FM 5839 LOT #4 p. 125

D-09317

FINGERPRINT TEST DATA REPORT

NAS8-36298 COPY # 21

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NAS8-36298

U.S. Polymeric O.E. 71108

Filler Lot for NASA Lot# 4

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U.S. Polymeric

FILLER TESTING

NAS8-36298

U.S. POLYMERIC O.E. 71108

Filler Lot for NASA Lot# 4

		SAMPLE			
1. Carbon Content, % QAI-5560		#4-1	#4-2	#4-3	
		99.75	99.57	99.17	
	NASA LOT# 4 AVERAGE			99.50	
2. Ash Content, % PTM-71B		.005	.000	.010	
		.021	.015	.005	
	AVG.	.013	.008	.008	
	NASA LOT# 4 AVERAGE			.010	
3. Atomic Absorption, ppm CTM-53B (Values are average of 2 determinations)		#4-1	#4-2	#4-3	LOT#4 AVG.
	Na	2.0	2.0	1.0	1.7
	K	1.5	2.0	1.0	1.5
	Ca	1.5	0.5	1.5	1.2
	Mg	1.0	1.0	0.0	0.7
	Li	0.0	0.0	0.0	0.0
	TOTAL	6.0	5.5	3.5	5.0
3a. Moisture Content, % CTM-53B		0.018	0.005	0.010	
		0.030	0.015	0.015	
	AVG.	0.024	0.010	0.013	
	NASA LOT# 4 AVERAGE			0.016	
3b. Ash Content, % CTM-53B		0.005	0.005	0.000	
		0.000	0.005	0.000	
	AVG.	0.003	0.005	0.000	
	NASA LOT# 4 AVERAGE			0.003	
4. pH, Units ASTM D1512		4.70	4.80	4.80	
		4.80	4.85	4.65	
	AVG.	4.75	4.82	4.72	
	NASA LOT# 4 AVERAGE			4.76	
5. Particle Size, microns S.E.M. procedure (Average values are of 10 determinations)	AVG.	.42	.38	.43	
	Maximum	.56	.73	.70	
	Minimum	.20	.20	.23	
	Std. Dev	.08	.05	.08	
	NASA LOT# 4 AVERAGE SIZE			.41	
6a. TGA, °C at 50% Loss CTM-51		701	688	697	
	NASA LOT# 4 AVERAGE			695	

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Filler Lot for NASA Lot# 4

6b. TGA
CTM-51 — See Charts 6A-6C

7. Particle Size Distribution
CTM-72 — See Charts 7A-7C

7a. Particle Size, microns
CTM-72

	#4-1	#4-2	#4-3
	.94	.79	.98
	.94	.82	.91
AVG.	.94	.80	.94

NASA LOT# 4 AVERAGE .89

U.S. Polymeric

Hamid M. Quraishi

Hamid M. Quraishi, Manager
Quality Assurance Department

Sample: 4-1
Size: 17.543 mg
Run No: MIR #12831 (12)
Date: FEB/04/86 07:06

TGA.

OMNITHERM DATA SYSTEM
BECKMAN INDUSTRIAL

Operator: M. WEGENER
Disk ID: DATA DISK #93
File No: D 44.DAT V2.1
Plotted: FEB/04/86 10:23

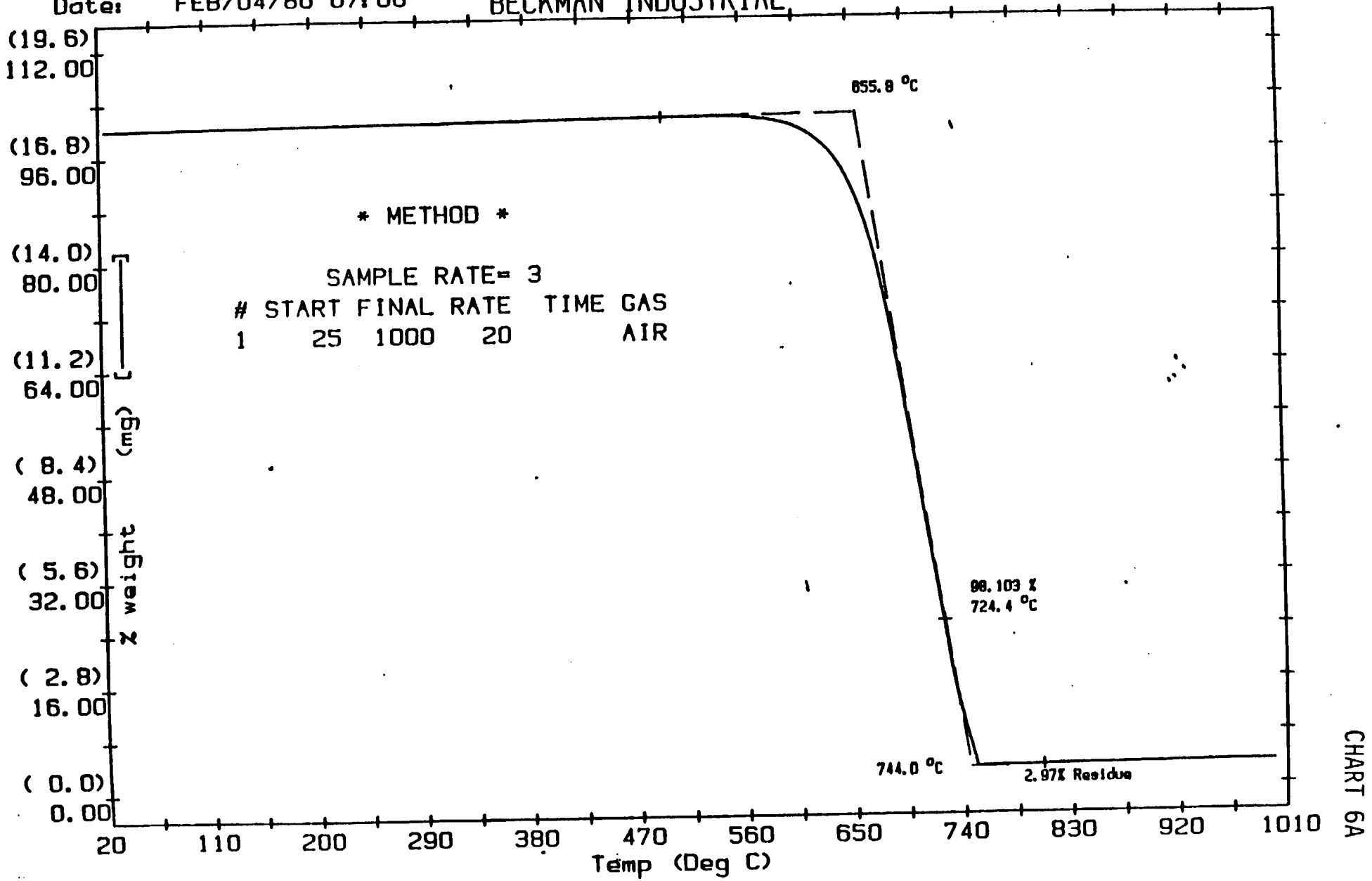

CHART 6A

Beckman Industrial™ ANALYTICAL LABORATORY SERVICES

Sample: 4-2
Size: 19.186 mg
Run No: MIR #12831 (I2)
Date: FEB/04/86 08:21

TGA.

OMNITHERM DATA SYSTEM
BECKMAN INDUSTRIAL

Operator: M. WEGENER
Disk ID: DATA DISK #93
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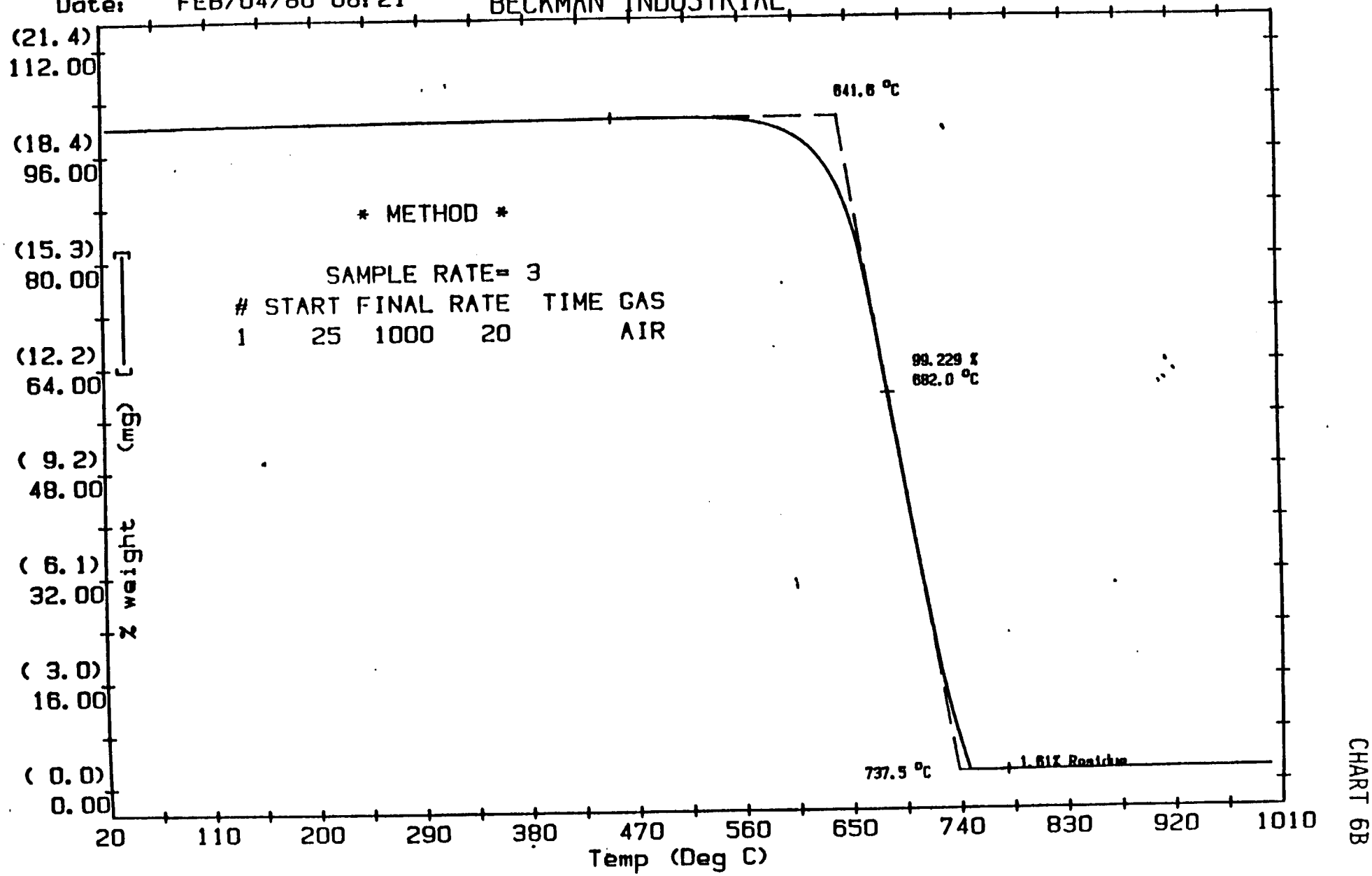


CHART 6B

Beckman Industrial™ ANALYTICAL LABORATORY SERVICES

Sample: 4-3
Size: 15.594 mg
Run No: MIR #12831 (I2)
Date: FEB/04/86 10:14

TGA.

OMNITHERM DATA SYSTEM
BECKMAN INDUSTRIAL

Operator: M. WEGENER
Disk ID: DATA DISK #93
File No: D 46.DAT V2.1
Plotted: FEB/04/86 11:43

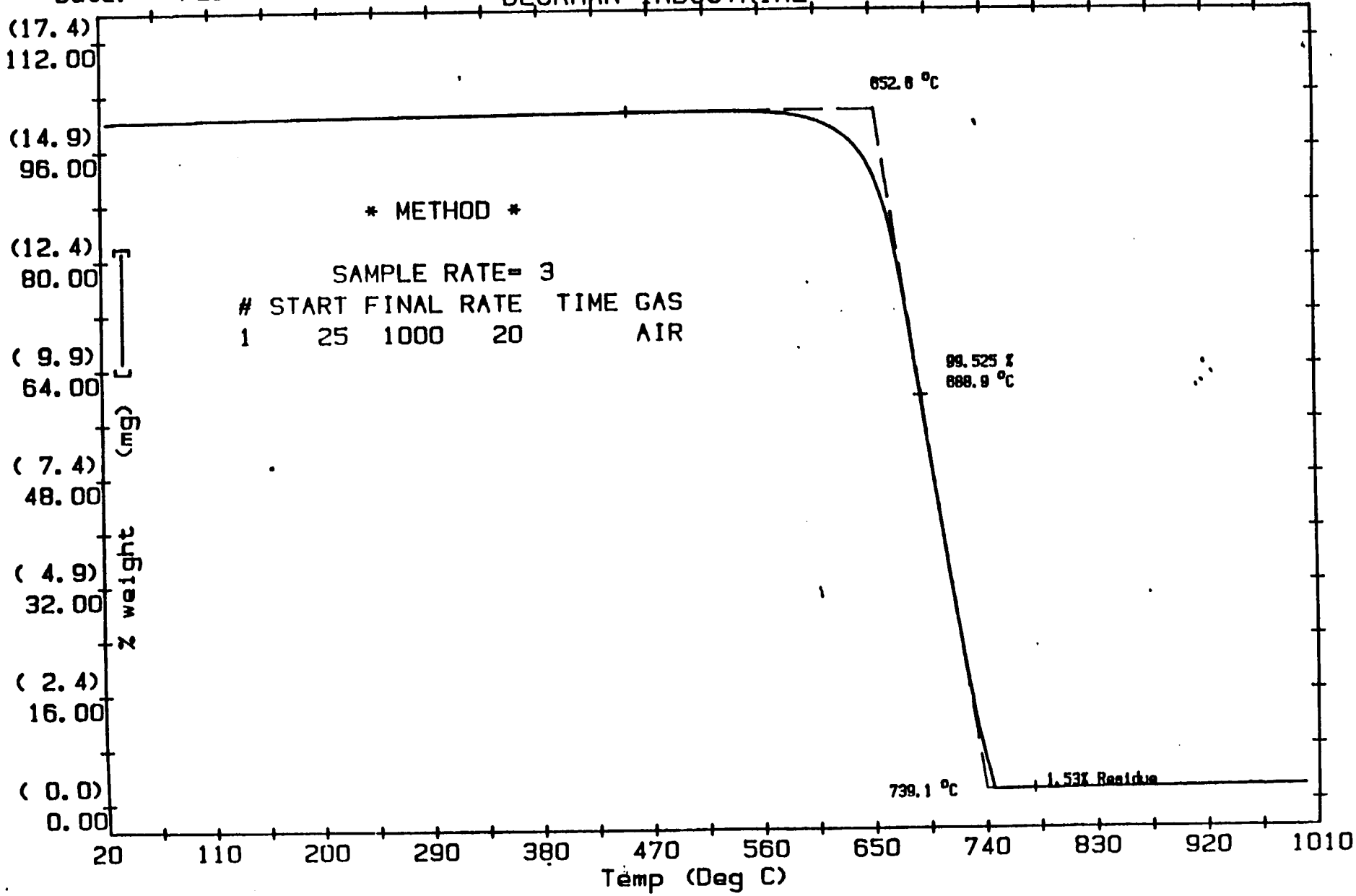


CHART 6C

Beckman Industrial™ ANALYTICAL LABORATORY SERVICES

HORIBA CAPA-500
PARTICLE ANALYZER

DATE 5-27-86
#1 SAMPLE NASA LOT#4-1
SOLVENT ETHYL GLYCOL
C=0.01 mg/ml

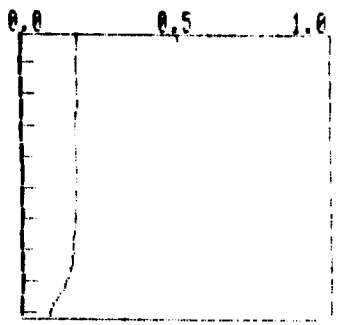
* CONDITIONS

SOLV.VISC	19.90(CP)
SOLV.DENS	1.11(G/CC)
SAMP.DENS	1.90(G/CC)
D(MAX)	5.0 (PM)
D(MIN)	0.01(PM)
D(DIV)	0.50(PM)
SPEED	5000. (RPM)

* TIME 0 H 11 MIN 31 SEC

* DATA

TIME ABSORBANCE

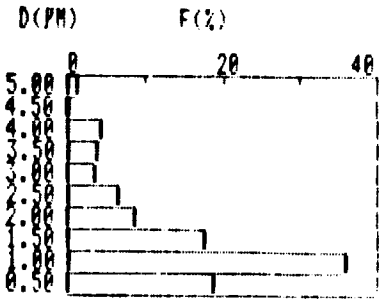


* DISTRIBUTION TABLE (BY VOL.)

D(PM)	F(%)	R(%)
5.00 <	0.0	0.0
5.00-4.50	1.1	1.1
4.50-4.00	0.0	1.1
4.00-3.50	4.4	5.5
3.50-3.00	3.8	9.3
3.00-2.50	3.4	12.7
2.50-2.00	6.5	19.2
2.00-1.50	8.6	27.9
1.50-1.00	17.5	45.4
1.00-0.50	35.8	81.2
0.50-0.00	18.8	100.0

D(AVE) 0.94 (PM)

* DISTRIBUTION GRAPH (BY VOL.)



LOT#4-1
Sample#1

HORIBA CAPA-500
PARTICLE ANALYZER

DATE 5-27-86
#2 SAMPLE NASA LOT#4-1
SOLVENT ETHYL GLYCOL
C=0.01 mg/ml

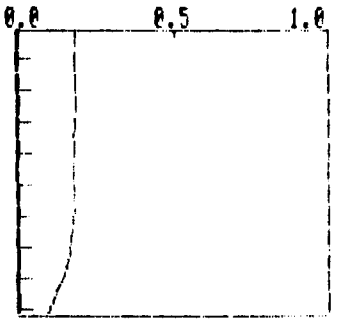
* CONDITIONS

SOLV.VISC	19.90(CP)
SOLV.DENS	1.11(G/CC)
SAMP.DENS	1.90(G/CC)
D(MAX)	5.0 (PM)
D(MIN)	0.01(PM)
D(DIV)	0.50(PM)
SPEED	5000. (RPM)

* TIME 0 H 11 MIN 31 SEC

* DATA

TIME ABSORBANCE

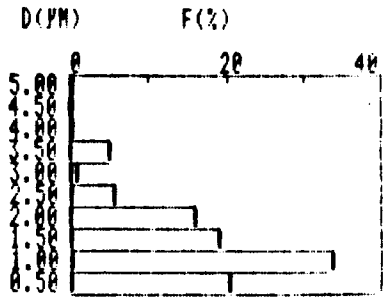


* DISTRIBUTION TABLE (BY VOL.)

D(PM)	F(%)	R(%)
5.00 <	0.0	0.0
5.00-4.50	0.0	0.0
4.50-4.00	0.0	0.0
4.00-3.50	0.0	0.0
3.50-3.00	5.1	5.1
3.00-2.50	0.6	5.7
2.50-2.00	5.5	11.2
2.00-1.50	16.0	27.2
1.50-1.00	18.8	46.0
1.00-0.50	33.7	79.7
0.50-0.00	20.3	100.0

D(AVE) 0.94 (PM)

* DISTRIBUTION GRAPH (BY VOL.)



LOT#4-1
Sample#2

ORIGINAL PAGE IS
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CHART 7A

HORIBA CAPA-500
PARTICLE ANALYZER

DATE 5-27-86
#2 SAMPLE NASA LOT#4-2
SOLVENT ETHYL. GLYCOL
C=0.01 mg/ml

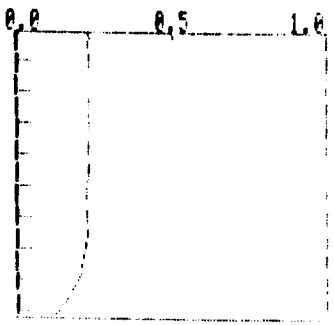
* CONDITIONS

SOLV.VISC	19.90(CP)
SOLV.DENS	1.11(G/CC)
SAMP.DENS	1.90(G/CC)
D(MAX)	5.0 (μM)
D(MIN)	0.01(μM)
D(DIV)	0.50(μM)
SPEED	5000. (RPM)

* TIME 0 H 11 MIN 31 SEC

* DATA

TIME ABSORBANCE

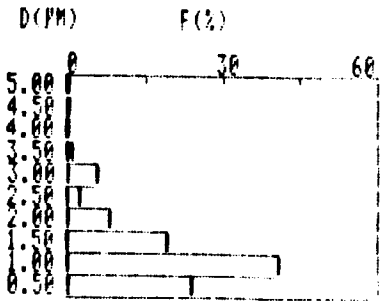


* DISTRIBUTION TABLE (BY VOL.)

D(μM)	F(%)	R(%)
5.00 <	0.0	0.0
5.00-4.50	0.0	0.0
4.50-4.00	0.0	0.0
4.00-3.50	0.0	0.0
3.50-3.00	0.7	0.7
3.00-2.50	5.5	6.2
2.50-2.00	2.2	8.4
2.00-1.50	7.9	16.3
1.50-1.00	19.2	35.5
1.00-0.50	41.1	76.5
0.50-0.00	23.5	100.0

D(AVE) 0.82 (μM)

* DISTRIBUTION GRAPH (BY VOL.)



Lot#4-2
Sample#2

HORIBA CAPA-500
PARTICLE ANALYZER

DATE 5-27-86
#1 SAMPLE NASA LOT#4-2
SOLVENT ETHYL. GLYCOL
C=0.01 mg/ml

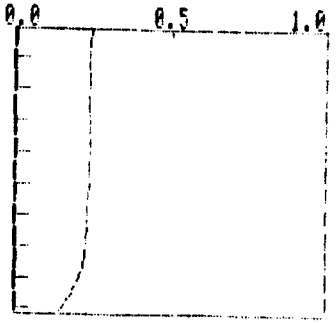
* CONDITIONS

SOLV.VISC	19.90(CP)
SOLV.DENS	1.11(G/CC)
SAMP.DENS	1.90(G/CC)
D(MAX)	5.0 (μM)
D(MIN)	0.01(μM)
D(DIV)	0.50(μM)
SPEED	5000. (RPM)

* TIME 0 H 11 MIN 31 SEC

* DATA

TIME ABSORBANCE

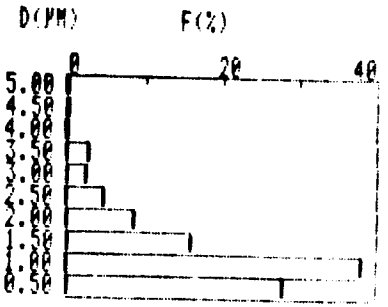


* DISTRIBUTION TABLE (BY VOL.)

D(μM)	F(%)	R(%)
5.00 <	0.0	0.0
5.00-4.50	0.0	0.0
4.50-4.00	0.0	0.0
4.00-3.50	0.0	0.0
3.50-3.00	2.7	2.7
3.00-2.50	2.4	5.1
2.50-2.00	4.7	9.8
2.00-1.50	8.4	18.2
1.50-1.00	15.7	33.9
1.00-0.50	38.1	72.0
0.50-0.00	28.0	100.0

D(AVE) 0.79 (μM)

* DISTRIBUTION GRAPH (BY VOL.)



Lot#4-2
Sample#1

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CHART 7B

HORIBA CAPA-500
PARTICLE ANALYZER

DATE 5-27-86
#1 SAMPLE NASA LOT#43
SOLVENT ETHYL.GLYCOL
C=0.01 mg/ml

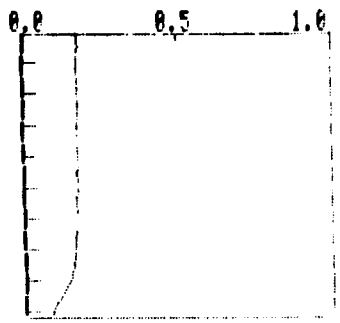
* CONDITIONS

SOLV.VISC	19.90(CP)
SOLV.DENS	1.11(G/CC)
SAMP.DENS	1.90(G/CC)
D(MAX)	5.0 (μM)
D(MIN)	0.01(μM)
D(DIV)	0.50(μM)
SPEED	5000. (RPM)

* TIME 0 H 11 MIN 31 SEC

* DATA

TIME ABSORBANCE

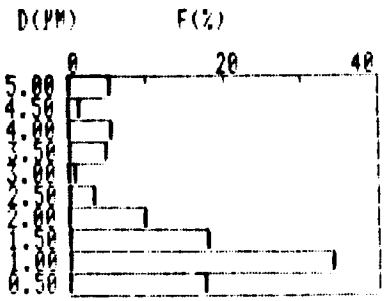


* DISTRIBUTION TABLE (BY VOL.)

D(μM)	F(%)	R(%)
5.00 <	0.0	0.0
5.00-4.50	5.3	5.3
4.50-4.00	1.3	6.6
4.00-3.50	5.5	12.2
3.50-3.00	4.6	16.8
3.00-2.50	0.7	17.5
2.50-2.00	3.0	20.5
2.00-1.50	9.9	30.4
1.50-1.00	18.0	48.4
1.00-0.50	34.1	82.4
0.50-0.00	17.6	100.0

D(AVE) 0.98 (μM)

* DISTRIBUTION GRAPH (BY VOL.)



Lot#43 Sample#1

HORIBA CAPA-500
PARTICLE ANALYZER

DATE 5-27-86
#2 SAMPLE NASA LOT#43
SOLVENT ETHYL.GLYCOL
C=0.01 mg/ml

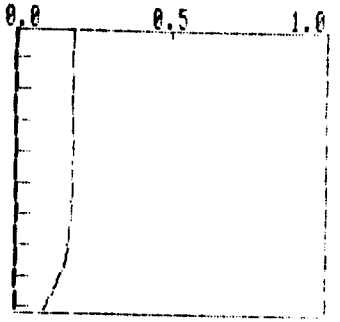
* CONDITIONS

SOLV.VISC	19.90(CP)
SOLV.DENS	1.11(G/CC)
SAMP.DENS	1.90(G/CC)
D(MAX)	5.0 (μM)
D(MIN)	0.01(μM)
D(DIV)	0.50(μM)
SPEED	5000. (RPM)

* TIME 0 H 11 MIN 31 SEC

* DATA

TIME ABSORBANCE

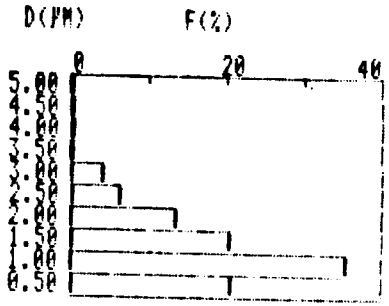


* DISTRIBUTION TABLE (BY VOL.)

D(μM)	F(%)	R(%)
5.00 <	0.0	0.0
5.00-4.50	0.0	0.0
4.50-4.00	0.0	0.0
4.00-3.50	0.0	0.0
3.50-3.00	0.0	0.0
3.00-2.50	3.8	3.8
2.50-2.00	6.2	10.0
2.00-1.50	13.5	23.6
1.50-1.00	20.3	43.8
1.00-0.50	35.6	79.4
0.50-0.00	20.6	100.0

D(AVE) 0.91 (μM)

* DISTRIBUTION GRAPH (BY VOL.)



Lot#43 Sample#2

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CHART 7C

TABLE OF CONTENTS

RESIN TESTING

NAS8-36298

U.S. Polymeric O.E. 71108

USP-39A Resin Lot for NASA Lot# 4

TEST		PAGE
1.	Resin Solids	1
2.	Specific Gravity	1
3.	Brookfield Viscosity	1
4.	Gel Time	1
5.	Atomic Absorption	1
6.	Gas Chromatography	1
7.	TGA	1
8.	DSC	1
9.	HPLC	1
10.	GPC	1
11.	pH	2
12.	Phenol Content	2
13.	Chang's Index	2
14.	RDS	2
15.	NMR	2

CHARTS

Gas Chromatography	6A - 6B
TGA	7A - 7B
DSC	8A - 8B
HPLC	9A - 9B
GPC	10A - 10B
RDS	14A - 14B
NMR	15A - 15B

U.S. Polymeric

RESIN TESTING

NAS8-36298

U.S. Polymeric O.E. 71108

USP-39A Resin Lot for NASA Lot# 4

		#4-1	#4-2	LOT4 AVG
1. Resin Solids, % PTM-7C		83.0	82.8	
		83.6	83.2	
		82.4	83.5	
	AVG.	83.0	83.2	
	Lot# 4 AVERAGE			83.1
2. Specific Gravity @ 25°C PTM-29C		1.167	1.169	
	Lot# 4 AVERAGE			1.168
3. Viscosity, Brookfield, cps. @ 22.8°C PTM-14C		13,750	13,500	
	Lot# 4 AVERAGE			13,625
4. Gel Time, min:sec PTM-47B		4:15	4:05	
	Lot# 4 AVERAGE			4:10
5. Atomic Absorption, ppm CTM-53B (Values are averages of two determinations)	Na	91.0	100.0	95.5
	K	3.0	3.0	3.0
	Ca	12.5	14.5	13.5
	Mg	4.0	3.5	3.8
	Li	0.0	0.0	0.0
	AVG.	110.5	121.0	115.8
6. Volatiles, Gas Chromatography CTM-55		See Charts 6A-6B		
7. TGA, % Weight Loss at 500°C CTM-51 (AIR)		42.8	42.5	
	Lot# 4 AVERAGE			42.7
		See Chart 7A-7B		
8. DSC, temperature °C CTM-50A		186	188	
	Lot# 4 AVERAGE			187
		See Chart 8A-8B		
9. HPLC CTM-49A		See Chart 9A-9B		
10. GPC, Average molecular wt. CTM-49A		1679	1577	
	Lot# 4 AVERAGE			1628
		See Chart 10A-10B		

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USP-39A Resin Lot for NASA Lot# 4

11. pH, units
CTM-1B

	#4-1	#4-2
	8.18	8.20
Lot# 4	AVERAGE	8.19

12. Phenol Content, %
CTM-55 Appendix 1

	12.83	12.93
	12.55	12.84
AVG.	12.69	12.88
Lot# 4	AVERAGE	12.79

13. Chang's Index, ml.
CTM-5B

	24.9	24.6
Lot# 4	AVERAGE	24.8

14. RDS, Minimum Viscosity, cps.
CTM-57A

	Min. Visc.	•C
#4-1	148	106
#4-2	143	106
AVG.	145	106

See Charts 14A-14B

15. NMR
Vendor procedure

See Charts 15A-15B

U. S. Polymeric

Hamid M. Quraishi

Hamid M. Quraishi, Manager
Quality Assurance Department

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TYPICAL GAS CHROMATOGRAPH SET-UP

Operator	J.S.B.	Date	12/16/86
Column		Detector	FID
Length	2FT.	Voltage	
Dia.	1/4 in.	Sensit.	
Liquid Phase	AT-1000	Flow Rates, ml/min	
Wt. %	0.1	Hydrogen	60 Air 96
Support	GRAPHPAC	Scavenge	
Mesh	80/100	Split	
Carrier Gas	He.	Temperature, °C	
Rotameter		Det.	320 Inj. 200
Inlet Press	60 psig	Column Initial	60
Rate	30 ml/min	Final	210
CHART SPEED		Rate	8°C/MIN
SAMPLE	USP 394,4-1	Solvent	THF
Size	0.05 µl	Concn.	0.1631 gm/ml

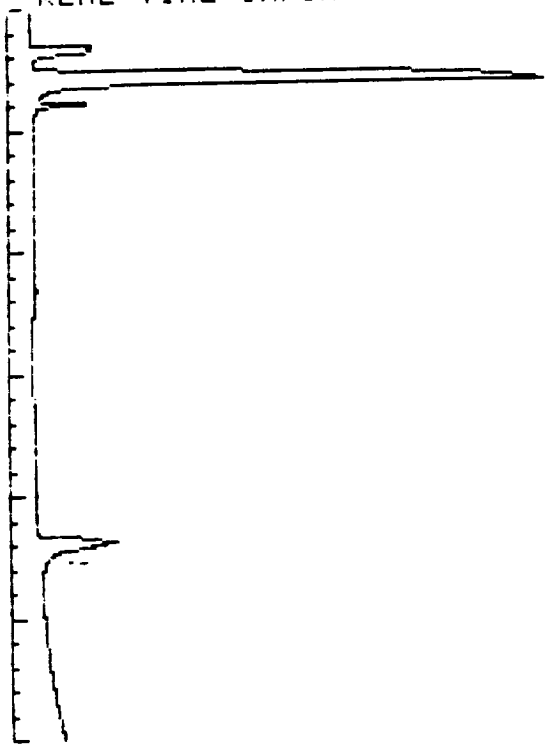
GAS CHROMATOGRAPHY STANDARD SOLVENT

TEST METHOD CTM-55

STANDARD SOLVENT/MONOMER	RETENTION TIME (MINS.)
MEOH	.6
ETHANOL	1.18
MECL2	1.28
ACETONE	1.45
IPA	1.83
THF	3.08
ACETONITRILE	3.2
CRESOL	4.03
MEK	4.08
FURFURAL	15.03
TOLUENE	17.98
CHLOROBENZENE	19.6
PHENOL	22.08

NOTE: THF WAS USED TO DILUTE THE RESIN SAMPLES.

REAL TIME CHROMATOGRAM ***



FINAL FULL SCALE MV =1000.00

SAMPLE: USP39A 4-1
MISC.: C=0.11631 GMS/ML

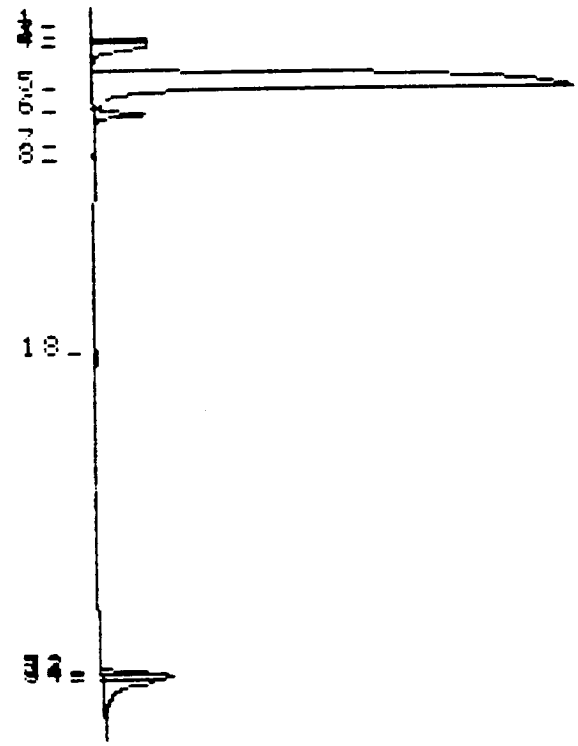
TIME: 12:34
DATE: 12/16/86
OPERATOR: JGZ

RUN TIME: 30.00 MINUTES
DELAY TIME: 0.00
CHAN: 0

PK NO	RET TIME	PEAK AREA	AREA %	B L	PEAK HT.
1	.63	1162	.029	1	191
3	1.60	76625	1.922	2	11349
4	1.80	191960	4.815	2	11360
5	3.20	3116800	78.236	2	97574
6	3.98	136680	3.429	3	10372
7	5.03	3086	.077	4	153
8	5.50	3265	.082	2	326
18	11.63	13890	.348	2	675
32	21.78	54611	1.370	2	10649
33	21.90	178710	4.483	2	14799
34	22.10	207590	5.207	2	10581

TOTAL AREA= 3986379
THRESHOLD= 1
MIN.PK.WIDTH= 15
AREA REJECT= 1000

VERTICAL SCALE FACTOR:1X



SAMPLE: USP39A 4-1
MISC.: C=0.11631 GMS/ML

TIME: 12:34
DATE: 12/16/86
OPERATOR: JGZ

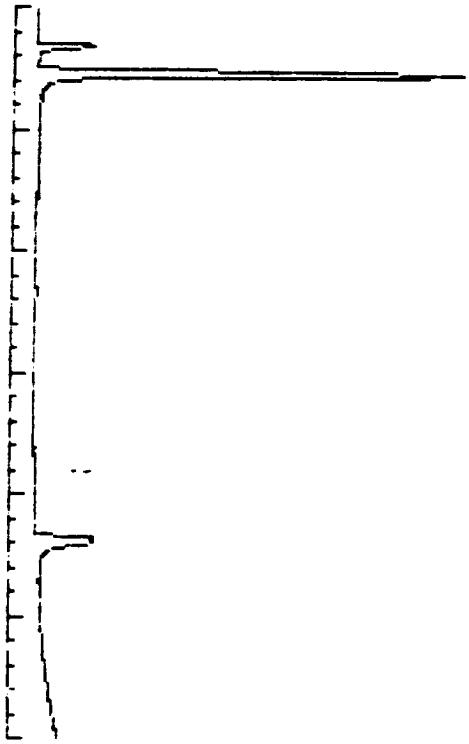
RUN TIME: 30.00 MINUTES
DELAY TIME: 0.00
CHAN: 0

PK NO.	RET TIME	PEAK AREA	AREA %	B L	PEAK HT.
3	1.60	76625	1.933	2	11349
4	1.80	191960	4.841	2	11360
5	3.20	3118800	78.659	2	97574
6	3.98	136680	3.447	3	10372
32	21.78	54611	1.377	2	10649
33	21.90	178710	4.507	2	14799
34	22.10	207590	5.236	2	10581

TOTAL AREA= 3964976
THRESHOLD= 1
MIN PK.WIDTH= 15
AREA REJECT= 15000

ORIGINAL PAGE IS
OF POOR QUALITY

*** REAL TIME CHROMATOGRAM ***



FINAL FULL SCALE MV.=1000.00

SAMPLE: USP39A 4-2
MISC.: C=0.10199 GMS/ML

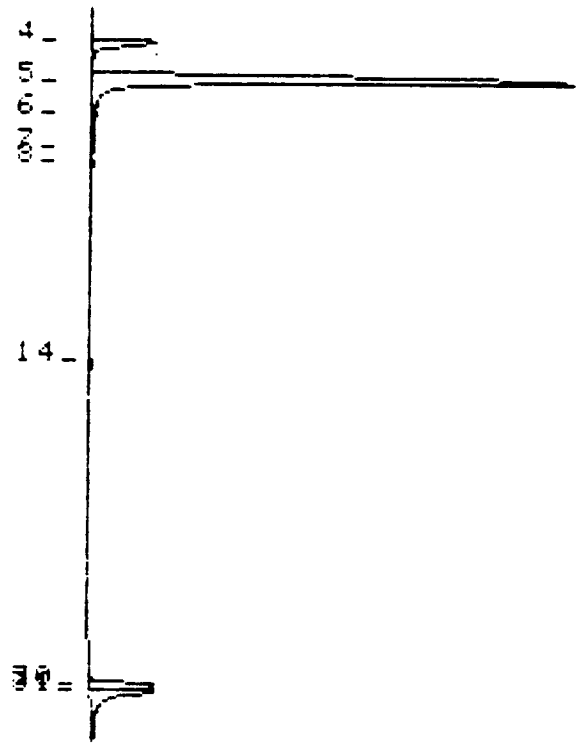
TIME: 14:04
DATE: 12/16/86
OPERATOR: JGZ

RUN TIME: 30.00 MINUTES
DELAY TIME: 0.00
CHAN: 0

PK NO	RET TIME	PEAK AREA	AREA %	B L	PEAK HT.
4	1.65	139370	7.563	2	10853
5	2.90	1343400	72.896	3	81323
6	3.88	16833	.913	4	843
7	4.98	2075	.113	4	123
8	5.48	2769	.150	3	235
14	11.65	9910	.538	1	512
30	21.85	121440	6.590	2	10620
31	22.03	207110	11.238	2	10643

TOTAL AREA= 1842907
THRESHOLD= 1
MIN.PK.WIDTH= 15
AREA REJECT= 1000

VERTICAL SCALE FACTOR: 1X



SAMPLE: USP39A 4-2
MISC.: C=0.10199 GMS/ML

TIME: 14:04
DATE: 12/16/86
OPERATOR: JGZ

RUN TIME: 30.00 MINUTES
DELAY TIME: 0.00
CHAN: 0

PK NO.	RET TIME	PEAK AREA	AREA %	B L	PEAK HT.
4	1.65	139370	7.694	2	10853
5	2.90	1343400	74.167	3	81323
30	21.85	121440	6.705	2	10620
31	22.03	207110	11.434	2	10643

TOTAL AREA= 1811330
THRESHOLD= 1
MIN PK.WIDTH= 15
AREA REJECT= 17000

Sample: SUP39A71108 4-1
Size: 19.594 mg
Run No: MIR #13079 (I2)
Date: MAY/21/86 14:16

TGA

OMNITHERM DATA SYSTEM
BECKMAN INDUSTRIAL

Operator: M. WEGENER
Disk ID: DATA DISK #107
File No: D 37.DAT V2.1
Plotted: MAY/22/86 08:15

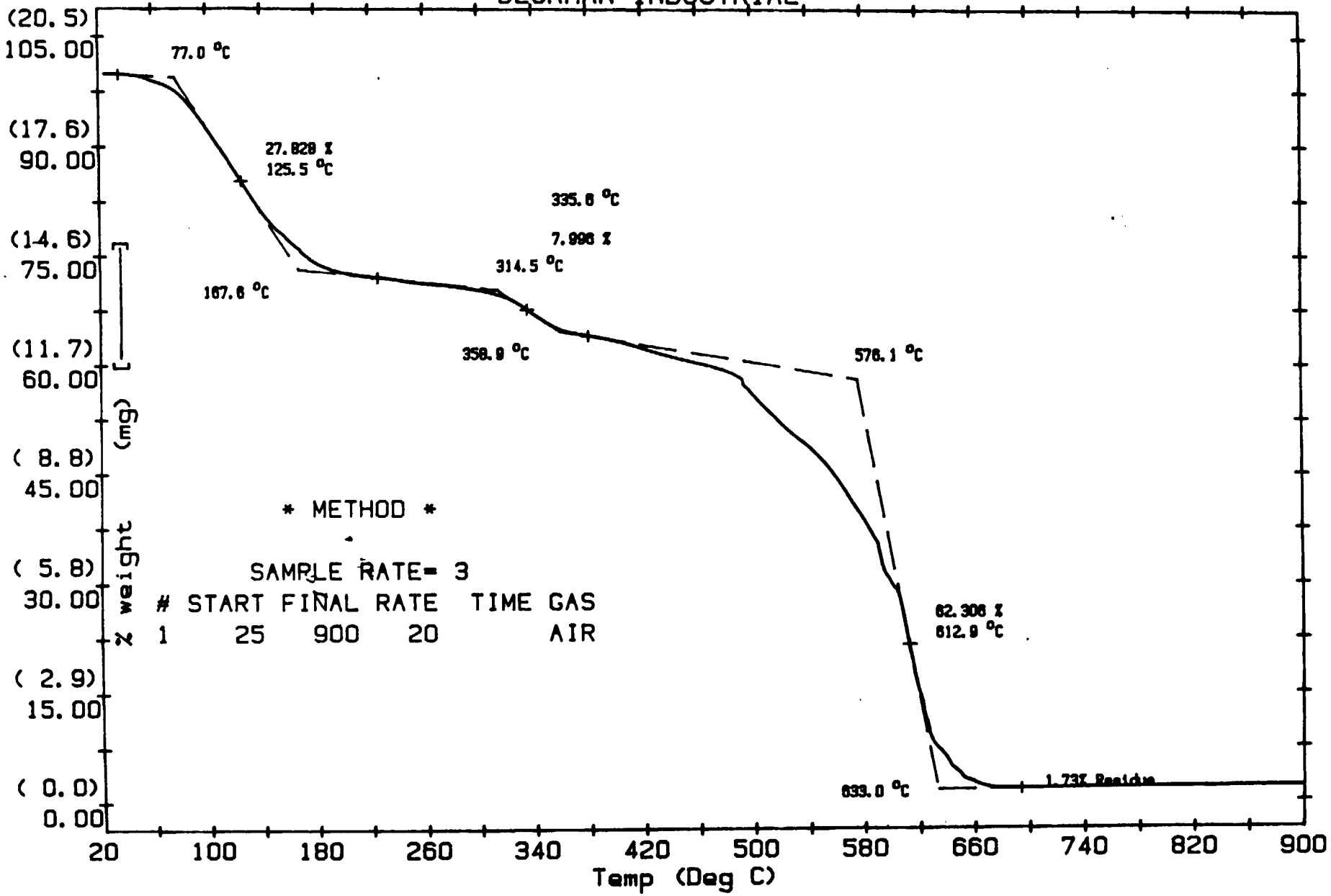


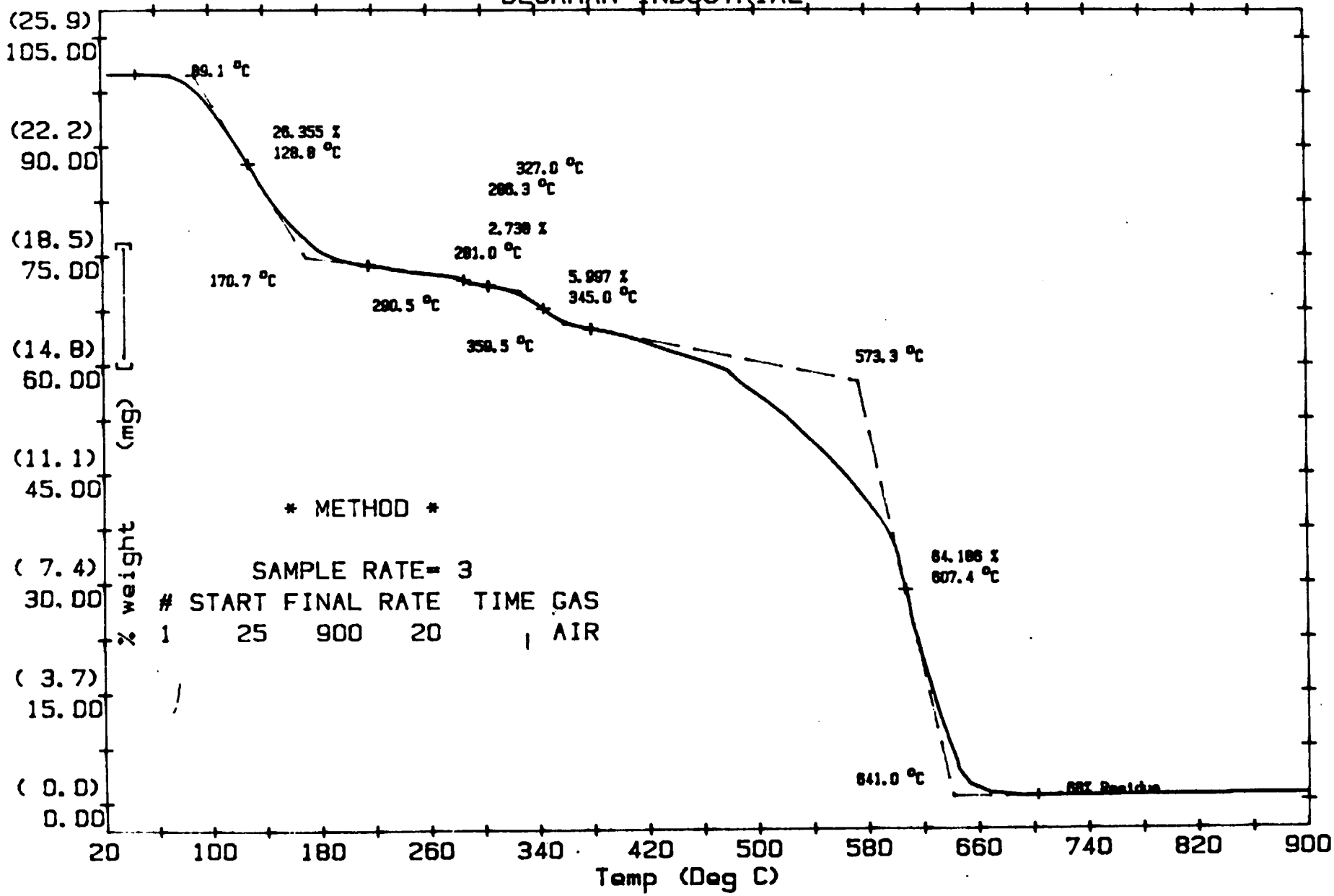
CHART 7A

Sample: USP39A71108 4-2
Size: 24.694 mg
Run No: MIR #13080 (I2)
Date: MAY/22/86 07:18

TGA

OMNITHERM DATA SYSTEM
BECKMAN INDUSTRIAL

Operator: M. WEGENER
Disk ID: DATA DISK #107
File No: D 46.DAT V2.1
Plotted: MAY/27/86 08:01



* METHOD *

SAMPLE RATE= 3

#	START	FINAL	RATE	TIME	GAS
1	25	900	20		AIR

CHART 7B

PART NO. 990088

ORIGINAL PAGE IS
OF POOR QUALITY

CHART 8A

RUN NO ____ DATE 2-23-87
OPERATOR ajk
SAMPLE: 4-1
USP 39A
ATM N2 @ 1atm
FLOW RATE 40ml/min

T-AXIS
SCALE, °C/in 50
PROG. RATE, °C/min 20°
HEAT ✓ COOL ____ ISO ____
SHIFT, in 0

DTA-DSC
SCALE, °C/in 1.0/5X
(mcal/sec)/in ____
WEIGHT, mg 3.2
REFERENCE 1 alum seal

DUPONT Instruments

MEASURED VARIABLE ____

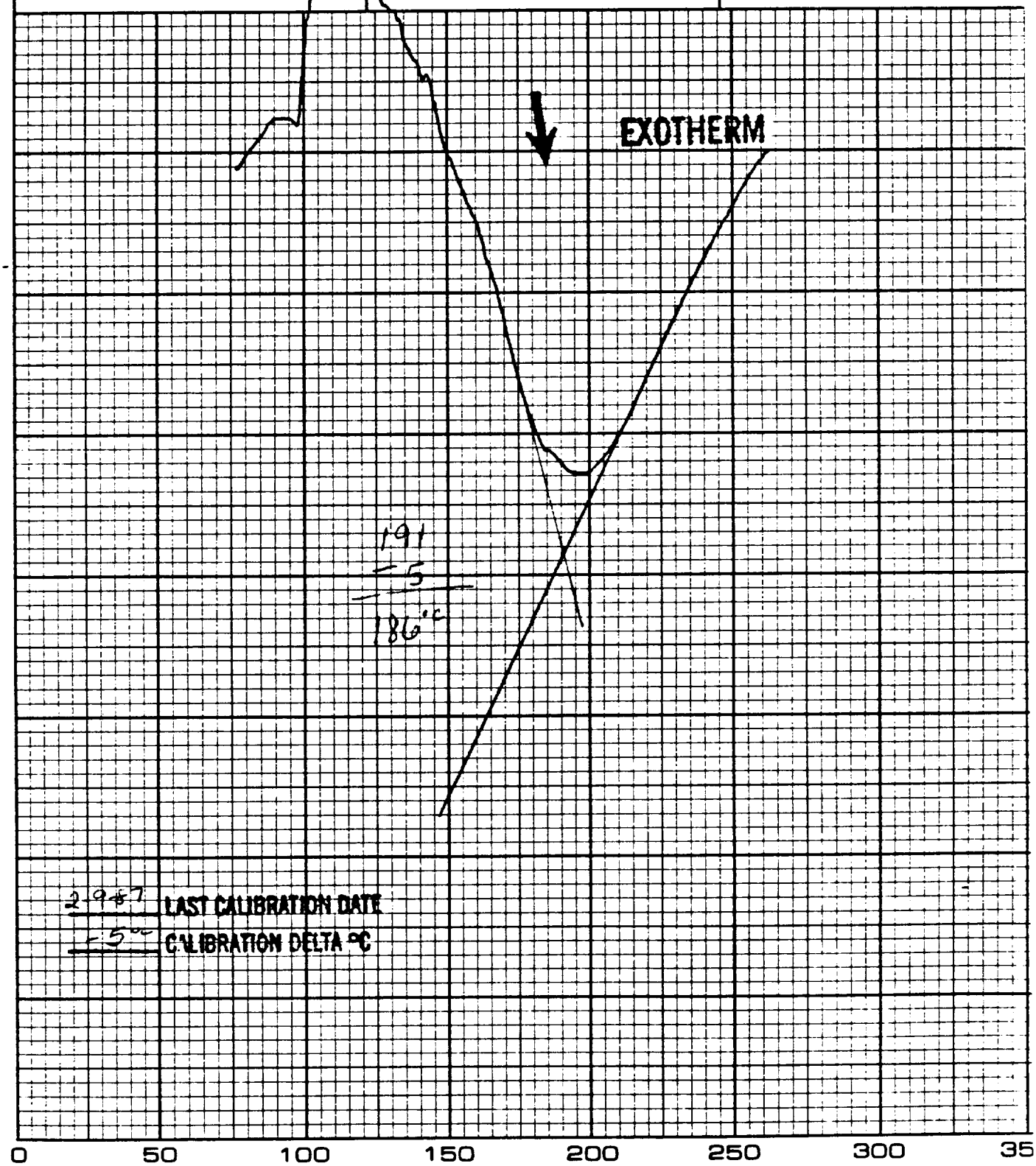


CHART 6B

PART NO. 990088

ORIGINAL PAGE IS OF POOR QUALITY

RUN NO ___ DATE 2-23-87

OPERATOR gek

SAMPLE: USP 39A 4-2

ATM N2 @ latm

FLOW RATE 40 ml/min

T-AXIS

SCALE, °C/in 50

PROG. RATE, °C/min 20°

HEAT ✓ COOL ___ ISO ___

SHIFT, in 0

DTA-DSC

SCALE, °C/in 1.0 /SX

(mcal/sec)/in ___

WEIGHT, mg 3.9

REFERENCE Talum seal

DUPONT Instruments

MEASURED VARIABLE ___

EXOTHERM

193
− 5
188°C

2-9-87 LAST CALIBRATION DATE

− 5° CALIBRATION DELTA °C

0 50 100 150 200 250 300 35

TEMPERATURE, °C (CHRO

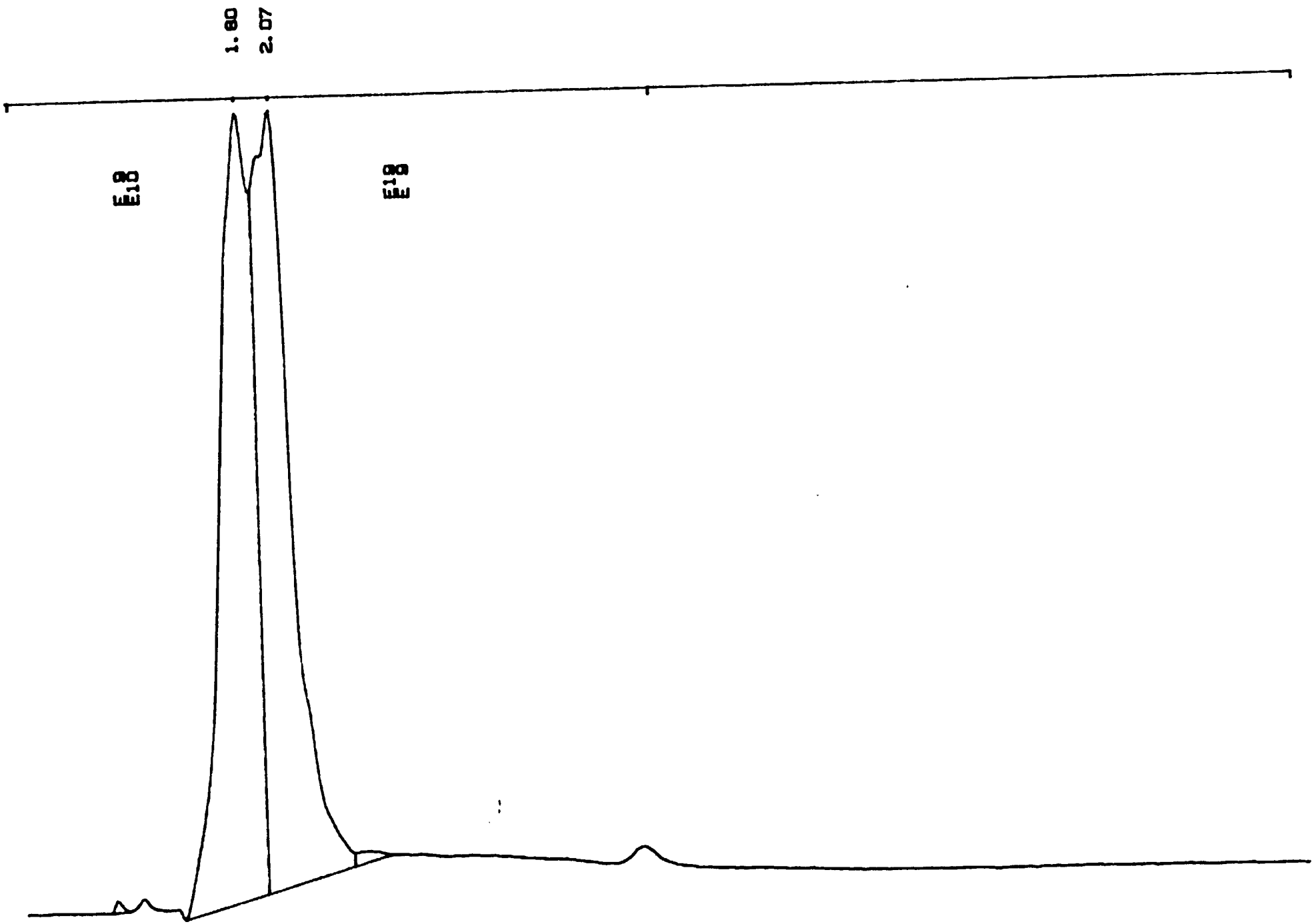
********* AREA PERCENT REPORT *********

```
*********************************************************************************
* Sample Name: USP39A,4-1,C=6.67                  Operator Initials: JGZ        *
* Date:  09-05-1986 12:02:14 Method:PHENOLIC    DATA FILE: A:PHEN029.PTS        *
* Interface: 4                 Cycle#:  29       Channel#: 0    Vial#: N.A.    *
* Starting Peak Width:  10   Threshold:  .01                                    *
*********************************************************************************
*  Instrument Type: BECKMAN HPLC              Column Type: MICROBONDAPAK C-18   *
*             Solvent Description: THF/WATER, 2:1 BY WEIGHT                     *
*   Operating Conditions: R.T., FLOWRATE=1.5 ML/MIN                             *
*            Detector 0: 220NM/.5AU            Detector 1:                      *
*     Misc. Information:  LENGTH=25                                             *
*********************************************************************************
Starting Delay:    0.00                      Ending Retention Time:    10.00
```

Pk No.	Ret. Time	Peak Area	Area %	B L	Peak Ht.	Normalized %	Area/ Height
2	1.80	89195	51.2031	2	4841	100.000	18.4
3	2.07	85003	48.7969	2	4793	95.301	17.7

Total Area: 174198 Area Reject: 1000 One sample per 1.000 sec.

DATA FILE=PHEN029 FROM 0.00 MIN. TO 10.00 MIN. LOW SCALE= 5.416 Mv. HIGH SCALE= 10.398 Mv.
USP-39A. 4-1. C=6.67 MG/ML. 9/5/86. JGZ



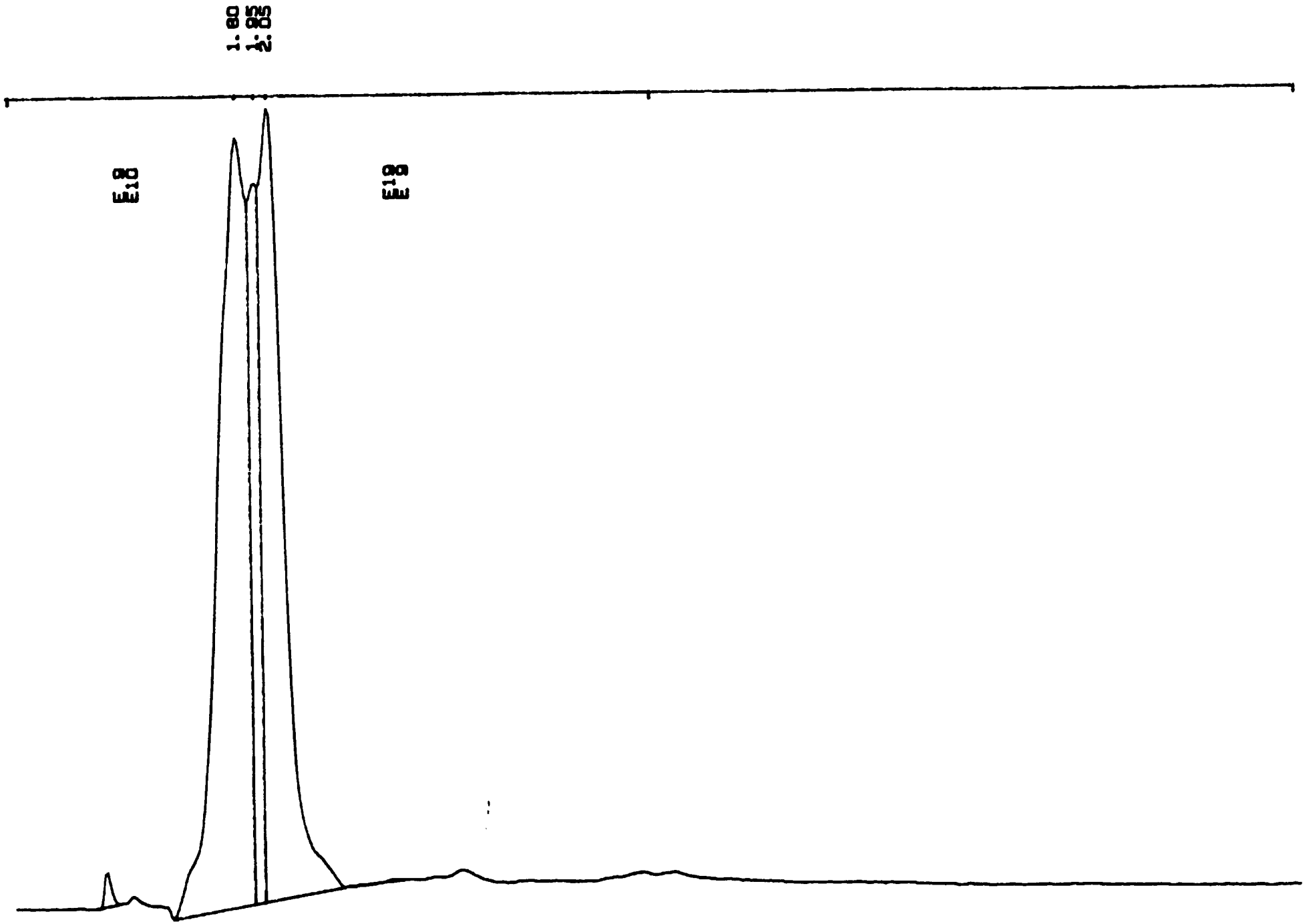
********* AREA PERCENT REPORT *********

```
*****************************************************************************
* Sample Name: USP39A,4-2,C=4.96                  Operator Initials: JGZ    *
* Date:  09-01-1986 15:58:03 Method:PHENOLIC   DATA FILE: A:PHEN021.PTS     *
* Interface: 4               Cycle#:  21        Channel#: 0    Vial#: N.A.  *
* Starting Peak Width:  10   Threshold:  .01                                *
*****************************************************************************
*  Instrument Type: BECKMAN HPLC          Column Type: MICROBONDAPAK C-18    *
*            Solvent Description: THF/WATER, 2:1 BY WEIGHT                  *
*   Operating Conditions: R.T., FLOWRATE=1.5 ML/MIN                         *
*           Detector 0: 220NM/.5AU          Detector 1:                     *
*     Misc. Information:  LENGTH=25                                         *
*****************************************************************************
Starting Delay:   0.00                      Ending Retention Time:   10.00
```

Pk No.	Ret Time	Peak Area	Area %	B L	Peak Ht.	Normalized %	Area/ Height
2	1.80	81017	49.7413	2	4923	100.000	16.5
3	1.95	22173	13.6137	2	4605	27.369	4.8
4	2.05	59686	36.6450	2	5071	73.671	11.8

Total Area: 162876 Area Reject: 1000 One sample per 1.000 sec.

DATA FILE=PHEN021 FROM 0.00 MIN. TO 10.00 MIN. LOW SCALE= 5.445 Mv. HIGH SCALE= 10.636 Mv.
USP-38A, 4-2, C=4.96 MG/ML, 8/2/86, JGZ



*** Calibration Data ***
Calibration Name:
Misc Information:

Fit Type: 3
Log Mol Wt = A + Bx + Cx^2 + Dx^3
A= 2.538977 B= 2.115815 C= -.5646824 D= 3.606432E-02
Coefficient of Determination: 0.9902

Ret Time	Molecular Weight	Log Mol Wt
3.50	35000	4.544
4.33	15000	4.176
4.83	3600	3.556
5.09	2350	3.371
6.00	570	2.756
7.17	92	1.964
7.50	72	1.857

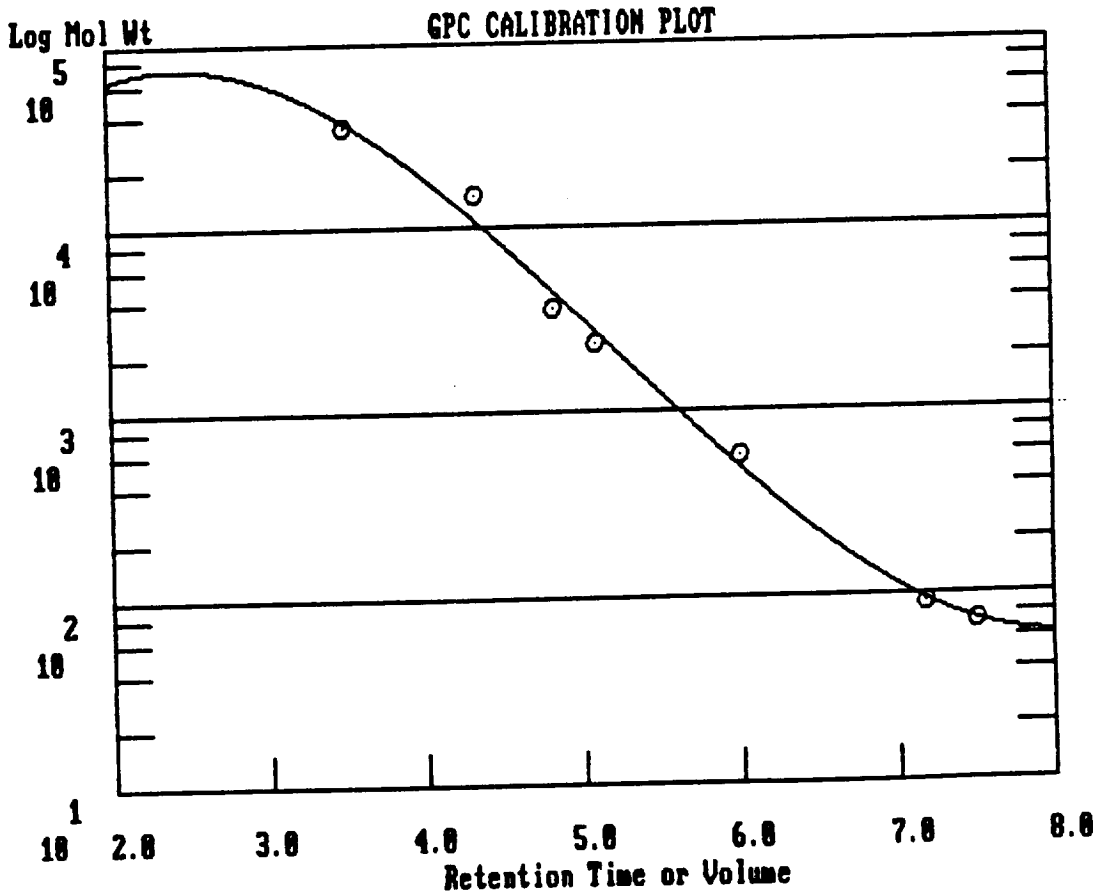


CHART 10A

A FILE A:GPC36.HDR TAKEN 08-05-1986 17:56:32

********* GPC REPORT *********

```
**********************************************************************
Sample Name: USP39A 4-1=2.68                Operator Initials: GBF   *
Date:  08-05-1986 16:34:28 Method:          DATA FILE: A:GPC36.PTS   *
nterface: 5                Cycle#:  36      Channel#: 0   Vial#: N.A.*
Starting Peak Width:  60   Threshold:  0                             *
**********************************************************************
 Instrument Type: HPLC/BECKMAN          Column Type: ULTRASTYRAGEL 500A *
          Solvent Description: THF                                    *
  Operating Conditions: T=35C FLOWRATE=2.0ML/MIN                      *
          Detector 0: 254NM/.1AU          Detector 1:                 *
    Misc. Information: CALIBRATION/GPC                                *
**********************************************************************
rting Delay:   0.00                    Ending Retention Time:   10.00
ibration file: GPCPHEN
lecular Weight Distribution Averages
seline TIMES:    3.85 to   10.00   MW:     22295 to          2
ocess -TIMES:    3.85 to   10.00   MW:     22295 to          2
tal Area:       229203
=                 1679
=                  422
/Mn=            3.9799
=                 4462
=                 1459
```

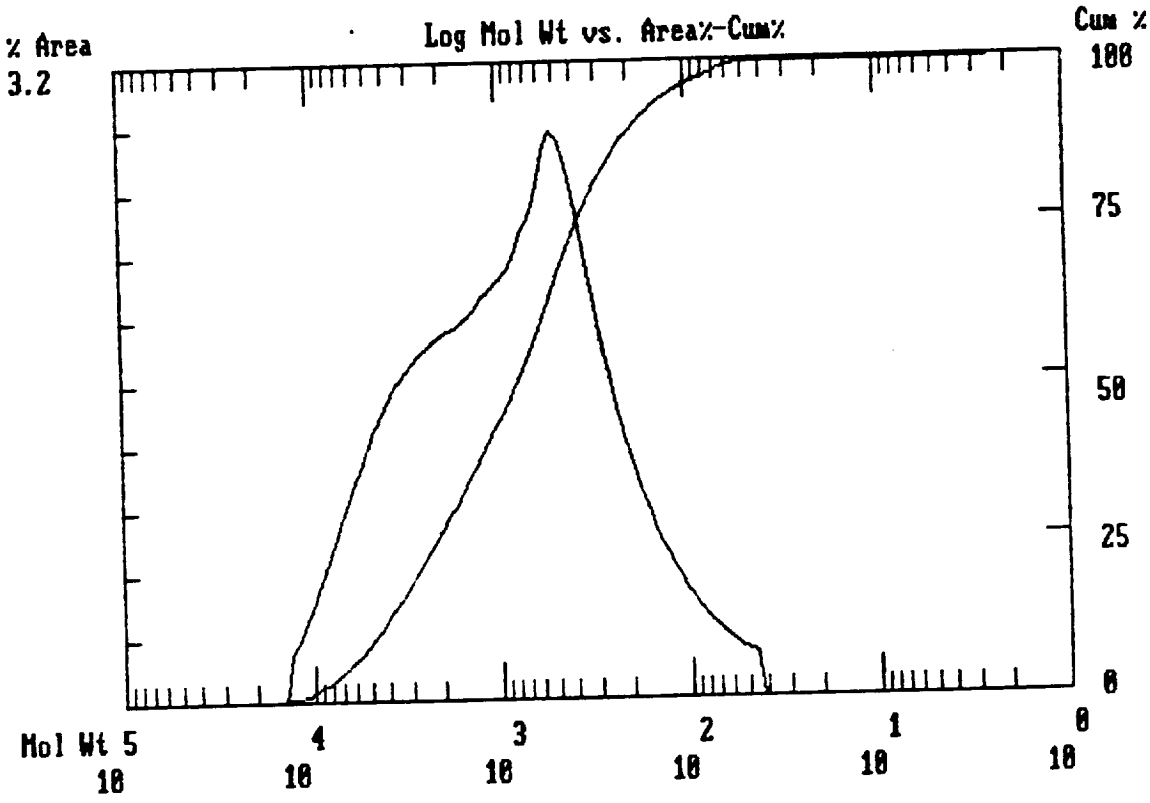
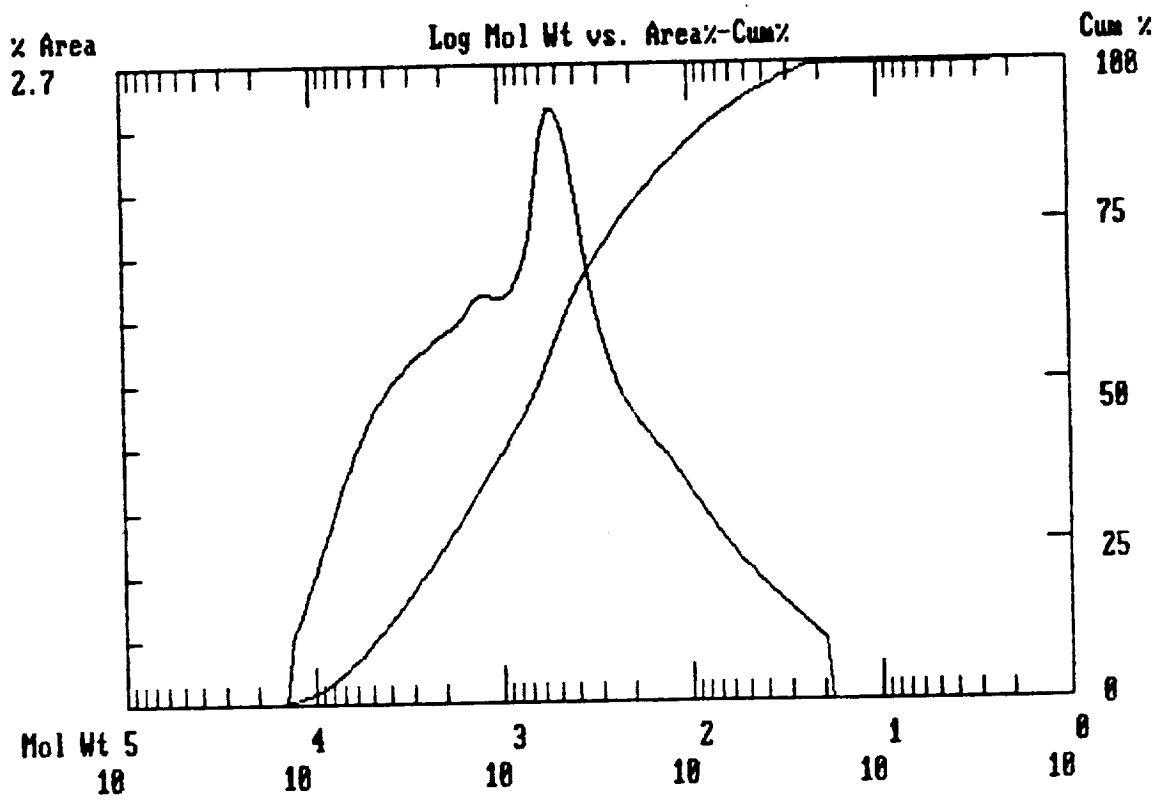


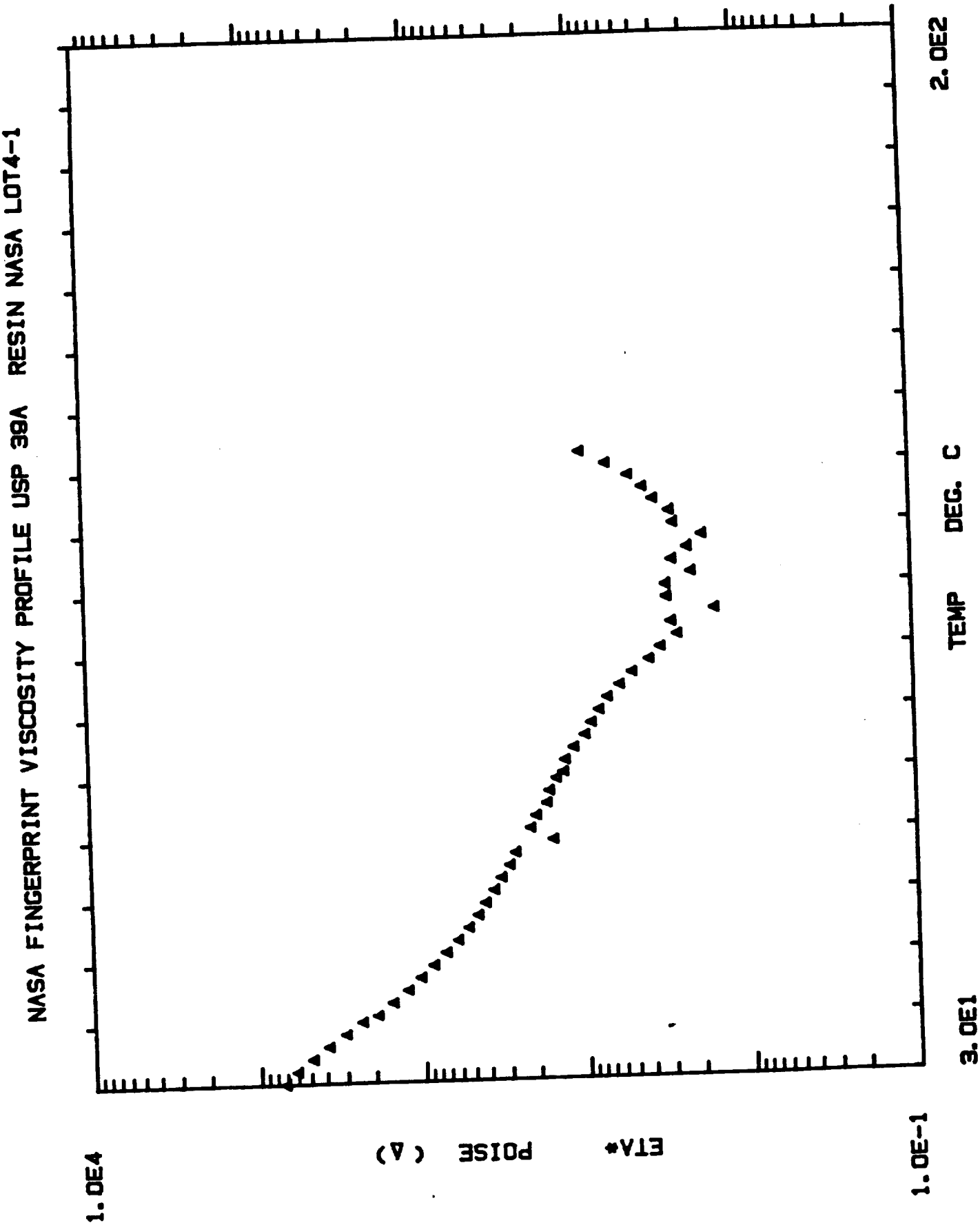
CHART 10B

A FILE A:GPC37.HDR TAKEN 08-05-1986 17:59:34

********* GPC REPORT *********

```
**********************************************************************
Sample Name: USP39A 4-2=2.68                  Operator Initials: GBF   *
Date:  08-05-1986 16:46:38 Method:            DATA FILE: A:GPC37.PTS   *
 nterface: 5                Cycle#:  37       Channel#: 0   Vial#: N.A.*
tarting Peak Width:  60     Threshold:  0                              *
**********************************************************************
  Instrument Type: HPLC/BECKMAN          Column Type: ULTRASTYRAGEL 500A *
            Solvent Description: THF                                   *
   Operating Conditions: T=35C FLOWRATE=2.0ML/MIN                      *
          Detector 0: 254NM/.1AU          Detector 1:                  *
     Misc. Information: CALIBRATION/GPC                                *
**********************************************************************
tarting Delay:   0.00                    Ending Retention Time:   10.00
 ibration file: GPCPHEN
ecular Weight Distribution Averages
aseline TIMES:    3.85 to   10.00   MW:      22295 to          2
 ocess .JIMES:    3.85 to   10.00   MW:      22295 to          2
 al Area:       192576
w=                1577
n=                 217
 Mn=            7.2524
z=                4789
v=                1326
```




NASA FINGERPRINT VISCOSITY PROFILE USP 38A RESIN NASA LOT4-1
1.0E4
ETA* POISE (A)
1.0E-1
2.0E2
TEMP DEG. C
3.0E1

Rheometrics RECAP II

---

eriment No. : 5 Sample No. : 1

le:
A FINGERPRINT VISCOSITY PROFILE USP 39A RESIN NASA LOT4-1

erator :cp

e and Time : Monday, August 18, 1986 - 10:37:58

rating Mode : DYNAMIC

eep Type : CURE

ometry : DISK & PLATE
RADIUS : 25.00
GAP : 0.50

tes :
RAIN =50%
QUENCY =10 RAD/SEC

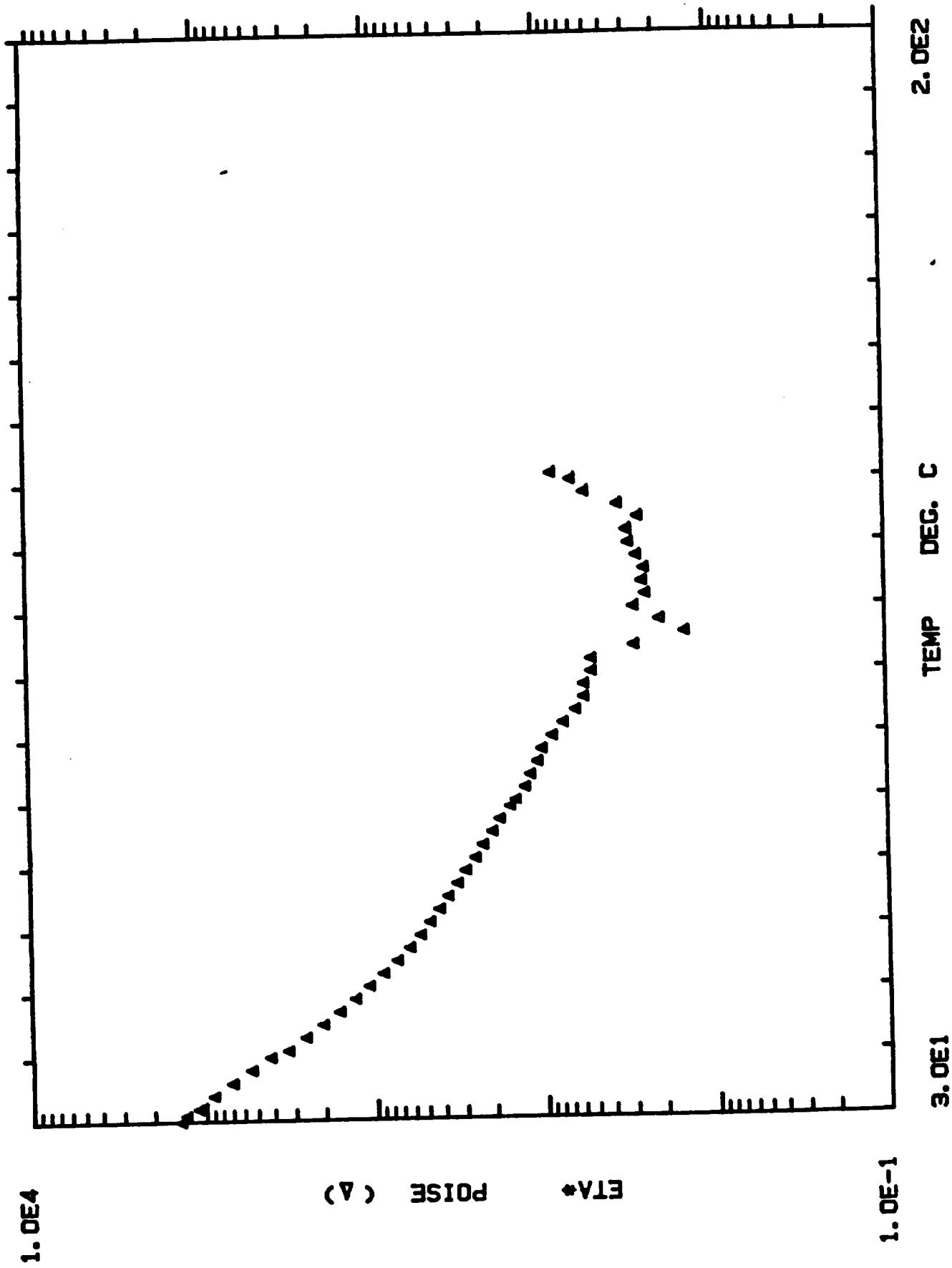
5A FINGERPRINT VISCOSITY PROFILE USP 39A RESIN NASA LOT4-1

O.	ETA* POISE	ETA' POISE	ETA" POISE	TORQUE GRAMS-CM	TIME MIN.	TEMP DEG. C
1	7.356e+002	7.347e+002	3.604e+001	9.281e+001	2.000e-001	2.900e+001
2	6.972e+002	6.962e+002	3.653e+001	8.800e+001	1.000e+000	3.000e+001
3	5.909e+002	5.901e+002	3.035e+001	7.450e+001	2.000e+000	3.200e+001
4	4.739e+002	4.732e+002	2.555e+001	5.973e+001	3.000e+000	3.400e+001
5	3.764e+002	3.753e+002	2.849e+001	4.741e+001	4.000e+000	3.600e+001
6	2.946e+002	2.931e+002	2.905e+001	3.704e+001	5.000e+000	3.800e+001
7	2.327e+002	2.314e+002	2.503e+001	2.927e+001	6.000e+000	4.000e+001
8	1.876e+002	1.859e+002	2.533e+001	2.357e+001	7.000e+000	4.100e+001
9	1.507e+002	1.487e+002	2.445e+001	1.893e+001	8.000e+000	4.300e+001
10	1.215e+002	1.193e+002	2.343e+001	1.527e+001	9.000e+000	4.500e+001
11	1.010e+002	9.834e+001	2.309e+001	1.268e+001	1.000e+001	4.700e+001
12	8.403e+001	8.084e+001	2.311e+001	1.055e+001	1.100e+001	4.900e+001
13	7.028e+001	6.723e+001	2.049e+001	8.813e+000	1.200e+001	5.100e+001
14	5.958e+001	5.642e+001	1.915e+001	7.477e+000	1.300e+001	5.300e+001
15	5.106e+001	4.824e+001	1.673e+001	6.413e+000	1.400e+001	5.500e+001
16	4.459e+001	4.208e+001	1.475e+001	5.599e+000	1.500e+001	5.700e+001
17	4.010e+001	3.795e+001	1.295e+001	5.030e+000	1.600e+001	5.900e+001
18	3.536e+001	3.360e+001	1.100e+001	4.437e+000	1.700e+001	6.100e+001
19	3.190e+001	3.052e+001	9.294e+000	3.999e+000	1.800e+001	6.300e+001
20	2.823e+001	2.706e+001	8.066e+000	3.540e+000	1.900e+001	6.500e+001
21	2.593e+001	2.497e+001	6.980e+000	3.254e+000	2.000e+001	6.700e+001
22	1.516e+001	1.340e+001	7.078e+000	1.902e+000	2.100e+001	6.900e+001
23	2.092e+001	2.021e+001	5.397e+000	2.625e+000	2.200e+001	7.100e+001
24	1.918e+001	1.861e+001	4.625e+000	2.406e+000	2.300e+001	7.300e+001
25	1.646e+001	1.596e+001	4.031e+000	2.066e+000	2.400e+001	7.500e+001
26	1.582e+001	1.536e+001	3.810e+000	1.985e+000	2.500e+001	7.700e+001
27	1.428e+001	1.386e+001	3.450e+000	1.792e+000	2.600e+001	7.900e+001
28	1.286e+001	1.247e+001	3.145e+000	1.612e+000	2.700e+001	8.000e+001
29	1.250e+001	1.219e+001	2.770e+000	1.569e+000	2.800e+001	8.200e+001
30	1.103e+001	1.065e+001	2.864e+000	1.385e+000	2.900e+001	8.400e+001
31	9.406e+000	9.166e+000	2.113e+000	1.180e+000	3.000e+001	8.600e+001
32	8.563e+000	8.359e+000	1.860e+000	1.075e+000	3.100e+001	8.800e+001
33	7.639e+000	7.351e+000	2.078e+000	9.584e-001	3.200e+001	9.000e+001
34	6.766e+000	6.563e+000	1.644e+000	8.495e-001	3.300e+001	9.200e+001
35	5.684e+000	5.498e+000	1.444e+000	7.128e-001	3.400e+001	9.400e+001
36	4.764e+000	4.696e+000	8.022e-001	5.979e-001	3.500e+001	9.600e+001
37	3.731e+000	2.963e+000	2.268e+000	4.681e-001	3.600e+001	9.800e+001
38	3.183e+000	3.105e+000	6.963e-001	3.995e-001	3.700e+001	1.000e+002
39	2.505e+000	2.229e+000	1.143e+000	3.142e-001	3.800e+001	1.020e+002
40	2.716e+000	2.646e+000	6.147e-001	3.410e-001	3.900e+001	1.040e+002
41	1.491e+000	1.330e+000	6.518e-001	1.860e-001	4.000e+001	1.060e+002
42	2.881e+000	2.760e+000	8.249e-001	3.613e-001	4.100e+001	1.080e+002
43	2.905e+000	2.669e+000	4.572e-001	3.646e-001	4.200e+001	1.100e+002
44	2.030e+000	1.650e+000	8.377e-001	2.546e-001	4.300e+001	1.120e+002
45	2.647e+000	2.470e+000	9.504e-001	3.320e-001	4.400e+001	1.140e+002
46	2.124e+000	1.852e+000	1.040e+000	2.663e-001	4.500e+001	1.160e+002
47	1.734e+000	1.529e+000	7.970e-001	2.164e-001	4.600e+001	1.180e+002
48	2.573e+000	2.367e+000	1.219e+000	3.231e-001	4.700e+001	1.200e+002
49	2.691e+000	2.318e+000	1.368e+000	3.377e-001	4.800e+001	1.220e+002
50	3.387e+000	2.814e+000	1.849e+000	4.228e-001	4.900e+001	1.240e+002

A FINGERPRINT VISCOSITY PROFILE USP 39A RESIN NASA LOT4-1

	ETA* POISE	ETA' POISE	ETA" POISE	TORQUE GRAMS-CM	TIME MIN.	TEMP DEG. C
	3.894e+000	3.271e+000	2.112e+000	4.887e-001	5.000e+001	1.260e+002
2	4.707e+000	3.972e+000	2.525e+000	5.911e-001	5.100e+001	1.280e+002
3	6.426e+000	5.930e+000	2.477e+000	8.062e-001	5.200e+001	1.300e+002
1	9.204e+000	8.352e+000	3.868e+000	1.156e+000	5.300e+001	1.320e+002

CHART 14B


NASA FINGERPRINT VISCOSITY PROFILE USP 39ARESIN NASA LOT4-2
ETA* POISE (A)
TEMP DEG. C
1.0E4
1.0E-1
2.0E2
3.0E1

Rheometrics RECAP II

---

periment No. : 6 Sample No. : 1

le:
SA FINGERPRINT VISCOSITY PROFILE USP 39ARESIN NASA LOT4-2

rator :CP

te and Time : Monday, August 18, 1986 - 12:16:20

rating Mode : DYNAMIC

ep Type : CURE

ometry : DISK & PLATE
RADIUS : 25.00
GAP : 0.50

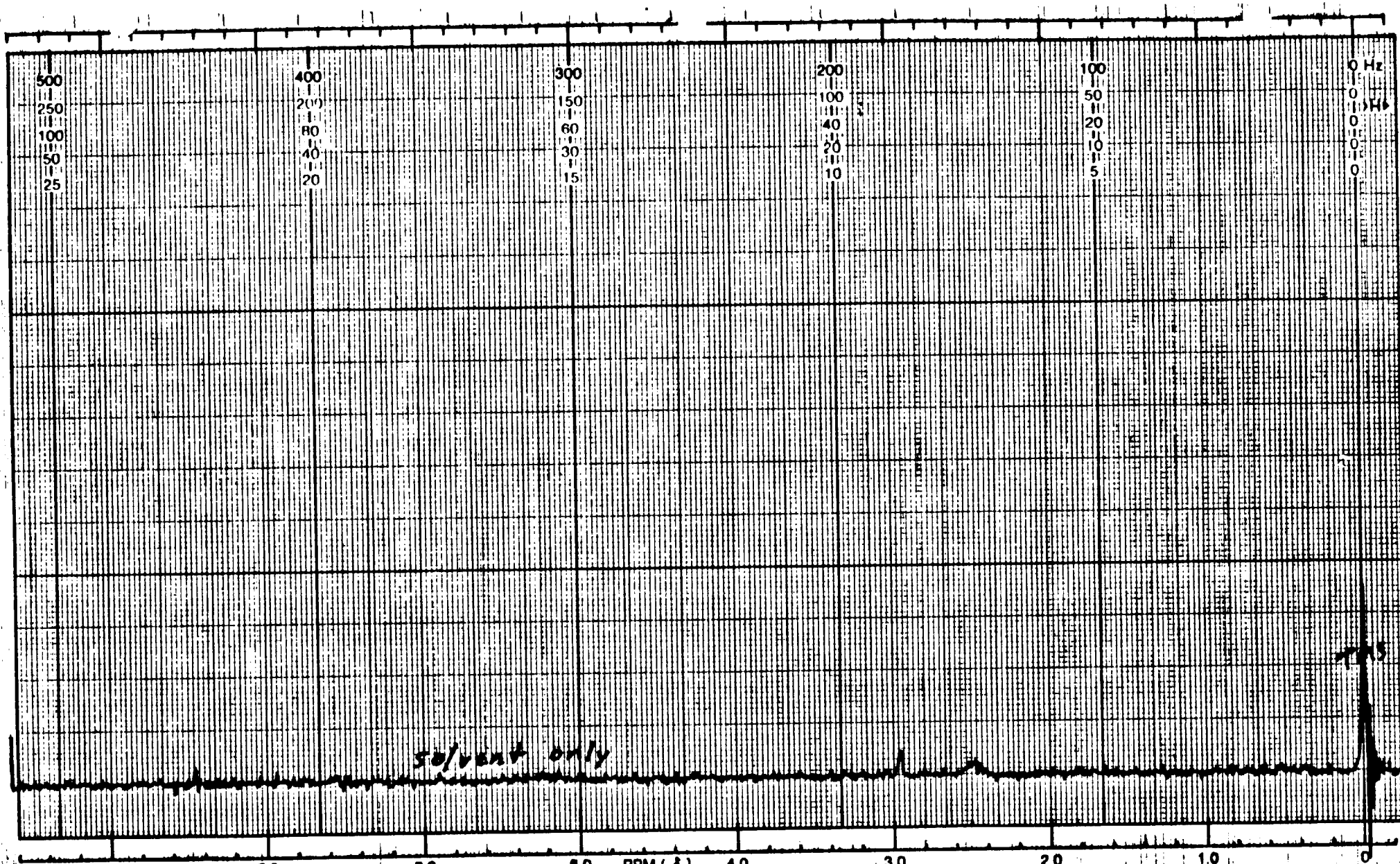
es :
AIN =50%
EQUENCY =10 RAD/SEC

FINGERPRINT VISCOSITY PROFILE USP 39ARESIN NASA LOT4-2

	ETA* POISE	ETA' POISE	ETA" POISE	TORQUE GRAMS-CM	TIME MIN.	TEMP DEG. C
1	1.376e+003	1.376e+003	4.762e+001	1.742e+002	2.000e-001	3.000e+001
2	1.278e+003	1.278e+003	4.150e+001	1.617e+002	1.000e+000	3.100e+001
3	1.080e+003	1.080e+003	3.796e+001	1.365e+002	2.000e+000	3.200e+001
4	8.738e+002	8.731e+002	3.545e+001	1.104e+002	3.000e+000	3.400e+001
5	6.808e+002	6.801e+002	3.189e+001	8.591e+001	4.000e+000	3.600e+001
6	5.270e+002	5.263e+002	2.742e+001	6.640e+001	5.000e+000	3.800e+001
7	4.063e+002	4.055e+002	2.577e+001	5.118e+001	6.000e+000	4.000e+001
8	3.184e+002	3.173e+002	2.591e+001	4.002e+001	7.000e+000	4.100e+001
9	2.503e+002	2.490e+002	2.551e+001	3.146e+001	8.000e+000	4.300e+001
10	1.979e+002	1.963e+002	2.496e+001	2.488e+001	9.000e+000	4.500e+001
11	1.583e+002	1.563e+002	2.356e+001	1.988e+001	1.000e+001	4.700e+001
12	1.275e+002	1.253e+002	2.335e+001	1.602e+001	1.100e+001	4.900e+001
13	1.055e+002	1.030e+002	2.283e+001	1.325e+001	1.200e+001	5.100e+001
14	8.678e+001	8.404e+001	2.163e+001	1.089e+001	1.300e+001	5.300e+001
15	7.319e+001	6.930e+001	2.022e+001	9.058e+000	1.400e+001	5.500e+001
16	6.079e+001	5.825e+001	1.737e+001	7.630e+000	1.500e+001	5.700e+001
17	5.253e+001	5.019e+001	1.553e+001	6.596e+000	1.600e+001	5.900e+001
18	4.614e+001	4.405e+001	1.374e+001	5.792e+000	1.700e+001	6.100e+001
19	4.050e+001	3.872e+001	1.186e+001	5.054e+000	1.800e+001	6.300e+001
20	3.597e+001	3.452e+001	9.737e+000	4.501e+000	1.900e+001	6.500e+001
21	3.161e+001	3.043e+001	8.555e+000	3.968e+000	2.000e+001	6.700e+001
22	2.825e+001	2.730e+001	7.263e+000	3.544e+000	2.100e+001	6.900e+001
23	2.474e+001	2.393e+001	6.270e+000	3.106e+000	2.200e+001	7.100e+001
24	2.225e+001	2.159e+001	5.389e+000	2.791e+000	2.300e+001	7.300e+001
25	1.955e+001	1.898e+001	4.673e+000	2.455e+000	2.400e+001	7.500e+001
26	1.766e+001	1.711e+001	4.373e+000	2.216e+000	2.500e+001	7.700e+001
27	1.533e+001	1.497e+001	3.306e+000	1.934e+000	2.600e+001	7.900e+001
28	1.419e+001	1.375e+001	3.507e+000	1.731e+000	2.700e+001	8.000e+001
29	1.251e+001	1.205e+001	3.343e+000	1.570e+000	2.800e+001	8.200e+001
30	1.159e+001	1.127e+001	2.722e+000	1.456e+000	2.900e+001	8.400e+001
31	1.051e+001	1.033e+001	2.409e+000	1.318e+000	3.000e+001	8.600e+001
32	9.833e+000	9.514e+000	2.674e+000	1.240e+000	3.100e+001	8.800e+001
33	8.555e+000	8.397e+000	1.638e+000	1.073e+000	3.200e+001	9.000e+001
34	7.367e+000	7.234e+000	1.393e+000	9.245e-001	3.300e+001	9.200e+001
35	6.196e+000	6.091e+000	1.133e+000	7.771e-001	3.400e+001	9.400e+001
36	5.547e+000	5.406e+000	1.240e+000	6.961e-001	3.500e+001	9.600e+001
37	5.524e+000	5.374e+000	1.279e+000	6.927e-001	3.600e+001	9.800e+001
38	5.003e+000	4.947e+000	7.478e-001	6.278e-001	3.700e+001	1.000e+002
39	4.991e+000	4.896e+000	9.667e-001	6.258e-001	3.800e+001	1.020e+002
40	2.805e+000	2.645e+000	9.323e-001	3.519e-001	3.900e+001	1.040e+002
41	1.425e+000	1.229e+000	7.202e-001	1.788e-001	4.000e+001	1.060e+002
42	1.995e+000	1.774e+000	9.136e-001	2.504e-001	4.100e+001	1.080e+002
43	2.815e+000	2.740e+000	6.471e-001	3.534e-001	4.200e+001	1.100e+002
44	2.394e+000	2.342e+000	4.931e-001	3.003e-001	4.300e+001	1.120e+002
45	2.505e+000	2.454e+000	3.215e-001	3.146e-001	4.400e+001	1.140e+002
46	2.430e+000	2.340e+000	6.570e-001	3.049e-001	4.500e+001	1.160e+002
47	2.658e+000	2.495e+000	1.000e+000	3.374e-001	4.600e+001	1.180e+002
48	2.979e+000	2.814e+000	9.793e-001	3.741e-001	4.700e+001	1.200e+002
49	3.045e+000	2.971e+000	6.678e-001	3.820e-001	4.800e+001	1.220e+002
50	2.614e+000	2.449e+000	9.131e-001	3.281e-001	4.900e+001	1.240e+002

A FINGERPRINT VISCOSITY PROFILE USP 394RESIN NASA LOT4-2

	ETA* POISE	ETA' POISE	ETA" POISE	TORQUE GRAMS-CM	TIME MIN.	TEMP DEG. C
51	3.427e+000	3.307e+000	8.978e-001	4.300e-001	5.000e+001	1.260e+002
52	5.347e+000	5.018e+000	1.845e+000	6.710e-001	5.100e+001	1.280e+002
53	6.402e+000	6.055e+000	2.079e+000	8.032e-001	5.200e+001	1.300e+002
54	8.322e+000	7.985e+000	2.347e+000	1.045e+000	5.300e+001	1.310e+002



SWEEP OFFSET (Hz): 0
SPECTRUM AMPLITUDE: 1.2
INTEGRAL AMPLITUDE: —
SPINNING RATE (RPS): 30

MANUAL
SWEEP TIME (SEC): 50 | 250 | 500 | 1000
SWEEP WIDTH (Hz): 75 | 50 | 100 | 250 | 500
FILTER: 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8
RF POWER LEVEL: 0.30

AUTO ☐
(250)
(500)
(2)
(.05)

SAMPLE: Solvent
SOLVENT: Uniol-d + 0.82%
DEC. LEVEL

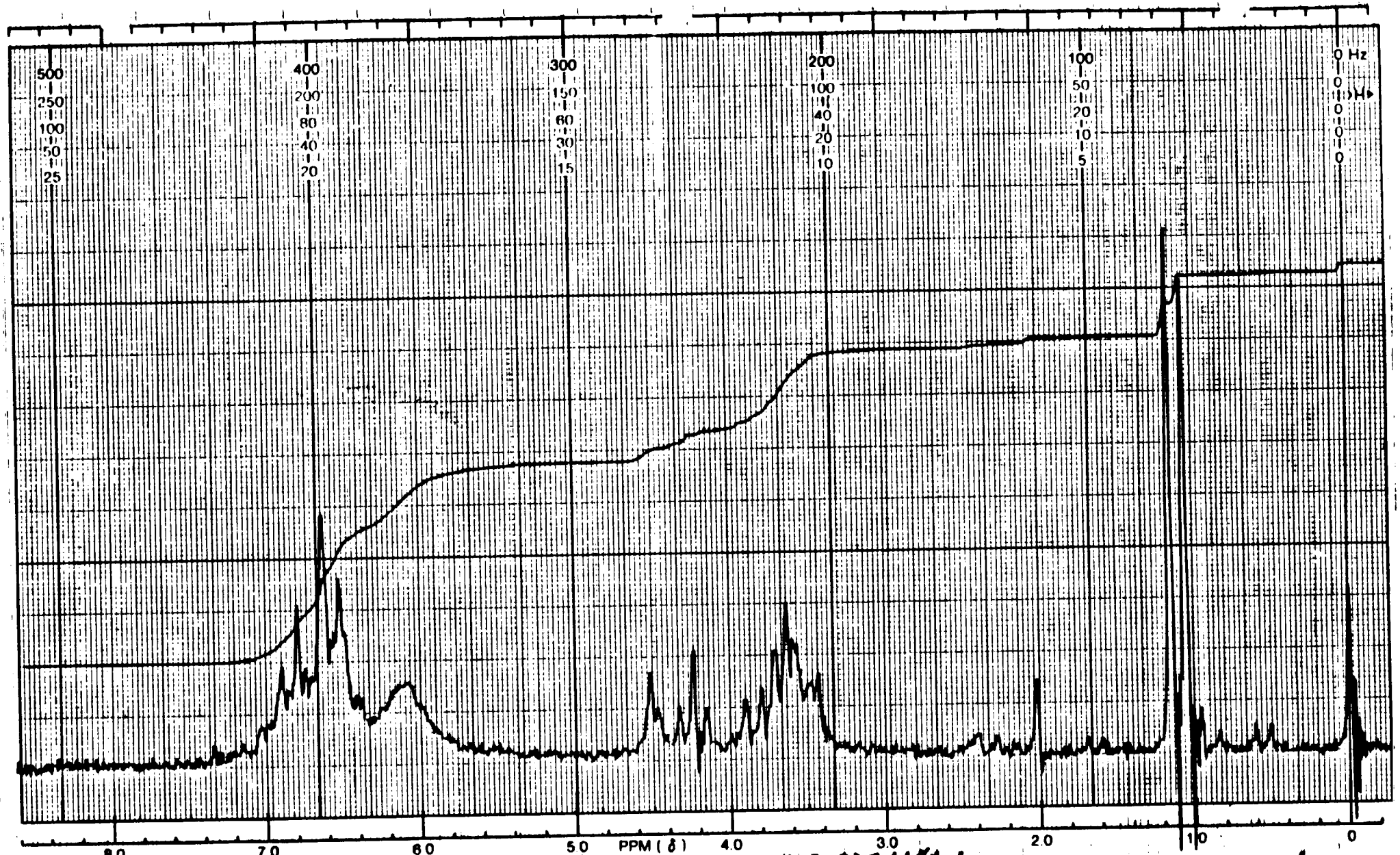
REMARKS:

ORIGINAL PAGE IS
OF POOR QUALITY

SOLVENT ONLY SCAN

DATE: 3-21-86
OPERATOR DEW
SPECTRUM NO. 1A of 7
solvent scan

NORELL, INC.
LANDISVILLE, N.J. 08326
T60 Phone: (609) 697-0020



SWEEP OFFSET (Hz): 0
SPECTRUM AMPLITUDE: 8.0
INTEGRAL AMPLITUDE: 5.0
SPINNING RATE (RPS): 30

MANUAL
SWEEP TIME (SEC): 30 250 500 1000
SWEEP WIDTH (Hz): 25 50 100 250 500
FILTER: 1 2 3 4 5 6 7 8
RF POWER LEVEL: 0.25

AUTO ☐
(250)
(500)
(2)
(.05)

SAMPLE: USP-39A Lot#4-1
SOLVENT: Unisol-d + 0.52 TMS
DEC. LEVEL

REMARKS: 0.106 gm sample
0.906 gm solvent

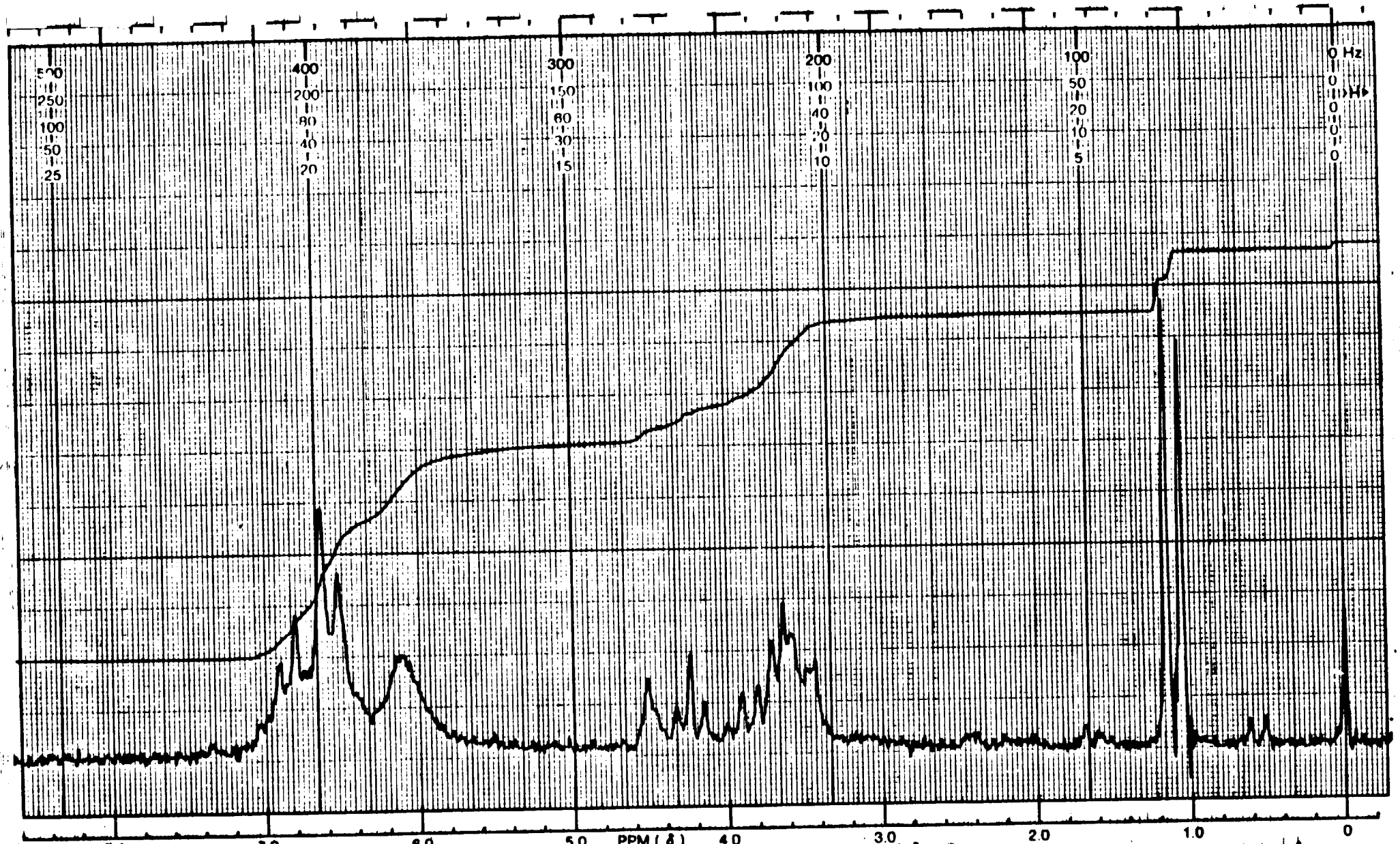
NORELL, INC.
LANDISVILLE, N.J. 08326
T60 Phone: (609) 697-0020

DATE: 3-21-86

OPERATOR DFW

SPECTRUM NO. 6 of 7 USP-39A Lot#4-1

CHART 15A



SWEEP OFFSET (Hz): 0
SPECTRUM AMPLITUDE: 8.0
INTEGRAL AMPLITUDE: 6.0
SPINNING RATE (RPS): 20

MANUAL
SWEEP TIME (SEC): 30 250 500 1000
SWEEP WIDTH (Hz): 25 50 100 250 500
FILTER: 1 2 3 4 5 6 7 8
RF POWER LEVEL: 0.25

AUTO ☐
(250)
(500)
(2)
(.05)

SAMPLE: USP-394 Lot 4-2
SOLVENT: Uniso/-d+0.52 TMS
DEC. LEVEL

REMARKS: 0.108gm sample
0.836 gm solvent

ORIGINAL PAGE IS
OF POOR QUALITY

DATE: 3-21-86
OPERATOR DGW
SPECTRUM NO. 7 of 7 USP-394 Lot # 4-2

CHART 15B

NORELL, INC.
LANDISVILLE, N.J. 08328
T60 Phone: (609) 697-0020

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U.S. Polymeric

FABRIC TESTING

NAS8-36298

U.S. POLYMERIC O.E. 71108

PWB-6 Fabric for NASA Lot# 4

1a. Breaking Strength, lbs/in, WARP
ASTM D1682

	#4-1	#4-2	#4-3
PICK	30	25	24
CENTER	30	28	28
PLAIN	33	21	23
AVG.	31.0	24.7	25.0

	#4-4	#4-5	#4-6	#4-7	#4-8	#4-9
PICK	25	22	24	43	39	16
CENTER	33	33	26	32	33	30
PLAIN	25	32	19	27	35	29
AVG.	27.7	29.0	23.0	34.0	35.7	25.0

	#4-10	#4-11	#4-12	#4-13	LOT4 AVG
PICK	30	20	27	5	25.4
CENTER	27	20	19	2	26.2
PLAIN	27	18	15	5	23.8
AVG.	28.0	19.3	20.3	4.0	25.1

1b. Breaking Strength, lbs/inch, FILL
ASTM D1682

	#4-1	#4-2	#4-3
PICK	25	31	25
CENTER	31	42	30
PLAIN	25	36	21
AVG.	27.0	36.3	25.3

	#4-4	#4-5	#4-6	#4-7	#4-8	#4-9
PICK	29	22	22	30	16	30
CENTER	37	23	20	35	38	39
PLAIN	38	22	22	17	23	31
AVG.	34.7	22.3	21.3	27.3	25.7	33.3

	#4-10	#4-11	#4-12	#4-13	LOT4 AVG
PICK	33	31	36	41	28.5
CENTER	37	38	54	42	35.8
PLAIN	33	30	48	31	29.0
AVG.	34.3	33.0	46.0	38.0	31.1

2a. Carbon Assay, %
MDQAI 5560

	#4-1	#4-2	#4-3
PICK	99.9	99.7	99.9
CENTER	99.9	99.9	99.7
PLAIN	99.9	99.8	99.9
AVG.	99.9	99.8	99.83

	#4-4	#4-5	#4-6	#4-7	#4-8	#4-9
PICK	99.9	99.9	99.9	99.9	99.9	99.9
CENTER	99.9	99.9	99.9	99.7	99.9	99.9
PLAIN	99.9	99.9	99.8	99.9	99.7	99.9
AVG.	99.9	99.9	99.87	99.83	99.83	99.9

HITCO MATERIALS DIVISION
700 E. DYER ROAD, SANTA ANA, CALIFORNIA 92707 • (714) 549-1101 • TWX (910) 595-1130 • FAX # (714) 549-2858-5-2407

PWB-6 Fabric for NASA Lot# 4

2a. Carbon Assay, % (CONTINUED)
MDQAI 5560

	#4-10	#4-11	#4-12	#4-13	LOT4 AVG
PICK	99.9	99.9	99.9	99.8	99.88
CENTER	99.7	99.9	99.9	99.8	99.85
PLAIN	99.7	99.9	99.9	99.9	99.85
AVG.	99.77	99.9	99.9	99.83	99.86

2b. Hydrogen Assay, %
MDQAI 5560

	#4-1	#4-2	#4-3
PICK	<.01	.01	.01
CENTER	.01	<.01	<.01
PLAIN	<.01	<.01	<.01
AVG.	EST .004	EST .004	EST .004

	#4-4	#4-5	#4-6	#4-7	#4-8	#4-9
PICK	<.01	<.01	<.01	<.01	<.01	.01
CENTER	.02	<.01	<.01	<.01	<.01	<.01
PLAIN	<.01	.01	.02	<.01	<.01	<.01
AVG.	EST .007	EST .004	EST .007	EST .001	EST .001	EST .004

	#4-10	#4-11	#4-12	#4-13	LOT4 AVG
PICK	<.01	.02	<.01	.02	EST .006
CENTER	<.01	.01	.01	.01	EST .005
PLAIN	<.01	<.01	.01	.02	EST .005
AVG.	EST .001	EST .010	EST .007	.017	EST .006

2c. Nitrogen Assay, %
MDQAI 5560

	#4-1	#4-2	#4-3
PICK	.1	<.1	.1
CENTER	.1	<.1	.2
PLAIN	.1	<.1	.1
AVG.	.1	EST .01	.13

	#4-4	#4-5	#4-6	#4-7	#4-8	#4-9
PICK	.1	.1	.1	.1	.1	.1
CENTER	.1	.1	.1	.1	.1	.1
PLAIN	.1	.1	.1	.1	.1	.1
AVG.	.1	.1	.1	.1	.1	.1

	#4-10	#4-11	#4-12	#4-13	LOT4 AVG
PICK	<.1	<.1	<.1	.1	EST .072
CENTER	<.1	.1	<.1	.2	EST .095
PLAIN	.2	<.1	.1	.1	EST .094
AVG.	EST .07	EST .04	EST .04	EST .13	EST .087

3. Visual Inspection
QCi-102

See Charts 3A-3M

4. Specific Gravity, Units
PTM-84

	#4-1	#4-2	#4-3
PICK	1.8240	1.7814	1.7112
CENTER	1.8127	1.8349	1.7918
PLAIN	1.8561	1.8030	1.7814
AVG.	1.831	1.806	1.761

PWB-6 Fabric for NASA Lot# 4

4. Specific Gravity, Units (CONTINUED)
PTM-84

	#4-4	#4-5	#4-6	#4-7	#4-8	#4-9
PICK	1.7418	1.8686	1.8152	1.8379	1.7634	1.7991
CENTER	1.8405	1.7740	1.8295	1.8717	1.8192	1.7744
PLAIN	1.7536	1.8538	1.8594	1.7937	1.7792	1.7942
AVG.	1.779	1.832	1.835	1.834	1.787	1.789

	#4-10	#4-11	#4-12	#4-13	LOT4 AVG
PICK	1.7142	1.8155	1.7845	1.8586	1.7935
CENTER	1.8348	1.7851	1.8187	1.8336	1.8170
PLAIN	1.8218	1.8251	1.8030	1.8286	1.8118
AVG.	1.790	1.809	1.802	1.840	1.807

5. pH, Units
CTM-24B

	#4-1	#4-2	#4-3
	7.6	7.5	8.0
	7.5	7.4	7.6
AVG.	7.55	7.45	7.8

	#4-4	#4-5	#4-6	#4-7	#4-8	#4-9
	8.0	7.9	7.8	7.8	7.9	7.6
	7.6	7.8	7.7	7.8	7.9	7.6
AVG.	7.8	7.85	7.75	7.8	7.9	7.6

	#4-10	#4-11	#4-12	#4-13	LOT4 AVG
	7.6	10.0	10.1	10.1	8.30
	7.6	10.0	10.1	10.0	8.20
AVG.	7.6	10.0	10.1	10.05	8.25

6. TGA, •C at 50% Weight Loss
CTM-51 (AIR)

SET UP# 1		SET UP# 2	
#4-1	876	#4-2	815
#4-3	886	#4-4	828
#4-5	878	#4-6	828
#4-7	856	#4-8	816
#4-9	876	#4-10	819
#4-11	845	#4-12	798
#4-13	874		
AVG.	870	AVG.	817

See Chart 6A-6M

7a. Atomic Absorption, ppm
CTM-53B

	#4-1	#4-2	#4-3
Na	3	5	2
K	2	2	2
Ca	69	80	64
Mg	1	1	1
Li	0	0	0
AVG.	75	88	69

	#4-4	#4-5	#4-6	#4-7	#4-8	#4-9
Na	4	6	4	2	4	2
K	3	3	2	2	2	2
Ca	55	61	88	92	105	80
Mg	0	1	0	0	1	1
Li	0	0	0	0	0	0
AVG.	62	71	94	96	112	85

PWB-6 Fabric for NASA Lot# 4

7a. Atomic Absorption, ppm (CONTINUED)
CTM-53B

	#4-10	#4-11	#4-12	#4-13	LOT4 AVG
Na	2	3	4	4	3.5
K	2	1	1	2	2.0
Ca	89	100	117	77	82.8
Mg	1	1	1	1	0.8
Li	0	0	0	0	0.0
AVG.	94	105	123	84	89.1

7b. Moisture Content, %
CTM-53B

#4-1	-.044	#4-8	-.025
#4-2	-.015	#4-9	.010
#4-3	-.015	#4-10	-.010
#4-4	-.029	#4-11	.010
#4-5	.015	#4-12	.015
#4-6	-.005	#4-13	-.005
#4-7	-.099		
	LOT# 4	AVERAGE	-.015

7c. Ash Content, %
CTM-53B

#4-1	.039	#4-8	.080
#4-2	.029	#4-9	.041
#4-3	.020	#4-10	.067
#4-4	.059	#4-11	.054
#4-5	.040	#4-12	.068
#4-6	.062	#4-13	.063
#4-7	.025		
	LOT# 4	AVERAGE	.050

8a. Filament diameter, microns, WARP
S.E.M. procedure
(diameters are an average of 10 measurements)

	#4-1	#4-2	#4-3
AVERAGE	8.75	9.59	9.47
Minimum	8.00	7.85	8.65
Maximum	9.65	12.05	10.45
Std. Dev	0.52	1.47	0.56

	#4-4	#4-5	#4-6	#4-7	#4-8	#4-9
AVERAGE	9.40	8.79	9.15	9.26	9.14	9.03
Minimum	8.50	7.45	8.00	7.50	8.40	8.45
Maximum	11.00	11.75	10.50	10.95	10.00	10.50
Std. Dev	0.89	1.24	0.87	1.06	0.58	0.65

	#4-10	#4-11	#4-12	#4-13	LOT4 AVG
AVERAGE	9.10	9.06	9.28	9.04	9.16
Minimum	7.15	8.00	8.60	8.05	7.15
Maximum	10.05	10.05	10.50	10.05	12.05
Std. Dev	0.86	0.64	0.53	0.67	0.85

8b. Filament diameter, microns, FILL
S.E.M. procedure
(diameters are an average of 10 measurements)

	#4-1
AVERAGE	9.10
Minimum	8.50
Maximum	10.30
Std. Dev	0.65

PWB-6 Fabric for NASA Lot# 4

9a. Thread Count, per inch, WARP
PTM-5A

	#4-1	#4-2	#4-3
	30	29	31
	29	28	28
	29	27	27
	29	27	28
	29	28	28
AVG.	29.2	27.8	28.4

	#4-4	#4-5	#4-6	#4-7	#4-8	#4-9
	28	30	28	28	28	29
	27	29	27	26	28	28
	27	29	27	28	27	28
	27	29	27	28	27	28
	28	30	28	28	29	28
AVG.	27.4	29.4	27.4	27.6	27.8	28.2

	#4-10	#4-11	#4-12	#4-13	LOT4 AVG
	28	28	28	30	28.8
	28	27	27	28	27.7
	28	27	27	28	27.6
	28	27	27	28	27.7
	28	28	28	29	28.4
AVG.	28.0	27.4	27.4	28.6	28.0

9b. Thread Count, per inch, FILL
PTM-5A

	#4-1	#4-2	#4-3
	29	27	29
	28	27	28
	28	28	28
	28	28	29
	28	28	29
AVG.	28.2	27.6	28.6

	#4-4	#4-5	#4-6	#4-7	#4-8	#4-9
	28	28	27	27	28	28
	28	28	27	27	28	28
	27	28	27	27	28	28
	28	28	27	27	28	28
	28	28	27	27	28	28
AVG.	27.8	28.0	27.0	27.0	28.0	28.0

	#4-10	#4-11	#4-12	#4-13	LOT4 AVG
	30	28	28	28	28.1
	28	28	27	29	27.8
	28	28	28	30	27.9
	28	28	28	30	28.1
	29	27	27	30	28.0
AVG.	28.6	27.8	27.6	29.4	28.0

10a. Areal Weight as received, gm/4x4
PTM-3A

	#4-1	#4-2	#4-3
LEFT	2.645	2.192	2.486
CENTER	2.519	2.160	2.396
RIGHT	2.561	2.229	2.458
AVG.	2.575	2.194	2.447

PWB-6 Fabric for NASA Lot# 4

10a. Areal Weight as received, gm/4x4
PTM-3A

	#4-4	#4-5	#4-6	#4-7	#4-8	#4-9
LEFT	2.424	2.477	2.299	2.296	2.399	2.319
CENTER	2.384	2.472	2.261	2.176	2.237	2.255
RIGHT	2.506	2.564	2.338	2.254	2.365	2.327
AVG.	2.438	2.504	2.299	2.242	2.334	2.300

	#4-10	#4-11	#4-12	#4-13	LOT4 AVG
LEFT	2.567	2.411	2.436	2.596	2.427
CENTER	2.433	2.376	2.385	2.531	2.353
RIGHT	2.533	2.430	2.421	2.604	2.430
AVG.	2.511	2.406	2.414	2.577	2.403

10b. Volatiles as received, %
PTM-3A

	#4-1	#4-2	#4-3
	.60	.82	.88
	.64	.74	.71
	.59	.81	.69
AVG.	.61	.79	.76

	#4-4	#4-5	#4-6	#4-7	#4-8	#4-9
	.83	.89	.96	.35	.50	.47
	.80	.69	.80	.37	.58	.53
	.72	.66	.73	.31	.38	.43
AVG.	.78	.75	.83	.34	.49	.48

	#4-10	#4-11	#4-12	#4-13	LOT4 AVG
	.55	.71	.78	.65	.69
	.49	.59	.67	.59	.63
	.59	.58	.58	.54	.58
AVG.	.54	.62	.68	.60	.64

10c. Weight change on Acetone wash, %
PTM-3A

	#4-1	#4-2	#4-3
LEFT	.00	.05	.04
CENTER	-.08	-.14	-.13
RIGHT	-.20	-.18	-.25
AVG.	-.09	-.09	-.11

	#4-4	#4-5	#4-6	#4-7	#4-8	#4-9
LEFT	-.08	-.04	-.13	.09	.13	.04
CENTER	-.13	-.24	-.31	-.05	.09	.04
RIGHT	-.28	-.35	-.43	-.27	.00	.04
AVG.	-.16	-.21	-.29	-.08	.07	.04

	#4-10	#4-11	#4-12	#4-13	LOT4 AVG
LEFT	.08	.08	.00	.00	.02
CENTER	-.04	.00	.00	.00	-.08
RIGHT	.12	.08	-.08	-.12	-.15
AVG.	.05	.06	-.03	-.04	-.07

U.S. Polymeric

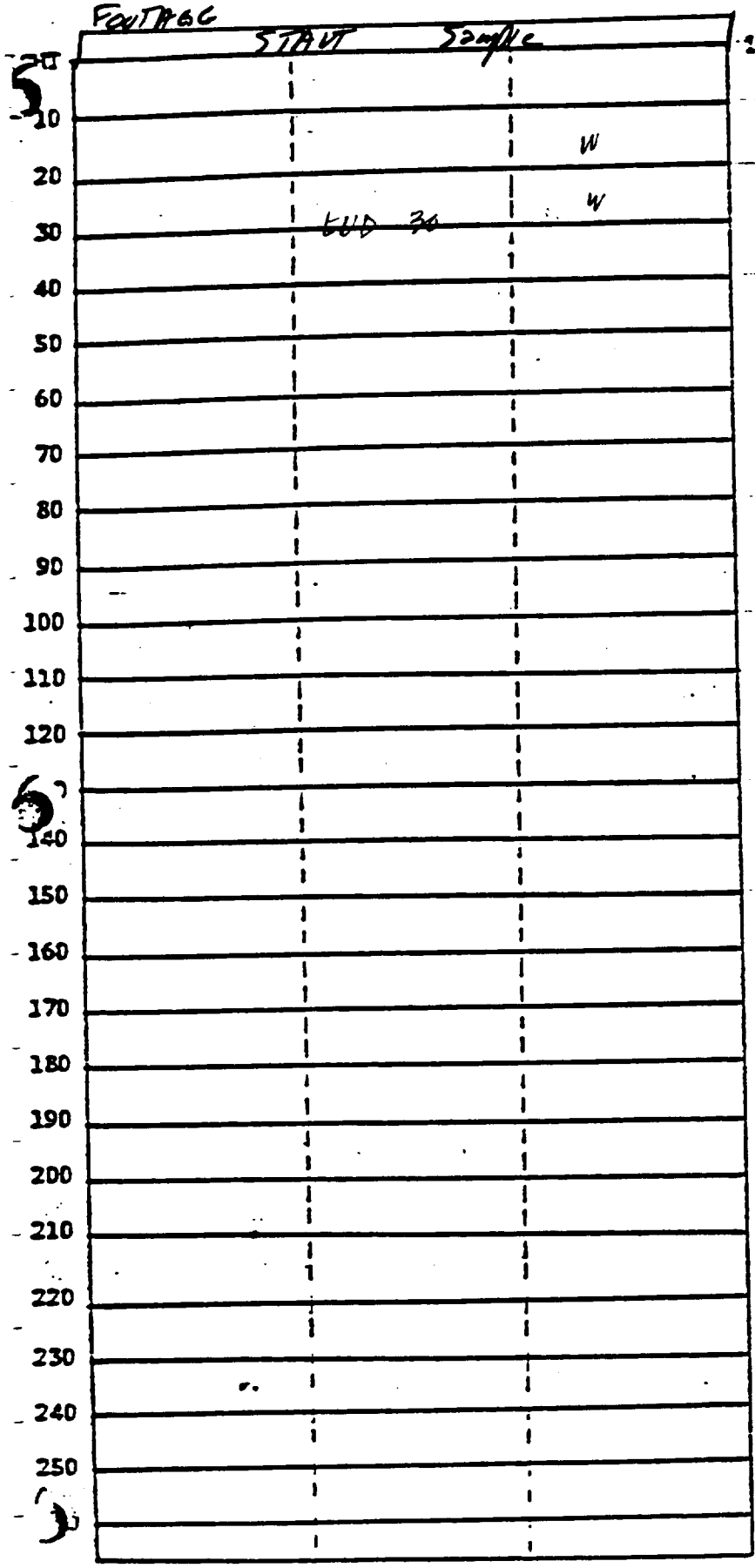
Hamid M. Quraishi, Manager
Quality Assurance Department

USP NO. CHART 3A

FOOTAGE

START Sample

15FT



DATE 6/6/86

FABRIC PWB-6

MFG. STACKPOLE Lot#1507-3

ROLL NO. 168810 A

YARDS 13.0

POUNDS 5.0

ORDER NO. 71108

SPECIFICATION STD MFG CRITS

Q.C. FILE # NASP 4-1

TREATER OPERATOR READ UP

SYMBOLS

- TEAR
- SPOTS OR STAINS
- FOLDS
- EDGE CURL
- TIGHT WEAVE OR SELVAGE
- WEAVE DISTORTION
- VISIBLE PUCKERS
- ONE PUCKER CREASING
- TWO OR MORE CREASINGS

REMARKS

GRADE Group A

GARCIA

USP NO.

DATE 6/6/86

FABRIC PWB-6

MFG. STOCKPOLE FIBERS CO. INC.

ROLL NO. 16/809A LOT 1507-3

YARDS 23.0

POUNDS 10.25

ORDER NO. 7108

SPECIFICATION STI MFG CATS.

Q.C. FILE # NASA #4-2

FOOTAGE

START — Sample 3 @ 5 @ 10 @

24 @ W

W

66 END

UASA 4-1

16-1809A

1 SFT

TREATER OPERATOR READ UP

SYMBOLS

- TEAR
- SPOTS OR STAINS
- FOLDS
- EDGE CURL
- TIGHT WEAVE OR SELVAGE
- WEAVE DISTORTION
- VISIBLE PUCKERS
- ONE PUCKER CREASING
- TWO OR MORE CREASINGS

REMARKS

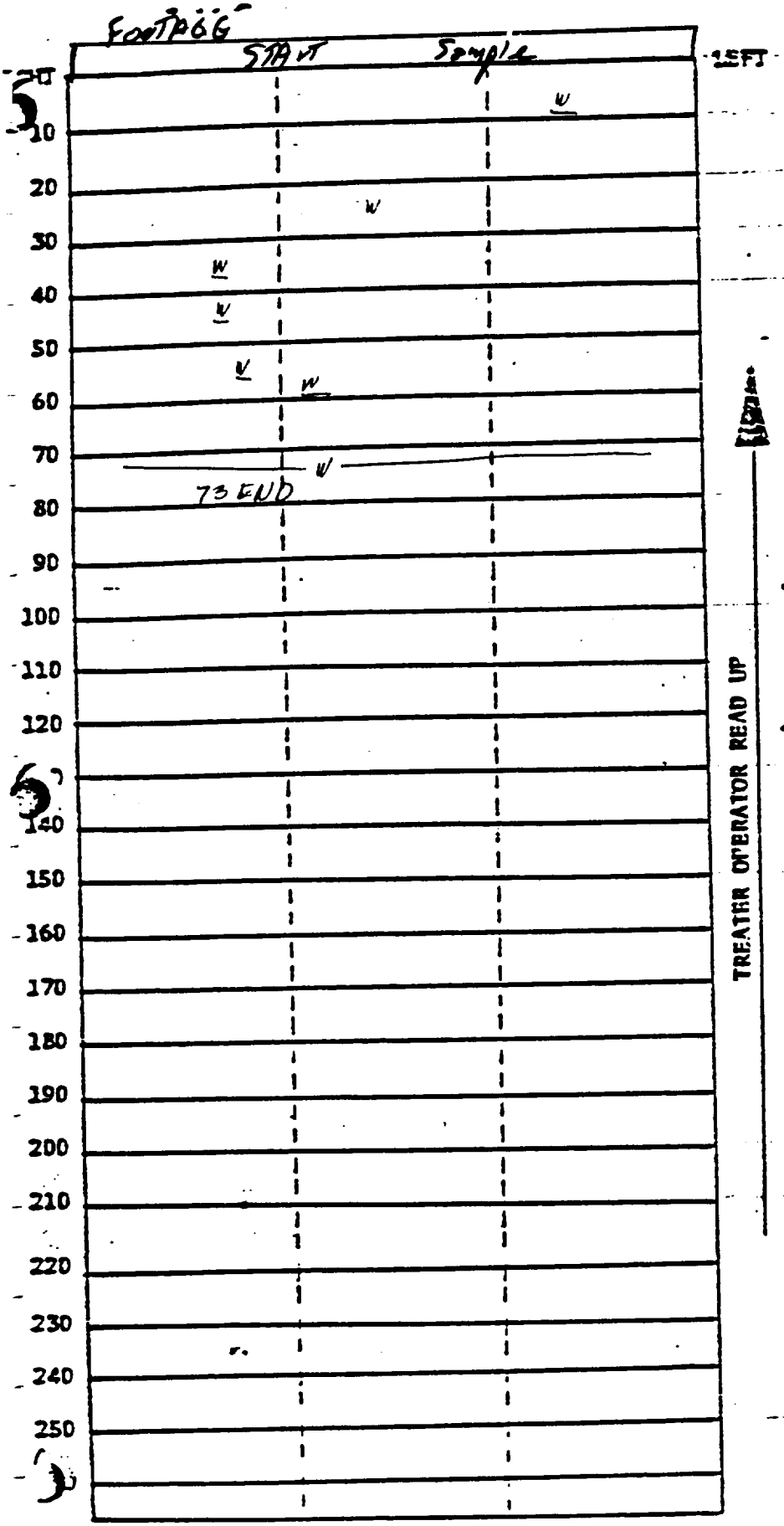
WEAVE DISTORTION ALL OVER THE ARE

GRADE Group C

GARCIA

QUALITY

USP NO. CHART 3C



DATE 6/6/86

FABRIC PWB-6

MFG. STACKPOLE fibers LOT 1507-3

ROLL NO. 161821A

YARDS 25.0

POUNDS 11.0

ORDER NO. 71108

SPECIFICATION Std mfg Cuts.

Q.C. FILE # NASA 4-3

SYMBOLS

- TEAR
- SPOTS OR STAINS
- FOLDS
- EDGE CURL
- TIGHT WEAVE OR SELVAGE
- WEAVE DISTORTION
- VISIBLE PUCKERS
- ONE PUCKER CREASING
- TWO OR MORE CREASINGS

REMARKS

DISTORTION ALL OVER THE MATERIAL

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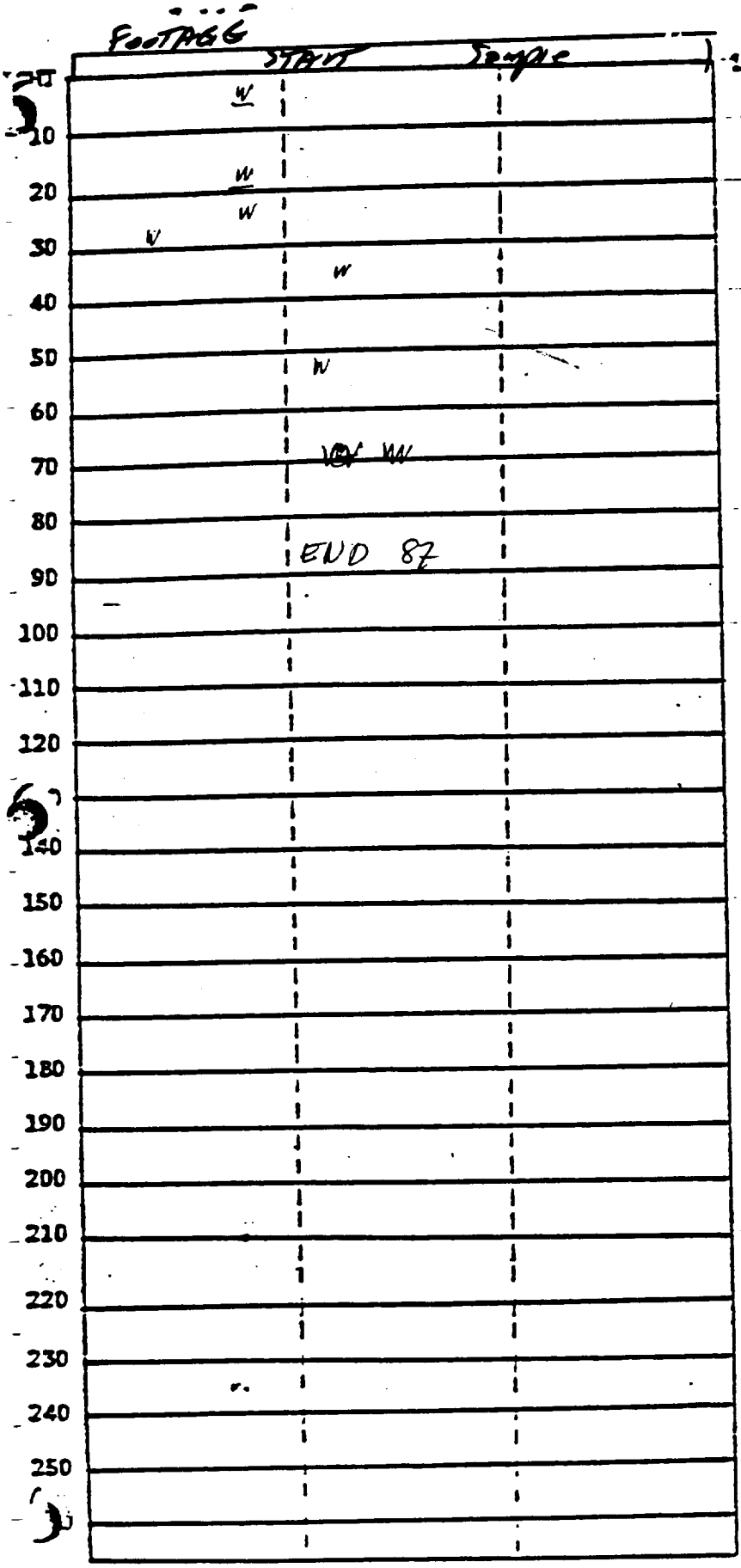
GRADE Group B

Operator

USP NO. ___ CHART 3D



DATE 6/6/86

FABRIC PWB 6

MFG. STACKPOLE Fibers Lot #1507-3

ROLL NO. 16-1844A

YARDS 3500

POUNDS 13.5

ORDER NO. 71108

SPECIFICATION STD MFG CNTS.

Q.C. FILE # NASA #4-4

SYMBOLS

- TEAR
- SPOTS OR STAINS
- FOLDS
- EDGE CURL
- TIGHT WEAVE OR SELVAGE
- WEAVE DISTORTION
- VISIBLE PUCKERS
- ONE PUCKER CREASING
- TWO OR MORE CREASINGS

REMARKS

BAG 2 1/2 FT

GRADE Group B

GARCIA

USP NO. CHART 3E

DATE 6/6/86

FABRIC PWB 6

MFG. STACKPOLE Fibers LOT# 1507-3

ROLL NO. 161872A

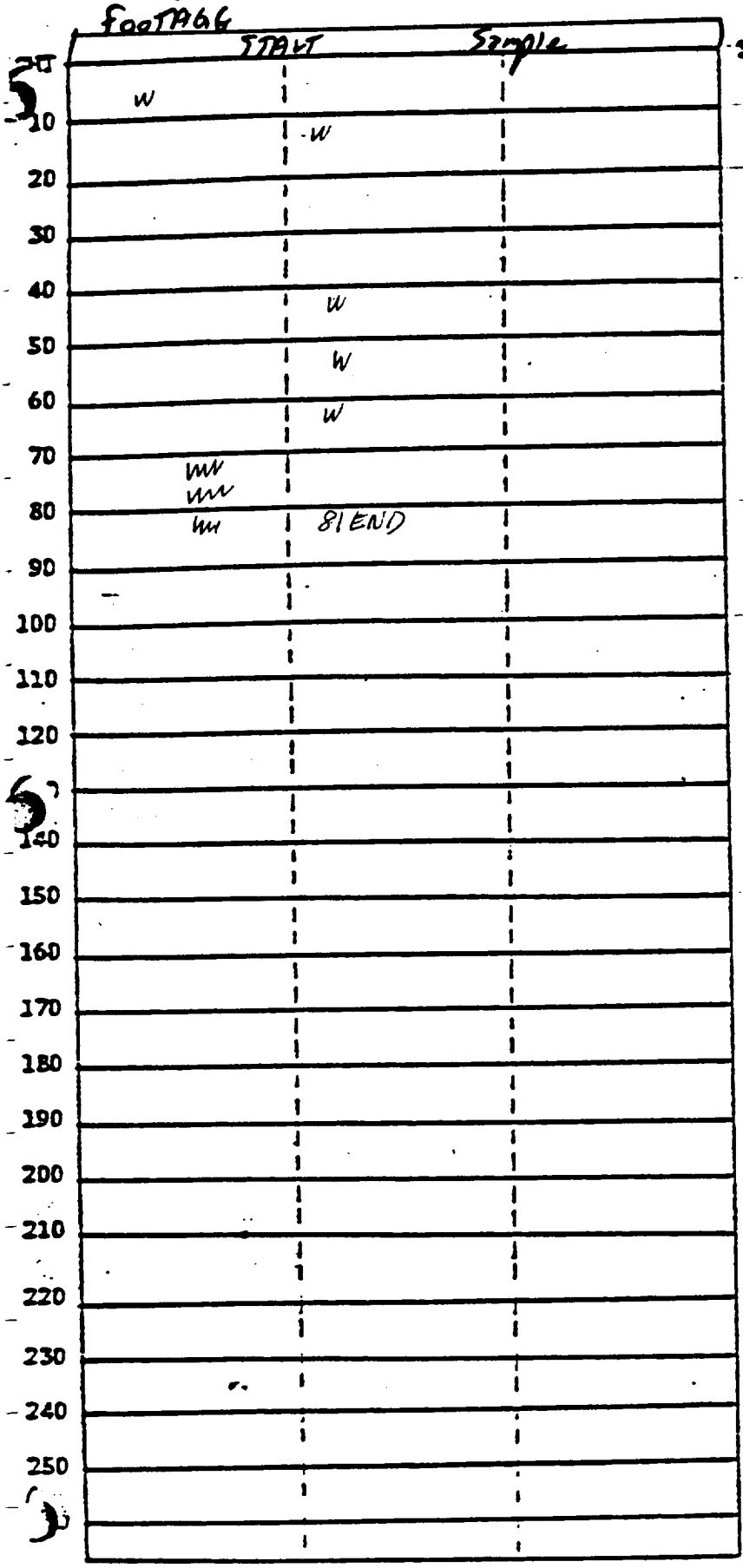
YARDS 27.0

POUNDS 12.75

ORDER NO. 71108

SPECIFICATION STD MFG CUTS.

Q.C. FILE # NASA #4-5



SYMBOLS

- TEAR
- SPOTS OR STAINS
- FOLDS
- EDGE CURL
- TIGHT WEAVE OR SELVAGE
- WEAVE DISTORTION
- VISIBLE PUCKERS
- ONE PUCKER CREASING
- TWO OR MORE CREASINGS

REMARKS

BAG 2½ RT

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GRADE Group B

GARCIA

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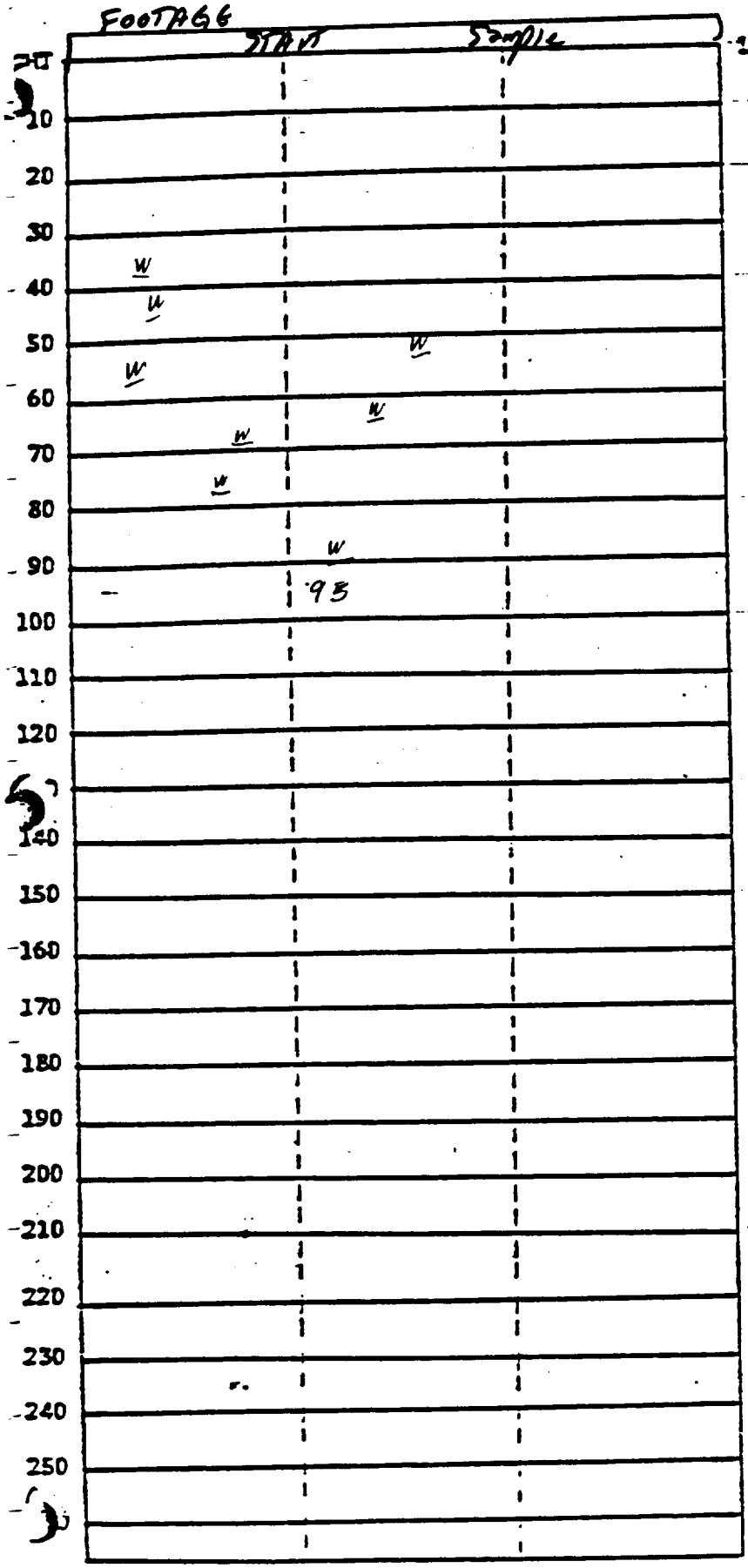
USP NO. CHART 3F



DATE 6/6/86

FABRIC PWB 6

MFG. STACIPPLE Fibers Lot* 1507-3

ROLL NO. 161823 A

YARDS 38.0

POUNDS 14.0

ORDER NO. 71108

SPECIFICATION STD MFG Certs

Q.C. FILE # NASA # 4-6

SYMBOLS

- TEAR
- SPOTS OR STAINS
- FOLDS
- EDGE CURL
- TIGHT WEAVE OR SELVAGE
- WEAVE DISTORTION
- VISIBLE PUCKERS
- ONE PUCKER CREASING
- TWO OR MORE CREASINGS

REMARKS

BAG 4" RT.

GRADE Group B

QA2C1A

USP NO. _____ CHART 3G

footage

START Sample

LEFT

TREATER OPERATOR READ UP

DATE 6/6/86

FABRIC PWBG

MFG. STACKPOLE Fibers Lot 1507-3

ROLL NO. 1618734

YARDS 33.0

POUNDS 14.0

ORDER NO. 71108

SPECIFICATION Std mfg Cat B.

Q.C. FILE # NASA 4-7

SYMBOLS

- TEAR
- SPOTS OR STAINS
- FOLDS
- EDGE CURL
- TIGHT WEAVE OR SELVAGE
- WEAVE DISTORTION
- VISIBLE PUCKERS
- ONE PUCKER CREASING
- TWO OR MORE CREASINGS

REMARKS

GRADE Group B

GARCIA

CHART 3H

USP NO.

DATE 6/6/86

FABRIC PW BG

MFG. STACKPOLE Fibers Lot #1501-3

ROLL NO. 161892

YARDS 45.0

POUNDS 19.0

ORDER NO. 71108

SPECIFICATION STD MFG CERTS.

Q.C. FILE # NASA #4-8

FOOTAGE

	START		Sample	LEFT
0		VVV VVV } 4		
10		VVV -1		
20		VVV VV VV } 3		
30				
40	V			
50				
60			W	
70				
80	W			
90	W			
100				
110				
120		128 END		
130				
140				
150				
160				
170				
180				
190				
200				
210				
220				
230				
240				
250				

TREATER OPERATOR READ UP

SYMBOLS

- VVV - TEAR
- ● ● - SPOTS OR STAINS
- △ △ - FOLDS
- S - EDGE CURL
- ǂ - TIGHT WEAVE OR SELVAGE
- W - WEAVE DISTORTION
- V - VISIBLE PUCKERS
- V̲ - ONE PUCKER CREASING
- V̳ - TWO OR MORE CREASINGS

REMARKS

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GRADE Group B

GARCIA

USP NO. CHART 31

DATE 6/6/84

FABRIC PWB6

MFG. STACKPOLE Fibas-Lot 1507-3

ROLL NO. 161901A

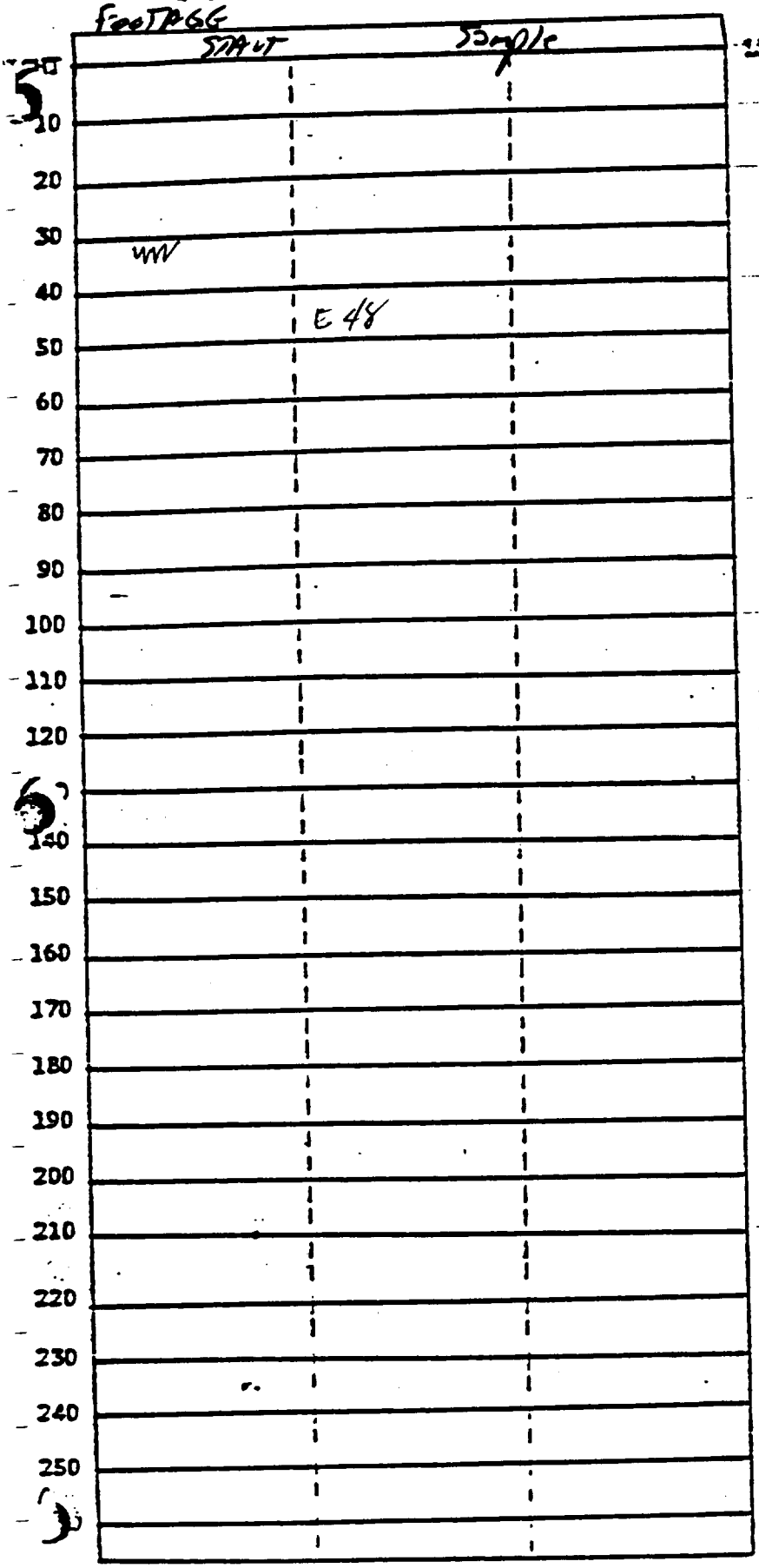
YARDS 18yds

POUNDS 7.5

ORDER NO. 71108

SPECIFICATION STD MFG CNTS

Q.C. FILE # NASA #4-9



SYMBOLS

- TEAR
- SPOTS OR STAINS
- FOLDS
- EDGE CURL
- TIGHT WEAVE OR SELVAGE
- WEAVE DISTORTION
- VISIBLE PUCKERS
- ONE PUCKER CREASING
- TWO OR MORE CREASINGS

REMARKS

GRADE Group A

ORIGINAL PAGE IS
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CHART 3J

USP NO.

DATE 6/6/86

FOOTAGE

START Sample

LEFT

10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250

TREATER OPERATOR READ UP

FABRIC PWP-6

MFG. STACKPOLE Fibers Lot 1507-3

ROLL NO. 161887A

YARDS 25 yds

POUNDS 11.0

ORDER NO. 71108

SPECIFICATION STD MFG CARD

Q.C. FILE # NASA* 4-10

SYMBOLS

- TEAR
- SPOTS OR STAINS
- FOLDS
- EDGE CURL
- TIGHT WEAVE OR SELVAGE
- WEAVE DISTORTION
- VISIBLE PUCKERS
- ONE PUCKER CREASING
- TWO OR MORE CREASINGS

REMARKS

BAG - 3 INCHES RT

GRADE Group B

GARCIA

ORIGINAL PAGE IS
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USP NO. CHART 3K

FOOTAGE

START Sample

LEFT

DATE 6/6/84

FABRIC PWB C -34"

MFG. STACKPOLE Fiber Lot 1513-1

ROLL NO. 161919

YARDS 38.0

POUNDS 17.0

ORDER NO. 71108

SPECIFICATION 5.2 MFG CATS.

Q.C. FILE # NASA U-11

20 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250

W W W Y W

107 END

TREATER OPERATOR READ UP

SYMBOLS

- TEAR
- SPOTS OR STAINS
- FOLDS
- EDGE CURL
- TIGHT WEAVE OR SELVAGE
- WEAVE DISTORTION
- VISIBLE PUCKERS
- ONE PUCKER CREASING
- TWO OR MORE CREASINGS

REMARKS

GRADE Grap B

GARCIA

USP NO. CHART 3L

DATE 6/6/86

FABRIC PMB6-34"

MFG. STACKPOLE Fibers Lot 1513-1

ROLL NO. 161931

YARDS 39

POUNDS 16.5

ORDER NO. 71108

SPECIFICATION STD MFG CONTS

Q.C. FILE # NASA #4-12

Footage

START Sample

All Clear

END 105

TREATER OPERATOR READ UP

SYMBOLS

- TEAR
- SPOTS OR STAINS
- FOLDS
- EDGE CURL
- TIGHT WEAVE OR SELVAGE
- WEAVE DISTORTION
- VISIBLE PUCKERS
- ONE PUCKER CREASING
- TWO OR MORE CREASINGS

REMARKS

GRADE Group A

GARCIA

USP NO. CHART 3M

DATE 6/6/86

FABRIC PWBG

MFG. STACKPOLE Fibers Lot 1513-1

ROLL NO. 161936

YARDS 39

POUNDS 16.75

ORDER NO. 71108

SPECIFICATION STD MFG CRITS.

Q.C. FILE # NASA 4-13

FOOTAGE

START Single

LEFT

10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250

W

W

W W

W

END 106

TREATER OPERATOR READ UP

SYMBOLS

- TEAR
- SPOTS OR STAINS
- FOLDS
- EDGE CURL
- TIGHT WEAVE OR SELVAGE
- WEAVE DISTORTION
- VISIBLE PUCKERS
- ONE PUCKER CREASING
- TWO OR MORE CREASINGS

REMARKS

BAG 3 INCHES RT.

GRADE Group B

GARCIA

CHART 6A

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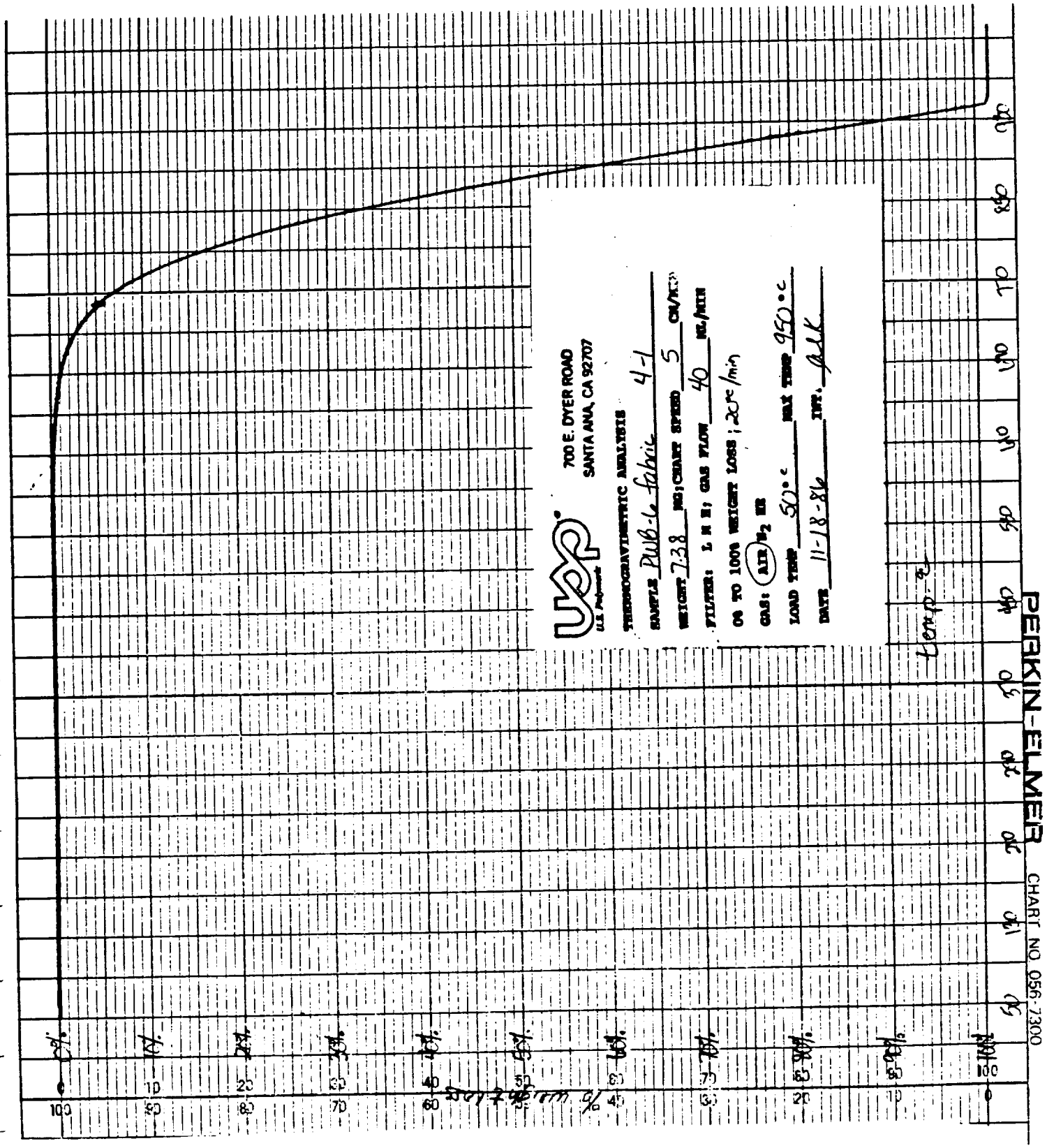

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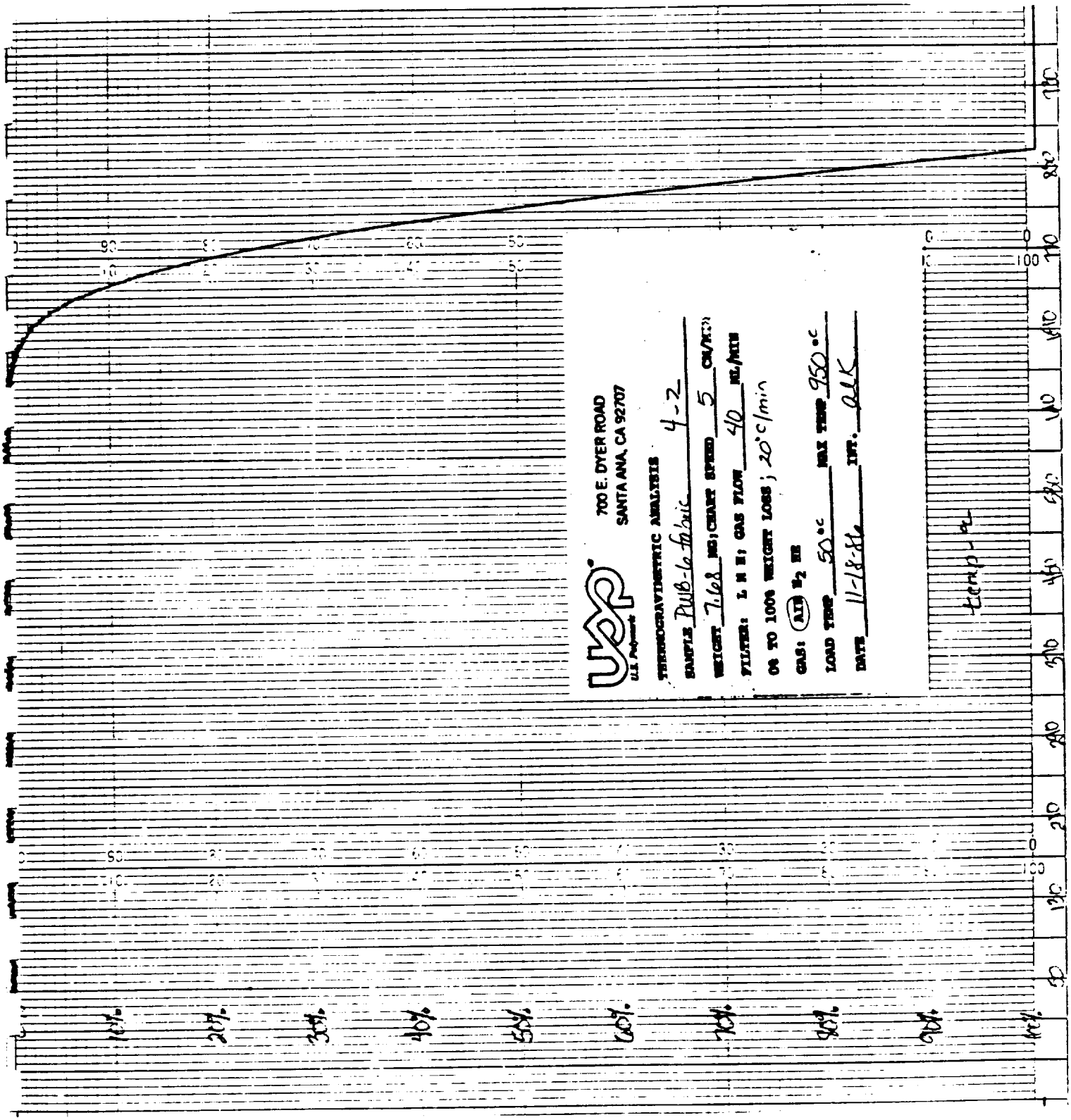

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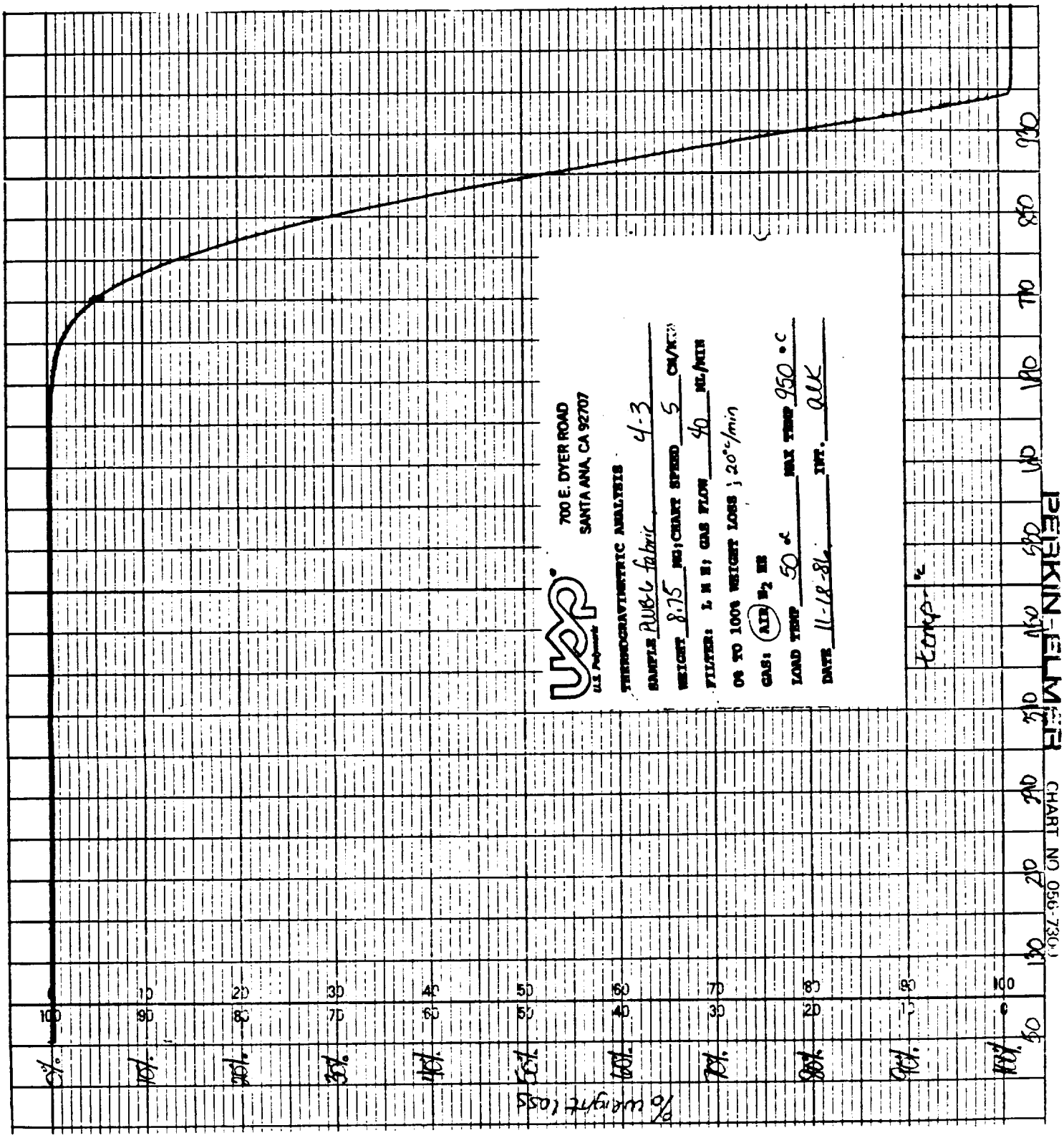

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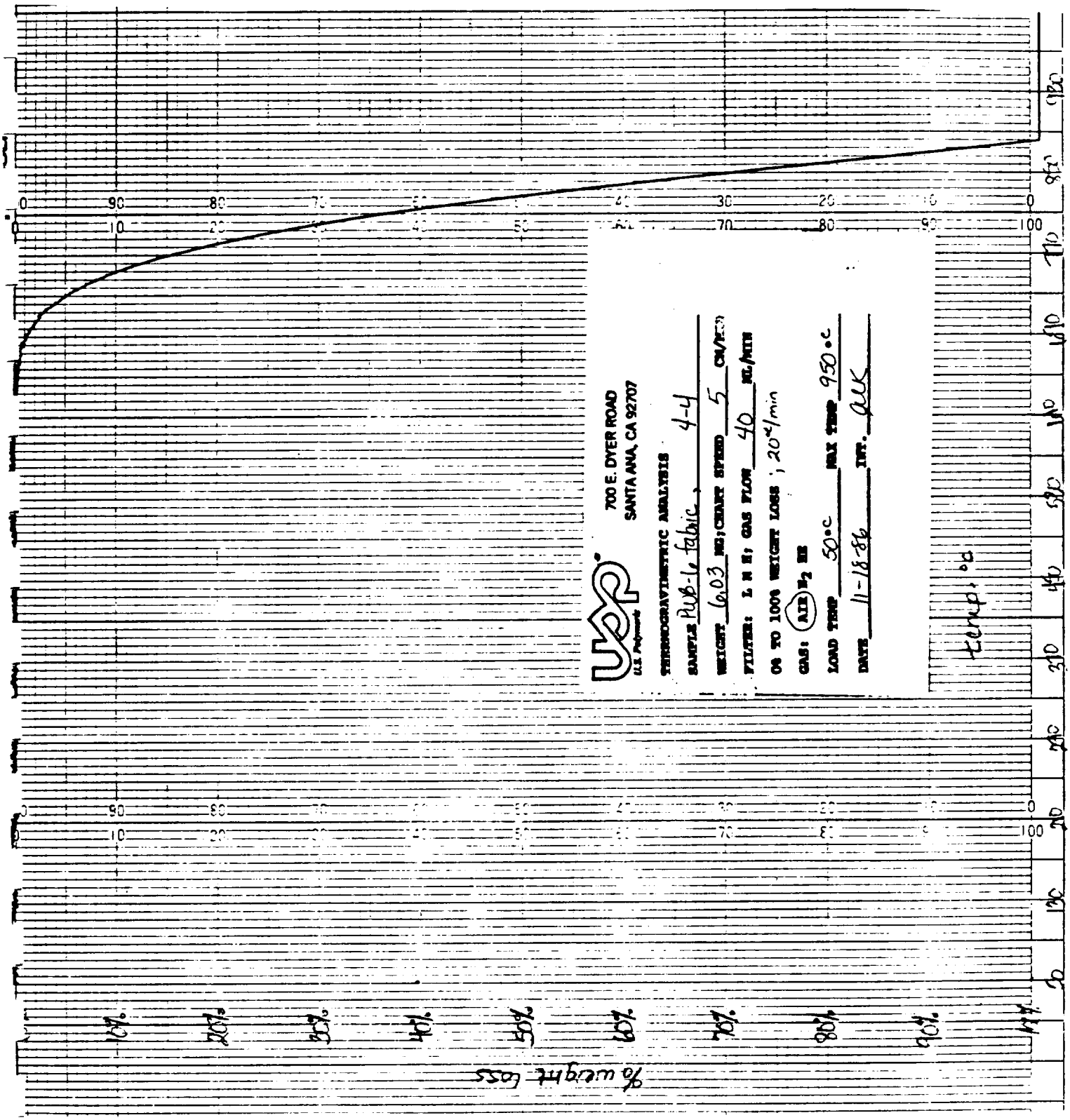

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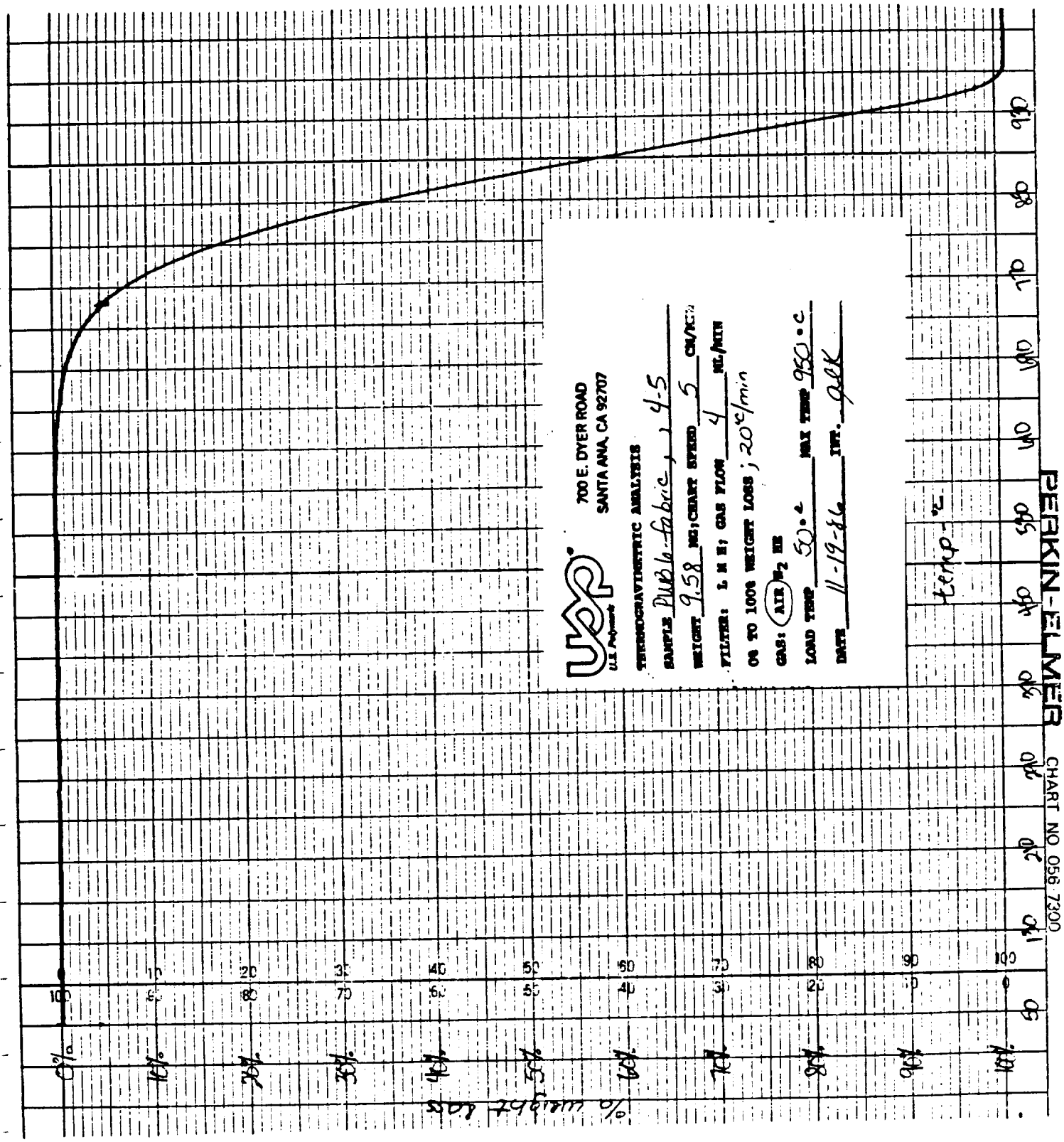

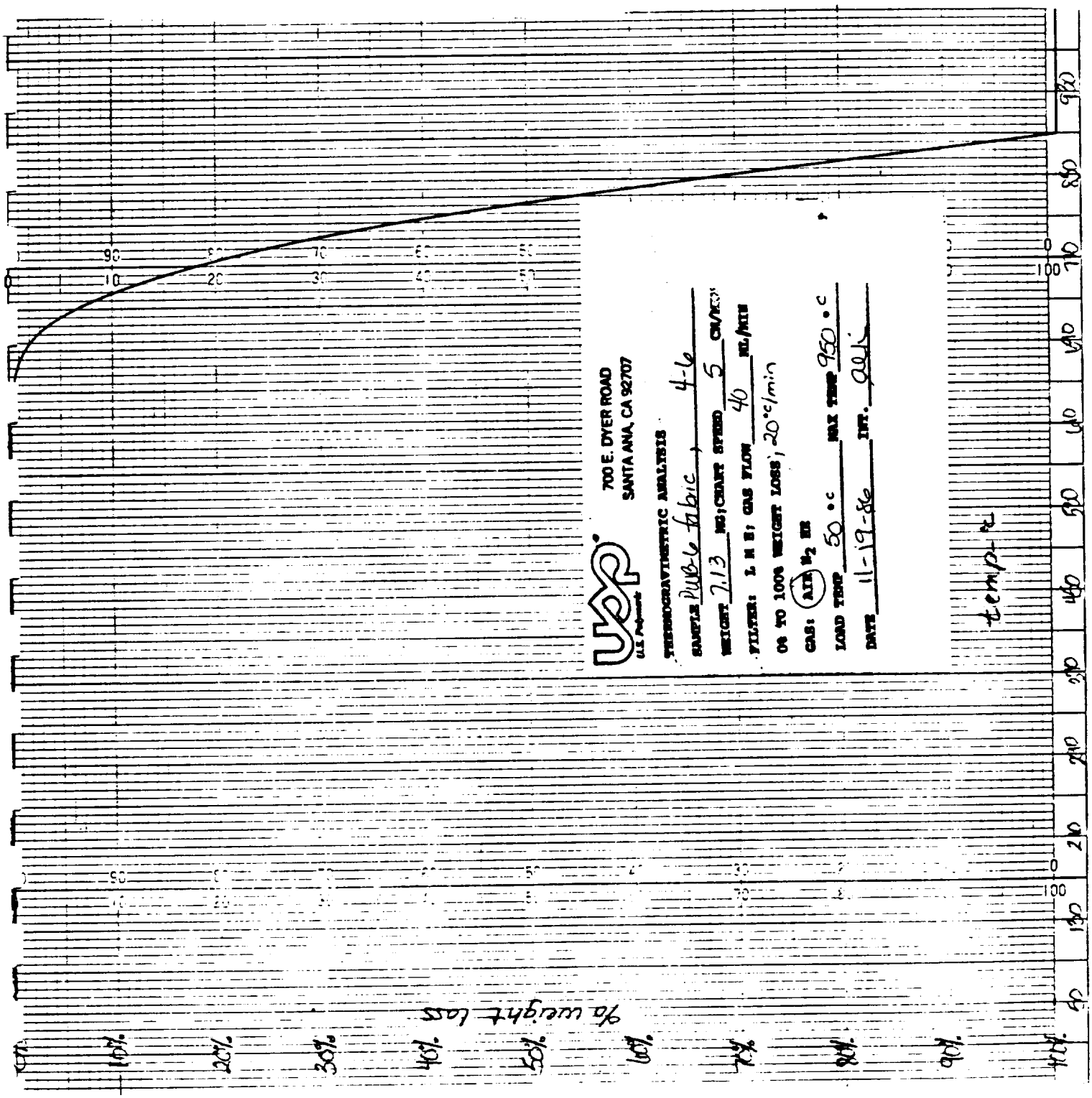

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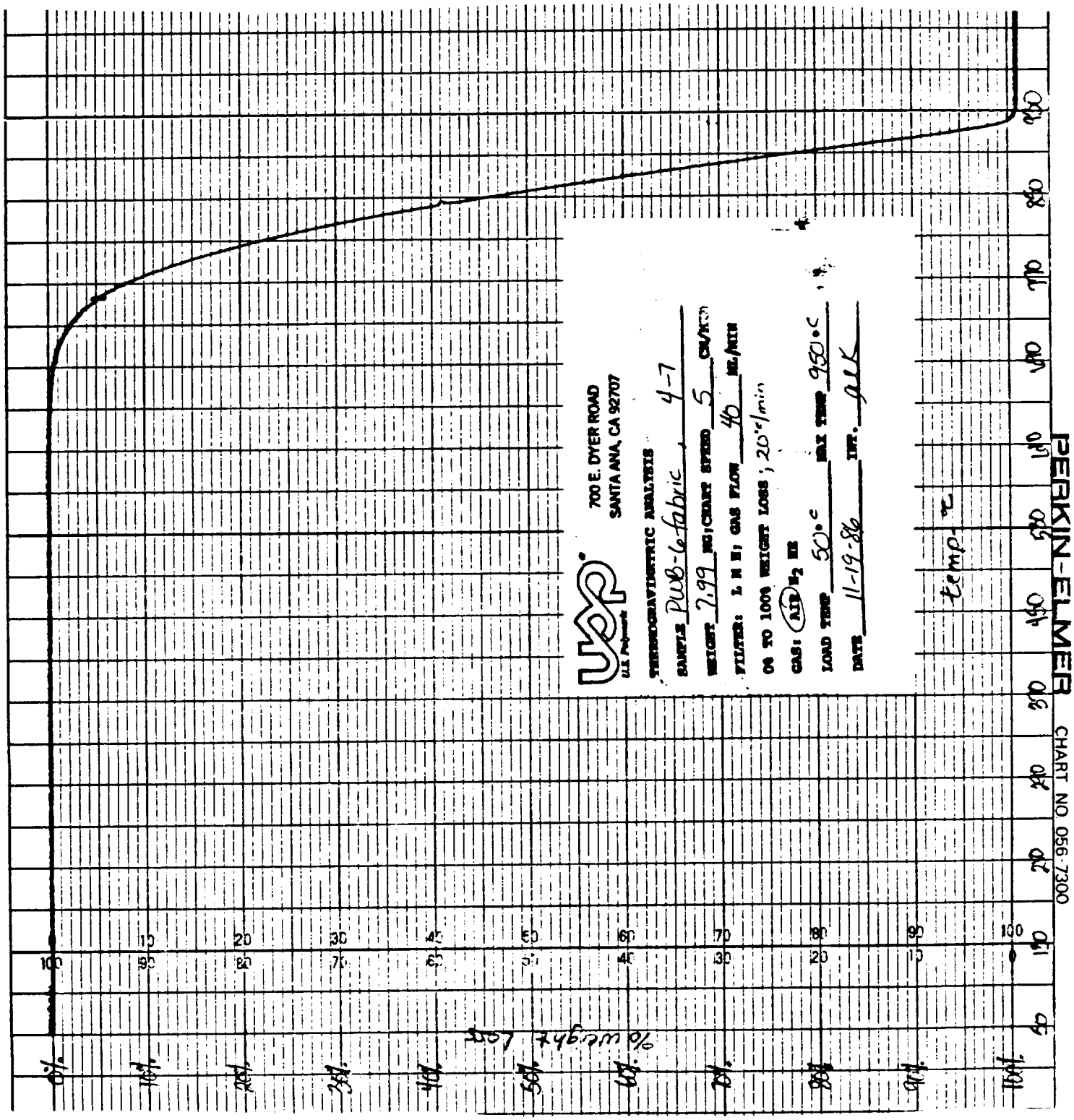

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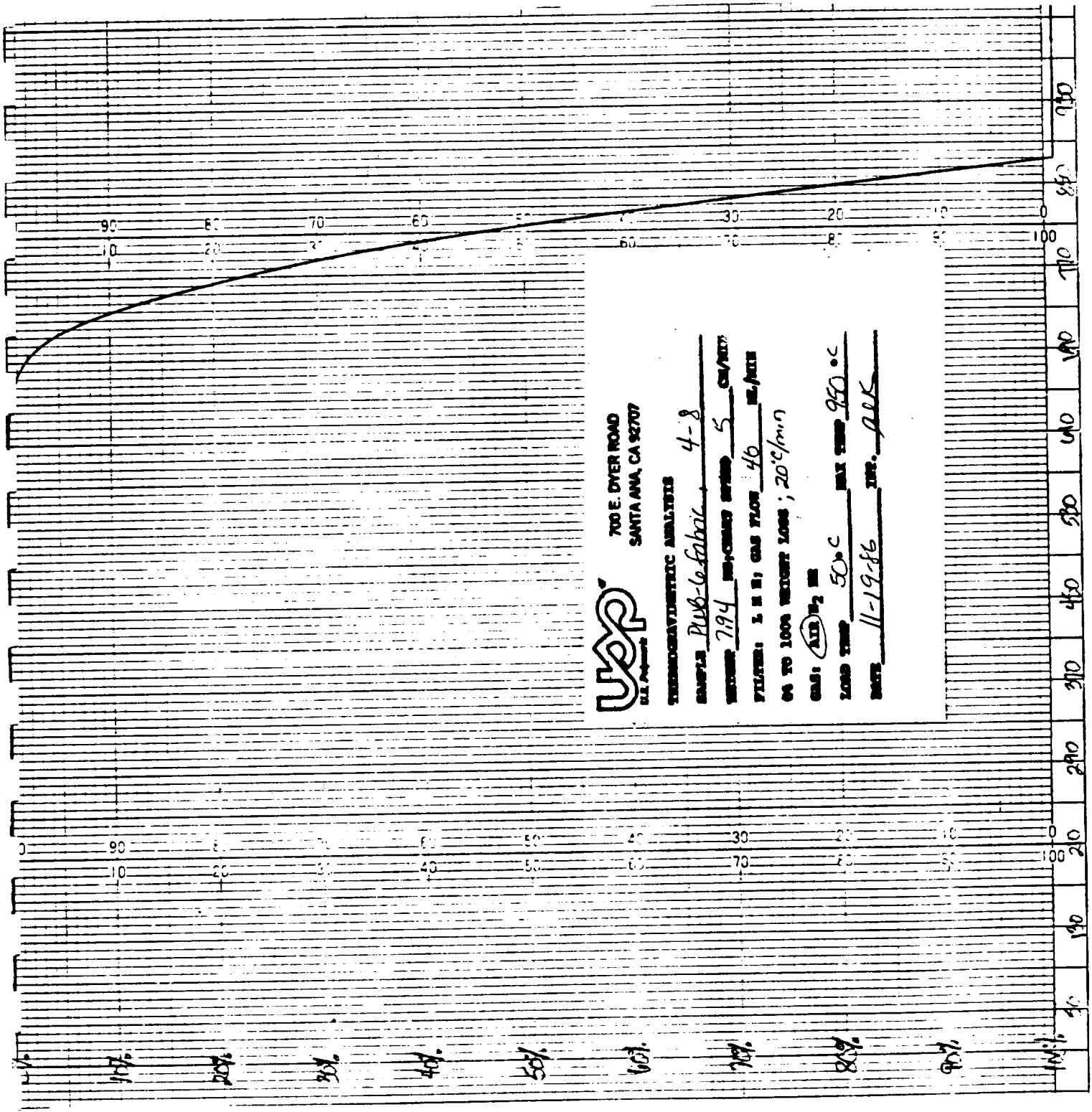

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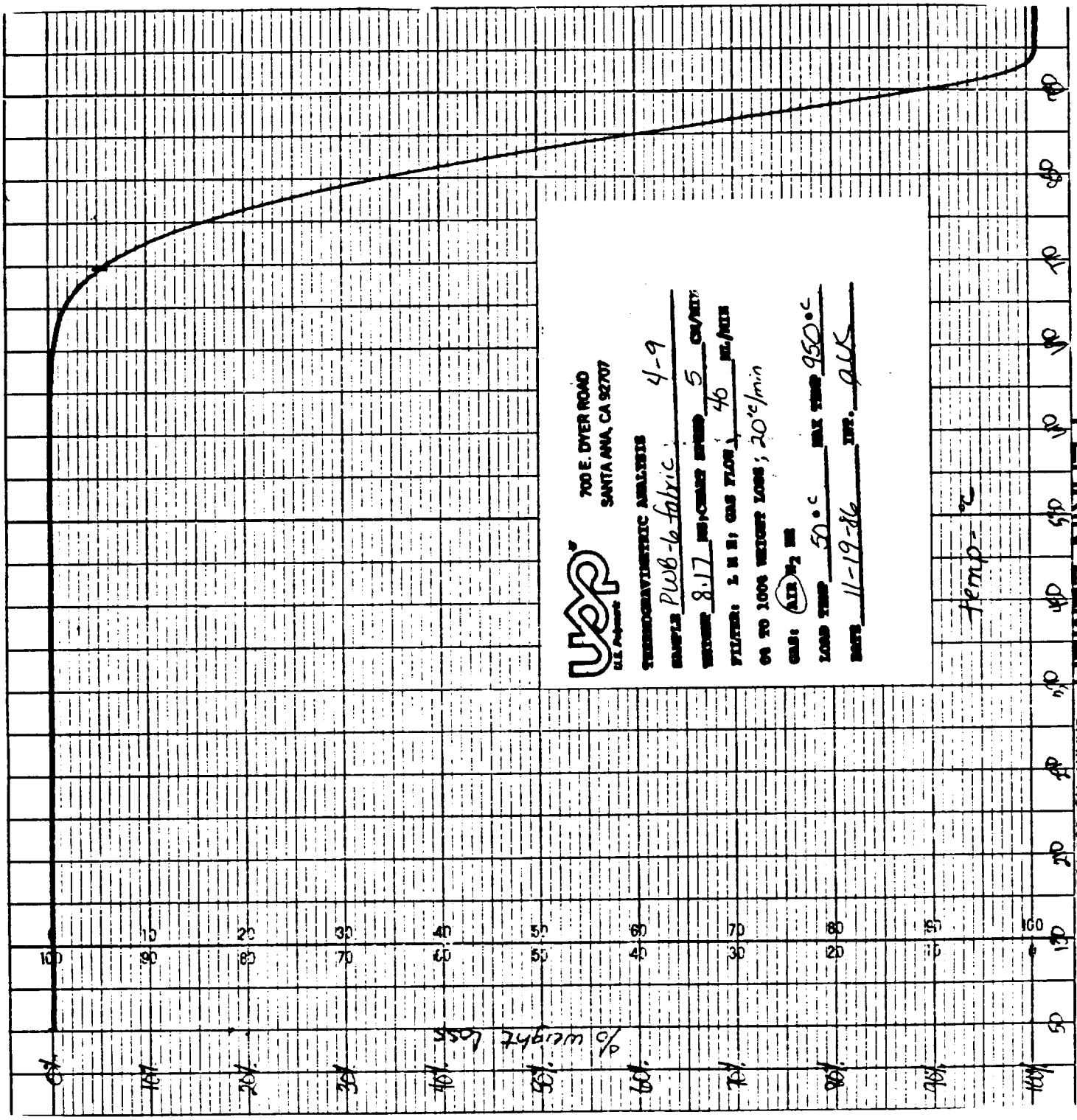

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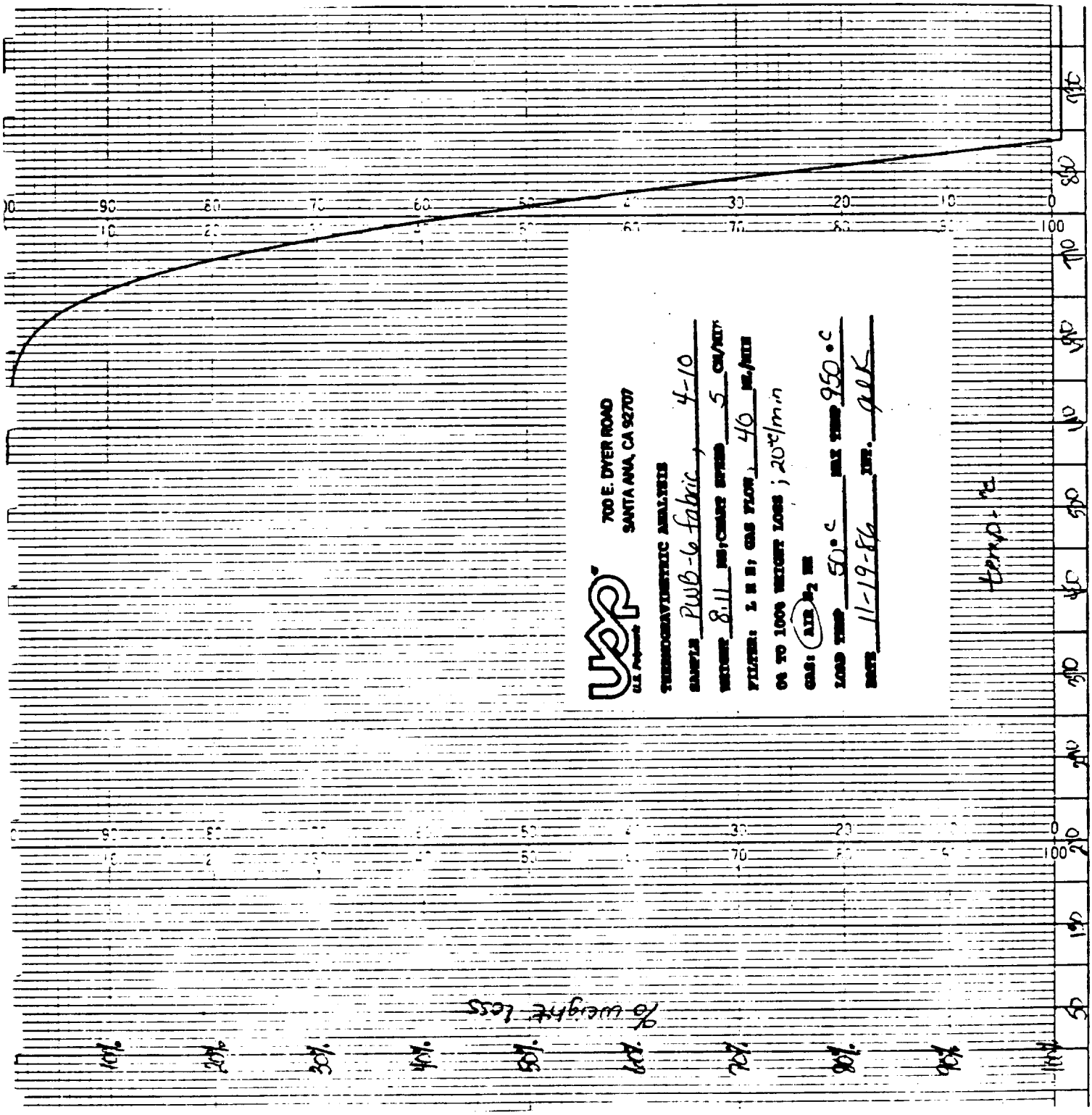

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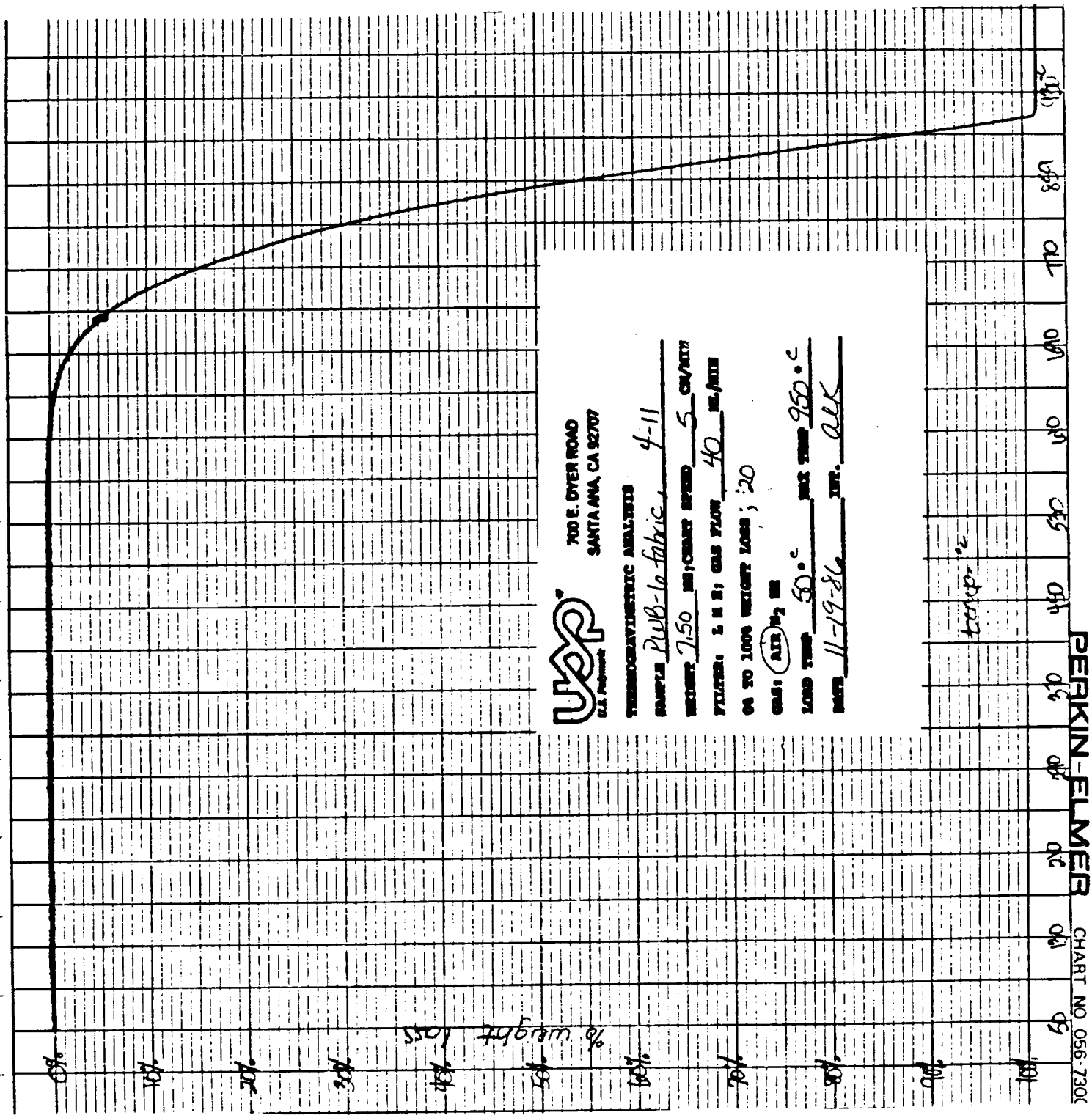

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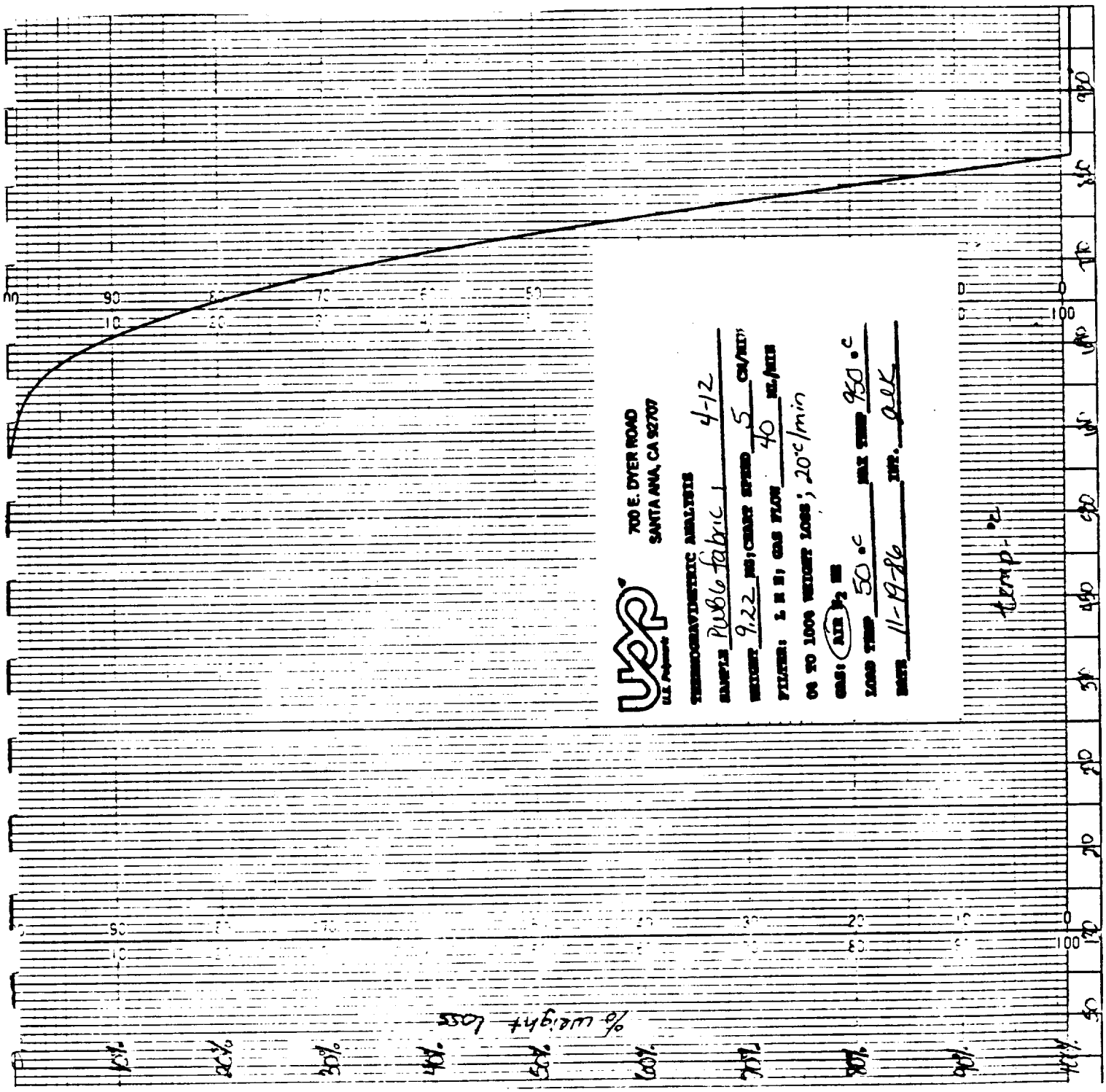

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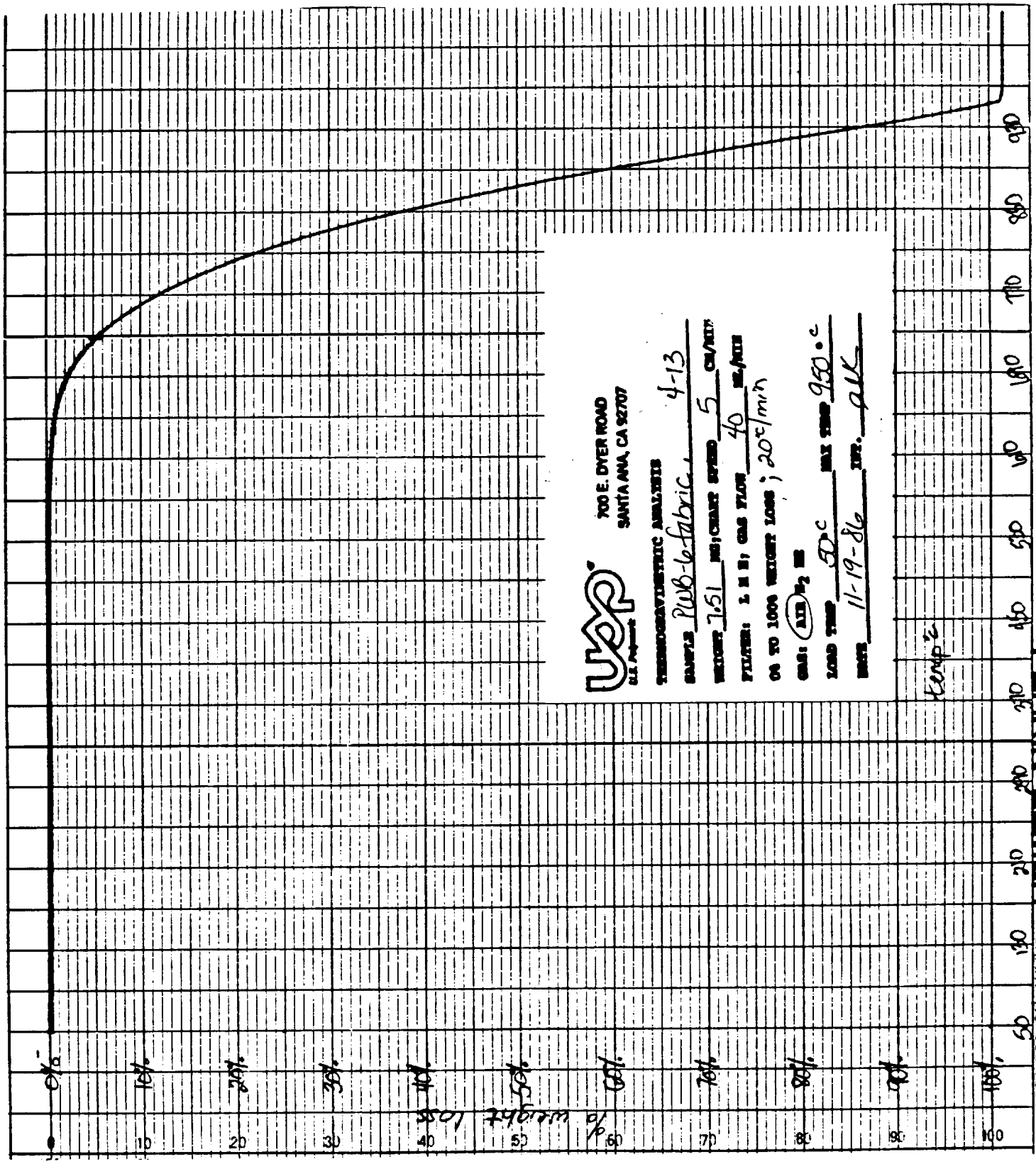

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NAS8-36298

U.S. Polymeric O.E. 71108

FM 5839 NASA LOT# 4 U.S.P. LOT# D09317

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20.	Acetone Extraction	6
21a.	CTE, with ply	6
21b.	CTE, crossply	6

CHARTS

TGA	8A - 8F
DSC	9A - 9F
Infrared (IRZB) Baseline	10A - 10F
CTE	21A - 21F

U.S. Polymeric

PREPREG TESTING

NAS8-36298

U.S. POLYMERIC O.E. 71108

FM 5839 NASA LOT# 4 U.S.P. LOT# D09317

1a. Resin Content, Soxhlet, %
CTM-6D

	ROLL#1 START	ROLL#2 START	ROLL#3 START	ROLL#4 START	ROLL#5 START	ROLL#6 START
	35.3	35.8	32.1	28.7	34.6	35.7
	34.9	36.3	34.9	28.6	34.6	36.8
	35.5	35.1	33.6	29.7	34.3	36.1
AVG.	35.2	35.7	33.5	29.0	34.5	36.2
				NASA LOT# 4	AVERAGE	34.0

1b. Filler Content, Soxhlet, %
CTM-6D

	15.0	15.2	13.6	12.2	14.7	15.2
	14.8	15.4	14.8	12.1	14.7	15.6
	15.1	14.9	14.2	12.6	14.6	15.3
AVG.	15.0	15.2	14.2	12.3	14.7	15.4
				NASA LOT# 4	AVERAGE	14.4

1c. Cloth Content, Soxhlet, %
CTM-6D

	49.7	49.0	54.3	59.1	50.7	49.1
	50.3	48.3	50.3	59.3	50.7	47.6
	49.4	50.0	52.2	57.7	51.1	48.6
AVG.	49.8	49.1	52.3	58.7	50.8	48.4
				NASA LOT# 4	AVERAGE	51.5

2. Volatile Content, %
PTM-17B

	2.4	2.6	2.4	2.3	2.5	2.7
	2.4	1.8	2.3	2.2	2.6	2.8
	2.3	2.9	2.4	2.3	2.7	2.6
AVG.	2.4	2.4	2.4	2.3	2.6	2.7
				NASA LOT# 4	AVERAGE	2.5

3. Flow, 1000 psi, %
PTM-19G

	11.0	17.7	11.5	9.7	19.2	17.3
	10.4	18.1	10.9	9.7	19.1	15.2
	11.7	17.7	10.7	9.0	18.0	15.9
AVG.	11.0	17.8	11.0	9.5	18.8	16.1
				NASA LOT# 4	AVERAGE	14.0

HITCO MATERIALS DIVISION
700 E. DYER ROAD, SANTA ANA, CALIFORNIA 92707 • (714) 549-1101 • TWX (910) 595-1130 • FAX # (714) 549-2858-5-2407

FM 5839 NASA LOT# 4 U.S.P. LOT# D09317

4. Resin Content, Dry Basis, %
PTM-16F, Type II

	ROLL#1 START	ROLL#2 START	ROLL#3 START	ROLL#4 START	ROLL#5 START	ROLL#6 START
	35.3	36.8	34.2	28.7	38.3	37.3
	36.3	38.2	34.5	29.9	38.5	36.8
	36.0	37.6	33.9	32.2	38.4	35.1
AVG.	35.9	37.5	34.2	30.3	38.4	36.4

NASA LOT# 4 AVERAGE 35.4

5. Tack, lbs
PTM-80

11	16	10	9	12	13

NASA LOT#4 AVERAGE 12

6. Gel Time, Seconds
PTM-20E

87	97	82	58	82	84

NASA LOT# 4 AVERAGE 82

7a. Atomic Absorption, ppm
CTM-53B

	ROLL#1 START	ROLL#2 START	ROLL#3 START	ROLL#4 START	ROLL#5 START	ROLL#6 START	LOT#4 AVG.
Na	31	36	29	29	30	33	31
K	2	4	2	2	3	2	3
Ca	17	14	22	21	19	25	20
Mg	1	3	1	1	1	1	1
Li	0	0	0	0	0	0	0
TOTAL	51	57	54	53	53	61	55

7b. Moisture Content, %
CTM-53B

ROLL#1 START	ROLL#2 START	ROLL#3 START	ROLL#4 START	ROLL#5 START	ROLL#6 START
1.95	2.33	2.03	4.48	2.13	2.61

NASA LOT# 4 AVERAGE 2.59

7c. Ash Content, %
CTM-53B

.01	.04	.03	.05	.08	.07

NASA LOT# 4 AVERAGE .04

FM 5839 NASA LOT# 4 U.S.P. LOT# D09317

8. TGA, % Weight Loss at 500°C
CTM-51 (Nitrogen)

ROLL#1 START	ROLL#2 START	ROLL#3 START	ROLL#4 START	ROLL#5 START	ROLL#6 START
9.4	11.9	8.9	9.0	8.6	10.0

NASA LOT# 4 AVERAGE 9.6

See Chart 8A-8F

9. DSC, °C
CTM-50A

			First Temperature		
184	184	184	185	185	185

NASA LOT# 4 AVERAGE 185

See Chart 9A-9F

10. Infrared (IRZB) Baseline
CTM-21C

.81	.80	.81	.80	.81	.79

NASA LOT# 4 AVERAGE .80

See Chart 10A-10F

11. Environmental History

Date manufactured: 2 July 1986
Packaged in: MIL-B-131 Class I bag supported in cardboard carton
Date shipped: 31 July 1986 in 40°F truck

12. Specific Gravity, Cured, Units
ASTM D 792

	1.566	1.564	1.573	1.587	1.567	1.556
	1.562	1.561	1.572	1.590	1.565	1.553
	1.564	1.560	1.572	1.592	1.563	1.550
AVG.	1.564	1.562	1.572	1.590	1.565	1.553

NASA LOT# 4 AVERAGE 1.568

13a. Tensile Strength, ksi, WARP
FTMS 406-1011

	23.25	20.88	17.81	17.99	18.67	19.43
	20.57	20.44	19.79	17.42	18.93	14.51
	19.43	19.92	20.10	18.38	19.53	15.62
	22.44	20.28	18.22	16.39	18.76	15.12
	20.01	21.12	17.18	16.25	18.39	14.15
AVG.	21.14	20.53	18.62	17.29	18.86	15.77

NASA LOT# 4 AVERAGE 18.70

FM 5839 NASA LOT# 4 U.S.P. LOT# D09317

13b. Tensile Modulus, msi, WARP
FTMS 406-1011

	ROLL#1 START	ROLL#2 START	ROLL#3 START	ROLL#4 START	ROLL#5 START	ROLL#6 START
	4.55	4.58	4.47	4.70	3.81	4.13
	4.11	4.12	4.53	4.60	4.13	3.52
	3.98	4.36	4.65	4.70	4.73	3.61
	4.15	4.01	4.86	4.28	4.43	3.31
	3.89	4.44	4.51	4.71	3.86	3.10
AVG.	4.14	4.30	4.60	4.60	4.19	3.53
				NASA LOT# 4	AVERAGE	4.23

13c. Tensile Elongation, %, WARP
FTMS 406-1011

	1.01	.76	.59	.61	.78	.58
	.85	.72	.67	.59	.80	.74
	1.21	.70	.63	.54	.66	.72
	.82	.86	.56	.62	.70	.90
	.95	.89	.69	.44	.77	.96
AVG.	.97	.79	.63	.56	.74	.78
				NASA LOT# 4	AVERAGE	.74

14a. Flexural Strength, Ksi, WARP
FTMS 406-1031

	35.05	35.98	33.01	34.28	38.61	32.22
	35.78	34.48	30.59	32.80	38.16	33.63
	35.51	33.37	32.49	30.91	37.83	30.29
	34.55	33.43	33.54	31.49	38.98	33.60
	34.47	33.26	32.90	29.87	35.13	32.00
AVG.	35.07	34.10	32.51	31.87	37.74	32.35
				NASA LOT# 4	AVERAGE	33.94

14b. Flexural Modulus, msi, WARP
FTMS 406-1031

	4.16	4.20	3.97	4.15	5.02	3.79
	3.93	4.05	4.24	3.93	5.78	4.47
	4.03	4.11	4.42	4.22	5.01	3.34
	4.23	4.01	4.07	4.27	5.35	3.66
	4.26	4.01	4.29	4.18	5.35	4.06
AVG.	4.12	4.08	4.20	4.15	5.30	3.86
				NASA LOT# 4	AVERAGE	4.29

FM 5839 NASA LOT# 4 U.S.P. LOT# D09317

15a. Compressive Strength, ksi, WARP
FTMS 406-1021

	ROLL#1 START	ROLL#2 START	ROLL#3 START	ROLL#4 START	ROLL#5 START	ROLL#6 START
	23.59	23.76	22.42	20.42	24.00	22.25
	24.49	17.32	22.46	19.24	24.59	23.25
	23.64	23.38	23.34	19.69	24.04	21.82
	24.35	23.21	22.13	19.72	24.36	21.69
	23.51	22.82	23.56	19.26	24.16	21.93
AVG.	23.91	22.10	22.78	19.67	24.23	22.19
				NASA LOT# 4 AVERAGE		22.48

15b. Compressive Modulus, msi, WARP
FTMS 406-1021

	4.77	4.44	4.65	5.18	4.30	4.34
	4.77	4.42	3.98	5.15	4.08	4.09
	4.62	4.70	4.61	5.02	4.57	4.42
	4.75	4.02	4.44	5.00	4.33	4.74
	4.56	4.33	4.23	4.86	4.67	4.50
AVG.	4.69	4.38	4.38	5.04	4.39	4.42
				NASA LOT# 4 AVERAGE		4.55

16. Double Shear Strength, ksi
FTMS 406-1041A

	3.57	3.50	3.24	3.15	3.55	4.01
	3.50	3.77	3.02	3.28	3.71	3.99
	3.37	3.65	3.31	2.78	3.34	3.71
	3.59	3.83	2.76	3.05	3.30	4.25
	3.57	3.42	2.94	2.90	3.36	3.69
AVG.	3.52	3.63	3.05	3.03	3.45	3.93
				NASA LOT# 4 AVERAGE		3.44

17. Barcol Hardness, Units
ASTM D-2583
(Average of 10 determinations)

	70.5	70.7	70.5	69.3	70.7	70.2
				NASA LOT# 4 AVERAGE		70.3

18. Residual Volatiles, %
PTM-98

	1.82	1.92	1.95	1.86	1.80	1.91
	1.83	1.92	1.92	1.81	1.77	1.83
	1.82	1.95	1.88	1.82	1.75	1.87
AVG.	1.82	1.93	1.92	1.83	1.77	1.87
				NASA LOT# 4 AVERAGE		1.86

FM 5839 NASA LOT# 4 U.S.P. LOT# D09317

19. Resin Content, Pyrolysis, %
CTM-14B

	ROLL#1 START	ROLL#2 START	ROLL#3 START	ROLL#4 START	ROLL#5 START	ROLL#6 START
	31.66	33.97	31.13	30.48	33.20	34.03
	32.87	34.45	30.37	30.26	32.99	32.70
	29.83	33.94	30.28	30.80	32.54	32.95
AVG.	31.46	34.12	30.59	30.51	32.91	33.23
				NASA LOT# 4	AVERAGE	32.14

20. Acetone Extraction, %
CTM-18A

	7.32	5.23	4.95	5.26	5.24	6.13
	7.74	5.69	4.98	5.05	5.20	4.61
	5.36	4.75	5.18	6.35	5.09	6.84
AVG.	6.81	5.22	5.04	5.55	5.18	5.86
				NASA LOT# 4	AVERAGE	5.61

21a. CTE, in/in °F, with PLY
PTM-61B

	-1.18	-2.40	-1.44	-1.34	.67	-1.14
	.00	.00	.54	-1.35	-.86	.00
AVG.	- .59	-1.20	- .45	-1.35	-.09	- .57
				NASA LOT# 4	AVERAGE	-.71

21b CTE, in/in °F, Cross PLY
PTM-61B

	7.79	6.57	5.99	3.85	3.24	2.72
	5.60	8.01	4.63	6.41	3.12	3.92
AVG.	6.70	7.29	5.13	5.31	3.18	3.32
				NASA LOT# 4	AVERAGE	5.15

See Chart 21A-21F

U.S. Polymeric

Hamid M. Quraishi, Manager
Quality Assurance Department

CHART 8A

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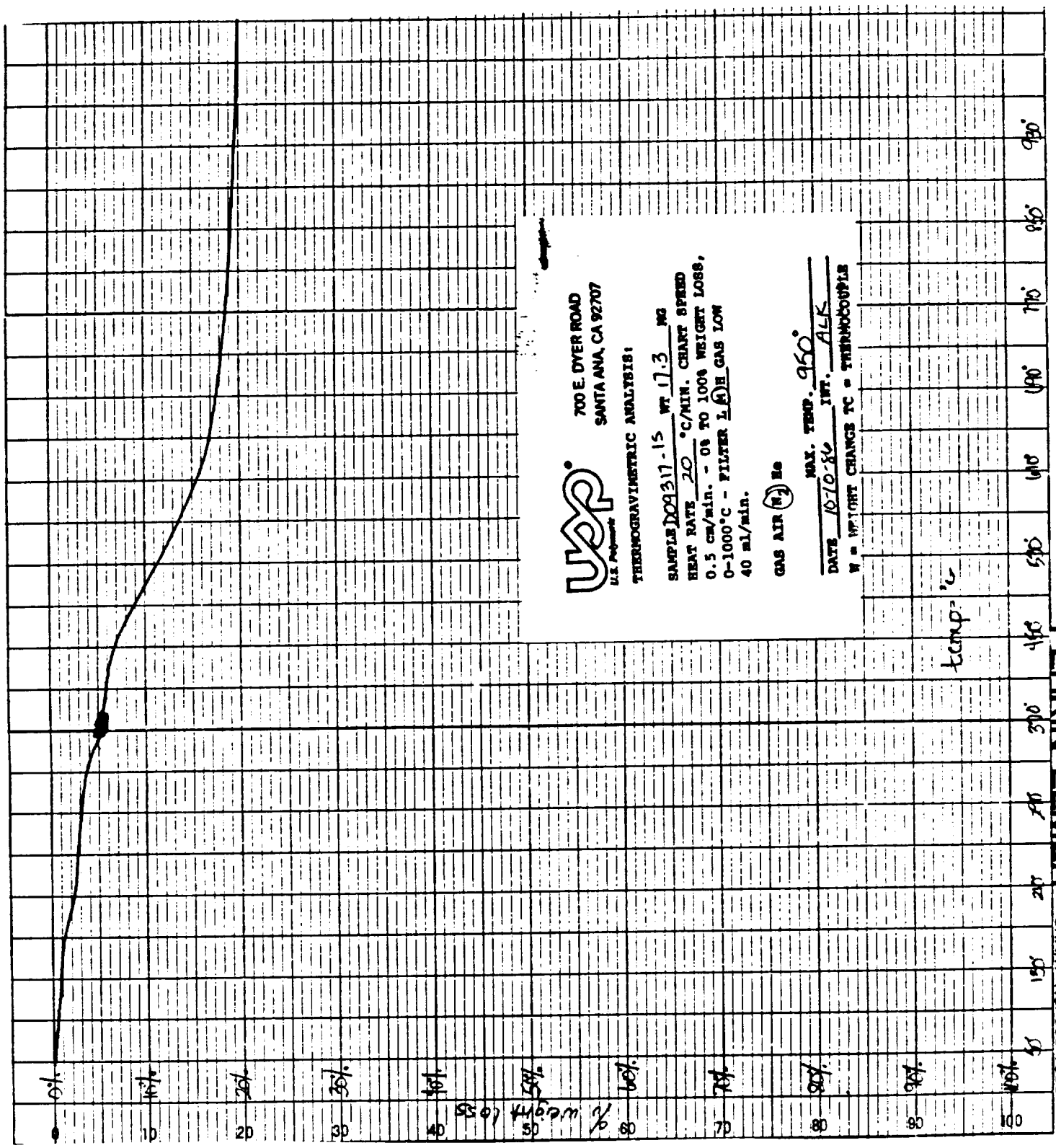

CHART 8B

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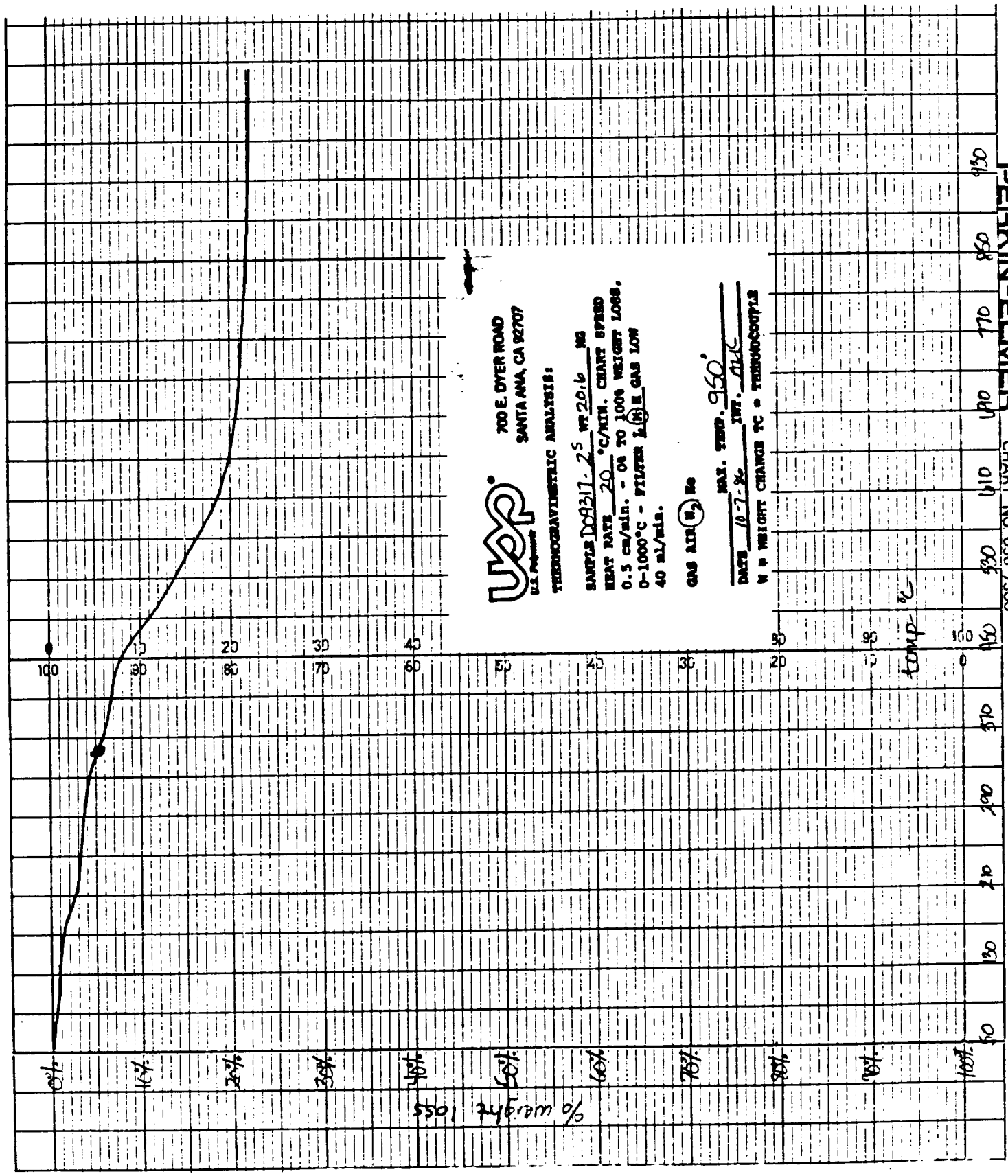

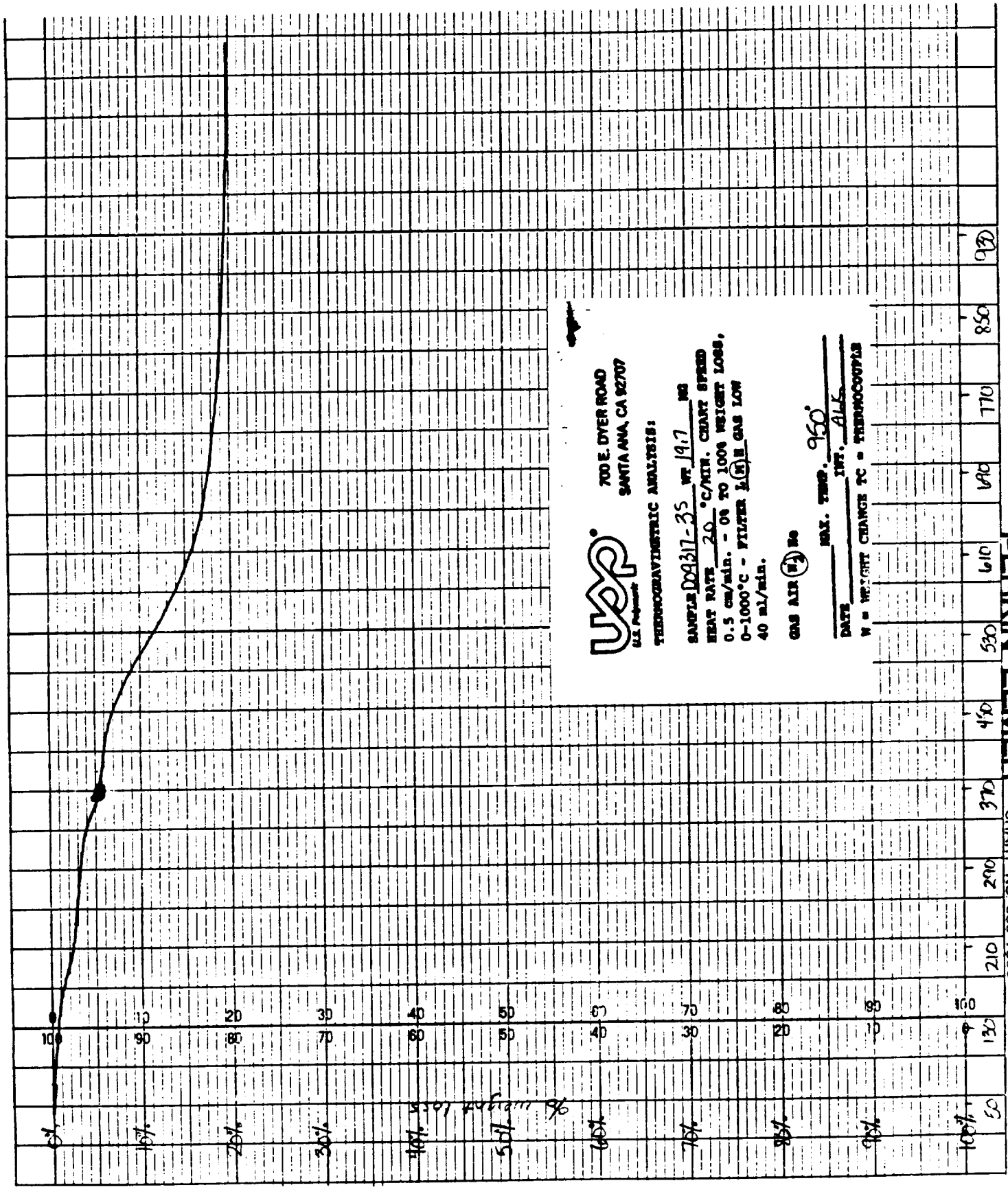

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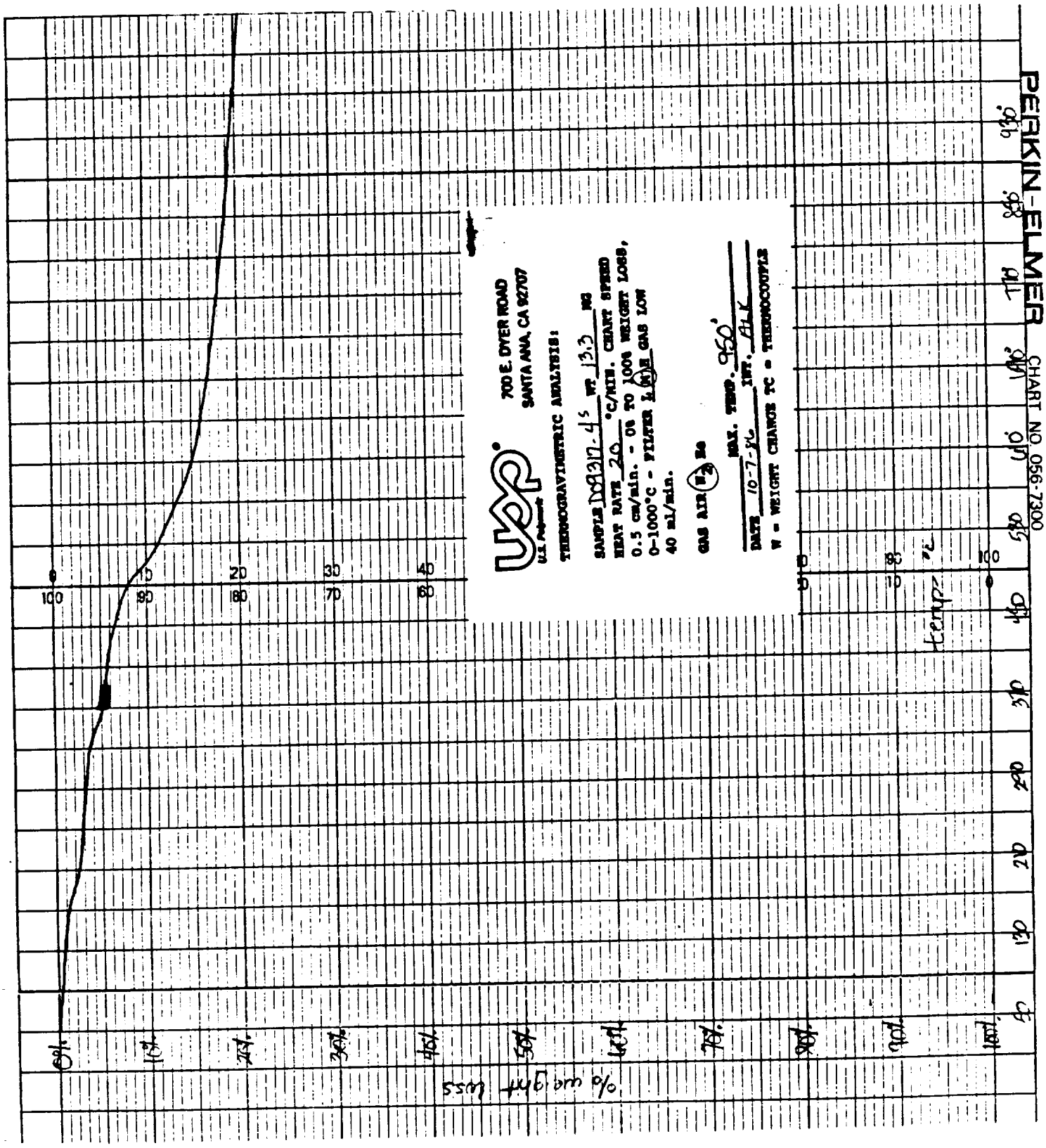

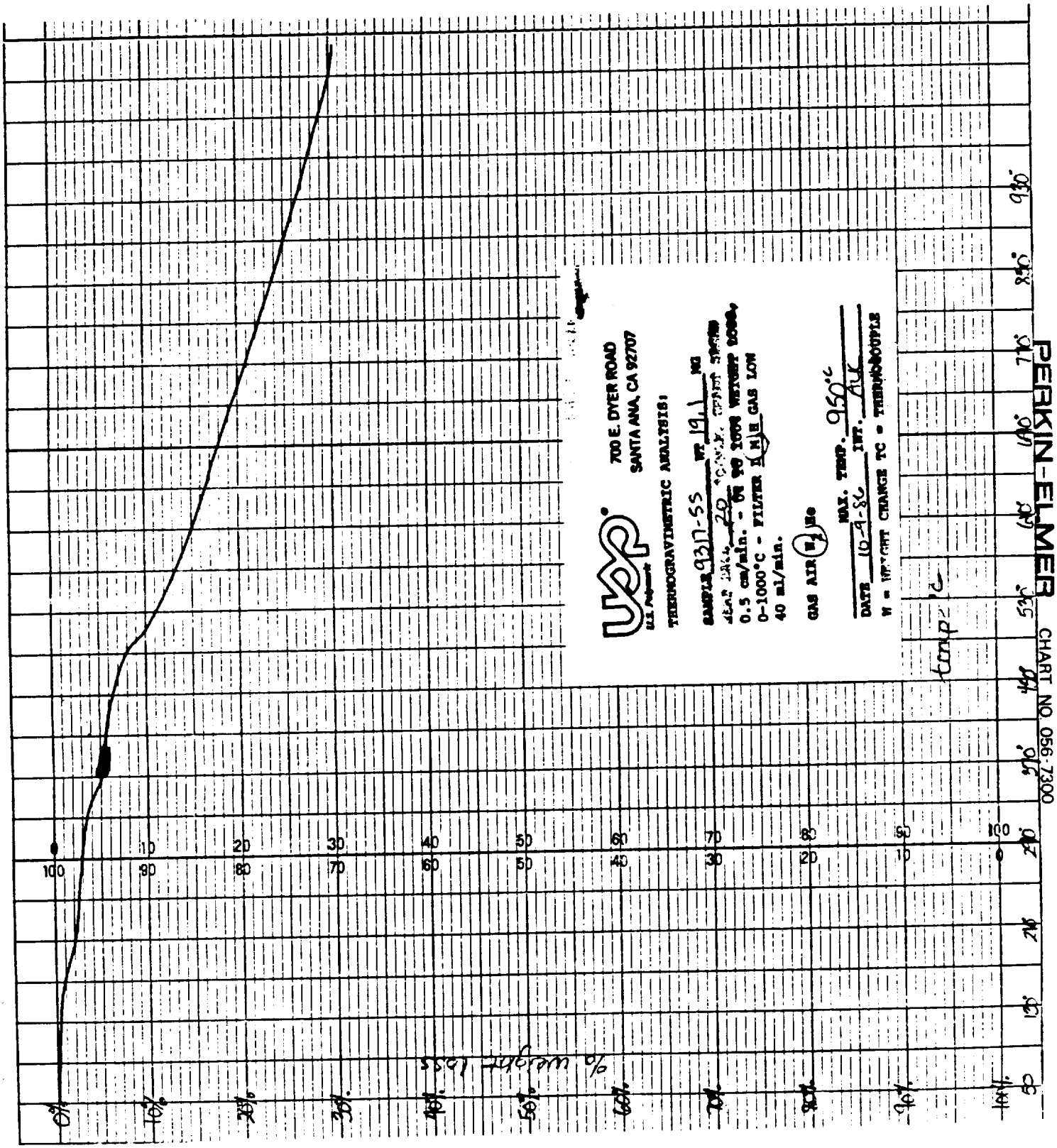

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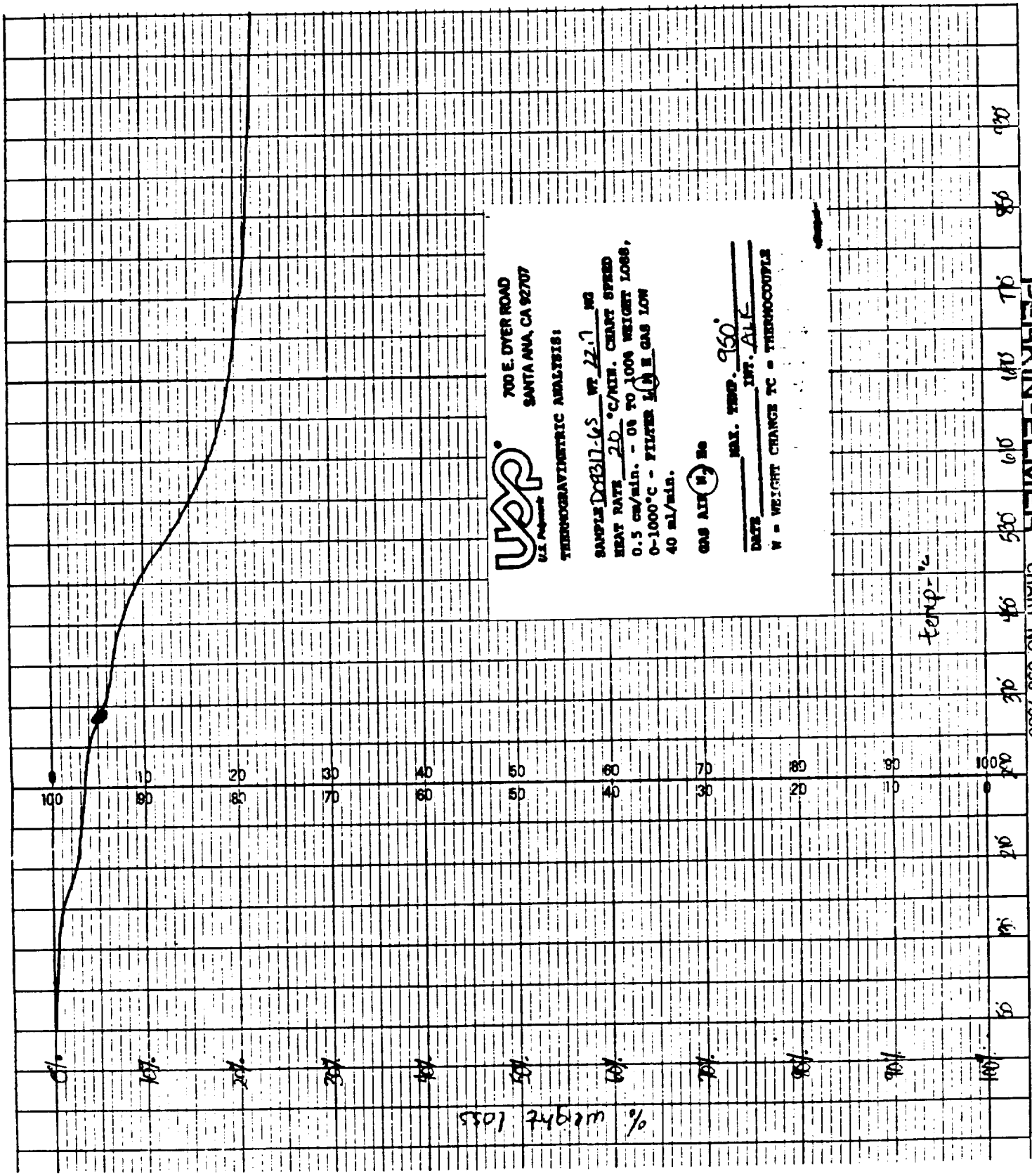

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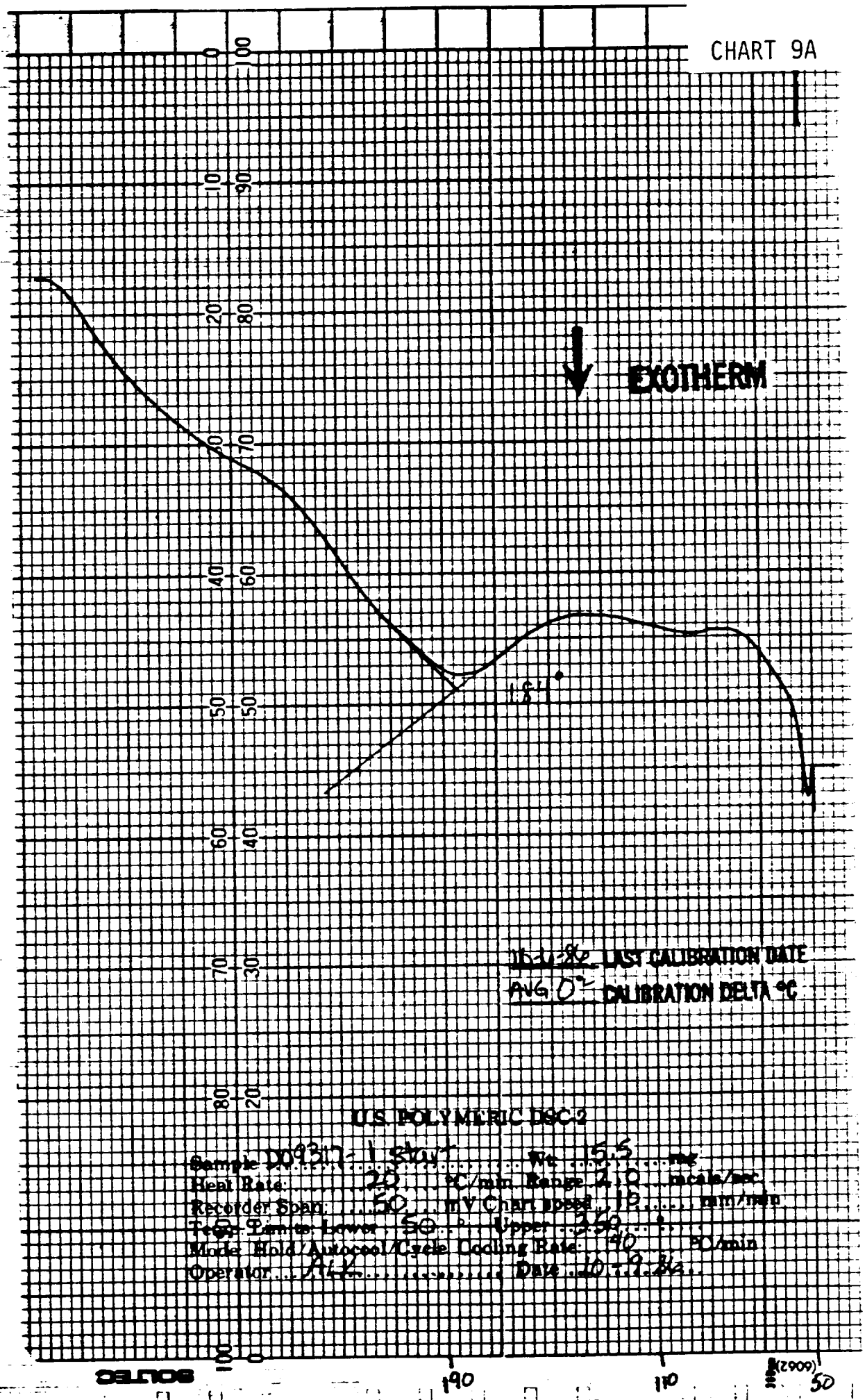

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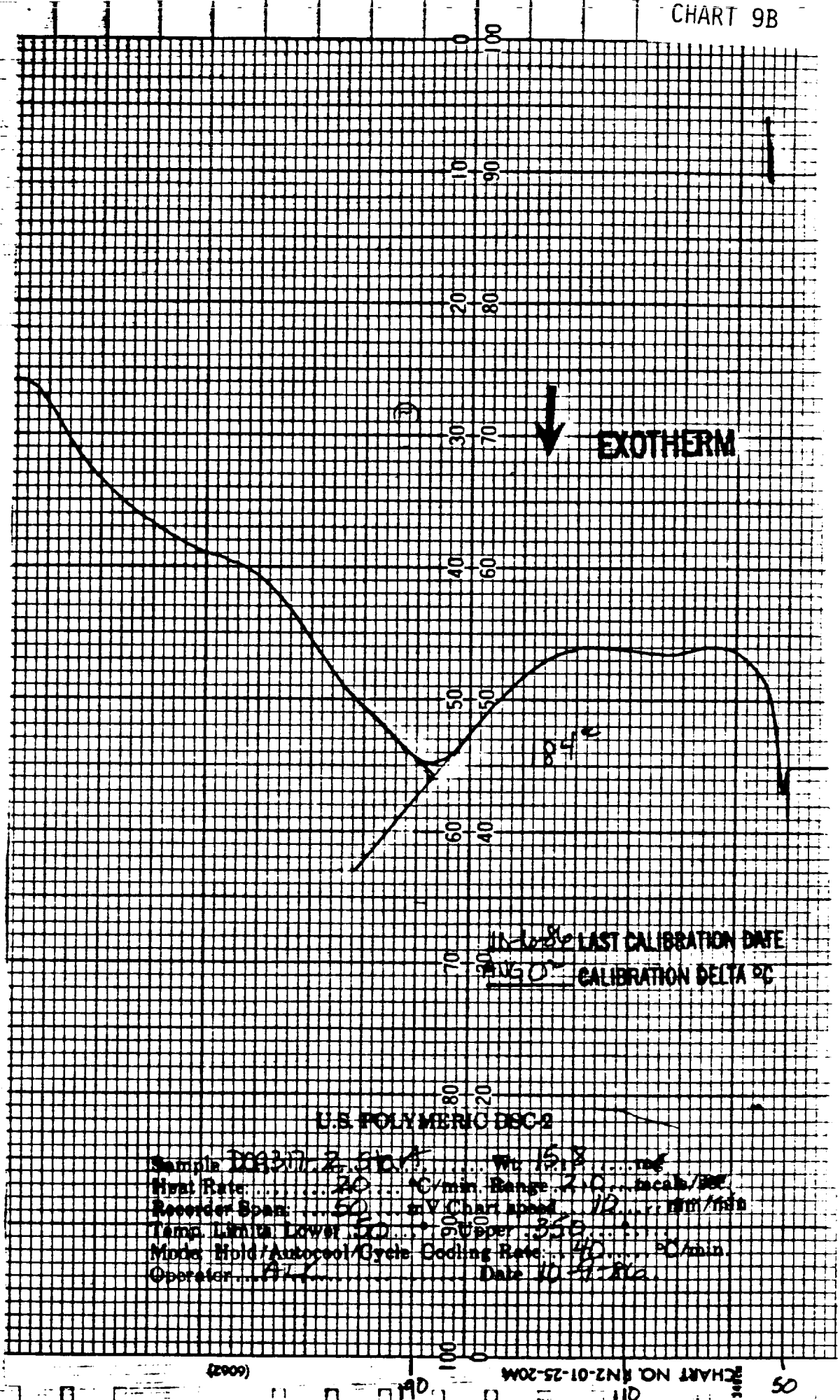

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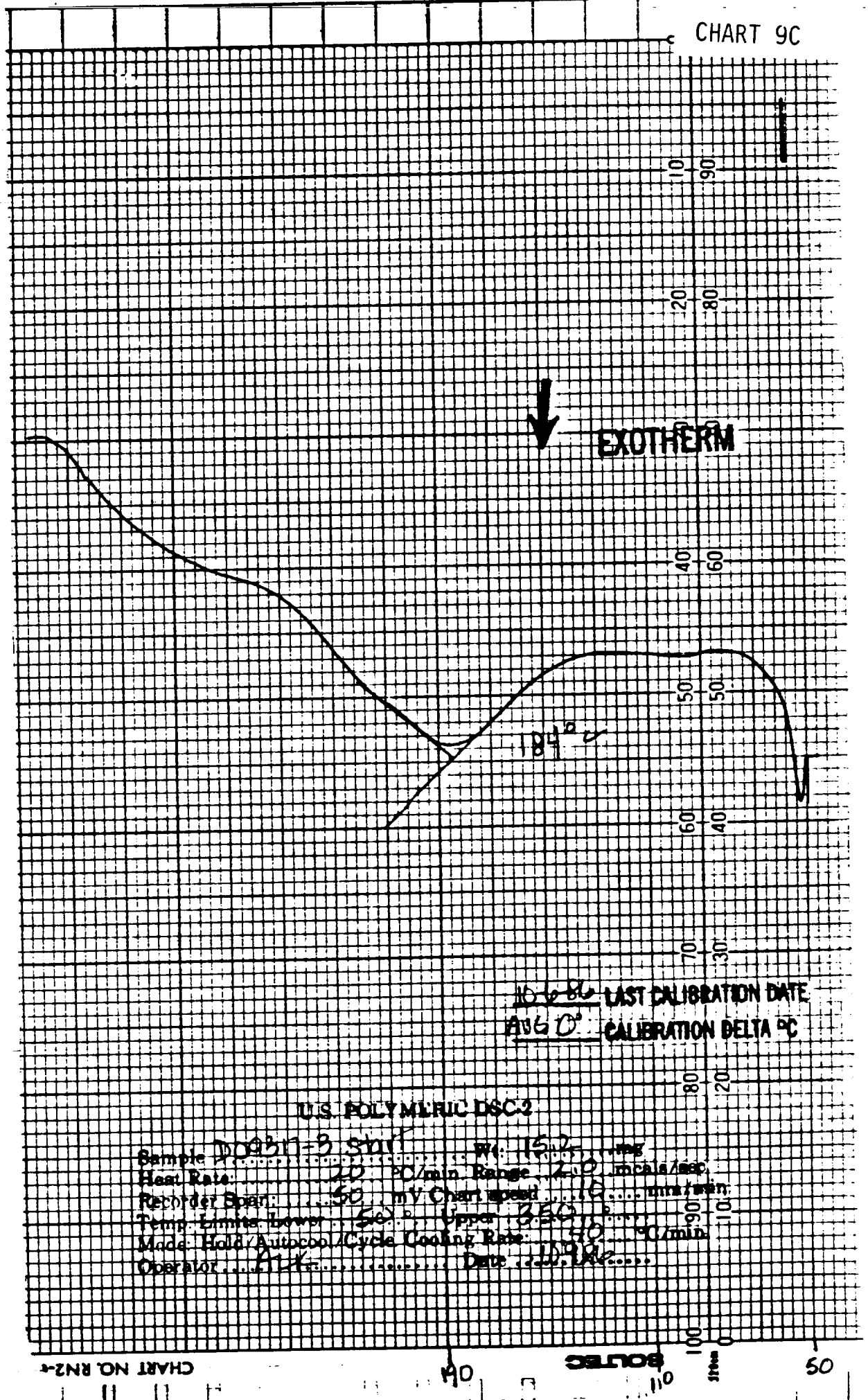

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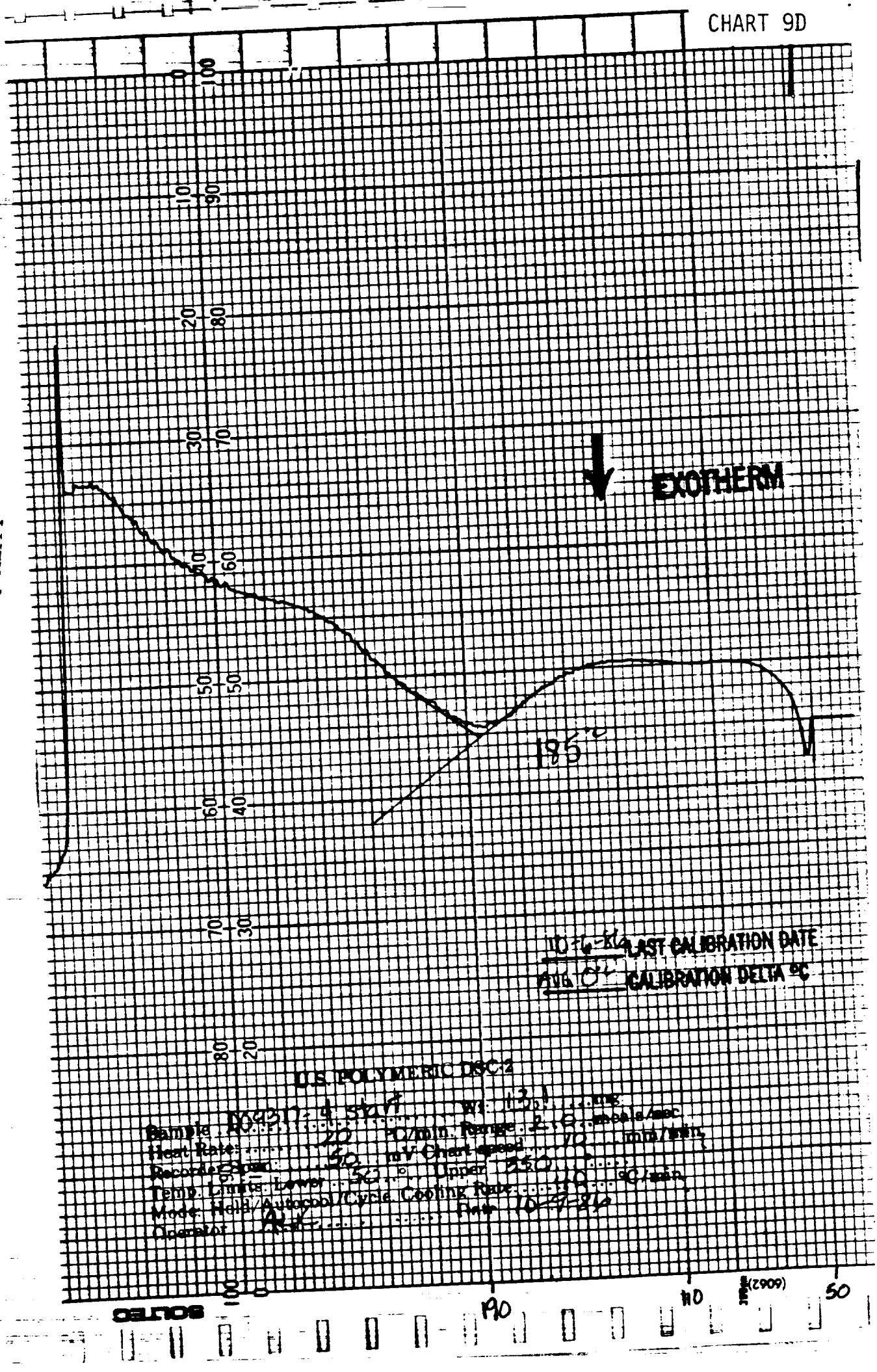

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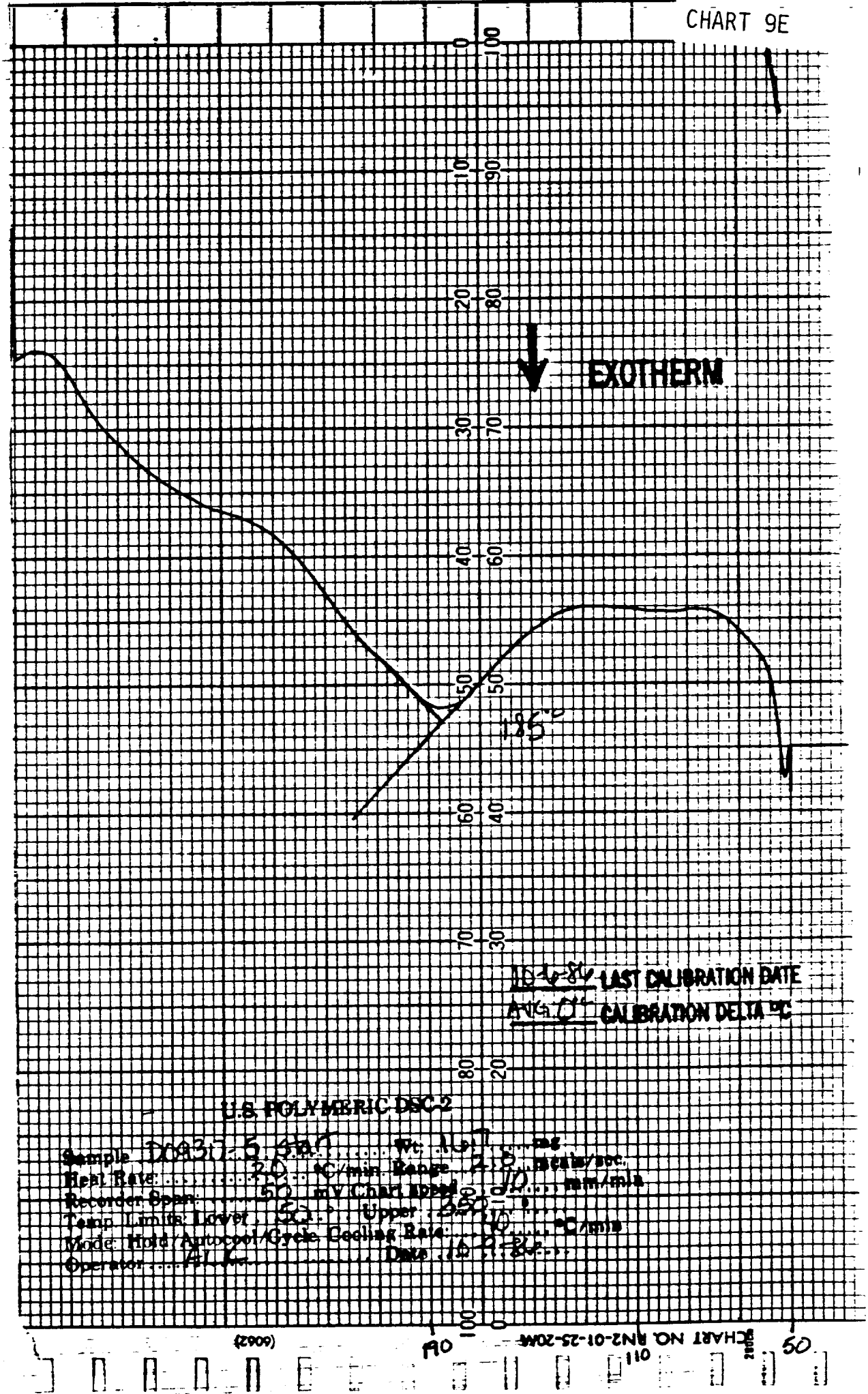

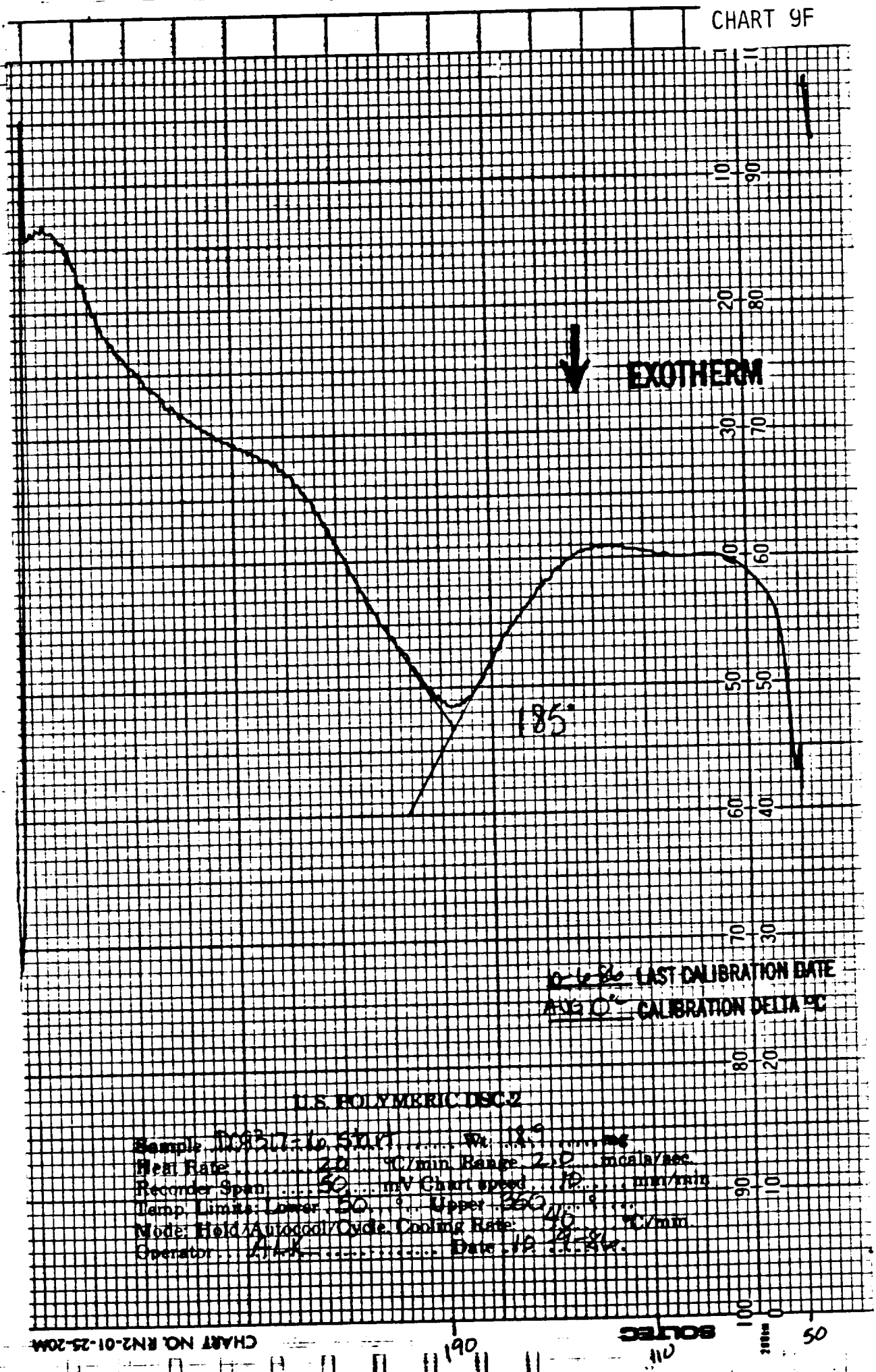

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DATE 7-09-86
SAMPLE FM 5839
D09317 # ST-1

SOURCE

STRUCTURE

PATH 0.2 mm NACL
SOLVENT ACETONE
CONCENTRATION 30-50%T
PHASE 3
COMMENTS PRE-PREG
MATERIAL

ANALYST V. MIRANDA

Beckman®
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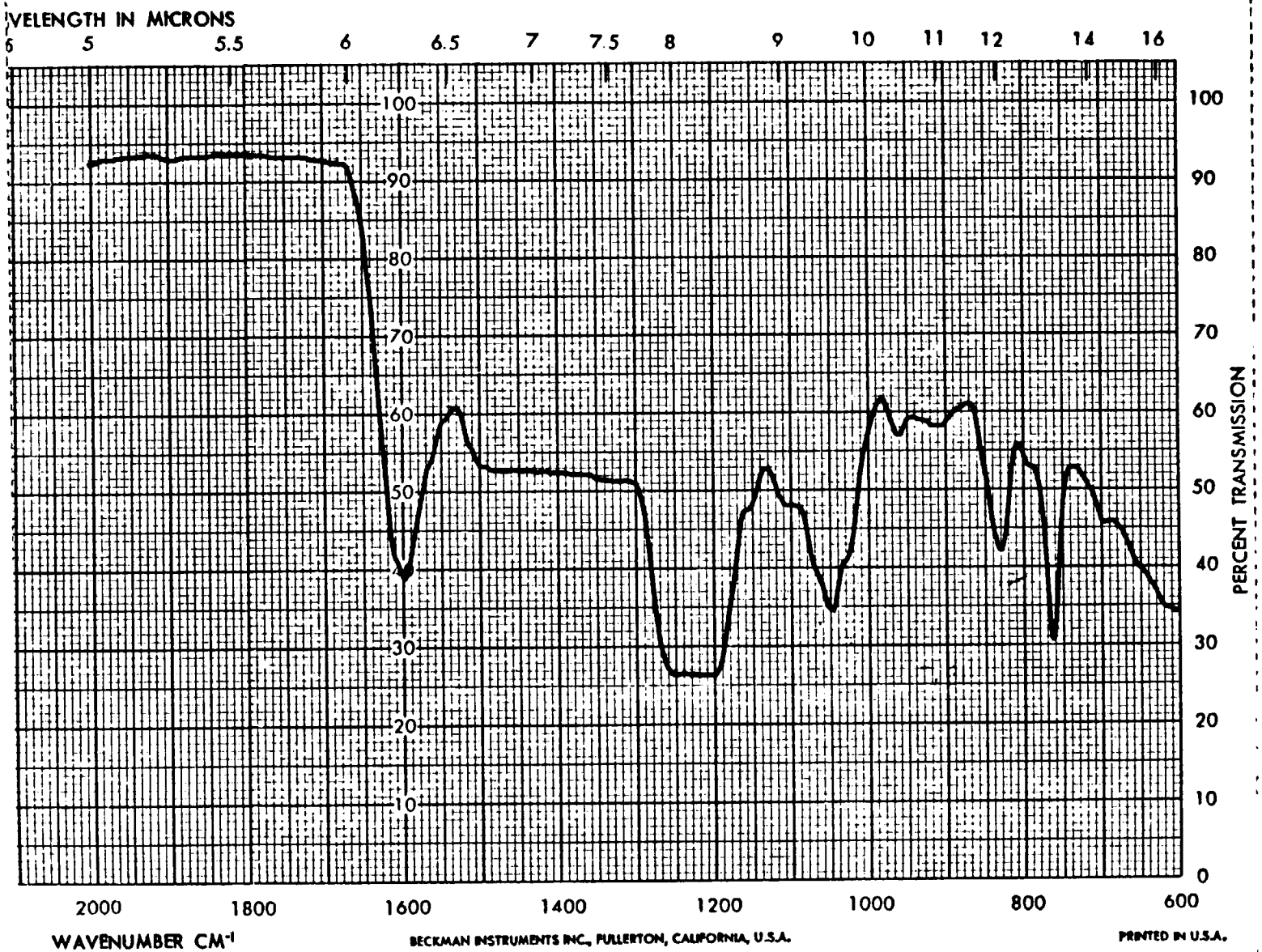

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CHART 10A

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DATE 7-09-86
SAMPLE FM 5839
D09317 # ST-2

SOURCE

STRUCTURE

PATH 0.2 mm NACL
SOLVENT ACETONE
CONCENTRATION 30-50%T
PHASE S
COMMENTS PRE-PREG
MATERIAL

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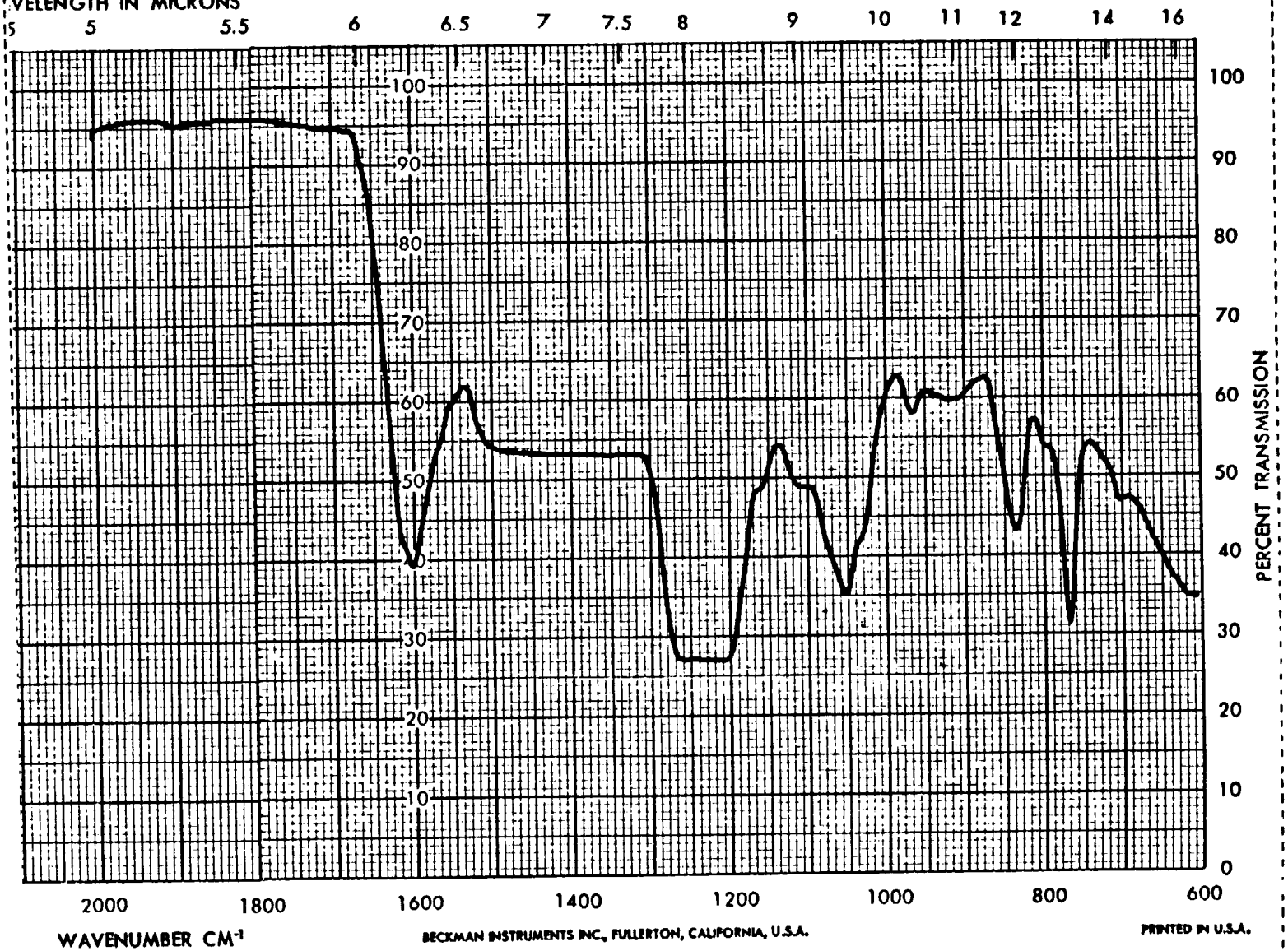

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SPECTRUM NO. 15247
DATE 7-09-86
SAMPLE FM 5839
DD9317 # ST-3

SOURCE
STRUCTURE

PATH 0.2 mm NACL
SOLVENT ACETONE
CONCENTRATION 30-50%T
PHASE 3
COMMENTS PRE-PREG
MATERIAL

ANALYST V. MIRANDA

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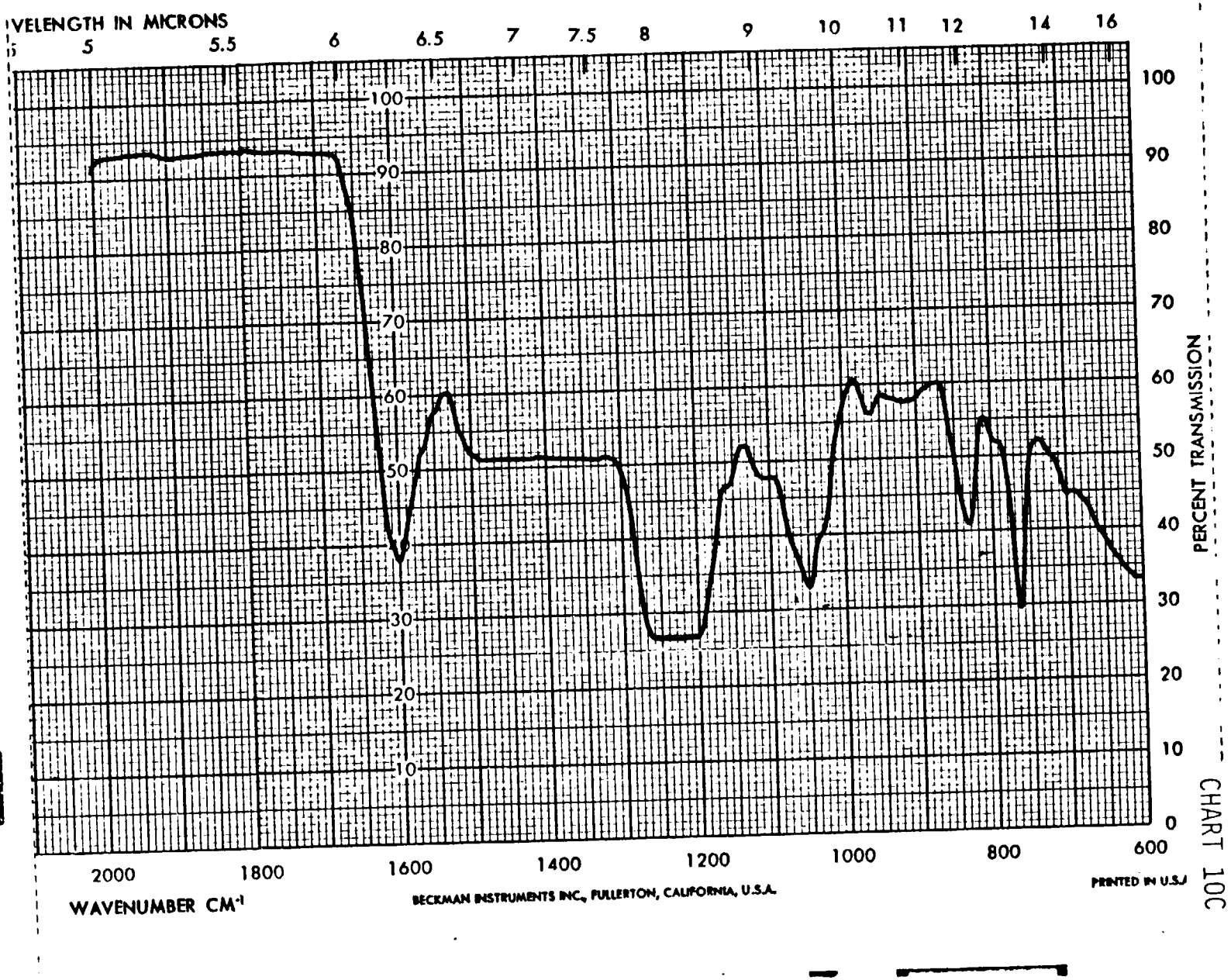

CHART 10C

ORIGINAL PAGE IS
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SPECTRUM NO. 15249
DATE 7-09-86
SAMPLE FM 5839
DOW # ST-4

SOURCE
STRUCTURE

PATH 0.2 mm NACL
SOLVENT ACETONE
CONCENTRATION 30-50% I
PHASE 3
COMMENTS PRE-PREG
MATERIAL

ANALYST V. MIRANDA

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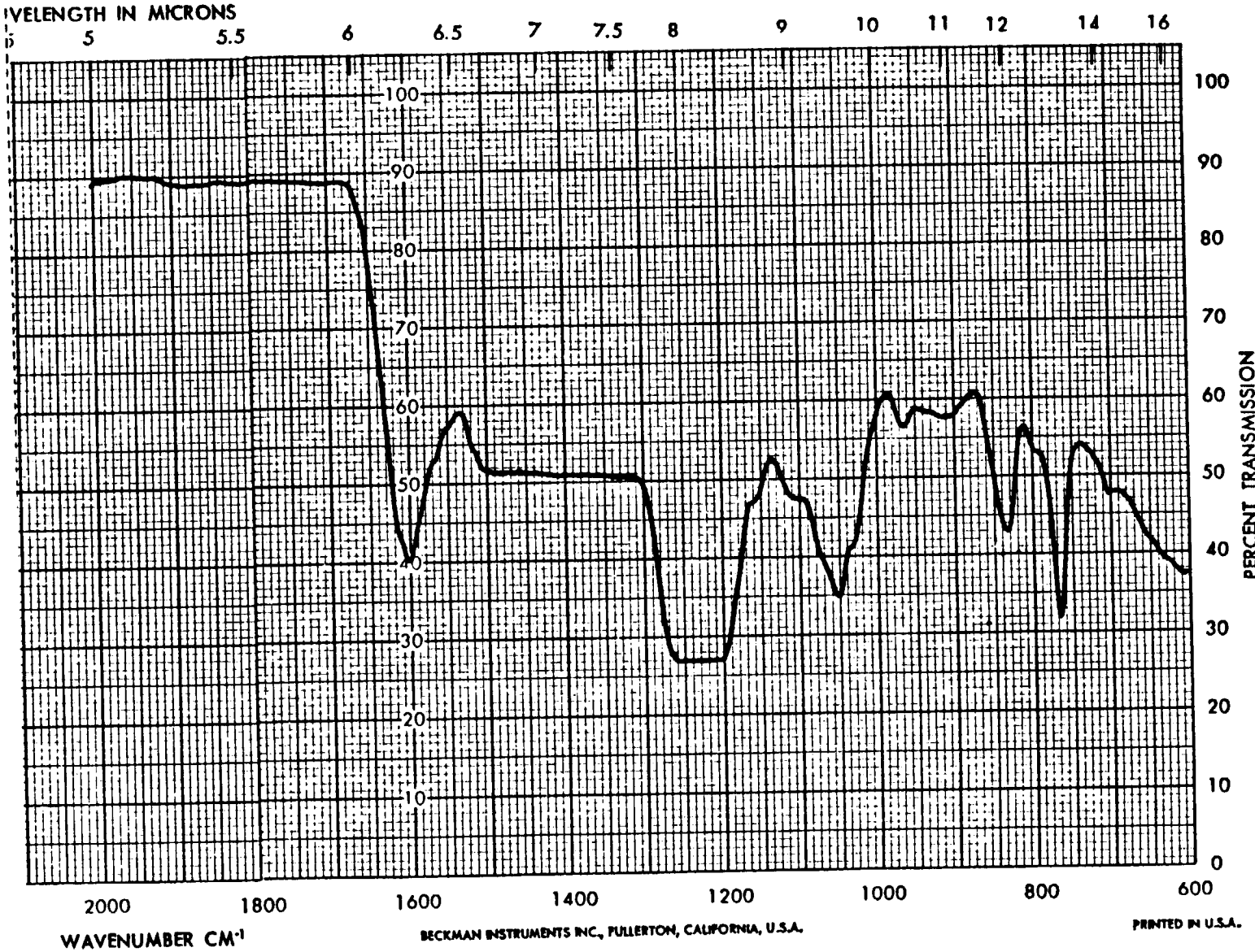

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SPECTRUM NO. 15251
DATE 7-09-86
SAMPLE FM 5B39
DD9317 # ST-5
SOURCE
STRUCTURE

PATH 0.2 mm NACL
SOLVENT ACETONE
CONCENTRATION 30-50%T
PHASE 3
COMMENTS PRE-PREG
MATERIAL
ANALYST Y. MIRANDA

Beckman®
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SPECTROPHOTOMETER

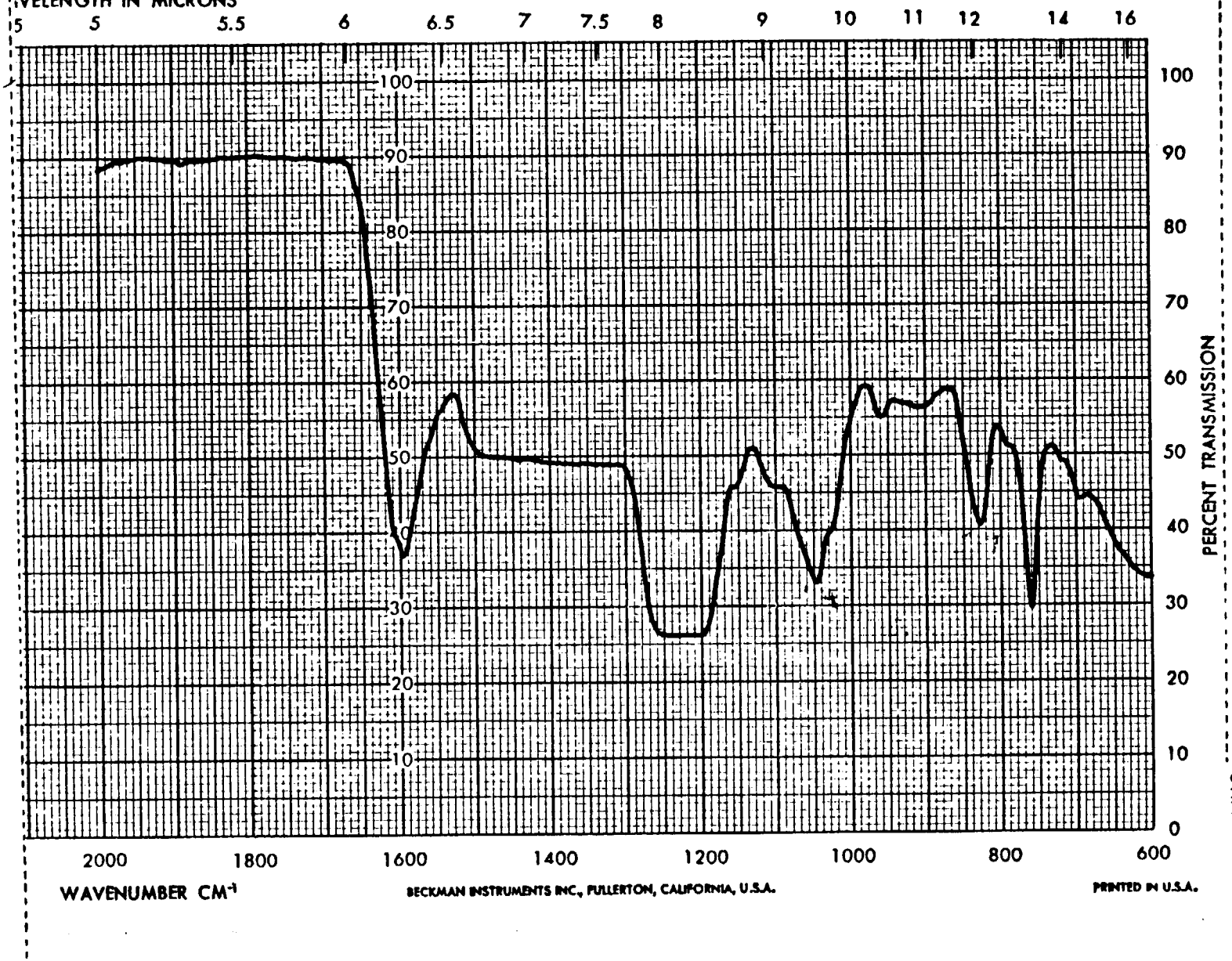

CHART 10E

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DATE 7-11-86
SAMPLE FM 5839
D09317 # ST-6

SOURCE
STRUCTURE

PATH 0.2 mm NACL
SOLVENT ACETONE
CONCENTRATION 30-50% ST
PHASE 3
COMMENTS PRE-PREG
MATERIAL

ANALYST V. MIRANDA

Beckman®
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SPECTROPHOTOMETER

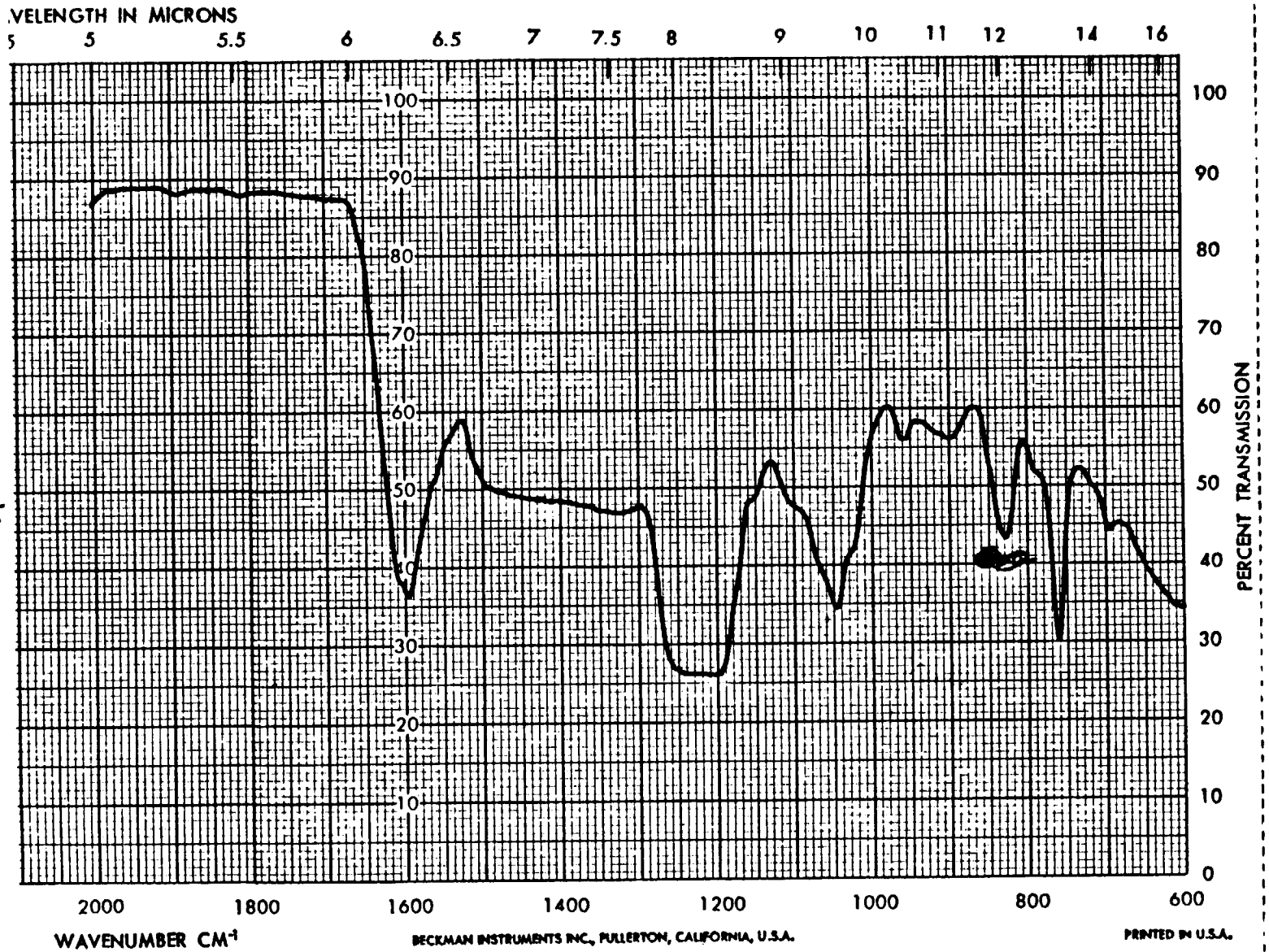

CHART 10F

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PART NO. 990068

RUN NO ___ DATE 12/6/94 OPERATOR DH SAMPLE: D9317-1-start-(1) ATM Air @ STP FLOW RATE 3.33 cfh w/pill	T-AXIS SCALE, °C/in 30 20 PROG. RATE, °C/min 10 HEAT ✓ COOL ___ ISO ___ SHIFT, in 0	DTA-DSC SCALE, °C/in ___ (mcal/sec)/in ___ WEIGHT, mg ___ REFERENCE ___	TGA SCALE, mg/in ___ SUPPRESSION, mg ___ WEIGHT, mg ___ TIME CONST., sec ___ dY, (mg/min) /in ___	TMA (mm/min) SCALE, mils/in 0.1/0.2 MODE Expansion SAMPLE SIZE 0.262 LOAD, g 10 dY, (10X), (mils/min)/in ___	___ ___ ___ ___ ___ ___

$\frac{\Delta L}{L_0} = \frac{(1.36\ \text{mm})}{18\ (\text{mm})(0.262)} = 1.44$

DuPont Instruments

MEASURED VARIABLE ___

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Chart 21A1

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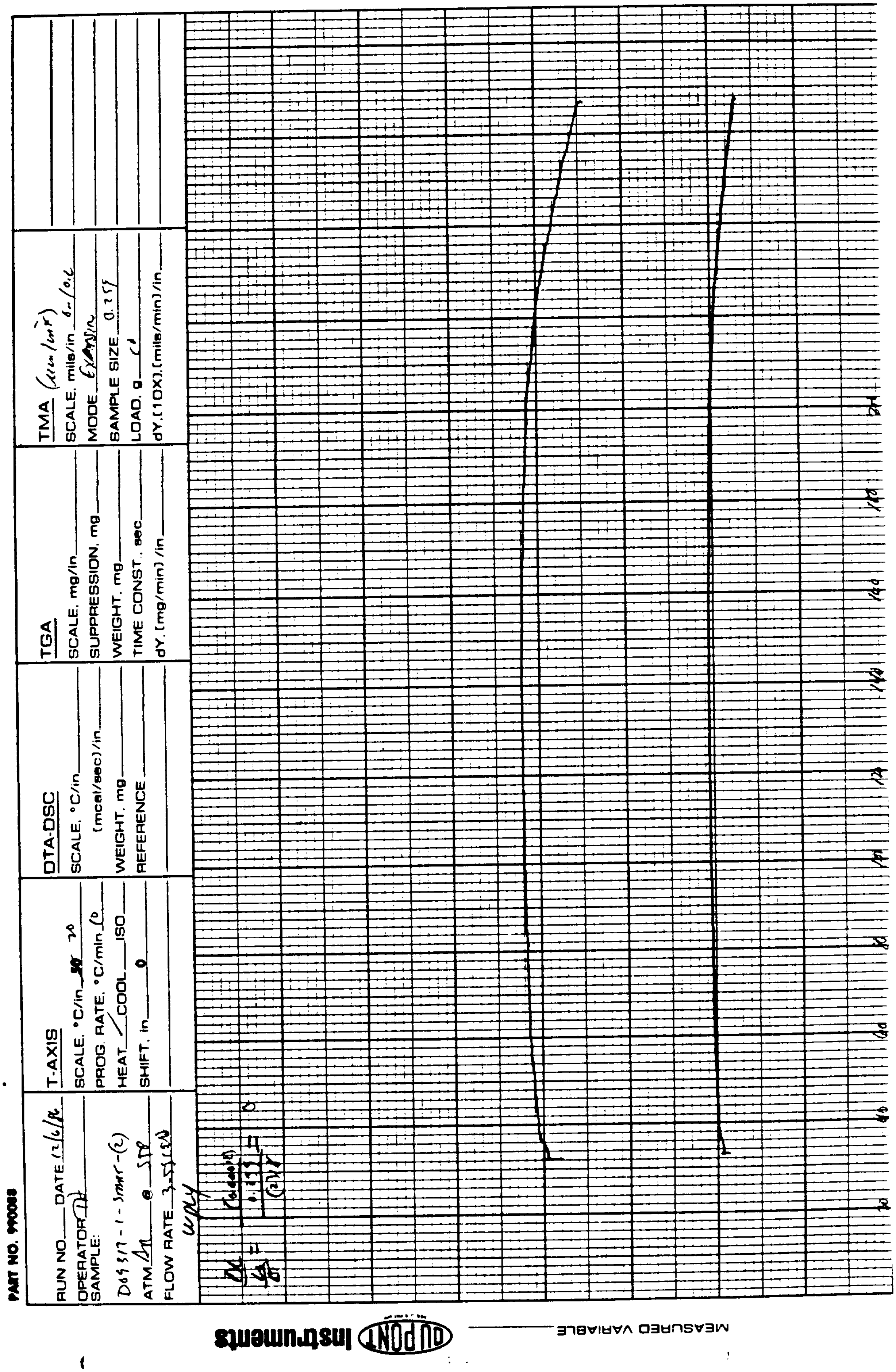
Chart 21A2

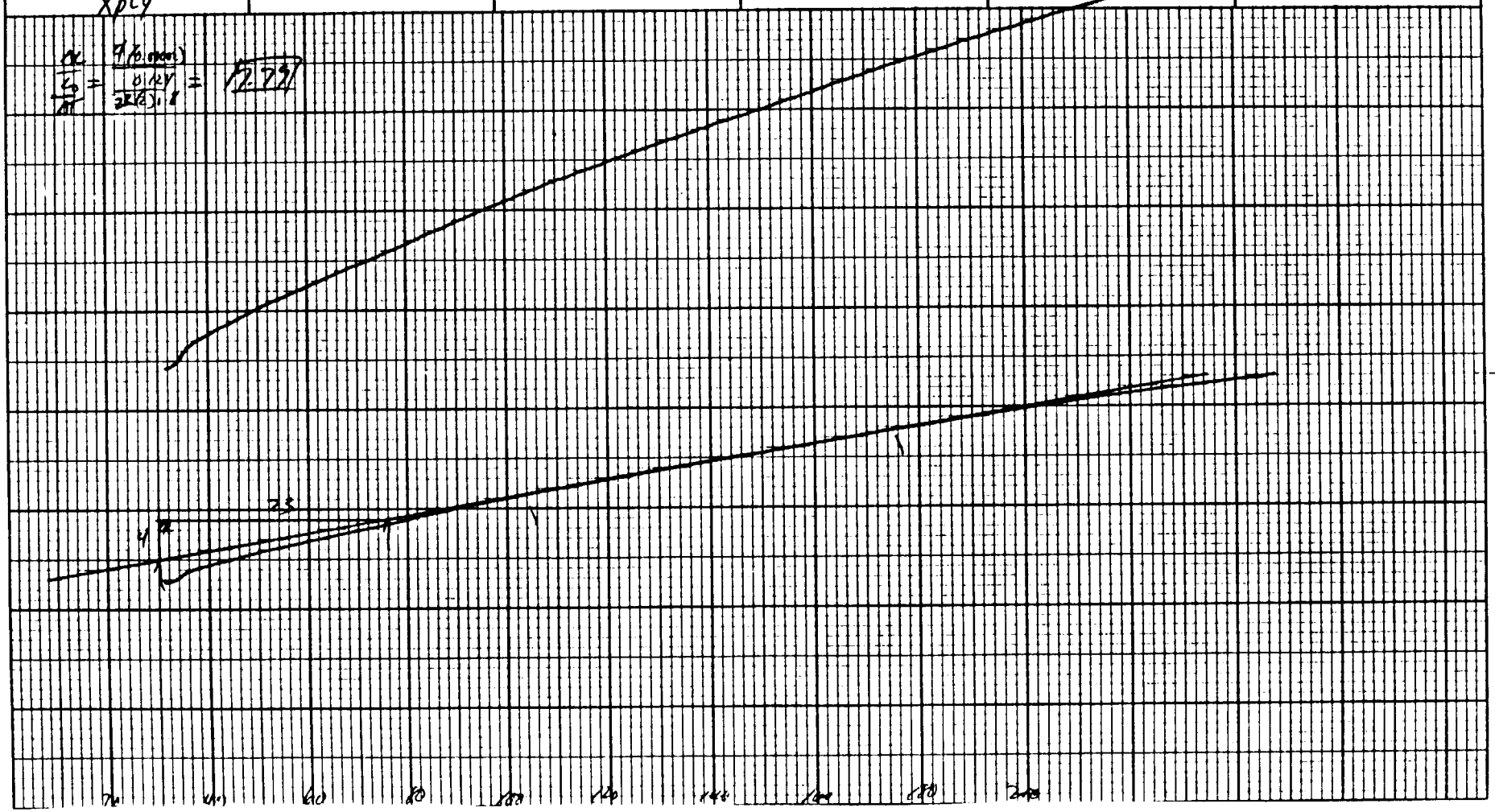


PART NO. 990068

RUN NO ___ DATE 12/3/16	T-AXIS	DTA-DSC	TGA	TMA (µm/in Δ)	
OPERATOR PJ	SCALE, °C/in 50 20	SCALE, °C/in	SCALE, mg/in	SCALE, mils/in 0.1/0.2	
SAMPLE:	PROG. RATE, °C/min 10	(mcal/sec)/in	SUPPRESSION, mg	MODE Expansion	
D0317-1-start-(3)	HEAT ✓ COOL ___ ISO ___	WEIGHT, mg	WEIGHT, mg	SAMPLE SIZE 0.124	
ATM Air @ STP	SHIFT, In 0	REFERENCE	TIME CONST., sec	LOAD, g 10	
FLOW RATE 3-5 SCFH			dY, (mg/min)/in	dY, (10X), (mils/min)/in	

XPLY

$\frac{\Delta L}{L_0} = \frac{9.6\ (0.001")}{0.124"} = 12.73\%$



MEASURED VARIABLE

DU PONT Instruments

Chart 21A3

PART NO. 990068

RUN NO.___ DATE 12/3/96	T-AXIS	DTA-DSC	TGA	TMA (5 min/min IF)	
OPERATOR DH	SCALE, °C/in 30 20	SCALE, °C/in	SCALE, mg/in	SCALE, mils/in 0.1/0.2	
SAMPLE:	PROG. RATE, °C/min 10	(mcal/sec)/in	SUPPRESSION, mg	MODE Expansion	
Dog 8/7 - 1 - Stmt - (4)	HEAT ✓ COOL ___ ISO ___	WEIGHT, mg	WEIGHT, mg	SAMPLE SIZE 0.124	
ATM Air @ STP	SHIFT, in 0	REFERENCE	TIME CONST., sec	LOAD, g 10	
FLOW RATE 3 scfm			dY, (mg/min) /in	dY, (10X), (mils/min)/in	
XPLY					

$\frac{dL}{L_0 \, dT} = \frac{3.16 \text{ mils/min}}{0.124 \text{ in} \times 16 \text{ mils/in}} = 15.5\,\text{/min}$

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MEASURED VARIABLE

Chart 21A4

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Chart 21B1

JT NO. 990088

RUN NO ____ DATE 12/16/86
OPERATOR TJ
SAMPLE:
D6317-2-3mm-(1)
ATM Air @ STP
FLOW RATE 3.5 SCFH
wdy

T-AXIS
SCALE, °C/in 50 20
PROG. RATE, °C/min 10
HEAT ✓ COOL ___ ISO ___
SHIFT, in 0

DTA-DSC
SCALE, °C/in ___
(mcal/sec)/in ___
WEIGHT, mg ___
REFERENCE ___

TGA
SCALE, mg/in ___
SUPPRESSION, mg ___
WEIGHT, mg ___
TIME CONST., sec ___
dY, (mg/min) /in ___

TMA (μm/mil)
SCALE, mils/in 0.1/0.2
MODE Extension
SAMPLE SIZE 0.257
LOAD, g 10
dY, (10X), (mils/min) /in ___

MEASURED VARIABLE

DUPONT instruments

PART NO. 990088

RUN NO ___ DATE 12/6/82	T-AXIS	DTA-DSC	TGA	TMA (min)	
OPERATOR TJ	SCALE, °C/in 50 20	SCALE, °C/in	SCALE, mg/in	SCALE, mils/in 0.1/0.2	
SAMPLE:	PROG. RATE, °C/min 10	(mcal/sec)/in	SUPPRESSION, mg	MODE Expansion	
D09317-2-Start (2)	HEAT ✓ COOL ___ ISO ___	WEIGHT, mg	WEIGHT, mg	SAMPLE SIZE 0.257	
ATM Air @ STP	SHIFT, in 0	REFERENCE	TIME CONST., sec	LOAD, g 1	
FLOW RATE 75 SCFH			dY, (mg/min) /in	dY, (10X), (mils/min) /in	

wply

$\frac{\Delta T}{\Delta t} = \frac{(6.0002)}{0.297} \times \frac{1}{(2)1.8} = 0$

MEASURED VARIABLE

DUPONT Instruments

Chart 21B2

PART NO. 990088

RUN NO ___ DATE 12/4/96	T-AXIS	DTA-DSC	TGA	TMA (mil/min)	
OPERATOR DJ	SCALE, °C/in 30 20	SCALE, °C/in ___	SCALE, mg/in ___	SCALE, mils/in 0.1/0.2	
SAMPLE:	PROG. RATE, °C/min 10	(mcal/sec)/in ___	SUPPRESSION, mg ___	MODE EXPANSION	
D69317-2-START-(3)	HEAT ✓ COOL ___ ISO ___	WEIGHT, mg ___	WEIGHT, mg ___	SAMPLE SIZE 0.136	
ATM Air @ STP	SHIFT, in 0	REFERENCE ___	TIME CONST., sec ___	LOAD, g 10	
FLOW RATE 3-55(CF)			dY, (mg/min) /in ___	dY,(10X),(mils/min)/in ___	

Xply

$\frac{dL}{L_i} = \frac{2.50\text{ mm}}{15.130} = 16.52\%$

MEASURED VARIABLE ___

DUPONT Instruments

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Chart 21B3

Chart 21B4

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Chart 21C1

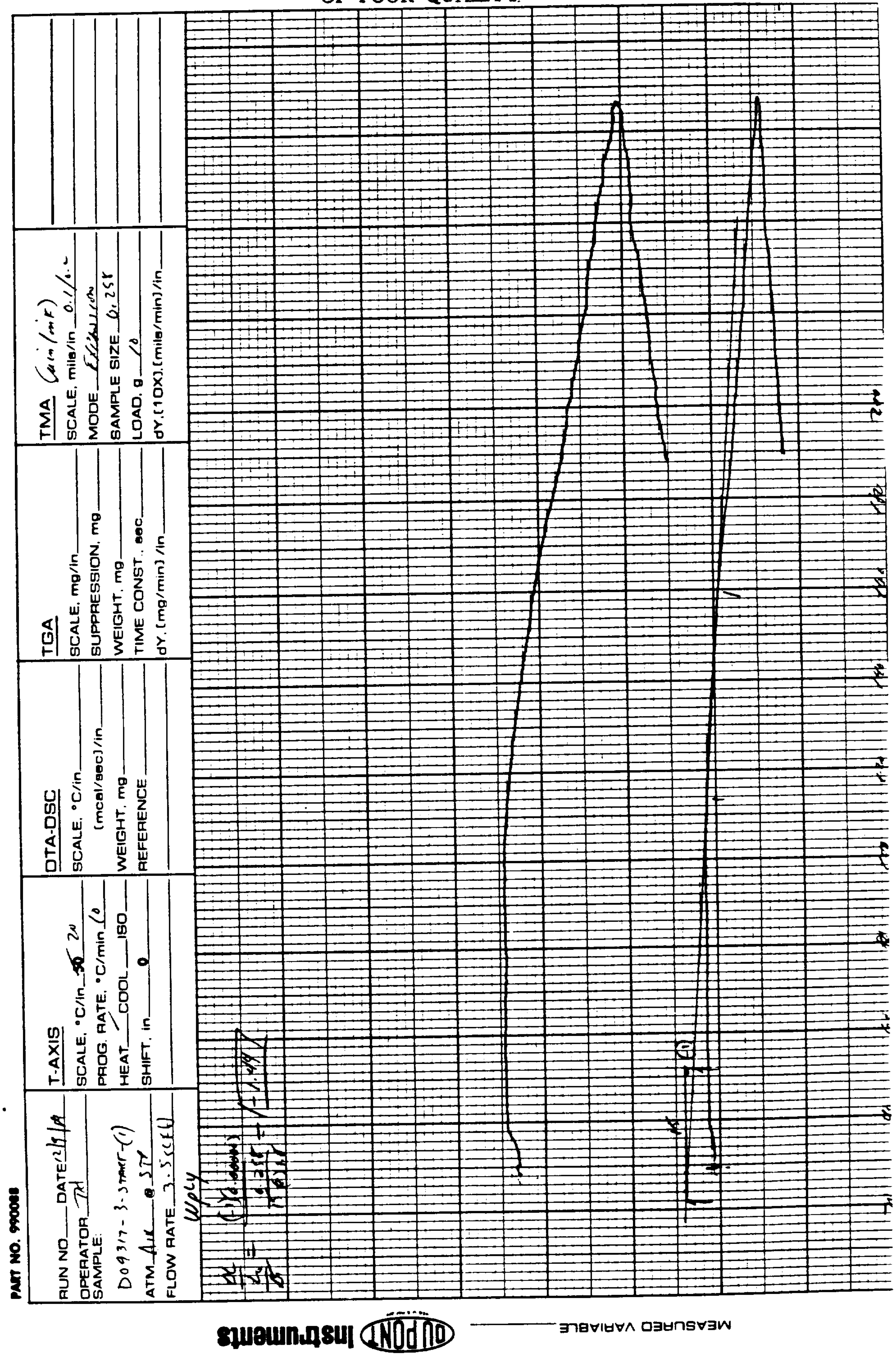

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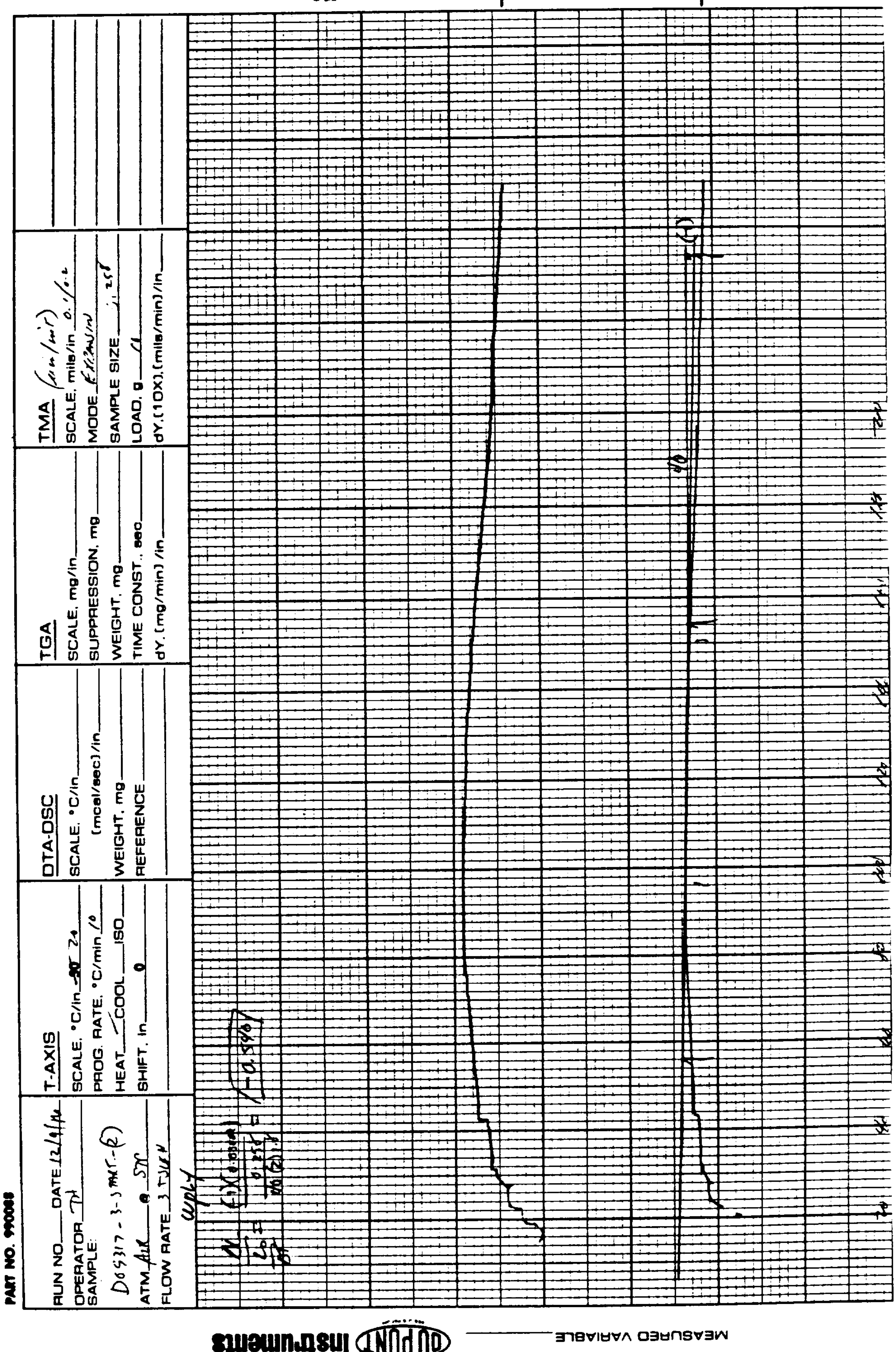
Chart 21C2



PART NO. 990088

RUN NO ___ DATE 12/10/91 OPERATOR TH SAMPLE Dg317-3-sheet-(7) ATM Dn @ STP FLOW RATE 3-5516	T-AXIS SCALE, °C/in 50/20 PROG. RATE, °C/min 10 HEAT ✓ COOL ___ ISO ___ SHIFT, In 0	DTA-DSC SCALE, °C/in ___ (mcal/sec)/in ___ WEIGHT, mg ___ REFERENCE ___	TGA SCALE, mg/in ___ SUPPRESSION, mg ___ WEIGHT, mg ___ TIME CONST., sec ___ dY, (mg/min) /in ___	TMA (Expansion) SCALE, mils/in 0.1/0.2 MODE Expansion SAMPLE SIZE 0.121 LOAD, g 1 dY, (10X), (mils/min)/in ___	___ ___ ___ ___ ___ ___

Xpy

$\frac{\Delta L}{L_0 \Delta T} = \frac{3(6.0000)}{\frac{0.121}{23(3)+8}} \Rightarrow 15.99$

23

3

DUPONT Instruments

MEASURED VARIABLE

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Chart 21C3

PART NO. 990088

RUN NO ___ DATE 12/16/96	T-AXIS	DTA-DSC	TGA	TMA (µm/min)	
OPERATOR DJ	SCALE, °C/in 50 W	SCALE, °C/in	SCALE, mg/in	SCALE, mils/in 0.1/0.2	
SAMPLE: Dog 3/7-3-smear-(4)	PROG. RATE, °C/min 10	(mcal/sec)/in	SUPPRESSION, mg	MODE Expansion	
ATM Air @ STP	HEAT ✓ COOL ___ ISO ___	WEIGHT, mg	WEIGHT, mg	SAMPLE SIZE 0.120	
FLOW RATE 3 SCFH	SHIFT, in 0	REFERENCE	TIME CONST., sec	LOAD, g 10	
XpLy			dY, (mg/min) /in	dY, (10X), (mils/min)/in	

$\frac{\Delta X}{\Delta Y} = \frac{2.0000}{0.120} = 16.67$

MEASURED VARIABLE

DU PONT Instruments

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Chart 2104

PART NO. 990088

RUN NO ___ DATE 12/9/96	T-AXIS	DTA-DSC	TGA	TMA (mil/min)	
OPERATOR [illegible]	SCALE, °C/in 50 20	SCALE, °C/in ___	SCALE, mg/in ___	SCALE, mils/in 0.1/0.2	
SAMPLE D69317-4-3 start-(1)	PROG. RATE, °C/min 10	(mcal/sec)/in ___	SUPPRESSION, mg ___	MODE Extension	
ATM Air @ STP	HEAT ✓ COOL ___ ISO ___	WEIGHT, mg ___	WEIGHT, mg ___	SAMPLE SIZE 0.260	
FLOW RATE 3.55 cfh	SHIFT, in 0	REFERENCE ___	TIME CONST., sec ___	LOAD, g 10	
w/ply			dY, (mg/min) /in ___	dY, (10X), (mils/min) /in ___	

$\frac{dL}{L_0 \, dT} = \frac{(1.5\text{ mils})}{\frac{0.260}{1.8(2)}\text{ in}} = 1.34$

MEASURED VARIABLE

DUPONT Instruments

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Chart 21D1

PART NO. 990088

RUN NO ___ DATE 12/5/14	T-AXIS	DTA-DSC	TGA	TMA (expansion)	
OPERATOR TI	SCALE, °C/in 50 20	SCALE, °C/in ___	SCALE, mg/in ___	SCALE, mils/in 0.1 1.2	
SAMPLE:	PROG. RATE, °C/min 10	(mcal/sec)/in ___	SUPPRESSION, mg ___	MODE Expansion	
DO 9317 - 4-Smer - (2)	HEAT / COOL ___ ISO ___	WEIGHT, mg ___	WEIGHT, mg ___	SAMPLE SIZE 0.257	
ATM Air @ STP	SHIFT, in 0	REFERENCE ___	TIME CONST., sec ___	LOAD, g 10	
FLOW RATE 3 ISLPM			dY, (mg/min) /in ___	dY, (10X), (mils/min) /in ___	

apply

$\frac{\Delta L}{L_0} \frac{1}{\Delta T} = \frac{(-1)(0.0005)}{0.257} \frac{1}{12(0)1.8} = [-1.35]$

MEASURED VARIABLE ___

DUPONT Instruments

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Chart 21D2

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Chart 21D3

PART NO. 990088

RUN NO.___ DATE 12/1/94
OPERATOR DJ
SAMPLE:
D093/7 - 4-smart - (3)
ATM Air @ STP
FLOW RATE 3.5SCFH
Xprl

T-AXIS
SCALE, °C/in 10 20
PROG. RATE, °C/min 2
HEAT COOL ISO
SHIFT, in 0

DTA-DSC
SCALE, °C/in
(mcal/sec)/in
WEIGHT, mg
REFERENCE

TGA
SCALE, mg/in
SUPPRESSION, mg
WEIGHT, mg
TIME CONST., sec.
dY, (mg/min)/in

TMA (min/inf)
SCALE, mils/in 6.1/6.2
MODE Expansion
SAMPLE SIZE 0.103
LOAD, g 1
dY, (10X), (mils/min)/in

MEASURED VARIABLE

DUPONT instruments

Chart 21D4

PART NO. 990068

RUN NO ___ DATE 12/5/86
OPERATOR (D)
SAMPLE:
D65317 - 4 - START - (N)
ATM Air @ SP
FLOW RATE 3.5 (SCFH)

T-AXIS
SCALE, °C/in 20 ~~30~~ 20
PROG RATE, °C/min 10
HEAT ✓ COOL ___ ISO ___
SHIFT, in 0

DTA-DSC
SCALE, °C/in ___
(mcal/sec)/in ___
WEIGHT, mg ___
REFERENCE ___

TGA
SCALE, mg/in ___
SUPPRESSION, mg ___
WEIGHT, mg ___
TIME CONST., sec ___
dY/dT (mg/min) /in ___

TMA (air/air)
SCALE, mils/in 0.1/0.2
MODE Expansion
SAMPLE SIZE 0.101
LOAD, g ___
dY/dT (10X), (mils/min) /in ___

Xplot

MEASURED VARIABLE

DUPONT instruments

PART NO. 990088

RUN NO ___ DATE 12/18/96	T-AXIS	DTA-DSC	TGA	TMA (mm/min)	
OPERATOR TH	SCALE, °C/in 20	SCALE, °C/in	SCALE, mg/in	SCALE, mils/in 0.1/0.2	
SAMPLE:	PROG. RATE, °C/min 10	(mcal/sec)/in	SUPPRESSION, mg	MODE Expansion	
D09317-5-Smart (1)	HEAT ✓ COOL ___ ISO ___	WEIGHT, mg	WEIGHT, mg	SAMPLE SIZE 0.257	
ATM Air @ 50	SHIFT, in 0	REFERENCE	TIME CONST., sec	LOAD, g 10	
FLOW RATE 50 CC/MIN			dY, (mg/min) /in	dY, (10X), (mils/min) /in	
wpy					

$$\frac{\frac{3(6.0000)}{0.257}}{9.1(2)1.8} = 10.670$$

99

MEASURED VARIABLE

DUPONT Instruments

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Chart 21E1

Chart 21E2

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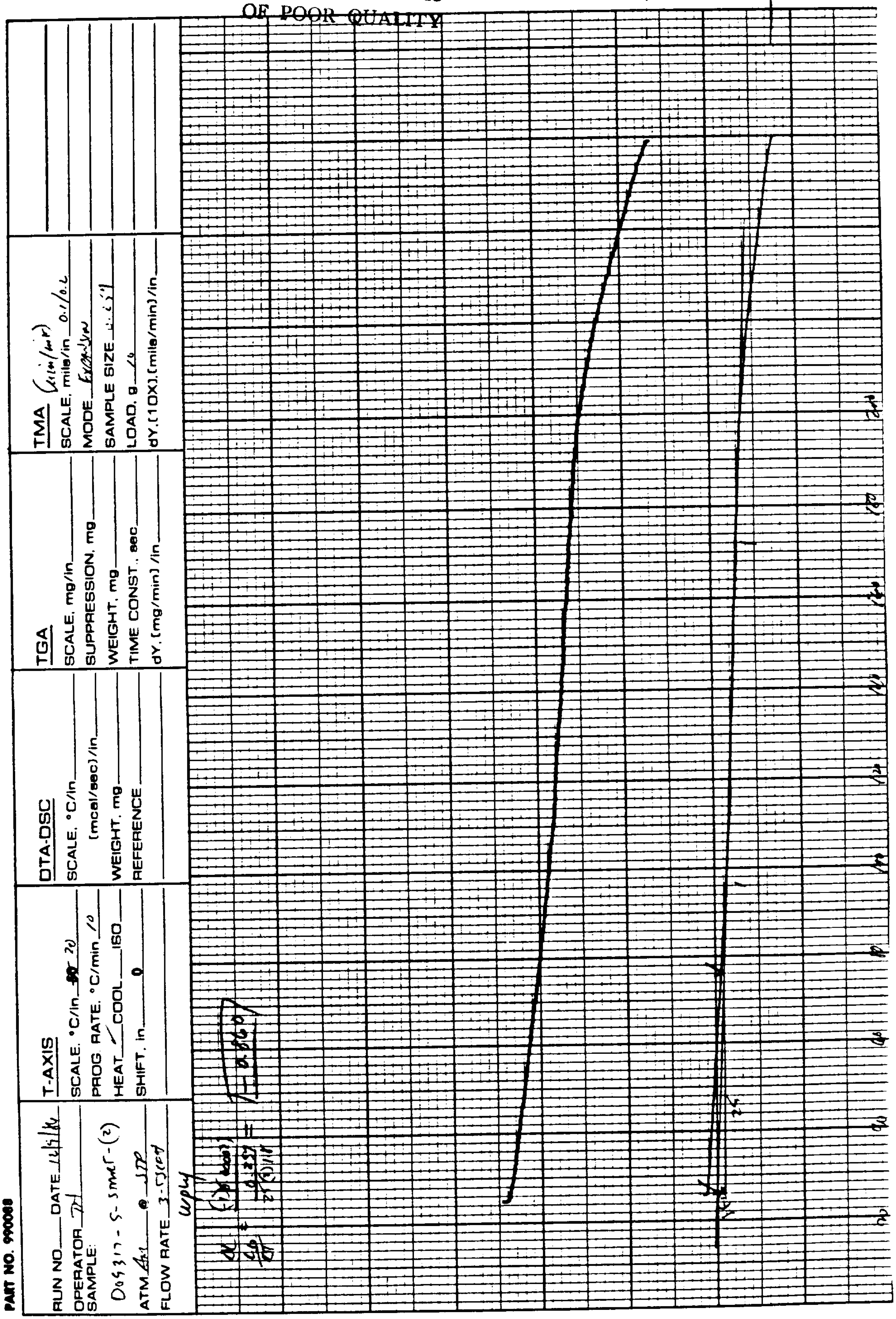

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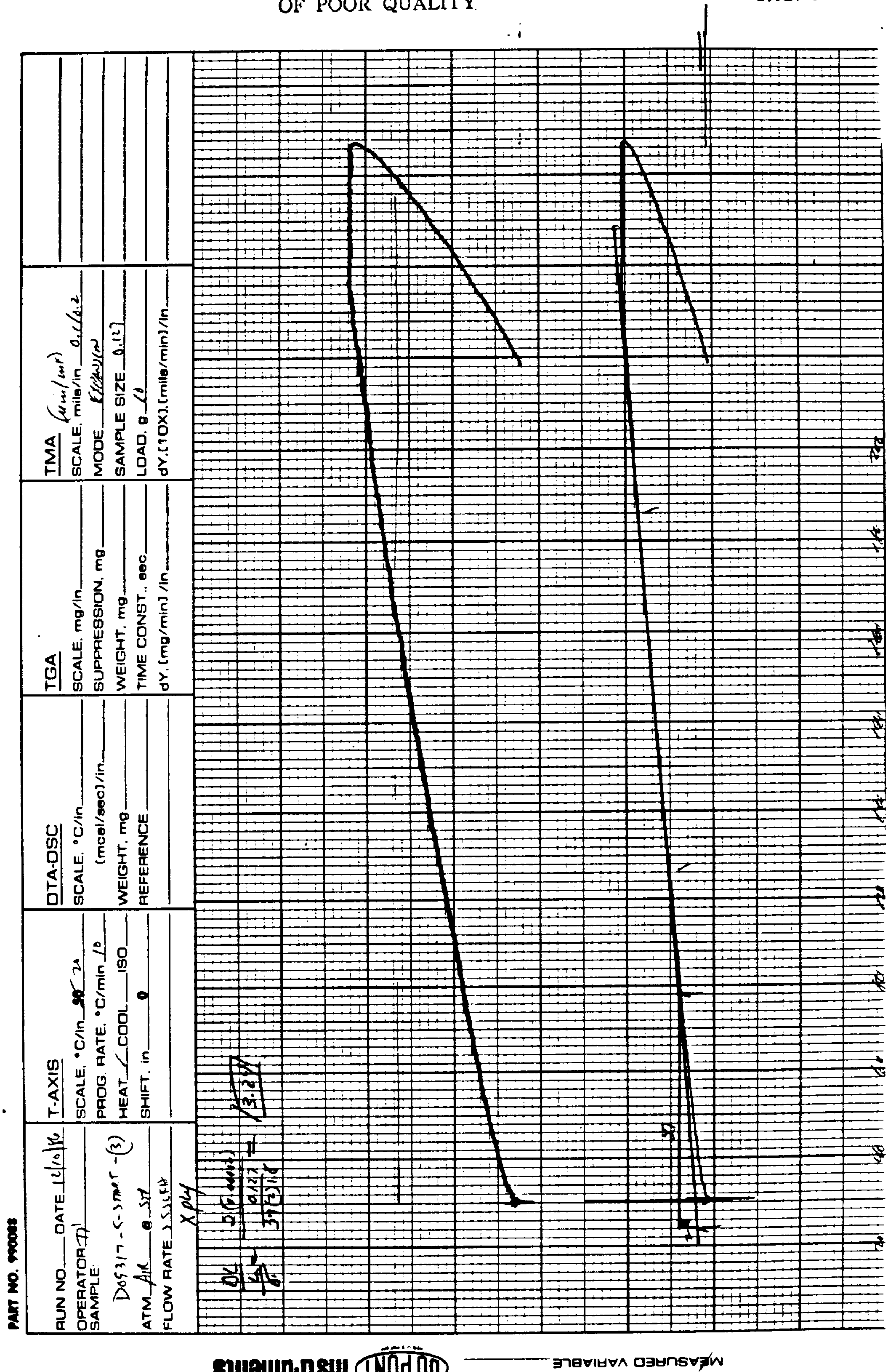
Chart 21E3



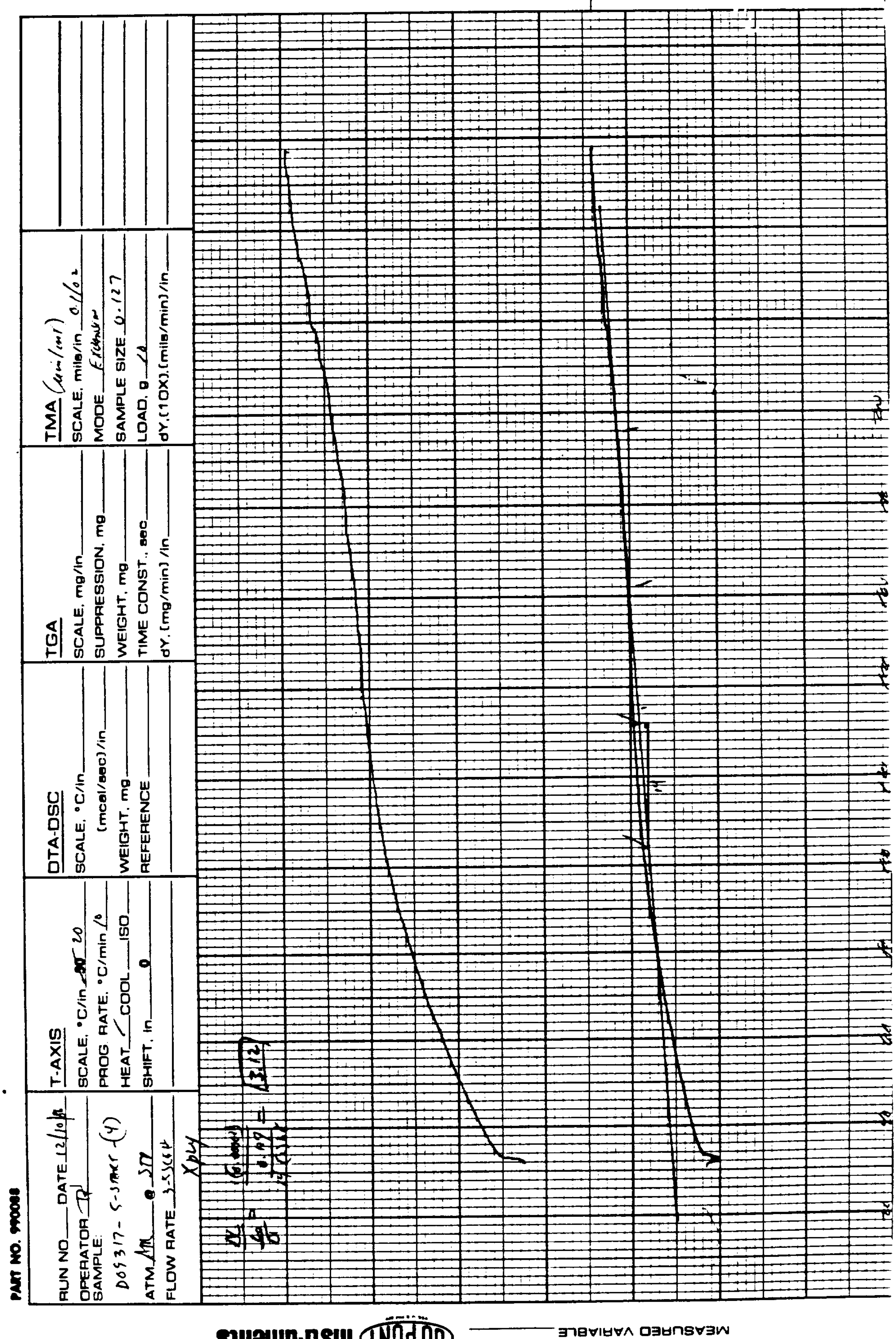


Chart 21F1

PART NO. 990088

RUN NO ___ DATE 12/11/86
OPERATOR DJ
SAMPLE:
D65317-6-3 mat-(1)
ATM Air @ SP
FLOW RATE 3 SCFH

T-AXIS
SCALE, °C/in 50 20
PROG. RATE, °C/min 10
HEAT ✓ COOL ___ ISO ___
SHIFT, in 0

DTA-DSC
SCALE, °C/in ___
(mcal/sec)/in ___
WEIGHT, mg ___
REFERENCE ___

TGA
SCALE, mg/in ___
SUPPRESSION, mg ___
WEIGHT, mg ___
TIME CONST., sec ___
dY, (mg/min) /in ___

TMA Lucite/Lu. F)
SCALE, mils/in 0.1/1.2
MODE Expansion
SAMPLE SIZE 0.257
LOAD, g 10
dY, (10X), (mils/min)/in ___

Cupel

MEASURED VARIABLE

DUPONT Instruments

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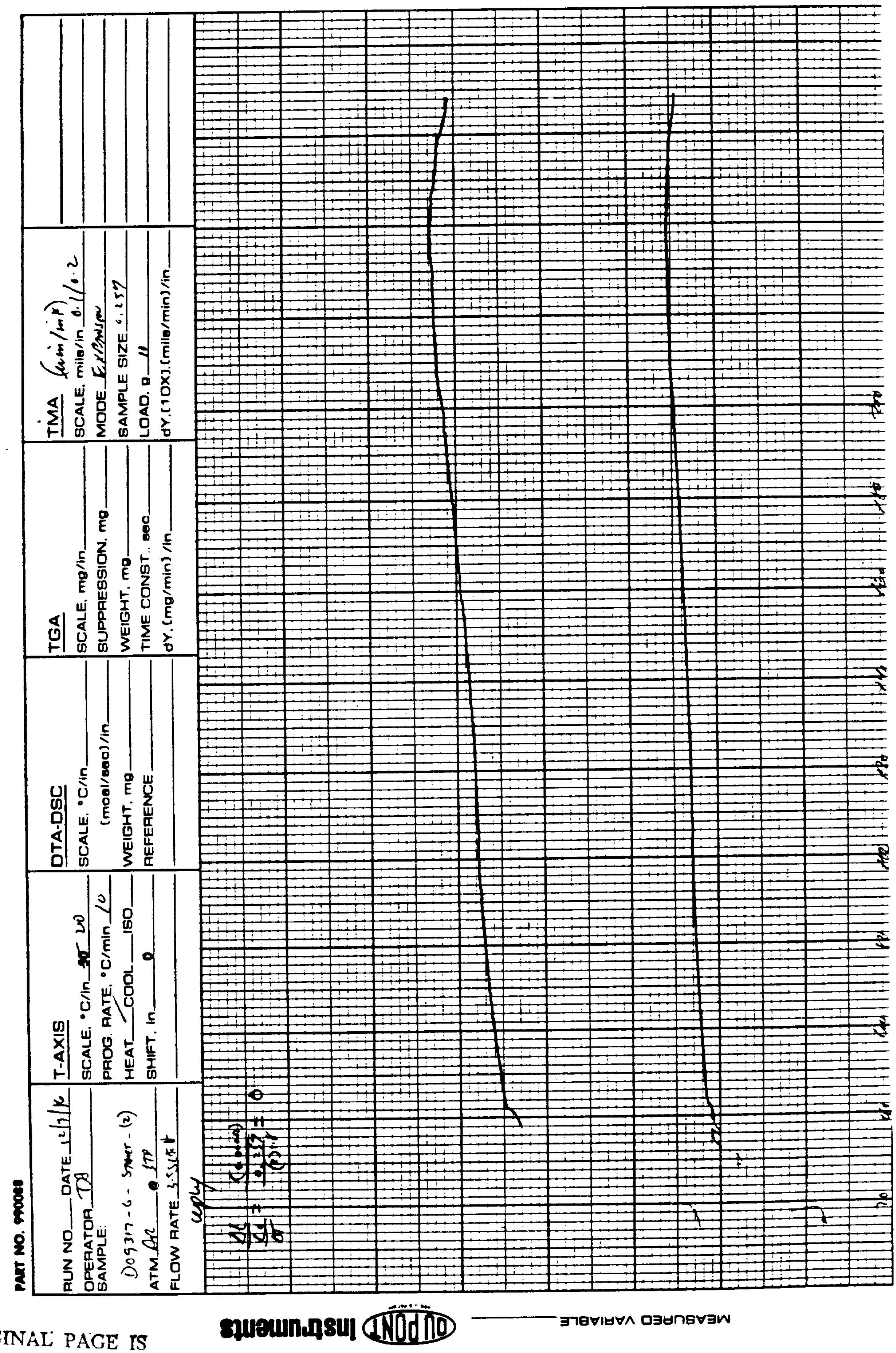
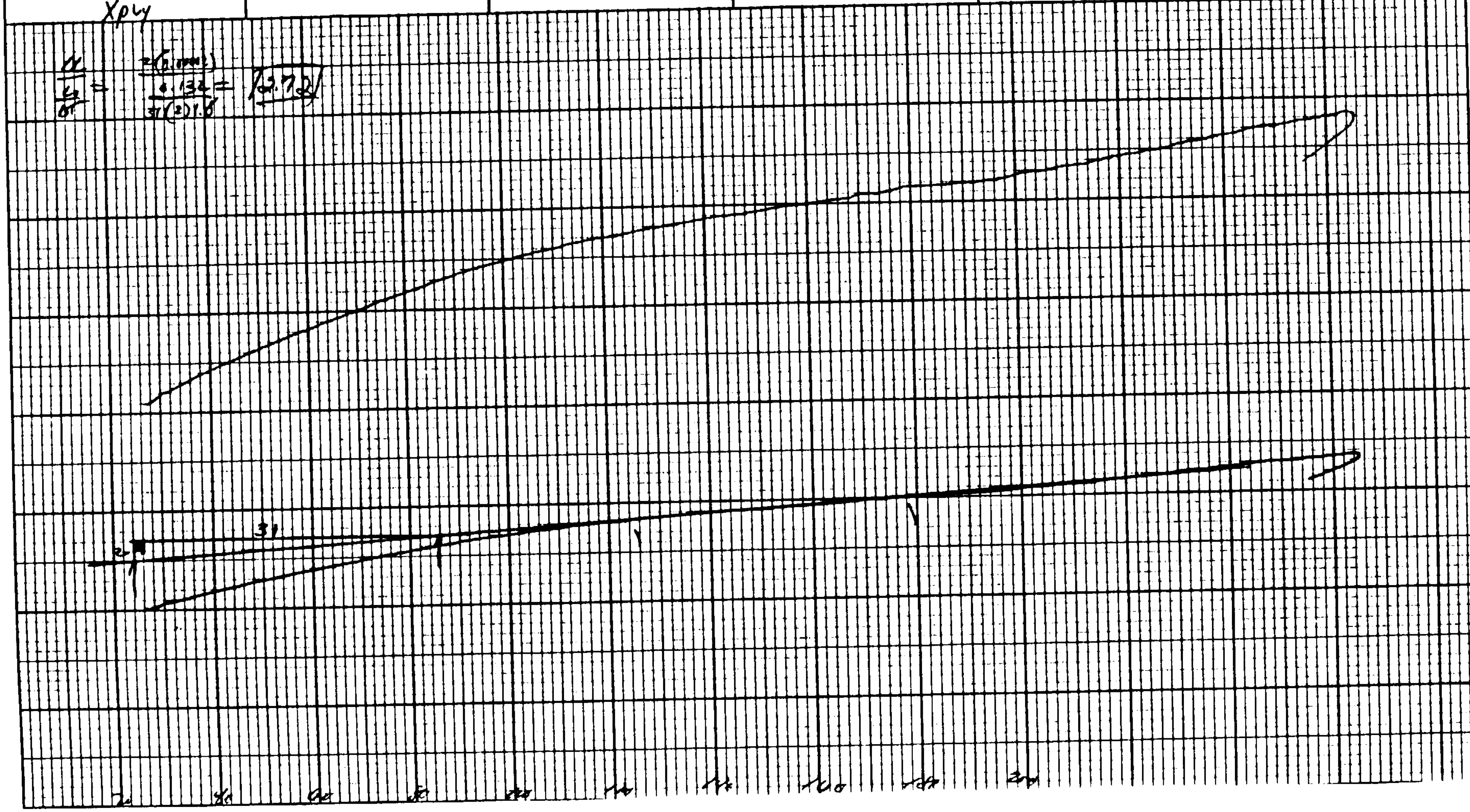


Chart 21F3

PART NO. 990088

RUN NO___ DATE 12/10/8	**T-AXIS**	**DTA-DSC**	**TGA**	**TMA** (mm/mm?)	
OPERATOR ___	SCALE, °C/in ~~50~~ 20	SCALE, °C/in___	SCALE, mg/in___	SCALE, mils/in 0.1/0.2	
SAMPLE: D05 317-C-Start-(3)	PROG. RATE, °C/min 10	(mcal/sec)/in___	SUPPRESSION, mg___	MODE EXPANSION	
ATM Air @ STP	HEAT ✓ COOL___ ISO___	WEIGHT, mg___	WEIGHT, mg___	SAMPLE SIZE 0.132	
FLOW RATE 3.55 (cf)	SHIFT, in 0	REFERENCE___	TIME CONST., sec___	LOAD, g 10	
			dY, (mg/min) /in___	dY,(10X),(mils/min)/in___	



DUPONT Instruments

MEASURED VARIABLE ___

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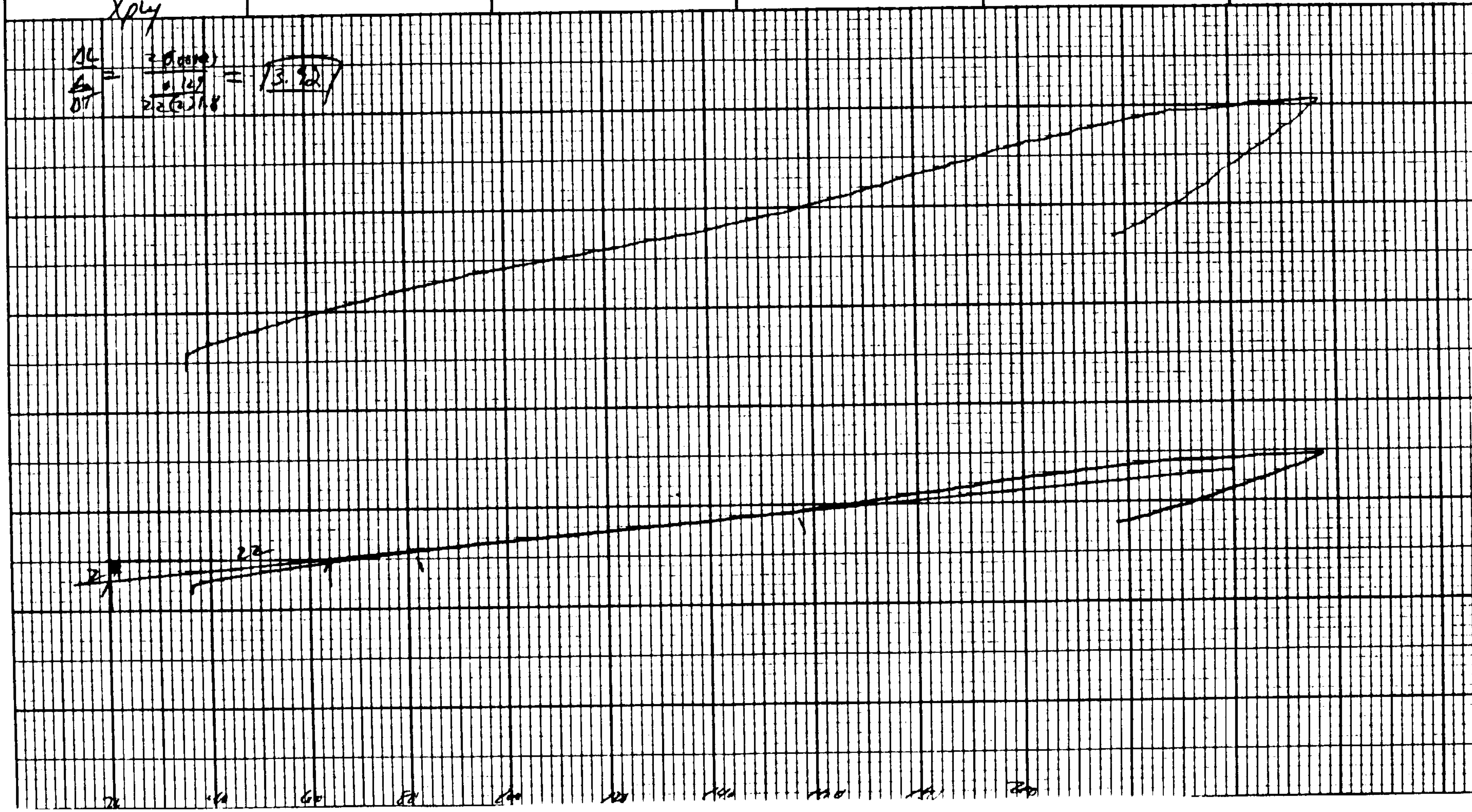
Chart 21F4

PART NO. 990088

RUN NO. ___ DATE 12/11/84	T-AXIS	DTA-DSC	TGA	TMA (in/in)	
OPERATOR DI	SCALE, °C/in 20	SCALE, °C/in ___	SCALE, mg/in ___	SCALE, mils/in 0.1/0.2	
SAMPLE: Dog 317 - 6-strut - (4)	PROG. RATE, °C/min 10	(mcal/sec)/in ___	SUPPRESSION, mg ___	MODE Expansion	
ATM Air @ STP	HEAT ✓ COOL ___ ISO ___	WEIGHT, mg ___	WEIGHT, mg ___	SAMPLE SIZE 0.129	
FLOW RATE 3.5 SCFH	SHIFT, in 0	REFERENCE ___	TIME CONST., sec ___	LOAD, g 10	
			dY, (mg/min)/in ___	dY, (10X), (mils/min)/in ___	



MEASURED VARIABLE

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