	603.00	599.00	596.00	
66	25	0	652.00	659.00	653.00	656.00	651.00	
67	25	20	647.00	653.00	649.00	650.00	644.00	
68	25	40	634.00	639.00	639.00	641.00	638.00	
69	25	60	624.00	629.00	631.00	629.00	626.00	
70	25	80	610.00	616.00	618.00	617.00	612.00	
71	25	100	595.00	600.00	602.00	598.00	595.00	
72	15	0	648.00	656.00	654.00	653.00	648.00	
73	15	20	641.00	649.00	649.00	644.00	635.00	
74	15	40	623.00	631.00	632.00	629.00	624.00	
75	15	60	614.00	619.00	622.00	617.00	612.00	
76	15	80	596.00	603.00	607.00	602.00	600.00	

file requested **********
214.c
****

comb. press. - pr (mm water gage) 28.00
cross flow temp. - tr (degree celsius) 380.00
comb. air flow rate - mcr (mm water diff.) 30.00
cool air flow rate - mkr (mm water diff.) 145.00
natural gas flow rate - mgr (mm water diff.) 15.00
natural gas total press. - pggr (psi gage) 0.00
air total press. - psar (mm water gage) 0.00
jet temp. - tjr (degree celsius) 32.00
single jet flow rate - msjr (s.c.f.m.) 1.84
wall temp. - t5 (degree celsius) 161.00
wall temp. - t6 (degree celsius) 240.00
wall temp. - t7 (degree celsius) 238.00
wall temp. - t8 (degree celsius) 296.00
wall temp. - t9 (degree celsius) 210.00
wall temp. - t10 (degree celsius) 211.00

mc = 0.0164317 kg/sec
mk = 0.1131910 kg/sec
mg = 0.001162 kg/sec
m = 0.130785 kg/sec
p = 98374.7 pascal
t = 653 degree kelvin
tj = 305 degree kelvin
t5 = 434 degree kelvin
t6 = 513 degree kelvin
t7 = 511 degree kelvin
t8 = 569 degree kelvin
t9 = 483 degree kelvin
t10= 484 degree kelvin
ro = 0.5249 kg/cubic meter
roj= 1.1238 kg/cubic meter
v = 9.22 meter/sec
msj= 0.0009623 kg/sec
vj = 21.55 meter/sec
dr = 2.14 density ratio
j = 11.7 momentum ratio
fr = 24990 froude number
sr = 7.41 spacing ratio

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	599.00	591.00	570.00	610.00	625.00
2	95	20	605.00	590.00	573.00	607.00	628.00
3	95	40	607.00	591.00	573.00	603.00	626.00
4	95	60	609.00	593.00	577.00	603.00	627.00
5	95	80	605.00	595.00	580.00	601.00	621.00
6	95	100	601.00	597.00	583.00	602.00	619.00
7	95	120	595.00	595.00	588.00	603.00	618.00
8	95	140	593.00	601.00	592.00	606.00	619.00
9	95	160	590.00	601.00	595.00	606.00	617.00
10	95	180	584.00	596.00	597.00	609.00	618.00
11	85	0	610.00	579.00	564.00	598.00	630.00
12	85	20	609.00	576.00	563.00	593.00	628.00
13	85	40	610.00	582.00	568.00	594.00	626.00

14	85	60	607.00	587.00	573.00	599.00	625.00	
15	85	80	609.00	596.00	583.00	604.00	625.00	
16	85	100	601.00	597.00	588.00	603.00	617.00	
17	85	120	600.00	602.00	597.00	610.00	621.00	
18	85	140	591.00	601.00	601.00	613.00	620.00	rdg.
19	85	160	586.00	597.00	601.00	612.00	618.00	214.c
20	85	180	581.00	593.00	598.00	609.00	612.00	
21	75	0	613.00	562.00	552.00	587.00	631.00	
22	75	20	614.00	573.00	561.00	593.00	630.00	
23	75	40	615.00	585.00	570.00	598.00	629.00	
24	75	60	615.00	596.00	584.00	606.00	628.00	
25	75	80	611.00	602.00	593.00	611.00	626.00	
26	75	100	606.00	333.00	603.00	616.00	624.00	
27	75	120	600.00	607.00	606.00	616.00	621.00	
28	75	140	591.00	602.00	608.00	616.00	615.00	
29	75	160	588.00	600.00	331.00	611.00	610.00	
30	75	180	584.00	596.00	602.00	610.00	609.00	
31	65	0	624.00	568.00	556.00	596.00	640.00	
32	65	20	623.00	584.00	570.00	604.00	639.00	
33	65	40	346.00	596.00	583.00	609.00	633.00	
34	65	60	618.00	605.00	596.00	617.00	632.00	
35	65	80	615.00	611.00	604.00	620.00	628.00	
36	65	100	605.00	609.00	611.00	621.00	622.00	
37	65	120	596.00	605.00	609.00	617.00	615.00	
38	65	140	600.00	335.00	611.00	343.00	611.00	
39	65	160	591.00	604.00	608.00	611.00	606.00	
40	65	180	586.00	599.00	604.00	607.00	602.00	
41	55	0	629.00	585.00	566.00	614.00	645.00	
42	55	20	630.00	601.00	587.00	620.00	644.00	
43	55	40	634.00	343.00	603.00	626.00	641.00	
44	55	60	622.00	616.00	611.00	626.00	636.00	
45	55	80	613.00	616.00	615.00	625.00	627.00	
46	55	100	604.00	612.00	617.00	624.00	621.00	
47	55	120	597.00	608.00	613.00	616.00	610.00	
48	55	140	592.00	604.00	607.00	607.00	601.00	
49	55	160	592.00	601.00	604.00	602.00	598.00	
50	55	180	600.00	600.00	600.00	599.00	597.00	
51	45	0	654.00	625.00	603.00	641.00	651.00	
52	45	20	651.00	631.00	617.00	640.00	649.00	
53	45	40	648.00	635.00	626.00	641.00	645.00	
54	45	60	640.00	630.00	626.00	634.00	637.00	
55	45	80	628.00	626.00	623.00	628.00	626.00	
56	45	100	619.00	619.00	617.00	617.00	613.00	
57	45	120	599.00	606.00	608.00	607.00	601.00	
58	45	140	597.00	600.00	599.00	595.00	592.00	
59	35	0	649.00	642.00	630.00	652.00	652.00	
60	35	20	643.00	641.00	632.00	645.00	646.00	
61	35	40	634.00	634.00	630.00	639.00	638.00	
62	35	60	625.00	629.00	626.00	632.00	632.00	
63	35	80	611.00	616.00	618.00	620.00	617.00	
64	35	100	603.00	610.00	613.00	611.00	606.00	
65	35	120	595.00	600.00	600.00	596.00	592.00	
66	25	0	654.00	657.00	650.00	657.00	653.00	
67	25	20	642.00	646.00	642.00	647.00	643.00	
68	25	40	631.00	635.00	634.00	637.00	634.00	
69	25	60	618.00	622.00	624.00	624.00	623.00	
70	25	80	610.00	614.00	616.00	613.00	610.00	
71	25	100	596.00	599.00	600.00	595.00	592.00	
72	15	0	654.00	657.00	651.00	651.00	644.00	
73	15	20	637.00	645.00	643.00	641.00	634.00	
74	15	40	626.00	632.00	631.00	629.00	625.00	
75	15	60	612.00	618.00	618.00	617.00	613.00	
76	15	80	592.00	598.00	602.00	597.00	593.00	

file requested

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215.c
****

comb. press. - pr (mm water gage) 18.00
cross flow temp. - tr (degree celsius) 563.00
comb. air flow rate - mcr (mm water diff.) 30.00
cool air flow rate - mkr (mm water diff.) 64.00
natural gas flow rate - mgr (mm water diff.) 15.50
natural gas total press. - pggr (psi gage) 0.00
air total press. - pgar (mm water gage) 0.00
jet temp. - tjr (degree celsius) 32.00
single jet flow rate - mgjr (s.c.f.m.) 1.03
wall temp. - t5 (degree celsius) 194.00
wall temp. - t6 (degree celsius) 297.00
wall temp. - t7 (degree celsius) 293.00
wall temp. - t8 (degree celsius) 358.00
wall temp. - t9 (degree celsius) 259.00
wall temp. - t10 (degree celsius) 270.00

mc = 0.0164317 kg/sec
mk = 0.0752000 kg/sec
mg = 0.001181 kg/sec
m = 0.092813 kg/sec
p = 98276.6 pascal
t = 836 degree kelvin
tj = 305 degree kelvin
t5 = 467 degree kelvin
t6 = 570 degree kelvin
t7 = 566 degree kelvin
t8 = 631 degree kelvin
t9 = 532 degree kelvin
t10= 543 degree kelvin
ro = 0.4096 kg/cubic meter
roj= 1.1227 kg/cubic meter
v = 8.38 meter/sec
mgj= 0.0005387 kg/sec
vj = 12.08 meter/sec
dr = 2.74 density ratio
j = 5.7 momentum ratio
fr = 6583 froude number
sr = 7.41 spacing ratio

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	803.00	768.00	684.00	752.00	771.00
2	95	20	814.00	761.00	690.00	744.00	777.00
3	95	40	823.00	771.00	702.00	750.00	791.00
4	95	60	822.00	771.00	705.00	748.00	788.00
5	95	80	821.00	779.00	714.00	750.00	790.00
6	95	100	826.00	794.00	735.00	758.00	793.00
7	95	120	825.00	801.00	747.00	768.00	794.00
8	95	140	821.00	808.00	763.00	775.00	798.00
9	95	160	811.00	800.00	762.00	766.00	785.00
10	95	180	798.00	796.00	760.00	765.00	780.00
11	85	0	822.00	740.00	675.00	748.00	793.00
12	85	20	826.00	742.00	687.00	752.00	802.00
13	85	40	828.00	757.00	706.00	759.00	805.00

14	85	60	828.00	772.00	721.00	767.00	805.00	
15	85	80	829.00	787.00	744.00	777.00	806.00	
16	85	100	830.00	803.00	762.00	785.00	808.00	
17	85	120	824.00	807.00	777.00	789.00	802.00	
18	85	140	810.00	799.00	778.00	786.00	794.00	
19	85	160	801.00	791.00	777.00	788.00	800.00	rdg.
20	85	180	783.00	779.00	767.00	778.00	786.00	215.c
21	75	0	825.00	729.00	673.00	763.00	810.00	
22	75	20	831.00	752.00	701.00	769.00	809.00	
23	75	40	824.00	770.00	727.00	777.00	810.00	
24	75	60	824.00	785.00	752.00	789.00	810.00	
25	75	80	823.00	795.00	768.00	789.00	804.00	
26	75	100	809.00	791.00	772.00	786.00	791.00	
27	75	120	804.00	795.00	780.00	790.00	794.00	
28	75	140	789.00	780.00	776.00	786.00	792.00	
29	75	160	778.00	771.00	769.00	776.00	779.00	
30	75	180	768.00	765.00	763.00	773.00	777.00	
31	65	0	832.00	758.00	695.00	782.00	809.00	
32	65	20	831.00	780.00	735.00	794.00	814.00	
33	65	40	824.00	789.00	759.00	796.00	811.00	
34	65	60	824.00	802.00	779.00	803.00	809.00	
35	65	80	811.00	798.00	780.00	791.00	797.00	
36	65	100	803.00	792.00	781.00	790.00	787.00	
37	65	120	787.00	781.00	775.00	785.00	782.00	
38	65	140	772.00	764.00	763.00	771.00	772.00	
39	65	160	760.00	756.00	757.00	763.00	761.00	
40	65	180	747.00	746.00	746.00	755.00	751.00	
41	55	0	835.00	798.00	754.00	812.00	814.00	
42	55	20	840.00	813.00	782.00	815.00	816.00	
43	55	40	829.00	812.00	793.00	815.00	813.00	
44	55	60	823.00	814.00	800.00	809.00	803.00	
45	55	80	806.00	799.00	788.00	793.00	790.00	
46	55	100	782.00	776.00	773.00	778.00	775.00	
47	55	120	768.00	763.00	765.00	772.00	766.00	
48	55	140	757.00	752.00	757.00	757.00	748.00	
49	55	160	745.00	738.00	742.00	738.00	732.00	
50	55	180	738.00	728.00	723.00	723.00	722.00	
51	45	0	839.00	827.00	803.00	830.00	823.00	
52	45	20	843.00	833.00	816.00	828.00	820.00	
53	45	40	827.00	821.00	809.00	818.00	808.00	
54	45	60	813.00	809.00	797.00	797.00	793.00	
55	45	80	793.00	790.00	785.00	785.00	780.00	
56	45	100	770.00	764.00	765.00	767.00	760.00	
57	45	120	753.00	748.00	748.00	743.00	732.00	
58	45	140	739.00	729.00	724.00	717.00	712.00	
59	35	0	840.00	841.00	827.00	831.00	820.00	
60	35	20	831.00	834.00	825.00	824.00	816.00	
61	35	40	817.00	820.00	811.00	805.00	795.00	
62	35	60	793.00	795.00	791.00	790.00	779.00	
63	35	80	777.00	775.00	770.00	769.00	759.00	
64	35	100	755.00	752.00	751.00	745.00	736.00	
65	35	120	735.00	723.00	723.00	714.00	707.00	
66	25	0	839.00	845.00	833.00	832.00	820.00	
67	25	20	823.00	831.00	826.00	818.00	802.00	
68	25	40	801.00	808.00	802.00	792.00	779.00	
69	25	60	779.00	783.00	779.00	772.00	760.00	
70	25	80	761.00	760.00	754.00	747.00	738.00	
71	25	100	734.00	723.00	720.00	704.00	697.00	
72	15	0	811.00	823.00	820.00	815.00	802.00	
73	15	20	793.00	806.00	807.00	796.00	780.00	
74	15	40	770.00	783.00	782.00	770.00	756.00	
75	15	60	759.00	764.00	760.00	747.00	736.00	
76	15	80	725.00	724.00	727.00	713.00	703.00	

file requested **********
216.c
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comb. press. - pr (mm water gage) 18.00
cross flow temp. - tr (degree celsius) 563.00
comb. air flow rate - mcr (mm water diff.) 30.00
cool air flow rate - mkr (mm water diff.) 64.00
natural gas flow rate - mgr (mm water diff.) 15.50
natural gas total press. - pggr (psi gage) 0.00
air total press. - pgar (mm water gage) 0.00
jet temp. - tjr (degree celsius) 32.00
single jet flow rate - mgjr (s.c.f.m.) 1.35
wall temp. - t5 (degree celsius) 209.00
wall temp. - t6 (degree celsius) 305.00
wall temp. - t7 (degree celsius) 302.00
wall temp. - t8 (degree celsius) 365.00
wall temp. - t9 (degree celsius) 269.00
wall temp. - t10 (degree celsius) 275.00

mc = 0.0164317 kg/sec
mk = 0.0752000 kg/sec
mg = 0.001181 kg/sec
m = 0.092813 kg/sec
p = 98276.6 pascal
t = 836 degree kelvin
tj = 305 degree kelvin
t5 = 482 degree kelvin
t6 = 578 degree kelvin
t7 = 575 degree kelvin
t8 = 638 degree kelvin
t9 = 542 degree kelvin
t10= 548 degree kelvin
ro = 0.4096 kg/cubic meter
roj= 1.1227 kg/cubic meter
v = 8.38 meter/sec
mgj= 0.0007034 kg/sec
vj = 15.77 meter/sec
dr = 2.74 density ratio
j = 9.7 momentum ratio
fr = 11226 froude number
sr = 7.41 spacing ratio

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	813.00	782.00	697.00	757.00	773.00
2	95	20	817.00	769.00	712.00	757.00	796.00
3	95	40	823.00	772.00	719.00	754.00	795.00
4	95	60	821.00	775.00	722.00	756.00	797.00
5	95	80	825.00	780.00	728.00	754.00	792.00
6	95	100	829.00	790.00	741.00	764.00	799.00
7	95	120	825.00	797.00	744.00	767.00	795.00
8	95	140	820.00	805.00	757.00	768.00	797.00
9	95	160	807.00	799.00	755.00	766.00	790.00
10	95	180	803.00	801.00	760.00	769.00	789.00
11	85	0	822.00	746.00	699.00	745.00	791.00
12	85	20	821.00	734.00	702.00	738.00	794.00
13	85	40	816.00	747.00	715.00	747.00	799.00

14	85	60	822.00	761.00	724.00	759.00	801.00	
15	85	80	818.00	766.00	729.00	755.00	789.00	
16	85	100	816.00	782.00	747.00	772.00	799.00	
17	85	120	808.00	784.00	750.00	768.00	789.00	
18	85	140	799.00	788.00	761.00	770.00	785.00	
19	85	160	789.00	782.00	762.00	772.00	785.00	rdg.
20	85	180	780.00	777.00	763.00	775.00	787.00	216.0
21	75	0	823.00	713.00	688.00	741.00	804.00	
22	75	20	816.00	727.00	700.00	747.00	802.00	
23	75	40	815.00	750.00	721.00	763.00	805.00	
24	75	60	814.00	763.00	733.00	770.00	799.00	
25	75	80	814.00	775.00	749.00	773.00	795.00	
26	75	100	805.00	787.00	767.00	783.00	793.00	
27	75	120	794.00	784.00	770.00	778.00	787.00	
28	75	140	780.00	774.00	762.00	770.00	773.00	
29	75	160	767.00	765.00	758.00	768.00	768.00	
30	75	180	760.00	757.00	753.00	761.00	761.00	
31	65	0	828.00	726.00	692.00	763.00	823.00	
32	65	20	829.00	754.00	722.00	775.00	813.00	
33	65	40	816.00	765.00	735.00	778.00	808.00	
34	65	60	820.00	781.00	757.00	786.00	805.00	
35	65	80	807.00	785.00	768.00	786.00	797.00	
36	65	100	795.00	780.00	768.00	778.00	783.00	
37	65	120	782.00	776.00	770.00	777.00	775.00	
38	65	140	768.00	761.00	762.00	771.00	769.00	
39	65	160	757.00	753.00	753.00	764.00	756.00	
40	65	180	749.00	744.00	747.00	755.00	747.00	
41	55	0	835.00	759.00	711.00	788.00	820.00	
42	55	20	833.00	780.00	749.00	799.00	821.00	
43	55	40	825.00	792.00	768.00	800.00	811.00	
44	55	60	816.00	794.00	778.00	796.00	801.00	
45	55	80	804.00	792.00	782.00	789.00	790.00	
46	55	100	779.00	775.00	767.00	773.00	771.00	
47	55	120	768.00	765.00	762.00	767.00	760.00	
48	55	140	751.00	746.00	748.00	751.00	741.00	
49	55	160	741.00	737.00	735.00	733.00	724.00	
50	55	180	735.00	725.00	727.00	725.00	719.00	
51	45	0	838.00	796.00	764.00	820.00	827.00	
52	45	20	834.00	805.00	783.00	816.00	818.00	
53	45	40	822.00	805.00	792.00	811.00	811.00	
54	45	60	809.00	800.00	790.00	795.00	792.00	
55	45	80	790.00	786.00	780.00	781.00	778.00	
56	45	100	768.00	763.00	760.00	763.00	757.00	
57	45	120	755.00	751.00	749.00	744.00	733.00	
58	45	140	738.00	727.00	724.00	715.00	709.00	
59	35	0	849.00	835.00	815.00	837.00	829.00	
60	35	20	834.00	827.00	813.00	821.00	811.00	
61	35	40	817.00	811.00	801.00	807.00	800.00	
62	35	60	793.00	792.00	786.00	786.00	778.00	
63	35	80	775.00	774.00	769.00	768.00	761.00	
64	35	100	754.00	751.00	749.00	740.00	730.00	
65	35	120	737.00	725.00	720.00	710.00	704.00	
66	25	0	836.00	837.00	827.00	829.00	821.00	
67	25	20	819.00	826.00	820.00	815.00	803.00	
68	25	40	802.00	803.00	802.00	794.00	781.00	
69	25	60	780.00	783.00	777.00	772.00	763.00	
70	25	80	756.00	758.00	750.00	743.00	734.00	
71	25	100	739.00	730.00	723.00	709.00	702.00	
72	15	0	822.00	832.00	825.00	818.00	808.00	
73	15	20	795.00	812.00	812.00	803.00	781.00	
74	15	40	772.00	784.00	781.00	767.00	752.00	
75	15	60	762.00	767.00	765.00	749.00	737.00	
76	15	80	726.00	724.00	725.00	712.00	702.00	

85 %

file requested

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217.c
****

comb. press. - pr (mm water gage) 18.00
cross flow temp. - tr (degree celsius) 565.00
comb. air flow rate - mcr (mm water diff.) 30.00
cool air flow rate - mkr (mm water diff.) 60.00
natural gas flow rate - mgr (mm water diff.) 15.50
natural gas total press. - pggr (psi gage) 0.00
air total press. - pgar (mm water gage) 0.00
jet temp. - tjr (degree celsius) 33.00
single jet flow rate - mgjr (s.c.f.m.) 1.44
wall temp. - t5 (degree celsius) 218.00
wall temp. - t6 (degree celsius) 311.00
wall temp. - t7 (degree celsius) 313.00
wall temp. - t8 (degree celsius) 367.00
wall temp. - t9 (degree celsius) 279.00
wall temp. - t10 (degree celsius) 288.00

mc = 0.0164317 kg/sec
mk = 0.0728121 kg/sec
mg = 0.001181 kg/sec
m = 0.090425 kg/sec
p = 98276.6 pascal
t = 838 degree kelvin
tj = 306 degree kelvin
t5 = 491 degree kelvin
t6 = 584 degree kelvin
t7 = 586 degree kelvin
t8 = 640 degree kelvin
t9 = 552 degree kelvin
t10= 561 degree kelvin
ro = 0.4086 kg/cubic meter
roj= 1.1190 kg/cubic meter
v = 8.19 meter/sec
mgj= 0.0007531 kg/sec
vj = 16.94 meter/sec
dr = 2.74 density ratio
j = 11.7 momentum ratio
fr = 12959 froude number
sr = 7.41 spacing ratio

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	824.00	795.00	721.00	771.00	782.00
2	95	20	829.00	783.00	728.00	767.00	801.00
3	95	40	830.00	780.00	728.00	765.00	801.00
4	95	60	835.00	787.00	737.00	769.00	806.00
5	95	80	837.00	793.00	748.00	773.00	807.00
6	95	100	839.00	802.00	748.00	768.00	801.00
7	95	120	838.00	805.00	759.00	778.00	806.00
8	95	140	831.00	812.00	763.00	774.00	800.00
9	95	160	815.00	809.00	770.00	777.00	801.00
10	95	180	808.00	807.00	767.00	779.00	802.00
11	85	0	832.00	752.00	717.00	753.00	799.00
12	85	20	826.00	746.00	719.00	752.00	804.00
13	85	40	827.00	486.00	457.00	756.00	803.00

14	85	60	825.00	769.00	738.00	764.00	803.00	
15	85	80	823.00	776.00	742.00	771.00	804.00	
16	85	100	818.00	786.00	752.00	772.00	797.00	
17	85	120	814.00	793.00	763.00	780.00	796.00	
18	85	140	800.00	790.00	766.00	775.00	789.00	
19	85	160	794.00	790.00	769.00	777.00	789.00	
20	85	180	789.00	784.00	768.00	782.00	790.00	rdg.
21	75	0	835.00	721.00	707.00	750.00	812.00	217.c
22	75	20	822.00	833.00	715.00	754.00	810.00	
23	75	40	818.00	748.00	724.00	762.00	811.00	
24	75	60	820.00	766.00	738.00	773.00	811.00	
25	75	80	820.00	776.00	752.00	780.00	807.00	
26	75	100	809.00	784.00	764.00	782.00	796.00	
27	75	120	798.00	787.00	770.00	782.00	790.00	
28	75	140	787.00	778.00	769.00	782.00	784.00	
29	75	160	778.00	771.00	764.00	774.00	776.00	
30	75	180	769.00	767.00	759.00	771.00	772.00	
31	65	0	832.00	723.00	702.00	760.00	822.00	
32	65	20	829.00	745.00	720.00	768.00	820.00	
33	65	40	822.00	765.00	741.00	781.00	817.00	
34	65	60	822.00	778.00	755.00	781.00	808.00	
35	65	80	812.00	786.00	769.00	793.00	808.00	
36	65	100	795.00	783.00	772.00	785.00	791.00	
37	65	120	787.00	778.00	772.00	781.00	783.00	
38	65	140	773.00	768.00	764.00	771.00	767.00	
39	65	160	762.00	758.00	758.00	766.00	754.00	
40	65	180	756.00	752.00	752.00	761.00	750.00	
41	55	0	840.00	746.00	712.00	789.00	836.00	
42	55	20	831.00	771.00	740.00	793.00	828.00	
43	55	40	826.00	784.00	763.00	799.00	819.00	
44	55	60	818.00	792.00	775.00	801.00	813.00	
45	55	80	808.00	791.00	779.00	792.00	798.00	
46	55	100	785.00	781.00	773.00	782.00	782.00	
47	55	120	771.00	768.00	764.00	768.00	763.00	
48	55	140	760.00	755.00	755.00	757.00	747.00	
49	55	160	746.00	742.00	744.00	742.00	730.00	
50	55	180	737.00	729.00	727.00	726.00	719.00	
51	45	0	846.00	789.00	753.00	817.00	833.00	
52	45	20	837.00	806.00	779.00	817.00	826.00	
53	45	40	824.00	804.00	788.00	808.00	811.00	
54	45	60	813.00	801.00	791.00	800.00	797.00	
55	45	80	793.00	788.00	780.00	784.00	781.00	
56	45	100	771.00	771.00	764.00	765.00	758.00	
57	45	120	760.00	757.00	752.00	748.00	741.00	
58	45	140	743.00	733.00	732.00	724.00	719.00	
59	35	0	850.00	828.00	798.00	839.00	840.00	
60	35	20	839.00	824.00	807.00	826.00	823.00	
61	35	40	821.00	812.00	799.00	809.00	806.00	
62	35	60	797.00	797.00	790.00	787.00	782.00	
63	35	80	779.00	778.00	770.00	770.00	765.00	
64	35	100	763.00	757.00	752.00	746.00	736.00	
65	35	120	744.00	732.00	724.00	716.00	711.00	
66	25	0	848.00	849.00	834.00	843.00	832.00	
67	25	20	825.00	825.00	819.00	823.00	810.00	
68	25	40	805.00	810.00	807.00	800.00	789.00	
69	25	60	785.00	792.00	785.00	776.00	766.00	
70	25	80	769.00	769.00	759.00	753.00	742.00	
71	25	100	746.00	737.00	725.00	709.00	704.00	
72	15	0	831.00	842.00	838.00	835.00	822.00	
73	15	20	810.00	824.00	823.00	808.00	788.00	
74	15	40	783.00	795.00	794.00	779.00	764.00	
75	15	60	772.00	776.00	769.00	756.00	746.00	
76	15	80	738.00	736.00	734.00	720.00	710.00	

file requested **********
218.c
****

comb. press. - pr (mm water gage) 28.00
cross flow temp. - tr (degree celsius) 380.00
comb. air flow rate - mcr (mm water diff.) 30.00
cool air flow rate - mkr (mm water diff.) 139.00
natural gas flow rate - mgr (mm water diff.) 15.00
natural gas total press. - pggr (psi gage) 0.00
air total press. - pgar (mm water gage) 0.00
jet temp. - tjr (degree celsius) 32.00
single jet flow rate - mgjr (s.c.f.m.) 1.26
wall temp. - t5 (degree celsius) 164.00
wall temp. - t6 (degree celsius) 245.00
wall temp. - t7 (degree celsius) 262.00
wall temp. - t8 (degree celsius) 308.00
wall temp. - t9 (degree celsius) 209.00
wall temp. - t10 (degree celsius) 212.00

mc = 0.0164317 kg/sec
mk = 0.1108244 kg/sec
mg = 0.001162 kg/sec
m = 0.128418 kg/sec
p = 98374.7 pascal
t = 653 degree kelvin
tj = 305 degree kelvin
t5 = 437 degree kelvin
t6 = 518 degree kelvin
t7 = 535 degree kelvin
t8 = 581 degree kelvin
t9 = 482 degree kelvin
t10= 485 degree kelvin
ro = 0.5249 kg/cubic meter
roj= 1.1238 kg/cubic meter
v = 9.05 meter/sec
mgj= 0.0006590 kg/sec
vj = 14.76 meter/sec
dr = 2.14 density ratio
j = 5.7 momentum ratio
fr = 11718 froude number
sr = 4.94 spacing ratio

pt	radius	angle	t11	t12	t13	t14	t15
1	95	0	591.00	572.00	529.00	583.00	588.00
2	95	20	592.00	575.00	535.00	584.00	591.00
3	95	40	590.00	579.00	542.00	588.00	592.00
4	95	60	589.00	585.00	552.00	587.00	595.00
5	95	80	591.00	592.00	563.00	593.00	597.00
6	95	100	589.00	596.00	579.00	599.00	601.00
7	95	120	593.00	601.00	591.00	603.00	605.00
8	95	140	594.00	600.00	595.00	606.00	607.00
9	95	160	596.00	603.00	603.00	610.00	611.00
10	95	180	601.00	608.00	608.00	612.00	614.00
11	85	0	602.00	564.00	527.00	588.00	592.00
12	85	20	603.00	577.00	541.00	595.00	604.00
13	85	40	607.00	590.00	557.00	600.00	610.00

14	85	60	609.00	598.00	574.00	608.00	612.00	
15	85	80	606.00	605.00	588.00	612.00	614.00	
16	85	100	609.00	610.00	602.00	618.00	619.00	
17	85	120	611.00	615.00	615.00	626.00	624.00	
18	85	140	612.00	617.00	617.00	624.00	628.00	
19	85	160	616.00	619.00	621.00	627.00	631.00	rdg.
20	85	180	615.00	621.00	623.00	629.00	626.00	218.c
21	75	0	617.00	579.00	539.00	609.00	616.00	
22	75	20	625.00	602.00	569.00	621.00	627.00	
23	75	40	625.00	611.00	589.00	627.00	634.00	
24	75	60	625.00	617.00	600.00	628.00	633.00	
25	75	80	625.00	624.00	616.00	633.00	636.00	
26	75	100	625.00	627.00	626.00	637.00	638.00	
27	75	120	623.00	628.00	630.00	637.00	638.00	
28	75	140	615.00	624.00	630.00	637.00	637.00	
29	75	160	597.00	614.00	623.00	635.00	642.00	
30	75	180	616.00	625.00	628.00	633.00	639.00	
31	65	0	633.00	612.00	581.00	635.00	643.00	
32	65	20	639.00	626.00	606.00	642.00	650.00	
33	65	40	635.00	631.00	617.00	644.00	652.00	
34	65	60	637.00	634.00	624.00	643.00	648.00	
35	65	80	632.00	633.00	631.00	645.00	647.00	
36	65	100	629.00	633.00	633.00	643.00	646.00	
37	65	120	625.00	632.00	636.00	641.00	641.00	
38	65	140	622.00	629.00	633.00	640.00	641.00	
39	65	160	611.00	625.00	630.00	636.00	640.00	
40	65	180	593.00	613.00	623.00	633.00	638.00	
41	55	0	623.00	627.00	617.00	646.00	654.00	
42	55	20	625.00	632.00	629.00	655.00	665.00	
43	55	40	624.00	635.00	636.00	657.00	665.00	
44	55	60	623.00	634.00	636.00	656.00	662.00	
45	55	80	615.00	631.00	636.00	651.00	656.00	
46	55	100	609.00	625.00	635.00	648.00	651.00	
47	55	120	604.00	623.00	636.00	646.00	649.00	
48	55	140	599.00	619.00	634.00	639.00	644.00	
49	55	160	596.00	614.00	629.00	634.00	638.00	
50	55	180	588.00	606.00	620.00	628.00	633.00	
51	45	0	635.00	642.00	640.00	660.00	668.00	
52	45	20	632.00	643.00	646.00	663.00	672.00	
53	45	40	630.00	643.00	649.00	665.00	673.00	
54	45	60	626.00	640.00	649.00	664.00	670.00	
55	45	80	619.00	633.00	643.00	656.00	661.00	
56	45	100	610.00	626.00	638.00	649.00	652.00	
57	45	120	602.00	622.00	634.00	643.00	647.00	
58	45	140	596.00	616.00	629.00	635.00	637.00	
59	35	0	640.00	653.00	658.00	673.00	681.00	
60	35	20	638.00	652.00	662.00	676.00	684.00	
61	35	40	631.00	647.00	657.00	671.00	677.00	
62	35	60	622.00	638.00	649.00	662.00	668.00	
63	35	80	615.00	632.00	643.00	654.00	659.00	
64	35	100	607.00	627.00	637.00	647.00	650.00	
65	35	120	601.00	618.00	631.00	636.00	640.00	
66	25	0	641.00	658.00	667.00	682.00	690.00	
67	25	20	637.00	655.00	666.00	678.00	685.00	
68	25	40	632.00	649.00	661.00	672.00	679.00	
69	25	60	621.00	639.00	651.00	662.00	668.00	
70	25	80	615.00	632.00	645.00	654.00	658.00	
71	25	100	603.00	621.00	635.00	639.00	643.00	
72	15	0	646.00	665.00	677.00	691.00	698.00	
73	15	20	638.00	658.00	671.00	683.00	688.00	
74	15	40	636.00	648.00	659.00	668.00	673.00	
75	15	60	630.00	641.00	652.00	660.00	663.00	
76	15	80	615.00	628.00	641.00	644.00	645.00	

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13. ABSTRACT ***(Maximum 200 words)***
Results of flow visualization experiments and measurements of the temperature field produced by a single jet and a row of dilution jets issued into a reverse flow combustor are presented. The flow in such combustors is typified by transverse and longitudinal acceleration during the passage through its bending section. The flow visualization experiments were designed to examine the separate effects of longitudinal and transverse acceleration on the jet trajectory and spreading rate. A model describing a dense single jet in a lighter accelerating cross flow is developed. The model is based on integral conservation equations, including the pressure terms appropriate to accelerating flows. It uses a modified entrainment correlation obtained from previous experiments of a jet in a cross stream. The flow visualization results are compared with the model calculations in terms of trajectories and spreading rates. Each experiment is typified by a set of three parameters: momentum ratio, density ratio, and the densimetric Froude number. When injection velocities are large or densities are small, the Froude number becomes very large and hence, unimportant. Therefore, the Froude number is generally significant in describing liquid experiments but is unimportant for the gas experiments in the combustor. Agreement between test and calculated results is encouraging but tends to become poorer with increasing momentum ratio. The temperature measurements are presented primarily in the form of consecutive normalized temperature profiles. Some interpolated isothermal contours are also shown. The single jet trajectories are consistently found to be swept towards the inner wall of the bend, whether injection is from the outer or the inner wall. This behavior is explained by a drifting effect which consists of a transverse velocity component across the combustor due to the developing nature of the flow along it. Plots of lateral temperature distributions of the jet indicate that under longitudinal acceleration conditions the thermal spreading of the jet may be completely suppressed. Comparison between combustor experimental results and model calculations shows poor agreement due to the drifting effect which is not taken into consideration in the model calculations. The row of jets experiments are characterized by two additional parameters: spacing ratio and confinement parameter. The results are shown in the form of consecutive normalized temperature profiles. The confinement parameter appears to become increasingly important with decreasing spacing ratio, in particular when its effect is enhanced by the drifting phenomenon and associated pressure field. A tightly spaced row of jets injected from the inner wall, prior to the bend, is surprisingly kept attached to the inner wall in spite of the strong turning. A similar attachment for a jet injected from the outer wall is not observed.

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Dilution jets; Reverse flow; Combustors; Jet mixing

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