Final Report 275.03-72-11

on

A Survey of Compatibility of Materials with High Pressure Oxygen Service

prepared for

National Aeronautics and Space Administration
George C. Marshall Space Flight Center
Huntsville, Alabama

October 1972

NASA Order Number H-9 2180A
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I. Introduction

The Cryogenics Division of the National Bureau of Standards (NBS-CD) was recently requested by the Marshall Space Flight Center of the National Aeronautics and Space Administration (NASA-MSFC) to perform a survey and assess the existing state of knowledge regarding compatibility of materials with high pressure oxygen. Particular emphasis is to be placed on past practical operational and research experience.

Material compatibility, in general, implies a harmonious coexistence of all the materials of a system. The lack of such compatibility can lead to undesirable and sometimes disastrous results. For example, the chemical reaction of a combustible material with oxygen in a system results in corrosion, burning, or even explosion. It is clear that the general definition of incompatibility encompasses many phenomena. In this study, however, we have restricted ourselves to the consideration of materials exposed to high pressure oxygen. Because only high pressures are considered, any man-related incompatibilities are ignored. The harmonious coexistence of materials in a high pressure oxygen system implies the physical containment of the oxygen as well as the lack of significant chemical reactions with the oxygen. Thus compatible materials are defined, in this study, as those materials or combinations of materials with sufficient mechanical strength to withstand the high pressures and whose properties are not significantly degraded by the presence of oxygen. We will pay particular attention to the ease with which any degradation is initiated (reaction sensitivity), the rate at which degradation progresses (reaction intensity), and the sources of degradation

initiation (ignition sources). The dependence of these parameters on physical properties, such as thermal conductivity, specific heat, density, and heat of combustion, as well as system characteristics, such as pressure, pipe wall thickness, total mass, radius of pipe bends, and surface roughness, is considered. It is to be noted that the dependence on pressure is the primary consideration here; however, the interdependence of the effects of these characteristics makes it essentially impossible to analyze any one separately.

The objective of this survey is to gather the available information on the compatibility of materials with oxygen as applied to the production, transport, and applications experience of high pressure liquid and gaseous oxygen and to compile this material into a usable reference report. High pressure is here defined to be above about 2000 to 3000 psia. Since high pressure projections sometimes can be made from lower pressure data, some low pressure data are also included. Low pressure data are included if they are considered helpful to a better understanding of the behavior at high pressures.

It is anticipated that this technical input to NASA-MSFC will assist in the establishment of practical and safe, but not stifling, guidelines in the future use of high pressure oxygen. It is hoped that such guidelines will eventually be commonly accepted throughout NASA, other government agencies, and the commercial sector as well.

Recently, Clark (1971) of NBS performed a survey on oxygen compatibility of materials at ordinary pressures. Information from Clark's report which is especially applicable to high pressure application will be repeated for convenience. Surveys of oxygen related accidents have been conducted recently by Ordin (1971) and Johnson (1970) for NASA and by McQuaid and Cole (1972) for the Navy. Each of these surveys indicate a surprisingly high rate of accidents caused by material incompatibility. The surveys by Ordin and Johnson covered

NASA, some Air Force, and some related contractor records. Ordin reported 20% of the mishaps with liquid oxygen and 36% of the mishaps with gaseous oxygen involved material incompatibility. Johnson reported 56% were caused by the presence of oxygen incompatible materials. In many cases more than one factor was involved in the mishaps. For example, procedural errors were involved in 78% of the mishaps and design errors were present in 63% of the mishaps according to Ordin. Even though material incompatibility with oxygen was present in fewer instances than procedural or design error, the percentage due to incompatibility is significantly large and it is expected to be even higher in high pressure oxygen systems. It is also noted that the accident rate due to material incompatibility in high pressure gaseous oxygen is almost twice that in liquid oxygen.

McQuaid and Cole's (1972) survey indicates an accident in a Navy compressed gas system due to spontaneous ignition every four weeks during the period January 1968 to May 1971. They do not indicate what proportion of these are due to material incompatibility, but do state that material failure accounts for about half of these accidents; the cause of the other half is unknown. No accidents are attributed to design failure or personnel error. From this information one can not rule out that a sizable proportion may be due to material incompatibility.

Recent trends in NASA, military, and commercial use of liquid (LOX) and gaseous (GOX) oxygen point toward use of higher pressures. With this increased use to 10,000 psi and higher, compatibility considerations are of paramount importance. Deep concern with safety is rightfully prevalent throughout the field, both by the producer and the user. This survey will better define material incompatibility problems and hazards caused by the use of high pressure LOX and GOX. This report contains recommended guidelines in later sections which will hopefully allow the necessary flexibility and compromise between cost - effectiveness and

safety. Also included is a tabulation and assessment of available high pressure compatibility data and an indication of the availability of equipment. The next section is a discussion of the compatibility parameters affecting the selection of materials for high pressure oxygen service. Following sections include discussions on structural integrity, chemical compatibility, and experimental tests and data which characterize the relative compatibility of different materials.

II. Material Selection

The selection of a given material to fulfill a specified function in high pressure oxygen service must be based both on its physical-mechanical properties as well as its chemical properties. The principal chemical property of interest here is its potential reactivity with oxygen. The relevant physical-mechanical properties are primarily strength and plastic deformation properties. For example the plastic deformation of polytetrafluoroethylene may make it unusable for a valve seat material at sufficiently high pressure and copper may be too weak for a pressure chamber, even though they may be judged chemically compatible with oxygen. Also, the designer needs to consider that plastics and nearly all metals become more brittle at LOX temperatures. Other properties such as specific heat, thermal conductivity, density, and thermal diffusivity influence material compatibility. For example, nickel-copper alloys are rapidly replacing stainless steel in high pressure oxygen systems because of the increased thermal conductivity and diffusivity of the nickel-copper alloys. The higher thermal conductivity results in lower reaction sensitivity. Also, mechanical properties may be altered in the presence of high pressure oxygen, e.g. crack propagation may be enhanced.

Several good reviews of lower pressure oxygen compatibility have been written. Many of these contain information basic to the understanding of the higher pressure phenomena. The most recent review is by Clark (1971);

other noteworthy reviews and technical papers are by Pelouch (1972), McQuaid and Cole (1972), McKinley (1971), Attwood and Allen (1971), Ordin (1971), Schwinghamer (1971), Keeping (1971), Blackstone and Ku (1971), Johnston (1970), Kimzey (1970), Guter (1967), Olson (1967), White and Ward (1966), Nihart and Smith (1964), Baum, Goobich, and Trainer (1962), Dean and Thompson (1961), Van Dyke (1959), and Grosse and Conway (1958). An assessment of the views presented by these authors along with our own views are described in this report.

Of particular interest is the work on oxygen safety by the Aerospace Safety Research and Data Institute (ASRDI) at NASA - Lewis Research Center. They will be publishing, soon, a series of NASA Special Publications entitled "ASRDI Oxygen Technology Survey: - - - - -" covering the subject areas of metals and alloys, cleaning requirements, hardware, and contamination control. Of special interest for material selection is the report in this series by Pelouch (1972). Another pertinent report of this series is a state-of-the-art survey on oxygen instrumentation, including a section on pressure measurement. This survey is being performed by the Cryogenics Division, NBS, Boulder. ASRDI has also collected a large amount of oxygen safety related information into a computerized data retrieval system called RECON. These reports and the readily accessible data bank should be very helpful for assessing specific problems.

An extensive treatise on the subject of material selection for application in manned spacecraft is NASA MSC-02681 (1972). This volume contains more general technical information and design guidelines regarding oxygen compatibility than any other single reference work. It is not addressed toward problems associated with high pressures; however, as is stressed later, low pressure guidelines are directly applicable at high pressure as well.

A. Structural Considerations

Prior to chemical reaction considerations, one should be assured that the material selected for a given application is structurally adequate. If the material is not structurally adequate there is little point in assessing its chemical compatibility. The physical - mechanical properties of interest for high pressure service are strength, hardness, mechinability, brittleness, thermal expansion, etc. Data necessary for structural design can be found in many sources. A few recent sources are Aerospace Structural Metals Handbook by Weiss (1966), Cryogenic Materials Data Handbook, Schwartzberg (1968), and Materials Properties Data Handbook by Aerojet Nuclear Systems Company (1970), NATO-AGARD (1959).

ASRDI recently contracted Linde Division of Union Carbide Corporation to report on their vast experience in design and handling of oxygen systems. The resulting report, Linde (1971), includes a section on "Structural Compatibility" with emphasis on thermal expansion problems encountered with LOX equipment.

B. Chemical Reaction Consideration

Chemical reactions with system materials are important in that the material properties may be altered to the point of system failure. Material incompatibility here is generally synonymous with oxidation or burning. Important factors in the consideration of oxidation are reaction sensitivity, reaction intensity, and ignition sources. The effect of high pressures on these factors and ultimately on equipment design is essentially the subject of this study.

1. Reaction sensitivity

Reaction sensitivity is a measure of how readily a material will react with oxygen. Most of the experimental tests performed to characterize oxygen compatibility (described in a later section) are directed toward obtaining a measure of reaction sensititivy. Examples of reaction sensitivity tests are those involving reactions initiated by impact, by heating, or by electric arc. The variable most important to reaction sensitivity is the

ignition temperature of the material. However, this may be considerably altered by the presence of oxide coatings or contamination. It is to be noted that many of the materials tested include contamination or impurities. Oxide coatings on metals usually raise the apparent ignition temperatures; while contaminants generally lower the ignition temperature. Impurities such as oil or grease, rust, metal filings, etc. on metals usually drastically increase the probability of reaction. Other factors which are significant in the consideration of reaction sensitivity are specific heat, thermal conductivity, density, thermal diffusivity, and material configuration.

The ignition temperature is the most critical factor in determining a material's reaction sensitivity. As will be shown later, the ignition temperature of a solid generally decreases with increasing pressure up to about 2000 psia. Above this pressure the ignition temperature is relatively independent of pressure. Thus, the reaction sensitivity is not expected to change appreciably at higher pressures. However, the possibility of ignition at higher pressures is enhanced because the possibility of the release of sufficient energy is greater.

2. Reaction intensity

Reaction intensity is a measure of the rate of energy release of the reaction once it is started. The importance of reaction intensity to material selection is discussed by Blackstone et al (1971), (1970), (1967) and Jamison (1971). Reaction intensity determines to a large extent the degree of damage done to a system, the speed with which the damage progresses, and the ability of the reaction to spread to other materials in the system. The factors which most influence reaction intensity are heat of combustion and oxygen availability. Oxygen availability is determined by temperature, volume, pressure, and rate of flow. Other factors influencing reaction intensity are material density, configuration (e.g. the size of the heat sink) and the properties of combustion products. Reaction intensity is expected to be greater in high pressure systems due to the increased availability of oxygen and concomitant increased burning potential.

3. Ignition Sources

It is often stated that a reaction is only possible in the presence of a fuel, an oxidizer, and an ignition source. This statement is of little consolation in an oxygen system when one realizes that the fluid is the oxidizer, the system is the fuel, and ignition sources are ever-present in varied forms. Probably the most important source of ignition in a high pressure system is the heating due to rapid adiabatic compression. The use of materials with high thermal diffusivity and high heat capacity are most beneficial here since the most rapid rates of heating by compression are not appreciably faster than the effective surface cooling rate of good heat conductors.

Another important source of ignition is impact, such as by small particles or built pieces in a flowing stream of oxygen. Heating caused by friction and static discharges can also ignite system components. In high pressure systems the probability of ignition is greater because of increased likelihood of encountering high temperatures and possible lowered ignition temperatures. High pressures generally also result in greater flow velocities, increased impact energies, and frictional heating effects.

A chemical reaction of significance that is seldom considered is the fracture or crack propagation enhancement by an oxygen atmosphere. The fatigue behavior of a high pressure oxygen container is very critical, particularly if the pressure is cycled, yet very little work has been done [Linde (1971) and Baum, Goobich, and Trainer (1962)]. Crack growth enhancement has been reported for a titanium alloy by Jackson et al (1963) and the absence of any enhancement for a nickel alloy has been reported by NASA (1970). This is an area of investigation that has been sorely neglected and, therefore, projections to high pressure are impossible.

C. Recommended Selection Procedure

As indicated earlier, it is best to first select materials which physically fulfill the mechanical demands of the component considered. These materials are then analyzed to select the most chemically compatible material. This selection process is often based upon the material ranking of a given compatibility test. Or it may be based upon the concensus of the material ranking recommendations found in the literature, as is also frequently advocated. However, we believe that both of these suffer from two serious drawbacks: (1) no consideration is given to the uniqueness of the particular demands of the application in question and (2) the materials ranking recommendations based upon the results of individual investigations often are highly contradictory. These contradictory results are frequently due to the specialized nature of the test and the biased interpretation of the results. A case in point is the wide disparity in the ranking of aluminum and stainless steel reported by various investigators: Dean and Thompson (1961), Kirschfeld (1961), (1965), (1967) and (1968), and Nihart and Smith (1964). We believe the material selection process should be accomplished by matching the particular demands of the equipment component with the materials best satisfying these demands. Material selection on this basis assumes the existence of several types of compatibility and physical properties data for these materials. For example, if a component is likely to be impacted but not likely to be in a high temperature environment, materials with a low impact sensitivity should be considered regardless of their ranking according to ignition temperature. This procedure, apparently already used by NASA, is discussed in the report NASA, MSC-02681 (1972). The importance of equipment design, as discussed in other parts of this report, should not be ignored. For example, the introduction of slow opening valves and heat sinks, whenever possible, will reduce the probability of ignition by adiabatic compression.

The following is a priority sequence of guidelines that should be followed when selecting materials for oxygen use in the presence of ignition sources. Of course any considerations must include the effects of possible contaminants in the system.

1. Eliminate ignition - select a material which is least likely to ignite under the operational conditions.

2. Prevent continued reaction - select a material which tends to quench the reaction after ignition.

3. Reduce the rate of reaction - select materials which react as slowly as possible after ignition to permit the control of the reaction.

These recommendations encompass those suggested by McKinley (1971) and recommended by NASA - Myers (1971). The first guideline is most likely satisfied by selecting the material with highest ignition temperature but is also affected by the presence of oxide coatings or the possibility of inter-material reactions. For example, it has been reported and discussed by Key (1968), (1964), Ordin (1971), and Keeping (1971) that chlorofluoro compounds may react strongly with aluminum under shear forces. This reaction may be sufficient to ignite aluminum in the presence of oxygen. Iron rust according to Keeping (1971) significantly lowers the ignition resistance of aluminum in oxygen. Materials with a high thermal diffusivity are better in dynamic systems since local energy impulses will result in less pronounced hot spots than with low diffusivity materials. In a static system high thermal conductivity materials are more desirable for essentially the same reason. Materials whose melting point is higher than the ignition temperature should be free of sharp edges. The presence of sharp edges may result in hot spots for ignition. If the ignition temperature is sufficiently above the melting point, sharp edges will probably be smoothed by melting before ignition occurs. This has been reported to be the case for aluminum by Keeping (1971).

The second guideline, selecting a material which tends to quench itself, is influenced by several factors. The heat of combustion is the most important. If it is sufficiently low, the heat may be conducted away rapidly enough to quench the burning. The reaction products may also interfere with continued oxidation. For example, slag buildup has been reported to have a quenching effect in iron.

The materials portion of the third guideline, select slow burning materials, is affected by essentially the same factors. However, one can also utilize good design to slow down the reaction. For example, one might insert a nickel-alloy pipe section in a predominantly stainless steel pipe. The nickel alloy section, having a lower reaction intensity, would either quench or slow a reaction propagating along the pipe. The shape and size of components at strategic points in a system can be significant in controlling a reaction. Thermal anchoring of potentially reactive components to a cold heat sink can also be useful in curtailing a burn. A rapid operating system to shut down the oxygen supply upon detecting a malfunction may prevent extensive damage, unless the initial burn occurs with explosive violence. Limiting the oxygen availability by restricting oxygen flow where possible is desirable for control purposes.

Material ranking lists are most useful for design purposes if they are clearly identified as to the experimental tests upon which they are based. McKinley (1971) has compiled ranking lists based upon individual past tests. These lists and the recommendations in NASA, MSC-02681 (1972) should be consulted for material selection. The results of various compatibility experiments along with physical property data, such as melting and vaporization temperatures, thermal conductivity, specific heat, and heat of combustion,' are sometimes combined to produce a weighted index of oxygen compatibility. Such an equation has been used by Linde Division of Union Carbide Corporation [Carlson (1971)]. The critical point of setting up such an equation is the choice of the weighting factor for each parameter in the

equation. In our opinion, the importance of ignition temperatures can hardly be overstressed at high pressures and the prevention of ignition should be the principle goal. Next we will discuss tests which have been devised to characterize these properties and then summarize the data which have been obtained with these tests.

III. Material Compatibility Tests

A test to measure the compatibility of a material with oxygen basically consists of placing the material in oxygen in the presence of an ignition source and observing the sensitivity or intensity of the reaction. The tests may be conducted under different conditions, such as at different temperatures, pressures, or ignition energies, to determine any dependence on these variables. The kinds of tests possible are limited primarily by the number of possible ignition sources. However, most tests are quite realistic in simulating working conditions and common ignition sources. Somewhat arbitrarily, these tests are described below by the following ignition categories: impact, thermal, electric arc, abrasive, and fracture. Also discussed are environmental and configuration tests which involve various forms of ignition in simulation tests. There are also many experiments designed to measure specific thermodynamic properties, such as heat of combustion, thermal conductivity, specific heat, or melting point. Strictly speaking, these are not compatibility tests, but do provide a basis for understanding the results of compatibility tests. Most compatibility tests are concerned primarily with resistance to ignition (reaction sensitivity) but some also are designed to measure the burning rate or quenchant behavior (reaction intensity) after combustion is initiated.

One of the most probable ignition mechanisms is by impact in the presence of oxygen; be it by dropping a wrench in an oxygen spill (mechanical impact), by impinging a piece of weld slag on the bend of an oxygen pipeline (particle impact), or simply by rapidly opening or closing a high pressure valve (pneumatic impact). Each of these conditions are simulated by a particular impact compatibility test method.

The most common version of an impact test is the Mechanical Impact Test developed by Lucas and Riehl (1960). This test has been used extensively and has resulted in an enormous number of data, Key (1963), (1964), (1966), (1968), Jamison (1970), and NASA, MSC-02681 (1972). It

is one of only two ASTM standard tests for oxygen compatibility, ASTM (1970). The test is conducted by imparting a known amount of energy from a falling plummet to a striker pin which is in contact with the specimen in the presence of liquid or gaseous oxygen and any reaction is noted. The test is relatively simple and readily adapted to variable pressure and temperature. Compatibility by this ASTM test is defined as no reactions out of 20 impacts with the plummet impact energy adjusted to 70 ft-lbs. Key (1968) indicated that this go-no-go test has been remarkably successful in rejecting incompatible materials. However, the arguments described in the next paragraph suggest that the poor repeatability inherent in the test may lead to the rejection of some compatible as well as the incompatible materials. Blackstone and Ku (1971) have gone so far as to suggest that this test has also passed some unacceptable materials.

The mechanical impact test procedure has undergone extensive criticism by Blackstone (1970), Blackstone and Ku (1971), Blackstone, Baber, and Ku (1967), Burmeister, et al (1967), Reynales (1958), (1961), Staph et al (1962), and Jamison (1970). The criticism indicates essentially that the statistical procedure of the test is at fault rather than the test apparatus per se. Schwinghamer (1972) has refuted some of this criticism. A different statistical approach has been recommended by Jamison (1971) as a consequence of this criticism. Instead of accepting a material if it doesn't react in 20 tests at 70 ft-lbs, the test would be repeated 20 times at different energies to find the energy at which 50% reactions are obtained. This energy (determined from the drop height of the falling weight) is used to indicate the relative impact sensitivity of the material. This method is referred to as the Bruceton or "up-and-down" method of mechanical impact testing. According to Jamison (1971) the "up-and-down" method of impact testing, as an alternative to the go-no-go test, is both efficient and repeatable. That the Bruceton method is more repeatable than the go-no-go test is intuitively reasonable; however, the go-no-go test is less time consuming and therefore is considered useful

as a screening test if the occasional rejection of an acceptable material is permissible. Blackstone and Ku (1971) and Jamison (1971) give historical accounts of the development from the first impact testor described by Lucas and Riehl (1960) to current models. As a result of recent attempts to improve the mechanical impact test it has been suggested that reaction intensity testing should also play a major role in material selection in conjunction with reaction sensitivity testing. Jamison (1971) has pointed out that the improved repeatability of the Bruceton method of impact sensitivity testing shows that materials are not significantly different in sensitivity. However, he indicates that these materials differ widely in intensity since some of them react violently and are totally consumed while others are only slightly charred. It appears that further statistical considerations may be in order here to take advantage of both techniques rather than to reject either totally.

Another form of impact test which has been used considerably is the Pneumatic Impact Test. The pneumatic impact test is designed to simulate the adiabatic compression resulting from a rapidly opening high pressure valve. It is usually performed in just that way with a small specimen containing test chamber suddenly opened to a high pressure reservoir. The adiabatic compression test uses the highest pressures of all the compatibility tests, except for a variation of this test using explosively generated shock waves.

Adiabatic compression tests involve the study of material ignition in the compressively heated oxygen gas. The absolute temperature, T, of an ideal gas under adiabatic compression as a function of pressure, P, for an ideal gas is given by

$$T = T_o \left(\frac{P}{P_o}\right)^{\frac{n-1}{n}}$$

where T_o and P_o are initial temperature and pressure, respectively and n is the ratio of specific heat at constant pressure to specific heat at constant volume and is about 1.4 for oxygen. Nihart and Smith (1964) plotted values of T versus P for T_o = 273 K and P_o = 14.7 psia. At 10,000 psia T is 1900 K which is sufficiently high to ignite almost any structural material. Whether ignition actually occurs is determined by the temperature of the material and not just the temperature of the compressed gas. Thus the transient thermal characteristics of the system are important. The thermal diffusivity, heat capacity, and other factors such as the existence of sharp edges, determine the peak temperature of the material. For these reasons an adiabatic compression test is most meaningful if performed on a system rather than on a specimen of material.

The Particle Impact Test is the least used of the impact tests; however, its importance should not be neglected especially in high pressure systems. This test is performed by impacting particles in a flowing oxygen stream with a test specimen and any resulting reaction is recorded. This test is conducted at various temperatures, pressures, flow rates (velocities), and particle size.

Thermal tests are those in which the ignition source is essentially the temperature of the specimen and its environment. In reality, all ignition sources are thermal in that a local hot spot must be created for ignition to occur. Classed as thermal ignition tests are bomb tests, promoted ignition tests, and hot wire tests. The Oxygen Bomb Test, described by Nihart and Smith (1964) and Guter (1967) is performed as follows: a specimen is placed in an oxygen filled bomb. The temperature of the contents of the bomb is gradually raised until ignition occurs, as indicated by a rapid rise in temperature, visible flash, or audible explosion. The temperature at which ignition occurs is called the self- or auto-ignition temperature. The pressure in the chamber during the controlled temperature rise may be either constant or allowed to rise with increasing temperature. In some cases the specimen

is exposed to oxygen only after equilibrium has been reached at each temperature and the specimen is changed after each such measurement. The Oxygen Bomb Test can be used to determine gaseous oxygen compatibility of metals or non-metals in the solid, liquid or gaseous states. The Pot Test described by Guter (1967) is similar to the Bomb Test except the Pot Test is done at standard pressure and with flowing oxygen. It frequently is intended to simulate actual conditions of use and with it one can assess flow effects.

Promoted Ignition Tests are performed by burning an ignition promoting material in the presence of a specimen. Many materials have been used for promoters, however, the best materials are those that do not significantly effect the composition of the specimen surface as the promoter is burned. Contamination of the surface of the specimen by the promoter can change the specimen's ignition characteristics and thus produce erroneous results. The amount of specimen consumed by the burning of a fixed amount and type of promoter or the amount of promoter required to consume the entire specimen is used as a measure of its resistance to combustion.

The Hot Wire Test is conducted by heating a metal wire in a gaseous oxygen atmosphere. An electrical current is passed through the wire, resulting in I^2R (or Joule) heating. The temperature is increased with increasing current, resulting eventually in the wire either igniting or melting. This test can only be used on metals below their melting temperatures and its only advantage is simplicity.

Probably the most tragic oxygen accidents have involved electrical ignition sources such as electrical arcing from associated electronic equipment. The Flash and Fire Point Test, used primarily on organic materials, is performed to simulate these conditions by using an electric arc to ignite a specimen in an oxygen filled chamber. The temperature of the chamber is raised and the electric spark is generated periodically near the specimen. The temperature at which a momentary ignition occurs is defined as the

flash point; the temperature at which sustained burning occurs is called the fire point. At high oxygen pressures the flash and fire points are coincident. The relationship of flash and fire points and auto-ignition temperatures (see oxygen bomb test) is not known specifically. Intuitively, one would expect that the auto-ignition temperature is equal to or greater than the flash and fire temperature; the experimental data presented later indicate that at high pressures there is little difference between these temperatures.

Galling caused by two pieces of metal rubbing was projected as one of the possible causes of an oxygen tank truck accident and there have been a few Abrasive Tests to study such phenomena. Also the abrasive effect of fine particles in a flowing oxygen stream has been and is being studied.

A highly probable yet seldom observed accident source is Fracture. The exposure of a fresh clean surface of some metals to oxygen can cause a violent reaction. Various methods have been used from straight tensile tests to puncture by bullets or other projectiles, Jackson et al (1963). Even the effect of the projectile size and material has been considered.

Configurational - The final test of oxygen compatibility for any material is whether it will ignite in its final configuration, complete with adjacent materials and possible contaminants. Because of our lack of understanding of the ignition and combustion of metals, most critical applications also undergo an environmental test. Artificial ignition of wire harnesses or clothing, hyperbaric testing of breathing apparatus, and overloading liquid oxygen pumps are all examples of this category. These tests will always be indispensable, especially where safety is of prime concern.

In view of the controversies which exist regarding the value of various testing techniques, it is recommended that an independent group, such as NBS, study these methods and test results, using whatever expertise is necessary to establish standardized test procedures for liquid and gaseous oxygen compatibility testing. Any recommendations should be flexible enough to include new

methods or procedures as they are proven useful. As a consequence of the recent and thorough survey by Johnston (1970), it was concluded that there is considerable concern for better and improved materials selection and testing methods and safety criteria. This plea has been repeated often since 1957 with apparent little effect. Recent activity in test development and reanalysis by NASA-ASRDI may be a partial answer to these recommendations.

IV. Material Compatibility Data

A not insignificant portion of the materials compatibility data is unpublished. Some is difficult to obtain from the "unpublished" literature and it is especially hard to obtain corporate data. However, this is not to say that data are lacking for most technical materials. There are considerable data available, but, in some instances the inconsistencies produce a confusing picture. The principal sources containing information regarding the effect of pressure on oxygen compatibility are Attwood (1971), Baum (1962), Dean (1961), Guter (1967), Kimzey (1970), Kirschfeld (1961), (1965), (1967), (1968) and NASA MSC-02681 (1972). High pressure data from these and other sources are tabulated in Appendix I. One extensive set of unpublished data included in Appendix I is from John Austin, Marshall Space Flight Center (1972). An extensive tabulation of test data, contained in Appendix E of NASA MSC-02681, (1972), is reproduced for convenience as Appendix II. Appendix II contains the high pressure compatibility test data of both metals and non-metals, not just non-metals as indicated by the title of the source document. The document, NASA MSC-02681 (1972) is periodically updated to include the most recent NASA test data. Additional updated copies may be obtained from

Chief, Reliability Division
Code NB
NASA-Manned Spacecraft Center
Houston, Texas 77058.

In several instances, data have been reported and conclusions have been drawn by the investigators which can not be neatly tabulated in Appendix I

or are difficult to summarize briefly. These data, often resulting from configuration and other non-standardized tests, are, however, very useful in assessing the oxygen compatibility of materials. To make some of these results more readily available, the summaries, conclusions, and recommendations of these papers are presented in Appendix III for the convenience of the reader. For additional detailed data, the reader is referred to the references. We are not including further summarization of these papers individually, see for example McKinley (1971); however, some of the generalizations which follow are based on the results of these papers.

The sources of oxygen compatibility information include considerable data below 3000 psia; these data are not tabulated in Appendix I unless they are useful for projections at higher pressures. The discussion of these data is separated into sections on (A) Metals and (B) Non-Metals. In Appendix I, metals are further separated into (1) Pure Metals and (2) Alloys. The non-metals are divided into (1) Halogenated Compounds, (2) Non-Halogenated Plastics, (3) Sealants, Threading Compounds and Lubricants, (4) Elastomers, and (5) Miscellaneous. The format of the tables in Appendix I is chosen to be similar to the format of NASA MSC-02681 (1972).

Table 1 contains miscellaneous thermal data for pure metals and alloys as well as a few selected polymers. These data are useful in the selection of materials for high pressure oxygen service.

A. Metals

McKinley (1971) has done a complete and objective review of the literature on ignition and combustion of metals. He includes both low and high pressures and compiles metal ranking lists according to various experiments. These lists show that nickel and copper and their alloys are most suitable for oxygen service. They also suggest that neither aluminum nor iron alloys (including stainless steel) are highly desirable. Stainless steels, however, are generally more oxygen compatible than aluminum. The overall

Table 1 - Miscellaneous Thermal Data on Metals and Alloys

Material	Reference(s)	Ignition Temp. (K)	Melting Temp. (K)	Thermal Conductivity at 300 K (W/cm K)	Thermal Diffusivity at 300 K (cm^2/sec)	Heat of Combustion (J/g)
Aluminum		1000	933	2.2	0.86	31,000
Copper		1300	1360	4.0	0.28	2,400
Gold		does not ignite	1336	3.1		
Iron		1200	1812	0.8	0.052	7,000
Nickel		1730	1730	0.6	0.035	4,000
Silver		does not ignite	1233	4.0	0.38	142
Brass		1273	1183	1.0	0.074	3,600
Inconel		1620	1670	0.11	0.008	4,700
Hastelloy		1600	1640	0.11	0.008	5,000
Monel		1520	1600	0.25	0.016	3,400
Cr Steel		1423	1670	0.30	0.02	7,700
300 and 400 Stainless Steels		1400-1670	1670	0.15	0.01	8,000
Carbon Steel		1365	1780	0.80	0.05	7,500*
Polyethylene		450	~400	0.004	0.002*	9,000
Nylon		475	~ 500	0.003	0.002*	7,000
Teflon		700	~ 600	0.002	0.002*	1,100

* Approximated

ranking suggested by Clark (1971) is in general agreement with these lists. Pelouch (1972) has also presented material ranking lists as a function of such parameters as strength, reaction intensity, volume, etc. and reaches essentially the same conclusions. Considering the lack of contradictory evidence at higher pressures, it is reasonable that these rankings would also be valid at high pressures.

The existing compatibility data can be summarized as follows. The ignition temperatures of metals decrease with increasing pressure. However, there are insufficient data available to quantitatively define this pressure dependence for but a few metals over relatively small pressure ranges. Figure 1 illustrates the available ignition temperature data which approach the high pressure range. It is interesting to note that the nickel alloy curve crosses the steel curve, suggesting the possibility that steels may be better suited for high pressure service. The ignition temperature data presented by Nesgorov et al (1968) were normalized to unity at low pressure. To obtain the data attributed to Nesgorov presented in figure 1, we used the low pressure ignition temperature values for nickel alloys and steels as listed in Appendix I. No ignition temperature data exist above 2000 psia. There appears to be a definite need for a careful measurement of ignition temperature as a function of pressure up to at least 10,000 psia for some of the more technically important metals. The effect of specimen size and shape should also be investigated.

The burning rate of metals varies as the square root of pressure and inversely with cross-sectional area at low pressures; but at higher pressures burning rates decrease, Kirschfeld (1961), (1965), (1967), (1968). The nature of this reversal and the pressure at which it occurs are subjects for further study.

The oxygen compatibility of metals under mechanical impact has been extensively studied; however, the repeatability of the data are in question as previously discussed. Because of this lack of repeatability, it is difficult to be certain from the available data listed in Appendices I and II if metals are

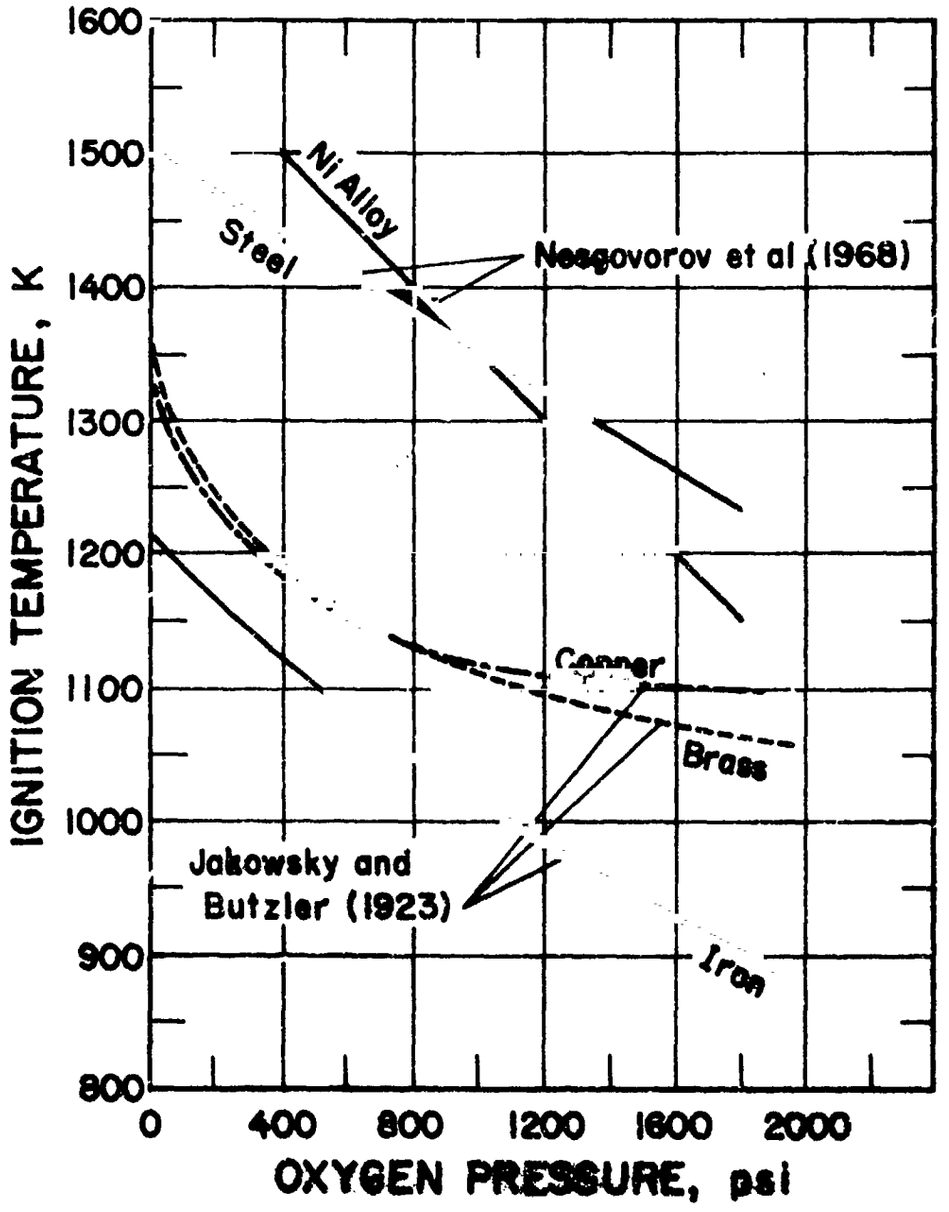

Figure 1 - Ignition temperature of metals as a function of pressure (Nesgovorov's relative data converted to absolute values by using low pressure data from Appendix I).

more or less sensitive to mechanical impact at higher pressures. The dependence on pressure, according to these data, is, at best, small. On the basis of the impact test data alone, it appears that any of the common metals and alloys, including aluminum and stainless steel, are acceptable for use. However, it is noted that the nickel and copper alloys are less sensitive to mechanical impact than aluminum and stainless steel, in particular. This can be seen in table 2, which summarizes the metals impact data of Austin (1972). This table gives the reaction frequency of each alloy class as a function of pressure. It appears that aluminum is especially impact sensitive at 100 psi. We note that the 50 psi rate is based on only 40 tests while at each of the other pressures several hundred tests were conducted. Thus the reaction frequency at 50 psi may not be statistically significant. Ignoring the data at this pressure, we see that if all metals are considered as a group, there is little pressure dependence up to 1500 psi. Table 2 also shows the lack of precision in impact testing mentioned earlier. The mechanical impact screening test was probably never intended to be subjected to such a statistical analysis; however, it is felt that the availability of a large sampling of data introduces a worthwhile degree of significance into the results of the analysis. It is recommended that all impact data listed in NASA MSC-02681 (1972) be subjected to a similar analysis. However, since other variables besides pressure are present, a statistical analysis is essentially a problem in multiple regression analysis. The analysis performed here is of course much simpler and is the reason why only Austin's data were used. In most of his data pressure was the only variable in successive tests for each material.

Other high pressure data such as ignition by electric arc, particle impact, and flash and fire point data are being determined by Stradling (1972) for both metals and non-metals. Some of these measurements will be at pressures to 10,000 psi and, therefore, will be very useful for material ranking.

In summary, it is recommended that all types of compatibility data be extended to 10,000 psia. The data compiled in NASA MSC-02681 (1972) are

Table 2 - Summary of OX Mechanical Impact Data of Austin (1972) for the Indicated Alloy Classes. Numbers in parenthesis after reaction frequency indicate number of tests.

PRESSURE, psi	REACTION FREQUENCY			
	1. Aluminum	2. Steel	3. Nickel & Copper	All (1, 2, & 3)
50	0(40)	-	0(40)	0(80)
100	0.22(167)	0(500)	0(200)	0.03(867)
500	0.04(348)	0(480)	0(200)	0.02(1028)
1000	0.05(212)	0.01(520)	0(200)	0.02(932)
1500	0.02(122)	0.06(440)	0.03(200)	0.05(762)
10,000	-	-	0(60)	0(60)

extensive; however, a statistical analysis of these along with other data is needed to obtain full benefit from this compilation.

B. Non-Metals

Compared to metals, most non-metals are highly combustible. Since some of the metals are considered incompatible for oxygen service, it follows that most non-metals are oxygen incompatible. Because of their unique physical properties some organics, such as the polymers polychlorotrifluoroethylene and polytetrafluoroethylene, have been used extensively in oxygen service. These are probably the most compatible of the organic materials because they are highly fluorinated with strong fluorine-hydrogen bonds. Generally, the more halogenated (particularly with fluorine) a hydrocarbon is, the more compatible it is with oxygen. The reader should refer to Appendix III for specific criticism regarding the oxygen compatibility of other organic materials. Compatibility test data for non-metals are found in Appendices I, II and III. Some general observations are given below.

The ignition temperatures, as well as the related flash and fire point temperatures of non-metals, generally decrease with increasing pressure up to about 1500 psia. Above this pressure ignition temperatures tend to be independent of pressure. A few typical curves of flash temperature versus pressure are presented in figure 2. The reader should note the close correspondence between flash point and ignition temperature. This correspondence may be even closer than appears in figure 2 because of the following: the flash points reported by Pippen and Stradling (1971) were obtained with a low pressure apparatus and a high pressure apparatus. The transition was at 50 psi. In almost all cases the flash temperatures from the low pressure apparatus were 50 to 100 K higher than the temperatures from the high pressure apparatus. The low pressure data are not shown in figure 2; however, they suggest that the flash points shown may be too low by as much as 100 K. Such an uncertainty would make high pressure

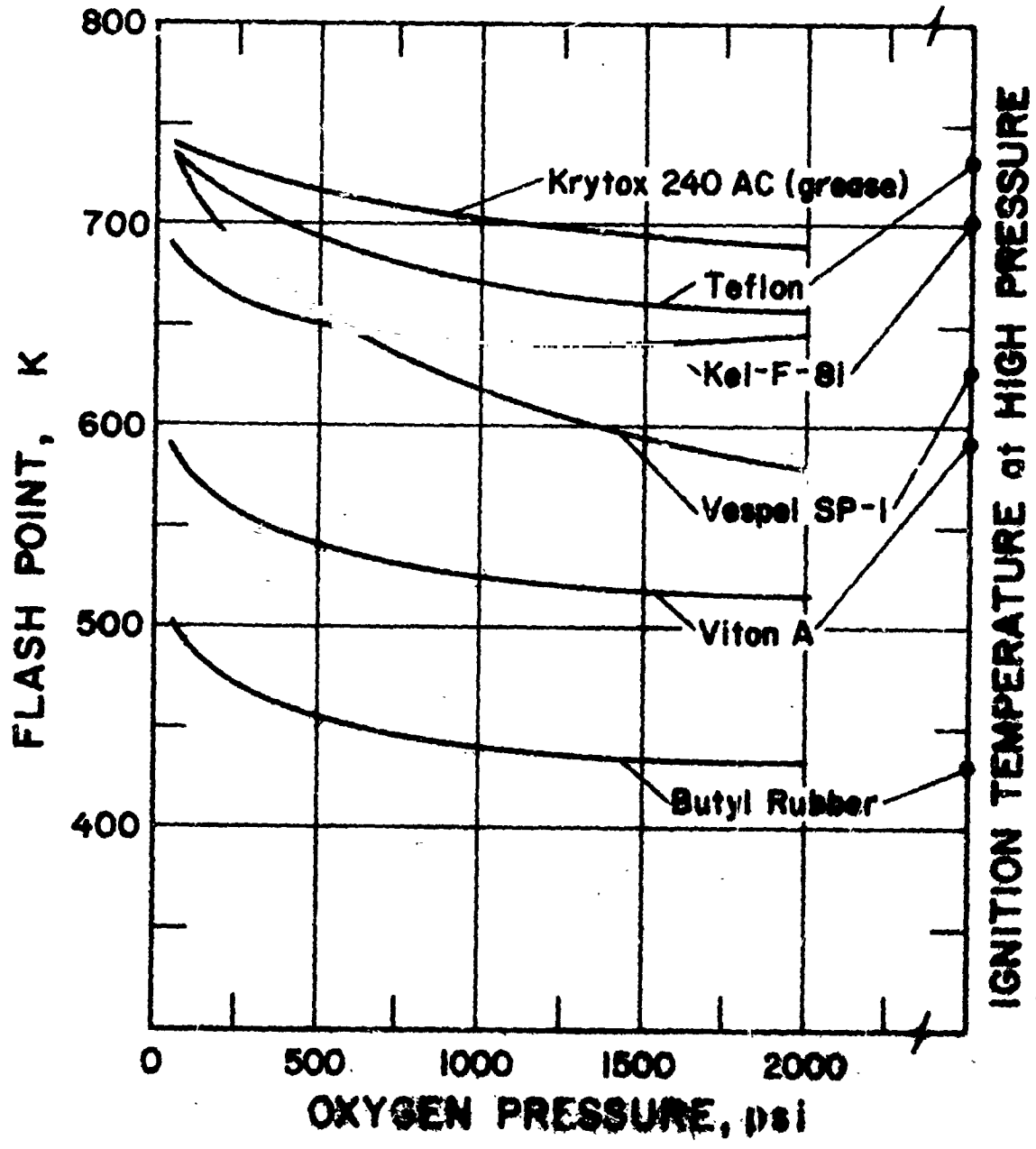

Figure 2 - Flash point temperature as a function of pressure for some non-metals.

ignition temperature and flash points the same within experimental error. It is also observed that the flash points are nearly independent of pressure at 2000 psi, strengthening the conclusion of Nihart and Smith (1964) that the ignition temperature is independent of pressure from 2000 to 7500 psi.

Due to the imprecision of the mechanical impact data on non-metals it is difficult to readily detect a pressure dependence in sensitivity. To support this, the data of Austin (1972) were combined as shown in table 3. A similar analysis of all of the impact data is a very lengthy and complicated multiple regression problem which is not considered within the scope of this project. This however, is recommended as a project which needs to be done for both metals and non-metals.

The polymers, polychlorotrifluoroethylene and polytetrafluoroethylene, often used as valve seat materials, are oxygen compatible according to the mechanical impact data listed in Appendix I. Although more compatibility data exist for non-metals than metals, additional data at high pressures are needed to confirm the pressure dependence of ignition and impact characteristics. A more critical need, however, is the investigation of other non-metals to find those with the highest oxygen compatibility. Some areas which have probably not been fully explored are the ceramics and composites.

V. High Pressure Oxygen Equipment

Some effort has been directed toward the acquisition of information regarding the availability of high pressure oxygen service equipment. The equipment suppliers listed below have been contacted and all have sent information regarding their off-the-shelf items. This supplier list is not intended to be complete nor is it an endorsement of these companies but rather, it is a random selection of high pressure equipment suppliers intended only to illustrate the degree of availability of such equipment. In parenthesis after each of the listings we show a few of the more common products of each of these suppliers. From an assessment of this literature it appears that considerable equipment is readily available which is, or by

Table 3 - Summary of GOX Mechanical Impact Data of Austin (1972) for the Indicated Non-Metals
Numbers in parenthesis after reaction frequency indicate number of tests.

PRESSURE, psi	REACTION FREQUENCY			
	1. Epoxy and Epoxy Fiberglass	2. Electrofilm	3. Everlube Fluorolube Halocarbon Inlox Krytox	All (1, 2, & 3)
100	0.35(40)	0(140)	0(480)	0.1(660)
500	0.08(40)	0(140)	0(480)	0.006(660)
1000	0.17(40)	0.02(140)	0(480)	0.009(660)
1500	1.0(40)	0.12(140)	0.04(480)	0.07(660)

specification can be made, compatible with high pressure oxygen. The manufacturers are aware of the problems with oxygen and are both willing and able to construct equipment using oxygen compatible materials. Their catalogs often do not specifically mention applications for oxygen, however, the materials lists and equipment design show that oxygen compatibility was considered. Manufacturers, of course, rely heavily on the user to assist in selecting oxygen compatible materials. Metals most commonly used in high pressure oxygen compatible equipment are 300 series stainless steels, and nickel alloys. Aluminum and 400 series steel alloys are used in fewer instances. The polymers Kel-F and Teflon are frequently used in valves and regulators. It has been recommended by Burmeister, Loser and Sneegas (1967) that these as well as other organics be replaced with metal parts whenever possible. It has been recommended that material ranking lists for various experimental tests be established. Such specifications will be necessary to remove the incompatible materials such as the organics in existing high pressure equipment.

In specifying equipment for use at high pressures one should be particularly careful of adiabatic compression heating. For this reason, safeguards such as slow opening valves and heat sinks to absorb the energy from compression heating should be included whenever possible. In a high flow rate system, the sharpness of pipe bends should be limited, solid particles should be removed from the stream, sharp edges should be eliminated, and electric charge build-up should be avoided. Whenever possible, organic materials should be replaced by metal components, such as in valve seats and regulator parts. Since materials compatibility lists used by manufacturers may differ from lists established by NASA, the purchasing agency must bear the final responsibility of materials compatibility for specific applications.

Random Selection of High Pressure Equipment Suppliers
Contacted for Oxygen Compatibility Information

1. Airco Cryogenics Division, 1900 Main St., Irvine, Calif. 92664, Ph. 714-540-3010 (cryogenic pumps)
2. AiResearch Manufacturing Division of the Garrett Corporation, 9851 Sepulveda Blvd. Los Angeles, Calif. 90009, Ph. 213-588-1153 (storage vessels).
3. American Instrument Co., 8020 Georgia Ave. Silver Spring, Maryland, 20910, Ph. 301-589-1727 (pumps, valves)
4. Autoclave Engineers, Inc., 2930 W. 22nd St., Erie, Pa., 16512, Ph. 814-838-2071 (storage and reactor vessels, valves, tubing, pumps, intensifiers, metal diaphragm compressors, flanges)
5. Bingham-Willamette Company, Div. of Guy F. Atkinson Company, 2800 N.W. Front Ave., Portland, Oregon 97210, Ph. 910-464-8031 (pumps)
6. Cosmodyne Corp., 2920 Columbia St., Torrance, Calif., 90509, Ph. 213-320-5650 (pumps, vaporizers, tube trailers, storage vessels)
7. CVI Corp., P.O. Box 2138, Columbus, Ohio, 43216, Ph. 614-876-7381 (cryogenic piping, valves, vaporizers)
8. Flodyne Controls, Inc., 48 Commerce Dr., Murray Hills, New Jersey, 07974, Ph. 201-464-6200 (valves)
9. Harwood Engineering Co., Walpole, Mass., 02081, Ph. 617-668-3600 (tubing, fittings, valves, pumps, compressors, intensifiers, gauges)
10. High pressure Equipment Co., 1224 Linden Ave., Erie, Pa., 16505, Ph. 814-838-2128 (tubing, couplings, fittings, valves, pressure and reactor vessels, pumps, intensifiers, gauges)
11. Linde Company, Dov. of Union Carbide Corporation, Tonawanda, New York, Ph. 716-555-1212 (pumps)
12. Ruska Instrument, 6123 Hillcraft Ave., Houston, Texas 77036, Ph. 713-774-2533 (high pressure instrumentation)
13. Ryan Industries Inc., 4800 Allmond Ave., Louisville, Ky. 40214, Ph. 502-368-1633 (pumps, vaporizers, tube trailers, storage vessels)

VI High Pressure Oxygen Facilities

At the present time the bulk of the high pressure oxygen compatibility research is being done at NASA-MSFC (Marshall Space Flight Center) and NASA-WSTF (White Sands Test Facility). Existing high pressure programs at NASA-MSFC concentrate on impact and flammability testing. High pressure programs have been initiated at NASA-WSTF on ignition by abrasion and electric arc as well as high pressure GOX and LOX impact testing and flash and fire point testing. The impact apparatus at MSFC and WSTF, although not identical, are quite similar. Present information indicates that practically no oxygen compatibility research is being conducted at private laboratories in the 3,000 to 10,000 psi range. The use of very high pressure oxygen is presently nearly restricted to NASA. One exception is the use of high pressure breathing oxygen systems in the medical profession and aircraft industries. Most of the past high-pressure research and experience stems from the development of such breathing systems as well as those used in NASA programs. Johnston (1970) has compiled characteristics of these high pressure systems, along with the failures experience of the metal and non-metals used. Rocketdyne is establishing a facility to conduct mechanical impact studies at pressures to 10,000 psia. The impact tester now being built is the same as the one used by NASA-MSFC.

The following list of facilities includes principally those that are presently doing research or engineering involving high pressure oxygen compatibility as well as a few that have considerable high pressure applications experience. Their testing capabilities and other pertinent facts are given in parentheses after each entry.

1. Battelle Memorial Institute
   Columbus, Ohio
   (past compatibility research from 2500 to 12,000 psi including effects of vibration, shock, adiabatic compression, flow, and temperature)

2. British Oxygen Co., Ltd
   England
   (ignition temperature to 3700 psi)

3. Kennedy Space Center, NASA
   Cocoa Beach, Florida
   (10,000 psi GOX usage)

4. Linde Company, Division of Union Carbide Corp.
   Tonawanda, New York
   (past: compatibility testing to 7500 psi, including adiabatic compression, galling, powder impact, promoted ignition, and mechanical impact; most not to high pressure. present: ignition and calorimetric bomb testing to 2000 psi)

5. McDonnell-Douglas Aircraft
   Huntington Beach, California
   (high pressure O_2 applications)

6. Manned Space Center, NASA
   Houston Texas
   (high pressure O_2 applications, no testing)

7. Marshall Space Flight Center, NASA
   Huntsville, Alabama
   (extensive LOX and GOX testing to 10,000 psi - mechanical impact, low pressure flammability testing)

8. Naval Ship Research and Development Center
   Annapolis Laboratory
   Annapolis, Maryland
   (ignition temperature testing to 3000 psi)
   (also some lower pressure adiabatic compression and hot O_2 flow)

9. Rocketdyne Division, North American-Rockwell
   Canoga Park, California
   (mechanical impact testing to 10,000 psi)
10. White Sands Test Facility, NASA
    White Sands, New Mexico
    (GOX and LOX compatibility testing to 10,000 psi - mechanical impact, abrasive impact, pneumatic, flash and fire point).

VII. Recommendations

The extension of GOX and LOX applications to pressures above 3000 psia is reasonable based on the present data. However, in cases where extremely high reliability is demanded, such as in manned space flight, the extension is considered marginal without further compatibility testing. Considerable compatibility data exist at pressures up to 2000 psia; the sparse compatibility data up to 7500 psia suggest no additional problems will be encountered. However, to obtain high reliability, extensive materials compatibility testing to 10,000 psia will have to be done. Some of these data are now being obtained at NASA-MSFC and WSTF. Standardization of test procedures and materials is essential to reliability and interagency comparisons, and will also encourage involvement of industry in compatibility testing. New data need to be combined with existing data to be analyzed for proper interpretation. Old tests need to be studied for degree of validity, and new tests which better describe oxygen compatibility are desirable. Design and applications guidelines will encourage safe use of oxygen and uniform practice throughout NASA. Data necessitated by future design applications must be anticipated. In support of these general recommendations, an excerpt from the Apollo 13 - High Pressure Oxygen Report (Johnston 1970) is given below:

Despite the many standards and specifications reviewed by this panel, it has become obvious that a void exists in several areas. One area of major concern is the apparent lack of sufficient detail on nonmetallic materials and their application for high pressure oxygen systems to enable a designer to select the proper material for his system.

The reason for this is that a comprehensive test program has yet to be defined and accomplished. Although some work has been started in this area, it appears that the required effort is a major one and should begin with developing a standard approach to the problem on the part of both Government and industry so that all data developed can ultimately be universally used without the requirements for interpolating test results from a many faceted approach.

The second area of concern is that no standards and/or specifications appear to exist on a total system which points out the hazards resulting from misapplication of a component which may serve its function well in some applications, but may be trigger mechanism of disaster in another application.

Based upon these generalities, the following specific recommendations are suggested:

1. Extend Measurements indicated below to high pressure (10,000 psi) for materials of immediate interest (Include effects of contamination).

   (a) Ignition temperature

   (b) Impact sensitivity

   (c) Flash and Fire temperatures

   (d) Pertinent configuration tests

2. Develop and Standardize Tests and Materials

(a) The standardization of test procedures is essential if meaningful results are to be obtained. This standardization is probably best coordinated by a group not directly involved in conducting the measurements. Involvement of ASTM would be very desirable and possibly NBS could assist in developing standard test methods, with the cooperation of test facilities.

(b) Standard reference materials for use in compatibility tests should be established. These materials, which can be stocked for distribution by the Office of Standard Reference Materials, National Bureau of Standards, are invaluable for the intercomparison of existing apparatus as well as the standardization of new apparatus. The establishment of standards should be done through a cooperative effort of NBS and testing facilities.

(c) The development of new tests more closely related to fundamental physical or mechanical properties of materials is desirable. Examples of existing tests which fall in this category are: ignition temperature and flash and fire temperature.

(d) An independent statistical analysis of the repeatability of mechanical impact test data is needed. Past studies have not been conclusive and the continuing controversy and wealth of data is justification for an in depth study.

3. Analyze Data to obtain best values.

(a) A statistical analysis of all existing compatibility data to determine dependence on pressure, in particular, but also on other factors affecting the reliability of the material. Multiple regression analysis would be necessary to extract this information from the existing data. The data to be analyzed are principally those listed in this report. This analysis is not a trivial task; however, the resulting increased worth of the data justifies the effort. The general validity and uncertainty estimates of material ranking data will be considerably improved as a result of this critical analysis.

(b) More universal agreement should be obtained on material ranking lists. This can be initiated by establishing such a list for each standard test within NASA. Work should proceed to extend the acceptance of these lists by other government agencies and industry. Ultimately international acceptance is desirable. It cannot be overstressed that the test conditions are an integral part of any ranking list.

(c) A compilation of thermodynamics data relevant to material compatibility is essential to any effort to understand compatibility. Test methods, test results, ranking lists, etc. are all more meaningful when they can be related to fundamental properties. Such properties as ignition temperature, heat of combustion, thermal diffusivity, melting and vaporization temperatures of metals and their oxides should be considered.

4. Adopt Guidelines for design and procedures for oxygen systems. Participation of oxygen producers and equipment manufacturers is indispensable in this process.

(a) Oxygen system or components design can have many inherent safety features that can be spelled out for the design engineer. This should include the materials used, flow rates, valving rates, heat sinks, cleaning accessibility, filters, internal flow cross sections, temperature limits, and many others.

(b) Cleanliness standards and procedural guidelines that are NASA wide and even nation wide are essential to the safe operation of high pressure oxygen systems.

5. Fundamental Research should be pursued in all areas of ignition and combustion, because understanding always leads to better and safer applications. Two areas in particular stand out as areas of concern for high pressure oxygen:

(a) The mechanical properties of materials in the presence of high pressure oxygen has been virtually ignored. Oxygen embrittlement is small at low pressures but may be significant at 10,000 psi. Fatigue behavior and crack propagation rates in the presence of oxygen are not known for any pressures.

(b) The burning behavior at high oxygen pressure is in real doubt. Since the degree of damage is directly related to the burning rate, this should be known. The only study of burning rates versus pressure indicate possible dramatic changes around 2000 psi.

Some of the above recommendations are already being pursued by NASA. ASRDI is sponsoring some ignition research at White Sands and is establishing design and cleanliness guidelines at Lewis Research Center. MSFC is funding some lower pressure combustion studies at NBS. These should be considered an integral but initial part of NASA's pursuit of the safe applications of high pressure oxygen.

VIII. Summary

Based on the available data it appears that no fundamental problems would prevent the common use of high pressure GOX or LOX. There are dangers involved, of course, but with a reasonable set of rules and guidelines, these dangers can be reduced to a workable level. It appears that a large proportion of past accidents are caused by material incompatibility but an even larger proportion are caused by personal carelessness or equipment failure. With care, the added hazards due to high pressure will not increase accident rates significantly.

In high pressure systems the enhancement of existing ignition sources is more important than the decreased ignition temperature of materials. For example, in high pressure applications the effect of adiabatic compression becomes increasingly important, higher flow rates enhance the probability of ignition from friction, impact, static discharge, etc., and reaction intensities increase because of the increased density and availability of O_2. The possibility of ignition due to mechanical failures is also greater.

There are little compatibility data on most materials above 3000 psia and much is needed. It is also desirable to have more quantitative fundamental data. This requires study of the physical phenomena involved and the design of experiments to develop parameters representing these phenomena. There is a strong need for more engineering compatibility characterization measurements, such as configuration and component tests by manufacturers.

From the available data the pressure dependence of ignition and burning are not well characterized. Metal burning rates are proportional to $\sqrt{P}$ at lower pressures but at higher pressures burning rates decrease. Only a few ignition temperature versus pressure data are available. These data show the ignition temperature decreasing with increasing pressure. It would be unwise to extend these few data to other materials without further confirming measurements. Some impact test data as a function of pressure are available but considerably more are needed. These show, but not clearly, an increasing sensitivity with pressure. Flash and fire point data also show an increased sensitivity for non-metals at higher pressures.

Equipment for the handling and storage of high pressure oxygen, both liquid and gas, is readily available. In some instances it is necessary to specify the elimination of marginal materials. This presents a problem only if a better substitute material is not yet available. Equipment manufacturers are eager to cooperate in fabrication of more reliable components.

Present high pressure compatibility testing facilities are restricted nearly totally to NASA-WSTF and MSFC. Commercial laboratories have performed various compatibility tests in the past but generally not above about 3000 psi.

It is recommended that NASA extend specific experimental tests to higher pressures, establish standard tests and reference materials, perform statistical analyses of existing data, develop material ranking lists, and encourage new test methods and fundamental research.

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APPENDIX I - HIGH PRESSURE OXYGEN COMPATIBILITY DATA

PURE METALS

Reference	Materials	Test Pressure (psi)	Ignition Temp. (K)	Test Temp. (K)	Mechanical Impact Energy (kg m)	Mechanical Impact Reaction Rate	Pneumatic Impact Reaction Rate	Specimen Thickness (in)	Flash Point (K)	Fire Point (K)	Environment
Jakowsky and Butzier (1923)	Copper	15	1325								GOX
		400	1180								GOX
		800	1130								GOX
		1200	1110								GOX
		1600	1100								GOX
		2000	1100								GOX
"	Iron	15	1210								GOX
		400	1120								GOX
		800	1050								GOX
		1000	1015								GOX
		1200	980								GOX
		1600	925								GOX
		2000	870								GOX

ALLOYS

Referece	Materials	Test Pressure (psi)	Ignition Temp. (K)	Test Temp. (K)	Mechanical Impact Energy (kg m)	Mechanical Impact Reaction Rate	Pneumatic Impact Reaction Rate	Specimen Thickness (in)	Flash Point (K)	Fire Point (K)	Environment
Austin (1972)	Aluminum 6061-T6	100		90	10	3/7		.032			LOX
		100		90	10	16/20		.032			LOX
		100		90	7.4	4/20		.032			LOX
		100		90	10	0/20		.063			LOX
		100		90	10	0/20		.063			LOX
		500		90	10	0/20		.063			LOX
		500		90	10	0/20		.063			LOX
		1000		90	10	0/20		.063			LOX
		1500		90	10	0/20		.063			LOX
		50		300	10	0/20		.032			GOX
		100		300	10	9/20		.032			GOX
		100		300	10	0/20		.032			GOX
		500		300	10	6/20		.032			GOX
		500		300	10	0/20		.032			GOX
		500		300	10	0/6		.032			GOX
		1000		300	10	0/20		.032			GOX
		1000		300	10	0/6		.032			GOX
Austin (1972)	Aluminum 2014-T6	500		90	10	3/20		.063			LOX
		1000		90	7	0/20		.063			LOX
		1000		90	5	0/20		.063			LOX
		1400		90	5	6/20		.063			LOX
		100		90	10	0/20		.090			LOX
		500		90	10	0/20		.090			LOX
		1400		90	5	0/20		.090			LOX
		250		300	10	0/20		.063			GOX
		500		300	10	0/20		.063			GOX
		500		300	5	6/20		.063			GOX
		500		300	10	0/20		.063			GOX
		500		300	10	0/20		.063			GOX
		500		300	10	0/20		.063			GOX
		500		300	10	0/20		.063			GOX
		500		300	10	2/20		.063			GOX
		1000		300	10	2/3		.063			GOX
		1000		300	5	2/20		.063			GOX

ALLOYS cont.

Reference	Materials	Test Pressure (psi)	Ignition Temp. (K)	Test Temp. (K)	Mechanical Impact Energy (kg m)	Mechanical Impact Reaction Rate	Pneumatic Impact Reaction Rate	Specimen Thickness (in)	Flash Point (K)	Fire Point (K)	Environment
Austin (1972)	Aluminum 2219-T87	50		90	10	0/20		.063			LOX
		100		90	10	0/20		.063			LOX
		500		90	10	1/2		.063			LOX
		1000		90	7.62	0/20		.063			LOX
		1000		90	5.54	0/20		.063			LOX
		500		90	10	0/20		.070			LOX
		500		90	10	0/20		.090			LOX
		500		300	10	0/20		.063			GOX
		500		300	5.54	0/20		.063			GOX
		1000		300	10	1/3		.063			GOX
		1000		300	7.62	0/20		.063			GOX
		1000		300	5.54	0/20		.063			GOX
		1000		300	5	0/20		.063			GOX
		1400		300	10	1/2		.063			GOX
		1400		300	9.02	0/20		.063			GOX
		1400		300	7.62	0/20		.063			GOX
		1400		300	5.54	0/20		.063			GOX
Austin (1972)	Ferrous Alloy A286	100		90	10	0/20		.020			LOX
		500		90	10	0/20		.020			LOX
		1000		90	10	0/20		.020			LOX
		1500		90	10	0/20		.020			LOX
		100		90	10	0/20		.050			LOX
		500		90	10	0/20		.050			LOX
		1000		90	10	0/20		.050			LOX
		1500		90	10	0/20		.050			LOX
		100		300	10	0/20		.020			GOX
		500		300	10	0/20		.020			GOX
		1000		300	10	2/20		.020			GOX
		1000		300	10	0/20		.020			GOX
		1000		300	9.02	0/20		.020			GOX
		1500		300	10	8/20		.020			GOX
		1500		300	9.02	4/20		.020			GOX
		1500		300	8.14	0/20		.020			GOX
		1500		300	7.62	0/20		.020			GOX

ALLOYS cont.

Reference	Materials	Test Pressure (psi)	Ignition Temp. (K)	Test Temp. (K)	Mechanical Impact Energy (kg m)	Mechanical Impact Reaction Rate	Pneumatic Impact Reaction Rate	Specimen Thickness (in)	Flash Point (K)	Fire Point (K)	Environment
Austin (1972)	304 Stainless Steel	15		90	10	0/30		.063			LOX
		15		90	10	0/20		.063			LOX
		100		90	10	0/20		.063			LOX
		500		90	10	0/20		.063			LOX
		1000		90	10	0/20		.063			LOX
		1500		90	10	0/20		.063			LOX
		15		90	10	0/20		.090			GOX
		100		300	10	0/20		090			GOX
		500		300	10	0/20		.090			GOX
		1000		300	10	0/20		.090			GOX
		1500		300	10	2/20		.090			GOX
		1500		300	9.02	0/20		.090			GOX
		1500		300	8.34	0/20		.090			GOX
Austin (1972)	PH 15-7 Stainless Steel	100		90	10	0/20		.030			LOX
		500		90	10	0/20		.030			LOX
		1000		90	10	3/20		.030			LOX
		1000		90	9.02	0/20		.030			LOX
		1000		90	8.34	0/20		.030			LOX
		1500		90	10	5/20		.030			LOX
		1500		90	9.02	0/20		.030			LOX
		1500		90	8.34	0/20		.030			LOX
		100		90	10	0/20		.050			LOX
		500		90	10	0/20		.050			LOX
		1000		90	10	2/20		.050			LOX
		1500		90	10	3/20		.050			LOX
		1500		90	9 02	0/20		.050			LOX
		1500		90	8.34	0/20		.050			LOX
		100		90	10	0/20		.090			LOX
		500		90	10	0/20		090			LOX
		1000		90	10	0/20		0			LOX

ALLOYS cont.

Reference	Materials	Test Pressure (psi)	Ignition Temp. (K)	Test Temp. (K)	Mechanical Impact Energy (kg m)	Mechanical Impact Reaction Rate	Pneumatic Impact Reaction Rate	Specimen Thickness (in)	Flash Point (K)	Fire Point (K)	Environment
Austin (1972)	17-7 PH Stainless Steel	15		90	10	2/20		.030			LOX
		15		90	10	0/20		.030			LOX
		1500		90	10	0/20		.030			LOX
		100		90	10	0/20		.063			LOX
		500		90	10	0/20		.063			LOX
		1000		90	10	0/20		.063			LOX
		1500		90	10	0/20		.063			LOX
		15		90	10	0/20		.070			LOX
		100		90	10	0/20		.070			LOX
		500		90	10	0/20		.070			LOX
		1000		90	10	0/20		.070			LOX
		1500		90	10	0/20		.070			LOX
		100		300	10	0/20		.030			GOX
		500		300	10	0/20		.030			GOX
		1000		300	10	0/20		.030			GOX
		100		300	10	0/20		.063			GOX
		500		300	10	0/20		.063			GOX
Austin (1972)	Stainless Steel 21Ni-6Cr-9Mn	100		90	10	0/20		.030			LOX
		500		90	10	0/20		.030			LOX
		1000		90	10	0/20		.030			LOX
		1500		90	10	0/20		.020			LOX
		100		90	10	0/20		.063			LOX
		500		90	10	0/20		.063			LOX
		1000		90	10	0/20		.063			LOX
		1500		90	10	0/20		.063			LOX
		100		90	10	0/20		.085			LOX
		500		90	10	0/20		.085			LOX
		1000		90	10	0/20		.085			LOX
		1500		90	10	0/20		.085			LOX
		100		300	10	0/20		.031			GOX
		500		300	10	0/20		.031			GOX
		1000		300	10	0/20		.031			GOX
		1500		300	10	0/20		.031			GOX
Austin (1972)	Stainless Steel 22Ni-13Cr-5Mn	100		90	10	0/20		.050			LOX
		500		90	10	0/20		.050			LOX
		1000		90	10	0/20		.050			LOX
		1500		90	10	0/20		.050			LOX
		100		300	10	0/20		.050			GOX
		500		300	10	0/20		.050			GOX
		1000		300	10	0/20		.050			GOX
		1500		300	10	0/20		.050			GOX

ALLOYS cont.

Reference	Materials	Test Pressure (psi)	Ignition Temp. (K)	Test Temp. (K)	Mechanical Impact Energy (kg m)	Reaction Rate	Pneumatic Impact Reaction Rate	Specimen Thickness (in)	Flash Point (K)	Fire Point (K)	Environment
Austin (1972)	Haynes alloy 186	100		90	10	0/20		.063			LOX
		500		90	10	0/20		.063			LOX
		1000		90	10	0/20		.063			LOX
		1500		90	10	0/20		.063			LOX
		100		90	10	0/20		.090			LOX
		500		90	10	0/20		.090			LOX
		1000		90	10	0/20		.090			LOX
		1500		90	10	0/20		.090			LOX
		100		300	10	0/20		.063			GOX
		500		300	10	0/20		.063			GOX
		1000		300	10	0/20		.063			GOX
		1500		300	10	0/20		.063			GOX
		100		300	10	0/20		.090			GOX
		500		300	10	0/20		.090			GOX
		1000		300	10	0/20		.090			GOX
		1500		300	10	0/20		.090			GOX
Austin (1972)	301 Stainless Steel	100		90	10	0/20		.125			LOX
		500		90	10	0/20		.125			LOX
		1000		90	10	0/20		.125			LOX
		1500		90	10	0/20		.125			LOX
		100		300	10	0/20		.125			GOX
		500		300	10	0/20		.125			GOX
		1000		300	10	0/20		.125			GOX
		1500		300	10	0/20		.125			GOX
Austin (1972)	Inconel 600	15		90	10	0/20		.031			LOX
		15		90	10	0/20		.031			LOX
		15		90	10	0/20		.090			LOX
		100		300	10	0/20		.031			GOX
		500		300	10	0/20		.031			GOX
		1000		300	10	0/20		.031			GOX
		1500		300	10	0/20		.031			GOX
		100		300	10	0/20		.063			GOX
		500		300	10	0/20		.063			GOX
		1000		300	10	0/20		.063			GOX
		1500		300	10	0/20		.063			GOX
		100		300	10	0/20		.093			GOX
		500		300	10	0/20		.093			GOX
		1000		300	10	0/20		.093			GOX
		1500		300	10	0/20		.093			GOX

ALLOYS cont.

Reference	Materials	Test Pressure (psi)	Ignition Temp. (K)	Test Temp (K)	Mechanical Impact Energy (kg m)	Reaction Rate	Pneumatic Impact Reaction Rate	Specimen Thickness (in)	Flash Point (K)	Fire Point (K)	Environment
Austin (1972)	Inconel 718	50		90	10	0/20		.125			LOX
		100		90	10	0/20		.125			LOX
		500		90	10	0/20		.125			LOX
		1000		90	10	0/20		.125			LOX
		1500		90	10	0/20		.125			LOX
		500		300	10	0/20		.063			GOX
		5[illegible]		300	10	0/20		.125			GOX
		10[illegible]		300	10	0/20		.125			GOX
		[illegible]00		300	10	0/20		.125			GOX
		1000		300	10	0/20		.125			GOX
		1500		300	10	0/20		.125			GOX
		10000			10	0/20		.012			GOX
Austin (1972)	Inconel 750	100		90	10	0/20		.062			LOX
		500		90	10	0/20		.062			LOX
		1000		90	10	0/20		.062			LOX
		1500		90	10	0/20		.062			LOX
		100		300	10	0/20		.062			GOX
		500		300	10	0/20		.062			GOX
		1000		300	10	0/20		.062			GOX
		1500		300	10	0/20		.062			GOX
Austin (1972)	Monel 400	15		90	10	0/20		.031			LOX
		15		90	10	0/20		.063			LOX
		100		300	10	0/20		.031			GOX
		500		300	10	0/20		.031			GOX
		000		300	10	0/20		.031			GOX
		1500		300	10	2/20		.031			GOX
		1500		300	9.02	0/20		.031			GOX
		1500		300	9.02	0/20		.031			GOX
		1500		300	8.34	0/20		.031			GOX
		1500		300	8.34	0/20		.031			GOX
		100		300	10	0/20		.062			GOX
		500		300	10	0/20		.062			GOX
		1000		300	10	0/20		.062			GOX
		1500		300	10	3/20		.062			GOX
		1500		300	9.62	0/20		.062			GOX
		1500		300	8.34	0/20		.062			GOX
		100		300	10	0/20		.090			GOX
Austin (1972)	Inconel 625	10000		420	10	0/20		.05			GOX
	K-Monel	10000		300	10	0/20		.05			GOX
"	Inconel 718 brazed with	10000		300	10	0/20		.05			GOX
"	Nicrobraze alloy										

ALLOYS cont.

Reference	Materials	Test Pressure (psi)	Ignition Temp. (K)	Test Temp. (K)	Mechanical Impact Energy (kg m)	Mechanical Impact Reaction Rate	Pneumatic Impact Reaction Rate	Specimen Thickness (in)	Flash Point (K)	Fire Point (K)	Environment
Jakowsky and Butzler(1923)	Brass	15	1350								GOX
		400	1190								GOX
		800	1130								GOX
		1200	1090								GOX
		1600	1070								GOX
		2000	1050								

HALOGENATED COMPOUNDS

Reference	Materials	Test Pressure (psi)	Ignition Temp. (K)	Test Temp. (K)	Mechanical Impact Energy (kg m)	Mechanical Impact Reaction Rate	Pneumatic Impact Reaction Rate	Specimen Thickness (in)	Flash Point (K)	Fire Point (K)	Environment
Jamison (1970)	Fluorel 1059	2000		297	2.8	0/12					GOX
Pippen and Stradling (1971)	Fluorel	5							668	None	GOX
		25							680	728	GOX
		50							645	700	GOX
		50							581	581	GOX
		100							548	548	GOX
		500							506	506	GOX
		1000							506	506	GOX
		1500							505	505	GOX
		2000							494	494	GOX
Marzani (1968a) (1968b)	Polychloro-trifluor-ethylene (CTFE)	4000	700								GOX GOX GOX GOX GOX
Jamison (1970)	KEL-F Bar Stock	2000		299	1.4	0/18					GOX
Pippen and Stradling (1971)	KEL-F-81	5							745	None	GOX
		25							698	None	GOX
		50							693	724	GOX
		500							639	639	GOX
		1000							647	647	GOX
		1500							643	643	GOX
		2000							647	647	GOX
McQuaid (1972)	CTFE	3800	685								GOX
Marzani (1968a)	Polytetra-fluoro-ethylene (Teflon)(TFE)	4025	735								GOX
Jamison (1970)	TFE	2000		289	2.8	0/21					GOX
"	TFE tubing	2000		286	1.4	0/21					GOX

HALOGENATED COMPOUNDS cont.

Reference	Materials	Test Pressure (psi)	Ignition Temp. (K)	Test Temp. (K)	Mechanical Impact Energy (kg m)	Mechanical Impact Reaction Rate	Pneumatic Impact Reaction Rate	Specimen Thickness (in)	Flash Point (K)	Fire Point (K)	Environment
Pippen and Stradling (1971)	Glass Filled Teflon	500			1.4	1/2					GOX
		1000			1.4	1/1					GOX
		2500					0/4				GOX
"	Teflon	5							None	None	GOX
		25							741	None	GOX
		50							754	None	GOX
		50							735	735	GOX
		100							733	733	GOX
		200							728	728	GOX
		500							707	707	GOX
		1000							645	645	GOX
		1500							637	637	GOX
		2000							660	660	GOX
"	Virgin Teflon Sheet	4000					0/4				GOX
		4500					4/4				GOX
		5000			.34	0/4					GOX
Jamison (1970)	T-EMS372 (J.L. Dore)	2000		289	1.4	0/21					GOX

NON-HALOGENATED PLASTICS

Reference	Materials	Test Pressure (psi)	Ignition Temp. (K)	Test Temp. (K)	Mechanical Impact Energy (kg m)	Reaction Rate	Pneumatic Impact Reaction Rate	Specimen Thickness (in)	Flash Point (K)	Fire Point (K)	Environment
Austin (1972)	Electrofilm 2306	100		90	1.4	0/20					LOX
		500		90	1.4	0/20					LOX
		1000		90	1.4	0/20					LOX
		1500		90	1.4	0/20					LOX
		100		300	1.4	0/20					GOX
		500		300	1.4	0/20					GOX
		1000		300	1.4	0/20					GOX
		1000		300	1.2	0/20					GOX
		1000		300	1.1	0/20					GOX
		1500		300	1.4	4/20					GOX
		1500		300	1.2	0/20					GOX
		1500		300	1.1	0/20					GOX
"	Electrofilm 2396	100		90	1.4	0/20					LOX
		100		90	1.4	0/20					LOX
		500		90	1.4	0/20					LOX
		500		90	1.4	0/20					LOX
		1000		90	1.4	0/20					LOX
		1000		90	1.4	0/20					LOX
		1500		90	1.4	0/20					LOX
		1500		90	1.4	0/20					LOX
		100		300	1.4	0/20					GOX
		100		300	1.4	0/20					GOX
		500		300	1.4	0/20					GOX
		500		300	1.4	0/20					GOX
		1000		300	1.4	0/20					GOX
		1000		300	1.4	0/20					GOX
		1500		300	1.4	0/20					GOX
		1500		300	1.4	6/20					GOX
		1500		300	1.2	5/20					GOX
"	Electrofilm 2406	100		90	1.4	0/20					LOX
		500		90	1.4	0/20					LOX
		1000		90	1.4	0/20					LOX
		1500		90	1.4	0/20					LOX
		100		300	1.4	0/20					GOX
		500		300	1.4	0/20					GOX
		1000		300	1.4	0/20					GOX
		1500		300	1.4	0/20					GOX

NON-HALOGENATED PLASTICS cont.

Reference	Materials	Test Pressure (psi)	Ignition Temp. (K)	Test Temp. (K)	Mechanical Impact Energy (kg m)	Mechanical Impact Reaction Rate	Pneumatic Impact Reaction Rate	Specimen Thickness (in)	Flash Point (K)	Fire Point (K)	Environment
Austin(1972)	Epoxy Fiberglass	15		90	1.4	20/20		.050			LOX
		15		90	1.1	20/20		.050			LOX
		15		90	0.76	20/20		.050			LOX
		15		90	0.48	20/20		.050			LOX
		15		90	0.19	4/20		.050			LOX
		15		90	0.094	2/20		.050			LOX
		100		300	1.4	15/20		.050			GOX
		100		300	1.1	20/20		.050			GOX
		100		300	0.76	5/20		.050			GOX
		100		300	0.67	2/20		.050			GOX
		100		300	0.57	0/20		.050			GOX
		100		300	0.48	0/20		.050			GOX
		500		300	0.67	2/5		.050			GOX
		500		300	0.57	0/20		.050			GOX
		1000		300	0.57	1/6		.050			GOX
		1500		300	0.57	1/1		.050			GOX
Pippen and Stradling (1971)	Gemon 3010 Polymide laminate	4000			1.4	0/4	0/4				GOX
		4500			1.4	1/3	0/1				GOX
Guter(1967)	German Buna Solid Black	15	737								GOX
		300	588								GOX
		750	622								GOX
Pippen and Stradling (1971)	Glass Fabric	5000			1.4	0/4					GOX
Jamison (1970)	Lexan 1100 (Polycarbonate)	2000		297	2.8	0/22					GOX
"	Nylon	2000		299	2.8	0/21					GOX
Guter(1967)	Nylon	750	601								GOX
		1500	522								GOX
		2625	461								GOX
		3750	492								GOX
Pippen and Stradling (1971)	Nylon Sheet	5							665	None	GOX
		25							677	684	GOX
		50							664	664	GOX
		50							570	570	GOX
		100							548	548	GOX
		500							507	507	GOX
		1087							494	494	GOX

NON-HALOGENATED PLASTICS cont.

Reference	Materials	Test Pressure (psi)	Ignition Temp. (K)	Test Temp. (K)	Mechanical Impact Energy (kg m)	Mechanical Impact Reaction Rate	Pneumatic Impact Reaction Rate	Specimen Thickness (in)	Flash Point (K)	Fire Point (K)	Environment
McQuaid(1972)	Nylon '66' (Valve Seat)	2400	458								GOX
"	Nylon '66'	200	575								GOX
Guter(1967)	Perpex Block and Shavings	750	562								GOX
		1500	557								GOX
		2625	464								GOX
		3750	497								GOX
Marzani (1968a)	Polyethylene	2525	452								GOX
		2400	449								GOX
		2350	449								GOX
		750	452								GOX
		325	457.5								GOX
		325	457.5								GOX
		250	>740.5								GOX
		250	>699								GOX
"	70% Polyethylene 30% Fiberglass	2350	458								GOX
Marzani (1968a)	85% Polymide 15% Graphite	3350	618								GOX
Schwinghamer (1971)	Polymide #3	50				0					GOX
		100				29%					GOX
		500				100%					GOX
		1000				100%					GOX
Marzani (1968a)	Polymide	3350	620								GOX
McQuaid(1972)	Polymide	3375	622								GOX
Guter(1967)	Polythene	750	508								GOX
		1500	478								GOX
		2625	444								GOX
		3000	476								GOX

NON-HALOGENATED PLASTICS cont.

Reference	Materials	Test Pressure (psi)	Ignition Temp. (K)	Test Temp. (K)	Mechanical Impact Energy (kg m)	Mechanical Impact Reaction Rate	Pneumatic Impact Reaction Rate	Specimen Thickness (in)	Flash Point (K)	Fire Point (K)	Environment
Marzani (1968a)	Polyvinylidene Fluoride	2975	560								GOX
"	Polyurethane	2725	560								GOX
"	Polyurethane Foam, Renticulated	2650	491								GOX
"	Polyurethane Foam Renticulated, Fire Retardant	2450	471								GOX
McQuaid (1972)	Polyurethane Foam, Renticulated	2725	522								GOX
Marzani (1968a)	Polyurethane Foam, Fire Retardant	2450	471								GOX
Guter(1967)	Polyvinyl Alcohol (with H_3PO_4)	750	695								GOX
		1500	728								GOX
		3375	593								GOX
"	Polyvinyl Chloride (unplasticized)	15	717								GOX
		750	518								GOX
		1500	477								GOX
		2625	433								GOX
		3375	434								GOX

NON-HALOGENATED PLASTICS cont.

Reference	Materials	Test Pressure (psi)	Ignition Temp. (K)	Test Temp. (K)	Mechanical Impact Energy (kg m)	Mechanical Impact Reaction Rate	Pneumatic Impact Reaction Rate	Specimen Thickness (in)	Flash Point (K)	Fire Point (K)	Environment
Guter(1967)	Polyvinyl Chloride	750	547								GOX
	(plasticized)	1500	517								GOX
		3375	464								GOX
"	Tufnol	750	564								GOX
		1500	521								GOX
		2625	444								GOX
Jamison	Vespel	2000		297	2.8	2/38					GOX
(1970)	(Polyamide)	2000		297	1.4	0/42					GOX
Pippen and	Vespel SP-1	5							None	None	GOX
Stradling		25							722	None	GOX
(1971)		50							722	None	GOX
		50							755	755	GOX
		100							724	724	GOX
		500							658	658	GOX
		1000							619	619	GOX
		1500							588	588	GOX
		2000							582	582	GOX
"	Vespel SP-21	5							569	None	GOX
		25							784	None	GOX
		50							548	None	GOX
		50							774	774	GOX
		100							766	766	GOX
		500							718	718	GOX
		1000							660	660	GOX
		1500							620	620	GOX
		2000							605	605	GOX
Marzani	Vespel SP-1										
(1968b)	Polyimide	3325	621								GOX

SEALANTS, THREAD. COMPOUNDS, AND LUBRICANTS

Reference	Materials	Test Pressure (psi)	Ingition Temp. (K)	Test Temp (K)	Mechanical Impact Energy (kg m)	Reaction Rate	Pneumatic Impact Reaction Rate	Specimen Thickness (in)	Flash Point (K)	Fire Point (K)	Environment
Guter(1967)	Aircraft Lubricating Oil DE 2472 B/O	15	582								GOX
		300	513								GOX
		750	498								GOX
		1500	483								GOX
		2625	475								GOX
		3750	480								GOX
Jamison(1970)	Andox C Oil	2000		299	1.4	0/21					GOX
Nihart and Smith(1964)	Aroclor 1254	2000	649								GOX
		7500	628								GOX
"	Burnil Brand Microplates	2000	>773								GOX
		7500	>773								GOX
"	Dixon's Flake Graphite No. 1	2000	>773								GOX
		7500	>773								GOX
Jamison(1970)	Dow Corning 33 Grease	2000		297	1.4	0/20					GOX
Pippen and Stradling (1971)	Drilube 822	5							721	None	GOX
		25							648	677	GOX
		50							608	608	GOX
		50							561	561	GOX
		100							576	576	GOX
		500							525	525	GOX
		1000							511	511	GOX
		1500							473	473	GOX
		2000							483	483	GOX
Nihart and Smith(1964)	Everlube No. 811	2000	489								GOX
		7500	523								GOX
Austin(1972)	Everlube No. 811	100		90	10	0/20		.030			LOX
		500		90	10	0/20		.030			LOX
		1000		90	10	0/20		.030			LOX
		1500		90	10	0/20		.030			LOX
		100		300	10	0/20		.030			GOX
		500		300	10	0/20		.030			GOX
		1000		300	10	0/20		.030			GOX
		1500		300	10	0/20		.030			GOX

SEALANTS, THREAD, COMPOUNDS, AND LUBRICANTS cont.

Reference	Materials	Test Pressure (psi)	Ignition Temp. (K)	Test Temp. (K)	Mechanical Impact Energy (kg m)	Mechanical Impact Reaction Rate	Pneumatic Impact Reaction Rate	Specimen Thickness (in)	Flash Point (K)	Fire Point (K)	Environment
Austin(1972)	Everlube	100		90	10	0/20		.030			LOX
	No. 811 B-2	500		90	10	0/20		.030			LOX
		1000		90	10	0/20		.030			LOX
		1500		90	10	2/20		.030			LOX
		1500		90	9	0/20		.030			LOX
		1500		90	8.3	0/20		.030			LOX
		100		300	10	0/20		.030			GOX
		500		300	10	0/20		.030			GOX
		1000		300	10	0/20		.030			GOX
		1500		300	10	0/20		.030			GOX
"	Everlube	100		90	10	0/20		.030			LOX
	No. 812	500		90	10	0/20		.030			LOX
		1000		90	10	0/20		.030			LOX
		1500		90	10	0/20		.030			LOX
		100		300	10	0/20		.030			GOX
		500		300	10	0/20		.030			GOX
		1000		300	10	0/20		.030			GOX
		1500		300	10	0/20		030			GOX
Nihart and Smith(1964)	Fluorinated Hydrocarbon	50				0					GOX
		100				20 %					GOX
		500				50 %					GOX
		1000				66.6%					GOX
Austin(1972)	Fluorolube	100		90	10	0/20		.030			LOX
	GR 290	500		90	10	0/20		.030			LOX
		1000		90	10	0/20		.030			LOX
		1500		90	10	0/20		.030			LOX
		100		300	10	0/20		.030			GOX
		500		300	10	0/20		.030			GOX
		1000		300	10	0/20		.030			GOX
		1500		300	10	8/20		.030			GOX
		1500		300	9	5/20		.030			GOX
		1500		300	8.3	0/20		.030			GOX
		1500		300	7.6	0/20		.030			GOX

SEALANTS, THREAD, COMPOUNDS, AND LUBRICANTS cont.

Reference	Materials	Test Pressure (psi)	Ingition Temp. (K)	Test Temp. (K)	Mechanical Impact Energy (kg m)	Mechanical Impact Reaction Rate	Pneumatic Impact Reaction Rate	Specimen Thickness (in)	Flash Point (K)	Fire Point (K)	Environment
Austin(1972)	Halocarbon 4-11ES	100		90	10	0/20		.030			LOX
		500		90	10	0/20		.030			LOX
		1000		90	10	0/20		.030			LOX
		1500		90	10	0/20		.030			LOX
		100		300	10	0/20		.030			GOX
		500		300	10	0/20		.030			GOX
		1000		300	10	0/20		.030			GOX
		1500		300	10	0/20		.030			GOX
"	Halocarbon 10-25E	100		90	10	0/20		.030			LOX
		500		90	10	0/20		.030			LOX
		1000		90	10	0/20		.030			LOX
		1500		90	10	0/20		.030			LOX
		100		300	10	0/20		.030			GOX
		500		300	10	0/20		.030			GOX
		1000		300	10	0/20		.030			GOX
		1500		300	10	12/20		.030			GOX
		1500		300	8.3	2/20		.030			GOX
		1500		300	7.6	0/20		.030			GOX
		1500		300	7.0	0/20		.030			GOX
"	Halocarbon 14-25	100		90	10	0/20		.030			LOX
		500		90	10	0/20		.030			LOX
		1000		90	10	0/20		.030			LOX
		1500		90	10	0/20		.030			LOX
		100		300	10	0/20		.030			GOX
		500		300	10	0/20		.030			GOX
		1000		300	10	0/20		.030			GOX
		1500		300	10	2/20		.030			GOX
		1500		300	9	0/20		.030			GOX
		1500		300	8.3	0/20		030			GOX
"	Halocarbon 14-25ES	100		90	10	0/20		.030			LOX
		500		90	10	0/20		.030			LOX
		1000		90	10	0/20		.030			LOX
		1500		90	10	0/20		.030			LOX
		100		300	10	0/20		.030			GOX
		500		300	10	0/20		.030			GOX
		1000		300	10	0/20		.030			GOX
		1500		300	10	0/20		.030			GOX

SEALANTS, THREAD, COMPOUNDS, AND LUBRICANTS cont

Reference	Materials	Test Pressure (psi)	Ignition Temp. (K)	Test Temp. (K)	Mechanical Impact Energy (kg m)	Mechanical Impact Reaction Rate	Pneumatic Impact Reaction Rate	Specimen Thickness (in.)	Flash Point (K)	Fire Point (K)	Environment
Austin(1972)	Halocarbon 11-14E	100		90	10	0/20		.030			LOX
		500		90	10	0/20		.030			LOX
		1000		90	10	0/20		.030			LOX
		1500		90	10	0/20		.030			LOX
		100		300	10	0/20		.030			LOX
		500		300	10	0/20		.030			GOX
		1000		300	10	0/20		030			GOX
		1500		300	10	0/20		.030			GOX
"	Halocarbon 11-21E	100		90	10	0/20		.030			LOX
		100		90	10	0/20		.030			LOX
		500		90	10	0/20		.030			LOX
		1500		90	10	0/20		.030			LOX
		100		300	10	0/20		.030			GOX
		500		300	10	0/20		.030			GOX
		1000		300	10	0/20		.030			GOX
		1500		300	10	0/20		.030			GOX
"	Halocarbon 11-21ES	100		90	10	0/20		.030			LOX
		500		90	10	0/20		.030			LOX
		1000		90	10	0/20		.030			LOX
		1500		90	10	0/20		.030			LOX
		100		300	10	0/20		.030			GOX
		500		300	10	0/20		.030			GOX
		1000		300	10	0/20		.030			GOX
		1500		300	10	0/20		.030			GOX
"	Halocarbon 13-21ES	100		90	10	0/20		.030			LOX
		500		90	10	0/20		.030			LOX
		1000		90	10	0/20		.030			LOX
		1500		90	10	0/20		.030			LOX
		100		300	10	0/20		.030			GOX
		500		300	10	0/20		.030			GOX
		1000		300	10	0/20		.030			GOX
		1500		300	10	0/20		.030			GOX
Nihart and Smith(1964)	Halocarbon Grease Series 25-10	2000, 7500	704								GOX
"	Halocarbon Oil Series 13-21	2000, 7500	708								GOX

SEALANTS, THREAD, COMPOUNDS, AND LUBRICANTS cont

Reference	Materials	Test Pressure (psi)	Ignition Temp. (K)	Test Temp. (K)	Mechanical Impact Energy (kg m)	Mechanical Impact Reaction Rate	Pneumatic Impact Reaction Rate	Specimen Thickness (in)	Flash Point (K)	Fire Point (K)	Environment
Nihart and Smith(1964)	High Purity Goop	2000, 7500	684								GOX
Austin(1972)	Inlox 44	100		90	10	0/20		.030			LOX
		500		90	10	0/20		.030			LOX
		1000		90	10	0/20		.030			LOX
		1500		90	10	0/20		.030			LOX
		100		300	10	0/20		.030			GOX
		500		300	10	0/20		.030			GOX
		1000		300	10	0/20		.030			GOX
		1500		300	10	0/20		.030			GOX
Jamison(1970)	Invelco 33F Grease	2000		294	10	0/20					GOX
Nihart and Smith(1964)	KEL-F 90 Grease	2000	708								GOX
		7500	708								GOX
Austin(1972)	Krytox 280-AB	100		90	10	0/20		.030			LOX
		500		90	10	0/20		.030			LOX
		1000		90	10	0/20		.030			LOX
		1500		90	10	0/20		.030			LOX
		100		300	10	0/20		.030			GOX
		500		300	10	0/20		.030			GOX
		1000		300	10	0/20		.030			GOX
		1500		300	10	0/20		.030			GOX
Pippen and Stradling(1971)	Krytox 240 AC Grease	5							621	None	GOX
		25							429	None	GOX
		50							None	None	GOX
		50							739	[illegible]	GOX
		100							731	731	GOX
		500							725	725	GOX
		1000							689	689	GOX
		1500							703	703	GOX
		2000							689	689	GOX
"	Krytox 240 AC Grease	5000		300	1.4	0/4	0/4				GOX
Jamison(1970)	Krytox 240 AC Grease	2000		297	1.4	0/20					GOX

SEALANTS, THREAD, COMPOUNDS, AND LUBRICANTS cont

Reference	Materials	Test Pressure (psi)	Ignition Temp. (K)	Test Temp. (K)	Mechanical Impact Energy (kg m)	Mechanical Impact Reaction Rate	Pneumatic Impact Reaction Rate	Specimen Thickness (in)	Flash Point (K)	Fire Point (K)	Environment
Nihart and Smith(1964)	Linde Green Pipe Joint Compound	2000	629								GOX
		7500	635								GOX
"	50-50 Soft Solder	2000	>773								GOX
		7500	>773								GOX
Brooks(1923)	Linseed Oil	0-3200	394								GOX
Pippen and Stradling (1971)	L9/3T Grease	5							641	None	GOX
		25							671	678	GOX
		50							685	685	GOX
		50							588	588	GOX
		100							551	551	GOX
		500							518	518	GOX
		1000							512	512	GOX
		1500							506	506	GOX
		2000							515	515	GOX
Nihart and Smith(1964)	Mano Pipe and Joint Compound	2000	633								GOX
		7500	695								GOX
"	MolyKote Z	2000, 7500	550								GOX
"	Oxweld Anti-Friction Compound No. 54	2000	510								GOX
		7500	503								GOX
"	Oxweld Anti-Friction Compound No. 64	2000, 7500	683								GOX
"	Oxylube No. 703	2000	511								GOX
		7500	463								GOX
"	Rectorseal No. 15	2000	647								GOX
		7500	628								GOX
Guter(1967)	Silicone D.C. Fluid 200	750	561								GOX
	CSTICS 100	3750	474								GOX

ELASTOMERS

Reference	Materials	Test Pressure (psi)	Ignition Temp. (K)	Test Temp. (K)	Mechanical Impact Energy (kg m)	Mechanical Impact Reaction Rate	Pneumatic Impact Reaction Rate	Specimen Thickness (in)	Flash Point (K)	Fire Point (K)	Environment
Pippin and Stradling (1971)	Burma-N Rubber	5000		300	0.34	0/4	0/4				GOX
		1500		300	0.34	0/4	2/4				GOX
		2000		300	0.34	0/4	4/4				GOX
"	Butyl Rubber	5							650	None	GOX
		25							619	619	GOX
		50							617	617	GOX
		50							503	503	GOX
		100							494	494	GOX
		500							453	453	GOX
		1000							439	439	GOX
		1500							431	431	
		2000									
Nihart and Smith (1964)	Duroid 5600	7500	742								GOX
	Duroid 5650	7500	725								GOX
	Duroid 5870	7500	730								GOX
	Duroid 5813	7500	736								GOX
		2000	701								
McQuaid (1972)	Ethylene Propylene Rubber	2475	456.5								GOX
Marsani (1968)	Ethylene Propylene Rubber	2500	457								GOX
"	Ebonite	750	455								GOX
		1500	439								GOX
		2625	417								GOX
		3750	419								GOX
Jamison (1970)	Ethylene - Propylene Rubber-EMS 388 (EPR)	2000		294	1.4	8/9					GOX
Pippen and Stradling (1971)	Fluorosilicone Elastomer	2500		300			0/4				GOX
		3000		300	1.4	0/2	1/4				GOX
		3500		300			1/2				GOX
		4000		300	1.4	0/2	1/2				GOX
		4500		300			4/4				GOX
		5000		300	1.4	0/8					GOX

ELASTOMERS cont.

Reference	Materials	Test Pressure (psi)	Ignition Temp. (K)	Test Temp. (K)	Mechanical Impact Energy (kg m)	Mechanical Impact Reaction Rate	Pneumatic Impact Reaction Rate	Specimen Thickness (in)	Flash Point (K)	Fire Point (K)	Environment
Schwinghamer (1971)	Fluorinated Silicone	50				50%					GOX
		100				50%					GOX
		500				100%					GOX
		1000				100%					GOX
Pippen and Stradling (1971)	Fluorosilicone L-449-6	5							644	644	GOX
		25							653	653	GOX
		50							639	639	GOX
		50							548	548	GOX
		100							544	544	GOX
		500							529	529	GOX
		1000							498	498	GOX
		1500							465	465	GOX
		2000							463	463	GOX
Guter (1967)	Hycar Lining Tube	750	643								GOX
		1500	646								GOX
		2625	473								GOX
		3750	435								GOX
"	I. C. I. Standard Rubber	750	598								
		1500	589								
		3750	470								
"	I. O. I Standard Rubber	750	524								
		1500	409								
		2625	408								
		3750	407								
Nihart and Smith (1964)	KEL-F 81	7500	701				1/1				GOX
	KEL-F Elastomer 3700	7500	610								GOX
	KEL-F Elastomer 5500	7500	620								GOX
Guter (1967)	Natural Rubber Hose	750	584								GOX
		1500	451								GOX
		2625	406								GOX

ELASTOMERS cont.

Reference	Materials	Test Pressure (psi)	Ignition Temp (K)	Test Temp. (K)	Mechanical Impact Energy (kg m)	Mechanical Impact Reaction Rate	Pneumatic Impact Reaction Rate	Specimen Thickness (in)	Flash Point (K)	Fire Point (K)	Environment
McQuaid (1972)	Neoprene (Valve Diaphragm)	2300	454								GOX
	Neoprene	1000		300			0/4				GOX
		1500		300			2/3				GOX
		4500		300			4/4				GOX
		5000		300	0.34	0/4					GOX
Guter (1967)	Neoprene	750	579								GOX
		1500	558								GOX
		2625	518								GOX
		3750	478								GOX
Pippen and Stradling (1971)	Neoprene	5							611	None	GOX
		25							600	602	GOX
		50							649	649	GOX
		50							507	507	GOX
		100							506	506	GOX
		500							496	496	GOX
		1000							496	496	GOX
		1500							460	460	GOX
		2000							465	465	GOX
"	Red Fiber Sheet	5000		300	0.34	0/4					GOX
		1500		300		0/4					GOX
		2000		300		1/2					GOX
		2500		300		1/2					GOX
		3000		300		4/4					GOX
Guter (1967)	Red Vulcanized Fiber Block	15	648								
		750	545								
		1500	493								
		2625	483								
		3750	485								
Guter (1967)	Red Vulcanized Fiber Shavings	15	625								
		750	546								
		1500	488								
		2625	462								
		3750	418								
	Rubber Diaphragms	750	503								GOX
		1500	448								GOX
		3750	410								GOX

ELASTOMERS cont.

Reference	Materials	Test Pressure (psi)	Ignition Temp. (K)	Test Temp. (K)	Mechanical Impact Energy (kg m)	Mechanical Impact Reaction Rate	Pneumatic Impact Reaction Rate	Specimen Thickness (in)	Flash Point (K)	Fire Point (K)	Environment
Nihart and Smith (1964)	Rulon A	7500	737								GOX
"	Rulon B	7500	736								GOX
"	Rulon C	7500	735								GOX
Jamison (1970)	Si Elastomer SE-342	2000		294	1.4	4/20					GOX
"	Si Elastomer	2000		297	1.4	5/9					GOX
Pippen and Stradling (1971)	Silicone Elastomer	1000		300	1.4	0/4					GOX
		1500		300	1.4	1/2					GOX
		2000		300	1.4	4/4					GOX
		3000		300			0/4				GOX
		3500		300			4/4				GOX
		4500		300	0.34	0/4					GOX
		5000		300	0.34	1/2					GOX
"	Silicone C-Ring	5							None	None	GOX
		25							684	702	GOX
		50							688	688	GOX
		50							610	610	GOX
		100							656	656	GOX
		500							527	527	GOX
		1000							496	496	GOX
		1500							503	503	GOX
		2000							501	501	GOX
Jamison (1970)	Silicone Rubber Primer A-4094	2000		299	1.4	0/21					GOX
"	Primer SS-4004	2000		297	1.4	3/6					GOX
Schwinghamer (1971)	Silicone	50				50%					GOX
		100				100%					GOX
		500				100%					GOX
		1000									GOX
Jamison (1970)	Silicone 5537	20		296.5	2.8	0/21					GOX
		100		299.5	2.8	3/9					GOX
		2000		296.5	1.4	7/16					GOX
Guter (1967)	Silicone Rubber	750-3750	598								GOX

ELASTOMERS cont.

Reference	Materials	Test Pressure (psi)	Ignition Temp. (K)	Test Temp. (K)	Mechanical Impact Energy (kg m)	Mechanical Impact Reaction Rate	Pneumatic Impact Reaction Rate	Specimen Thickness (in)	Flash Point (K)	Fire Point (K)	Environment
Nihart and Smith (1964)	Teflon (virgin)	7500	740				1/1				GOX
	Teflon (100 x)	7500	688								GOX
"	Viton A (virgin)	7500	578				2/2				GOX
	Viton B (virgin)	7500	593								GOX
Jamison (1970)	Viton V-EMS-338	2000		299	1.4	0/20					GOX
"	Viton A-HS-757A	2000		299	1.4	0/20					GOX
"	Viton B	2000		200	1.4	0/21					GOX
Pippen and Stradling (1971)	Viton Rubber	3500		300			0/4				GOX
		4000		300	.34	0/1	1/3				GOX
		5000		300	.34	0/4					GOX
"	Viton A	5							621	None	GOX
		25							610	740	GOX
		50							660	714	GOX
		50							590	590	GOX
		100							583	583	GOX
		500							540	540	GOX
		1000							523	523	GOX
		1500							518	518	GOX
		2000							515	515	GOX

MISCELLANEOUS

Reference	Materials	Test Pressure (psi)	Ignition Temp. (K)	Test Temp. (K)	Mechanical Impact Energy (kg m)	Mechanical Impact Reaction Rate	Pneumatic Impact Reaction Rate	Specimen Thickness (in)	Flash Point (K)	Fire Point (K)	Environment
Jamison(1970)	Armstrong A-2	2000		294	1.4	4/20					GOX
	Activator A	100		294	1.4	0/22					GOX
Marzani (1968a)	Asbestos, TFE, MOS_2 Phenolic Resin	2250	446.5								GOX
"	Asbestos Cloth TFE Phenolic Resin	2200	432.5								GOX
"	Asbestos Cloth Graphite, Phenolic Resin	2200	430								GOX
"	Carbon Graphite-Copper	3275	607								GOX
"	Carbon Graphite-Silver	3200	588								GOX
"	Carbon Graphite-Babbit	3100	576.5								GOX
Pippen and Stradling (1971)	Epibond 70-1768	500		300	1.4	4/4					GOX
		1000		300			0/4				GOX
		1500		300			1/2				GOX
		2000		300			1/3				GOX
Jamison(1970)	Epibond 123	2000		297	1.4	5/9					GOX
	Hardner 931	100		297	1.4	0/21					GOX
Pippen and Stradling (1971)	2T Epoxy	4500		300	.34	0/4					GOX
		5000			.34	1/3	0/4				GOX
"	EA-40 Epoxy	3500		300			0/1				GOX
		4000		300			0/4				GOX
		4500		300			4/4				GOX
Marzani (1968a)	Laminated Glass-Filled Epoxy	2500	460								GOX

MISCELLANEOUS cont.

Reference	Materials	Test Pressure (psi)	Ignition Temp. (K)	Test Temp. (K)	Mechanical Impact Energy (kg m)	Mechanical Impact Reaction Rate	Pneumatic Impact Reaction Rate	Specimen Thickness (in)	Flash Point (K)	Fire Point (K)	Environment
Austin(1972)	Epoxy Fiberglass	15		90	10	20/20		0.05			LOX
		15		90	7.62	20/20		0.05			LOX
		15		90	5.54	20/20		0.05			LOX
		15		90	3.46	20/20		0.05			LOX
		15		90	1.38	4/20		0.05			LOX
		15		90	0.68	2/20		0.05			LOX
		100		300	10	15/20		0.05			GOX
		100		300	7.62	20/20		0.05			GOX
		100		300	5.54	20/20		0.05			GOX
		100		300	4.86	2/20		0.05			GOX
		100		300	4.17	0/20		0.05			GOX
		100		300	3.46	0/20		0.05			GOX
		500		300	4.86	2/5		0.05			GOX
		500		300	4.17	0/20		0.05			GOX
		1000		300	4.17	1/6		0.05			GOX
		1500		300	4.17	1/1		0.05			GOX
Guter(1967)	GACO Seats Grade H22	750	673								GOX
		1500	604								GOX
		3750	455								GOX
Marzani (memo)	Graphite	3800	724								GOX
Guter(1967)	Lamp Black	750	646								GOX
Jamison (1970)	Locktite Grade C	2000		294	1.4	0/20					GOX
Pippen and Stradling (1971)	FLV Viton Cement	25							None	None	GOX
		50							701	701	GOX
		50							617	617	GOX
		100							632	632	GOX
		500							574	574	GOX
		1000							589	559	GOX
		1500							507	507	GOX
		2000							516	516	GOX
Jamison (1970)	RTV	2000		297	1.4	4/4					GOX
Guter(1967)	Resin Bonded Fabric	750	483								GOX
		1500	474								GOX
		3750	434								GOX
Jamison (1970)	Scot Weld Structural	2000		297	1.4	2/19					GOX
"	Viton Cement Coating Material	2000		299	1.4	0/20					GOX

APPENDIX II - NONMETALLIC MATERIALS DESIGN GUIDELINES AND TEST DATA HANDBOOK, APPENDIX E MATERIALS TEST DATA FOR APPLICATIONS IN HIGH PRESSURE OXYGEN AND OTHER HAZARDOUS FLUIDS, NASA, MSC-02681 (1972)

APPENDIX E MATERIALS TEST DATA FOR APPLICATIONS IN HIGH PRESSURE OXYGEN AND OTHER HAZARDOUS FLUIDS

E1.0 INTRODUCTION

The test data presented in this appendix is from a computer generated report, NB/RT-71-45, dated February 1972. It is sorted by manufacturer's designation and presents thermal reaction data for materials tested in oxygen or other hazardous fluids. These tests were initiated as a result of the Apollo 13 investigation and were incorporated as Apollo Program Office requirements by addendum 2 of MSC-PA-D-67-13, Apollo Spacecraft Nonmetallic Materials Requirements.

The tests included in this report are:

- Pneumatic impact in gaseous oxygen
- Mechanical impact in gaseous oxygen
- Thermogravimetric analysis
- Flash and fire point
- Reaction propagation in fluids other than oxygen
- Auto ignition
- Fluid impact in liquid oxygen and other fluids

E2 ENCODING KEY

MATERIAL TEST DATA BY MANUFACTURER'S DESIGNATION AS OF (DATE) (17) PAGE (#)

MFGR'S DESIGNATION (1)	MANUFACTURER (2)	SPEC. THICK. (3)	TEST RPT NO. (4)	TEST ENVR (5)	TEST PRESS (6)	TEST TEMP (7)	IMPT ENER (8)	NO OF REACT (9)	FLASH POINT (10)	FIRE PT (11)	PROP DIST (12)	% WT LOSS (13)	R T I T (14) (15)	MATL CODE (16)

(1) **MANUFACTURER'S DESIGNATION** This column contains the identification of the material, composite, component, or assembly and the stock or formulation number or other unique designation that a manufacturer has assigned to it.

(2) **MANUFACTURER** This column contains names of the manufacturer, formulator or producer of the material, component, assembly, etc., which has been tested.

(3) **SPECIMEN THICKNESS** The thickness of the material in the particular test shown.

(4) **TEST REPORT NUMBER** The test report number is the number assigned to the test report by the facility performing the test. The dash number suffix indicates that multiple tests were performed for the given test type (reference 15).

(5) **TEST ENVIRONMENT** This column contains the environment (gaseous or liquid) in which the material was tested.

(6) **TEST PRESSURE** This column contains the pressure, in psia, which the material tests were performed.*

(7) **TEST TEMPERATURE** This column contains the test temperature in degrees Fahrenheit (^{o}F).*

(8) **IMPACT ENERGY** This column contains impact energy notations for foot pounds per square inch.

(9) **NUMBER OF REACTIONS** This column contains the number of reactions per the total number of specimen tested.

(10) **FLASH POINT** Flash point temperature in degrees Fahrenheit (^{o}F). For tests terminated before flash point is determined, entry is the letter "N" followed by the test termination temperature; e.g., N420 indicates test terminated at 420^{o}F. Test termination temperatures exceeding 1000^{o}F will be entered at N999.

(11) **FIRE POINT** Fire point temperature in degrees Fahrenheit (^{o}F). For tests terminated before fire point is determined, entry is the letter "N" followed by the test termination temperature; e.g., N500 indicates test terminated at 500^{o}F. Test termination temperatures exceeding 1000^{o}F will be entered at N999.

(12) **PROPAGATION DISTANCE** This column contains the flame propagation distance in inches from the point of ignition. A propagating glow will be reported as a propagating flame.

(13) **PERCENTAGE WEIGHT LOSS** This column shows the percent weight lost by the sample during the thermogravimetric test.

*The temperature and pressure shown for the autoignition test No. 15 is the maximum temperature and pressure occuring during the test.

(14) RI Results indicator code indicates the results of the test. These codes and their definitions are shown in the following tables

Code	Result Indicator (RI) Code Definition
A	No ignition (defined as no evidence of having been ignited after ignition source has been removed). (11)***
B	Self-extinguishing (defined as, in the event of ignition, that the flame will go out within 3.0 inches of sample length after the ignition source has been removed). (10)
C	Propagated partially, (Flame propagated completely across sample). (5)
D	Propagated completely. (Flame propagated completely across sample). (4)
E	Ignited explosively. (1)
F	Light smoke, visible (8)
G	Smoldering combustion. (Material combustion was evidenced by a glow rather than a flame). (9)
H	No evidence of fire; however, severe deformation of configuration resulted. (Not to be used with sample tests.)
I	Inconclusive results. (related to configuration testing--not to be used with sample tests.)
J	Soot and/or char detectable. (6)
K	Case burst vented or sealed container
L	Case external wall temperature exceeded 450°F.
M	Matter transfer. Material sparked, sputtered, spurted flame, dripped globules of burning matter, or otherwise gave evidence of matter transfer. (2)
N	No external effect (vented or sealed container)
P	Emission of toxic gas or fumes (vented or sealed container).
Q	Emission of sparks or flames (vented or sealed container).
R	Discoloration
S	Smoke, heavy and dark. (7)
T	Evidence of combustion (no rate measured)
V	Detonation
W	Odor produced.
X	Material burned at a high rate, too fast to measure, but not classified as an explosion. (3)
Y	Melted (not accompanied by burning).
Z	See Test Report

*** Parenthetical Numbers are the order of Preference in the use of the Results Indicator (RI) in the Test Data Listing.

(15) TT Test type code indicates type of test performed. These codes and their definitions appear in the following table.

Code	Test Type (TT) Code Definition
10	Pneumatic Impact (Gaseous Oxygen)
11	Mechanical Impact (Gaseous Oxygen)
12	Thermogravimetric Analysis (TGA)
13	Flame and Fire Point
14	Reaction Propagation Test
15	Autoignition Test
16	Fluid Impact Test (LOX and other fluids)

(16) MATERIAL CODE Material code, a six-letter (three pair) code capable of defining materials, components, subassemblies, etc. generically and functionally. The first pair of letters of these codes describes the functional applications for which the material is tested. The second pair of letters describes the basic chemical composition of the material and the third pair of letters describes additional information, primarily of a chemical nature if available.

(17) DATE OF REPORT Date report is generated.

The following information is a listing of material usage and generic identification found in the NB/PT-71-45 Test Data Listing. This code contains six letters (three groups of two each). The first group refers to the functional application of the material, while the second gives the chemical composition. The third group will give additional information, usually chemical information if available. Reference is made to all of this information as number sixteen of the key on pages E2-1 and E2-2.

E2 CODES OF MATERIAL USAGE AND GENERIC IDENTIFICATION

NASA MATERIAL CODES (COMAT)

CODE	LISTING	DEFINITION	TABLE
AA	ABSORBER	ABSORBER,N.O.C.	1
AB	ADHES	ADHESIVE,N.O.C.	1
AC	ADHES,FILM	ADHESIVE,FILM	1
AD	ADHES,HOT MELT	ADHESIVE,HOT MELT	1
AE	ADHES,LIQUID	ADHESIVE,LIQUID	1
AF	ADHES,PRESS SENS	ADHESIVE,PRESSURE SENSITIVE	1
AG	ADHES,PRIMER	ADHESIVE,PRIMER	1
AH	BEARING MATL	BEARING MATERIAL,N.O.C.	1
AI	CHEMICAL	CHEMICAL,N.O.C.	1
AK	COATG	COATING,N.O.C.	1
AL	COATG,CONFORMAL	COATING,CONFORMAL	1
AM	COATG,ELEC CONDUCT	COATING,ELECTRICALLY CONDUCTIVE	1
AN	COATG,FLUIDIZED	COATING,FLUIDIZED	1
AO	COATG,FRICTION	COATING,FRICTION	1
AP	COATG,INK	COATING,INK,N.O.C.	1
AQ	COATG,INK,S SCRN	COATING,INK,SILK SCREEN	1
AR	COATG,INTUMESCENT	COATING,INTUMESCENT	1
AS	COATG,LACQUER	COATING,LACQUER	1
AT	COATG,PAINT	COATING,PAINT	1
AU	COATG,PRIMER	COATING,PRIMER	1
AV	COATG,TEMP CONTROL	COATING,TEMPERATURE CONTROL	1
AW	COMPOUND,N.O.C.	COMPOUND,N.O.C.	1
AX	COMPOUND,GREASELIKE	COMPOUND,GREASE,N.O.C.	1
AY	COMPOUND,HEATSINK	COMPOUND,HEATSINK	1
AZ	COMPOUND,MOLDING	COMPOUND,MOLDING	1
BA	COMPOUND,POTTING	COMPOUND,POTTING	1
BB	COMPOSITE	COMPOSITE,N.O.C.	1
BC	CONNECTOR,ELEC	CONNECTOR,ELECTRICAL	1
BD	ELEC PART	ELECTRICAL PART,N.O.C.	1
BE	ELEC PART,MOLDED	ELECTRICAL PART,MOLED	1
BF	FABRIC	FABRIC,N.O.C.	1
BG	FABRIC,COAT/IMPREG	FABRIC,COATED OR IMPREGNATED	1
BH	FABRIC,ELASTIC	FABRIC,ELASTIC	1
BI	FABRIC,FELT	FABRIC,FELT	1
BJ	FABRIC,FLATWEAVE	FABRIC,FLATWEAVE	1

CODE	LISTING	DEFINITION	TABLE
BK	FABRIC,DUCK WEAVE	FABRIC,DUCK WEAVE	1
BL	FABRIC,OPEN WEAVE	FABRIC,OPEN WEAVE	1
BM	FABRIC,WEBBING	FABRIC,WEBBING	1
BN	FASTENER	FASTENER,N.O.C.	1
BO	FASTENER,HOOK + PILE	FASTENER,HOOK AND PILE	1
BP	FILM	FILM,N.O.C.	1
BQ	FILM,RUBBER	FILM,RUBBER	1
BR	FILM,DRAFTING	FILM,DRAFTING	1
BS	FILM,PHOTOGRAPHIC	FILM,PHOTOGRAPHIC	1
BT	FINISH	FINISH,N.O.C.	1
BU	FINISH,INORGANIC	FINISH,INORGANIC	1
BV	FLUID	FLUID,N.O.C.	1
BW	FLUID,HALOCARBON	FLUID,HALOCARBON,N.O.C.	1
BY	FLUID,PERFLUORO	FLUID,PERFLUORO,N.O.C.	1
BZ	FLUX	FLUX	1
CA	FOAM	FOAM,N.O.C.	1
CB	FOAM,FLEX,CLOS CELL	FOAM,FLEXIBLE CLOSED CELL	1
CC	FOAM,FLEX,OPEN CELL	FOAM,FLEXIBLE OPEN CELL	1
CD	FOAM,METALLIC	FOAM,METALLIC	1
CE	FOAM,RIGID,CLOS CELL	FOAM,RIGID,CLOSED CELL	1
CF	FOAM,RIGID,OPEN CELL	FOAM,RIGID,OPEN CELL	1
CG	FOOD	FOOD,N.O.C.	1
CH	GASKETING/SEAL	GASKETING OR SEAL,N.O.C.	1
CI	GASKETING/SEAL,RFI	GASKETING OR SEAL,RADIO FREQUENCY INTERFERENCE SHIELD	1
CJ	IMPREGNANT	IMPREGANT,N.O.C.	1
CK	INSUL,THERM	INSULATION,THERMAL,N.O.C.	1
CL	INSUL,THERM,COMPOS	INSULATION,THERMAL,COMPOSITE	1
CM	INSUL,THERM,FILM	INSULATION,THERMAL,FILM	1
CN	LABEL	LABEL,N.O.C.	1
CO	LAM	LAMINATE,N.O.C.	1
CP	LAM,ASBESTOS BASE	LAMINATE,ASBESTOS BASE	1
CQ	LAM,COTTON CL BASE	LAMINATE,COTTON CLOTH BASE	1
CR	LAM,GLASS FIBER BASE	LAMINATE,GLASS FIBER BASE	1
CS	LAM,MICA BASE	LAMINATE,MICA BASE	1

CODE	LISTING	DEFINITION	TABLE
CT	LAM,PAPER BASE	LAMINATE,PAPER BASE	1
CU	LAM,PREPREG	LAMINATE,PREIMPREGNATED	1
CV	LEATHER	LEATHER,N.O.C.	1
CW	LEATHER,NATURAL	LEATHER,NATURAL	1
CY	LEATHER,SYNTHETIC	LEATHER,SYNTHETIC	1
CZ	LUBE,	LUBRICANT,N.O.C.	1
DA	LUBE,DRY FILM	LUBRICANT,DRY FILM	1
DB	LUBE,GREASE	LUBRICANT,GREASE	1
DC	LUBE,OIL	LUBRICANT,OIL	1
DD	MISC	MISCELLANEOUS,N.O.C.	1
DE	MISC,BAG	MISCELLANEOUS,BAG	1
DF	MISC,BOTTLE	MISCELLANEOUS,BOTTLE	1
DG	MISC,PAD	MISCELLANEOUS,PAD	1
DH	MISC,WAX	MISCELLANEOUS,WAX	1
DI	PAPER	PAPER,N.O.C.	1
DJ	PHARMACEUTICALS	PHARMACEUTICALS,N.O.C.	1
DK	PLASTIC	PLASTIC,N.O.C.	1
DL	PLASTIC,MOLD RESIN	PLASTIC,MOLDING RESIN,N.O.C.	1
DM	ROD	ROD,N.O.C.	1
DN	ROD,PLASTIC	ROD,PLASTIC	1
DO	RUBBER	RUBBER,N.O.C.	1
DP	SEALANT MATL	SEALANT MATERIAL (EXCLUDES GASKETING,ETC.SEE GASKTING)	1
DQ	SEALANT MATL,1 PART	SEALANT MATERIAL,1 PART	1
DR	SEALANT MATL,2 PART	SEALANT MATERIAL,2 PART	1
DS	SEALANT MATL,THREAD	SEALANT MATERIAL,THREAD	1
DT	SHEET	SHEET,N.O.C.	1
DU	SHEET,PLASTIC	SHEET,PLASTIC	1
DV	SHEET,RUBBER	SHEET,RUBBER	1
DW	SLEEVE,SOLDER	SLEEVE,SOLDER,N.O.C.	1
DX	SOLVENT	SOLVENT,N.O.C.	1
DY	TAPE	TAPE,N.O.C.	1
DZ	TAPE,ADHES SURF	TAPE,ADHESIVE SURFACED	1
EA	TAPE,ELASTIC	TAPE,ELASTIC	1
EB	TAPE,ELECTRICAL	TAPE,ELECTRICAL	1
EC	TAPE,LACING	TAPE,LACING	1

CODE	LISTING	DEFINITION	TABLE
ED	THREAD	THREAD,N.O.C.	1
EF	TUBING	TUBING,N.O.C.	1
EG	TUBING,FLEXIBLE	TUBING,FLEXIBLE	1
EH	TUBING,HEATSHRINK	TUBING,HEAT SHRINK	1
EI	TUBING,PLASTIC	TUBING,PLASTIC	1
EJ	TUBING,RIGID	TUBING,RIGID	1
EK	TUBING,RUBBER	TUBING,RUBBER	1
EL	WIRE	WIRE,N.O.C.	1
EM	WIRE,CABLE	WIRE,CABLE	1
EN	WIRE,CABLE,SHLD	WIRE,CABLE,SHIELDED	1
EO	WIRE,COAX	WIRE,COAXIAL	1
EP	WIRE,INSULATED	WIRE,INSULATED	1
EQ	WIRE,SHIELED	WIRE,SHIELED	1
ER	WIRE,MAGNET	WIRE,MAGNET	1
ES	FOAM,FLEX	FOAM,FLEXIBLE,NOC	1
ET	FOAM,RIGID	FOAM,RIGID,NOC	1
EU	CORD	CORD(NOT ELECTRICAL)	1
EW	COMP,ABLATIVE	COMPOUND,ABLATIVE	1
EX	ASSY	ASSEMBLY,N.O.C.	1
EY	CONTAINER	CONTAINER	1
EZ	ASSY,ELEC	ASSEMBLY,ELECTRICAL	1
FA	ASSY,HYD	ASSEMBLY,HYDRAULIC	1
FB	ASSY,COMPLEX	ASSEMBLY,COMPLEX	1
FC	ASSY,MECH	ASSEMBLY,MECHANICAL	1
FD	ASSY,PANEL	ASSEMBLY,PANEL	1
FE	ASSY,PNEU	ASSEMBLY,PNEUMATIC	1
FF	ASSY,WIREBDL	ASSEMBLY,WIREBUNDLE,INCLUD HARNES WITH/WO CLMPS,CNECT	1
FG	ASSY,SUIT	ASSEMBLY,SUIT OR MAJOR PORTIONS THEREOF.	1
FH	FOAM,LIQUID	FOAM,LIQUID	1
FI	DISK	DISK,N.O.C.	1
FJ	INSULATION	INSULATION,N.O.C.	1
FK	SOLDERING MATL	SOLDERING MATL,N.O.C.	1
FL	BRAZING MATL	BRAZING MATL, N.O.C.	1
FM	WELDING MATL	WELDING,N.O.C.	1

NASA MATERIAL CODES (CoMAT)

CODE	LISTING	DEFINITION	TABLE
PS	PROCESS SPECS USED ON	DETAIL DWGS	1
XX		N.O.C.	1

CODE	LISTING	DEFINITION	TABLE
	,FREONS	NO CODE-TRADE NAME DUPONT	2
	,ISOCYANATES	NO CODE-SEE URETHANE.	2
	,MELAMINE	NO CODE-SEE AMINO	2
	,SPANDEX	SEE URETHANE,SPANDEX FOR CODE	2
	,UREA	NO CODE-SEE AMINO	2
AA	,ACRYLIC LATEX	ACRYLIC LATEX	2
AB	,EPOXY ESTER	EPOXY ESTER	2
AC	,LATEX	LATEX,N.O.C.	2
AD	,MODIFIED	MODIFIED (FOR USE IN COLUMNS 5 + 6)	2
AE	,PVC,PLASTISOL	POLYVINYL CHLORIDE, PLASTISOL OR ORGANOSOL	2
AF	,SHELLAC	SHELLAC	2
AG	,URETHANE,H2O CURED	URETHANE,MOISTURE CURED	2
AH	,ZINC CHROMATE PIGMT	ZINC CHROMATE PIGMENTED	2
AI	,ABS	ACRYLONITRILE-BUTADIENE-STYRENE	2
AJ	,ACETAL,POM	ACETAL,E.G., COPOLYMER (CELCON),HOMOPOLYMER (DELRIN)	2
AK	,ACRYLIC	ACRYLIC,N.O.C.	2
AL	,ACRYLIC,BUTYL METH.	ACRYLIC,BUTYL METHACRYLATE	2
AM	,ACRYLIC,PMMA,CAST	ACRYLIC,METHYL METHACRYLATE,CAST	2
AN	,ACRYLIC,PMMA,MLDG	ACRYLIC,METHYL METHACRYLATE,MOLDING TYPE	2
AO	,ALKYD	ALKYD,N.O.C.	2
AP	,ALLYL	ALLYL,N.O.C.	2
AQ	,ALLYL,DAP	ALLYL,DIALLYL PHTHALATE	2
AR	,AMINO	AMINO,N.O.C.	2
AS	,AMINO,MELA-FORM(MF)	AMINO,MELAMINE-FORMALDEHYDE(MF)	2
AT	,AMINO,UREA-FORM(UF)	AMINO,UREA-FORMALDEHYDE	2
AU	,CELLULOSIC	CELLULOSIC,N.O.C.	2
AV	,CELLULOSE ACETATE	CELLULOSE ACETATE	2
AW	,CELLULOSE ACET-BUT	CELLULOSE ACETATE-BUTYRATE	2
AX	,CELLULOSE,ETHYL	ETHYL CELLULOSE	2
AY	,CELLULOSE NITRATE	CELLULOSE NITRATE	2
AZ	,CELLULOSE PROPION.	CELLULOSE PROPIONATE	2
BA	,CELLULOSE TRIACET.	CELLULOSE TRIACETATE	2
BB	,CHLORIN.POLYETHER	CHLORINATED POLYETHER (E.G. PENTRON)	2

CODE	LISTING	DEFINITION	TABLE
BC	,CHLOROFLUORO	CHLOROFLUORO,N.O.C.	2
BD	,CTFE	CHLOROTRIFLUOROETHYLENE,N.O.C.	2
BE	,CTFE,FILLED	POLYCHLOROTRIFLUOROETHYLENE,FILLED	2
BF	,CTFE RESIN	POLYCHLOROTRIFLUOROETHYLENE RESIN (E.G.,KEL-F 81,82)	2
BG	,EPOXY	EPOXY,N.O.C.	2
BH	,EPOXY,AMINE CURED	EPOXY,AMINE CURED	2
BI	,EPOXY,ANHYD.CURED	EPOXY,ANHYDRIDE CURED	2
BJ	,EPOXY,CATALYT.CURED	EPOXY,CATALYTICALLY CURED (E.G.,BF3-400 CURED)	2
BK	,EPOXY,NOVOLAK	EPOXY,NOVOLAK	2
BL	,EPOXY,POLYAM.CURED	EPOXY,POLYAMIDE CURED	2
BM	,EPOXY,PROPRI.OR UNK	EPOXY,PROPRIETARY OR UNKNOWN	2
BN	,EVA (ETH-VINYLACET)	EVA (ETHYLENE-VINYL ACETATE),N.O.C	2
BO	,FEP	PERFLUORO (ETHYLENE-PROPYLENE) COPOLYMER	2
BP	,FLUORO	FLUORO,N.O.C.	2
BQ	,FURAN	FURAN,N.O.C	2
BR	,IONOMER	IONOMER,N.O.C.(E.G.,SURLYN A)	2
BS	,NYLON	NYLON,N.O.C.	2
BT	,NYLON (6,6)	NYLON, 6,6 TYPE	2
BU	,NYLON,SOLUBLE	NYLON,SOLUBLE	2
BV	,NYLON,AROMATIC	NYLON,AROMATIC (E.G.,NOMEX)	2
BW	,PARYLENE,N.O.C.	PARYLENE,N.O.C.	2
BX	,PHENOLIC (PF)	PHENOLIC(PF)(PHENOL-FORMALDEHYDE)	2
BY	,PLASTICS	PLASTICS,N.O.C.	2
BZ	,POLYBUTYLENE	POLYBUTYLENE,N.O.C.	2
CA	,POLYCARBONATE(PC)	POLYCARBONATE,N.O.C.	2
CB	,POLYESTHER	POLYESTHER,N.O.C.	2
CC	,PE TEREPHTHALATE	POLYETHYLENE TERPHTHALATE(PETP)	2
CD	,POLYIMIDE	POLYIMIDE,N.O.C.	2
CE	,POLYOLEFIN	POLYOLEFIN,N.O.C	2
CF	,POLYOLEFIN,PE	POLYOLEFIN,POLYETHYLENE	2
CG	,POLYOLEFIN,PP	POLYOLEFIN,POLYPROPYLENE	2
CH	,POLYPHENYL.OXIDE	POLYPHENYLENE OXIDE,N.O.C. (E.G.,PPO)	2
CI	,POLYSULFONE	POLYSULFONE,N.O.C.	2
CJ	,PVF	POLYVINYL FLUORIDE (E.G., TEDLAR)	2
CK	,SILICONE	SILICONE,N.O.C.	2

CODE	LISTING	DEFINITION	TABLE
CL	,SILICONE,RESINOUS	SILICONE,RESINOUS	2
CM	,STYRENE-ACRYLONITR	STYRENE-ACRYLONITRILE	2
CN	,TFE	TETRAFLUOROETHYLENE,N.O.C.	2
CO	,TFE,PTFE RESIN	TFE,PTFE RESIN (E.G.,TEFLON TFE,HALON TFE,THIOKOL TFE	2
CP	,TFE,PTFE FILLED	TFE,PTFE FILLED (E.G.,RULON,FLUOROGREEN)	2
CQ	,URETHANE	URETHANE,N.O.C. (SEE ALSO RUBBER AND COATINGS LISTS)	2
CR	,URETHANE,RESINOUS	URETHANE,RESINOUS,N.O.C.	2
CS	,URETHANE,SPANDEX	URETHANE,SPANDEX	2
CT	,VF2	(E.G. KYNAR)	2
CU	,VINYL	VINYL,N.O.C.	2
CV	,VINYL,PVAC	VINYL,POLYVINYL ACETATE	2
CW	,VINYL,PVAL	VINYL,POLYVINYL ALCHOL	2
CX	,ACRYLIC RUBBER	ACRYLIC RUBBER,N.O.C.	2
CY	,BUTADIENE(BR)	BUTADIENE RUBBER,N.O.C.	2
CZ	,BUTYL(IIR)	BUTYL RUBBER,N.O.C.	2
DA	,CHLOROFLUORO ELAST	CHLOROFLUORO ELASTOMER,N.O.C.	2
DB	,CHLOROPRENE(CR)	CHLOROPRENE,N.O.C.(NEOPRENE)	2
DC	,CHLOROSULF.PE(CSM)	CHLOROSULFONATED POLYETHYLENE,N.O.C.(E.G.,HYPALON)	2
DD	,ETH-PROP.RUB.	ETHYLENE PROPYLENE RUBBER(EPT,EPM,EPR),N.O.C.	2
DE	,FLUOROELAST	FLUOROELASTOMER,N.O.C.(E.G.,FLUOREL)	2
DF	,FLUOROELAST FPM	VINYLIDE FLUORIDE AND HEXAFLUOROPROPYLENE COPOLYMER	2
DG	,FLUOROSILICONE RUB.	FLUOROSILICONE RUBBER (FSI),N.O.C.(E.G.,SILASTIC LS)	2
DH	,ISOPRENE(NAT),NR	NATURAL ISOPRENE RUBBER	2
DI	,ISOPRENE(SYN),IR	SYNTHETIC ISOPRENE RUBBER	2
DJ	,NITRILE RUBBER(NBR)	NITRILE RUBBER,N.O.C.	2
DK	,POLYISOBUTYLENE RUB	POLYISOBUTYLENE RUBBER,N.O.C.	2
DL	,POLYSULFIDE	POLYSULFIDE,N.O.C.	2
DM	,POLYSULFIDE,MILLED	POLYSULFIDE RUBBER,MILLED	2
DN	,POLYSULFIDE,LIQUID	POLYSULFIDE RUBBER,LIQUID	2
DO	,RECLAIMED RUBBER	RECLAIMED RUBBER	2
DP	,SILIC.RUB	SILICONE RUBBER,N.O.C.	2
DQ	,SILIC.RUB, MILLED	SILICONE RUBBER,MILLED (SEE ALSO FLUOROSILICONE.)	2
DR	,SILIC.RUB,RTV 1PART	SILICONE RUBBER,ROOM TEMPERATURE VULCANIZING	2
DS	,SILIC.RUB,RTV 2PART	SILICONE RUBBER,ROOM TEMPERATURE VULCANIZING	2

CODE	LISTING	DEFINITION	TABLE
DT	,STY-BUTADI.RUB,SBR	STYRENE-BUTADIENE RUBBER	2
DU	,URETH.RUB	URETHANE RUBBER,N.O.C.	2
DV	,URETH.RUB,MILLED	URETHANE RUBBER,MILLED	2
DW	,URETH.RUB,LIQ AMINE	URETHANE RUBBER,LIQUID,AMINE CURE	2
DX	,URETH.RUB,LIQ CATAL	URETHANE RUBBER,LIQUID,CATALYTICALLY CURED	2
DY	,URETH.RUB,LIQ POLYO	URETHANE RUBBER,LIQUID,POLYOL CURE	2
DZ	,ET-GLYCOL-H2O 35-36	ETHYLENE-GLYOL 35 PCT,WATER 65 PCT,N.O.C.	2
EA	,HEAT TRANSFER	HEAT TRANSFER,N.O.C.	2
EB	,PROCESSING	PROCESSING,N.O.C.	2
EC	,PROPYLENE GLYC-H2O	PROPYLENE GLYCOL-WATER,N.O.C.	2
ED	,DIESTER	DIESTER,N.O.C.	2
EE	,DIESTER,PHOSPATE	DIESTER,PHOSPHATE TYPE	2
EF	,FLUOROCARB.TELOMER	FLUOROCARBON TELOMER,N.O.C.	2
EG	,FLUOROSILICONE	FLUOROSILICONE,N.O.C.	2
EH	,GRAPHITE BASE	GRAPHITE BASE,N.O.C.	2
* EI	,METAL BASE,	METALLIC BASE,N.O.C.	2
EJ	,MOLYDISULFIDE BASE	MOLYBDENUM DISULFIDE BASE,N.O.C.	2
EK	,HYDROCARBON BASE	HYDROCARBON BASE,N.O.C.	2
EL	,SOAP BASE	SOAP BASE,N.O.C.	2
EM	,+SOAP	PLUS SOAP	2
EN	,VEGETABLE OIL BASE	VEGETABLE OIL BASE (E.G.,CASTOR),N.O.C.	2
EO	,ACETONE	ACETONE	2
EP	,METHANOL	METHANOL	2
EQ	,METHYLENE CHLORIDE	METHYLENE CHLORIDE	2
ER	,METHYL ETHYL KETONE	METHYL ETHYL KETONE,(MEK),N.O.C.	2
ES	,MIXED LACQ THINNER	MIXED LACQUER THINNER,N.O.C.	2
ET	,MIXED PAINT THINNER	MIXED PAINT THINNER,N.O.C.	2
EU	,TOLUENE	TOLUENE,N.O.C.	2
EV	,TRICHLOROETHYLENE	TRICHLOROETHYLENE,N.O.C.	2
EW	,XYLENE	XYLENE,N.O.C.	2
EX	,ASPIRIN	ASPIRIN,N.O.C.	2
EY	,BENZEDRINE	BENZEDRINE,N.O.C.	2
EZ	,BENZOIC ACID	BENZOIC ACID,N.O.C.	2
FA	,CHLOROPHENYLPHENOL	CHLOROPHENYLPHENOL,N.O.C.	2
FB	,FLUORESCEIN	FLUORESCEIN	2

* Prior to using this code in assigning a NASA MATERIAL CODE, refer to Page E2-16.

	CODE	LISTING	DEFINITION	TABLE
	FC	,GERMICIDE	GERMICIDE	2
	FD	,ISOPROPANOL	ISOPROPANOL	2
	FE	,LOTION	LOTION,N.O.C.	2
	FF	,PENICILLIN	PENICILLIN,N.O.C.	2
	FG	,PILL	PILL,N.O.C.	2
	FH	,PROPYLENE GLYCOL	PROPYLENE GLYCOL	2
	FI	,NA ORTHOPHENYLPHENOL	SODIUM ORTHOPHENYLPHENOL,N.O.C.	2
	FJ	,ALUMINIZED	ALUMINIZED,N.O.C.	2
*	FK	,ALUMINUM	ALUMINUM,N.O.C.	2
	FL	,ASBESTOS	ASBESTOS,N.O.C.	2
	FM	,+BINDER	PLUS BINDER,N.O.C.	2
*	FN	,CADMIUM	CADMIUM,N.O.C.	2
*	FO	,CARBON	CARBON,N.O.C.	2
	FP	,CHAMOIS	CHAMOIS	2
	FR	,CORK	CORK,N.O.C.	2
	FS	,COTTON	COTTON,N.O.C.	2
	FT	,DYE	DYE,N.O.C.	2
	FU	,FIBER	FIBER,N.O.C.	2
	FV	,FIBER,GLASS	FIBER,GLASS	2
	FW	,FILLED	FILLED,N.O.C.	2
	FX	,FILLER	FILLER,N.O.C.	2
	FY	,FILLER,INORGANIC	FILLER,INORGANIC,N.O.C.	2
	FZ	,FILLER,METAL	FILLER,METAL,N.O.C.	2
	GA	,FILLER,ORGANIC	FILLER,ORGANIC,N.O.C.	2
	GB	,FINISH	FINISH,N.O.C.	2
	GC	,FINISH,FRICTION	FINISH,FRICTION	2
	GD	,GLASS FIBER	GLASS FIBER,N.O.C.	2
	GE	,GALVANIZE	GALVANIZE	2
	GF	,GRAPHITE	GRAPHITE,N.O.C.	2
	GG	,HYDROCARBON	HYDROCARBON,N.O.C.	2
	GH	,LITHIUM HYDROXIDE	LITHIUM HYDROXIDE,N.O.C.	2
*	GI	,METAL	METAL,N.O.C.	2
	GJ	,METALIZED	METALLIZED,N.O.C.	2
*	GK	,METALLIZED,AL	METALLIZED WITH ALUMINUM,N.O.C. NOT ALUMINIZED	2

* Prior to using this code in assigning a NASA MATERIAL CODE, refer to Page E2-16.

CODE	LISTING	DEFINITION	TABLE
GL	,1PART	ONE PART	2
GP	,PAPER	PAPER	2
GN	,POLYBLEND	POLYBLEND,N.O.C.	2
GO	,RAYON	RAYON	2
GP	,SILICATE	SILICATE	2
* GQ	,SILVER	SILVER	2
GR	,TREATED	TREATED	2
GS	,2PART	TWO PART	2
GT	,UNKNOWN	UNKNOWN,N.O.C.	2
GU	,UNKNOWN,PROPRIETARY	UNKNOWN,PROPRIETARY	2
GV	,VULCANIZED FIBER	VULCANIZED FIBER	2
GW	,WAX	WAX	2
GX	,WOOD	WOOD	2
GY	,WOOD FLOUR	WOOD FLOUR	2
GZ	,WOOL	WOOL	2
* HA	,ZINC	ZINC	2
HB	,POLYSTYRENE(PS)	POLYSTYRENE,N.O.C.	2
HC	,VINYL,PVC	VINYL,POLYVINYL CHLORIDE	2
HD	,RUBBER,N.O.C.	RUBBER,N.O.C.	2
HE	,PBI	POLYBENZIMIDAZOLE, NOC	2
HF	,MICA	MICA,NOC	2
HG	,*FOOL	PLUS FOOL	2
HH	, ISOPRENE	ISOPRENE,N.O.C.	2
HI	,MONEL	MONEL	2
HJ	,CARBOXYNITROSO	CNR RUBBER, FOR EXAMPLE	2
HK	,SILICA	SILICA,QUARTZ,NOC	2
HL	,BETA FIBER	BETA GLASS FIBER , NOC	2
HM	,HONEYCB	HONEYCOMB-LIKE STRUCTURE	2
* HN	,COPPER	COPPER,NOC	2
HO	,CERAMIC	CERAMIC,NOC	2
HP	,RESORCINOL	RESORCINOL	2
HQ	,FORMALDEHYDE	FORMALDEHYDE,NOC	2
HR	,BOILERPLATE	BOILERPLATE,LARGE SCALE	2
HS	,COATED	COATED	2
HT	,EXPTL	EXPERIMENTAL	2

* Prior to using this code in assigning a NASA MATERIAL CODE, refer to Page E2-16.

CODE	LISTING	DEFINITION	TABLE
HU	,POTTED	POTTED	2
HV	,SEALED	SEALED	2
HW	,VENTED	VENTED	2
HX	,MOCK-UP	MOCK-UP OR DUMMY	2
HY	,RADIOACTIVE MATL	RADIOACTIVE MATERIAL	2
HZ	,NYLON 6	CAPROLACTAM TYPE NYLON	2
1A	,GLASS	GLASS, NOC	2
1B	,CARBORANESILOXANE	POLYCARBORA SILOXANE	2
1C	,POLYQUINOXALINE RESI	POLYQUINOXALINE RESIN	2
1D	,SILICA GEL	SILICA GEL	2
XX	,	NO CLASSIFICATION	2
YY	,SEE REMARKS		2

In order to facilitate the assignment of NASA MATERIAL CODES for metals as required for TEST CATEGORIES 'D' and 'J,' a special code table, "MATERIAL CODES FOR METALS," has been prepared and is tabulated below. Those codes identified on the previous pages by an asterisk (*) have been assigned a new code beginning with the letter 'M' which shall be used in identifying TEST CATEGORY 'D' and 'J' metals. The 2nd pair of the NASA MATERIAL CODE will identify the base metal and the 3rd pair will identify the primary alloying element.

* MATERIAL CODES FOR METALS *

MA	,ALUMINUM	ALUMINUM	2
MB	,ANTIMONY	ANTIMONY	2
MC	,COPPER	COPPER	2
MD	,STEEL	STEEL,N.O.C.	2
MG	,MANGANESE	MANGANESE	2
MH	,CHROMIUM	CHROMIUM	2
MI	,IRON	IRON	2
MJ	,CARBON	CARBON	2
MK	,PLATINUM	PLATINUM	2
ML	,MOLYBDENUM	MOLYBDENUM	2
MM	,MAGNESIUM	MAGNESIUM	2
MN	,NICKEL	NICKEL	2
MO	,COBALT	COBALT	2
MP	,LEAD	LEAD	2
MQ	,MERCURY	MERCURY	2
MR	,SILVER	SILVER	2
MS	,TIN	TIN	2
MT	,TITANIUM	TITANIUM	2
MU	,GOLD	GOLD	2
MV	,VANADIUM	VANADIUM	2
MW	,TUNGSTEN	TUNGSTEN	2
MY	,BERYLLIUM	BERYLLIUM	2

NASA MATERIAL CODES (COMAT)

CODE	LISTING	DEFINITION	PAGE - 14 TABLE
MZ	,ZINC	Zinc	2

MFGR'S DESIGNATION	MANUFACTURER	SPEC. THICK.	TEST RPT NO.	TEST ENVR	TEST PRESS	TEST TEMP	INPT ENER	NO OF REACT	FLASH POINT	FIRE PT	PROP TEST	WT LOSS	P T T	MATL CODE
			10-88-12	GOX	1000.0				N999	N999			A 13	
			69-1346/70-X	GOX	1000.0	707							T 15	
A-286 CRES STEEL	NR DOWNEY	.0750	70-2035	GOX	1500.0		50	00/04					A 11	DTMDXX
A-286 CRES STEEL	NR DOWNEY	.0750	70-2035-1	GOX	1500.0			00/04					A 10	DTMDXX
A-286 STEEL	GAC		71-2319	A-50	670.0	462							T 15	DMMDXX
A-286 STEEL	GAC		71-2319-1	A-50	701.0	487							T 15	DMMDXX
A-286 STEEL	GAC		71-2319-2	A-50	779.0	517							T 15	DMMDXX
A-286 STEEL	GAC		71-2319-3	A-50	774.0	509							T 15	DMMDXX
A-286•IRON BASE ALLOY	GAC	.0750	70-2106	GOX	4500.0			00/04					A 10	DMMIXX
A-286•IRON BASE ALLOY	GAC	.0750	70-2106-1	GOX	2000.0		50	00/04					A 11	DMMIXX
ADHESIVE 281	DOW CORNING CORP		71-2670	GOX	1500.0			01/02					T 10	AECKGS
ADHESIVE 281	DOW CORNING CORP		71-2670-1	GOX	1000.0				15	515			R 13	AECKGS
ADHESIVE 281	DOW CORNING CORP		71-2670-2	GOX	1500.0		50	00/04					A 11	AECKGS
AG COATED CU WIRE	GAC		71-2704	A-50	783.0	523							T 15	ELMCMR
AG COATED CU WIRE	GAC		71-2704-1	A-50	777.0	516							T 15	ELMCMR
AGC-3-126	AGC INC.		71-2378	GOX	500.0		50	00/04					A 11	DVCKXX
AGC-3-126	AGC INC.		71-2378-1	GOX	500.0			01/04					T 10	DVCKXX
AGC-3-126	AGC INC.		71-2378-2	GOX	250.0			00/04					A 10	DVCKXX
AGC-3-126	AGC INC.		71-2378-3	GOX	100.0				539	539			D 13	DVCKXX
AGC-3-54-6 SILICONE	AGC INC.		71-2412	GOX	250.0			00/04					A 10	DVCKXX
AGC-3-54-6 SILICONE	AGC INC.		71-2412-1	GOX	75.0				544	544			D 13	DVCKXX
ALLOY 52			71-2689	GOX	1500.0			00/04					A 10	EXMIMM
ALLOY 6262-T9			71-2690	GOX	1500.0		50	00/04					A 11	EXMAXX
ALLOY 6262-T9			71-2690-1	GOX	1500.0			00/04					A 10	EXMAXX
ALNICO 5	GAC		71-2598	A-50	776.0	514							T 15	DMMAMN
ALNICO 5	GAC		71-2598-1	A-50	781.0	517							T 15	DMMAMN
ALNICO 6/AU PLATE	PARKER AIRCRAFT		71-2421	A-50	754.0	504							T 15	DTMDMU
ALNICO 6/AU PLATE	PARKER AIRCRAFT		71-2421-1	A-50	771.0	498							T 15	DTMDMU
ALPHA FLUX NO. 90	ALPHA METALS		71-2270	GOX	5.0	1000			N999	N999			J 13	BZXXXX
ALPHA FLUX NO. 90	ALPHA METALS		71-2270-1	GOX	500.0		50	00/04					A 11	BZXXXX
ALPHA FLUX NO. 90	ALPHA METALS		71-2270-2	GOX	500.0			00/04					A 10	BZXXXX
ALSIMAG TEFLON COATED	AMERICAN LAVA CORP		70-1874	GOX	50.0	1000			N999	N999			A 13	BBXXXX
ALSIMAG 645	AMERICAN LAVA CORP		10-99	GOX	4000.0			00/01					A 10	BBXXXX
ALSIMAG 645	AMERICAN LAVA CORP		10-99-1	GOX	4500.0			00/01					A 10	BBXXXX
ALSIMAG 645	AMERICAN LAVA CORP		10-99-2	GOX	5000.0			00/04					A 10	BBXXXX
ALSIMAG 645	AMERICAN LAVA CORP		10-99-3	GOX	4000.0		200	00/01					A 11	BBXXXX
ALSIMAG 645	AMERICAN LAVA CORP		10-99-4	GOX	5000.0		200	00/04					A 11	BBXXXX
ALUM PHOSPHATE/ASBESTOS	G.E. CHEM MATL		10-88-10	GOX	50.0				921	N999			T 13	DTFLXX
ALUM PHOSPHATE/ASBESTOS	G.E. CHEM MATL		10-88-12	GOX	1000.0				N999	N999			A 13	DTFLXX
ALUM PHOSPHATE/ASBESTOS	G.E. CHEM MATL		10-88-8	GOX	50.0				N999	N999			A 13	DTFLXX
ALUM PHOSPHATE/ASBESTOS	G.E. CHEM MATL		10-88-9	GOX	1000.0				N999	N999			A 13	DTFLXX
ALUM PHOSPHATE/ASBESTOS	G.E. CHEM MATL DEPT	.0750	10-88	GOX	2500.0			00/01					A 10	DTFLXX
ALUM PHOSPHATE/ASBESTOS	G.E. CHEM MATL DEPT	.0750	10-88-1	GOX	3000.0			00/01					A 10	DTFLXX
ALUM PHOSPHATE/ASBESTOS	G.E. CHEM MATL DEPT	.0750	10-88-2	GOX	3500.0			00/01					A 10	DTFLXX

MFGR S DESIGNATION	MANUFACTURER	SPEC. THICK.	TEST RPT NO.	TEST ENVR	TEST PRESS	TEST TEMP	IMPT ENER	NO OF REACT	FLASH POINT	FIRE PT	WT LOSS	R I	T T	MATL CODE
ALUM PHOSPHATE/ASBESTOS	G.E. CHEM MATL DEPT	.0750	10-88-3	GOX	4000.0			00/01				A	10	DTFLXX
ALUM PHOSPHATE/ASBESTOS	G.E. CHEM MATL DEPT	.0750	10-88-4	GOX	4500.0			00/01				A	10	DTFLXX
ALUM PHOSPHATE/ASBESTOS	G.E. CHEM MATL DEPT	.0750	10-88-5	GOX	5000.0			00/04				A	10	DTFLXX
ALUM PHOSPHATE/ASBESTOS	G.E. CHEM MATL DEPT	.0750	10-88-6	GOX	4000.0		200	00/01				A	11	DTFLXX
ALUM PHOSPHATE/ASBESTOS	G.E. CHEM MATL DEPT	.0750	10-88-7	GOX	5000.0		200	00/04				A	11	DTFLXX
ALUMINA POWDER-MANDREL	ROSEMONT ENG. CORP		70-1985	GOX	1500.0		50	00/04				A	11	DDMAXX
ALUMINA POWDER-MANDREL	ROSEMONT ENG. CORP		70-1985	GOX	1500.0			00/04				A	10	DDMAXX
ALUMINA POWDER-MANDREL	ROSEMONT ENG. CORP		70-1985-1	GOX	1500.0	1000			N999	N999		A	13	DDMAXX
ALUMINUM ALLOY 1145	GAC	.0750	70-2110	GOX	2000.0			00/04				A	10	FIMAXX
ALUMINUM ALLOY 1145	GAC	.0750	70-2110-1	GOX	2500.0		50	00/04				A	11	FIMAXX
ALUMINUM FOIL REFLECTOR	BEECH AIRCRAFT		70-1995	GOX	500.0		50	00/04				A	11	DTMAXX
ALUMINUM FOIL REFLECTOR	BEECH AIRCRAFT		70-1995	GOX	500.0			00/04				A	10	DTMAXX
ALUMINUM FOIL REFLECTOR	BEECH AIRCRAFT		70-1995-1	GOX	1500.0		50	00/04				A	11	DTMAXX
ALUMINUM FOIL REFLECTOR	BEECH AIRCRAFT		70-1995-1	GOX	1500.0			00/04				A	10	DTMAXX
ALUMINUM FOIL REFLECTOR	BEECH AIRCRAFT		70-1995-2	GOX	80.0	1000			N999	N999		A	13	DTMAXX
ALUMINUM LEMINATE	NR		71-2520	MMH	811.0	514						T	15	EXMAXX
ALUMINUM LEMINATE	NR		71-2520-1	MMH	646.0	479						T	15	EXMAXX
ALUMINUM 2014 CHROMIC AN	GAC		70-2151	GOX	4500.0			00/04				A	10	DTMAXX
ALUMINUM 2014 CHROMIC AN	GAC		70-2151-1	GOX	2500.0		50	00/04				A	11	DTMAXX
ALUMINUM 2024	GAC		71-2334	A-50	777.0	499						T	15	DTMAXX
ALUMINUM 2024	GAC		71-2334-1	A-50	738.0	497						T	15	DTMAXX
ALUMINUM 2024	GAC		71-2334-2	A-50	771.0	511						T	15	DTMAXX
ALUMINUM 2024	GAC		71-2334-3	A-50	768.0	508						T	15	DTMAXX
ALUMINUM 2024	GAC		71-2391	A-50	795.0	509						T	15	DTMAXX
ALUMINUM 2024	GAC		71-2391-1	A-50	818.0	513						T	15	DTMAXX
ALUMINUM 2024	GAC		71-2396	A-50	769.0	496						T	15	DTMAXX
ALUMINUM 2024	GAC		71-2396-1	A-50	785.0	510						T	15	DTMAXX
ALUMINUM 2024 SULF AN	GAC	.0750	70-2157	GOX	5000.0		50	00/04				A	11	DTMAXX
ALUMINUM 2024 SULF AN	GAC		70-2157-1	GOX	5000.0			00/04				A	10	DTMAXX
ALUMINUM 2024 SULF AN	GAC		70-2157-2	GOX	6800.0			00/04				A	10	DTMAXX
ALUMINUM 2024-T351	GAC	.0750	70-2191	GOX	1500.0			00/04				A	10	DTMAXX
ALUMINUM 2024-T351	GAC	.0750	70-2191-1	GOX	1500.0		50	00/04				A	11	DTMAXX
ALUMINUM 356 ALODINE FIN	GAC	.0750	70-2135	GOX	2000.0			00/04				A	10	FIMAXX
ALUMINUM 356-T6	V + W AIRCRAFT CASTINGS	.0750	70-2202	GOX	1500.0			00/04				A	10	DTMAXX
ALUMINUM 356-T6	V + W AIRCRAFT CASTINGS	.0750	70-2202-1	GOX	1500.0		50	00/04				A	11	DTMAXX
ALUMINUM 6061	GAC		71-2332	A-50	781.0	499						T	15	DTMAXX
ALUMINUM 6061	GAC		71-2332-1	A-50	805.0	499						T	15	DTMAXX
ALUMINUM 6061	GAC		71-2333	A-50	803.0	508						T	15	DTMAXX
ALUMINUM 6061	GAC		71-2333-1	A-50	766.0	487						T	15	DTMAXX
ALUMINUM 6061	GAC		71-2335	A-50	789.0	504						T	15	DTMAXX
ALUMINUM 6061	GAC		71-2335-1	A-50	701.0	486						T	15	DTMAXX
ALUMINUM 6061 + ALODINE	GAC		70-2149	GOX	2000.0			00/04				A	10	DTMAXX
ALUMINUM 6061 + ALODINE	GAC		70-2149-1	GOX	2500.0		50	00/04				A	11	DTMAXX
ALUMINUM 6061 ANODIZED	GAC		70-2167	GOX	2000.0			00/04				A	10	DTMAXX

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ALUMINUM 6061 HARD AN	GAC		70-2152	GOX	2000.0			00/04					A	10	DTMAXX
ALUMINUM 6061 HARD AN	GAC		70-2153	GOX	4500.0			00/04					A	10	DTMAXX
ALUMINUM 6061 HARD AN	GAC		70-2153-1	GOX	5000.0		50	00/04					A	11	DTMAXX
ALUMINUM 6061 HARD AN	GAC		70-2153-2	A-50	765.0	496							T	15	DTMAXX
ALUMINUM 6061 HARD AN	GAC		70-2153-3	A-50	760.0	504							T	15	DTMAXX
ALUMINUM 6061 HARD AN	GAC		70-2153-4	A-50	758.0	496							T	14	DTMAXX
ALUMINUM 6061 HARD AN	GAC		70-2153-5	A-50	760.0	504							T	14	DTMAXX
ALUMINUM 6061 SULF AN	GAC	.0750	70-2156	GOX	4500.0			00/04					A	10	DTMAXX
ALUMINUM 6061 SULF AN	GAC	.0750	70-2156-1	GOX	5000.0		50	00/04					A	11	DTMAXX
ALUMINUM 6061-T6	HARVEY ALUMINUM		70-2062	A-50	749.0	496							T	15	DTMAXX
ALUMINUM 6061-T6	HARVEY ALUMINUM		70-2062-1	A-50	744.0	498							T	15	DTMAXX
ALUMINUM 7075	GAC		71-2397	A-50	756.0	496							T	15	DTMAXX
ALUMINUM 7075	GAC		71-2397-1	A-50	805.0	520							T	15	DTMAXX
ALUMINUM 7075 SULF AN	GAC	.0750	70-2155	GOX	2500.0		50	00/04					A	11	DTMAXX
ALUMINUM 7075-T 651	REYNOLDS ALUM		70-2239	GOX	1500.0		50	00/04					A	11	DTMAXX
ALUMINUM 7075-T 651	REYNOLDS ALUM		70-2239-1	GOX	1500.0			00/04					A	10	DTMAXX
AM 350	ADVANCED ALLOYS		71-2402	A-50	797.0	504							T	15	DTMXMH
AM 350	ADVANCED ALLOYS		71-2402-1	A-50	787.0	498							T	15	DTMXMH
AM 355	ADVANCED ALLOYS		71-2399	A-50	750.0	496							T	15	DMMXMH
AM 355	ADVANCED ALLOYS		71-2399-1	A-50	682.0	488							T	15	DMMXMH
AMPCOLOY 45	PACIFIC METALS		70-2234	GOX	1500.0		50	00/04					A	11	DMMCXX
AMPCOLOY 45	PACIFIC METALS		70-2234-1	GOX	1500.0			00/04					A	10	DMMCXX
AMS-3651 SVSK 81370-12A	HAMILTON STANDARD		71-2293	GOX	5000.0			01/01					T	15	ONCNXX
AMS-3651 SVSK 81370-12A	HAMILTON STANDARD		71-2293-1	GOX	5000.0		50	00/04					A	11	ONCNXX
AMS-3651 SVSK 81370-12A	HAMILTON STANDARD		71-2293-2	GOX	3000.0				570	570			D	13	ONCNXX
AMS-3651 SVSK 81370-12A	HAMILTON STANDARD		71-2293-3	GOX	3000.0				623	623			D	13	ONCNXX
AMS-4031 SVSK 81370-29A	HAMILTON STANDARD		71-2296	GOX	5000.0			00/02					A	10	DTMAXX
AMS-4031 SVSK 81370-29A	HAMILTON STANDARD		71-2296-1	GOX	6800.0			00/04					A	10	DTMAXX
AMS-4921 SVSK 81730-16A	HAMILTON STANDARD		71-2294	GOX	2500.0		50	00/04					A	11	DTMTXX
AMS-5616 SVSK 81370-34B	HAMILTON STANDARD		71-2297	GOX	2000.0			00/04					A	10	DMMOXX
AMS-5648 SVSK 81370-14	HAMILTON STANDARD		71-2290	GOX	2500.0		50	00/04					A	11	DMMCXX
AMS-5665 SVSK 81730-27A	HAMILTON STANDARD		71-2295	GOX	5000.0			00/04					A	10	DTMAXX
AMS-5665 SVSK 81730-27A	HAMILTON STANDARD		71-2295-1	GOX	6800.0			00/04					A	10	DTMAXX
ANAMID-M COATED WIRE	ANACONDA WIRE + CABLE CO		70-2218	GOX	1500.0			00/04					A	10	ELHSXX
ANAMID-M COATED WIRE	ANACONDA WIRE + CABLE CO		70-2218-1	GOX	1500.0		50	00/04					A	11	ELHSXX
ANAMID-M COATED WIRE	ANACONDA WIRE + CABLE CO		70-2218-2	GOX	1000.0				809	809			D	13	ELHSXX
ARMALON 4062-116	E.I. DUPONT CO.,INC.		71-2367	A-50	765.0	498							T	15	BGGDCO
ARMALON 4062-116	E.I. DUPONT CO.,INC.		71-2367-1	A-50	773.0	496							T	15	BGGDCO
ARMALON 4062-116	E.I. DUPONT CO.,INC.		71-2367-2	MMH	781.0	503							T	15	BGGDCO
ARMALON 4062-116	E.I. DUPONT CO.,INC.		71-2367-3	MMH	783.0	506							T	15	BGGDCO
ARMSTRONG A-14	ARMSTRONG		71-2555	MMH	797.0	514							T	15	ABHGXX
ARMSTRONG A-14	ARMSTRONG		71-2555-1	MMH	767.0	497							T	15	ABHGXX
AROCLOR 1242	MONSANTO CORP		71-2590	GOX	1500.0			00/04					A	10	DC-KAD
AROCLOR 1242	MONSANTO CORP		71-2590-1	GOX	6.2				412	449			D	13	DC-KAD

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ARACLOR 1242	MONSANTO CORP		71-2590-2	GOX	50.0				640	640			D	13	DCEKAD
ASTM G260 BAU-4	GAC	.0750	70-2126	GOX	2000.0			00/04					A	10	FLMNMU
AZ-61A MAGNESIUM		.0750	10-82	GOX	500.0			00/04					A	10	DTMGXX
AB-4144/MB-3496 ADHESIVE	HYSOL CORP		71-2328	GOX	6800.0			01/01					T	10	ABBGXX
AB-4144/MB-3496 ADHESIVE	HYSOL CORP		71-2328-1	GOX	6800.0		50	00/04					A	11	ABBGXX
AB-4144/MB-3496 ADHESIVE	HYSOL CORP		71-2328-2	GOX	3000.0				256	256			D	13	ABBGXX
B 1112 STEEL/SN PLATE	GAC		71-2708	A-50	676.0	493							T	15	DMMDMS
B 1112 STEEL/SN PLATE	GAC		71-2708-1	A-50	771.0	515							T	15	DMMDMS
B-318-7	PARKER SEAL/LOS ANGLS		70-1971	A-50	334.0	430							T	15	DJCZXX
B-318-7	PARKER SEAL/LOS ANGLS		70-1971-1	A-50	397.0	516							T	15	DJCZXX
B-318-7	PARKER SEAL/LOS ANGLS		70-1971-2	A-50	571.0	468							T	15	DJCZXX
B-318-7	PARKER SEAL/LOS ANGLS		70-1971-3	A-50	526.0	453							T	15	DJCZXX
BC-340	GAC		71-2513	A-50	771.0	502							T	15	ALXXXX
BC-340	GAC		71-2513-1	A-50	816.0	513							T	15	ALXXXX
BERYLCO 25 CA-172	BERYLCO	.0750	70-2140	GOX	2000.0		50	00/04					A	11	DMMCMY
BERYLLIUM CW.00-C-530	BERYLCO	.0750	70-2211	GOX	1500.0			00/04					A	10	DMMYMC
BERYLLIUM CW.00-C-530	BERYLCO		70-2211-1	GOX	1500.0		50	00/04					A	11	DMMYMC
BERYLLIUM CW.00-C-530	BERYLCO		70-2211-2	A-50	779.0	498							T	15	DMMYMC
BERYLLIUM CW.00-C-530	BERYLCO		70-2211-3	A-50	756.0	501							T	15	DMMYMC
BOEING 101 BEARING MATL	BOEING CO		70-1982	GOX	1500.0		50	00/04					A	11	AHMWMD
BOEING 101 BEARING MATL	BOEING CO		70-1982	GOX	1500.0			00/04					A	10	AHMWMD
BOEING 101 BEARING MATL	BOEING CO.		70-1982-1	GOX	1500.0				N999	N999			A	13	AHMWMD
BOMBMASTER M773	PITTSBURGH PLATE GLASS		71-2481	A-50	637.0	475							T	15	ABBGGS
BOMBMASTER M773	PITTSBURGH PLATE GLASS		71-2481-1	A-50	770.0	504							T	15	ABBGGS
BONE HARD WASHER	DARLING.R.E. CO..INC	.0750	70-1644	GOX	5000.0		50	00/04					A	11	CHGUXX
BONE HARD WASHER	DARLING.R.E. CO..INC		70-1644-1	GOX	5000.0			01/01					T	10	CHGUXX
BONE HARD WASHER	DARLING.R.E. CO..INC		70-1644-2	GOX	5000.0			01/02					T	10	CHGUXX
BR 610 ADHESIVE	W.T. BEAN		71-2479	A-50	776.0	506							T	15	AEGSXX
BR 610 ADHESIVE	W.T. BEAN		71-2479-1	A-50	769.0	495							T	15	AEGSXX
BR-24			71-2703	A-50	339.0	376							T	15	DPCJXX
BR-24			71-2703-1	A-50	772.0	450							T	15	DPCJXX
BRASS 1/2 HARD	ANACONDA WIRE + CABLE CO		70-2056	A-50	759.0	512							T	15	DMMCMZ
BRASS 1/2 HARD	ANACONDA WIRE + CABLE CO		70-2056-1	A-50	779.0	521							T	15	DMMCMZ
BRAYCOTE 617	BRAY OIL CO		69-1424	GOX	5.0	1000			619	N999			Y	13	DBBPXX
BRAYCOTE 617	BRAY OIL CO		69-1424-1	GOX	25.0	1000			552	N999			J	13	DBBPXX
BRAYCOTE 617	BRAY OIL CO	.0050	69-1424-10	GOX	4000.0			01/01					T	10	DBBPXX
BRAYCOTE 617	BRAY OIL CO	.0050	69-1424-11	GOX	4500.0			00/01					A	10	DBBPXX
BRAYCOTE 617	BRAY OIL CO	.0050	69-1424-12	GOX	5000.0			04/04					T	10	DBBPXX
BRAYCOTE 617	BRAY OIL CO	.0050	69-1424-13	GOX	2000.0		200	00/04					A	11	DBBPXX
BRAYCOTE 617	BRAY OIL CO		69-1424-14	GOX	6.2	1000			N999	N999			J	13	DBBPXX
BRAYCOTE 617	BRAY OIL CO		69-1424-15	GOX	16.5	1000			N999	N999			J	13	DBBPXX
BRAYCOTE 617	BRAY OIL CO		69-1424-2	GOX	50.0	1000			619	N999			Y	13	DBBPXX
BRAYCOTE 617	BRAY OIL CO		69-1424-3	GOX	50.0	1000			N999	N999			A	13	DBBPXX
BRAYCOTE 617	BRAY OIL CO		69-1424-4	GOX	100.0				516	516			D	13	DBBPXX

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BRAYCOTE 617	BRAY OIL CO		69-1424-5	GOX	500.0				458	458		D	13	DBBPXX
BRAYCOTE 617	BRAY OIL CO		69-1424-6	GOX	1000.0				451	451		D	13	DBBPXX
BRAYCOTE 617	BRAY OIL CO		69-1424-7	GOX	1500.0				417	417		D	13	DBBPXX
BRAYCOTE 617	BRAY OIL CO		69-1424-8	GOX	2000.0				406	406		D	13	DBBPXX
BRAYCOTE 617	BRAY OIL CO	.0050	69-1424-9	GOX	3500.0			00/04				A	10	DBBPXX
BRAYCOTE 631A	BRAY OIL CO		70-1746	GOX	25.0	1000			N999	N999		Y	13	DABPEF
BRAYCOTE 631A	BRAY OIL CO		70-1746-1	GOX	50.0	1000			N999	N999		Y	13	DABPEF
BRAYCOTE 631A	BRAY OIL CO		70-1746-2	GOX	62.0	1000			N999	N999		Y	13	DABPEF
BRAYCOTE 631A	BRAY OIL CO		70-1746-3	GOX	165.0	1000			N999	N999		Y	13	DABPEF
BRAYCOTE 631A	BRAY OIL CO		70-1746-4	GOX	100.0				822	822		D	13	DABPEF
BRAYCOTE 631A	BRAY OIL CO		70-1746-5	GOX	500.0				700	700		D	13	DABPEF
BRAYCOTE 631A	BRAY OIL CO		70-1746-6	GOX	1000.0				683	683		D	13	DABPEF
BRAYCOTE 631A	BRAY OIL CO		70-1746-7	GOX	1500.0				687	687		D	13	DABPEF
BRAYCOTE 631A	BRAY OIL CO		70-1746-8	GOX	2000.0				673	673		D	13	DABPEF
BRAZE ALLOY AMS-4773	HANDY AND HARMON		70-1981	GOX	1500.0		50	00/04				A	11	FLXXXX
BRAZE ALLOY AMS-4773	HANDY AND HARMON		70-1981	GOX	1500.0			00/04				A	10	FLXXXX
BRAZE ALLOY AMS-4773	HANDY AND HARMON		70-1981-1	GOX	1500.0	1000			N999	N999		A	13	FLXXXX
BRONZE AMCO NO. 18	A.M. CASTLE CO.		70-2199	GOX	1500.0			00/04				A	10	DMXXXX
BRONZE AMCO NO. 18	A.M. CASTLE CO.		70-2199-1	GOX	1500.0		50	00/04				A	11	DMXXXX
BUNA N FRICTION WASHER	VICTOR EQUIPMENT CO.		71-2779-1	GOX	2500.0			02/04				D	10	CHDJXX
BUNA N FRICTION WASHER	VICTOR EQUIPMENT CO.		71-2779-2	GOX	1500.0			01/01				D	10	CHDJXX
BUNA N FRICTION WASHER	VICTOR EQUIPMENT CO.		71-2779-3	GOX	1000.0			01/01				D	10	CHDJXX
BUNA N FRICTION WASHER	VICTOR EQUIPMENT CO.		71-2779-4	GOX	500.0			00/04				A	10	CHDJXX
BUNA N O-RING	VICTOR EQUIPMENT CO.		71-2777-1	GOX	2500.0			02/02				D	10	CHDJXX
BUNA N O-RING	VICTOR EQUIPMENT CO.		71-2777-2	GOX	1000.0			01/02				D	10	CHDJXX
BUNA N O-RING	VICTOR EQUIPMENT CO.		71-2777-3	GOX	500.0			00/04				A	10	CHDJXX
BUNA N O-RING	VICTOR EQUIPMENT CO.		71-2784-1	GOX	2500.0			02/02				D	10	CHDJXX
BUNA N O-RING	VICTOR EQUIPMENT CO.		71-2784-2	GOX	2000.0			01/01				D	10	CHDJXX
BUNA N O-RING	VICTOR EQUIPMENT CO.		71-2784-3	GOX	1500.0			01/01				D	10	CHDJXX
BUNA N O-RING	VICTOR EQUIPMENT CO.		71-2784-4	GOX	1000.0			01/01				D	10	CHDJXX
BUNA N O-RING	VICTOR EQUIPMENT CO.		71-2784-5	GOX	500.0			00/04				A	10	CHDJXX
BUTYL	NR		70-1965	A-50	451.0	515						T	15	DVCZXX
BUTYL	NR		70-1965-1	A-50	604.0	611						T	15	DVCZXX
BUTYL	NR		70-1965-2	A-50	651.0	649						T	15	DVCZXX
BUTYL	NR		70-1965-3	A-50	568.0	507						T	15	DVCZXX
BUTYL	NR		70-1965-4	A-50	460.0	496						T	15	DVCZXX
BUTYL	NR		70-1965-5	MMH	760.0	505						T	15	DVCZXX
BUTYL	NR		70-1965-6	MMH	767.0	509						T	15	DVCZXX
BUTYL 591-80	PARKER SEAL/LOS ANGLS		71-2601	A-50	804.0	518						T	15	CHCZXX
BUTYL 591-80	PARKER SEAL/LOS ANGLS		71-2601-1	A-50	773.0	516						T	15	CHCZXX
C-1213 STEEL	HAMSLEY		71-2652	A-50	762.0	506						T	15	DMMDXX
C-1213 STEEL	HAMSLEY		71-2652-1	A-50	771.0	507						T	15	DMMDXX
C-147-7 NEOPRENE	PARKER SEAL/LOS ANGLS	.0750.	10-48	GOX	1000.0			00/04				A	10	CHDBXX
C-147-7 NEOPRENE	PARKER SEAL/LOS ANGLS	.0750	10-48-1	GOX	1500.0			02/03				D	10	CHDBXX

MFGR S DESIGNATION	MANUFACTURER	SPEC. THICK.	TEST RPT NO.	TEST ENVR	TEST PRESS	TEST TEMP	IMPT ENER	NO OF REACT	FLASH POINT	FIRE PT	PROP DIST	WT LOSS	R I	T T	MATL CODE
C-147-7 NEOPRENE	PARKER SEAL/LOS ANGLS	.0750	10-48-10	GOX	4000.0		50	00/00					A	11	CHDBXX
C-147-7 NEOPRENE	PARKER SEAL/LOS ANGLS	.0750	10-48-11	GOX	4500.0		50	00/00					A	11	CHDBXX
C-147-7 NEOPRENE	PARKER SEAL/LOS ANGLS	.0750	10-48-12	GOX	5000.0		50	00/00					A	11	CHDBXX
C-147-7 NEOPRENE	PARKER SEAL/LOS ANGLS	.0750	10-48-2	GOX	2000.0			01/03					D	10	CHDBXX
C-147-7 NEOPRENE	PARKER SEAL/LOS ANGLS	.0750	10-48-3	GOX	2500.0			01/02					D	10	CHDBXX
C-147-7 NEOPRENE	PARKER SEAL/LOS ANGLS	.0750	10-48-4	GOX	3000.0			02/03					D	10	CHDBXX
C-147-7 NEOPRENE	PARKER SEAL/LOS ANGLS	.0750	10-48-5	GOX	3500.0			01/02					D	10	CHDBXX
C-147-7 NEOPRENE	PARKER SEAL/LOS ANGLS	.0750	10-48-6	GOX	4000.0			01/02					D	10	CHDBXX
C-147-7 NEOPRENE	PARKER SEAL/LOS ANGLS	.0750	10-48-7	GOX	4500.0			04/04					D	10	CHDBXX
C-147-7 NEOPRENE	PARKER SEAL/LOS ANGLS	.0750	10-48-8	GOX	3000.0		50	00/00					A	11	CHDBXX
C-147-7 NEOPRENE	PARKER SEAL/LOS ANGLS	.0750	10-48-9	GOX	3500.0		50	00/00					A	11	CHDBXX
C-557-7 NEOPRENE	PARKER SEAL/LOS ANGLS	.0750	10-54	GOX	5000.0		50	00/04					A	11	CHDBXX
C-557-7 NEOPRENE	PARKER SEAL/LOS ANGLS	.0750	10-54-1	GOX	1000.0			00/04					A	10	CHDBXX
C-557-7 NEOPRENE	PARKER SEAL/LOS ANGLS		10-54-10	GOX	3000.0		50	00/04					A	11	CHDBXX
C-557-7 NEOPRENE	PARKER SEAL/LOS ANGLS		10-54-11	GOX	3000.0			01/01					T	10	CHDBXX
C-557-7 NEOPRENE	PARKER SEAL/LOS ANGLS		10-54-12	GOX	4500.0		50	00/04					A	11	CHDBXX
C-557-7 NEOPRENE	PARKER SEAL/LOS ANGLS		10-54-13	GOX	4500.0			01/01					T	10	CHDBXX
C-557-7 NEOPRENE	PARKER SEAL/LOS ANGLS		10-54-14	GOX	1500.0				405	405			D	13	CHDBXX
C-557-7 NEOPRENE	PARKER SEAL/LOS ANGLS		10-54-15	GOX	500.0				395	395			D	13	CHDBXX
C-557-7 NEOPRENE	PARKER SEAL/LOS ANGLS		10-54-16	GOX	200.0				471	471			D	13	CHDBXX
C-557-7 NEOPRENE	PARKER SEAL/LOS ANGLS		10-54-17	GOX	1000.0				398	398			D	13	CHDBXX
C-557-7 NEOPRENE	PARKER SEAL/LOS ANGLS		10-54-18	GOX	2000.0				309	309			D	13	CHDBXX
C-557-7 NEOPRENE	PARKER SEAL/LOS ANGLS		10-54-19	GOX	3000.0				298	298			D	13	CHDBXX
C-557-7 NEOPRENE	PARKER SEAL/LOS ANGLS	.0750	10-54-2	GOX	1500.0			01/03					D	10	CHDBXX
C-557-7 NEOPRENE	PARKER SEAL/LOS ANGLS	.0750	10-54-3	GOX	2000.0			01/02					D	10	CHDBXX
C-557-7 NEOPRENE	PARKER SEAL/LOS ANGLS	.0750	10-54-4	GOX	2500.0			01/02					D	10	CHDBXX
C-557-7 NEOPRENE	PARKER SEAL/LOS ANGLS	.0750	10-54-5	GOX	3000.0			04/04					D	10	CHDBXX
C-557-7 NEOPRENE	PARKER SEAL/LOS ANGLS		10-54-6	GOX	500.0		50	00/04					A	11	CHDBXX
C-557-7 NEOPRENE	PARKER SEAL/LOS ANGLS		10-54-7	GOX	500.0			00/04					A	10	CHDBXX
C-557-7 NEOPRENE	PARKER SEAL/LOS ANGLS		10-54-8	GOX	1500.0		50	00/04					A	11	CHDBXX
C-557-7 NEOPRENE	PARKER SEAL/LOS ANGLS		10-54-9	GOX	1500.0			01/02					T	10	CHDBXX
CARBON RESISTORS			71-2267	GOX	150.0				701	701			D	13	BDMJXX
CARBON RESISTORS			71-2267-1	GOX	500.0			00/04					A	10	BDMJXX
CARBON RESISTORS	NR		70-2215	GOX	500.0			00/04					A	10	BDMJXX
CARBON RESISTORS	NR		70-2215-1	GOX	500.0		50	00/04					A	11	BDMJXX
CARBON RESISTORS	NR		70-2215-2	GOX	160.0				700	700			D	13	BDMJXX
CERAMC PLSTC INSULTR-410	MYCALEX CORP		71-2362	GOX	500.0		50	00/04					A	11	CKHUXX
CERAMC PLSTC INSULTR-410	MYCALEX CORP		71-2362-1	GOX	500.0			00/04					A	10	CKHUXX
CERAMC PLSTC INSULTR-410	MYCALEX CORP		71-2362-2	GOX	100.0	1000			N999	N999			A	13	CKHUXX
CERAMIC POWDER INSUL	ROSEMONT ENG. CORP		70-1992	GOX	1500.0		50	00/04					A	11	FJHOXX
CERAMIC POWDER INSUL	ROSEMONT ENG. CORP		70-1992	GOX	1500.0			00/04					A	10	FJHOXX
CERAMIC POWDER INSUL	ROSEMONT ENG. CORP		70-1992-1	GOX	1500.0	1000			N999	N999			R	13	FJHOXX
CERAMIC ROD	GAC		71-2606	A-50	773.0	513							T	15	DMHOXX
CERAMIC ROD	GAC		71-2606-1	A-50	774.0	518							T	15	DMHOXX

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CERROBEND AND CU BE WIREMSFC			70-2042	GOX	6.2	1000			N999	N999		Y	13	AWGIMC
CERROBEND AND CU BE WIREMSFC			70-2042-1	GOX	16.5	1000			N999	N999		Y	13	AWGIMC
CERROBEND-COPPER PARTCLSMSFC			70-2041	GOX	6.2	1000			N999	N999		Y	13	AWGIMC
CERROBEND-COPPER PARTCLSMSFC			70-2041-1	GOX	16.5	1000			N999	N999		J	13	AWGIMC
CFX LUBRICANT	MARCHEM		71-2572	GOX	5000.0		50	00/04				A	11	CZGFBP
CFX LUBRICANT	MARCHEM		71-2572-1	GOX	2500.0			01/01				T	10	CZGFBP
CFX LUBRICANT	MARCHEM		71-2572-2	GOX	2000.0			01/01				T	10	CZGFBP
CFX LUBRICANT	MARCHEM		71-2572-3	GOX	1500.0			01/01				T	10	CZGFBP
CFX LUBRICANT	MARCHEM		71-2572-4	GOX	1000.0			01/02				T	10	CZGFBP
CFX LUBRICANT	MARCHEM		71-2572-5	GOX	500.0			00/04				A	10	CZGFBP
CHEMCERAM/GLASS LAMINATEWHITTAKER (PACE DIV.)			70-1978	GOX	1500.0			00/04				A	10	CRHOHT
CHEMCERAM/GLASS LAMINATEWHITTAKER (PACE DIV.)			70-1978	GOX	1500.0		50	00/04				A	11	CRHOHT
CHEMCERAM/GLASS LAMINATEWHITTAKER (PACE DIV.)			70-1978-1	GOX	1000.0	1000			N999	N999		A	13	CRHOHT
CHEMLOK 607	HUGHSON CHEMICAL		71-2434	GOX	100.0				270	270		D	13	ABCKXX
CHEMLOK 607	HUGHSON CHEMICAL		71-2434-1	GOX	1550.0		50	00/04				A	11	ABCKXX
CHEMLOK 607	HUGHSON CHEMICAL		71-2434-2	GOX	1550.0			01/01				T	10	ABCKXX
CNR	THIOKOL CHEM CORP		70-1961	A-50	85.0	291						T	15	DVHJXX
CNR	THIOKOL CHEM CORP		70-1961-1	A-50	115.0	303						T	15	DVHJXX
CNR	THIOKOL CHEM CORP		70-1961-2	A-50	132.0	295						T	15	DVHJXX
CNR	THIOKOL CHEM CORP		70-1961-3	A-50	156.0	310						T	15	DVHJXX
CNR	THIOKOL CHEM CORP		70-1961-4	MMH	122.0	302						T	15	DVHJXX
CNR	THIOKOL CHEM CORP		70-1961-5	MMH	314.0	411						T	15	DVHJXX
CNR	THIOKOL CHEM CORP		70-1977	A-50	133.0	294						T	15	DVHJXX
CNR	THIOKOL CHEM CORP		70-1977-1	A-50	131.0	304						T	15	DVHJXX
CNR	THIOKOL CHEM CORP		70-1977-2	A-50	120.0	290						T	15	DVHJXX
CNR	THIOKOL CHEM CORP		70-1977-3	A-50	112.0	279						T	15	DVHJXX
CNR	THIOKOL CHEM CORP		70-1977-4	MMH	778.0	470						T	15	DVHJXX
CNR	THIOKOL CHEM CORP		70-1977-5	MMH	757.0	473						T	15	DVHJXX
CNR	THIOKOL CHEM CORP		70-1977-6	MMH	259.0	382						T	15	DVHJXX
COBALT NITRATE/BORON	MSFC		70-2054	GOX	6.2	1000			N999	N999		Y	13	AWMOFI
COBALT NITRATE/BORON	MSFC		70-2054-1	GOX	16.5	1000			N999	N999		Y	13	AWMOFI
COIN SILVER	THE WILKINSON CO.		71-2271	GOX	1500.0		50	00/04				A	11	EXMRMC
COIN SILVER	THE WILKINSON CO.		71-2271-1	GOX	1500.0			00/04				A	10	EXMRMC
COLFLEX TFE HOSE LINER	HOKE INC		71-3001	GOX	3000.0		50	00/04				A	11	EGCOXX
COLFLEX TFE HOSE LINER	HOKE INC		71-3001-1	GOX	3000.0			01/02				W	10	EGCOXX
COLFLEX TFE HOSE LINER	HOKE INC		71-3001-2	GOX	2500.0			00/04				A	10	EGCOXX
COLFLEX TFE HOSE LINER	HOKE INC		71-3001-3	GOX	2000.0			00/01				A	10	EGCOXX
COPPER	ANACONDA WIRE + CABLE CO		71-2672	A-50	748.0	513						T	15	DTMCXX
COPPER	ANACONDA WIRE + CABLE CO		71-2672-1	A-50	757.0	515						T	15	DTMCXX
COPPER	ANACONDA WIRE + CABLE CO		71-2672-2	MMH	757.0	522						T	15	DTMCXX
COPPER	ANACONDA WIRE + CABLE CO		71-2672-3	MMH	826.0	551						T	15	DTMCXX
COPPER STRIP	GAC		71-2651	A-50	753.0	504						T	15	ELMCXX
COPPER STRIP	GAC		71-2651-1	A-50	772.0	521						T	15	ELMCXX
COPPER-INDIUM BISMUTH	MSFC		70-2040	GOX	6.2	1000			N999	N999		Y	13	AWMCFZ

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COPPER-INDIUM BISMUTH	MSFC		70-2040-1	GOX	16.5	1000			N999	N999		Y	13	AWMCFZ
COPPER/TIN COATED	ANACONDA WIRE + CABLE CO		70-2097	A-50	801.0	520						T	15	ODMCMS
COPPER/TIN COATED	ANACONDA WIRE + CABLE CO		70-2097-1	A-50	705.0	485						T	15	ODMCMS
COPPER/TIN COATED	ANACONDA WIRE + CABLE CO		70-2097-2	MMH	759.0	515						T	15	ODMCMS
COPPER/TIN COATED	ANACONDA WIRE + CABLE CO		70-2097-3	MMH	750.0	516						T	15	ODMCMS
COPPER/TIN PLATED	GAC		71-2702	A-50	757.0	513						T	15	DTMCMS
COPPER/TIN PLATED	GAC		71-2702-1	A-50	779.0	520						T	15	DTMCMS
CORNING 0010 GLASS	CORNING GLASS		70-2203	A-50	779.0	403						T	15	DMIAXX
CORNING 0010 GLASS	CORNING GLASS		70-2203-1	A-50	713.0	486						T	15	DMIAXX
CORNING 0010 GLASS	CORNING GLASS		70-2203-2	A-50	775.0	498						T	15	DMIAXX
CRESS CHROMIUM PLATED	NR		71-2382	GOX	1500.0		50	00/04				A	11	EXMHMI
CRESS CHROMIUM PLATED	NR		71-2382-1	GOX	1500.0			00/04				A	10	EXMHMI
CRYSTAL SVSK81370-22	HAMILTON STANDARD		71-2263	GOX	5000.0			00/04				A	10	ODIAXX
CRYSTAL SVSK81370-22	HAMILTON STANDARD		71-2263-1	GOX	6800.0			00/04				A	10	ODIAXX
CRYSTAL SVSK81370-22	HAMILTON STANDARD		71-2263-2	GOX	3000.0	1000			N999	N999		A	13	DDIAXX
CU WIRE-MORH-2	PHELPS DODGE		71-2673	MMH	773.0	515						T	15	ELMCXX
CU WIRE-MORH-2	PHELPS DODGE		71-2673-1	MMH	789.0	520						T	15	ELMCXX
CYCLEWELD 55-9-100	CHRYSLER CORP		71-2495	GOX	1500.0		50	00/04				A	11	ABBCXX
CYCLEWELD 55-9-100	CHRYSLER CORP		71-2495-1	GOX	1500.0			00/04				A	10	ABBCXX
CYCLEWELD 55-9-100	CHRYSLER CORP		71-2495-2	GOX	1000.0				554	554		D	13	ABBCXX
DALUM PHOSPHATE ASBESTOSG.E. CHEM MATL			10-88-11	GOX	50.0				N999	N999		A	13	DTFLXX
DC-A-4094 PRIMER	DOW CORNING CORP		71-2497	GOX	1500.0		50	00/04				A	11	AUCHXX
DC-A-4094 PRIMER	DOW CORNING CORP		71-2497-1	GOX	1500.0			00/04				A	10	AUCHXX
DC-A-4094 PRIMER	DOW CORNING CORP		71-2497-2	GOX	1000.0	1000			N999	N999		A	13	AUCHXX
DC-V90-006 RTV	DOW CORNING CORP		70-1954	A-50	524.0	447						T	15	DRBGGS
DC-V90-006 RTV	DOW CORNING CORP		70-1954-1	A-50	259.0	373						T	15	DRBGGS
DC-V90-006 RTV	DOW CORNING CORP		70-1954-2	A-50	341.0	391						T	15	DRBGGS
DC-V90-006 RTV	DOW CORNING CORP		70-1954-3	A-50	370.0	409						T	15	DRBGGS
DC-3110	DOW CORNING CORP	.0750	70-2029	GOX	1500.0		50	00/04				A	11	BADPXX
DC-3110	DOW CORNING CORP	.0750	70-2029-1	GOX	1500.0			00/04				A	10	BADPXX
DC-3110	DOW CORNING CORP		70-2029-2	GOX	200.0				504	504		D	13	BADPXX
DC-3110	DOW CORNING CORP		70-2029-3	GOX	1000.0				450	450		D	13	BADPXX
DC-33	DOW CORNING CORP		71-2705	A-50	773.0	509						T	15	CZCKXX
DC-33	DOW CORNING CORP		71-2705-1	A-50	776.0	511						T	15	CZCKXX
DC-3400	DOW CORNING CORP		71-2527	GOX	1500.0		50	00/04				A	11	DAGHXX
DC-3400	DOW CORNING CORP		71-2527-1	GOX	1500.0			00/04				A	10	DAGHXX
DC-3400	DOW CORNING CORP		71-2527-2	GOX	6.2	1000			N999	N999		J	13	DAGHXX
DC-3400	DOW CORNING CORP		71-2527-3	GOX	1000.0				704	704		D	13	DAGHXX
DC-55M	DOW CORNING CORP		71-2273	A-50	630.0	481						T	15	DBCKAD
DC-55M	DOW CORNING CORP		71-2273-1	A-50	758.0	498						T	15	BTCLXX
DC-7	DOW CORNING CORP		71-2592	A-50	815.0	476						T	15	AXCKXX
DC-7	DOW CORNING CORP		71-2592-1	A-50	788.0	501						T	15	AXCKXX
DC-704 PUMP FLUID			70-2227	GOX	4500.0		50	00/04				A	11	BVXXXX
DC-704 PUMP FLUID			70-2227-1	GOX	5000.0		50	01/04				T	11	BVXXXX

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DC-704 PUMP FLUID			70-2227-2	GOX	2500.0			00/04					A	10	BVXXXX
DC-704 PUMP FLUID			70-2227-3	GOX	3000.0			01/02					T	10	BVXXXX
DC-704 PUMP FLUID			70-2227-4	GOX	3500.0			01/02					T	10	BVXXXX
DC-704 PUMP FLUID			70-2227-5	GOX	4000.0			01/02					T	10	BVXXXX
DC-704 PUMP FLUID			70-2227-6	GOX	4500.0			01/01					T	10	BVXXXX
DC-704 PUMP FLUID			70-2227-7	GOX	5000.0			01/01					T	10	BVXXXX
DC-994 VARNISH	DOW CORNING CORP		71-2404	GOX	250.0			00/04					A	10	BTCLXX
DC-994 VARNISH	DOW CORNING CORP		71-2404-1	GOX	75.0	1000			N999	N999			A	13	BTCLXX
DC-997 VARNISH	DOW CORNING CORP	.0050	70-2189	GOX	1500.0			00/04					A	10	BTCLXX
DC-997 VARNISH	DOW CORNING CORP		70-2189-1	GOX	1000.0				289	289			D	13	BTCLXX
DC-997 VARNISH	DOW CORNING CORP		70-2189-2	GOX	1500.0		50	00/04					A	11	BTCLXX
DC-997 VARNISH	DOW CORNING CORP		70-2189-3	GOX	100.0	1000			N999	N999			A	13	BTCLXX
DC-997 VARNISH	DOW CORNING CORP		70-2189-4	GOX	500.0				643	643			D	13	BTCLXX
DC-997 VARNISH	DOW CORNING CORP		70-2189-5	GOX	1000.0				589	589			D	13	BTCLXX
DC-997 VARNISH	DOW CORNING CORP		70-2189-6	GOX	1500.0				387	387			D	13	BTCLXX
DC-997 VARNISH	DOW CORNING CORP		70-2189-7	GOX	2000.0				370	370			D	13	BTCLXX
DC-997 VARNISH	DOW CORNING CORP		71-2480	A-50	767.0	471							T	15	BTCLXX
DC-997 VARNISH	DOW CORNING CORP		71-2480-1	A-50	771.0	501							T	15	BTCLXX
DECA-FLUORO-BIPHENYL	MSFC		70-2066	GOX	6.2				287	291			D	13	ANBPXX
DELRIN	E.I. DUPONT CO.,INC.		10-102	GOX	5.0	1000			529	N999			Y	13	GLAJXX
DELRIN	E.I. DUPONT CO.,INC.		10-102-1	GOX	25.0				509	509			D	13	DLAJXX
DELRIN	E.I. DUPONT CO.,INC.	.0750	10-102-10	GOX	250.0		200	01/02					D	11	DLAJXX
DELRIN	E.I. DUPONT CO.,INC.	.0750	10-102-11	GOX	500.0		200	03/04					D	11	DLAJXX
DELRIN	E.I. DUPONT CO.,INC.	.0750	10-102-12	GOX	1000.0		200	01/04					D	11	DLAJXX
DELRIN	E.I. DUPONT CO.,INC.		10-102-2	GOX	50.0				485	485			D	13	DLAJXX
DELRIN	E.I. DUPONT CO.,INC.		10-102-3	GOX	50.0				457	457			D	13	DLAJXX
DELRIN	E.I. DUPONT CO.,INC.		10-102-4	GOX	500.0				382	382			D	13	DLAJXX
DELRIN	E.I. DUPONT CO.,INC.		10-102-5	GOX	1000.0				373	373			D	13	DLAJXX
DELRIN	E.I. DUPONT CO.,INC.	.0750	10-102-6	GOX	500.0			00/04					A	10	DLAJXX
DELRIN	E.I. DUPONT CO.,INC.	.0750	10-102-7	GOX	1000.0			01/03					D	10	DLAJXX
DELRIN	E.I. DUPONT CO.,INC.	.0750	10-102-8	GOX	1500.0			01/02					D	10	DLAJXX
DELRIN	E.I. DUPONT CO.,INC.	.0750	10-102-9	GOX	2000.0			04/04					D	10	DLAJXX
DEXIGLASS INSULATION	DEXTER CORP		70-1993	GOX	500.0		50	00/04					A	11	BFGDXX
DEXIGLASS INSULATION	DEXTER CORP		70-1993	GOX	500.0			00/04					A	10	BFGDXX
DEXIGLASS INSULATION	DEXTER CORP		70-1993-1	GOX	1500.0			00/04					A	10	BFGDXX
DEXIGLASS INSULATION	DEXTER CORP		70-1993-1	GOX	1500.0		50	00/04					A	11	BFGDXX
DEXIGLASS INSULATION	DEXTER CORP		70-1993-2	GOX	500.0	1000			N999	N999			A	13	BFGDXX
DEXIGLASS INSULATION	DEXTER CORP		70-1993-3	GOX	1500.0	1000			N999	N999			D	13	BFGDXX
DMD-313	SUN CHEMICAL CORP		71-2435	GOX	1000.0				390	390			D	13	BGBSXX
DMD-313	SUN CHEMICAL CORP		71-2435-1	GOX	1500.0		50	00/04					A	11	BGBSXX
DMD-313	SUN CHEMICAL CORP		71-2435-2	GOX	1500.0			01/01					T	10	BGBSXX
DRILL ROD	NR	.0750	70-2209	GOX	500.0			00/04					A	10	DMXXXX
DRILL ROD	NR	.0750	70-2209-1	GOX	500.0		50	00/04					A	11	DMXXXX
DRILL ROD	NR		70-2209-2	GOX	1500.0		50	00/04					A	11	DMXXXX

MFGR S DESIGNATION	MANUFACTURER	SPEC. THICK.	TEST RPT NO.	TEST ENVR	TEST PRESS	TEST TEMP	IMPT ENER	NO OF REACT	FLASH POINT	FIRE PT	PROP WT DIST LOSS	R I	T T	MATL CODE
DRILL ROD	NR		70-2209-3	GOX	1500.0			00/04				A	10	CMXXXX
DRILUBE 822	DRILUBE CO.		10-56	GOX	6.2				672	672		D	13	DACNXX
DUROCK 204	PHYSICAL SCIENCES CORP		70-1937	GOX	1500.0		50	00/04				A	11	CHIAXX
DUROCK 204	PHYSICAL SCIENCES CORP		70-1937-1	GOX	1000.0	1000			N999	N999		Y	13	CHIAXX
DUROCK 204	PHYSICAL SCIENCES CORP	.0750	70-1937-2	GOX	1500.0			00/04				A	10	CHIAXX
DUROCK 204	PHYSICAL SCIENCES CORP		70-1937-3	GOX	1500.0	1000			N999	N999		A	13	CHIAXX
DUROID 5813	ROGERS CORP		70-2222	GOX	1500.0			00/04				A	10	DUCPIA
DUROID 5813	ROGERS CORP		70-2222-1	GOX	1500.0		50	00/04				A	11	DUCPIA
DUROID 5813	ROGERS CORP		70-2222-10	GOX	1000.0			01/01				T	10	DUCPIA
DUROID 5813	ROGERS CORP		70-2222-11	GOX	500.0			00/04				A	10	DUCPIA
DUROID 5813	ROGERS CORP		70-2222-2	GOX	1000.0				560	560		D	13	DUCPIA
DUROID 5813	ROGERS CORP		70-2222-3	GOX	2500.0			01/01				T	10	DUCPIA
DUROID 5813	ROGERS CORP		70-2222-4	GOX	1500.0			01/01				T	10	DUCPIA
DUROID 5813	ROGERS CORP		70-2222-5	GOX	1000.0			01/01				T	10	DUCPIA
DUROID 5813	ROGERS CORP		70-2222-6	GOX	500.0			00/04				A	10	DUCPIA
DUROID 5813	ROGERS CORP		70-2222-7	GOX	5000.0		50	00/04				A	11	DUCPIA
DUROID 5813	ROGERS CORP		70-2222-8	GOX	2500.0			01/01				T	10	DUCPIA
DUROID 5813	ROGERS CORP		70-2222-9	GOX	1500.0			01/01				T	10	DUCPIA
D6AC.NICKEL PLATED	GAC		70-2159	GOX	4500.0			00/04				A	10	DTMJMH
E-515-8	PARKER SEAL/LOS ANGLS		69-1565	GOX	5.0	1000			950	N999		J	13	DODDXX
E-515-8	PARKER SEAL/LOS ANGLS		69-1565-1	GOX	10.0	1000			930	N999		J	13	DODDXX
E-515-8	PARKER SEAL/LOS ANGLS		69-1565-10	GOX	1000.0				299	299		D	13	DODDXX
E-515-8	PARKER SEAL/LOS ANGLS		69-1565-11	GOX	1087.0				296	296		D	13	DODDXX
E-515-8	PARKER SEAL/LOS ANGLS		69-1565-12	GOX	1265.0				321	321		D	13	DODDXX
E-515-8	PARKER SEAL/LOS ANGLS		69-1565-13	GOX	1500.0				282	282		D	13	DODDXX
E-515-8	PARKER SEAL/LOS ANGLS		69-1565-14	GOX	1565.0				331	331		D	13	DODDXX
E-515-8	PARKER SEAL/LOS ANGLS		69-1565-15	GOX	2000.0				290	290		D	13	DODDXX
E-515-8	PARKER SEAL/LOS ANGLS	.0750	69-1565-16	GOX	1500.0			00/04				A	10	DODDXX
E-515-8	PARKER SEAL/LOS ANGLS	.0750	69-1565-17	GOX	2000.0			04/04				T	10	DODDXX
E-515-8	PARKER SEAL/LOS ANGLS	.0750	69-1565-18	GOX	2500.0			01/04				T	10	DODDXX
E-515-8	PARKER SEAL/LOS ANGLS	.0750	69-1565-19	GOX	500.0		200	04/04				T	11	DODDXX
E-515-8	PARKER SEAL/LOS ANGLS		69-1565-2	GOX	20.0	1000			920	N999		J	13	DODDXX
E-515-8	PARKER SEAL/LOS ANGLS	.0750	69-1565-20	GOX	1000.0		200	01/01				T	11	DODDXX
E-515-8	PARKER SEAL/LOS ANGLS	.0750	69-1565-21	GOX	1500.0		200	01/01				T	11	DODDXX
E-515-8	PARKER SEAL/LOS ANGLS	.0750	69-1565-22	GOX	2000.0		200	01/01				T	11	DODDXX
E-515-8	PARKER SEAL/LOS ANGLS		69-1565-3	GOX	25.0				604	621		D	13	DODDXX
E-515-8	PARKER SEAL/LOS ANGLS		69-1565-4	GOX	30.0	1000			920	N999		J	13	DODDXX
E-515-8	PARKER SEAL/LOS ANGLS		69-1565-5	GOX	40.0				510	510		D	13	DODDXX
E-515-8	PARKER SEAL/LOS ANGLS		69-1565-6	GOX	50.0				510	510		D	13	DODDXX
E-515-8	PARKER SEAL/LOS ANGLS		69-1565-7	GOX	50.0				435	435		D	13	DODDXX
E-515-8	PARKER SEAL/LOS ANGLS		69-1565-8	GOX	100.0				368	368		D	13	DODDXX
E-515-8	PARKER SEAL/LOS ANGLS		69-1565-9	GOX	500.0				297	297		D	13	DODDXX
E-515-8	PARKER SEAL/LOS ANGLS		70-1970	A-50	746.0	505						T	15	DODDXX
E-515-8	PARKER SEAL/LOS ANGLS		70-1970-1	A-50	760.0	508						T	15	DODDXX

MFGR S DESIGNATION	MANUFACTURER	SPEC. THICK.	TEST RPT NO.	TEST ENVR	TEST PRESS	TEST TEMP	IMPT ENER	NO OF REACT	FLASH POINT	FIRE PT	PRCP DIST	WT LOSS	R I	T I	MATL CODE
E-515-8	PARKER SEAL/LOS ANGLS		70-1970-2	A-50	748.0	510							T	15	DUCDXX
E-515-8	PARKER SEAL/LOS ANGLS		70-1970-3	A-50	805.0	497							T	15	DODDXX
E-540-8	PARKER SEAL/LOS ANGLS		70-1972	A-50	267.0	416							T	15	DVDDXX
E-540-8	PARKER SEAL/LOS ANGLS		70-1972-1	A-50	768.0	489							T	15	DVDDXX
E-540-8	PARKER SEAL/LOS ANGLS		70-1972-2	A-50	508.0	457							T	15	DVDDXX
E-540-8	PARKER SEAL/LOS ANGLS		70-1972-3	A-50	760.0	487							T	15	DVDDXX
E-540-8	PARKER SEAL/LOS ANGLS		70-1972-4	A-50	758.0	500							T	15	DVDDXX
E-617-9	PARKER SEAL/LOS ANGLS		69-1564	GOX	5.0				586	649			D	13	CHDDXX
E-617-9	PARKER SEAL/LOS ANGLS		69-1564-1	GOX	25.0				450	536			D	13	CHDDXX
E-617-9	PARKER SEAL/LOS ANGLS	.0750	69-1564-11	GOX	4500.0		50	00/04					A	11	CHDDXX
E-617-9	PARKER SEAL/LOS ANGLS	.0750	69-1564-12	GOX	4500.0			01/01					T	10	CHDDXX
E-617-9	PARKER SEAL/LOS ANGLS		69-1564-13	GOX	4000.0			01/01					T	10	CHDDXX
E-617-9	PARKER SEAL/LOS ANGLS		69-1564-14	GOX	3000.0				278	278			D	13	CHDDXX
E-617-9	PARKER SEAL/LOS ANGLS		69-1564-15	GOX	3000.0				234	234			D	13	CHDDXX
E-617-9	PARKER SEAL/LOS ANGLS		69-1564-16	GOX	5000.0		50	00/04					A	11	CHDDXX
E-617-9	PARKER SEAL/LOS ANGLS		69-1564-17	GOX	500.0			01/01					T	10	CHDDXX
E-617-9	PARKER SEAL/LOS ANGLS		69-1564-18	GOX	1000.0			01/01					T	10	CHDDXX
E-617-9	PARKER SEAL/LOS ANGLS		69-1564-19	GOX	1500.0			01/01					T	10	CHDDXX
E-617-9	PARKER SEAL/LOS ANGLS		69-1564-2	GOX	50.0				496	496			D	13	CHDDXX
E-617-9	PARKER SEAL/LOS ANGLS		69-1564-20	GOX	2500.0			01/01					T	10	CHDDXX
E-617-9	PARKER SEAL/LOS ANGLS		69-1564-21	GOX	1000.0		50	00/04					A	11	CHDDXX
E-617-9	PARKER SEAL/LOS ANGLS		69-1564-22	GOX	1000.0		200	01/02					T	11	CHDDXX
E-617-9	PARKER SEAL/LOS ANGLS		69-1564-23	LOX	14.7		50	00/04					A	16	CHDDXX
E-617-9	PARKER SEAL/LOS ANGLS		69-1564-24	LOX	14.7		200	00/04					A	16	CHDDXX
E-617-9	PARKER SEAL/LOS ANGLS		69-1564-3	GOX	50.0				324	324			D	13	CHDDXX
E-617-9	PARKER SEAL/LOS ANGLS		69-1564-4	GOX	100.0				329	329			D	13	CHDDXX
E-617-9	PARKER SEAL/LOS ANGLS		69-1564-5	GOX	500.0				287	287			D	13	CHDDXX
E-617-9	PARKER SEAL/LOS ANGLS		69-1564-6	GOX	1000.0				270	270			D	13	CHDDXX
E-617-9	PARKER SEAL/LOS ANGLS		69-1564-7	GOX	1500.0				273	273			D	13	CHDDXX
E-617-9	PARKER SEAL/LOS ANGLS		69-1564-8	GOX	2000.0				284	284			D	13	CHDDXX
EA-40 ADHESIVE	SMOOTH-ON MFG CO.	.0050	SP-6918	GOX	5.0	1000			638	N999			Y	13	ABXXXX
EA-40 ADHESIVE	SMOOTH-ON MFG CO.	.0050	SP-6918-1	GOX	25.0				659	675			D	13	ABXXXX
EA-40 ADHESIVE	SMOOTH-ON MFG CO.		SP-6918-10	GOX	1500.0				304	304			D	13	ABXXXX
EA-40 ADHESIVE	SMOOTH-ON MFG CO.		SP-6918-11	GOX	50.0				521	521			D	13	ABXXXX
EA-40 ADHESIVE	SMOOTH-ON MFG CO.		SP-6918-12	GOX	500.0				465	465			D	13	ABXXXX
EA-40 ADHESIVE	SMOOTH-ON MFG CO.		SP-6918-13	GOX	2000.0				259	259			D	13	ABXXXX
EA-40 ADHESIVE	SMOOTH-ON MFG CO.		SP-6918-14	GOX	100.0				507	507			D	13	ABXXXX
EA-40 ADHESIVE	SMOOTH-ON MFG CO.		SP-6918-15	GOX	1000.0				304	304			D	13	ABXXXX
EA-40 ADHESIVE	SMOOTH-ON MFG CO.	.0050	SP-6918-2	GOX	50.0				637	671			D	13	ABXXXX
EA-40 ADHESIVE	SMOOTH-ON MFG CO.	.0050	SP-6918-3	GOX	62.0	1000			663	N999			D	13	ABXXXX
EA-40 ADHESIVE	SMOOTH-ON MFG CO.	.0050	SP-6918-4	GOX	165.0				669	669			D	13	ABXXXX
EA-40 ADHESIVE	SMOOTH-ON MFG CO.	.0050	SP-6918-5	GOX	3500.0			00/01					A	10	ABXXXX
EA-40 ADHESIVE	SMOOTH-ON MFG CO.	.0050	SP-6918-6	GOX	4000.0			00/04					A	10	ABXXXX
EA-40 ADHESIVE	SMOOTH-ON MFG CO.	.0050	SP-6918-7	GOX	4500.0			04/04					D	10	ABXXXX

MFGR S DESIGNATION	MANUFACTURER	SPEC. THICK.	TEST RPT NO.	TEST ENVR	TEST PRESS	TEST TEMP	IMPT ENER	NO OF REACT	FLASH POINT	FIRE PT	PROP DIST	WT LOSS	R I	T T	MATL CODE
EA-40 ADHESIVE	SMOOTH-ON MFG CO.	.0050	SP-6918-8	GOX	250.0		200	04/04					D	11	ABXXXX
EA-40 ADHESIVE	SMOOTH-ON MFG CO.	.0050	SP-6918-9	GOX	500.0		200	01/01					D	11	ABXXXX
EASY FLOW 45	HANDY AND HARMON		71-2528	GOX	1500.0		50	00/04					A	11	FKMRMC
EASY FLOW 45	HANDY AND HARMON		71-2528-1	GOX	1500.0			00/04					A	10	FKMRMC
EAZY-FLO 45	GAC		70-2138	GOX	2000.0			00/04					A	10	FKMRXX
EAZY-FLO 45	GAC		70-2138-1	A-50	754.0	496							T	15	FKMRXX
EAZY-FLO 45	GAC		70-2138-2	A-50	775.0	501							T	15	FKMRXX
EC-9-1-N GLASS YARN	OWENS CORNING FIBGLS		70-2093	GOX	1500.0		50	00/04					A	11	EDGDXX
EC-9-1-N GLASS YARN	OWENS CORNING FIBGLS		70-2093-1	GOX	1500.0			00/04					A	10	EDGDXX
EC-9-1-N GLASS YARN	OWENS CORNING FIBGLS		70-2093-2	GOX	1000.0				N999	N999			A	13	EDGDXX
ECCO-STOCK R-19	EMERSON CUMING INC		71-2762	GOX	150.0				431	431			D	13	FJBYXX
ECCO-STOCK R-19	EMERSON CUMING INC		71-2762-1	GOX	250.0		50	00/04					A	11	FJBYXX
ECCO-STOCK R-19	EMERSON CUMING INC		71-2762-2	GOX	250.0			00/04					A	10	FJBYXX
ECCOFOAM	EMERSON CUMING INC		70-1953	A-50	401.0	505							T	15	CFCQXX
ECCOFOAM	EMERSON CUMING INC		70-1953-1	A-50	771.0	515							T	15	CFCQXX
ELASTOMER EMS-338	AIRESEARCH INDST DIV		71-2825	GOX	100.0				517	517			D	13	CDDFXX
ELASTOMER EMS-338	AIRESEARCH INDST DIV		71-2825-1	GOX	250.0		50	00/04					A	11	CDDFXX
ELASTOMER EMS-338	AIRESEARCH INDST DIV		71-2825-2	GOX	250.0			00/04					A	10	CDDFXX
ELASTOMER SVSK 81370-1	HAMILTON STANDARD		71-2289	GOX	2000.0			00/04					A	10	DDCPXX
ELASTOMER SVSK 81370-1	HAMILTON STANDARD		71-2289-1	GOX	5000.0			01/01					T	10	DDCPXX
ELASTOMER SVSK 81370-1	HAMILTON STANDARD		71-2289-2	GOX	5000.0		50	00/04					A	11	DDCPXX
ELASTOMER SVSK 81370-1	HAMILTON STANDARD		71-2289-3	GOX	1500.0				525	525			D	13	DDCPXX
ELASTOMER SVSK 81370-1	HAMILTON STANDARD		71-2289-4	GOX	3000.0				486	486			D	13	DDCPXX
ELECTROFILM 1000	ELECTROFILM INC.		70-1876	GOX	1500.0			00/04					A	10	DAEJFM
ELECTROFILM 1000	ELECTROFILM INC.		70-1876-1	GOX	62.0	1000			N999	N999			A	13	DAEJFM
ELECTROFILM 1000	ELECTROFILM INC.		70-1876-10	GOX	1500.0				606	606			D	13	DAEJFM
ELECTROFILM 1000	ELECTROFILM INC.		70-1876-11	GOX	2000.0				598	598			D	13	DAEJFM
ELECTROFILM 1000	ELECTROFILM INC.		70-1876-12	GOX	950.0				450	450			D	13	DAEJFM
ELECTROFILM 1000	ELECTROFILM INC.		70-1876-2	GOX	165.0	1000			N999	N999			A	13	DAEJFM
ELECTROFILM 1000	ELECTROFILM INC.		70-1876-3	GOX	900.0				413	413			D	13	DAEJFM
ELECTROFILM 1000	ELECTROFILM INC.		70-1876-4	GOX	25.0	1000			N999	N999			J	13	DAEJFM
ELECTROFILM 1000	ELECTROFILM INC.	.0050	70-1876-4	GOX	1500.0		50	00/04					A	11	DAEJFM
ELECTROFILM 1000	ELECTROFILM INC.		70-1876-5	GOX	50.0	1000			N999	N999			A	13	DAEJFM
ELECTROFILM 1000	ELECTROFILM INC.		70-1876-6	GOX	50.0	1000			N999	N999			J	13	DAEJFM
ELECTROFILM 1000	ELECTROFILM INC.		70-1876-7	GOX	100.0	1000			N999	N999			J	13	DAEJFM
ELECTROFILM 1000	ELECTROFILM INC.		70-1876-8	GOX	500.0				581	581			D	13	DAEJFM
ELECTROFILM 1000	ELECTROFILM INC.		70-1876-9	GOX	1000.0				621	621			D	13	DAEJFM
EMS-308	AIRESEARCH INDST DIV		67-0247	GOX	1565.0				495	495			D	13	BGCCDP
EMS-342	AIRESEARCH INDST DIV		67-0794	GOX	1087.0				438	438			D	13	DOCKXX
EMS-342	AIRESEARCH INDST DIV		67-0794-1	GOX	1565.0				492	492			D	13	DOCKXX
EMS-342	AIRESEARCH INDST DIV	.0750	67-0794-2	GOX	1500.0			01/02					T	10	DOCKXX
EMS-342	AIRESEARCH INDST DIV	.0750	67-0794-3	GOX	1500.0		50	00/04					A	11	DOCKXX
EMS-342	AIRESEARCH INDST DIV	.0750	67-0794-4	GOX	250.0			00/04					A	10	DOCKXX
EMS-363	AIRESEARCH INDST DIV	.0750	SP-6929	GOX	25.0				651	651			D	13	DOCOXX

MFGR S DESIGNATION	MANUFACTURER	SPEC. THICK.	TEST RPT NO.	TEST ENVR	TEST PRESS	TEST TEMP	IMPT ENER	NO OF REACT	FLASH POINT	FIRE PT	PROP DIST	WT LOSS	R I	T T	MATL CODE
EMS-363	AIRESEARCH INDST DIV	.0750	SP-6929-1	GOX	50.0				606	606			D	13	DOCQXX
EMS-363	AIRESEARCH INDST DIV	.0750	SP-6929-10	GOX	3000.0			04/04					D	10	DOCQXX
EMS-363	AIRESEARCH INDST DIV	.0750	SP-6929-11	GOX	500.0		200	00/01					A	11	DOCQXX
EMS-363	AIRESEARCH INDST DIV	.0750	SP-6929-12	GOX	1000.0		200	00/01					A	11	DOCQXX
EMS-363	AIRESEARCH INDST DIV	.0750	SP-6929-13	GOX	1500.0		200	00/01					A	11	DOCQXX
EMS-363	AIRESEARCH INDST DIV	.0750	SP-6929-14	GOX	2000.0		200	00/04					A	11	DOCQXX
EMS-363	AIRESEARCH INDST DIV		SP-6929-15	GOX	150.0				373	373			D	13	DOCQXX
EMS-363	AIRESEARCH INDST DIV		SP-6929-16	GOX	500.0		50	00/04					A	11	DOCQXX
EMS-363	AIRESEARCH INDST DIV		SP-6929-17	GOX	500.0			01/01					T	10	DOCQXX
EMS-363	AIRESEARCH INDST DIV		SP-6929-18	GOX	1500.0		50	00/04					A	11	DOCQXX
EMS-363	AIRESEARCH INDST DIV		SP-6929-19	GOX	1500.0			01/04					T	10	DOCQXX
EMS-363	AIRESEARCH INDST DIV	.0750	SP-6929-2	GOX	62.0				566	676			D	13	DOCQXX
EMS-363	AIRESEARCH INDST DIV		SP-6929-20	GOX	1000.0				291	291			D	13	DOCQXX
EMS-363	AIRESEARCH INDST DIV		SP-6929-21	GOX	500.0				211	211			D	13	DOCQXX
EMS-363	AIRESEARCH INDST DIV		SP-6929-22	GOX	50.0				290	290			D	13	DOCQXX
EMS-363	AIRESEARCH INDST DIV		SP-6929-23	GOX	100.0				296	286			D	13	DOCQXX
EMS-363	AIRESEARCH INDST DIV		SP-6929-24	GOX	1000.0				345	345			D	13	DOCQXX
EMS-363	AIRESEARCH INDST DIV		SP-6929-25	GOX	1500.0				201	201			D	13	DOCQXX
EMS-363	AIRESEARCH INDST DIV		SP-6929-26	GOX	2000.0				223	223			D	13	DODIXX
EMS-363	AIRESEARCH INDST DIV	.0750	SP-6929-3	GOX	165.0				640	643			D	13	DOCQXX
EMS-363	AIRESEARCH INDST DIV	.0750	SP-6929-4	GOX	200.0			00/04					A	10	DOCQXX
EMS-363	AIRESEARCH INDST DIV	.0750	SP-6929-5	GOX	500.0			01/02					D	10	DOCQXX
EMS-363	AIRESEARCH INDST DIV	.0750	SP-6929-6	GOX	1000.0			01/02					D	10	DOCQXX
EMS-363	AIRESEARCH INDST DIV	.0750	SP-6929-7	GOX	1500.0			01/02					D	10	DOCQXX
EMS-363	AIRESEARCH INDST DIV	.0750	SP-6929-8	GOX	2000.0			01/02					D	10	DOCQXX
EMS-363	AIRESEARCH INDST DIV	.0750	SP-6929-9	GOX	2500.0			01/02					D	10	DOCQXX
EMS-382	AIRESEARCH INDST DIV		SP-6926	GOX	50.0				572	572			D	13	DODIXX
EMS-382	AIRESEARCH INDST DIV		SP-6926-1	GOX	62.0				567	606			D	13	DODIXX
EMS-382	AIRESEARCH INDST DIV	.0750	SP-6926-10	GOX	500.0		50	00/01					A	11	DODIXX
EMS-382	AIRESEARCH INDST DIV	.0750	SP-6926-11	GOX	750.0		50	00/01					A	11	DODIXX
EMS-382	AIRESEARCH INDST DIV	.0750	SP-6926-12	GOX	1000.0		50	00/01					A	11	DODIXX
EMS-382	AIRESEARCH INDST DIV	.0750	SP-6926-13	GOX	1250.0		50	00/01					A	11	DODIXX
EMS-382	AIRESEARCH INDST DIV	.0750	SP-6926-14	GOX	1500.0		50	00/01					A	11	DODIXX
EMS-382	AIRESEARCH INDST DIV	.0750	SP-6926-15	GOX	100.0			00/01					A	10	DODIXX
EMS-382	AIRESEARCH INDST DIV	.0750	SP-6926-16	GOX	200.0			00/01					A	10	DODIXX
EMS-382	AIRESEARCH INDST DIV	.0750	SP-6926-17	GOX	300.0			00/01					A	10	DODIXX
EMS-382	AIRESEARCH INDST DIV	.0750	SP-6926-18	GOX	400.0			00/01					A	10	DODIXX
EMS-382	AIRESEARCH INDST DIV	.0750	SP-6926-19	GOX	500.0			00/04					A	10	DODIXX
EMS-382	AIRESEARCH INDST DIV		SP-6926-2	GOX	435.0				572	572			D	13	DODIXX
EMS-382	AIRESEARCH INDST DIV	.0750	SP-6926-20	GOX	1000.0			01/02					D	10	DODIXX
EMS-382	AIRESEARCH INDST DIV	.0750	SP-6926-21	GOX	1500.0			04/04					D	10	DODIXX
EMS-382	AIRESEARCH INDST DIV		SP-6926-22	GOX	14.7		200	01/01					T	11	DODIXX
EMS-382	AIRESEARCH INDST DIV	.0750	SP-6926-3	GOX	50.0		50	00/04					A	11	DODIXX
EMS-382	AIRESEARCH INDST DIV	.0750	SP-6926-4	GOX	100.0		50	00/04					A	11	DODIXX

MFGR S DESIGNATION	MANUFACTURER	SPEC. THICK.	TEST RPT NO.	TEST ENVR	TEST PRESS	TEST TEMP	IMPT ENER	NO OF REACT	FLASH POINT	FIRE PT	PROP DIST	WT LOSS	R I	T T	MATL CODE
EMS-382	AIRESEARCH INDST DIV	.0750	SP-6926-5	GOX	150.0		50	00/04					A	11	DODIXX
EMS-382	AIRESEARCH INDST DIV	.0750	SP-6926-6	GOX	200.0		50	00/04					A	11	DODIXX
EMS-382	AIRESEARCH INDST DIV	.0750	SP-6926-7	GOX	40.0		200	01/01					D	11	DODIXX
EMS-382	AIRESEARCH INDST DIV	.0750	SP-6926-8	GOX	100.0		200	01/01					D	11	DODIXX
EMS-382	AIRESEARCH INDST DIV	.0750	SP-6926-9	GOX	1500.0		200	01/01					D	11	DODIXX
ENDOX 1	INDIANA GENERAL CORP		71-2269	GOX	1500.0		50	00/04					A	11	EXMOMI
ENDOX 1	INDIANA GENERAL CORP		71-2269-1	GOX	1500.0			00/04					A	10	EXMOMI
EPIBOND 123/HARDNER 931	FURANE PLASTICS INC.		70-1768	GOX	1565.0				476	476			D	13	AEBGGS
EPIBOND 123/HARDNER 931	FURANE PLASTICS INC.	.0050	70-1768-1	GOX	2000.0		50	00/04					A	11	AEBGGS
EPIBOND 123/HARDNER 931	FURANE PLASTICS INC.		70-1768-10	GOX	1500.0			01/02					T	10	AEBGGS
EPIBOND 123/HARDNER 931	FURANE PLASTICS INC.		70-1768-11	GOX	2000.0			01/03					T	10	AEBGGS
EPIBOND 123/HARDNER 931	FURANE PLASTICS INC.		70-1768-12	GOX	2500.0			04/04					T	10	AEBGGS
EPIBOND 123/HARDNER 931	FURANE PLASTICS INC.		70-1768-13	GOX	3500.0			01/01					T	10	AEBGGS
EPIBOND 123/HARDNER 931	FURANE PLASTICS INC.		70-1768-14	GOX	4500.0			01/01					T	10	AEBGGS
EPIBOND 123/HARDNER 931	FURANE PLASTICS INC.		70-1768-15	GOX	500.0		50	00/04					A	11	AEBGGS
EPIBOND 123/HARDNER 931	FURANE PLASTICS INC.		70-1768-16	GOX	500.0			00/04					A	10	AEBGGS
EPIBOND 123/HARDNER 931	FURANE PLASTICS INC.		70-1768-17	GOX	1500.0		50	00/04					A	11	AEBGGS
EPIBOND 123/HARDNER 931	FURANE PLASTICS INC.		70-1768-18	GOX	1500.0			01/01					T	10	AEBGGS
EPIBOND 123/HARDNER 931	FURANE PLASTICS INC.		70-1768-19	GOX	25.0				659	659			D	13	AEBGGS
EPIBOND 123/HARDNER 931	FURANE PLASTICS INC.	.0050	70-1768-2	GOX	2500.0		50	01/02					T	11	AEBGGS
EPIBOND 123/HARDNER 931	FURANE PLASTICS INC.		70-1768-20	GOX	50.0				655	655			D	13	AEBGGS
EPIBOND 123/HARDNER 931	FURANE PLASTICS INC.		70-1768-21	GOX	150.0				533	533			D	13	AEBGGS
EPIBOND 123/HARDNER 931	FURANE PLASTICS INC.		70-1768-22	GOX	1000.0				399	399			D	13	AEBGGS
EPIBOND 123/HARDNER 931	FURANE PLASTICS INC.		70-1768-23	LOX	14.7		50	00/04					A	16	AEBGGS
EPIBOND 123/HARDNER 931	FURANE PLASTICS INC.		70-1768-24	LOX	14.7		200	00/04					A	16	AEBGGS
EPIBOND 123/HARDNER 931	FURANE PLASTICS INC.		70-1768-25	GOX	1000.0		50	00/04					A	11	AEBGGS
EPIBOND 123/HARDNER 931	FURANE PLASTICS INC.		70-1768-26	GOX	1000.0		200	00/04					A	11	AEBGGS
EPIBOND 123/HARDNER 931	FURANE PLASTICS INC.	.0050	70-1768-3	GOX	3000.0		50	04/04					T	11	AEBGGS
EPIBOND 123/HARDNER 931	FURANE PLASTICS INC.	.0050	70-1768-4	GOX	500.0		200	04/04					T	11	AEBGGS
EPIBOND 123/HARDNER 931	FURANE PLASTICS INC.	.0050	70-1768-5	GOX	1000.0		200	01/01					T	11	AEBGGS
EPIBOND 123/HARDNER 931	FURANE PLASTICS INC.	.0050	70-1768-6	GOX	2000.0		200	01/01					T	11	AEBGGS
EPIBOND 123/HARDNER 931	FURANE PLASTICS INC.	.0050	70-1768-7	GOX	3000.0		200	01/01					T	11	AEBGGS
EPIBOND 123/HARDNER 931	FURANE PLASTICS INC.	.0050	70-1768-8	GOX	4000.0		200	01/01					T	11	AEBGGS
EPIBOND 123/HARDNER 931	FURANE PLASTICS INC.		70-1768-9	GOX	1000.0			00/04					A	10	AEBGGS
EPIBOND 123/HARDNER 931	FURANE PLASTICS INC.	.0050	70-2208	GOX	1500.0			01/02					T	10	AEBGGS
EPIBOND 123/HARDNER 931	FURANE PLASTICS INC.		70-2208-1	GOX	1000.0				450	450			D	13	AEBGGS
EPIBOND 123/HARDNER 931	FURANE PLASTICS INC.		70-2208-2	GOX	1000.0				566	566			D	13	AEBGGS
EPON 8/CAT A	SHELL CHEMICAL CORP		70-1774	GOX	1500.0		50	00/04					A	11	AEBLGS
EPON 8/CAT A	SHELL CHEMICAL CORP		70-1774	GOX	1500.0			01/03					T	10	AEBLGS
EPON 8/CAT A	SHELL CHEMICAL CORP		70-1774	GOX	25.0				657	657			D	13	AEBLGS
EPON 8/CAT A	SHELL CHEMICAL CORP		70-1774-1	GOX	50.0				661	661			D	13	AEBLGS
EPON 8/CAT A	SHELL CHEMICAL CORP		70-1774-10	GOX	950.0				290	290			D	13	AEBLGS
EPON 8/CAT A	SHELL CHEMICAL CORP		70-1774-11	GOX	950.0				327	327			D	13	AEBLGS
EPON 8/CAT A	SHELL CHEMICAL CORP		70-1774-12	GOX	5000.0		50	01/02					T	11	AEBLGS

MFGR S DESIGNATION	MANUFACTURER	SPEC. THICK.	TEST RPT NO.	TEST ENVR	TEST PRESS	TEST TEMP	IMPT ENER	NO OF REACT	FLASH POINT	FIRE PT	PROP DIST	WT LOSS	R I	T T	MATL CODE
EPON 8/CAT A	SHELL CHEMICAL CORP		70-1774-13	GOX	4500.0		50	00/04					A	11	AEBLGS
EPON 8/CAT A	SHELL CHEMICAL CORP		70-1774-14	GOX	1500.0			01/01					T	10	AEBLGS
EPON 8/CAT A	SHELL CHEMICAL CORP		70-1774-15	GOX	1000.0			01/02					T	10	AEBLGS
EPON 8/CAT A	SHELL CHEMICAL CORP		70-1774-16	GOX	500.0			00/04					A	10	AEBLGS
EPON 8/CAT A	SHELL CHEMICAL CORP		70-1774-17	GOX	1000.0	263							D	15	AEBLGS
EPON 8/CAT A	SHELL CHEMICAL CORP		70-1774-18	GOX	50.0				524	524			D	13	AEBLGS
EPON 8/CAT A	SHELL CHEMICAL CORP		70-1774-2	GOX	62.0				665	682			D	13	AEBLGS
EPON 8/CAT A	SHELL CHEMICAL CORP		70-1774-3	GOX	100.0				483	483			D	13	AEBLGS
EPON 8/CAT A	SHELL CHEMICAL CORP		70-1774-4	GOX	165.0				664	665			D	13	AEBLGS
EPON 8/CAT A	SHELL CHEMICAL CORP		70-1774-5	GOX	500.0				352	352			D	13	AEBLGS
EPON 8/CAT A	SHELL CHEMICAL CORP		70-1774-6	GOX	900.0				333	333			D	13	AEBLGS
EPON 8/CAT A	SHELL CHEMICAL CORP		70-1774-7	GOX	1000.0				343	343			D	13	AEBLGS
EPON 8/CAT A	SHELL CHEMICAL CORP		70-1774-8	GOX	1500.0				291	291			D	13	AEBLGS
EPON 8/CAT A	SHELL CHEMICAL CORP		70-1774-9	GOX	2000.0				287	287			D	13	AEBLGS
EPOXY E-9405	FIBERITE WEST COAST CORP		71-2265	GOX	1500.0		50	00/04					A	11	BABGXX
EPOXY E-9405	FIBERITE WEST COAST CORP		71-2265-1	GOX	1500.0			00/04					A	10	BABGXX
EPOXY E-9405	FIBERITE WEST COAST CORP		71-2265-10	GOX	1000.0	271							D	15	BABGXX
EPOXY E-9405	FIBERITE WEST COAST CORP		71-2265-11	GOX	25.0				766	766			D	13	BABGXX
EPOXY E-9405	FIBERITE WEST COAST CORP		71-2265-12	GOX	50.0				650	650			D	13	BABGXX
EPOXY E-9405	FIBERITE WEST COAST CORP		71-2265-13	GOX	50.0				831	831			D	13	BABGXX
EPOXY E-9405	FIBERITE WEST COAST CORP		71-2265-14	GOX	100.0				530	530			D	13	BABGXX
EPOXY E-9405	FIBERITE WEST COAST CORP		71-2265-15	GOX	500.0				534	534			D	13	BABGXX
EPOXY E-9405	FIBERITE WEST COAST CORP		71-2265-16	GOX	1500.0				232	232			D	13	BABGXX
EPOXY E-9405	FIBERITE WEST COAST CORP		71-2265-17	GOX	2000.0				232	232			D	13	BABGXX
EPOXY E-9405	FIBERITE WEST COAST CORP		71-2265-18	GOX	5050.0		50	00/04					A	11	BABGXX
EPOXY E-9405	FIBERITE WEST COAST CORP		71-2265-2	GOX	1000.0				295	295			D	13	BABGXX
EPOXY E-9405	FIBERITE WEST COAST CORP		71-2265-3	GOX	4000.0			01/01					T	10	BABGXX
EPOXY E-9405	FIBERITE WEST COAST CORP		71-2265-4	GOX	3500.0			01/01					T	10	BABGXX
EPOXY E-9405	FIBERITE WEST COAST CORP		71-2265-5	GOX	3000.0			01/01					T	10	BABGXX
EPOXY E-9405	FIBERITE WEST COAST CORP		71-2265-6	GOX	2500.0			01/02					T	10	BABGXX
EPOXY E-9405	FIBERITE WEST COAST CORP		71-2265-7	GOX	2000.0			01/01					T	10	BABGXX
EPOXY E-9405	FIBERITE WEST COAST CORP		71-2265-8	GOX	1500.0			01/01					T	10	BABGXX
EPOXY E-9405	FIBERITE WEST COAST CORP		71-2265-9	GOX	1000.0			00/04					T	10	BABGXX
EPOXY SHEET.TYPE 1	HYSOL CORP	.0750	70-2224	GOX	2000.0			00/04					A	10	FJBGXX
EPOXY SHEET.TYPE 1	HYSOL CORP	.0750	70-2224-1	GOX	4500.0			01/04					T	10	FJBGXX
EPOXY SHEET.TYPE 1	HYSOL CORP		70-2224-10	GOX	500.0				440	440			D	13	FJBGXX
EPOXY SHEET.TYPE 1	HYSOL CORP		70-2224-11	GOX	1000.0				341	341			D	13	FJBGXX
EPOXY SHEET.TYPE 1	HYSOL CORP		70-2224-12	GOX	1000.0				351	351			D	13	FJBGXX
EPOXY SHEET.TYPE 1	HYSOL CORP		70-2224-13	GOX	1150.0				375	375			D	13	FJBGXX
EPOXY SHEET.TYPE 1	HYSOL CORP		70-2224-14	GOX	1500.0				345	345			D	13	FJBGXX
EPOXY SHEET.TYPE 1	HYSOL CORP		70-2224-15	GOX	2000.0				349	349			D	13	FJBGXX
EPOXY SHEET.TYPE 1	HYSOL CORP		70-2224-16	GOX	5000.0		50	00/04					A	11	FJBGXX
EPOXY SHEET.TYPE 1	HYSOL CORP		70-2224-2	GOX	4500.0		50	00/04					A	11	FJBGXX
EPOXY SHEET.TYPE 1	HYSOL CORP		70-2224-3	GOX	2000.0		50	00/04					A	11	FJBGXX

MFGR S DESIGNATION	MANUFACTURER	SPEC. THICK.	TEST RPT NO.	TEST ENVR	TEST PRESS	TEST TEMP	IMPT ENER	NO OF REACT	FLASH POINT	FIRE PT	PROP DIST	WT LOSS	R I	T T	MATL CODE
EPOXY SHEET,TYPE 1	HYSOL CORP		70-2224-4	GOX	1150.0				432	432			D	13	FJBGXX
EPOXY SHEET,TYPE 1	HYSOL CORP		70-2224-5	GOX	3000.0				402	402			D	13	FJBGXX
EPOXY SHEET,TYPE 1	HYSOL CORP		70-2224-6	A-50	824.0	510							T	15	FJBGXX
EPOXY SHEET,TYPE 1	HYSOL CORP		70-2224-7	A-50	826.0	513							T	15	FJBGXX
EPOXY SHEET,TYPE 1	HYSOL CORP		70-2224-8	GOX	50.0				560	560			D	13	FJBGXX
EPOXY SHEET,TYPE 1	HYSOL CORP		70-2224-9	GOX	100.0				557	557			D	13	FJBGXX
EPOXY 175053	SIMMONS		71-2719	A-50	663.0	496							T	15	BABGGS
EPOXY 175053	SIMMONS		71-2719-1	A-50	759.0	507							T	15	BABGGS
EPOXY 250	3M CO. ST. PAUL		71-2492	A-50	663.0	480							T	15	BABGXX
EPOXY 250	3M CO. ST. PAUL		71-2492-1	A-50	776.0	507							T	15	BABGXX
EPOXYLITE 5302	EPOXYLITE CORP		71-2313	GOX	2000.0			01/02					T	10	DTBGXX
EPOXYLITE 5302	EPOXYLITE CORP		71-2313-1	GOX	1500.0				417	417			D	13	DTBGXX
EPOXYLITE 6001-16	EPOXYLITE		70-2169-14	A-50	785.0	503							T	14	ABBGXX
EPOXYLITE 6001-16	EPOXYLITE		70-2169-15	A-50	785.0	506							T	14	ABBGXX
EPOXYLITE 6001-16	EPOXYLITE CORP	.0050	70-2169	GOX	2000.0			01/02					T	10	ABBGXX
EPOXYLITE 6001-16	EPOXYLITE CORP		70-2169-1	GOX	1400.0				303	303			D	13	ABBGXX
EPOXYLITE 6001-16	EPOXYLITE CORP		70-2169-10	GOX	500.0				325	325			D	13	ABBGXX
EPOXYLITE 6001-16	EPOXYLITE CORP		70-2169-11	GOX	1000.0				310	310			D	13	ABBGXX
EPOXYLITE 6001-16	EPOXYLITE CORP		70-2169-12	GOX	1500.0				265	265			D	13	ABBGXX
EPOXYLITE 6001-16	EPOXYLITE CORP		70-2169-13	GOX	2000.0				282	282			D	13	ABBGXX
EPOXYLITE 6001-16	EPOXYLITE CORP		70-2169-14	GOX	1400.0	260							D	15	ABBGXX
EPOXYLITE 6001-16	EPOXYLITE CORP		70-2169-15	GOX	25.0				753	753			D	13	ABBGXX
EPOXYLITE 6001-16	EPOXYLITE CORP		70-2169-16	GOX	50.0				518	518			D	13	ABBGXX
EPOXYLITE 6001-16	EPOXYLITE CORP		70-2169-2	GOX	5000.0		50	00/04					A	11	ABBGXX
EPOXYLITE 6001-16	EPOXYLITE CORP		70-2169-3	GOX	2500.0			01/01					T	10	ABBGXX
EPOXYLITE 6001-16	EPOXYLITE CORP		70-2169-4	GOX	1000.0			01/01					T	10	ABBGXX
EPOXYLITE 6001-16	EPOXYLITE CORP		70-2169-5	GOX	500.0			00/04					A	10	ABBGXX
EPOXYLITE 6001-16	EPOXYLITE CORP		70-2169-6	A-50	785.0	503							T	15	ABBGXX
EPOXYLITE 6001-16	EPOXYLITE CORP		70-2169-7	A-50	785.0	506							T	15	ABBGXX
EPOXYLITE 6001-16	EPOXYLITE CORP		70-2169-8	GOX	50.0				314	314			D	13	ABBGXX
EPOXYLITE 6001-16	EPOXYLITE CORP		70-2169-9	GOX	100.0				392	392			D	13	ABBGXX
EPOXYLITE 6203	EPOXYLITE CORP		70-2170	GOX	1500.0			00/04					A	10	BABJGS
EPOXYLITE 6203	EPOXYLITE CORP		70-2170-1	GOX	1000.0				450	450			D	13	BABJGS
EPOXYLITE 6203	EPOXYLITE CORP		70-2170-1	GOX	2000.0			00/04					A	10	BABJGS
EPOXYLITE 6203	EPOXYLITE CORP		70-2170-10	GOX	1500.0				466	466			D	13	BABJGS
EPOXYLITE 6203	EPOXYLITE CORP		70-2170-11	GOX	2000.0				452	452			D	13	BABJGS
EPOXYLITE 6203	EPOXYLITE CORP		70-2170-12	GOX	3000.0	415							D	15	BABJGS
EPOXYLITE 6203	EPOXYLITE CORP		70-2170-13	GOX	1000.0	480							D	15	BABJGS
EPOXYLITE 6203	EPOXYLITE CORP		70-2170-14	GOX	50.0				714	714			D	13	BABJGS
EPOXYLITE 6203	EPOXYLITE CORP		70-2170-15	GOX	25.0				709	708			D	13	BABJGS
EPOXYLITE 6203	EPOXYLITE CORP		70-2170-2	GOX	1400.0				472	472			D	15	BABJGS
EPOXYLITE 6203	EPOXYLITE CORP		70-2170-2	GOX	4500.0			01/03					T	10	BABJGS
EPOXYLITE 6203	EPOXYLITE CORP		70-2170-3	GOX	3000.0				407	407			D	13	BABJGS
EPOXYLITE 6203	EPOXYLITE CORP		70-2170-4	A-50	785.0	500							T	15	BABJGS

MFGR S DESIGNATION	MANUFACTURER	SPEC. THICK.	TEST RPT NO.	TEST ENVR	TEST PRESS	TEST TEMP	IMPT ENER	NO OF REACT	FLASH POINT	FIRE PT	PROP DIST	WT LOSS	R I	T T	MATL CODE
EPOXYLITE 6203	EPOXYLITE CORP		70-2170-5	A-50	822.0	506							T	15	BABJGS
EPOXYLITE 6203	EPOXYLITE CORP		70-2170-6	GOX	50.0				641	641			D	13	BABJGS
EPOXYLITE 6203	EPOXYLITE CORP		70-2170-7	GOX	100.0				620	620			D	13	BABJGS
EPOXYLITE 6203	EPOXYLITE CORP		70-2170-8	GOX	500.0				497	497			D	13	BABJGS
EPOXYLITE 6203	EPOXYLITE CORP		70-2170-9	GOX	1400.0				461	461			D	13	BABJGS
EPOXYLITE 6203	EPOXYLITE CORP		70-2198	GOX	1500.0		50	00/04					A	11	BABJGS
EPR ELASTOMER	AIRESEARCH INDST DIV		70-1955	A-50	397.0	446							T	15	DODDXX
EPR ELASTOMER	AIRESEARCH INDST DIV		70-1955-1	A-50	496.0	612							T	15	DODDXX
EPR ELASTOMER	AIRESEARCH INDST DIV		70-1955-2	A-50	310.0	461							T	15	DODDXX
EPR ELASTOMER	AIRESEARCH INDST DIV		70-1955-3	A-50	297.0	491							T	15	DODDXX
EPR ELASTOMER	AIRESEARCH INDST DIV		70-1955-4	A-50	555.0	451							T	15	DODDXX
EPR ELASTOMER	AIRESEARCH INDST DIV		70-1955-5	MMH	731.0	496							T	15	DODDXX
EPR ELASTOMER	AIRESEARCH INDST DIV		70-1955-6	MMH	544.0	462							T	15	DODDXX
EPR ELASTOMER	AIRESEARCH INDST DIV		70-1955-7	MMH	317.0	487							T	15	DODDXX
EPR 515-8	GAC		71-2275	A-50	826.0	516							T	15	CHDDXX
EPR 515-8	GAC		71-2275-1	A-50	762.0	500							T	15	CHDDXX
EPY-400 CEMENT	BLH ELECTRONICS		71-2379	GOX	500.0		50	00/04					A	11	ABBGXX
EPY-400 CEMENT	BLH ELECTRONICS		71-2379-1	GOX	500.0			00/04					A	10	ABBGXX
EPY-400 CEMENT	BLH ELECTRONICS		71-2379-2	GOX	100.0				535	535			D	13	ABBGXX
ER-560 AG BRAZE ALLOY	HANDY AND HARMON		70-2213	GOX	500.0			00/04					A	10	FLMRXX
ER-560 AG BRAZE ALLOY	HANDY AND HARMON		70-2213-1	GOX	500.0		50	00/04					A	11	FLMRXX
EUTECTIC 1800	EUTECTIC CORP		71-2603	A-50	741.0	510							T	15	FLMRXX
EUTECTIC 1800	EUTECTIC CORP		71-2603-1	A-50	759.0	512							T	15	FLMRXX
EUTECTIC 1801-1801B FLUX	EUTECTIC CORP		70-1889-1	GOX	1500.0			00/04					A	10	BZXXXX
EUTECTIC 1801-1801B FLUX	EUTECTIC CORP		70-1889-2	GOX	1500.0		50	00/04					A	11	BZXXXX
EUTECTIC 1801-1801B FLUX	EUTECTIC CORP		70-1889-3	GOX	900.0	1000			N999	N999			R	13	
FC-43 TRANSFER FLUID	3M CO. ST. PAUL		70-1947	GOX	6.2	1000			N999	N999			A	13	BVBPXX
FC-43 TRANSFER FLUID	3M CO. ST. PAUL		70-1947-2	GOX	16.5				592	372			D	13	BVBPXX
FERRITE STEEL IF5-3C58TC	FERROXCUBE CORP	.0750	70-2212	GOX	500.0			00/04					A	10	DTMDMI
FERRITE STEEL IF5-3C58TC	FERROXCUBE CORP		70-2212-1	GOX	500.0		50	00/04					A	11	DTMDMI
FERROUS CHLORIDE	NR DOWNEY		71-2501	GOX	1500.0		50	00/04					A	11	DTMDGR
FERROUS CHLORIDE	NR DOWNEY		71-2501-1	GOX	1500.0			00/04					A	10	DTMDGR
FERROUS CHLORIDE	NR DOWNEY		71-2501-2	GOX	1500.0		200	00/04					A	11	DTMDGR
FERROUS CHLORIDE	NR DOWNEY		71-2501-3	A-50	775.0	480							T	15	DTMDGR
FERROUS CHLORIDE	NR DOWNEY		71-2501-4	A-50	752.0	508							T	15	DTMDGR
FERROUS CHLORIDE	NR DOWNEY		71-2501-5	MMH	765.0	492							T	15	DTMDGR
FERROUS CHLORIDE	NR DOWNEY		71-[illegible]-6	MMH	604.0	487							T	15	DTMDGR
FEURALON AW	BEMOL CORP		70-[illegible]00	GOX	1500.0		50	00/04					A	11	FIGIXX
FEURALON AW	BEMOL CORP		70-2100-1	GOX	1500.0			00/04					A	10	FIGIXX
FEURALON AW	BEMOL CORP		70-2100-2	GOX	1000.0				633	633			D	13	FIGIXX
FEUROLON AW	BEMOL CORP		70-2101	GOX	1500.0		50	00/04					A	11	DKFWGU
FEUROLON AW	BEMOL CORP		70-2101-1	GOX	1500.0			00/04					A	10	DKFWGU
FEUROLON AW	BEMOL CORP		70-2101-2	GOX	1000.0				658	658			D	13	DKFWGU
FEUROLON C	BEMOL CORP		70-2102	GOX	1500.0		50	00/04					A	11	DKFWGU

MFGR S DESIGNATION	MANUFACTURER	SPEC. THICK.	TEST RPT NO.	TEST ENVR	TEST PRESS	TEST TEMP	IMPT ENER	NO OF REACT	FLASH POINT	FIRE PT	PROP DIST	WT LOSS	R J	T T	MATL CODE
FEUROLON C	BEMOL CORP		70-2102-1	GOX	1500.0			00/04					A	10	DKFWGU
FEUROLON C	BEMOL CORP		70-2102-2	GOX	1000.0				752	752			D	13	DKFWGU
FEUROLON C	BEMOL CORP		70-2103	GOX	1500.0		50	00/04					A	11	DKFWGU
FEUROLON C	BEMOL CORP		70-2103-1	GOX	1500.0			00/04					A	10	DKFWGU
FEUROLON C	BEMOL CORP		70-2103-2	GOX	1000.0				596	596			D	13	DKFWGU
FIBERGLASS INSUL-E	OWENS CORNING FBRGLS		70-1996	GOX	500.0		50	00/04					A	11	FJFVXX
FIBERGLASS INSUL-E	OWENS CORNING FBRGLS		70-1996	GOX	500.0			00/04					A	10	FJFVXX
FIBERGLASS INSUL-E	OWENS CORNING FBRGLS		70-1996-1	GOX	1500.0			01/01					T	10	FJFVXX
FIBERGLASS INSUL-E	OWENS CORNING FBRGLS		70-1996-1	GOX	1500.0		50	00/04					A	11	FJFVXX
FIBERGLASS INSUL-E	OWENS CORNING FBRGLS		70-1996-2	GOX	80.0				699	699			D	13	FJFVXX
FIBERGLASS NO. 27	GAC		71-2596	A-50	782.0	516							T	15	FJFVCK
FIBERGLASS NO. 27	GAC		71-2596-1	A-50	758.0	518							T	15	FJFVCK
FIBERGLASS TAPE	CAROLINA NARROW FABRIC		71-2491	A-50	797.0	508							T	15	DZFWXX
FIBERGLASS TAPE	CAROLINA NARROW FABRIC		71-2491-1	A-50	682.0	484							T	15	DZFWXX
FIBERGLASS TAPE	CAROLINA NARROW FABRIC		71-2491-2	A-50	478.0	440							T	15	DZFWXX
FIBROUS ASBESTOS	WHITTAKE CLARK & DANIELS		71-2707	A-50	784.0	517							T	15	FJFLXX
FIBROUS ASBESTOS	WHITTAKE CLARK & DANIELS		71-2707-1	A-50	769.0	516							T	15	FJFLXX
FLUOREL L-3583-2	RAYBESTOS MANHATTAN INC.		69-1410	GOX	5.0	1000			741	N999			J	13	DVDEXX
FLUOREL L-3583-2	RAYBESTOS MANHATTAN INC.		69-1410-1	GOX	25.0				760	851			D	13	DVDEXX
FLUOREL L-3583-2	RAYBESTOS MANHATTAN INC.		69-1410-2	GOX	50.0				703	798			D	13	DVDEXX
FLUOREL L-3583-2	RAYBESTOS MANHATTAN INC.		69-1410-3	GOX	50.0				555	555			D	13	DVDEXX
FLUOREL L-3583-2	RAYBESTOS MANHATTAN INC.		69-1410-4	GOX	100.0				520	520			D	13	DVDEXX
FLUOREL L-3583-2	RAYBESTOS MANHATTAN INC.		69-1410-5	GOX	500.0				449	449			D	13	DVDEXX
FLUOREL L-3583-2	RAYBESTOS MANHATTAN INC.		69-1410-6	GOX	1000.0				451	451			D	13	DVDEXX
FLUOREL L-3583-2	RAYBESTOS MANHATTAN INC.		69-1410-7	GOX	1500.0				451	451			D	13	DVDEXX
FLUOREL L-3583-2	RAYBESTOS MANHATTAN INC.		69-1410-8	GOX	2000.0				418	418			D	13	DVDEXX
FLUOREL 10104 LOT 742	MOSITES.G.A.. FT. WORTH		71-2588	GOX	6.2				836	892			D	13	DODEXX
FLUOREL 1059	MOSITES.G.A.. FT. WORTH		70-1624	GOX	25.0				637	840			D	13	DODEXX
FLUOREL 1059	MOSITES.G.A.. FT. WORTH		70-1624-1	GOX	50.0				670	826			D	13	DODEXX
FLUOREL 1059	MOSITES.G.A.. FT. WORTH		70-1624-10	GOX	500.0				598	598			D	13	DODEXX
FLUOREL 1059	MOSITES.G.A.. FT. WORTH		70-1624-11	GOX	1000.0				549	549			D	13	DODEXX
FLUOREL 1059	MOSITES.G.A.. FT. WORTH		70-1624-12	GOX	1500.0				570	570			D	13	DODEXX
FLUOREL 1059	MOSITES.G.A.. FT. WORTH		70-1624-13	GOX	2000.0				547	547			D	13	DODEXX
FLUOREL 1059	MOSITES.G.A.. FT. WORTH		70-1624-2	GOX	50.0				616	616			D	13	DODEXX
FLUOREL 1059	MOSITES.G.A.. FT. WORTH		70-1624-3	GOX	62.0				836	859			D	13	DODEXX
FLUOREL 1059	MOSITES.G.A.. FT. WORTH		70-1624-4	GOX	165.0				685	860			D	13	DODEXX
FLUOREL 1059	MOSITES.G.A.. FT. WORTH	.0750	70-1624-5	GOX	2000.0			00/04					A	10	DODEXX
FLUOREL 1059	MOSITES.G.A.. FT. WORTH	.0750	70-1624-6	GOX	2500.0			01/01					T	10	DODEXX
FLUOREL 1059	MOSITES.G.A.. FT. WORTH	.0750	70-1624-7	GOX	3000.0			04/04					T	10	DODEXX
FLUOREL 1059	MOSITES.G.A.. FT. WORTH	.0750	70-1624-8	GOX	2000.0		200	00/04					A	11	DODEXX
FLUOREL 1059	MOSITES.G.A.. FT. WORTH		70-1624-9	GOX	100.0				686	686			D	13	DODEXX
FLUOREL 1079-K	MOSITES.G.A.. FT. WORTH	.0750	70-1819	GOX	500.0		50	00/01					A	11	DVDEXX
FLUOREL 1079-K	MOSITES.G.A.. FT. WORTH	.0750	70-1819-1	GOX	3000.0		50	00/01					A	11	DVDEXX
FLUOREL 1079-K	MOSITES.G.A.. FT. WORTH	.0750	70-1819-2	GOX	3500.0		50	00/01					A	11	DVDEXX

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FLUOREL 1079-K	MOSITES.G.A.. FT. WORTH	.0750	70-1815-3	GOX	4000.0		50	00/01					A	11	DVDEXX
FLUOREL 1079-K	MOSITES.G.A.. FT. WORTH	.0750	70-1819-4	GOX	4500.0		50	00/01					A	11	DVDEXX
FLUOREL 1079-K	MOSITES.G.A.. FT. WORTH	.0750	70-1819-5	GOX	5000.0		50	00/04					A	11	DVDEXX
FLUOREL 1079-K	MOSITES.G.A.. FT. WORTH	.0750	70-1819-6	GOX	3000.0			00/04					A	10	DVDEXX
FLUOROBESTOS LS-9225	RAYBESTOS MANHATTAN INC.		71-2405	GOX	250.0			00/04					A	10	DTDEFL
FLUOROBESTOS LS-9225	RAYBESTOS MANHATTAN INC.		71-2405-1	GOX	75.0	1000			N999	N999			A	13	DTDEFL
FLUOROCARBON CTD GLS TRDDODGE	INDUSTRIES.INC.		71-2387	GOX	500.0		50	00/04					A	11	EDCNGD
FLUOROCARBON CTD GLS TRDDODGE	INDUSTRIES.INC.		71-2387-1	GOX	500.0			00/04					A	10	EDCNGD
FLUOROCARBON CTD GLS TRDDODGE	INDUSTRIES.INC.		71-2387-2	GOX	100.0	1000			N999	N999			D	13	EDCNGD
FLUOROFLEX-T BLK R500-4	RESISTOFLEX CORP		71-2661	GOX	2000.0		50	00/04					A	11	EFCOXX
FLUOROFLEX-T BLK R500-4	RESISTOFLEX CORP		71-2661-1	GOX	2000.0			01/03					T	10	EFCOXX
FLUOROFLEX-T BLK R500-4	RESISTOFLEX CORP		71-2661-2	GOX	1500.0			01/01					T	10	EFCOXX
FLUOROFLEX-T BLK R500-4	RESISTOFLEX CORP		71-2661-3	GOX	1000.0			00/04					A	10	EFCOXX
FLUOROFLEX-T WHT R500-4	RESISTOFLEX CORP		71-2662	GOX	2000.0		50	00/04					A	11	EFCOXX
FLUOROFLEX-T WHT R500-4	RESISTOFLEX CORP		71-2662-1	GOX	1000.0			00/04					A	10	EFCOXX
FLUOROFLEX-T WHT R500-4	RESISTOFLEX CORP		71-2662-2	GOX	1500.0			01/01					D	10	EFCOXX
FLUOROLUBE LG-160	HOOKER CHEMICAL		71-2251	GOX	500.0		50	00/04					A	11	DBEGEM
FLUOROLUBE LG-160	HOOKER CHEMICAL		71-2251-1	GOX	500.0			00/04					A	10	DBEGEM
FLUOROLUBE LG-160	HOOKER CHEMICAL		71-2251-2	GOX	100.0				690	690			D	13	DBEGEM
FLUOROELAST SVSX 81370-4	HAMILTON STANDARD		71-2288	GOX	2000.0			00/04					A	10	DVDEXX
FLUOROELAST SVSX 81370-4	HAMILTON STANDARD		71-2288-1	GOX	1500.0				501	501			D	13	DVDEXX
FLUX LLOYDS SS	JOHNSON MFG CO.		71-2372	GOX	1500.0		50	00/04					A	11	FLDMXX
FLUX LLOYDS SS	JOHNSON MFG CO.		71-2372-1	GOX	1500.0			00/04					A	10	FLDMXX
FLUX LLOYDS SS	JOHNSON MFG CO.		71-2372-2	GOX	1000.0	1000			N999	N999			A	13	FLDMXX
FLUX-BRAZING	EUTECTIC CORP		70-1926	GOX	1500.0			00/04					Y	10	FLXXXX
FLUX-BRAZING	EUTECTIC CORP		70-1926-1	GOX	1500.0		50	00/04					A	11	FLXXXX
FLUX-BRAZING	EUTECTIC CORP		70-1926-2	GOX	1500.0	1000			N999	N999			Y	13	FLXXXX
FLUX-BRAZING O-F-499C	HANDY AND HARMON		70-1925	GOX	1500.0		50	00/04					A	11	FLXXXX
FLUX-BRAZING O-F-499C	HANDY AND HARMON		70-1925	GOX	1500.0			00/04					A	10	FLXXXX
FLUX-BRAZING O-F-499C	HANDY AND HARMON		70-1925-1	GOX	1500.0	1000			N999	N999			Y	13	FLXXXX
FORM-VAR COATED CU WIRE	ESSEX INTERNATIONAL CO.		70-2216	GOX	500.0			00/04					A	10	ELMCHS
FORM-VAR COATED CU WIRE	ESSEX INTERNATIONAL CO.		70-2216-1	GOX	500.0		50	00/04					A	11	ELMCHS
FORM-VAR COATED CU WIRE	ESSEX INTERNATIONAL CO.		70-2216-2	GOX	160.0	1000			N999	N999			Y	13	ELMCHS
FS-1281 COMPOUND	DOW CORNING CORP		71-3015	GOX	1500.0		50	00/04					A	11	DBCKXX
FS-1281 COMPOUND	DOW CORNING CORP		71-3015-1	GOX	1500.0			01/01					T	10	DBCKXX
FS-1281 COMPOUND	DOW CORNING CORP		71-3015-2	GOX	1500.0			00/01					A	10	DBCKXX
FYROQUEL 220 CELLUBE	STAUFFER CHEMICAL	.0050	10-73	GOX	5000.0		50	00/04					A	11	DCXXXX
FYROQUEL 220 CELLUBE	STAUFFER CHEMICAL	.0050	10-73-1	GOX	2000.0		50	00/01					A	11	DCXXXX
FYROQUEL 220 CELLUBE	STAUFFER CHEMICAL	.0050	10-73-10	GOX	4500.0			01/02					D	10	DCXXXX
FYROQUEL 220 CELLUBE	STAUFFER CHEMICAL	.0050	10-73-11	GOX	5000.0			01/02					D	10	DCXXXX
FYROQUEL 220 CELLUBE	STAUFFER CHEMICAL	.0050	10-73-12	GOX	2500.0			01/01					T	10	DCXXXX
FYROQUEL 220 CELLUBE	STAUFFER CHEMICAL		10-73-13	GOX	2000.0			01/01					T	10	DCXXXX
FYROQUEL 220 CELLUBE	STAUFFER CHEMICAL		10-73-14	GOX	1500.0			01/01					T	10	DCXXXX
FYROQUEL 220 CELLUBE	STAUFFER CHEMICAL		10-73-15	GOX	1000.0			00/04					A	10	DCXXXX

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FYROQUEL 220 CELLUBE	STAUFFER CHEMICAL		10-73-16	GOX	50.0				527	527			D	13	OCXXXX
FYROQUEL 220 CELLUBE	STAUFFER CHEMICAL	.0050	10-73-2	GOX	3000.0		50	00/01					A	11	OCXXXX
FYROQUEL 220 CELLUBE	STAUFFER CHEMICAL	.0050	10-73-3	GOX	4000.0		50	00/01					A	11	OCXXXX
FYROQUEL 220 CELLUBE	STAUFFER CHEMICAL	.0050	10-73-4	GOX	1500.0			00/04					A	10	OCXXXX
FYROQUEL 220 CELLUBE	STAUFFER CHEMICAL	.0050	10-73-5	GOX	2000.0			01/03					D	10	OCXXXX
FYROQUEL 220 CELLUBE	STAUFFER CHEMICAL	.0050	10-73-6	GOX	2500.0			01/02					D	10	OCXXXX
FYROQUEL 220 CELLUBE	STAUFFER CHEMICAL	.0050	10-73-7	GOX	3000.0			01/02					D	10	OCXXXX
FYROQUEL 220 CELLUBE	STAUFFER CHEMICAL	.0050	10-73-8	GOX	3500.0			01/02					D	10	OCXXXX
FYROQUEL 220 CELLUBE	STAUFFER CHEMICAL	.0050	10-73-9	GOX	4000.0			01/02					D	10	OCXXXX
GEMON 2010	G.E. CHEM MATL DEPT	.0750	10-94	GOX	3500.0			00/04					A	10	DLCDGF
GEMON 2010	G.E. CHEM MATL DEPT	.0750	10-94-1	GOX	4000.0			01/03					D	10	DLCDGF
GEMON 2010	G.E. CHEM MATL DEPT	.0750	10-94-2	GOX	4500.0			01/03					D	10	DLCDGF
GEMON 2010	G.E. CHEM MATL DEPT	.0750	10-94-3	GOX	5000.0			01/03					D	10	DLCDGF
GEMON 2010	G.E. CHEM MATL DEPT	.0750	10-94-4	GOX	4000.0		200	00/01					A	11	DLCDGF
GEMON 2010	G.E. CHEM MATL DEPT	.0750	10-94-5	GOX	5000.0		200	00/04					A	11	DLCDGF
GEMON 2010-0103	G.E. CHEM MATL DEPT	.0750	10-95	GOX	3500.0			01/02					A	10	DLCDGF
GEMON 2010-0103	G.E. CHEM MATL DEPT	.0750	10-95-1	GOX	4000.0			00/04					A	10	DLCDGF
GEMON 2010-0103	G.E. CHEM MATL DEPT	.0750	10-95-10	GOX	5000.0		200	00/04					A	11	DLCDGF
GEMON 2010-0103	G.E. CHEM MATL DEPT	.0750	10-95-2	GOX	4500.0			01/03					D	10	DLCDGF
GEMON 2010-0103	G.E. CHEM MATL DEPT	.0750	10-95-3	GOX	5000.0			01/02					D	10	DLCDGF
GEMON 2010-0103	G.E. CHEM MATL DEPT	.0750	10-95-4	GOX	2000.0		200	00/01					A	11	DLCDGF
GEMON 2010-0103	G.E. CHEM MATL DEPT	.0750	10-95-5	GOX	2500.0		200	00/01					A	11	DLCDGF
GEMON 2010-0103	G.E. CHEM MATL DEPT	.0750	10-95-6	GOX	3000.0		200	00/01					A	11	DLCDGF
GEMON 2010-0103	G.E. CHEM MATL DEPT	.0750	10-95-7	GOX	3500.0		200	00/01					A	11	DLCDGF
GEMON 2010-0103	G.E. CHEM MATL DEPT	.0750	10-95-8	GOX	4000.0		200	00/01					A	11	DLCDGF
GEMON 2010-0103	G.E. CHEM MATL DEPT	.0750	10-95-9	GOX	4500.0		200	00/01					A	11	DLCDGF
GEMON 2012-L0125	G.E. CHEM MATL DEPT		10-96	GOX	1000.0				484	484			D	13	DLCDCP
GEMON 2012-L0125	G.E. CHEM MATL DEPT		10-96-1	GOX	1500.0				392	392			D	13	DLCDCP
GEMON 2012-L0125	G.E. CHEM MATL DEPT		10-96-2	GOX	2000.0				421	421			D	13	DLCDCP
GEMON 2012-L0125	G.E. CHEM MATL DEPT	.0750	10-96-3	GOX	4000.0			00/01					A	10	DLCDCP
GEMON 2012-L0125	G.E. CHEM MATL DEPT	.0750	10-96-4	GOX	4500.0			00/04					A	10	DLCDCP
GEMON 2012-L0125	G.E. CHEM MATL DEPT	.0750	10-96-5	GOX	5000.0			01/02					T	10	DLCDCP
GEMON 2012-L0125	G.E. CHEM MATL DEPT	.0750	10-96-6	GOX	4000.0		200	00/01					A	11	DLCDCP
GEMON 2012-L0125	G.E. CHEM MATL DEPT	.0750	10-96-7	GOX	5000.0		200	00/04					A	11	DLCDCP
GEMON 3010	G.E. CHEM MATL DEPT	.0750	10-87	GOX	2000.0			00/01					A	10	DLCDGF
GEMON 3010	G.E. CHEM MATL DEPT	.0750	10-87-1	GOX	3000.0			00/01					A	10	DLCDGF
GEMON 3010	G.E. CHEM MATL DEPT	.0750	10-87-2	GOX	4000.0			00/01					A	10	DLCDGF
GEMON 3010	G.E. CHEM MATL DEPT	.0750	10-87-3	GOX	4500.0			00/04					A	10	DLCDGF
GEMON 3010	G.E. CHEM MATL DEPT	.0750	10-87-4	GOX	5000.0			01/03					D	10	DLCDGF
GEMON 3010	G.E. CHEM MATL DEPT	.0750	10-87-5	GOX	4000.0		200	00/01					A	11	DLCDGF
GEMON 3010	G.E. CHEM MATL DEPT	.0750	10-87-6	GOX	4500.0		200	00/04					A	11	DLCDGF
GEMON 3010	G.E. CHEM MATL DEPT	.0750	10-87-7	GOX	5000.0		200	01/03					D	11	DLCDGF
GEMON 3010 (.65GLASS)	G.E. CHEM MATL DEPT		70-1769	GOX	25.0				768	791			D	13	DLCDIA
GEMON 3010 (.65GLASS)	G.E. CHEM MATL DEPT		70-1769-1	GOX	50.0				614	614			D	13	DLCDIA

MFGR S DESIGNATION	MANUFACTURER	SPEC. THICK.	TEST RPT NO.	TEST ENVR	TEST PRESS	TEST TEMP	IMPT ENER	NO OF REACT	FLASH POINT	FIRE PT	PROP DIST	WT LOSS	R T	MATL CODE
GERON 3010 (.65GLASS)	G.E. CHEM MATL DEPT	.0750	70-1769-10	GOX	3500.0			00/04					A 10	DLCDIA
GERON 3010 (.65GLASS)	G.E. CHEM MATL DEPT	.0750	70-1769-11	GOX	4000.0			01/03					T 10	DLCDIA
GERON 3010 (.65GLASS)	G.E. CHEM MATL DEPT	.0750	70-1769-12	GOX	4500.0			01/03					T 10	DLCDIA
GERON 3010 (.65GLASS)	G.E. CHEM MATL DEPT	.0750	70-1769-13	GOX	5000.0			04/04					T 10	DLCDIA
GERON 3010 (.65GLASS)	G.E. CHEM MATL DEPT	.0750	70-1769-14	GOX	5000.0		200	00/04					A 11	DLCDIA
GERON 3010 (.65GLASS)	G.E. CHEM MATL DEPT		70-1769-2	GOX	50.0				868	868			D 13	DLCDIA
GERON 3010 (.65GLASS)	G.E. CHEM MATL DEPT		70-1769-3	GOX	62.0	1000			776	N999			J 13	DLCDIA
GERON 3010 (.65GLASS)	G.E. CHEM MATL DEPT		70-1769-4	GOX	100.0				608	608			D 13	DLCDIA
GERON 3010 (.65GLASS)	G.E. CHEM MATL DEPT		70-1769-5	GOX	165.0				835	837			D 13	DLCDIA
GERON 3010 (.65GLASS)	G.E. CHEM MATL DEPT		70-1769-6	GOX	500.0				503	503			D 13	DLCDIA
GERON 3010 (.65GLASS)	G.E. CHEM MATL DEPT		70-1769-7	GOX	1000.0				507	507			D 13	DLCDIA
GERON 3010 (.65GLASS)	G.E. CHEM MATL DEPT		70-1769-8	GOX	1500.0				396	396			D 13	DLCDIA
GERON 3010 (.65GLASS)	G.E. CHEM MATL DEPT		70-1769-9	GOX	2000.0				374	374			D 13	DLCDIA
GERON 3010-0096	G.E. CHEM MATL DEPT		10-101-1	GOX	25.0	1000			842	N999			J 13	DLCDIA
GERON 3010-0096	G.E. CHEM MATL DEPT	.0750	10-101-10	GOX	3500.0			00/01					A 10	DLCDIA
GERON 3010-0096	G.E. CHEM MATL DEPT	.0750	10-101-11	GOX	4000.0			00/04					A 10	DLCDIA
GERON 3010-0096	G.E. CHEM MATL DEPT	.0750	10-101-12	GOX	4500.0			01/02					D 10	DLCDIA
GERON 3010-0096	G.E. CHEM MATL DEPT	.0750	10-101-13	GOX	5000.0			01/02					D 10	DLCDIA
GERON 3010-0096	G.E. CHEM MATL DEPT	.0750	10-101-14	GOX	4000.0		200	00/01					A 11	DLCDIA
GERON 3010-0096	G.E. CHEM MATL DEPT	.0750	10-101-15	GOX	5000.0		200	00/04					A 11	DLCDIA
GERON 3010-0096	G.E. CHEM MATL DEPT		10-101-2	GOX	50.0				933	933			D 13	DLCDIA
GERON 3010-0096	G.E. CHEM MATL DEPT		10-101-3	GOX	50.0				763	763			D 13	DLCDIA
GERON 3010-0096	G.E. CHEM MATL DEPT		10-101-4	GOX	100.0				734	734			D 13	DLCDIA
GERON 3010-0096	G.E. CHEM MATL DEPT		10-101-5	GOX	500.0				656	656			D 13	DLCDIA
GERON 3010-0096	G.E. CHEM MATL DEPT		10-101-6	GOX	1000.0				657	657			D 13	DLCDIA
GERON 3010-0096	G.E. CHEM MATL DEPT		10-101-7	GOX	1500.0				418	418			D 13	DLCDIA
GERON 3010-0096	G.E. CHEM MATL DEPT		10-101-8	GOX	2000.0				369	369			D 13	DLCDIA
GERON 3010-0096	G.E. CHEM MATL DEPT	.0750	10-101-9	GOX	2500.0			00/01					A 10	DLCDIA
GLASS FAB 3-DIM	WOVEN PRODUCTS	.0750	10-98	GOX	4000.0			00/01					A 10	BFIAXX
GLASS FAB 3-DIM	WOVEN PRODUCTS	.0750	10-98-1	GOX	4500.0			00/01					A 10	BFIAXX
GLASS FAB 3-DIM	WOVEN PRODUCTS	.0750	10-98-2	GOX	5000.0			00/04					A 10	BFIAXX
GLASS FAB 3-DIM	WOVEN PRODUCTS	.0750	10-98-3	GOX	4000.0		200	00/01					A 11	BFIAXX
GLASS FAB 3-DIM	WOVEN PRODUCTS	.0750	10-98-4	GOX	5000.0		200	00/04					A 11	BFIAXX
GLASS FRIT	CORNING GLASS		71-2701	A-50	800.0	493							T 15	FJIAXX
GLASS FRIT	CORNING GLASS		71-2701-1	A-50	818.0	526							T 15	FJIAXX
GLASS FRIT	CORNING GLASS		71-2701-2	MMH	797.0	539							T 15	FJIAXX
GLASS TAPE 1180140	INSULECTRO CORP		71-2552	MMH	805.0	514							T 15	EBGDXX
GLASS TAPE 1180140	INSULECTRO CORP		71-2552-1	MMH	803.0	517							T 15	EBGDXX
GLYPTAL 1201	G.E. CHEM MATL DEPT		71-2671	A-50	751.0	515							T 15	ATAOXX
GLYPTAL 1201	G.E. CHEM MATL DEPT		71-2671-1	A-50	759.0	511							T 15	ATAOXX
GLYPTAL 1201	G.E. CHEM MATL DEPT		71-2671-2	MMH	748.0	518							T 15	ATAOXX
GLYPTAL 1201	G.E. CHEM MATL DEPT		71-2671-3	MMH	741.0	522							T 15	ATAOXX
GOLD ALLOY 581	HANDY AND HARMON		70-2139	GOX	4510.0			00/04					A 10	FKMUMR
GOLD ALLOY 581	HANDY AND HARMON		70-2139-1	A-50	801.0	513							T 15	FKMUMR

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GOLD ALLOY 581	HANDY AND HARMON		70-2139-2	A-50	693.0	487							T	15	FKMUMR
GOLD TEFLON WIRE INSUL			70-1750	GOX	5.0	1000			605	N999			R	13	EPCNGJ
GOLD TEFLON WIRE INSUL			70-1750-1	GOX	25.0	1000			910	N999			J	13	EPCNGJ
GOLD TEFLON WIRE INSUL			70-1750-10	GOX	16.5	1000			N999	N999			Y	13	EPCNGJ
GOLD TEFLON WIRE INSUL			70-1750-2	GOX	50.0				652	652			D	13	EPCNGJ
GOLD TEFLON WIRE INSUL			70-1750-3	GOX	100.0				654	654			D	13	EPCNGJ
GOLD TEFLON WIRE INSUL			70-1750-4	GOX	500.0				634	634			D	13	EPCNGJ
GOLD TEFLON WIRE INSUL			70-1750-5	GOX	1000.0				621	621			D	13	EPCNGJ
GOLD TEFLON WIRE INSUL			70-1750-6	GOX	1500.0				735	735			D	13	EPCNGJ
GOLD TEFLON WIRE INSUL			70-1750-7	GOX	2000.0				701	701			D	13	EPCNGJ
GOLD TEFLON WIRE INSUL			70-1750-8	GOX	50.0				904	943			D	13	EPCNGJ
GOLD TEFLON WIRE INSUL			70-1750-9	GOX	6.2	1000			N999	N999			Y	13	EPCNGJ
GOLD.FINE			70-2125-1	A-50	767.0	515							T	15	DTMUXX
GOLD.FINE			70-2125-2	A-50	764.0	515							T	15	DTMUXX
GOLD.FINE			70-2125-3	MMH	767.0	521							T	15	DTMUXX
GOLD.FINE			70-2125-4	MMH	807.0	527							T	15	DTMUXX
GOLD.FINE	GAC		70-2125	GOX	2000.0			00/04					A	10	DTMUXX
GP-2 DAMPING SHEET	SOUND COAT CO. INC		71-2346	GOX	6.2	600			N600	N600			J	13	DTCVHF
H-11 PYROMAT	CARPENTER TECH CORP		71-2376	GOX	500.0		50	00/04					A	11	EXMIXX
H-11 PYROMAT	CARPENTER TECH CORP		71-2376-1	GOX	500.0			00/04					A	10	EXMIXX
H-11 PYROMAT	CARPENTER TECH CORP		71-2376-2	MMH	828.0	517							T	15	EXMIXX
H-11 PYROMAT	CARPENTER TECH CORP		71-2376-3	MMH	787.0	511							T	15	EXMIXX
HASTELLOY-W	HAYNES STELLITE CO		71-2500	GOX	1500.0		50	00/04					A	11	FMMNMC
HASTELLOY-W	HAYNES STELLITE CO		71-2500-1	GOX	1500.0			00/04					A	10	FMMNMC
HAYNES STELLITE NO. 3	GAC		70-2171	GOX	5000.0		50	00/04					A	11	DMMOXX
HAYNES 25-HTLA	HAYNES ALLOY CORP		71-2340	A-50	785.0	503							T	15	DMMDMO
HAYNES 25-HTLA	HAYNES ALLOY CORP		71-2340-1	A-50	741.0	490							T	15	DMMDMO
HI-TEMP INSULATION MIN-K	FANSTEEL CORP		71-2363	GOX	500.0		50	00/04					A	11	CKGUXX
HI-TEMP INSULATION MIN-K	FANSTEEL CORP		71-2363-1	GOX	500.0			00/04					A	10	CKGUXX
HI-TEMP INSULATION MIN-K	FANSTEEL CORP		71-2363-2	GOX	1000.0	1000			N999	N999			A	13	CKGUXX
HI-TEMP INSULATION MIN-K	FANSTEEL CORP		71-2363-3	GOX	100.0	1000			N999	N999			A	13	CKGUXX
HIGH VACUUM GREASE	DOW CORNING CORP		71-2766	GOX	500.0		50	00/04					A	11	DBCKXX
HIGH VACUUM GREASE	DOW CORNING CORP		71-2766-1	GOX	500.0			00/04					A	10	DBCKXX
HS-248-2 AMS-5508	GAC		70-2148	GOX	2000.0			00/04					A	10	DTMDHS
HS-248-2 AMS-5508	GAC		70-2148-1	GOX	2000.0		50	00/04					A	11	DTMDHS
HS-248-41 AMS-5508	GAC		70-2146	GOX	2000.0			00/04					A	10	DTMDHS
HS-248-41 AMS-5508	GAC		70-2146-1	GOX	2000.0		50	00/04					A	11	DTMDHS
HYGRADE POLYTUBE 463	MARKEL.L. FRANK + SONS		71-2250	GOX	1000.0				290	290			D	13	EEXXXX
HYGRADE POLYTUBE 463	MARKEL.L. FRANK + SONS		71-2250-1	GOX	1500.0		50	00/04					A	11	AMBGXX
HYGRADE POLYTUBE 463	MARKEL.L. FRANK + SONS		71-2250-2	GOX	1500.0			01/01					T	10	AMBGXX
HYSOL C.-4	HYSOL CORP		71-2499	GOX	1000.0	1000			N999	N999			Z	13	AKBGXX
HYSOL DK-4	HYSOL CORP		71-2499-1	GOX	1500.0		50	00/04					A	11	AKBGXX
HYSOL DK-4	HYSOL CORP		71-2499-2	GOX	1500.0			01/01					T	10	AKBGXX
HYSOL EPOXY	HYSOL CORP		70-1964	A-50	350.0	531							T	15	FJBAXX

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HYSOL EPOXY	HYSOL CORP		70-1964-1	A-50	480.0	465							T	15	FJBAXX
HYSOL EPOXY	HYSOL CORP		70-1964-2	A-50	640.0	533							T	15	FJBAXX
HYSOL EPOXY	HYSOL CORP		70-1964-3	A-50	806.0	629							T	15	FJBAXX
HYSOL EPOXY	HYSOL CORP		70-1964-4	A-50	265.0	407							T	15	FJBAXX
HYSOL K7-5223	HYSOL CORP		70-2127	GOX	8.7	1000			N999	N999			R	13	AHBGXX
INCONEL ALLOY 706	INTERNATIONAL NICKEL CO.		71-2498	GOX	1500.0		50	00/04					A	11	DMMNMC
INCONEL ALLOY 706	INTERNATIONAL NICKEL CO.		71-2498-1	GOX	1500.0			00/04					A	10	DMMNMC
INCONEL FILLER 92T	INTERNATIONAL NICKEL CO.		71-2390	A-50	570.0	463							T	15	DMMDXX
INCONEL FILLER 92T	INTERNATIONAL NICKEL CO.		71-2390-1	A-50	775.0	494							T	15	DMMDXX
INCONEL FILLER 92T	INTERNATIONAL NICKEL CO.		71-2390-2	A-50	768.0	512							T	15	DMMDXX
INCONEL FILLER 92T	INTERNATIONAL NICKEL CO.		71-2390-3	MMH	774.0	523							T	15	DMM
INCONEL FILLER 92T	INTERNATIONAL NICKEL CO.		71-2390-4	MMH	816.0	532							T	15	DMMDXX
INCONEL X	INTERNATIONAL NICKEL CO.		70-2032	A-50	744.0	508							T	15	DMMNXX
INCONEL X	INTERNATIONAL NICKEL CO.		70-2032-1	A-50	803.0	528							T	15	DMMNXX
INCONEL X-750	INTERNATIONAL NICKEL CO.		70-2144	GOX	5000.0			00/04					A	10	DMMNXX
INCONEL X-750	INTERNATIONAL NICKEL CO.		70-2144-1	GOX	6800.0			00/04					A	10	DMMNXX
INCONEL X-750	INTERNATIONAL NICKEL CO.		70-2144-2	A-50	754.0	500							T	15	DMMNXX
INCONEL X-750	INTERNATIONAL NICKEL CO.		70-2144-3	A-50	689.0	491							T	15	DMMNXX
INCONEL 718	GAC	.0750	70-2142	GOX	2000.0		50	00/04					A	11	DMMNXX
INCONEL 718	GAC		70-2142-1	GOX	5000.0			00/04					A	10	DMMNXX
INCONEL 718	GAC		70-2142-2	GOX	6800.0			00/04					A	10	DMMNXX
INCONEL 718	GAC		70-2142-3	GOX	5050.0		50	00/04					A	11	DMMNXX
INDIUM BISMUTH AND CU BEMSFC			70-2043	GOX	6.2	1000			N999	N999			Y	13	AWFZMC
INDIUM BISMUTH AND CU BEMSFC			70-2043-1	GOX	16.5	1000			N999	N999			Y	13	AWFZMC
INVAR 36	ALLEN FRY STEEL CO.	.0750	70-2206	GOX	1500.0			00/04					A	10	DMMNXX
INVAR 36	ALLEN FRY STEEL CO.	.0750	70-2206-1	GOX	1500.0		50	00/04					A	11	DMMNXX
INVAR 36	GAC	.0750	70-2109	GOX	2500.0		50	00/04					A	11	FIMIMN
IOR RED FIBER SHEET			SP-6931-15	GOX	100.0				364	364			D	13	CRBGXX
IOR RED FIBER SHEET			SP-6931-16	GOX	500.0				265	265			D	13	CRBGXX
IOR RED FIBER SHEET			SP-6931-17	GOX	50.0				427	427			D	13	CRBGXX
K-602 STEEL	KENNAMETAL	.0750	70-2217	GOX	1500.0			00/04					A	10	DMMDXX
K-602 STEEL	KENNAMETAL		70-2217-1	GOX	1500.0		50	00/04					A	11	DMMDXX
K-602 STEEL	KENNAMETAL		71-2266	GOX	1500.0			00/04					A	10	DMMDXX
K-602 STEEL	KENNAMETAL		71-2266-1	GOX	500.0		50	00/01					A	11	DMMDXX
K-602 STEEL	KENNAMETAL		71-2266-10	GOX	1000.0		200	01/01					T	11	DMMDXX
K-602 STEEL	KENNAMETAL		71-2266-2	GOX	1000.0		50	00/01					A	11	DMMDXX
K-602 STEEL	KENNAMETAL		71-2266-3	GOX	1500.0		50	00/10					A	11	DMMDXX
K-602 STEEL	KENNAMETAL		71-2266-4	GOX	3000.0		50	00/03					A	11	DMMDXX
K-602 STEEL	KENNAMETAL		71-2266-5	GOX	500.0		200	02/05					T	11	DMMDXX
K-602 STEEL	KENNAMETAL		71-2266-6	GOX	1000.0		200	01/05					T	11	DMMDXX
K-602 STEEL	KENNAMETAL		71-2266-7	LOX	14.7		50	00/04					A	16	DMMDXX
K-602 STEEL	KENNAMETAL		71-2266-8	LOX	14.7		200	00/04					A	16	DMMDXX
K-602 STEEL	KENNAMETAL		71-2266-9	GOX	1000.0		50	01/01					T	11	DMMDXX
KAPTON H-FILM	E.I. DUPONT CO.,INC.		70-1752	GOX	5.0	1000			682	N999			R	13	EJCDXX

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KAPTON H-FILM	E.I. DUPONT CO.,INC.		70-1752-1	GOX	25.0	1000			800	N999			J	13	EJCDXX
KAPTON H-FILM	E.I. DUPONT CO.,INC.		70-1752-2	GOX	50.0				710	710			D	13	EJCDXX
KAPTON H-FILM	E.I. DUPONT CO.,INC.		70-1752-3	GOX	50.0				578	858			D	13	EJCDXX
KAPTON H-FILM	E.I. DUPONT CO.,INC.		70-1752-4	GOX	100.0				644	644			D	13	EJCDXX
KAPTON H-FILM	E.I. DUPONT CO. INC.		70-1752-5	GOX	500.0				579	579			D	13	EJCDXX
KAPTON H-FILM	E.I. DUPONT CO.,INC.		70-1752-6	GOX	1000.0				492	492			D	13	EJCDXX
KAPTON H-FILM	E.I. DUPONT CO.,INC.		70-1752-7	GOX	1500.0				535	535			D	13	EJCDXX
KAPTON H-FILM	E.I. DUPONT CO.,INC.		70-1752-8	GOX	2000.0				541	541			D	13	EJCDXX
KAPTON H-FILM	E.I. DUPONT CO.,INC.		70-1752-9	GOX	1615	1000			N999	N999			R	13	EJCDXX
KAPTON H-FILM	E.I. DUPONT CO.,INC.		70-1991	GOX	1000.0		50	00/04					A	11	CKCDXX
KAPTON H-FILM	E.I. DUPONT CO.,INC.		70-1991	GOX	1500.0			01/01					T	10	CKCDXX
KAPTON H-FILM	E.I. DUPONT CO.,INC.		70-1991-1	GOX	500.0		50	00/04					A	11	CKCDXX
KAPTON H-FILM	E.I. DUPONT CO.,INC.	.0750	70-1991-2	GOX	500.0			00/04					A	10	CKCDXX
KAPTON H-FILM	E.I. DUPONT CO.,INC.		70-1991-3	GOX	100.0				466	466			D	13	CKCDXX
KAPTON H-FILM	E.I. DUPONT CO.,INC.		70-1991-4	GOX	1500.0				374	374			D	13	CKCDXX
KAPTON H-FILM	E.I. DUPONT CO.,INC.		70-1991-5	GOX	1500.0		50	00/04					A	11	CKCDXX
KAPTON H-FILM	E.I. DUPONT CO.,INC.		71-2431	A-50	723.0	493							T	15	FJCDXX
KAPTON H-FILM	E.I. DUPONT CO.,INC.		71-2431-1	A-50	831.0	509							T	15	FJCDXX
KAPTON H-FILM	E.I. DUPONT CO.,INC.		71-2431-2	A-50	751.0	516							T	15	FJCDXX
KEL-F-81	3M CO. ST. PAUL		M9-0296	GOX	5.0	1000			870	N999				13	DKBDXX
KEL-F-81	3M CO. ST. PAUL		M9-0296	GOX	4500.0		50	00/04					A	11	DKBDXX
KEL-F-81	3M CO. ST. PAUL		M9-0296	GOX	4000.0			02/02					T	10	DKBDXX
KEL-F-81	3M CO. ST. PAUL		M9-0296-1	GOX	10.0	1000			890	N999				13	DKBDXX
KEL-F-81	3M CO. ST. PAUL		M9-0296-10	GOX	1110.0				655	655			D	13	DKBDXX
KEL-F-81	3M CO. ST. PAUL		M9-0296-11	GOX	1500.0				698	698			D	13	DKBDXX
KEL-F-81	3M CO. ST. PAUL		M9-0296-12	GOX	2000.0				706	706			D	13	DKBDXX
KEL-F-81	3M CO. ST. PAUL	.0750	M9-0296-13	GOX	4000.0			02/02					D	10	DKBDXX
KEL-F-81	3M CO. ST. PAUL	.0750	M9-0296-14	GOX	4500.0		50	00/04					A	11	DKBDXX
KEL-F-81	3M CO. ST. PAUL		M9-0296-15	GOX	1500.0			00/04					A	10	DKDBXX
KEL-F-81	3M CO. ST. PAUL		M9-0296-16	GOX	6.2	1000			N999	N999			F	13	DKBDXX
KEL-F-81	3M CO. ST. PAUL		M9-0296-17	GOX	3000.0				629	629			D	13	DKBDXX
KEL-F-81	3M CO. ST. PAUL		M9-0296-18	GOX	5000.0			01/01					T	10	DKBDXX
KEL-F-81	3M CO. ST. PAUL		M9-0296-19	GOX	4500.0			01/01					T	10	DKBDXX
KEL-F-81	3M CO. ST. PAUL		M9-0296-2	GOX	20.0	1000			850	N999				13	DKBDXX
KEL-F-81	3M CO. ST. PAUL		M9-0296-20	GOX	4000.0			01/01					T	10	DKBDXX
KEL-F-81	3M CO. ST. PAUL		M9-0296-21	GOX	3000.0			01/01					T	10	DKBDXX
KEL-F-81	3M CO. ST. PAUL		M9-0296-22	GOX	2500.0			01/01					T	10	DKBDXX
KEL-F-81	3M CO. ST. PAUL		M9-0296-23	GOX	2000.0			01/03					T	10	DKBDXX
KEL-F-81	3M CO. ST. PAUL		M9-0296-24	GOX	1500.0			01/01					T	10	DKBDXX
KEL-F-81	3M CO. ST. PAUL		M9-0296-25	GOX	1000.0			00/04					A	10	DKBDXX
KEL-F-81	3M CO. ST. PAUL		M9-0296-3	GOX	25.0	1000			791	N999			J	13	DKBDXX
KEL-F-81	3M CO. ST. PAUL		M9-0296-4	GOX	30.0	1000			760	N999				13	DKBDXX
KEL-F-81	3M CO. ST. PAUL		M9-0296-5	GOX	40.0	1000			790	N999				13	DKBDXX
KEL-F-81	3M CO. ST. PAUL		M9-0296-6	GOX	50.0				790	790			D	13	DKBDXX

MFGR S DESIGNATION	MANUFACTURER	SPEC. THICK.	TEST RPT NO.	TEST ENVR	TEST PRESS	TEST TEMP	IMPT ENER	NO OF REACT	FLASH POINT	FIRE PT	PROP DIST	WT LOSS	R I	T T	MATL CODE
KEL-F-81	3M CO. ST. PAUL		M9-0296-7	GOX	100.0				681	681			D	13	DKBDXX
KEL-F-81	3M CO. ST. PAUL		M9-0296-8	GOX	900.0				676	676			D	13	DKBDXX
KEL-F-81	3M CO. ST. PAUL		M9-0296-9	GOX	1000.0				702	702			D	13	DKBDXX
KEL-F-81 GR-3 CLEAR	3M CO. ST. PAUL		71-2700	GOX	3500.0		50	00/04					A	11	DKBDXX
KEL-F-81 GR-3 CLEAR	3M CO. ST. PAUL		71-2700-1	GOX	3500.0			01/02					T	10	DKBDXX
KEL-F-81 GR-3 CLEAR	3M CO. ST. PAUL		71-2700-2	GOX	3000.0			01/01					T	10	DKBDXX
KEL-F-81 GR-3 CLEAR	3M CO. ST. PAUL		71-2700-3	GOX	2000.0			01/01					T	10	DKBDXX
KEL-F-81 GR-3 CLEAR	3M CO. ST. PAUL		71-2700-4	GOX	1500.0			01/01					T	10	DKBDXX
KEL-F-81 GR-3 CLEAR	3M CO. ST. PAUL		71-2700-5	GOX	1000.0			01/03					T	10	DKBDXX
KEL-F-81 GR-3 CLEAR	3M CO. ST. PAUL		71-2700-6	GOX	500.0			00/04					T	10	DKBDXX
KESTER 815 SVSK 81370-31	HAMILTON STANDARD		71-2292	GOX	5000.0			00/04					A	10	FKXXXX
KESTER 815 SVSK 81370-31	HAMILTON STANDARD		71-2292-1	GOX	6800.0			00/04					A	10	FKXXXX
KESTER 815 SVSK 81370-31	HAMILTON STANDARD		71-2292-2	GOX	3000.0				700	700			D	13	FKXXXX
KESTER 815 SVSK 81370-31	HAMILTON STANDARD		71-2292-3	GOX	3000.0	1000			N999	N999			A	13	FKXXXX
KOVAR	WESTINGHOUSE ELECTRIC		70-1957	A-50	764.0	502							T	15	DTMDXX
KOVAR	WESTINGHOUSE ELECTRIC		70-1957-1	A-50	605.0	472							T	15	DTMDXX
KOVAR	WESTINGHOUSE ELECTRIC		70-1957-2	A-50	747.0	495							T	15	DTMDXX
KOVAR	WESTINGHOUSE ELECTRIC		70-1957-3	MMH	798.0	523							T	15	DTMDXX
KOVAR	WESTINGHOUSE ELECTRIC		70-1957-4	MMH	803.0	509							T	15	DTMDXX
KOVAR STEEL	WESTINGHOUSE ELECTRIC	.0750	70-2220	GOX	500.0			00/04					A	10	DTMDXX
KOVAR STEEL	WESTINGHOUSE ELECTRIC	.0750	70-2220-1	GOX	500.0		50	00/04					A	11	DTMDXX
KRYLON 1302	BORDEN IND.		71-2580	GOX	6.2				475	497			D	13	ASAKXX
KRYTOX 143AB	E.I. DUPONT CO..INC.	.0050	70-1882	GOX	5000.0		50	00/04					A	11	DCBPXX
KRYTOX 143AB	E.I. DUPONT CO..INC.	.0050	70-1882-1	GOX	5000.0			01/01					T	10	DCBPXX
KRYTOX 143AB	E.I. DUPONT CO..INC.	.0050	70-1882-2	GOX	4500.0			00/04					A	10	DCBPXX
KRYTOX 143AC	E.I. DUPONT CO..INC.	.0050	70-1928	GOX	5000.0		50	00/04					A	11	DCBPXX
KRYTOX 143AC	E.I. DUPONT CO..INC.	.0050	70-1928-1	GOX	5000.0			00/04					A	10	DCBPXX
KRYTOX 143AX	E.I. DUPONT CO..INC.	.0050	70-1883	GOX	5000.0			01/04					T	10	DCBPXX
KRYTOX 143AX	E.I. DUPONT CO..INC.	.0050	70-1883-1	GOX	4500.0			00/04					A	10	DCBPXX
KRYTOX 143AX	E.I. DUPONT CO..INC.	.0050	70-1883-2	GOX	5000.0		50	00/04					A	11	DCBPXX
KRYTOX 240AB	E.I. DUPONT CO..INC.	.0050	70-1884	GOX	5000.0		50	00/04					A	11	DBBPXX
KRYTOX 240AB	E.I. DUPONT CO..INC.	.0050	70-1884-1	GOX	5000.0			00/04					A	10	DBBPXX
KRYTOX 240AB	E.I. DUPONT CO..INC.		70-1885	GOX	5000.0			01/04					T	10	DBBPXX
KRYTOX 240AB	E.I. DUPONT CO..INC.	.0050	70-1885-1	GOX	5000.0		50	00/04					A	11	DBBPXX
KRYTOX 240AB	E.I. DUPONT CO..INC.	.0050	70-1885-2	GOX	2500.0			00/04					T	10	DBBPXX
KRYTOX 240AP	E.I. DUPONT CO..INC.	.0050	70-1885-3	GOX	3000.0			01/03					T	10	DBBPXX
KRYTOX 240AB	E.I. DUPONT CO..INC.	.0050	70-1885-4	GOX	3500.0			01/01					T	10	DBBPXX
KRYTOX 240AB	E.I. DUPONT CO..INC.	.0050	70-1885-5	GOX	4000.0			01/01					T	10	DBBPXX
KRYTOX 240AB	E.I. DUPONT CO..INC.	.0050	70-1885-6	GOX	4500.0			01/03					T	10	DBBPXX
KRYTOX 240AC	E.I. DUPONT CO.		69-1346-24	GOX	1000.0				768	768			D	13	DBBPXX
KRYTOX 240AC	E.I. DUPONT CO..INC.		69-1346	GOX	5.0	1000			570	N999			Y	13	DBBPXX
KRYTOX 240AC	E.I. DUPONT CO..INC.		69-1346	GOX	4500.0		50	00/04					A	11	DBBPXX
KRYTOX 240AC	E.I. DUPONT CO..INC.		69-1346	GOX	4000.0			01/03					T	10	DBBPXX
KRYTOX 240AC	E.I. DUPONT CO..INC.		69-1346-1	GOX	10.0	1000			590	N999			Y	13	DBBPXX

MFGR S DESIGNATION	MANUFACTURER	SPEC. THICK.	TEST RPT NO.	TEST ENVR	TEST PRESS	TEST TEMP	IMPT ENER	NO OF REACT	FLASH POINT	FIRE PT	PROP DIST	WT LOSS	R I	T T	MATL CODE
KRYTOX 240AC	E.I. DUPONT CO.,INC.		69-1346-10	GOX	900.0				802	802			D	13	DG3PXX
KRYTOX 240AC	E.I. DUPONT CO.,INC.		69-1346-11	GOX	1000.0				750	750			D	13	DBBPXX
KRYTOX 240AC	E.I. DUPONT CO.,INC.		69-1346-12	GOX	1000.0				784	784			D	13	DBBPXX
KRYTOX 240AC	E.I. DUPONT CO.,INC.		69-1346-13	GOX	1087.0				813	813			D	13	DBBPXX
KRYTOX 240AC	E.I. DUPONT CO.,INC.		69-1346-14	GOX	1110.0				795	795			D	13	DBBPXX
KRYTOX 240AC	E.I. DUPONT CO.,INC.		69-1346-15	GOX	1500.0				808	808			D	13	DBBPXX
KRYTOX 240AC	E.I. DUPONT CO.,INC.		69-1346-16	GOX	1565.0				830	830			D	13	DBBPXX
KRYTOX 240AC	E.I. DUPONT CO.,INC.		69-1346-17	GOX	2000.0				775	775			D	13	DBBPXX
KRYTOX 240AC	E.I. DUPONT CO.,INC.	.0050	69-1346-18	GOX	5000.0			00/04					A	10	DBBPXX
KRYTOX 240AC	E.I. DUPONT CO.,INC.	.0050	69-1346-19	GOX	5000.0		50	00/04					A	11	DBBPXX
KRYTOX 240AC	E.I. DUPONT CO.,INC.		69-1346-2	GOX	20.0	1000			546	N999			Y	13	DBBPXX
KRYTOX 240AC	E.I. DUPONT CO.,INC.		69-1346-20	GOX	16.5	1000			N999	N999			A	13	DBBPXX
KRYTOX 240AC	E.I. DUPONT CO.,INC.		69-1346-21	GOX	200.0				849	849			D	13	DBBPXX
KRYTOX 240AC	E.I. DUPONT CO.,INC.		69-1346-22	GOX	1000.0				790	790			D	13	DBBPXX
KRYTOX 240AC	E.I. DUPONT CO.,INC.		69-1346-23	GOX	3000.0				734	734			D	13	DBBPXX
KRYTOX 240AC	E.I. DUPONT CO.,INC.		69-1346-3	GOX	25.0	1000			290	N999			Y	13	DBBPXX
KRYTOX 240AC	E.I. DUPONT CO.,INC.		69-1346-4	GOX	30.0	1000			N999	N999			A	13	DBBPXX
KRYTOX 240AC	E.I. DUPONT CO.,INC.		69-1346-5	GOX	40.0				974	974			D	13	DBBPXX
KRYTOX 240AC	E.I. DUPONT CO.,INC.		69-1346-6	GOX	50.0	1000			N999	N999			J	13	DBBPXX
KRYTOX 240AC	E.I. DUPONT CO.,INC.		69-1346-7	GOX	50.0				864	864			D	13	DBBPXX
KRYTOX 240AC	E.I. DUPONT CO.,INC.		69-1346-8	GOX	100.0				854	854			D	13	DBBPXX
KRYTOX 240AC	E.I. DUPONT CO.,INC.		69-1346-9	GOX	500.0				831	831			D	13	DBBPXX
KRYTOX 240AC	E.I. DUPONT CO.,INC.		71-2274	A-50	779.0	496							T	15	DBBPXX
KRYTOX 240AC	E.I. DUPONT CO.,INC.		71-2274-1	A-50	744.0	497							T	15	DBBPXX
KRYTOX 240AC/TFE	E.I. DUPONT/DIXON CORP		69-1346/1041	GOX	1000.0	703							T	15	BBEFCP
KRYTOX 240AC/TFE (GLASS)	E.I. DUPONT/DIXON CORP	.0000	69-1346/70-X		.0		0				.00	.00		15	BBEFCP
KRYTOX 240AC/TFE (GLASS)	E.I. DUPONT/DIXON CORP		69-1346/70-X	GOX	1000.0	620							D	15	BBEFCP
KRYTOX 762AC	E.I. DUPONT CO.,INC.		10-45	GOX	50.0				830	830			D	13	CZBPXX
KYNAR	PENNSALT CORP		70-1956	A-50	407.0	449							T	15	EHCTXX
KYNAR	PENNSALT CORP		70-1956-1	A-50	471.0	415							T	15	EHCTXX
KYNAR	PENNSALT CORP		70-1956-2	A-50	424.0	410							T	15	EHCTXX
KYNAR	PENNSALT CORP		70-1956-3	GOX	1000.0		50	00/04					A	11	EHCTXX
KYNAR	PENNSALT CORP		70-1956-4	GOX	1000.0		200	00/04					A	11	EHCTXX
KYNAR	PENNSALT CORP		70-1956-5	LOX	14.7		50	00/04					A	16	EHCTXX
KYNAR	PENNSALT CORP		70-1956-6	LOX	14.7		200	00/04					A	16	EHCTXX
KYNAR	PENNSALT CORP		70-1956-7	A-50	502.0	423							T	15	EHCTXX
KYNAR	PENNSALT CORP		70-1973	A-50	479.0	419							T	15	BPCTXX
KYNAR	PENNSALT CORP		70-1973-1	NMH	370.0	420							T	15	EHCTXX
KYNAR	PENNSALT CORP		70-1973-2	NMH	481.0	437							T	15	EHCTXX
KYNAR	PENNSALT CORP		70-1973-3	A-50	515.0	437							T	15	EHCTXX
KYNAR-400	PENNSALT CORP		71-2259	A-50	484.0	417							T	15	EHCTXX
KYNAR-400	PENNSALT CORP		71-2259-1	A-50	494.0	419							T	15	EHCTXX
L-13098 SILICONE RUBBER			71-2413	GOX	250.0			00/04					A	10	DVDPXX
L-13098 SILICONE RUBBER			71-2413-1	GOX	75.0				634	634			D	13	DVDPXX

MFGR S DESIGNATION	MANUFACTURER	SPEC. THICK.	TEST RPT NO.	TEST ENVR	TEST PRESS	TEST TEMP	IMPT ENER	NO OF REACT	FLASH POINT	FIRE PT	PROP DIST	WT LOSS	R	T	MAT.
L-449-6 FLUOROSILICONE	PARKER SEAL/LOS ANGLS	.0750	10-40	GOX	3000.0			00/04					A	10	CHD
L-449-6 FLUOROSILICONE	PARKER SEAL/LOS ANGLS	.0750	10-40-1	GOX	3500.0			01/02					D	10	CHDGXX
L-449-6 FLUOROSILICONE	PARKER SEAL/LOS ANGLS		10-40-10	GOX	3000.0			01/01					T	10	CHDGXX
L-449-6 FLUOROSILICONE	PARKER SEAL/LOS ANGLS		10-40-11	GOX	2500.0			01/02					T	10	CHDGXX
L-449-6 FLUOROSILICONE	PARKER SEAL/LOS ANGLS		10-40-12	GOX	2000.0			00/04					A	10	CHDGXX
L-449-6 FLUOROSILICONE	PARKER SEAL/LOS ANGLS		10-40-13	GOX	500.0		50	02/02					T	11	CHDGXX
L-449-6 FLUOROSILICONE	PARKER SEAL/LOS ANGLS	.0750	10-40-2	GOX	4000.0			04/04					D	10	CHDGXX
L-449-6 FLUOROSILICONE	PARKER SEAL/LOS ANGLS	.0750	10-40-3	GOX	2000.0		200	00/04					A	11	CHDGXX
L-449-6 FLUOROSILICONE	PARKER SEAL/LOS ANGLS	.0750	10-40-4	GOX	3000.0		50	00/04					A	11	CHDGXX
L-449-6 FLUOROSILICONE	PARKER SEAL/LOS ANGLS	.0750	10-40-5	GOX	3500.0		50	01/01					D	11	CHDGXX
L-449-6 FLUOROSILICONE	PARKER SEAL/LOS ANGLS	.0750	10-40-6	GOX	4000.0		50	04/04					D	11	CHDGXX
L-449-6 FLUOROSILICONE	PARKER SEAL/LOS ANGLS		10-40-7	GOX	2000.0				298	298			D	13	CHDGXX
L-449-6 FLUOROSILICONE	PARKER SEAL/LOS ANGLS		10-40-8	GOX	6.2				735	762			D	13	CHDGXX
L-449-6 FLUOROSILICONE	PARKER SEAL/LOS ANGLS		10-40-9	GOX	16.5				748	754			D	13	CHDGXX
L-605 MS-25	GAC	.0750	70-2115	GOX	2000.0			00/04					A	10	DTMOXX
L-605 MS-25	GAC	.0750	70-2115-1	GOX	4500.0			00/04					A	10	DTMOXX
LANICOID G-7	SYNTHANE CORP		71-2533	A-50	801.0	512							T	15	DMCKGD
LANICOID G-7	SYNTHANE CORP		71-2533-1	A-50	762.0	512							T	15	DMCKGD
LAMINATE 7564 AND 7581	REEVES BROS. INC.		70-2090	GOX	300.0				570	570			D	13	SBDFCC
LAMINATE 7564 AND 7581	REEVES BROS. INC.		70-2090-1	GOX	450.0				500	500			D	13	BBDFCC
LEADED BRASS	ANACONDA AM. BRASS CO		71-2744	A-50	746.0	506							T	15	FLMCMZ
LEADED BRASS	ANACONDA AM. BRASS CO	.0000	71-2744-1		.0		0				.00	.00		15	FLMCMZ
LEMON FRESH JOY	PROCTOR + GAMBLE		71-2889-1	GOX	6000.0		500	00/04					A	11	AWXXXX
LEMON FRESH JOY	PROCTOR + GAMBLE		71-2889-2	GOX	3000.0			01/01						10	AWXXXX
LEMON FRESH JOY	PROCTOR + GAMBLE		71-2889-3	GOX	2000.0			01/01						10	AWXXXX
LEMON FRESH JOY	PROCTOR + GAMBLE		71-2889-4	GOX	1000.0			00/04						[illegible]	[illegible]
LEMON FRESH JOY	PROCTOR + GAMBLE		71-2889-5	GOX	1500.0			01/01						[illegible]	[illegible]
LINEAR POLYETHYLENE	NALGE CO. INC	.0000	71-2437		.0		0				.00	.00		[illegible]	[illegible]
LINEAR POLYETHYLENE	NALGE CO. INC	.0000	71-2437-1		.0		0				.00	.00		15	DTMOXX
LITHOBRAZE BT-720	HANDY AND HARMON		71-2560	MMH	807.0	530							T	15	FLMRMC
LITHOBRAZE BT-720	HANDY AND HARMON		71-2560-1	MMH	779.0	514							T	15	FLMRMC
LITHOBRAZE BT-720	HANDY AND HARMON		71-2560-2	GOX	1500.0			00/04					A	10	FLMRMC
LITOFLEX K20	REX ASBESTWERKE		71-2432	GOX	5000.0		50	00/04					A	11	CCFLXX
LITOFLEX K20	REX ASBESTWERKE		71-2432-1	GOX	5000.0			01/02					T	10	CCFLXX
LITOFLEX K20	REX ASBESTWERKE		71-2432-2	GOX	2500.0			01/01					T	10	CCFLXX
LITOFLEX K20	REX ASBESTWERKE		71-2432-3	GOX	2000.0			01/02					T	10	CCFLXX
LITOFLEX K20	REX ASBESTWERKE		71-2432-4	GOX	1500.0			01/01					T	10	CCFLXX
LITOFLEX K20	REX ASBESTWERKE		71-2432-5	GOX	1000.0			01/01					T	10	CCFLXX
LITOFLEX K20	REX ASBESTWERKE		71-2432-6	GOX	500.0			00/04					A	10	CCFLXX
LOCTITE•GRADE A	LOCTITE CORP		69-1516	GOX	1565.0				295	295			D	13	BSBMFW
LOCTITE•GRADE A	LOCTITE CORP	.0050	70-2063	GOX	1500.0		50	00/04					A	11	BSBMFW
LOCTITE•GRADE A	LOCTITE CORP	.0050	70-2063-1	GOX	1500.0			00/04					A	10	BSBMFW
LOCTITE•GRADE A	LOCTITE CORP		70-2063-10	GOX	1000.0				259	259			D	15	BSBMFW
LOCTITE•GRADE A	LOCTITE CORP		70-2063-11	GOX	25.0				258	445			D	13	BSBMFW

MFGR S DESIGNATION	MANUFACTURER	SPEC. THICK.	TEST RPT NO.	TEST ENVR	TEST PRESS	TEST TEMP	IMPT ENER	NO OF REACT	FLASH POINT	FIRE (F)	PROP DIST	WT LOSS	R I	T T	MTL CODE
LOCTITE•GRADE A	LOCTITE CORP		70-2063-12	GOX	50.0				218	398			D	13	BSBMFW
LOCTITE•GRADE A	LOCTITE CORP		70-2063-13	GOX	50.0				269	269			D	13	BSBMFW
LOCTITE•GRADE A	LOCTITE CORP		70-2063-14	GOX	1000.0				282	282			D	13	BSBMFW
LOCTITE•GRADE A	LOCTITE CORP		70-2063-15	GOX	2500.0		50	00/01					A	11	BSBMFW
LOCTITE•GRADE A	LOCTITE CORP		70-2063-16	GOX	3000.0		50	00/01					A	11	BSBMFW
LOCTITE•GRADE A	LOCTITE CORP		70-2063-17	GOX	5000.0		50	00/04					A	11	BSBMFW
LOCTITE•GRADE A	LOCTITE CORP		70-2063-18	GOX	500.0			01/01					B	10	BSBMFW
LOCTITE•GRADE A	LOCTITE CORP		70-2063-19	GOX	1000.0			01/01					B	10	BSBMFW
LOCTITE•GRADE A	LOCTITE CORP		70-2063-2	GOX	1000.0				282	282			D	13	BSBMFW
LOCTITE•GRADE A	LOCTITE CORP		70-2063-20	GOX	1500.0			01/01					D	10	BSBMFW
LOCTITE•GRADE A	LOCTITE CORP		70-2063-21	GOX	2000.0			01/01					D	10	BSBMFW
LOCTITE•GRADE A	LOCTITE CORP		70-2063-3	GOX	50.0				269	269			D	13	BSBMFW
LOCTITE•GRADE A	LOCTITE CORP		70-2063-4	GOX	100.0				241	241			D	13	BSBMFW
LOCTITE•GRADE A	LOCTITE CORP		70-2063-5	GOX	500.0				151	151			D	13	BSBMFW
LOCTITE•GRADE A	LOCTITE CORP		70-2063-6	GOX	1500.0				204	204			D	13	BSBMFW
LOCTITE•GRADE A	LOCTITE CORP		70-2063-7	GOX	2000.0				208	208			D	13	BSBMFW
LOCTITE•GRADE A	LOCTITE CORP		70-2063-8	MMH	776.0	520							T	15	BSBMFW
LOCTITE•GRADE A	LOCTITE CORP		70-2063-9	MMH	815.0	554							T	15	BSBMFW
LOCTITE•GRADE E	LOCTITE CORP		71-2558	A-50	768.0	512							T	15	DSCBXX
LOCTITE•GRADE E	LOCTITE CORP		71-2558-1	A-50	772.0	514							T	15	DSCBXX
LOCTITE•GRADE-E	LOCTITE CORP	.0050	70-2122	GOX	1500.0			02/02					T	10	DSCBXX
LOCTITE•GRADE-E	LOCTITE CORP	.0050	70-2122-1	GOX	1500.0		50	00/04					A	11	DSCBXX
LOCTITE•GRADE-E	LOCTITE CORP		70-2122-10	GOX	50.0				210	210			D	13	DSCBXX
LOCTITE•GRADE-E	LOCTITE CORP		70-2122-11	GOX	100.0				274	274			D	13	DSCBXX
LOCTITE•GRADE-E	LOCTITE CORP		70-2122-12	GOX	500.0				217	217			D	13	DSCBXX
LOCTITE•GRADE-E	LOCTITE CORP		70-2122-13	GOX	1000.0	168							D	15	DSCBXX
LOCTITE•GRADE-E	LOCTITE CORP		70-2122-13	GOX	1000.0				168	168			D	13	DSCBXX
LOCTITE•GRADE-E	LOCTITE CORP		70-2122-14	GOX	1500.0				182	182			D	13	DSCBXX
LOCTITE•GRADE-E	LOCTITE CORP		70-2122-15	GOX	2000.0				194	194			D	13	DSCBXX
LOCTITE•GRADE-E	LOCTITE COR.		70-2122-16	GOX	3000.0	226							D	15	DSCBXX
LOCTITE•GRADE-E	LOCTITE CORP		70-2122-17	GOX	25.0				452	452			D	13	DSCBXX
LOCTITE•GRADE-E	LOCTITE CORP		70-2122-18	GOX	50.0				424	424			D	13	DSCBXX
LOCTITE•GRADE-E	LOCTITE CORP		70-2122-2	GOX	4500.0		50	00/04					A	11	DSCBXX
LOCTITE•GRADE-E	LOCTITE CORP		70-2122-3	GOX	1000.0				300	300			D	13	DSCBXX
LOCTITE•GRADE-E	LOCTITE CORP		70-2122-4	GOX	3000.0				241	241			D	13	DSCBXX
LOCTITE•GRADE-E	LOCTITE CORP		70-2122-5	GOX	5000.0		50	00/04					A	11	DSCBXX
LOCTITE•GRADE-E	LOCTITE CORP		70-2122-6	GOX	2500.0			01/01					T	10	DSCBXX
LOCTITE•GRADE-E	LOCTITE CORP		70-2122-7	GOX	1500.0			01/01					T	10	DSCBXX
LOCTITE•GRADE-E	LOCTITE CORP		70-2122-8	GOX	1000.0			01/01					T	10	DSCBXX
LOCTITE•GRADE-E	LOCTITE CORP		70-2122-9	GOX	500.0			01/02					T	10	DSCBXX
LOCTITE•GRADE-E	LOCTITE CORP		71-2477	A-50	772.0	504							T	15	DSCBXX
LOCTITE•GRADE-E	LOCTITE CORP		71-2477-1	A-50	801.0	512							T	15	DSCBXX
LS-53	NICHOLS ENGINEERING		70-1778	GOX	1500.0		50	00/04					A	11	OODGCP
LS-53	NICHOLS ENGINEERING		70-1778	GOX	1500.0			01/04					T	10	OODGCP

MFGR S DESIGNATION	MANUFACTURER	SPEC. THICK.	TEST RPT NO.	TEST ENVR	TEST PRESS	TEST TEMP	IMPT ENER	NO OF REACT	FLASH POINT	FIRE PT	PROP DIST	WT LOSS	R T T	T Y	MATL CODE
LS-53	NICHOLS ENGINEERING		70-1778-1	GOX	3000.0				428	428			D	13	DODGCP
LS-53	NICHOLS ENGINEERING		70-1778-10	GOX	16.5				738	768			D	13	DODGCP
LS-53	NICHOLS ENGINEERING		70-1778-11	GOX	25.0				716	716			D	13	DODGCP
LS-53	NICHOLS ENGINEERING		70-1778-12	GOX	50.0				483	483			D	13	DODGCP
LS-53	NICHOLS ENGINEERING		70-1778-13	GOX	50.0				674	674			D	13	DODGCP
LS-53	NICHOLS ENGINEERING		70-1778-14	GOX	100.0				221	221			D	13	DODGCP
LS-53	NICHOLS ENGINEERING		70-1778-15	GOX	500.0				421	421			D	13	DODGCP
LS-53	NICHOLS ENGINEERING		70-1778-16	GOX	1000.0				394	394			D	13	DODGCP
LS-53	NICHOLS ENGINEERING		70-1778-17	GOX	1500.0				377	377			D	13	DODGCP
LS-53	NICHOLS ENGINEERING		70-1778-18	GOX	2000.0				329	329			D	13	DODGCP
LS-53	NICHOLS ENGINEERING		70-1778-19	GOX	3000.0	374							D	15	DODGCP
LS-53	NICHOLS ENGINEERING		70-1778-2	GOX	5000.0		50	00/04					A	11	DODGCP
LS-53	NICHOLS ENGINEERING		70-1778-3	GOX	1500.0			01/01					T	10	DODGCP
LS-53	NICHOLS ENGINEERING		70-1778-4	GOX	1000.0			00/04					A	10	DODGCP
LS-53	NICHOLS ENGINEERING		70-1778-5	GOX	1000.0		50	00/04					A	11	DODGCP
LS-53	NICHOLS ENGINEERING		70-1778-6	GOX	1000.0		200	00/04					A	11	DODGCP
LS-53	NICHOLS ENGINEERING		70-1778-7	LOX	14.7		50	00/04					A	16	DODGCP
LS-53	NICHOLS ENGINEERING		70-1778-8	LOX	14.7		200	00/04					A	16	DODGCP
LS-53	NICHOLS ENGINEERING		70-1778-9	GOX	6.2	1000			808	N999			J	13	DODGCP
LS-63	NICHOLS ENGINEERING	.0750	10-38	GOX	1000.0			00/01					A	10	CHDGXX
LS-63	NICHOLS ENGINEERING	.0750	10-38-1	GOX	1500.0			00/04					A	10	CHDGXX
LS-63	NICHOLS ENGINEERING	.0750	10-38-10	GOX	5000.0		200	01/01					D	11	CHDGXX
LS-63	NICHOLS ENGINEERING	.0750	10-38-11	GOX	1000.0		200	01/01					D	11	CHDGXX
LS-63	NICHOLS ENGINEERING	.0750	10-38-12	GOX	2000.0		200	01/01					D	11	CHDGXX
LS-63	NICHOLS ENGINEERING	.0750	10-38-13	GOX	3000.0		200	00/01					A	11	CHDGXX
LS-63	NICHOLS ENGINEERING	.0750	10-38-14	GOX	4000.0		200	00/01					A	11	CHDGXX
LS-63	NICHOLS ENGINEERING	.0750	10-38-15	GOX	5000.0		200	00/04					A	11	CHDGXX
LS-63	NICHOLS ENGINEERING		10-38-16	GOX	25.0				725	725			D	13	CHDGXX
LS-63	NICHOLS ENGINEERING		10-38-17	GOX	50.0				685	685			D	13	CHDGXX
LS-63	NICHOLS ENGINEERING		10-38-18	GOX	100.0				452	452			D	13	CHDGXX
LS-63	NICHOLS ENGINEERING	.0750	10-38-2	GOX	2000.0			04/04					D	10	CHDGXX
LS-63	NICHOLS ENGINEERING	.0750	10-38-3	GOX	3000.0			01/01					D	10	CHDGXX
LS-63	NICHOLS ENGINEERING	.0750	10-38-4	GOX	2500.0			00/04					A	10	CHDGXX
LS-63	NICHOLS ENGINEERING	.0750	10-38-5	GOX	3000.0			01/04					D	10	CHDGXX
LS-63	NICHOLS ENGINEERING	.0750	10-38-6	GOX	3500.0			01/02					D	10	CHDGXX
LS-63	NICHOLS ENGINEERING	.0750	10-38-7	GOX	4000.0			01/02					D	10	CHDGXX
LS-63	NICHOLS ENGINEERING	.0750	10-38-8	GOX	4500.0			04/04					D	10	CHDGXX
LS-63	NICHOLS ENGINEERING	.0750	10-38-9	GOX	200.0		200	04/04					D	11	CHDGXX
LUBECO N350 A/ALUMINUM	LUBECO INC.	.0050	70-1765	GOX	500.0		200	00/00					A	11	DAEJFM
LUBECO N350 A/ALUMINUM	LUBECO INC.		70-1765-3	GOX	500.0		10	00/05					A	11	DAEJFM
LUBECO N350 A/STAINLESS	LUBECO INC.	.0050	70-1765-1	GOX	500.0		200	00/04					A	11	DAEJFM
LUBECO N350 A/STAINLESS	LUBECO INC.		70-1765-2	GOX	500.0		10	00/05					A	11	DAEJFM
LUBECO N350A	LUBECO INC.		71-2272	GOX	1500.0		50	00/04					A	11	DAEJEH
LUBECO N350A	LUBECO INC.		71-2272-1	GOX	1500.0			00/04					A	10	DAEJEH

MFGR S DESIGNATION	MANUFACTURER	SPEC. THICK.	TEST RPT NO.	TEST ENVR	TEST PRESS	TEST TEMP	IMPT ENER	NO OF REACT	FLASH POINT	FIRE PT	PROP DIST	WT LOSS	R I	T T	MATL CODE
LUBECO N350A	LUBECO INC.		71-2272-2	GOX	1000.0	1000			N999	N999			A	13	DAEJEH
L9/3T GREASE	AIRESEARCH INDST DIV	.0050	SP-6928	GOX	5.0	1000			704	N999			Y	13	DBXXXX
L9/3T GREASE	AIRESEARCH INDST DIV	.0050	SP-6928-1	GOX	25.0				738	738			D	13	DBXXXX
L9/3T GREASE	AIRESEARCH INDST DIV	.0050	SP-6928-10	GOX	2000.0				466	466			D	13	DBXXXX
L9/3T GREASE	AIRESEARCH INDST DIV	.0050	SP-6928-11	GOX	3000.0			00/01					A	10	DBXXXX
L9/3T GREASE	AIRESEARCH INDST DIV	.0050	SP-6928-12	GOX	4000.0			00/01					A	10	DBXXXX
L9/3T GREASE	AIRESEARCH INDST DIV	.0050	SP-6928-13	GOX	5000.0			00/04					A	10	DBXXXX
L9/3T GREASE	AIRESEARCH INDST DIV	.0050	SP-6928-14	GOX	3500.0		200	00/01					A	11	DBXXXX
L9/3T GREASE	AIRESEARCH INDST DIV	.0050	SP-6928-15	GOX	4000.0		200	00/01					A	11	DBXXXX
L9/3T GREASE	AIRESEARCH INDST DIV	.0050	SP-6928-16	GOX	5000.0		200	00/04					A	11	DBXXXX
L9/3T GREASE	AIRESEARCH INDST DIV		SP-6928-17	GOX	500.0		50	00/04					A	11	DBXXXX
L9/3T GREASE	AIRESEARCH INDST DIV		SP-6928-18	GOX	500.0			00/04					A	10	DBXXXX
L9/3T GREASE	AIRESEARCH INDST DIV		SP-6928-19	GOX	1500.0		50	00/04					A	11	DBXXXX
L9/3T GREASE	AIRESEARCH INDST DIV	.0050	SP-6928-2	GOX	50.0				760	760			D	13	DBXXXX
L9/3T GREASE	AIRESEARCH INDST DIV		SP-6928-20	GOX	1500.0			01/01					T	10	DBXXXX
L9/3T GREASE	AIRESEARCH INDST DIV	.0050	SP-6928-3	GOX	50.0				600	600			D	13	DBXXXX
L9/3T GREASE	AIRESEARCH INDST DIV	.0050	SP-6928-4	GOX	100.0				530	530			D	13	DBXXXX
L9/3T GREASE	AIRESEARCH INDST DIV	.0050	SP-6928-5	GOX	500.0				467	467			D	13	DBXXXX
L9/3T GREASE	AIRESEARCH INDST DIV	.0050	SP-6928-6	GOX	1000.0				460	460			D	13	DBXXXX
L9/3T GREASE	AIRESEARCH INDST DIV	.0050	SP-6928-7	GOX	1087.0				464	464			D	13	DBXXXX
L9/3T GREASE	AIRESEARCH INDST DIV	.0050	SP-6928-8	GOX	1500.0				436	436			D	13	DBXXXX
L9/3T GREASE	AIRESEARCH INDST DIV	.0050	SP-6928-9	GOX	1565.0				547	547			D	13	DBXXXX
MAGNESIUM OX P/N 803666	NORTON CO.		70-2192	GOX	1500.0			00/04					A	10	FJMMXX
MAGNET WIRE-TYPE M	GAC		70-2158	GOX	2000.0			00/04					A	10	EPCDHS
MAGNET WIRE-TYPE M	GAC		70-2158-1	GOX	2500.0		50	00/04					A	11	EPCDHS
MAGNET WIRE-TYPE M	GAC		70-2158-2	GOX	1400.0				518	518			D	13	EPCDHS
MELAMINE	ROTARY PLASTICS		71-2488	A-50	783.0	499							T	15	DLASXX
MELAMINE	ROTARY PLASTICS		71-2488-1	A-50	727.0	486							T	15	DLASXX
MICANATTE	G.E. INSULATING MATLS		71-2597	A-50	784.0	501							T	15	FJHFXX
MICANATTE	G.E. INSULATING MATLS		71-2597-1	A-50	818.0	524							T	15	FJHFXX
MICAPLY TYPE GF	MICA CORP		71-2630	A-50	774.0	515							T	15	CRBGXX
MICAPLY TYPE GF	MICA CORP		71-2680-1	A-50	746.0	513							T	15	CRBGXX
MICAPLY.EPOXY GLASS LAM	MICA CORP		70-2236	GOX	1000.0				493	493			D	13	CRBGXX
MICAPLY.EPOXY GLASS LAM	MICA CORP		70-2236-1	GOX	1500.0		50	00/04					A	11	CRBGXX
MICAPLY.EPOXY GLASS LAM	MICA CORP		70-2236-2	GOX	1500.0			01/03					T	10	CRBGXX
MICRO QUARTZ THERM INSUL	ROSEMONT ENG. CORP		70-1990	GOX	1500.0		50	00/04					A	11	CKHKXX
MICRO QUARTZ THERM INSUL	ROSEMONT ENG. CORP		70-1990	GOX	1500.0			00/04					A	10	CKHKXX
MICRO QUARTZ THERM INSUL	ROSEMONT ENG. CORP		70-1990-1	GOX	1500.0	1000			N999	N999			A	13	CKHKXX
ML POLY CLD TEFLON WIRE			70-1751	GOX	5.0	1000			938	N999			Y	13	EPCNGI
ML POLY CLD TEFLON WIRE			70-1751-1	GOX	25.0	1000			919	N999			Y	13	EPCNGI
ML POLY CLD TEFLON WIRE			70-1751-2	GOX	50.0				835	835			D	13	EPCNGI
ML POLY CLD TEFLON WIRE			70-1751-3	GOX	50.0				798	939			D	13	EPCNGI
ML POLY CLD TEFLON WIRE			70-1751-4	GOX	100.0				679	679			D	13	EPCNGI
ML POLY CLD TEFLON WIRE			70-1751-5	GOX	500.0				817	817			D	13	EPCNGI

MFGR S DESIGNATION	MANUFACTURER	SPEC. THICK.	TEST RPT NO.	TEST ENVR	TEST PRESS	TEST TEMP	IMPT ENER	NO OF REACT	FLASH POINT	FIRE PT	PROP DIST	WT LOSS	R I	T T	MATL CODE
ML POLY CLD TEFLON WIRE			70-1751-6	GOX	1000.0				789	789			D	13	EPCNGI
ML POLY CLD TEFLON WIRE			70-1751-7	GOX	1500.0				714	714			D	13	EPCNGI
ML POLY CLD TEFLON WIRE			70-1751-8	GOX	2000.0				720	720			D	13	EPCNGI
MN METAL	ALLEGHENY LUDLUM		71-2483	A-50	746.0	511							T	15	DMMGXX
MN METAL	ALLEGHENY LUDLUM		71-2483-1	A-50	732.0	510							T	15	DMMGXX
MOLYCOTE X-15	ALPHA MOLYCOTE CORP		70-1877	GOX	1500.0			00/04					A	10	DAEJGP
MOLYKOTE X-15	ALPHA MOLYCOTE CORP		70-1877	GOX	16.5	1000			N999	N999			J	13	DAEJGP
MOLYKOTE X-15	ALPHA MOLYCOTE CORP		70-1877-1	GOX	25.0	1000			N999	N999			J	13	DAEJGP
MOLYKOTE X-15	ALPHA MOLYCOTE CORP		70-1877-10	GOX	1500.0	1000			N999	N999			J	13	DAEJGP
MOLYKOTE X-15	ALPHA MOLYCOTE CORP		70-1877-11	GOX	2000.0	1000			N999	N999			J	13	DAEJGP
MOLYKOTE X-15	ALPHA MOLYCOTE CORP		70-1877-12	GOX	950.0	1000			N999	N999			A	13	DAEJGP
MOLYKOTE X-15	ALPHA MOLYCOTE CORP		70-1877-2	GOX	50.0	1000			928	N999			J	13	DAEJGP
MOLYKOTE X-15	ALPHA MOLYCOTE CORP		70-1877-3	GOX	62.0	1000			N999	N999			A	13	DAEJGP
MOLYKOTE X-15	ALPHA MOLYCOTE CORP		70-1877-4	GOX	900.0	1000			N999	N999			A	13	DAEJGP
MOLYKOTE X-15	ALPHA MOLYCOTE CORP		70-1877-6	GOX	50.0	1000			N999	N999			J	13	DAEJGP
MOLYKOTE X-15	ALPHA MOLYCOTE CORP		70-1877-7	GOX	100.0	1000			N999	N999			J	13	DAEJGP
MOLYKOTE X-15	ALPHA MOLYCOTE CORP		70-1877-8	GOX	500.0	1000			N999	N999			J	13	DAEJGP
MOLYKOTE X-15	ALPHA MOLYCOTE CORP		70-1877-9	GOX	1000.0	1000			N999	N999			J	13	DAEJGP
MOLYKOTE X-15	ALPHA MOLYKOTE CORP	.0050	70-1877-5	GOX	1500.0		50	00/04					A	11	DAEJGP
MOLYKOTE X-15 AMS-5508	GAC		70-2147	GOX	2000.0			00/04					A	10	DTMDHS
MOLYKOTE X-15 AMS-5508	GAC		70-2147-1	GOX	2000.0		50	00/04					A	11	DTMDHS
MONEL	TOWNSEND CO.		70-2094-1	GOX	1500.0		500	00/04					A	11	ELMNMC
MONEL	TOWNSEND CO.		70-2094-2	GOX	1000.0			00/04					A	10	ELMNMC
MONEL	TOWNSEND CO.		70-2094-3	GOX	1500.0			00/04					A	10	ELMNMC
NYKROY 750	MOLECULAR DIELECTRICS		71-2712	GOX	250.0			00/04					A	10	FJHOXX
MYLAR SHEET	E.I. DUPONT CO.,INC.		70-2028	GOX	50.0				695	695			D	13	DUCBXX
MYLAR SHEET	E.I. DUPONT CO.,INC.		70-2028-1	GOX	1500.0			00/04					A	10	DUCDXX
MYLAR SHEET	E.I. DUPONT CO.,INC.		70-2028-2	GOX	100.0				649	649			D	13	DUCBXX
MYLAR SHEET	E.I. DUPONT CO.,INC.		70-2028-3	GOX	1000.0				440	440			D	13	DUCBXX
MYLAR SHEET	E.I. DUPONT CO.,INC.		70-2028-4	GOX	1500.0		50	00/04					A	11	DUCBXX
MYLAR SHEET	E.I. DUPONT CO.,INC.		70-2028-5	GOX	500.0				466	466			D	13	DUCBXX
MYLAR SHEET	E.I. DUPONT CO.,INC.		70-2028-6	GOX	1500.0				386	386			D	13	DUCBXX
MYLAR SHEET	E.I. DUPONT CO.,INC.		70-2028-7	GOX	25.0				733	750			D	13	DUCBXX
MYLAR SHEET	E.I. DUPONT CO.,INC.		70-2028-8	GOX	1000.0	419							D	15	DUCBXX
MYLAR SHEET	E.I. DUPONT CO.,INC.		70-2028-9	GOX	50.0				743	743			D	13	DUCBXX
MYLAR-A	E.I. DUPONT CO.,INC.	.0750	70-2120	GOX	1500.0			01/07					T	10	DUCBXX
MYLAR-A	E.I. DUPONT CO.,INC.	.0750	70-2120-1	GOX	4500.0			01/06					T	10	DUCBXX
MYLAR-A	E.I. DUPONT CO.,INC.		70-2120-10	GOX	1500.0				419	419			D	13	DUCBXX
MYLAR-A	E.I. DUPONT CO.,INC.		70-2120-11	GOX	2000.0				294	294			D	13	DUCBXX
MYLAR-A	E.I. DUPONT CO.,INC.		70-2120-13	GOX	25.0				763	763			D	13	DUCBXX
MYLAR-A	E.I. DUPONT CO.,INC.		70-2120-14	GOX	50.0				732	732			D	13	DUCBXX
MYLAR-A	E.I. DUPONT CO.,INC.		70-2120-2	GOX	1000.0				450	450			D	13	DUCBXX
MYLAR-A	E.I. DUPONT CO.,INC.		70-2120-3	GOX	3000.0				335	335			D	13	DUCBXX
MYLAR-A	E.I. DUPONT CO.,INC.		70-2120-4	A-50	779.0	505							T	15	DUCBXX

MFGR S DESIGNATION	MANUFACTURER	SPEC. THICK.	TEST RPT NO.	TEST ENVR	TEST PRESS	TEST TEMP	IMPT ENER	NO OF REACT	FLASH POINT	FIRE PT	PROP DIST	WT LOSS	R I	T T	MATL CODE
MYLAR-A	E.I. DUPONT CO.,INC.		70-2120-5	A-50	550.0	445							T	15	DUCBXX
MYLAR-A	E.I. DUPONT CO.,INC.		70-2120-6	GOX	50.0				675	675			D	13	DUCBXX
MYLAR-A	E.I. DUPONT CO.,INC.		70-2120-7	GOX	100.0				654	654			D	13	DUCBXX
MYLAR-A	E.I. DUPONT CO.,INC.		70-2120-8	GOX	500.0				483	483			D	13	DUCBXX
MYLAR-A	E.I. DUPONT CO.,INC.		70-2120-9	GOX	1000.0				446	446			D	13	DUCBXX
MYLAR-A	E.I.DUPONT CO.INC.		70-2120-15	N204	264.3	125							A	14	DUCBXX
MYLAR-A	E.I.DUPONT CO.INC.		70-2120-16	N204	279.8	88							A	14	DUCBXX
N-219-7 BUNA-N	PARKER SEAL/LOS ANGLS	.0750	10-51	GOX	5000.0		50	00/04					A	11	CHDJXX
N-219-7 BUNA-N	PARKER SEAL/LOS ANGLS	.0750	10-51-1	GOX	1500.0			00/04					A	10	CHDJXX
N-219-7 BUNA-N	PARKER SEAL/LOS ANGLS	.0750	10-51-2	GOX	2000.0			02/04					D	10	CHDJXX
N-219-7 BUNA-N	PARKER SEAL/LOS ANGLS	.0750	10-51-3	GOX	2500.0			04/04					D	10	CHDJXX
N-552-9 BUNA-N	PARKER SEAL/LOS ANGLS	.0750	10-55	GOX	5000.0		50	00/04					A	11	CHDJXX
N-552-9 BUNA-N	PARKER SEAL/LOS ANGLS	.0750	10-55-1	GOX	500.0			00/04					A	10	CHDJXX
N-552-9 BUNA-N	PARKER SEAL/LOS ANGLS	.0750	10-55-2	GOX	1000.0			01/03					D	10	CHDJXX
N-552-9 BUNA-N	PARKER SEAL/LOS ANGLS	.0750	10-55-3	GOX	1500.0			04/04					D	10	CHDJXX
N-552-9 BUNA-N	PARKER SEAL/LOS ANGLS		10-55-4	GOX	3000.0		50	00/04					A	11	CHDJXX
N-552-9 BUNA-N	PARKER SEAL/LOS ANGLS		10-55-5	GOX	3000.0			01/01					T	10	CHDJXX
N-552-9 BUNA-N	PARKER SEAL/LOS ANGLS		10-55-6	GOX	4500.0		50	00/04					A	11	CHDJXX
N-552-9 BUNA-N	PARKER SEAL/LOS ANGLS		10-55-7	GOX	4500.0			01/01					T	10	CHDJXX
N-552-9 BUNA-N	PARKER SEAL/LOS ANGLS		10-55-8	GOX	3000.0				485	485			D	13	CHDJXX
N-552-9 BUNA-N	PARKER SEAL/LOS ANGLS		10-55-9	GOX	2200.0				496	496			D	13	CHDJXX
N-591-8	PARKER SEAL/LOS ANGLS		70-1969	A-50	205.0	423							T	15	DVDJXX
N-591-8	PARKER SEAL/LOS ANGLS		70-1969-1	A-50	757.0	497							T	15	DVDJXX
N-591-8	PARKER SEAL/LOS ANGLS		70-1969-2	A-50	777.0	507							T	15	DVDJXX
N-591-8	PARKER SEAL/LOS ANGLS		70-1969-3	A-50	796.0	504							T	15	DVDJXX
N-591-8	PARKER SEAL/LOS ANGLS		70-1969-4	A-50	756.0	498							T	15	DVDJXX
N-674-7 BUNA-N	PARKER SEAL/LOS ANGLS	.0750	10-52	GOX	5000.0		50	00/04					A	11	CHDJXX
N-674-7 BUNA-N	PARKER SEAL/LOS ANGLS	.0750	10-52-1	GOX	1000.0			00/04					A	10	CHDJXX
N-674-7 BUNA-N	PARKER SEAL/LOS ANGLS	.0750	10-52-2	GOX	1500.0			01/03					D	10	CHDJXX
N-674-7 BUNA-N	PARKER SEAL/LOS ANGLS	.0750	10-52-3	GOX	2000.0			01/02					D	10	CHDJXX
N-674-7 BUNA-N	PARKER SEAL/LOS ANGLS	.0750	10-52-4	GOX	2500.0			04/04					D	10	CHDJXX
N-674-7 BUNA-N	PARKER SEAL/LOS ANGLS		10-52-5	GOX	3000.0		50	00/04					A	11	CHDJXX
N-674-7 BUNA-N	PARKER SEAL/LOS ANGLS		10-52-6	GOX	3000.0			01/01					T	10	CHDJXX
N-674-7 BUNA-N	PARKER SEAL/LOS ANGLS		10-52-7	GOX	4500.0		50	00/04					A	11	CHDJXX
N-674-7 BUNA-N	PARKER SEAL/LOS ANGLS		10-52-8	GOX	4500.0			01/01					T	10	CHDJXX
N-674-7 BUNA-N	PARKER SEAL/LOS ANGLS		10-52-9	GOX	2200.0				331	331			D	13	CHDJXX
NBG CONVOLUTED TUBING	RAYCHEM		70-2048	GOX	6.2	600			N600	N600			R	13	EGDFGR
NEOPRENE DIAPHRAMS	VICTOR EQUIPMENT CO.		71-2775-1	GOX	2500.0			02/02					D	10	CHDBXX
NEOPRENE DIAPHRAMS	VICTOR EQUIPMENT CO.		71-2775-2	GOX	2000.0			01/01					D	10	CHDBXX
NEOPRENE DIAPHRAMS	VICTOR EQUIPMENT CO.		71-2775-3	GOX	1500.0			00/04					A	10	CHDBXX
NEOPRENE MIL-R-900	RUBBERCRAFT CORP		71-2693	A-50	759.0	513							T	15	DPDBXX
NEOPRENE MIL-R-900	RUBBERCRAFT CORP		71-2693-1	A-50	764.0	514							T	15	DPDBXX
NEOPRENE SEATS	VICTOR EQUIPMENT CO.		71-2774-1	GOX	2500.0			02/02					A	10	CHDBXX
NEOPRENE SEATS	VICTOR EQUIPMENT CO.		71-2774-2	GOX	2000.0			01/01					D	10	CHDBXX

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NEOPRENE SEATS	VICTOR EQUIPMENT CO.		71-2774-3	GOX	1500.0			01/01					D	10	CHDBXX
NEOPRENE SEATS	VICTOR EQUIPMENT CO.		71-2774-4	GOX	1000.0			01/03					D	10	CHDBXX
NEOPRENE SEATS	VICTOR EQUIPMENT CO.		71-2774-5	GOX	500.0			00/04					A	10	CHDBXX
NEOPRENE SEATS	VICTOR EQUIPMENT CO.		71-2783-1	GOX	2500.0			02/02					D	10	CHDBXX
NEOPRENE SEATS	VICTOR EQUIPMENT CO.		71-2783-2	GOX	1500.0			01/01					D	10	CHDBXX
NEOPRENE SEATS	VICTOR EQUIPMENT CO.		71-2783-3	GOX	1000.0			00/04					A	10	CHDBXX
NI SPAN C	NR		70-1966	A-50	745.0	499							T	15	DMMIMN
NI SPAN C	NR		70-1966-1	A-50	812.0	512							T	15	DMMIMN
NI SPAN C	NR		70-1966-2	A-50	701.0	491							T	15	DMMIMN
NI SPAN C	NR		70-1966-3	A-50	773.0	505							T	15	DMMIMN
NI SPAN C	NR		70-1966-4	MMH	812.0	538							T	15	DMMIMN
NI SPAN C	NR		70-1966-5	MMH	765.0	511							T	15	DMMIMN
NI SPAN C ALLOY 902	GAC	.0750	70-2145	GOX	2000.0			00/04					A	10	DMMIMN
NI SPAN C ALLOY 902	GAC	.0750	70-2145-1	GOX	2000.0		50	00/04					A	11	DMMIMN
NI SPAN C ALLOY 902	INTERNATIONAL NICKEL CO.		71-2338	A-50	781.0	504							T	15	DMMNXX
NI SPAN C ALLOY 902	INTERNATIONAL NICKEL CO.		71-2338-1	A-50	746.0	494							T	15	DMMNXX
NI-FE NO 51			71-2706	A-50	813.0	523							T	15	DMMIMN
NI-FE NO 51			71-2706-1	A-50	780.0	519							T	15	DMMIMN
NI-FE NO 52	CARPENTER STEEL CORP		71-2650	A-50	750.0	512							T	15	DMMIMN
NI-FE NO 52	CARPENTER STEEL CORP		71-2650-1	A-50	746.0	514							T	15	DMMIMN
NI-TFE WIRE	HITEMP WIRES INC		71-2656	A-50	784.0	509							T	15	EPMCMN
NICHOL FILTER-WOVEN	HAMILTON STANDARD		70-2195	GOX	2000.0			00/04					A	10	DDMNMJ
NICKEL ALLOY 200	GAC	.0750	70-2121	GOX	2000.0			00/04					A	10	DTMNXX
NICKEL ALLOY 200	GAC		71-2395	A-50	799.0	490							T	15	DTMNXX
NICKEL ALLOY 200	GAC		71-2395-1	A-50	781.0	475							T	15	DTMNXX
NICKEL ALLOY 205			70-2123-5	N2O4	253.6	86							A	14	DTMNXX
NICKEL ALLOY 205	GAC	.0750	70-2123	GOX	4500.0			00/04					A	10	DTMNXX
NICKEL ALLOY 205	GAC		70-2123-1	A-50	578.0	455							T	15	DTMNXX
NICKEL ALLOY 205	GAC		70-2123-2	A-50	451.0	431							T	15	DTMNXX
NICKEL ALLOY 205	GAC		70-2123-3	A-50	841.0	541							T	15	DTMNXX
NICKEL ALLOY 205	GAC		70-2123-4	N2O4	252.1	72							A	14	DTMNXX
NICORD 80	HANDY AND HARMON		71-2674-2	MMH	768.0	540							T	15	ELMNMU
NICORD 80	HANDY AND HARMON		71-2674-3	MMH	811.0	515							T	15	ELMNMU
NICORD 80	HANDY AND HARMON		71-2674	A-50	773.0	518							T	15	ELMNMU
NICORD 80	HANDY AND HARMON		71-2674-1	A-50	772.0	516							T	15	ELMNMU
NICORD 80 WIRE	WESTERN GOLD + ALLOYS		71-2522	MMH	816.0	514							T	15	AHMUMC
NICORD 80 WIRE	WESTERN GOLD + ALLOYS		71-2522-1	MMH	779.0	513							T	15	AHMUMC
NICROBRAZ FLUX-BRAZING	WALL COLMONOY CORP		70-1943	GOX	1500.0		50	00/04					A	11	FLXXXX
NICROBRAZ FLUX-BRAZING	WALL COLMONOY CORP		70-1943	GOX	1500.0			00/04					A	10	FLXXXX
NICROBRAZ FLUX-BRAZING	WALL COLMONOY CORP		70-1943-1	GOX	1500.0	1000			N999	N999			Y	13	FLXXXX
NICROBRAZ-50 PELLETS	WALL COLMONOY CORP		70-2196	GOX	1500.0			00/04					A	10	FLXXXX
NICROBRAZ-50 PELLETS	WALL COLMONOY CORP		70-2196-1	GOX	1500.0		50	00/04					A	11	FLXXXX
NICROBRAZE ON 321 SS	WALL COLMONOY CORP		71-2430	GOX	2000.0			00/04					A	10	FLXXXX
NICROBRAZE ON 321 SS	WALL COLMONOY CORP		71-2430-1	GOX	4500.0			00/04					A	10	FLXXXX

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MICROBRAZE ON 321 SS	WALL COLMONOY CORP		71-2430-2	A-50	791.0	487							T	15	FLXXXX
MICROBRAZE ON 321 SS	WALL COLMONOY CORP		71-2430-3	A-50	795.0	495							T	15	FLXXXX
MICROBRAZE-50 PELLETS	WALL COLMONOY CORP		70-2196-2	GOX	1000.0	1000			N999	N999			J	13	FLXXXX
NIORO 8218	WESTERN GOLD & PLATM CO.		71-2743	A-50	819.0	525							T	15	ELMUMN
NIORO 8218	WESTERN GOLD & PLATM CO.		71-2743-1	A-50	774.0	515							T	15	ELMUMN
NIORO 8218	WESTERN GOLD & PLATM CO.		71-2743-2	MMH	808.0	536							T	15	ELMUMN
NIORO 8218	WESTERN GOLD & PLATM CO.		71-2743-3	MMH	839.0	541							T	15	ELMUMN
NORMATP 61-6013/3013KRLNK+E/BORDEN IND.			71-2575	GOX	6.2	600			499	N600			A	13	AKAKGU
NYLON GASKET	VICTOR EQUIPMENT CO.		71-2778-1	GOX	2500.0			02/02					D	10	CHBSXX
NYLON GASKET	VICTOR EQUIPMENT CO.		71-2778-2	GOX	1000.0			01/01					D	10	CHBSXX
NYLON GASKET	VICTOR EQUIPMENT CO.		71-2778-3	GOX	500.0			00/04					A	10	CHBSXX
NYLON GASKET	VICTOR EQUIPMENT CO.		71-2780-1	GOX	2500.0			02/02					D	10	CHBSXX
NYLON GASKET	VICTOR EQUIPMENT CO.		71-2780-2	GOX	1500.0			01/01					D	10	CHBSXX
NYLON GASKET	VICTOR EQUIPMENT CO.		71-2780-3	GOX	1000.0			01/01					D	10	CHBSXX
NYLON GASKET	VICTOR EQUIPMENT CO.		71-2780-4	GOX	500.0			00/04					A	10	CHBSXX
NYLON GASKET-NOZZLE	VICTOR EQUIPMENT CO.		71-2781-1	GOX	2500.0			02/02					D	10	CHBSXX
NYLON GASKET-NOZZLE	VICTOR EQUIPMENT CO.		71-2781-2	GOX	1000.0			01/01					D	10	CHBSXX
NYLON GASKET-NOZZLE	VICTOR EQUIPMENT CO.		71-2781-3	GOX	500.0			04/05					D	10	CHBSXX
NYLON ROD			71-2685	A-50	723.0	501							T	15	BEHZXX
NYLON ROD			71-2685-1	A-50	748.0	509							T	15	BEHZXX
NYLON SHEET			10-44	GOX	500.0		50	00/04					A	11	DUBSXX
NYLON SHEET			10-44-1	GOX	500.0			00/04					A	10	DUBSXX
NYLON SHEET			10-44-2	GOX	4500.0		50	00/04					A	11	DUBSXX
NYLON SHEET			10-44-3	GOX	4500.0			01/01					T	10	DUBSXX
NYLON SHEET			10-44-4	GOX	1500.0			01/01					T	10	DUBSXX
NYLON SHEET			10-44-5	GOX	1500.0				376	376			D	13	DUBSXX
NYLON SLIP RING	VICTOR EQUIPMENT CO.		71-2781-1	GOX	2500.0			02/02					D	10	CHBSXX
NYLON SLIP RING	VICTOR EQUIPMENT CO.		71-2782-2	GOX	2000.0			01/01					D	10	CHBSXX
NYLON SLIP RING	VICTOR EQUIPMENT CO.		71-2782-3	GOX	1500.0			01/02					D	10	CHBSXX
NYLON SLIP RING	VICTOR EQUIPMENT CO.		71-2782-4	GOX	1000.0			01/01					D	10	CHBSXX
NYLON SLIP RING	VICTOR EQUIPMENT CO.		71-2782-5	GOX	500.0			00/01					A	10	CHBSXX
NYLON TIE CORD	TRIMTEX CORP		71-2438	GOX	1500.0			01/01					T	10	EDBSXX
NYLON TIE CORD	TRIMTEX CORP		71-2438-1	GOX	1000.0				231	231			D	13	EDBSXX
NYLON TWINE 70NOZ3K	WESTERN FILAMENT CO		71-2678	A-50	777.0	511							T	15	EUBSXX
NYLON TWINE 70NOZ3K	WESTERN FILAMENT CO		71-2678-1	A-50	760.0	517							T	15	EUBSXX
NYLON TYING STRING	E.I. DUPONT CO..INC.		71-2436	GOX	500.0		50	00/04					A	11	EDBSXX
NYLON TYING STRING	E.I. DUPONT CO..INC.		71-2436-1	GOX	500.0			01/01					T	10	EDBSXX
NYLON/STAINLESS			71-2595	A-50	809.0	525							T	15	BNMDBS
NYLON/STAINLESS			71-2595-1	A-50	815.0	521							T	15	BNMDBS
OS-124/AL202	MONSANTO CORP		71-2604	A-50	777.0	516							T	15	AYXXXX
OS-124/AL202	MONSANTO CORP		71-2604-1	A-50	723.0	504							T	15	AYXXXX
P-665-7 POLYURETHANE	PARKER SEAL/LOS ANGLS	.0750	10-84	GOX	2000.0			00/04					A	10	CHCQXX
P-665-7 POLYURETHANE	PARKER SEAL/LOS ANGLS	.0750	10-84-1	GOX	2500.0			01/02					D	10	CHCQXX
P-665-7 POLYURETHANE	PARKER SEAL/LOS ANGLS	.0750	10-84-2	GOX	3000.0			01/03					D	10	CHCQXX

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P-665-7 POLYURETHANE	PARKER SEAL/LOS ANGLS	.0750	10-84-3	GOX	3500.0			01/03				D	10	CHCQXX
P-565-7 POLYURETHANE	PARKER SEAL/LOS ANGLS	.0750	10-84-4	GOX	4000.0			01/02				D	10	CHCQXX
P-665-7 POLYURETHANE	PARKER SEAL/LOS ANGLS	.0750	10-84-5	GOX	4500.0			04/04				D	10	CHCQXX
P-665-7 POLYURETHANE	PARKER SEAL/LOS ANGLS	.0750	10-84-6	GOX	5000.0		200	00/04				A	11	CHCQXX
PALINEY NO 7	THE J.M. NEY CO		71-2742	GOX	250.0			00/04				A	10	ELMKMF
PALINEY NO 7	THE J.M. NEY CO		71-2742-1	GOX	250.0		50	00/04				A	11	ELMKMF
PALNIRO-7	GAC		71-[illegible]	A-50	771.0	494						T	15	DTMUMN
PALNIRO-7	GAC		71-[illegible]	A-50	830.0	500						T	15	DTMUMN
PARAFFIN-BORON	MSFC		70-[illegible]	GOX	6.2				489	503		D	13	ANGWGI
PARAFFIN-BORON	MSFC		70-2037-1	GOX	16.5				492	492		D	13	ANGWGI
PARAFFIN-SILICONE CARBID	MSFC		70-2039	GOX	6.2				485	498		D	13	ANGWFW
PARAFFIN-SILICONE CARBID	MSFC		70-2039-1	GOX	16.5				544	544		D	13	ANGWFW
PARAFFIN-SODIUM ACETATE	MSFC		70-2055	GOX	6.2				502	502		D	13	ANGWFY
PARAFFIN-SODIUM ACETATE	MSFC		70-2055-1	GOX	16.5				294	492		D	13	ANGWFY
PARAFFIN-TUNGSTEN CARBID	MSFC		70-2038	GOX	6.2				492	492		D	13	ANGWGI
PARAFFIN-TUNGSTEN CARBID	MSFC		70-2038-1	GOX	16.5				487	487		D	13	ANGWGI
PARCO COMPOUND 1050-70	PLASTICS + RUBBER PRODS		69-1567	GOX	5.0				741	786		D	13	DUEGXX
PARCO COMPOUND 1050-70	PLASTICS + RUBBER PRODS		69-1567-1	GOX	25.0				711	711		D	13	DUEGXX
PARCO COMPOUND 1050-70	PLASTICS + RUBBER PRODS		69-1567-2	GOX	50.0				657	657		D	13	DUEGXX
PARCO COMPOUND 1050-70	PLASTICS + RUBBER PRODS		69-1567-3	GOX	50.0				428	428		D	13	DUEGXX
PARCO COMPOUND 1050-70	PLASTICS + RUBBER PRODS		69-1567-4	GOX	100.0				448	448		D	13	DUEGXX
PARCO COMPOUND 1050-70	PLASTICS + RUBBER PRODS		69-1567-5	GOX	500.0				388	388		D	13	DUEGXX
PARCO COMPOUND 1050-70	PLASTICS + RUBBER PRODS		69-1567-6	GOX	1000.0				392	392		D	13	DUEGXX
PARCO COMPOUND 1050-70	PLASTICS + RUBBER PRODS		69-1567-7	GOX	1500.0				386	386		D	13	DUEGXX
PARCO COMPOUND 1050-70	PLASTICS + RUBBER PRODS		69-1567-8	GOX	2000.0				391	391		D	13	DUEGXX
PARCO COMPOUND 1237-70	PLASTICS + RUBBER PRODS		69-1568	GOX	25.0				756	756		D	13	DVDPXX
PARCO COMPOUND 1237-70	PLASTICS + RUBBER PRODS		69-1568-1	GOX	50.0				720	720		D	13	DVDPXX
PARCO COMPOUND 1237-70	PLASTICS + RUBBER PRODS	.0750	69-1568-10	GOX	200.0		200	01/01				T	11	DVDPXX
PARCO COMPOUND 1237-70	PLASTICS + RUBBER PRODS	.0750	69-1568-11	GOX	500.0		200	01/01				T	11	DVDPXX
PARCO COMPOUND 1237-70	PLASTICS + RUBBER PRODS	.0750	69-1568-12	GOX	1000.0		200	01/01				T	11	DVDPXX
PARCO COMPOUND 1237-70	PLASTICS + RUBBER PRODS	.0750	69-1568-13	GOX	1500.0		200	01/01				T	11	DVDPXX
PARCO COMPOUND 1237-70	PLASTICS + RUBBER PRODS	.0750	69-1568-14	GOX	2000.0		200	01/01				T	11	DVDPXX
PARCO COMPOUND 1237-70	PLASTICS + RUBBER PRODS		69-1568-15	GOX	50.0				595	595		D	13	DVDPXX
PARCO COMPOUND 1237-70	PLASTICS + RUBBER PRODS		69-1568-16	GOX	100.0				551	551		D	13	DVDPXX
PARCO COMPOUND 1237-70	PLASTICS + RUBBER PRODS		69-1568-17	GOX	1000.0				444	444		D	13	DVDPXX
PARCO COMPOUND 1237-70	PLASTICS + RUBBER PRODS		69-1568-18	GOX	1500.0				397	397		D	13	DVDPXX
PARCO COMPOUND 1237-70	PLASTICS + RUBBER PRODS		69-1568-2	GOX	62.0				781	851		D	13	DVDPXX
PARCO COMPOUND 1237-70	PLASTICS + RUBBER PRODS		69-1568-3	GOX	165.0				760	760		D	13	DVDPXX
PARCO COMPOUND 1237-70	PLASTICS + RUBBER PRODS	.0750	69-1568-4	GOX	2000.0			00/01				A	10	DVDPXX
PARCO COMPOUND 1237-70	PLASTICS + RUBBER PRODS	.0750	69-1568-5	GOX	3000.0			00/01				A	10	DVDPXX
PARCO COMPOUND 1237-70	PLASTICS + RUBBER PRODS	.0750	69-1568-6	GOX	3500.0			00/01				A	10	DVDPXX
PARCO COMPOUND 1237-70	PLASTICS + RUBBER PRODS	.0750	69-1568-7	GOX	4000.0			00/04				A	10	DVDPXX
PARCO COMPOUND 1237-70	PLASTICS + RUBBER PRODS	.0750	69-1568-8	GOX	4500.0			01/02				T	10	DVDPXX
PARCO COMPOUND 1237-70	PLASTICS + RUBBER PRODS	.0750	69-1568-9	GOX	5000.0			01/02				T	10	DVDPXX

MFGR S DESIGNATION	MANUFACTURER	SPEC. THICK.	TEST RPT NO.	TEST ENVR	TEST PRESS	TEST TEMP	IMPT ENER	NO OF REACT	FLASH POINT	FIRE PT	PROP DIST	WT LOSS	R I	T T	MATL CODE
PARCO COMPOUND 920-70	PLASTICS + RUBBER PRODS		70-1710	GOX	5.0	1000			744	N999			J	13	DVDFXX
PARCO COMPOUND 920-70	PLASTICS + RUBBER PRODS		70-1710-1	GOX	25.0				789	813			D	13	DVDFXX
PARCO COMPOUND 920-70	PLASTICS + RUBBER PRODS		70-1710-11	GOX	2000.0			00/01					A	10	DVDFXX
PARCO COMPOUND 920-70	PLASTICS + RUBBER PRODS		70-1710-12	GOX	2500.0			00/04					A	10	DVDFXX
PARCO COMPOUND 920-70	PLASTICS + RUBBER PRODS		70-1710-13	GOX	3000.0			01/02					T	10	DVDFXX
PARCO COMPOUND 920-70	PLASTICS + RUBBER PRODS		70-1710-14	GOX	3500.0			01/02					T	10	DVDFXX
PARCO COMPOUND 920-70	PLASTICS + RUBBER PRODS		70-1710-15	GOX	4000.0			00/01					A	10	DVDFXX
PARCO COMPOUND 920-70	PLASTICS + RUBBER PRODS		70-1710-16	GOX	4500.0			04/04					T	10	DVDFXX
PARCO COMPOUND 920-70	PLASTICS + RUBBER PRODS		70-1710-17	GOX	2000.0		200	00/04					A	11	DVDFXX
PARCO COMPOUND 920-70	PLASTICS + RUBBER PRODS		70-1710-18	GOX	2500.0			00/01					A	10	DVDFXX
PARCO COMPOUND 920-70	PLASTICS + RUBBER PRODS		70-1710-19	GOX	3000.0			00/01					A	10	DVDFXX
PARCO COMPOUND 920-70	PLASTICS + RUBBER PRODS		70-1710-2	GOX	50.0				718	785			D	13	DVDFXX
PARCO COMPOUND 920-70	PLASTICS + RUBBER PRODS		70-1710-20	GOX	3500.0			00/01					A	10	DVDFXX
PARCO COMPOUND 920-70	PLASTICS + RUBBER PRODS		70-1710-21	GOX	4000.0			00/01					A	10	DVDFXX
PARCO COMPOUND 920-70	PLASTICS + RUBBER PRODS		70-1710-22	GOX	4500.0			00/04					A	10	DVDFXX
PARCO COMPOUND 920-70	PLASTICS + RUBBER PRODS		70-1710-23	GOX	5000.0			01/01					T	10	DVDFXX
PARCO COMPOUND 920-70	PLASTICS + RUBBER PRODS		70-1710-24	GOX	5000.0		200	00/04					A	11	DVDFXX
PARCO COMPOUND 920-70	PLASTICS + RUBBER PRODS		70-1710-3	GOX	50.0				574	574			D	13	DVDFXX
PARCO COMPOUND 920-70	PLASTICS + RUBBER PRODS		70-1710-4	GOX	100.0				562	562			D	13	DVDFXX
PARCO COMPOUND 920-70	PLASTICS + RUBBER PRODS		70-1710-5	GOX	500.0				480	480			D	13	DVDFXX
PARCO COMPOUND 920-70	PLASTICS + RUBBER PRODS		70-1710-6	GOX	1000.0				445	445			D	13	DVDFXX
PARCO COMPOUND 920-70	PLASTICS + RUBBER PRODS		70-1710-7	GOX	1500.0				414	414			D	13	DVDFXX
PARCO COMPOUND 920-70	PLASTICS + RUBBER PRODS		70-1710-8	GOX	2000.0				419	419			D	13	DVDFXX
PARCO COMPOUND 920-70	PLASTICS + RUBBER PRODS		70-1710-8	GOX	2000.0				419	419			D	13	DVDFXX
PARCO COMPOUND 920-70	PLASTICS + RUBBER PRODS		70-1710-9	GOX	16.5				844	861			M	13	DVDFXX
PARCO COMPOUND 975-75	PLASTICS + RUBBER PRODS	.0750	70-1951	GOX	5000.0		50	00/04					A	11	CHDFXX
PARCO COMPOUND 975-75	PLASTICS + RUBBER PRODS	.0750	70-1951-1	GOX	5000.0			00/04					A	10	CHDFXX
PBX BONDING CEMENT	WILLIAM T. BEAM INC		70-1987	GOX	1500.0		50	00/04					A	11	ABXXXX
PBX BONDING CEMENT	WILLIAM T. BEAM INC		70-1987	GOX	1500.0			00/04					A	10	ABXXXX
PBX BONDING CEMENT	WILLIAM T. BEAM INC		70-1987-1	GOX	1500.0	1000			N999	N999			A	13	ABXXXX
PBX CERAMIC CMNT P-1 SOL	WILLIAM T. BEAM INC		70-1988	GOX	1500.0		50	00/04					A	11	ABHOXX
PBX CERAMIC CMNT P-1 SOL	WILLIAM T. BEAM INC		70-1988	GOX	1500.0			00/04					A	10	ABHOXX
PBX CERAMIC CMNT P-1 SOL	WILLIAM T. BEAM INC		70-1988-1	GOX	1000.0	1000			N999	N999			R	13	ABHOXX
PC-12-007	HYSOL CORP		70-1963	GOX	1500.0			01/01					T	10	ALBJXX
PC-12-007	HYSOL CORP		70-1963-1	GOX	1500.0		50	00/04					A	11	ALBJXX
PC-12-007	HYSOL CORP		70-1963-2	A-50	413.0	515							T	15	ALBJXX
PC-12-007	HYSOL CORP		70-1963-3	A-50	818.0	522							T	15	ALBJXX
PC-12-007	HYSOL CORP		70-1963-4	A-50	791.0	497							T	15	ALBJXX
PC-12-007	HYSOL CORP		70-1963-5	A-50	827.0	505							T	15	ALBJXX
PC-12-007	HYSOL CORP		70-1963-6	GOX	1000.0				300	300			D	13	ALBJXX
PE-100 ADHESIVE TAPE	PERMACEL TAPE CORP		70-2047	GOX	6.2	600			N600	N600			F	13	DZGDFX
PENNTUBE 2 SMT	INSULECTRO CORP		71-2688	GOX	1500.0		50	00/04					A	11	EPDEXX
PENNTUBE 2 SMT	INSULECTRO CORP		71-2688-1	GOX	1500.0			01/02					T	10	EPDEXX
PENNTUBE 2 SMT	INSULECTRO CORP		71-2688-2	GOX	1000.0				584	584			D	13	EPDEXX

MFGR S DESIGNATION	MANUFACTURER	SPEC. THICK.	TEST RPT NO.	TEST ENVR	TEST PRESS	TEST TEMP	IMPT ENER	NO OF REACT	FLASH POINT	FIRE PT	PROP DIST	WT LOSS	R T I	T	MATL CODE
PENTON	HERCULES INC		71-2922	GOX	1000.0				270	270			D	13	DL88XX
PENTON	HERCULES INC		71-2922-1	GOX	1500.0		50	00/04					A	11	DL88XX
PENTON	HERCULES INC		71-2922-2	GOX	1500.0			01/01					W	10	DL88XX
PH 15-7	GAC		71-2315	A-50	623.0	473							T	15	DTMIML
PH 15-7	GAC		71-2315-1	A-50	770.0	504							T	15	DTMIML
PH 17-7	GAC		71-2316	A-50	779.0	499							T	15	DTMIMH
PH 17-7	GAC		71-2316-1	A-50	826.0	514							T	15	DTMIMH
PLASKON ALKYD 422	ALLIED CHEM CORP		71-2675	A-50	782.0	479							T	15	FJAOXX
PLASKON ALKYD 422	ALLIED CHEM CORP		71-2675-1	A-50	762.0	495							T	15	FJAOXX
PLATINUM COBALT MAGNETS	HAMILTON PRECIOUS METALS		71-2369	GOX	1500.0		50	00/04					A	11	EXMKMO
PLATINUM COBALT MAGNETS	HAMILTON PRECIOUS METALS		71-2369-1	GOX	1500.0			00/04					A	10	EXMKMO
PLV-2000	PELMORE LABS		70-1814-16	GOX	950.0				529	529			D	13	ABDFXX
PLV-2000 VITON	PELMORE LABS		70-1814	GOX	50.0				652	652			D	13	ABDFXX
PLV-2000 VITON	PELMORE LABS		70-1814	GOX	1500.0		50	00/04					A	11	ABDFXX
PLV-2000 VITON	PELMORE LABS		70-1814	GOX	1500.0			01/02					T	10	ABDFXX
PLV-2000 VITON	PELMORE LABS		70-1814-1	GOX	50.0				797	797			D	13	ABDFXX
PLV-2000 VITON	PELMORE LABS		70-1814-10	GOX	62.0	1000			304	N999			D	13	ABDFXX
PLV-2000 VITON	PELMORE LABS	.0050	70-1814-11	GOX	3000.0			00/04					A	10	ACDFXX
PLV-2000 VITON	PELMORE LABS	.0050	70-1814-12	GOX	3500.0			01/02					T	10	ABDFXX
PLV-2000 VITON	PELMORE LABS	.0050	70-1814-13	GOX	4000.0			04/04					T	10	ABDFXX
PLV-2000 VITON	PELMORE LABS	.0050	70-1814-14	GOX	3000.0		200	00/04					A	11	ABDFXX
PLV-2000 VITON	PELMORE LABS	.0050	70-1814-15	GOX	4000.0		200	00/04					T	11	ABDFXX
PLV-2000 VITON	PELMORE LABS		70-1814-2	GOX	100.0				669	669			D	13	ABDFXX
PLV-2000 VITON	PELMORE LABS		70-1814-3	GOX	165.0				797	812			D	13	ABDFXX
PLV-2000 VITON	PELMORE LABS		70-1814-4	GOX	500.0				570	570			D	13	ABDFXX
PLV-2000 VITON	PELMORE LABS		70-1814-5	GOX	900.0				517	517			D	13	ABDFXX
PLV-2000 VITON	PELMORE LABS		70-1814-6	GOX	1000.0				536	536			D	13	ABDFXX
PLV-2000 VITON	PELMORE LABS		70-1814-7	GOX	1500.0				408	408			D	13	ABDFXX
PLV-2000 VITON	PELMORE LABS		70-1814-8	GOX	2000.0				426	426			D	13	ABDFXX
PLV-2000 VITON	PELMORE LABS		70-1814-9	GOX	25.0	1000			N999	N999			D	13	ABDFXX
POLY-THERMALEX/200	ESSEX WIRE CORP	.0750	70-2092	GOX	1500.0		50	00/04					A	11	ERXXXX
POLY-THERMALEX/200	ESSEX WIRE CORP		70-2092-1	GOX	1000.0				N999	N999			J	13	ERXXXX
POLY-THERMALEX/200	ESSEX WIRE CORP	.0750	70-2092-2	GOX	1500.0			00/04					A	10	ERXXXX
POLYETHELENE	AIRESEARCH INDST DIV		69-1296	GOX	25.0				562	562			D	13	DUCFXX
POLYETHELENE	AIRESEARCH INDST DIV		69-1296-1	GOX	50.0				435	435			D	13	DUCFXX
POLYETHELENE	AIRESEARCH INDST DIV		69-1296-2	GOX	62.0	1000			883	N999			J	13	DUCFXX
POLYETHELENE	AIRESEARCH INDST DIV		69-1296-3	GOX	165.0				581	581			D	13	DUCFXX
POLYETHELENE	AIRESEARCH INDST DIV		69-1296-4	GOX	50.0				324	324			D	13	DUCFXX
POLYETHELENE	AIRESEARCH INDST DIV		69-1296-5	GOX	100.0				273	273			D	13	DUCFXX
POLYETHELENE	AIRESEARCH INDST DIV		69-1296-6	GOX	500.0				251	251			D	13	DUCFXX
POLYETHELENE	AIRESEARCH INDST DIV		69-1296-7	GOX	1000.0				286	286			D	13	DUCFXX
POLYETHELENE	AIRESEARCH INDST DIV		69-1296-8	GOX	1500.0				261	261			D	13	DUCFXX
POLYETHELENE	AIRESEARCH INDST DIV		69-1296-9	GOX	2000.0				307	307			D	13	DUCFXX
POLYISOPRENE	NR DOWNEY		SP-6926	GOX	1000.0		50	00/04					A	11	DODIXX

MFGR S DESIGNATION	MANUFACTURER	SPEC. THICK.	TEST RPT NO.	TEST ENVR	TEST PRESS	TEST TEMP	IMPT ENER	NO OF REACT	FLASH POINT	FIRE PT	PROP DIST	WT LOSS	R I	T T	MAT. CODE
POLYISOPRENE	NR DOWNEY		SP-6926-1	GOX	1000.0		200	00/04					A	11	DODIXX
POLYISOPRENE	NR DOWNEY		SP-6926-2	LOX	14.7		50	00/04					A	16	DODIXX
PR-11208.ZZ-R-765	PRECISION RUBBER PROD		70-1776	GOX	25.0				735	735			D	13	DODPXX
PR-11208.ZZ-R-765	PRECISION RUBBER PROD		70-1776-1	GOX	50.0				724	724			D	13	DODPXX
PR-11208.ZZ-R-765	PRECISION RUBBER PROD		70-1776-10	GOX	1500.0				471	471			D	13	DODPXX
PR-11208.ZZ-R-765	PRECISION RUBBER PROD		70-1776-11	GOX	2000.0				494	494			D	13	DODPXX
PR-11208.ZZ-R-765	PRECISION RUBBER PROD		70-1776-12	GOX	950.0				412	412			D	13	DODPXX
PR-11208.ZZ-R-765	PRECISION RUBBER PROD		70-1776-2	GOX	62.0	1000			751	N999			D	13	DODPXX
PR-11208.ZZ-R-765	PRECISION RUBBER PROD		70-1776-3	GOX	165.0				785	817			D	13	DODPXX
PR-11208.ZZ-R-765	PRECISION RUBBER PROD	.0750	70-1776-4	GOX	1500.0			01/01					T	10	DODPXX
PR-11208.ZZ-R-765	PRECISION RUBBER PROD	.0750	70-1776-5	GOX	1500.0		50	00/04					A	11	DODPXX
PR-11208.ZZ-R-765	PRECISION RUBBER PROD		70-1776-6	GOX	50.0				668	668			D	13	DODPXX
PR-11208.ZZ-R-765	PRECISION RUBBER PROD		70-1776-7	GOX	100.0				582	582			D	13	DODPXX
PR-11208.ZZ-R-765	PRECISION RUBBER PROD		70-1776-8	GOX	500.0				506	506			D	13	DODPXX
PR-11208.ZZ-R-765	PRECISION RUBBER PROD		70-1776-9	GOX	1000.0				498	498			D	13	DODPXX
PR-11208.ZZ-R-775	PRECISION RUBBER PROD		71-2303	GOX	2000.0			01/01					T	10	DVDPXX
PR-11208.ZZ-R-775	PRECISION RUBBER PROD		71-2303-1	GOX	1500.0				505	505			D	13	DVDPXX
PR-1538	PRODUCTS RESEARCH		71-5002	GOX	5000.0		50	00/04					A	11	BACQXX
PR-1538	PRODUCTS RESEARCH		71-5002-1	GOX	1000.0			01/01					T	10	BACQXX
PR-1538	PRODUCTS RESEARCH		71-5002-2	GOX	500.0			01/02					T	10	BACQXX
PR-1538	PRODUCTS RESEARCH		71-5002-3	GOX	500.0			01/01					T	10	BACQXX
PR-1538	PRODUCTS RESEARCH		71-5002-4	GOX	1500.0			01/01					T	10	BACQXX
PR-1538	PRODUCTS RESEARCH		71-5002-5	GOX	500.0			00/04					T	10	BACQXX
PR-1538	PRODUCTS RESEARCH		71-5002-6	GOX	500.0			01/03					T	10	BACQXX
PR-1538	PRODUCTS RESEARCH		71-5002-7	GOX	500.0			01/04					T	10	BACQXX
PRO-SEAL 333C	COAST PRO SEAL		71-2591	A-50	769.0	519							T	15	AKGUXX
PRO-SEAL 333C	COAST PRO SEAL		71-2591-1	A-50	765.0	511							T	15	AKGUXX
PVC 3025-140	3M CO. ST. PAUL		71-2554	A-50	439.0	425							T	15	EZGUXX
PVC 3025-140	3M CO. ST. PAUL		71-2554-1	A-50	574.0	465							T	15	EZGUXX
PYRE ML COAT WIRE	AIRESEARCH INDST DIV		71-2521	MMH	767.0	502							T	15	EPGDMA
PYRE ML COAT WIRE	AIRESEARCH INDST DIV		71-2521-1	MMH	779.0	540							T	15	EPGDMA
PYREX 7740	OWENS CORNING FIBGLS		71-2710	GOX	250.0		50	00/04					A	11	FJHOXX
PYREX 7740	OWENS CORNING FIBGLS		71-2710-1	GOX	250.0	0		00/04					A	10	FJHOXX
QUARTZ 7940	OWENS CORNING FIBGLS		70-1767	GOX	25.0	1000			N999	N999			A	13	DDHKXX
QUARTZ 7940	OWENS CORNING FIBGLS		70-1767-1	GOX	50.0	1000			N999	N999			A	13	DDHKXX
QUARTZ 7940	OWENS CORNING FIBGLS	.0750	70-1767-10	GOX	5000.0			00/04					A	10	DDHKXX
QUARTZ 7940	OWENS CORNING FIBGLS	.0750	70-1767-11	GOX	4000.0		200	00/01					A	11	DDHKXX
QUARTZ 7940	OWENS CORNING FIBGLS	.0750	70-1767-12	GOX	5000.0		200	00/04					A	11	DDHKXX
QUARTZ 7940	OWENS CORNING FIBGLS		70-1767-2	GOX	62.0	1000			N999	N999			A	13	DDHKXX
QUARTZ 7940	OWENS CORNING FIBGLS		70-1767-3	GOX	100.0	1000			N999	N999			A	13	DDHKXX
QUARTZ 7940	OWENS CORNING FIBGLS		70-1767-4	GOX	165.0	1000			N999	N999			A	13	DDHKXX
QUARTZ 7940	OWENS CORNING FIBGLS		70-1767-5	GOX	500.0	1000			N999	N999			A	13	DDHKXX
QUARTZ 7940	OWENS CORNING FIBGLS		70-1767-6	GOX	1000.0	1000			N999	N999			A	13	DDHKXX
QUARTZ 7940	OWENS CORNING FIBGLS		70-1767-7	GOX	1500.0	1000			N999	N999			A	13	DDHKXX

MFGR S DESIGNATION	MANUFACTURER	SPEC. THICK.	TEST RPT NO.	TEST ENVR	TEST PRESS	TEST TEMP	IMPT ENER	NO OF REACT	FLASH POINT	FIRE PT	PROP DIST	WT LOSS	R I	T T	MATL CODE
QUARTZ 7940	OWENS CORNING FIBGLS		70-1767-8	GOX	2000.0	1000			N999	N999			A	13	DDHKXX
QUARTZ 7940	OWENS CORNING FIBGLS	.0750	70-1767-9	GOX	4000.0			00/01					A	10	DDHKXX
QUARTZ 7940	OWENS CORNING FIBGLS		70-1920	GOX	1500.0			00/04					A	10	DDHKXX
QUARTZ 7940	OWENS CORNING FIBGLS		70-1920-1	GOX	1500.0		50	00/04					A	11	DDHKXX
QUARTZ 7940	OWENS CORNING FIBGLS		70-1920-2	GOX	1500.0	1000			N999	N999			A	13	DDHKXX
REDAR SI-500-03	DARLING.R.E. CO..INC		70-1648	GOX	5.0	1000			737	N999			D	13	DVDPXX
REDAR SI-500-03	DARLING.R.E. CO..INC		70-1648-1	GOX	25.0				728	728			D	13	DVDPXX
REDAR SI-500-03	DARLING.R.E. CO..INC		70-1648-10	GOX	3000.0			01/02					T	10	DVDPXX
REDAR SI-500-03	DARLING.R.E. CO..INC		70-1648-11	GOX	3500.0			00/01					A	10	DVDPXX
REDAR SI-500-03	DARLING.R.E. CO..INC		70-1648-12	GOX	4000.0			00/01					A	10	DVDPXX
REDAR SI-500-03	DARLING.R.E. CO..INC		70-1648-13	GOX	4500.0			02/03					T	10	DVDPXX
REDAR SI-500-03	DARLING.R.E. CO..INC		70-1648-14	GOX	5000.0			03/04					T	10	DVDPXX
REDAR SI-500-03	DARLING.R.E. CO..INC		70-1648-15	GOX	5000.0		200	00/04					A	11	DVDPXX
REDAR SI-500-03	DARLING.R.E. CO..INC		70-1648-16	GOX	2000.0			00/04					A	10	DVDPXX
REDAR SI-500-03	DARLING.R.E. CO..INC		70-1648-17	GOX	2500.0			01/01					T	10	DVDPXX
REDAR SI-500-03	DARLING.R.E. CO..INC		70-1648-18	GOX	3500.0			01/01					T	10	DVDPXX
REDAR SI-500-03	DARLING.R.E. CO..INC		70-1648-19	GOX	4000.0			01/03					T	10	DVDPXX
REDAR SI-500-03	DARLING.R.E. CO..INC		70-1648-2	GOX	50.0				720	720			D	13	DVDPXX
REDAR SI-500-03	DARLING.R.E. CO..INC		70-1648-20	GOX	4500.0			01/02					T	10	DVDPXX
REDAR SI-500-03	DARLING.R.E. CO..INC		70-1648-21	GOX	5000.0			04/04					T	10	DVDPXX
REDAR SI-500-03	DARLING.R.E. CO..INC		70-1648-22	GOX	200.0		200	01/01					T	11	DVDPXX
REDAR SI-500-03	DARLING.R.E. CO..INC		70-1648-23	GOX	500.0		200	01/01					T	11	DVDPXX
REDAR SI-500-03	DARLING.R.E. CO..INC		70-1648-24	GOX	1000.0		200	01/01					T	11	DVDPXX
REDAR SI-500-03	DARLING.R.E. CO..INC		70-1648-25	GOX	1500.0		200	01/01					T	11	DVDPXX
REDAR SI-500-03	DARLING.R.E. CO..INC		70-1648-3	GOX	50.0				474	474			D	13	DVDPXX
REDAR SI-500-03	DARLING.R.E. CO..INC		70-1648-4	GOX	100.0				472	472			D	13	DVDPXX
REDAR SI-500-03	DARLING.R.E. CO..INC		70-1648-5	GOX	500.0				441	441			D	13	DVDPXX
REDAR SI-500-03	DARLING.R.E. CO..INC		70-1648-6	GOX	1000.0				391	391			D	13	DVDPXX
REDAR SI-500-03	DARLING.R.E. CO..INC		70-1648-7	GOX	1500.0				359	359			D	13	DVDPXX
REDAR SI-500-03	DARLING.R.E. CO..INC		70-1648-8	GOX	2000.0				417	417			D	13	DVDPXX
REDAR SI-500-03	DARLING.R.E. CO..INC		70-1648-9	GOX	2500.0			00/04					A	10	DVDPXX
REDAR SI-503-00	DARLING.R.E. CO..INC		70-1647	GOX	5.0				711	772			D	13	DVDPXX
REDAR SI-503-00	DARLING.R.E. CO..INC		70-1647-1	GOX	25.0				749	749			D	13	DVDPXX
REDAR SI-503-00	DARLING.R.E. CO..INC	.0750	70-1647-10	GOX	3500.0			01/01					T	10	DVDPXX
REDAR SI-503-00	DARLING.R.E. CO..INC	.0750	70-1647-11	GOX	4000.0			04/04					T	10	DVDPXX
REDAR SI-503-00	DARLING.R.E. CO..INC	.0750	70-1647-12	GOX	2000.0		200	00/04					A	11	DVDPXX
REDAR SI-503-00	DARLING.R.E. CO..INC		70-1647-2	GOX	50.0				657	657			D	13	DVDPXX
REDAR SI-503-00	DARLING.R.E. CO..INC		70-1647-26	GOX	6.2				721	759			D	13	DVDPXX
REDAR SI-503-00	DARLING.R.E. CO..INC		70-1647-27	GOX	16.5				735	744			D	13	DVDPXX
REDAR SI-503-00	DARLING.R.E. CO..INC		70-1647-3	GOX	50.0				481	481			D	13	DVDPXX
REDAR SI-503-00	DARLING.R.E. CO..INC		70-1647-4	GOX	100.0				447	447			D	13	DVDPXX
REDAR SI-503-00	DARLING.R.E. CO..INC		70-1647-5	GOX	500.0				393	393			D	13	DVDPXX
REDAR SI-503-00	DARLING.R.E. CO..INC		70-1647-6	GOX	1000.0				381	381			D	13	DVDPXX
REDAR SI-503-00	DARLING.R.E. CO..INC		70-1647-7	GOX	1500.0				382	382			D	13	DVDPXX

MFGR S DESIGNATION	MANUFACTURER	SPEC. THICK.	TEST RPT NO.	TEST ENVR	TEST PRESS	TEST TEMP	IMPT ENER	NO OF REACT	FLASH POINT	FIRE PT	PROP DIST	WT LOSS	R I	T T	MATL CODE
REDAR SI-503-00	DARLING.R.E. CO..INC		70-1647-8	GOX	2000.0				353	353			D	13	DVDPXX
REDAR SI-503-00	DARLING.R.E. CO..INC	.0750	70-1647-9	GOX	3000.0			00/04					A	10	DVDPXX
REDAR SI-528-00	DARLING.R.E. CO..INC		70-1938	GOX	1500.0			01/01					T	10	EKDPXX
REDAR SI-528-00	DARLING.R.E. CO..INC		70-1938	GOX	1500.0		50	00/04					A	11	EKDPXX
REDAR SI-528-00	DARLING.R.E. CO..INC		70-1938-1	GOX	100.0				555	555			D	13	EKDPXX
REDAR SI-528-00	DARLING.R.E. CO..INC		70-1938-10	GOX	1000.0	284							D	15	EKDPXX
REDAR SI-528-00	DARLING.R.E. CO..INC		70-1938-11	GOX	1500.0	232							D	15	EKDPXX
REDAR SI-528-00	DARLING.R.E. CO..INC		70-1938-12	GOX	1500.0				287	287			D	13	EKDPXX
REDAR SI-528-00	DARLING.R.E. CO..INC		70-1938-2	GOX	500.0				302	302			D	13	EKDPXX
REDAR SI-528-00	DARLING.R.E. CO..INC		70-1938-3	GOX	1000.0				250	250			D	13	EKDPXX
REDAR SI-528-00	DARLING.R.E. CO..INC		70-1938-4	GOX	50.0				728	728			D	13	EKDPXX
REDAR SI-528-00	DARLING.R.E. CO..INC		70-1938-5	GOX	25.0				768	768			D	13	EKDPXX
REDAR SI-528-00	DARLING.R.E. CO..INC		70-1938-6	GOX	6.2	1000			769	N999			J	13	EKDPXX
REDAR SI-528-00	DARLING.R.E. CO..INC		70-1938-7	GOX	16.5				787	787			D	13	EKDPXX
REDAR SI-528-00	DARLING.R.E. CO..INC		70-1938-8	GOX	1500.0				232	232			D	13	EKDPXX
RS-025 SHIM			SP-6919	GOX	5.0	1000			N999	N999			R	13	CHMAXX
RS-025 SHIM			SP-6919-1	GOX	25.0	1000			N999	N999			R	13	CHMAXX
RS-025 SHIM			SP-6919-10	GOX	500.0		200	00/01					A	11	CHMAXX
RS-025 SHIM			SP-6919-11	GOX	1000.0		200	00/01					A	11	CHMAXX
RS-025 SHIM			SP-6919-12	GOX	1500.0		200	00/01					A	11	CHMAXX
RS-025 SHIM			SP-6919-13	GOX	2000.0		200	00/04					A	11	CHMAXX
RS-025 SHIM			SP-6919-14	GOX	50.0	1000			N999	N999			R	13	CHMAXX
RS-025 SHIM			SP-6919-15	GOX	100.0	1000			N999	N999			R	13	CHMAXX
RS-025 SHIM			SP-6919-2	GOX	50.0	1000			868	N999			R	13	CHMAXX
RS-025 SHIM			SP-6919-3	GOX	62.0	1000			N999	N999			R	13	CHMAXX
RS-025 SHIM			SP-6919-4	GOX	165.0	1000			N999	N999			R	13	CHMAXX
RS-025 SHIM			SP-6919-5	GOX	900.0	1000			N999	N999			R	13	CHMAXX
RS-025 SHIM			SP-6919-6	GOX	2500.0			00/01					A	10	CHMAXX
RS-025 SHIM			SP-6919-7	GOX	3000.0			00/01					A	10	CHMAXX
RS-025 SHIM			SP-6919-8	GOX	3500.0			00/01					A	10	CHMAXX
RS-025 SHIM			SP-6919-9	GOX	4000.0			00/01					A	10	CHMAXX
RTV-106 RED	G.E. SILICONE PRODUCTS		71-2368	GOX	500.0		50	00/04					A	11	AEDRXX
RTV-106 RED	G.E. SILICONE PRODUCTS		71-2368-1	GOX	500.0			00/04					A	10	AEDRXX
RTV-106 RED	G.E. SILICONE PRODUCTS		71-2368-2	GOX	100.0				560	560			D	13	AEDRXX
RTV-21	G.E. SILICONE PRODUCTS		71-2446	A-50	820.0	524							T	15	DODPGS
RTV-21	G.E. SILICONE PRODUCTS		71-2446-1	A-50	764.0	501							T	15	DODPGS
RTV-30	G.E. SILICONE PRODUCTS		71-2442	A-50	423.0	419							T	15	DODPGS
RTV-30	G.E. SILICONE PRODUCTS		71-2442-1	A-50	457.0	431							T	15	DODPGS
RTV-60	G.E. SILICONE PRODUCTS		71-2443	A-50	397.0	415							T	15	DODPGS
RTV-60	G.E. SILICONE PRODUCTS		71-2443-1	A-50	417.0	416							T	15	DODPGS
RTV-90	G.E. SILICONE PRODUCTS		71-5000	GOX	5000.0		50	00/04					A	11	DODPXX
RTV-90	G.E. SILICONE PRODUCTS		71-5000-1	GOX	500.0			00/04					A	10	DODPXX
RTV-90	G.E. SILICONE PRODUCTS		71-5000-10	GOX	1500.0			00/04					A	10	DODPXX
RTV-90	G.E. SILICONE PRODUCTS		71-5000-11	GOX	2000.0			01/01					T	10	DODPXX

MFGR S DESIGNATION	MANUFACTURER	SPEC. THICK.	TEST RPT NO.	TEST ENVR	TEST PRESS	TEST TEMP	IMPT ENER	NO OF REACT	FLASH POINT	FIRE PT	PROP DIST	WT LOSS	P T T	MATL CODE
RTV-90	G.E. SILICONE PRODUCTS		71-5000-12	GOX	2000.0			01/02					T 10	DODPXX
RTV-90	G.E. SILICONE PRODUCTS		71-5000-13	GOX	2500.0			01/01					T 10	DODPXX
RTV-90	G.E. SILICONE PRODUCTS		71-5000-14	GOX	2500.0			01/02					T 10	DODPXX
RTV-90	G.E. SILICONE PRODUCTS		71-5000-15	GOX	2500.0			01/03					T 10	DODPXX
RTV-90	G.E. SILICONE PRODUCTS		71-5000-16	GOX	3000.0			01/01					T 10	DODPXX
RTV-90	G.E. SILICONE PRODUCTS		71-5000-17	GOX	3500.0			01/01					T 10	DODPXX
RTV-90	G.E. SILICONE PRODUCTS		71-5000-2	GOX	1000.0			01/01					T 10	DODPXX
RTV-90	G.E. SILICONE PRODUCTS		71-5000-3	GOX	1000.0			01/03					T 10	DODPXX
RTV-90	G.E. SILICONE PRODUCTS		71-5000-4	GOX	1000.0			01/04					T 10	DODPXX
RTV-90	G.E. SILICONE PRODUCTS		71-5000-5	GOX	1000.0			00/04					A 10	DODPXX
RTV-90	G.E. SILICONE PRODUCTS		71-5000-6	GOX	1500.0			01/04					T 10	DODPXX
RTV-90	G.E. SILICONE PRODUCTS		71-5000-7	GOX	1500.0			01/01					T 10	DODPXX
RTV-90	G.E. SILICONE PRODUCTS		71-5000-8	GOX	1500.0			01/03					T 10	DODPXX
RTV-90	G.E. SILICONE PRODUCTS		71-5000-9	GOX	1500.0			01/02					T 10	DODPXX
RULON A	DIXON CORP	.0300	70-1716	GOX	25.0				989	989			D 13	DKCNAD
RULON A	DIXON CORP	.0300	70-1716-1	GOX	50.0				735	965			D 13	DKCNAD
RULON A	DIXON CORP	.0750	70-1716-10	GOX	1000.0		200	00/01					A 11	DKCNAD
RULON A	DIXON CORP	.0750	70-1716-11	GOX	1500.0		200	00/01					A 11	DKCNAD
RULON A	DIXON CORP	.0750	70-1716-12	GOX	2000.0		200	00/04					A 11	DKCNAD
RULON A	DIXON CORP		70-1716-13	GOX	1500.0		50	00/04					A 11	DKCNAD
RULON A	DIXON CORP		70-1716-14	GOX	1500.0			00/04					A 10	DKCNAD
RULON A	DIXON CORP		70-1716-15	GOX	50.0				802	802			D 13	DKCNAD
RULON A	DIXON CORP		70-1716-17	GOX	500.0				788	788			D 13	DKCNAD
RULON A	DIXON CORP		70-1716-18	GOX	1000.0				761	761			D 13	DKCNAD
RULON A	DIXON CORP	.0300	70-1716-2	GOX	62.0	1000			N999	N999			Y 13	DKCNAD
RULON A	DIXON CORP	.0300	70-1716-3	GOX	165.0	1000			N999	N999			Y 13	DKCNAD
RULON A	DIXON CORP	.0750	70-1716-4	GOX	2500.0			00/01					A 10	DKCNAD
RULON A	DIXON CORP	.0750	70-1716-5	GOX	3000.0			01/02					T 10	DKCNAD
RULON A	DIXON CORP	.0750	70-1716-6	GOX	3500.0			00/01					A 10	DKCNAD
RULON A	DIXON CORP	.0750	70-1716-7	GOX	4000.0			02/04					T 10	DKCNAD
RULON A	DIXON CORP	.0750	70-1716-8	GOX	4500.0			01/01					T 10	DKCNAD
RULON A	DIXON CORP	.0750	70-1716-9	GOX	500.0		200	00/01					A 11	DKCNAD
RULON A	DIXON CORP	.0720	70-1717	GOX	5.0	1000			752	N999			Y 13	DKCNAD
RULON A	DIXON CORP	.0720	70-1717-1	GOX	25.0				627	986			D 13	DKCNAD
RULON A	DIXON CORP	.0750	70-1717-10	GOX	1000.0		200	00/01					A 11	DKCNAD
RULON A	DIXON CORP	.0750	70-1717-11	GOX	1500.0		200	00/01					A 11	DKCNAD
RULON A	DIXON CORP	.0750	70-1717-12	GOX	2000.0		200	00/04					A 11	DKCNAD
RULON A	DIXON CORP	.0750	70-1717-13	GOX	3000.0		50	00/01					A 11	DKCNAD
RULON A	DIXON CORP	.0750	70-1717-14	GOX	4000.0		50	00/01					A 11	DKCNAD
RULON A	DIXON CORP	.0750	70-1717-15	GOX	5000.0		50	00/04					A 11	DKCNAD
RULON A	DIXON CORP	.0720	70-1717-2	GOX	50.0				650	971			D 13	DKCNAD
RULON A	DIXON CORP	.0720	70-1717-3	GOX	62.0	1000			N999	N999			Y 13	DKCNAD
RULON A	DIXON CORP	.0720	70-1717-4	GOX	165.0	1000			739	N999			Y 13	DKCNAD
RULON A	DIXON CORP	.0750	70-1717-5	GOX	3000.0			00/01					A 10	DKCNAD

MFGR S DESIGNATION	MANUFACTURER	SPEC. THICK.	TEST RPT NO.	TEST ENVR	TEST PRESS	TEST TEMP	IMPT ENER	NO OF REACT	FLASH POINT	FIRE PT	PROP DIST	WT LOSS	R I	T T	MATL CODE
RULON A	DIXON CORP	.0750	70-1717-6	GOX	3500.0			00/01					A	10	DKCNAD
RULON A	DIXON CORP	.0750	70-1717-7	GOX	4000.0			00/01					A	10	DKCNAD
RULON A	DIXON CORP	.0750	70-1717-8	GOX	4500.0			00/01					A	10	DKCNAD
RULON A	DIXON CORP	.0750	70-1717-9	GOX	5000.0			00/04					A	10	DKCNAD
RULON A	DIXON CORP		70-1975	A-50	750.0	491							T	15	DKCNAD
RULON A	DIXON CORP		70-1975-1	A-50	686.0	478							T	15	DKCNAD
RULON A	DIXON CORP		70-1975-2	A-50	750.0	497							T	15	DKCNAD
RULON A	DIXON CORP		71-2242	GOX	1500.0		50	00/04					A	11	DKCNAD
RULON A	DIXON CORP		71-2242-1	GOX	1500.0			01/02					A	10	DKCNAD
RULON A	DIXON CORP		71-2242-2	GOX	1000.0				738	738			D	13	DKCNAD
RULON A	DIXON CORP		71-2276	A-50	807.0	513							T	15	CHCNFW
RULON A	DIXON CORP		71-2276-1	A-50	781.0	510							T	15	CHCNFW
RULON A	DIXON CORP		71-2526	GOX	1500.0		50	00/04					A	11	DKCNAD
RULON A	DIXON CORP		71-2526-1	GOX	1500.0			01/02					T	10	DKCNAD
RULON A	DIXON CORP		71-2526-2	GOX	1000.0				635	635			D	13	DKCNAD
R751-18 FLUORGLAS	DODGE INDUSTRIES.INC.		71-2383	GOX	500.0		50	00/04					A	11	BFCNGD
R751-18 FLUORGLAS	DODGE INDUSTRIES.INC.		71-2383-1	GOX	500.0			00/04					A	10	BFCNGD
R751-18 FLUORGLAS	DODGE INDUSTRIES.INC.		71-2383-2	GOX	100.0	1000			N999	N999			J	13	BFCNGD
S-604-7	PARKER SEAL/LOS ANGLS		10-46	GN2	200.0		10	00/04					R	11	CHDPXX
S-604-7	PARKER SEAL/LOS ANGLS		10-46-1	GN2	1000.0		4	00/04					R	11	CHDPXX
S-604-7	PARKER SEAL/LOS ANGLS		70-1570	GOX	4000.0			01/01					T	10	CHDPXX
S-604-7	PARKER SEAL/LOS ANGLS		70-1570-1	GOX	4000.0		50	00/04					A	11	CHDPXX
S-604-7	PARKER SEAL/LOS ANGLS		70-1570-10	GOX	1000.0				428	428			D	13	CHDPXX
S-604-7	PARKER SEAL/LOS ANGLS		70-1570-11	GOX	1500.0				400	400			D	13	CHDPXX
S-604-7	PARKER SEAL/LOS ANGLS		70-1570-12	GOX	2000.0				394	394			D	13	CHDPXX
S-604-7	PARKER SEAL/LOS ANGLS		70-1570-13	GOX	3000.0				419	419			D	13	CHDPXX
S-604-7	PARKER SEAL/LOS ANGLS		70-1570-13	GOX	1000.0	428							J	15	CHDPXX
S-604-7	PARKER SEAL/LOS ANGLS		70-1570-14	GOX	3000.0	388							J	15	CHDPXX
S-604-7	PARKER SEAL/LOS ANGLS		70-1570-15	GOX	25.0				801	827			D	13	CHDPXX
S-604-7	PARKER SEAL/LOS ANGLS		70-1570-16	GOX	3000.0				419	419			J	13	CHDPXX
S-604-7	PARKER SEAL/LOS ANGLS		70-1570-2	GOX	5000.0		50	00/04					A	11	CHDPXX
S-604-7	PARKER SEAL/LOS ANGLS		70-1570-3	GOX	1500.0			01/01					T	10	CHDPXX
S-604-7	PARKER SEAL/LOS ANGLS		70-1570-4	GOX	1000.0			00/04					A	10	CHDPXX
S-604-7	PARKER SEAL/LOS ANGLS		70-1570-5	GOX	50.0				766	766			D	13	CHDPXX
S-604-7	PARKER SEAL/LOS ANGLS		70-1570-6	GOX	50.0				642	642			D	13	CHDPXX
S-604-7	PARKER SEAL/LOS ANGLS		70-1570-7	GOX	100.0				471	471			D	13	CHDPXX
S-604-7	PARKER SEAL/LOS ANGLS		70-1570-8	GOX	500.0				389	389			D	13	CHDPXX
S-604-7	PARKER SEAL/LOS ANGLS		70-1570-9	GOX	1000.0				404	404			D	13	CHDPXX
S-613-6	PARKER SEAL/LOS ANGLS	.0750	71-2408	GOX	250.0			00/04					A	10	CHDPXX
S-613-6	PARKER SEAL/LOS ANGLS		71-2408-1	GOX	75.0				564	564			D	13	CHDPXX
S-614-80	PARKER SEAL/LOS ANGLS	.0750	10-83	GOX	2000.0			00/04					A	10	CHCKXX
S-614-80	PARKER SEAL/LOS ANGLS	.0750	10-83-1	GOX	2500.0			01/04					A	10	CHCKXX
S-614-80	PARKER SEAL/LOS ANGLS	.0750	10-83-2	GOX	3500.0			03/04					A	10	CHCKXX
S-614-80	PARKER SEAL/LOS ANGLS	.0750	10-83-3	GOX	1500.0		200	00/04					A	11	CHCKXX

MFGR S DESIGNATION	MANUFACTURER	SPEC. THICK.	TEST RPT NO.	TEST ENVR	TEST PRESS	TEST TEMP	IMPT ENER	NO OF REACT	FLASH POINT	FIRE PT	PROP DIST	WT LOSS	M I	T T	MATL CODE
S-614-80	PARKER SEAL/LOS ANGLS	.0750	10-83-4	GOX	2000.0		200	03/04					D	11	CHCKXX
S-614-80	PARKER SEAL/LOS ANGLS		10-83-5	GOX	6.2				782	851			D	13	CHCKXX
S-614-80	PARKER SEAL/LOS ANGLS		10-83-6	GOX	16.5				824	886			D	13	CHCKXX
SAVEREISEN NO. 8	CONTROL PRODUCTS,INC.		71-2411	GOX	250.0			00/04					A	10	FJCKXX
SAVEREISEN NO. 8	CONTROL PRODUCTS,INC.		71-2411-1	GOX	75.0	1000			N999	N999			A	13	FJCKXX
SCOTCH 393 TAPE	3M CO. ST. PAUL		71-2398	GOX	75.0	600			N600	N600			S	13	DZFSGT
SCOTCHCAL 3930	3M CO. ST. PAUL		70-2067	GOX	6.2	600			N999	N999			R	13	AKAKXX
SCOTCHCAST 248	3M CO. ST. PAUL		71-2593	A-50	732.0	492							T	15	AKBGXX
SCOTCHCAST 248	3M CO. ST. PAUL		71-2593-1	A-50	750.0	511							T	15	AKBGXX
SCOTCHCAST 282	3M CO. ST. PAUL		71-2562	MMH	578.0	465							T	15	BABGXX
SCOTCHCAST 282	3M CO. ST. PAUL		71-2562-1	MMH	783.0	503							T	15	BABGXX
SE-550	G.E. SILICONE PRODUCTS		67-0243	GOX	1555.0				461	461			D	15	DODQXX
SE-565/VAROX CAT	G.E. SILICONE PRODUCTS		70-1775	GOX	25.0				854	854			D	13	DOUPXX
SE-565/VAROX CAT	G.E. SILICONE PRODUCTS		70-1775	GOX	1500.0		50	00/04					A	11	DODPXX
SE-565/VAROX CAT	G.E. SILICONE PRODUCTS		70-1775	GOX	1500.0			01/02					T	10	DODPXX
SE-565/VAROX CAT	G.E. SILICONE PRODUCTS		70-1775-1	GOX	50.0				533	533			D	13	DODPXX
SE-565/VAROX CAT	G.E. SILICONE PRODUCTS		70-1775-10	GOX	2000.0				410	410			D	13	DODPXX
SE-565/VAROX CAT	G.E. SILICONE PRODUCTS	.0750	70-1775-11	GOX	1500.0		200	00/04					A	11	DODPXX
SE-565/VAROX CAT	G.E. SILICONE PRODUCTS	.0750	70-1775-12	GOX	2000.0		200	01/03					T	11	DODPXX
SE-565/VAROX CAT	G.E. SILICONE PRODUCTS	.0750	70-1775-13	GOX	2500.0		200	01/03					T	11	DODPXX
SE-565/VAROX CAT	G.E. SILICONE PRODUCTS	.0750	70-1775-14	GOX	3000.0		200	01/01					T	11	DODPXX
SE-565/VAROX CAT	G.E. SILICONE PRODUCTS	.0750	70-1775-15	GOX	3500.0		200	01/01					T	11	DODPXX
SE-565/VAROX CAT	G.E. SILICONE PRODUCTS	.0750	70-1775-16	GOX	4000.0		200	04/04					T	11	DODPXX
SE-565/VAROX CAT	G.E. SILICONE PRODUCTS		70-1775-17	GOX	1500.0			00/04					A	10	DODPXX
SE-565/VAROX CAT	G.E. SILICONE PRODUCTS		70-1775-18	GOX	2000.0			01/03					T	10	DODPXX
SE-565/VAROX CAT	G.E. SILICONE PRODUCTS		70-1775-19	GOX	2500.0			03/04					T	10	DODPXX
SE-565/VAROX CAT	G.E. SILICONE PRODUCTS		70-1775-2	GOX	50.0				770	770			D	13	DODPXX
SE-565/VAROX CAT	G.E. SILICONE PRODUCTS		70-1775-20	GOX	3000.0			04/04					T	10	DODPXX
SE-565/VAROX CAT	G.E. SILICONE PRODUCTS		70-1775-21	GOX	5000.0		50	00/04					A	11	DODPXX
SE-565/VAROX CAT	G.E. SILICONE PRODUCTS		70-1775-22	GOX	3000.0			01/01					T	10	DODPXX
SE-565/VAROX CAT	G.E. SILICONE PRODUCTS		70-1775-23	GOX	2000.0			01/01					T	10	DODPXX
SE-565/VAROX CAT	G.E. SILICONE PRODUCTS		70-1775-24	GOX	1000.0			01/01					T	10	DODPXX
SE-565/VAROX CAT	G.E. SILICONE PRODUCTS		70-1775-25	GOX	500.0			00/04					A	10	DODPXX
SE-565/VAROX CAT	G.E. SILICONE PRODUCTS		70-1775-26	GOX	2090.0				314	314			D	13	DODPXX
SE-565/VAROX CAT	G.E. SILICONE PRODUCTS		70-1775-3	GOX	62.0	1000			769	N999			D	13	DODPXX
SE-565/VAROX CAT	G.E. SILICONE PRODUCTS		70-1775-4	GOX	106.0				549	549			D	13	DODPXX
SE-565/VAROX CAT	G.E. SILICONE PRODUCTS		70-1775-5	GOX	165.0				819	819			D	13	DODPXX
SE-565/VAROX CAT	G.E. SILICONE PRODUCTS		70-1775-6	GOX	500.0				386	386			D	13	DODPXX
SE-565/VAROX CAT	G.E. SILICONE PRODUCTS		70-1775-7	GOX	900.0				428	428			D	13	DODPXX
SE-565/VAROX CAT	G.E. SILICONE PRODUCTS		70-1775-8	GOX	1000.0				413	413			D	13	DODPXX
SE-565/VAROX CAT	G.E. SILICONE PRODUCTS		70-1775-9	GOX	1500.0				379	379			D	13	DODPXX
SE-565/VEROX CAT	G.E. SILICONE PRODUCTS		70-1775-27	GOX	950.0				376	376			J	13	DODPXX
SHRINK SLEEVE 221-1/16	ROYAL INDUSTRIES INC		71-2655	A-50	797.0	516							T	15	EMCEXX
SIL CRYSTAL STRAIN GAGE	DYNASCIENCES		70-2134	GOX	2000.0			00/04					A	10	FIGIXX

MFGR S DESIGNATION	MANUFACTURER	SPEC. THICK.	TEST RPT NO.	TEST ENVR	TEST PRESS	TEST TEMP	IMPT ENER	NO OF REACT	FLASH POINT	FIRE PT	PROP DIST	WT LOSS	R I	T T	MATL CODE
SIL CRYSTAL STRAIN GAGE	DYNASCIENCES		70-2134-1	GOX	2500.0		50	00/04					A	11	FIGIXX
SIL CRYSTAL STRAIN GAGE	DYNASCIENCES		70-2134-2	GOX	1400.0	1000			N999	N999			A	13	FIGIXX
SIL DIOX INSUL SP 950-46	ROSEMONT ENG. CORP		70-1986	GOX	1500.0			00/04					A	10	FJCKXX
SIL DIOX INSUL SP 950-46	ROSEMONT ENG. CORP		70-1986-1	GOX	500.0		50	01/01					T	11	FJCKXX
SIL DIOX INSUL SP 950-46	ROSEMONT ENG. CORP		70-1986-2	GOX	1500.0	1000			N999	N999			A	13	FJCKXX
SIL DIOX INSUL SP 950-46	ROSEMONT ENG. CORP		70-1986-3	GOX	1500.0		50	01/01					T	11	FJCKXX
SIL DIOX INSUL SP 950-46	ROSEMONT ENG. CORP		70-1986-4	GOX	5000.0		50	00/04					A	11	FJCKXX
SIL DIOX INSUL SP 950-46	ROSEMONT ENG. CORP		70-1986-5	GOX	5000.0			00/04					A	10	FJCKXX
SIL GLASS LAM MIL-P-997	CADILLAC PROCESS CO.	.0750	70-2210	GOX	1500.0			01/03					T	10	CRCKXX
SIL GLASS LAM MIL-P-997	CADILLAC PROCESS CO.		70-2210-1	GOX	1000.0				614	614			D	15	CRCKXX
SIL LUMPS SX-150 LOT 670	MATHESON COLEMAN + BELL		70-2240	GOX	1500.0		50	00/04					A	11	DDCKXX
SIL LUMPS SX-150 LOT 670	MATHESON COLEMAN + BELL		70-2240-1	GOX	1500.0			00/04					A	10	DDCKXX
SIL LUMPS SX-150 LOT 670	MATHESON COLEMAN + BELL		70-2240-2	A-50	771.0	500							T	15	DDCKXX
SIL LUMPS SX-150 LOT 670	MATHESON COLEMAN + BELL		70-2240-3	A-50	835.0	528							T	15	DDCKXX
SIL LUMPS SX-150 LOT 670	MATHESON COLEMAN + BELL		70-2240-4	MMH	752.0	502							T	15	DDCKXX
SIL LUMPS SX-150 LOT 670	MATHESON COLEMAN + BELL		70-2240-5	MMH	756.0	503							T	15	DDCKXX
SIL RUB RC/DC 916	RUBBERCRAFT CORP		71-2563	A-50	286.0	370							T	15	DPDPXX
SIL RUB RC/DC 916	RUBBERCRAFT CORP		71-2563-1	A-50	293.0	370							T	15	DPDPXX
SIL RUB SVSK-81370-3	HAMILTON STANDARD		71-2264	GOX	2000.0			00/04					A	10	DVDPXX
SIL RUB SVSK-81370-3	HAMILTON STANDARD		71-2264-1	GOX	1500.0				564	564			D	13	DVDPXX
SILASTIC S-5370 RTV	GAC		71-2512	A-50	783.0	509							T	15	DODPHS
SILASTIC S-5370 RTV	GAC		71-2512-1	A-50	807.0	506							T	15	DODPHS
SILASTIC S-5370-RTV	DOW CORNING CORP		71-2489	A-50	765.0	501							T	15	DVDPXX
SILASTIC S-5370-RTV	DOW CORNING CORP		71-2489-1	A-50	771.0	498							T	15	DVDPXX
SILASTIC 140-RTV	DOW CORNING CORP		71-2496	GOX	1500.0		50	00/04					A	11	AECKGL
SILASTIC 140-RTV	DOW CORNING CORP		71-2496-1	GOX	1500.0			01/03					T	10	AECKGL
SILASTIC 140-RTV	DOW CORNING CORP		71-2496-2	GOX	1000.0				342	342			D	13	AECKGL
SILASTIC 3118-RTV	DOW CORNING CORP		70-2205	GOX	1500.0			00/04					A	10	BADPXX
SILASTIC 3118-RTV	DOW CORNING CORP		70-2205-1	GOX	1000.0				441	441			D	13	BADPXX
SILASTIC 3118-RTV	DOW CORNING CORP		70-2205-2	GOX	50.0				442	442			D	13	BADPXX
SILASTIC 3118-RTV	DOW CORNING CORP		70-2205-3	GOX	100.0				450	450			D	13	BADPXX
SILASTIC 3118-RTV	DOW CORNING CORP		70-2205-4	GOX	500.0				403	403			D	13	BADPXX
SILASTIC 3118-RTV	DOW CORNING CORP		70-2205-5	GOX	1500.0				353	353			D	13	BADPXX
SILASTIC 3118-RTV	DOW CORNING CORP		70-2205-6	GOX	2000.0				382	382			D	13	BADPXX
SILASTIC 3120 RTV	DOW CORNING CORP		71-2407	GOX	250.0			00/04					A	10	BADPXX
SILASTIC 3120 RTV	DOW CORNING CORP		71-2407-1	GOX	75.0				645	645			D	13	BADPXX
SILASTIC 601 RTV	DOW CORNING CORP		71-2364	GOX	1500.0		50	00/04					A	11	DRDSXX
SILASTIC 601 RTV	DOW CORNING CORP		71-2364-1	GOX	1500.0			01/01					T	10	DRDSXX
SILASTIC 601 RTV	DOW CORNING CORP		71-2364-2	GOX	1000.0				420	420			D	13	DRDSXX
SILASTIC 601 RTV	DOW CORNING CORP		71-2364-3	LOX	14.7		50	00/04					A	16	DRDSXX
SILASTIC 601 RTV	DOW CORNING CORP		71-2364-4	LOX	14.7		200	00/04					A	16	DRDSXX
SILASTIC 601 RTV	DOW CORNING CORP		71-2364-5	GOX	1000.0		50	00/04					A	11	DRDSXX
SILASTIC 601 RTV	DOW CORNING CORP		71-2364-6	GOX	1000.0		200	00/04					A	11	DRDSXX
SILASTIC 731-RTV	DOW CORNING CORP	.0050	SP-6932	GOX	5.0	1000			N999	N999			F	13	ABCKXX

MFGR S DESIGNATION	MANUFACTURER	SPEC. THICK.	TEST RPT NO.	TEST ENVR	TEST PRESS	TEST TEMP	IMPT ENER	NO OF REACT	FLASH POINT	FIRE PT	PROP DIST	WT LOSS	R T	T	MATL CODE
SILASTIC 731-RTV	DOW CORNING CORP	.0050	SP-6932-1	GOX	10.0				730	820			D	13	ABCKXX
SILASTIC 731-RTV	DOW CORNING CORP	.0050	SP-6932-10	GOX	1000.0			00/01					A	10	ABCKXX
SILASTIC 731-RTV	DOW CORNING CORP	.0050	SP-6932-11	GOX	1500.0			00/01					A	10	ABCKXX
SILASTIC 731-RTV	DOW CORNING CORP	.0050	SP-6932-12	GOX	2000.0			00/01					A	10	ABCKXX
SILASTIC 731-RTV	DOW CORNING CORP	.0050	SP-6932-13	GOX	2500.0			00/01					A	10	ABCKXX
SILASTIC 731-RTV	DOW CORNING CORP	.0050	SP-6932-14	GOX	3000.0			00.01					A	10	ABCKXX
SILASTIC 731-RTV	DOW CORNING CORP	.0050	SP-6932-15	GOX	3500.0			00/01					A	10	ABCKXX
SILASTIC 731-RTV	DOW CORNING CORP	.0050	SP-6932-16	GOX	4000.0			00/01					A	10	ABCKXX
SILASTIC 731-RTV	DOW CORNING CORP	.0050	SP-6932-17	GOX	4500.0			00/01					A	10	ABCKXX
SILASTIC 731-RTV	DOW CORNING CORP	.0050	SP-6932-18	GOX	5000.0			00/04					A	10	ABCKXX
SILASTIC 731-RTV	DOW CORNING CORP	.0050	SP-6932-19	GOX	500.0		200	00/01					A	11	ABCKXX
SILASTIC 731-RTV	DOW CORNING CORP	.0050	SP-6932-2	GOX	20.0	1000			N999	N999			J	13	ABCKXX
SILASTIC 731-RTV	DOW CORNING CORP	.0050	SP-6932-20	GOX	1000.0		200	00/01					A	11	ABCKXX
SILASTIC 731-RTV	DOW CORNING CORP	.0050	SP-6932-21	GOX	1500.0		200	00/01					A	11	ABCKXX
SILASTIC 731-RTV	DOW CORNING CORP	.0050	SP-6932-22	GOX	2000.0		200	00/04					A	11	ABCKXX
SILASTIC 731-RTV	DOW CORNING CORP		SP-6932-23	GOX	500.0		50	00/04					A	11	ABCKXX
SILASTIC 731-RTV	DOW CORNING CORP		SP-6932-24	GOX	500.0			00/04					A	10	ABCKXX
SILASTIC 731-RTV	DOW CORNING CORP		SP-6932-25	GOX	1500.0		50	00/04					A	11	ABCKXX
SILASTIC 731-RTV	DOW CORNING CORP		SP-6932-26	GOX	1500.0			00/04					A	10	ABCKXX
SILASTIC 731-RTV	DOW CORNING CORP	.0050	SP-6932-3	GOX	25.0				708	708			D	13	ABCKXX
SILASTIC 731-RTV	DOW CORNING CORP	.0050	SP-6932-4	GOX	30.0				620	620			D	13	ABCKXX
SILASTIC 731-RTV	DOW CORNING CORP	.0050	SP-6932-5	GOX	40.0				660	660			D	13	ABCKXX
SILASTIC 731-RTV	DOW CORNING CORP	.0050	SP-6932-6	GOX	50.0				700	700			D	13	ABCKXX
SILASTIC 731-RTV	DOW CORNING CORP	.0050	SP-6932-7	GOX	62.0	1000			693	N999			Y	13	ABCKXX
SILASTIC 731-RTV	DOW CORNING CORP	.0050	SP-6932-8	GOX	165.0				668	668			D	13	ABCKXX
SILASTIC 731-RTV	DOW CORNING CORP	.0050	SP-6932-9	GOX	1565.0				409	409			D	13	ABCKXX
SILASTIC 881-RTV	DOW CORNING CORP	.0750	70-2193	GOX	1500.0			01/02					T	10	BADSXX
SILASTIC 881-RTV	DOW CORNING CORP	.0750	70-2193-1	GOX	1500.0		50	00/04					A	11	BADSXX
SILASTIC 881-RTV	DOW CORNING CORP		70-2193-11	GOX	25.0				686	686			D	13	BADSXX
SILASTIC 881-RTV	DOW CORNING CORP		70-2193-12	GOX	50.0				663	663			D	13	BADSXX
SILASTIC 881-RTV	DOW CORNING CORP		70-2193-2	GOX	1000.0				377	377			D	13	BADSXX
SILASTIC 881-RTV	DOW CORNING CORP		70-2193-3	GOX	1500.0			01/01					T	10	BADSXX
SILASTIC 881-RTV	DOW CORNING CORP		70-2193-4	GOX	50.0				475	475			D	13	BADSXX
SILASTIC 881-RTV	DOW CORNING CORP		70-2193-5	GOX	100.0				438	438			D	13	BADSXX
SILASTIC 881-RTV	DOW CORNING CORP		70-2193-6	GOX	500.0				363	363			D	13	BADSXX
SILASTIC 881-RTV	DOW CORNING CORP		70-2193-7	GOX	1500.0				326	326			D	13	BADSXX
SILASTIC 881-RTV	DOW CORNING CORP		70-2193-8	GOX	2000.0				300	300			D	13	BADSXX
SILASTIC 881-RTV	DOW CORNING CORP		70-2193-9	GOX	1000.0	432							D	15	BADSXX
SILASTIC 882-RTV	DOW CORNING CORP		71-2490	A-50	781.0	500							T	15	DODPXX
SILASTIC 882-RTV	DOW CORNING CORP		71-2490-1	A-50	764.0	505							T	15	DODPXX
SILCON/R ALUMINUM PAINT	DEXTER CORP		71-2377	GOX	500.0		50	00/04					A	11	ATFKXX
SILCON/R ALUMINUM PAINT	DEXTER CORP		71-2377-1	GOX	500.0			00/04					A	10	ATFKXX
SILCON/R ALUMINUM PAINT	DEXTER CORP		71-2377-2	GOX	100.0	1000			N999	N999			J	13	ATFKXX
SILICONE CTD GLASS CLOTH	3M.DIELECTRIC MATLS DIV		71-2561	MMH	787.0	508							T	15	FJCKGD

MFGR S DESIGNATION	MANUFACTURER	SPEC. THICK.	TEST RPT NO.	TEST ENVR	TEST PRESS	TEST TEMP	IMPT ENER	NO OF REACT	FLASH POINT	FIRE PT	PROP DIST	WT LOSS	R I	T T	MATL CODE
SILICONE CTD GLASS CLOTH	3M.DIELECTRIC MATLS DIV		71-2561-1	MMH	787.0	510							T	15	FJCKGD
SILICONE GLASS CLOTH	ELECTRO PRODUCTS		70-2096	GOX	1500.0		50	00/04					A	11	BGCKGD
SILICONE GLASS CLOTH	ELECTRO PRODUCTS		70-2096-1	GOX	1500.0			01/03					T	10	BGCKGD
SILICONE GLASS CLOTH	ELECTRO PRODUCTS		70-2096-2	GOX	1000.0				509	509			D	13	BGCKGD
SILICONE O-RING 1063-70	PLASTICS + RUBBER PRODS		70-1593-2	GOX	62.0	1000			N999	N999			J	13	CHDPXX
SILICONE O-RING 1063-70	PLASTICS + RUBBER PRODS		70-1593-3	GOX	165.0	1000			755	N999			J	13	CHDPXX
SILICONE RUB SM 3500-41			71-2694	GOX	1500.0			01/01					T	10	DPDAXX
SILICONE RUB SM 3500-41			71-2694-1	GOX	1000.0				364	364			D	13	DPDAXX
SILICONE RUB 6070	NICHOLS ENGINEERING		71-2386	GOX	500.0		50	00/04					A	11	CHDPXX
SILICONE RUB 6070	NICHOLS ENGINEERING		71-2386-1	GOX	500.0			00/04					A	10	CHDPXX
SILICONE RUB 6070	NICHOLS ENGINEERING		71-2386-2	GOX	100.0				535	535			D	13	CHDPXX
SILICONE RUBBER.AMS 3357	AGC INC.		71-2380	GOX	500.0		50	00/04					A	11	DVCKXX
SILICONE RUBBER.AMS 3357	AGC INC.		71-2380-1	GOX	500.0			00/04					A	10	DVCKXX
SILICONE RUBBER.AMS 3357	AGC INC.		71-2380-2	GOX	100.0				550	550			D	13	DVCKXX
SILICONE S-355-7	PARKER SEAL/LOS ANGLS		71-2373	GOX	500.0		50	00/04					A	11	CHDPXX
SILICONE S-355-7	PARKER SEAL/LOS ANGLS		71-2373-1	GOX	500.0			00/04					A	10	CHDPXX
SILICONE S-355-7	PARKER SEAL/LOS ANGLS		71-2373-2	GOX	1500.0			01/01					T	10	CHDPXX
SILICONE S-355-7	PARKER SEAL/LOS ANGLS		71-2373-3	GOX	1500.0		50	00/04					A	11	CHDPXX
SILICONE S-355-7	PARKER SEAL/LOS ANGLS		71-2373-4	GOX	100.0				578	578			D	13	CHDPXX
SILICONE S-355-7	PARKER SEAL/LOS ANGLS		71-2373-5	LOX	14.7		50	00/04					A	16	CHDPXX
SILICONE S-355-7	PARKER SEAL/LOS ANGLS		71-2373-6	LOX	14.7		200	00/04					A	16	CHDPXX
SILICONE S-355-7	PARKER SEAL/LOS ANGLS		71-2373-7	GOX	1000.0		50	00/04					A	11	CHDPXX
SILICONE S-355-7	PARKER SEAL/LOS ANGLS		71-2373-8	GOX	1000.0		200	01/02					T	11	CHDPXX
SILICONE S-355-7	PARKER SEAL/LOS ANGLS		71-2373-9	GOX	1000.0				478	478			D	13	CHDPXX
SILICONE 555U	G.E. SILICONE PRODUCTS		69-1281	GOX	1265.0				470	470			D	13	AWDPXX
SILICONE 555U	G.E. SILICONE PRODUCTS		69-1281-1	GOX	1565.0				432	432			D	13	AWDPXX
SILICONE 555U	G.E. SILICONE PRODUCTS	.0750	69-1281-2	GOX	1500.0			01/01					T	10	AWDPXX
SILICONE 555U	G.E. SILICONE PRODUCTS	.0750	69-1281-3	GOX	1500.0		50	00/04					A	11	AWDPXX
SILVER SOLDER NO. 1618	ROSEMONT ENG. CORP		70-1984	GOX	1500.0		50	00/04					A	11	FKMRXX
SILVER SOLDER NO. 1618	ROSEMONT ENG. CORP		70-1984	GOX	1500.0			00/04					A	10	FKMRXX
SILVER SOLDER NO. 1618	ROSEMONT ENG. CORP		70-1984-1	GOX	1500.0	1000			N999	N999			A	13	FKMRXX
SILVER SOLDER QQ-S-561D	HANDY AND HARMON		70-1924	GOX	1500.0		50	00/04					A	11	FKMAXX
SILVER SOLDER QQ-S-561D	HANDY AND HARMON		70-1924	GOX	1500.0			00/04					A	10	FKMAXX
SILVER SOLDER-BRAZING	EUTECTIC CORP		70-1922	GOX	1500.0		50	00/04					A	11	DMMRXX
SILVER SOLDER-BRAZING	EUTECTIC CORP		70-1922	GOX	1500.0			00/04					A	10	DMMRXX
SILVER.AA FINE	GAC		70-2061	A-50	778.0	506							T	15	DMMRXX
SILVER.AA FINE	GAC		70-2061-1	A-50	807.0	507							T	15	DMMRXX
SIMCO 567 LEAK DETECTOR	SIMCO		70-1827	GOX	5000.0		5	00/04					A	11	EYGUXX
SIMCO 567 LEAK DETECTOR	SIMCO		70-1827-1	GOX	5000.0			00/04					A	10	EYGUXX
SN 63 QQ-S-571	KESTER SOLDER CO.		71-2657	A-50	772.0	517							T	15	FKMSMP
SN 63 QQ-S-571	KESTER SOLDER CO.		71-2657-1	A-50	766.0	505							T	15	FKMSMP
SN 96	GAC	.0750	70-2143	GOX	4500.0			00/04					A	10	DMMSMR
SN 96	GAC		70-2143-1	A-50	771.0	500							T	15	DMMSMR
SN 96	GAC		70-2143-2	A-50	771.0	514							T	15	DMMSMR

MFGR S DESIGNATION	MANUFACTURER	SPEC. THICK.	TEST RPT NO.	TEST ENVR	TEST PRESS	TEST TEMP	MPT ENER	NO OF REACT	FLASH POINT	FIRE PT	PROP DIST	WT LOSS	R I	T T	MATL CODE
SN 96.5 SN/AG 3.5	GAC		70-2143-3	N2O4	361.5	195							T	14	DMMSMR
SN 96.5 SN/AG 3.5	GAC		70-2143-4	N2O4	360.0	190							T	14	DMMSMR
SN-60	KESTER SOLDER CO.		70-1960	A-50	763.0	507							T	15	FKMSMP
SN-60	KESTER SOLDER CO.		70-1960-1	A-50	814.0	518							T	15	FKMSMP
SN-60	KESTER SOLDER CO.		70-1960-2	MMH	750.0	509							T	15	FKMSMP
SN-60	KESTER SOLDER CO.		70-1960-3	MMH	756.0	507							T	15	FKMSMP
SN-60 QQ-S-571	KESTER SOLDER CO.		70-2137	GOX	4500.0			00/04					A	10	FKMSMP
SN-60 QQ-S-571	KESTER SOLDER CO.		70-2137-1	GOX	1000.0		50	00/04					A	11	FKMSMP
SN-60 QQ-S-571	KESTER SOLDER CO.		70-2137-2	GOX	1000.0		200	01/01					T	11	FKMSMP
SN-60 QQ-S-571	KESTER SOLDER CO.		70-2137-3	LOX	14.7		50	00/04					A	16	FKMSMP
SN-60 QQ-S-571	KESTER SOLDER CO.		70-2137-4	LOX	14.7		200	00/04					A	16	FKMSMP
SN-60 QQ-S-571	KESTER SOLDER CO.		70-2137-5	A-50	781.0	503							T	15	FKMSMP
SN-60 W-RA-P2	KESTER SOLDER CO.		71-2329	GOX	1500.0		50	00/04					A	11	FKMSMP
SN-60 W-RA-P2	KESTER SOLDER CO.		71-2329-1	GOX	1500.0			00/04					A	10	FKMSMP
SN-60-QQ-S-571	GAC		70-2137-6	N2O4	289.4	130							A	14	FKMSMP
SN-60-C. S-571	GAC		70-2137-7	N2O4	297.7	144							A	14	FKMSMP
SN30/PB70-PB70 QQ-S-571			71-2653	A-50	766.0	506							T	15	FKMPMS
SN30/PB70-PB70 QQ-S-571			71-2653-1	A-50	765.0	520							T	15	FKMPMS
SOLDER 95SN/5 SB			71-2660	A-50	743.0	502							T	15	FKMSMP
SOLDER 95SN/5 SB			71-2660-1	A-50	698.0	504							T	15	FKMSMP
SOLDER.SILVER	NR		70-1952	A-50	821.0	494							T	15	FKMRXX
SOLDER.SILVER	NR		70-1952-1	A-50	760.0	505							T	15	FKMRXX
SOLDER.SILVER	NR		70-1952-2	MMH	745.0	696							T	15	FKMRXX
SOLDER.SILVER	NR		70-1952-3	MMH	808.0	512							T	15	FKMRXX
SR 634-70	STILLMAN RUBBER DIV		70-1968	A-50	319.0	541							T	15	DVCZXX
SR 634-70	STILLMAN RUBBER DIV		70-1968-1	A-50	521.0	478							T	15	DVCZXX
SR 634-70	STILLMAN RUBBER DIV		70-1968-2	A-50	767.0	504							T	15	DVCZXX
SR 634-70	STILLMAN RUBBER DIV		70-1968-3	MMH	732.0	493							T	15	DVCZXX
SR 634-70	STILLMAN RUBBER DIV		70-1968-4	MMH	769.0	502							T	15	DVCZXX
SR 634-70	STILLMAN RUBBER DIV		71-2277	A-50	472.0	442							T	15	CHCZXX
SR 634-70	STILLMAN RUBBER DIV		71-2277-1	A-50	315.0	393							T	15	CHCZXX
SR-2702-75 FLUOROCARBON	SARGENT INDUSTRIES		71-2253	GOX	100.0				622	622			D	13	DPDGXX
SR-2702-75 FLUOROCARBON	SARGENT INDUSTRIES		71-2253-1	GOX	500.0		50	00/04					A	11	DPDGXX
SR-2702-75 FLUOROCARBON	SARGENT INDUSTRIES		71-2253-10	GOX	500.0				435	435			D	13	DPDGXX
SR-2702-75 FLUOROCARBON	SARGENT INDUSTRIES		71-2253-12	GOX	500.0				794	794			D	13	DPDGXX
SR-2702-75 FLUOROCARBON	SARGENT INDUSTRIES		71-2253-13	GOX	1500.0				396	396			D	13	DPDGXX
SR-2702-75 FLUOROCARBON	SARGENT INDUSTRIES		71-2253-14	GOX	2000.0				369	369			D	13	DPDGXX
SR-2702-75 FLUOROCARBON	SARGENT INDUSTRIES		71-2253-15	GOX	1000.0				461	461			D	13	DPDGXX
SR-2702-75 FLUOROCARBON	SARGENT INDUSTRIES		71-2253-16	GOX	1000.0				461	461			D	13	DPDGXX
SR-2702-75 FLUOROCARBON	SARGENT INDUSTRIES		71-2253-2	GOX	500.0			00/04					A	10	DPDGXX
SR-2702-75 FLUOROCARBON	SARGENT INDUSTRIES		71-2253-3	GOX	1500.0		50	00/04					A	11	DPDGXX
SR-2702-75 FLUOROCARBON	SARGENT INDUSTRIES		71-2253-4	GOX	1500.0			01/01					T	10	DPDGXX
SR-2702-75 FLUOROCARBON	SARGENT INDUSTRIES		71-2253-5	GOX	1000.0			01/02					T	10	DPDGXX
SR-2702-75 FLUOROCARBON	SARGENT INDUSTRIES		71-2253-6	GOX	5000.0		50	00/04					A	11	DPDGXX

MFGR S DESIGNATION	MANUFACTURER	SPEC. THICK.	TEST RPT NO.	TEST ENVR	TEST PRESS	TEST TEMP	IMPT ENER	NO OF REACT	FLASH POINT	FIRE PT	POUR PT	WT DIST LOSS	R I	T T	MATL CODE
SR-2702-75 FLUOROCARBON	SARGENT INDUSTRIES		71-2253-8	GOX	75.0				R29	R36			D	13	DPDGXX
SR-2702-75 FLUOROCARBON	SARGENT INDUSTRIES		71-2253-9	GOX	50.0				503	503			D	13	DPDGXX
SR-634-70			10-62	GOX	1500.0		50	00/04					A	11	DDCZXX
SR-634-70			10-62-1	GOX	1500.0			01/02					T	10	DDCZXX
SRG-0610CTD F/G-5406-1023M	CO. ST. PAUL		71-2384	GOX	500.0		50	00/04					A	11	BFCKGD
SRG-0610CTD F/G-5406-1023M	CO. ST. PAUL		71-2384-1	GOX	500.0			00/04					A	10	BFCKGD
SRG-0610CTD F/G-5406-1023M	CO. ST. PAUL		71-2384-2	GOX	100.0				488	488			D	13	BFCKGD
SRG-2115CTD F/G-5469-1023M	CO. ST. PAUL		71-2385	GOX	500.0		50	00/04					A	11	BFCKGD
SRG-2115CTD F/G-5469-1023M	CO. ST. PAUL		71-2385-1	GOX	500.0			00/04					A	10	BFCKGD
SRG-2115CTD F/G-5469-1023M	CO. ST. PAUL		71-2385-2	GOX	100.0				474	474			D	13	BFCKGD
SS-304 QQ-S-763	GAC		70-2105	GOX	5000.0		50	00/04					A	11	DMMIMH
SS-304 QQ-S-763	GAC		70-2105-1	GOX	5000.0			00/04					A	10	DMMIMH
SS-304 QQ-S-763	GAC		70-2105-2	GOX	6800.0			00/04					A	10	DMMIMH
SS-4101 RTV PRIMER	G.E. SILICONE PRODUCTS		71-2268	GOX	1000.0	1000			N999	N999			A	13	AUDPXX
STABOND 136 ADHESIVE	AMERICAN LATEX PRODUCTS		71-2569	GOX	1500.0		50	03/03					T	11	ABBYXX
STABOND 136 ADHESIVE	AMERICAN LATEX PRODUCTS		71-2569-1	GOX	250.0			00/03					A	10	ABBYXX
STABOND 136 ADHESIVE	AMERICAN LATEX PRODUCTS		71-2569-2	GOX	1000.0		50	05/10					T	11	ABBYXX
STABOND 136 ADHESIVE	AMERICAN LATEX PRODUCTS		71-2569-3	GOX	1250.0		50	01/01					T	11	ABBYXX
STABOND 136 ADHESIVE	AMERICAN LATEX PRODUCTS		71-2569-4	GOX	900.0		50	00/04					A	11	ABBYXX
STABOND 136 ADHESIVE	AMERICAN LATEX PRODUCTS		71-2569-5	GOX	1000.0		25	02/05					T	11	ABBYXX
STABOND 136 ADHESIVE	AMERICAN LATEX PRODUCTS		71-2569-6	GOX	900.0		25	00/05					A	11	ABBYXX
STAKYD POLYESTR+105A	RESULTRONIX INC		71-2677	A-50	755.0	500							T	15	BACCXX
STAKYD POLYESTR+105A	RESULTRONIX INC		71-2677-1	A-50	767.0	517							T	15	BACCXX
STEEL CD PLATED			71-2715	A-50	759.0	509							T	15	BNMDHS
STEEL CD PLATED			71-2715-1	A-50	783.0	521							T	15	BNMDHS
STEEL A-19-C4	ARMCO		71-2564	GOX	1500.0		50	00/04					A	11	BDMIMN
STEEL A-19-C4	ARMCO		71-2564-1	GOX	1500.0			00/04					A	10	BDMIMN
STELLITE 98M-2	HAYNES ALLOY CORP		70-2033	A-50	777.0	501							T	15	DMMDMO
STELLITE 98M-2	HAYNES ALLOY CORP		70-2033-1	MMH	832.0	529							T	15	DMMDMO
STELLITE 98M-2	HAYNES ALLOY CORP		70-2033-2	MMH	783.0	510							T	15	DMMDMO
STELLITE 98M-2	HAYNES ALLOY CORP		70-2033-3	MMH	758.0	490							T	15	DMMDMO
STELLITE-25	HAYNES ALLOY CORP		71-2241	GOX	1500.0		50	00/04					A	11	DMMDMO
STELLITE-25	HAYNES ALLOY CORP		71-2241-1	GOX	1500.0			00/04					A	10	DMMDMO
STELLITE-68	HAYNES ALLOY CORP		71-2243	GOX	1500.0		50	00/04					A	11	DMMDMO
STELLITE-68	HAYNES ALLOY CORP		71-2243-1	GOX	1500.0			00/04					A	10	DMMDMO
STYCAST 1090	EMERSON CUMING INC		71-2482	A-50	816.0	528							T	15	BABHXX
STYCAST 1090	EMERSON CUMING INC		71-2482-1	A-50	769.0	498							T	15	BABHXX
STYCAST 1090	EMERSON CUMING INC		71-5001	GOX	5000.0		50	00/04					A	11	BABHXX
STYCAST 1090	EMERSON CUMING INC		71-5001	GOX	5000.0		50	00/04					A	11	BABHXX
STYCAST 1090	EMERSON CUMING INC		71-5001-1	GOX	500.0			00/04					A	10	BABHXX
STYCAST 1090	EMERSON CUMING INC		71-5001-1	GOX	500.0			00/04					A	10	BABHXX
STYCAST 1090	EMERSON CUMING INC		71-5001-10	GOX	1000.0			01/04					T	10	BABHXX
STYCAST 1090	EMERSON CUMING INC		71-5001-10	GOX	1000.0			01/04					T	10	BABHXX
STYCAST 1090	EMERSON CUMING INC		71-5001-11	GOX	50.0				670	670			D	13	BABHXX

MFGR S DESIGNATION	MANUFACTURER	SPEC. THICK.	TEST RPT NO.	TEST ENVR	TEST PRESS	TEST TEMP	IMPT ENER	NO OF REACT	FLASH POINT	FIRE PT	PROP DIST	WT LOSS	R I	T T	MATL CODE
STYCAST 1090	EMERSON CUMING INC		71-5001-2	GOX	1000.0			01/01					T	10	BABHXX
STYCAST 1090	EMERSON CUMING INC		71-5001-3	GOX	1500.0			01/01					T	10	BABHXX
STYCAST 1090	EMERSON CUMING INC		71-5001-4	GOX	2000.0			01/01					T	10	BABHXX
STYCAST 1090	EMERSON CUMING INC		71-5001-5	GOX	2500.0			01/01					T	10	BABHXX
STYCAST 1090	EMERSON CUMING INC		71-5001-6	GOX	1000.0			00/04					A	10	BABHXX
STYCAST 1090	EMERSON CUMING INC		71-5001-7	GOX	1000.0			01/03					T	10	BABHXX
STYCAST 1090	EMERSON CUMING INC		71-5001-8	GOX	1500.0			01/03					T	10	BABHXX
STYCAST 1090	EMERSON CUMING INC		71-5001-9	GOX	3000.0			01/01					T	10	BABHXX
STYCAST 2651/CAT 9	EMERSON CUMING INC	.0750	70-2065	GOX	1500.0		50	00/04					A	11	BABHGS
STYCAST 2651/CAT 9	EMERSON CUMING INC	.0750	70-2065-1	GOX	1500.0			01/02					T	10	BABHGS
STYCAST 2651/CAT 9	EMERSON CUMING INC		70-2065-2	GOX	1000.0				563	563			D	13	BABHGS
STYCAST 2651/CAT 9	EMERSON CUMING INC		70-2065-3	GOX	250.0			00/04					A	10	BABHGS
STYCAST 2651/CAT 9	EMERSON CUMING INC		70-2065-4	A-50	754.0	427							T	15	BABHGS
STYCAST 2651/CAT 9	EMERSON CUMING INC		70-2065-5	A-50	809.0	516							T	15	BABHGS
STYCAST 2651/CAT 9	EMERSON CUMING INC		71-2312	GOX	2000.0			01/04					T	10	BABGXX
STYCAST 2651/CAT 9	EMERSON CUMING INC		71-2312-1	GOX	1500.0				566	566			D	13	BABGXX
STYCAST 2762-FT	EMERSON CUMING INC		71-2691	GOX	250.0			00/04					A	10	DPBGXX
STYCAST 2762-FT	EMERSON CUMING INC		71-2691-1	GOX	1500.0			01/01					T	10	DPBGXX
STYCAST 2762-FT	EMERSON CUMING INC		71-2691-2	GOX	150.0				608	608			D	13	DPBGXX
SUPFLEX 18			71-2691-3	GOX	1000.0				569	569			D	13	DPBGXX
SUPFLEX 18			71-2600	A-50	773.0	518							T	15	FJDPFV
SUPERBRITE GLASS BEADS	3M CO. ST. PAUL		71-2600-1	A-50	762.0	514							T	15	FJDPFV
SUPERBRITE GLASS BEADS	3M CO. ST. PAUL		70-2031	GOX	200.0	1000			N999	N999			R	13	BEIAXX
SUPERBRITE GLASS BEADS	3M CO. ST. PAUL		70-2031-1	GOX	1000.0	1000			N999	N999			R	13	BEIAXX
SVSK 81370-11.AMS-3674	HAMILTON STANDARD		70-2031-2	GOX	200.0	1000			N999	N999			A	13	BEIAXX
SVSK 81370-11.AMS-3674	HAMILTON STANDARD		71-2309	GOX	5000.0			01/01					T	10	DUBOXX
SVSK 81370-11.AMS-3674	HAMILTON STANDARD		71-2309-1	GOX	5000.0		50	00/04					A	11	DUBOXX
SVSK 81370-11.AMS-3674	HAMILTON STANDARD		71-2309-2	GOX	1500.0				639	639			D	13	DUBOXX
SVSK 81370-13B.MIL-A8625	HAMILTON STANDARD		71-2309-3	GOX	3000.0				639	639			D	13	DUBOXX
SVSK 81370-15B	HAMILTON STANDARD		71-2305	GOX	2000.0			00/04					A	10	FIXXXX
SVSK 81370-17 TUNGSTON	HAMILTON STANDARD		71-2301	GOX	2000.0			00/04					A	10	DTMDXX
SVSK 81370-18.AMS-4928	HAMILTON STANDARD		71-2374	GOX	2500.0		50	00/04					A	11	DMMWXX
SVSK 81370-19A TI ALLOY	HAMILTON STANDARD		71-2307	GOX	2500.0		50	00/04					A	11	FIMTXX
SVSK 81370-21	HAMILTON STANDARD		71-2375	GOX	2500.0		50	01/01					T	11	DMMTXX
SVSK 81370-21	HAMILTON STANDARD		71-2310	GOX	2000.0			00/04					A	10	ELCDHS
SVSK 81370-23A	HAMILTON STANDARD		71-2310-1	GOX	1500.0				651	651			D	13	ELCDHS
SVSK 81370-23A	HAMILTON STANDARD		71-2306	GOX	5000.0			00/04					A	10	FKMRXX
SVSK 81370-30A	HAMILTON STANDARD		71-2306-1	GOX	6800.0			00/04					A	10	FKMRXX
SVSK 81370-32A	HAMILTON STANDARD		71-2308	GOX	2000.0			00/04					A	10	FLXXX
SVSK 81370-5	HAMILTON STANDARD		71-2299	GOX	6800.0		50	00/04					A	11	DMMRXX
SVSK 81370-5	HAMILTON STANDARD		71-2298	GOX	2000.0			01/01					T	10	DVXXXX
SVSK 81370-7	HAMILTON STANDARD		71-2298-1	GOX	1500.0				518	518			D	13	DVXXXX
SVSK 81370-7	HAMILTON STANDARD		71-2300	GOX	2000.0			00/04					A	10	DVXXXX
			71-2300-1	GOX	1500.0				466	466			D	13	DVXXXX

MFGR S DESIGNATION	MANUFACTURER	SPEC. THICK.	TEST RPT NO.	TEST ENVR	TEST PRESS	TEST TEMP	IMPT ENER	NO OF REACT	FLASH POINT	FIRE PT	PROP DIST	WT LOSS	R I	T T	MATL CODE
SVSK 81370-8A	HAMILTON STANDARD		71-2302	GOX	2000.0			00/04					A	10	DVXXXX
SVSK 81370-8A	HAMILTON STANDARD		71-2302-1	GOX	1500.0				564	564			D	13	DVXXXX
SYLGARD 183	DOW CORNING CORP		71-2550	MMH	785.0	510							T	15	BADPXX
SYLGARD 183	DOW CORNING CORP		71-2550-1	MMH	729.0	501							T	15	BADPXX
SYLGARD 184	DOW CORNING CORP	.0750	70-2057	GOX	1500.0		50	00/04					A	11	BADPXX
SYLGARD 184	DOW CORNING CORP	.0750	70-2057-1	GOX	1500.0			01/01					T	10	BADPXX
SYLGARD 184	DOW CORNING CORP		70-2057-10	GOX	50.0				616	616			D	13	BADPXX
SYLGARD 184	DOW CORNING CORP		70-2057-2	GOX	1000.0				371	371			D	13	BADPXX
SYLGARD 184	DOW CORNING CORP		70-2057-3	GOX	50.0				414	414			D	13	BADPXX
SYLGARD 184	DOW CORNING CORP		70-2057-4	GOX	100.0				397	397			D	13	BADPXX
SYLGARD 184	DOW CORNING CORP		70-2057-5	GOX	500.0				361	361			D	13	BADPXX
SYLGARD 184	DOW CORNING CORP		70-2057-6	GOX	1500.0				314	314			D	13	BADPXX
SYLGARD 184	DOW CORNING CORP		70-2057-7	GOX	2000.0				234	234			D	13	BADPXX
SYLGARD 184	DOW CORNING CORP		70-2057-8	GOX	1000.0	398							D	15	BADPXX
SYLGARD 184	DOW CORNING CORP		70-2057-9	GOX	25.0				656	696			D	13	BADPXX
SYNTHETIC RUBBER	NR		71-2711	A-50	655.0	480							T	15	DOCKXX
SYNTHETIC RUBBER	NR		71-2711-1	A-50	671.0	488							T	15	DOCKXX
SYNTHETIC RUBBER GLOVE	CHARLESTON RUBBER CO.		71-2361	GOX	500.0		50	00/04					A	11	DPDPXX
SYNTHETIC RUBBER GLOVE	CHARLESTON RUBBER CO.		71-2361-1	GOX	500.0			00/04					A	10	DPDPXX
SYNTHETIC RUBBER GLOVE	CHARLESTON RUBBER CO.		71-2361-2	GOX	100.0				419	419			D	13	DPDPXX
S417-7	PARKER SEAL/LOS ANGLS		69-1566	GOX	5.0				725	787			D	13	CHDQXX
S417-7	PARKER SEAL/LOS ANGLS		69-1566-1	GOX	25.0				578	746			D	13	CHDQXX
S417-7	PARKER SEAL/LOS ANGLS	.0750	69-1566-10	GOX	1500.0			01/01					T	10	CHDQXX
S417-7	PARKER SEAL/LOS ANGLS	.0750	69-1566-11	GOX	2000.0			01/04					T	10	CHDQXX
S417-7	PARKER SEAL/LOS ANGLS	.0750	69-1566-12	GOX	2500.0			01/01					T	10	CHDQXX
S417-7	PARKER SEAL/LOS ANGLS	.0750	69-1566-13	GOX	3000.0			01/02					T	10	CHDQXX
S417-7	PARKER SEAL/LOS ANGLS	.0750	69-1566-14	GOX	3500.0			01/02					T	10	CHDQXX
S417-7	PARKER SEAL/LOS ANGLS	.0750	69-1566-15	GOX	4000.0			01/01					T	10	CHDQXX
S417-7	PARKER SEAL/LOS ANGLS	.0750	69-1566-16	GOX	4500.0			01/01					T	10	CHDQXX
S417-7	PARKER SEAL/LOS ANGLS	.0750	69-1566-17	GOX	5000.0			04/04					T	10	CHDQXX
S417-7	PARKER SEAL/LOS ANGLS	.0750	69-1566-18	GOX	4500.0		200	00/04					A	11	CHDQXX
S417-7	PARKER SEAL/LOS ANGLS	.0750	69-1566-19	GOX	5000.0		200	01/02					T	11	CHDQXX
S417-7	PARKER SEAL/LOS ANGLS		69-1566-2	GOX	50.0				689	732			D	13	CHDQXX
S417-7	PARKER SEAL/LOS ANGLS		69-1566-20	GOX	6.2	1000			N999	N999			R	13	CHDQXX
S417-7	PARKER SEAL/LOS ANGLS		69-1566-3	GOX	50.0				523	523			D	13	CHDQXX
S417-7	PARKER SEAL/LOS ANGLS		69-1566-4	GOX	100.0				509	509			D	13	CHDQXX
S417-7	PARKER SEAL/LOS ANGLS		69-1566-5	GOX	500.0				446	446			D	13	CHDQXX
S417-7	PARKER SEAL/LOS ANGLS		69-1566-6	GOX	1000.0				422	422			D	13	CHDQXX
S417-7	PARKER SEAL/LOS ANGLS		69-1566-7	GOX	1500.0				393	393			D	13	CHDQXX
S417-7	PARKER SEAL/LOS ANGLS		69-1566-8	GOX	2000.0				393	393			D	13	CHDQXX
S417-7	PARKER SEAL/LOS ANGLS	.0750	69-1566-9	GOX	1000.0			00/04					A	10	CHDQXX
T-83 FELT			71-2659	MMH	791.0	525							T	15	DUEFXX
T-83 FELT			71-2659-1	MMH	730.0	505								15	DUEFXX
TAPE P-211	PERMACEL TAPE CORP		71-2601	MMH	802.0	542							T	15	EBFVXX

MFGR S DESIGNATION	MANUFACTURER	SPEC. THICK.	TEST RPT NO.	TEST ENVR	TEST PRESS	TEST TEMP	IMPT ENER	NO OF REACT	FLASH POINT	FIRE PT	PROP DIST	WT LOSS	R I	T Y	MATL CODE
TAPE P-211	PERMACEL TAPE CORP		71-2681-1	MMH	795.0	540							T	15	CBFVXX
TAPE P-422	PERMACEL TAPE CORP		71-2403	GOX	250.0			00/04					A	10	EBCNXX
TAPE P-422	PERMACEL TAPE CORP		71-2403-1	GOX	75.0				476	476			D	13	EBCNXX
TAPE 56	3M CO. ST. PAUL		70-2172	GOX	1500.0			01/01					T	10	DZCCDH
TAPE 56	3M CO. ST. PAUL		70-2172-1	GOX	1000.0				194	194			D	13	DZCCDH
TAPE 56	3M CO. ST. PAUL		70-2172-2	GOX	1000.0				212	212			D	13	DZCCDH
TAPE 56	3M CO. ST. PAUL		70-2172-3	GOX	1000.0	308							D	15	DZCCDH
TAPE 56	3M CO. ST. PAUL		71-2487	A-50	824.0	519							T	15	DZCCDH
TAPE 56	3M CO. ST. PAUL		71-2487-1	A-50	760.0	494							T	15	DZCCDH
TAPE 59	3M CO. ST. PAUL		70-2173	GOX	1500.0			01/01					T	10	DYCBCK
TAPE 59	3M CO. ST. PAUL		70-2173-1	GOX	1000.0				232	232			D	13	DYCBCK
TAPE 59	3M CO. ST. PAUL		70-2173-10	GOX	50.0				501	501			D	13	DYCBCK
TAPE 59	3M CO. ST. PAUL		70-2173-11	GOX	100.0				471	471			D	13	DYCBCK
TAPE 59	3M CO. ST. PAUL		70-2173-12	GOX	500.0				416	416			D	13	DYCBCK
TAPE 59	3M CO. ST. PAUL		70-2173-13	GOX	1000.0				264	264			D	13	DYCBCK
TAPE 59	3M CO. ST. PAUL		70-2173-14	GOX	1500.0				196	196			D	13	DYCBCK
TAPE 59	3M CO. ST. PAUL		70-2173-15	GOX	2000.0				225	225			D	13	DYCBCK
TAPE 59	3M CO. ST. PAUL		70-2173-16	GOX	3000.0				265	265			D	15	DYCBCK
TAPE 59	3M CO. ST. PAUL		70-2173-18	GOX	25.0				664	664			D	13	DYCBCK
TAPE 59	3M CO. ST. PAUL		70-2173-19	GOX	50.0				652	652			D	13	DYCBCK
TAPE 59	3M CO. ST. PAUL		70-2173-2	GOX	3000.0				223	223			D	13	DYCBCK
TAPE 59	3M CO. ST. PAUL		70-2173-3	GOX	5000.0		50	01/01					Z	11	DYCBCK
TAPE 59	3M CO. ST. PAUL		70-2173-4	GOX	4000.0		50	01/01					Z	11	DYCBCK
TAPE 59	3M CO. ST. PAUL		70-2173-5	GOX	2000.0		50	01/01					Z	11	DYCBCK
TAPE 59	3M CO. ST. PAUL		70-2173-6	GOX	1000.0		50	01/01					Z	11	DYCBCK
TAPE 59	3M CO. ST. PAUL		70-2173-7	GOX	500.0		50	01/01					Z	11	DYCBCK
TAPE 59	3M CO. ST. PAUL		70-2173-8	GOX	1000.0			01/01					T	10	DYCBCK
TAPE 59	3M CO. ST. PAUL		70-2173-9	GOX	500.0			00/04					A	10	DYCBCK
TAPE 59	3M CO. ST. PAUL		71-2478	A-50	734.0	474							T	15	DYCBCK
TAPE 59	3M CO. ST. PAUL		71-2478-1	A-50	733.0	494							T	15	DYCBCK
TAPE 60	3M CO. ST. PAUL		71-2409	GOX	250.0			00/04					A	10	DZCDCK
TAPE 60	3M CO. ST. PAUL		71-2409-1	GOX	75.0				542	542			D	13	DZCDCK
TAPE 61	3M CO. ST. PAUL		71-2261	A-50	779.0	497							T	15	DZCDCK
TAPE 61	3M CO. ST. PAUL		71-2261-1	A-50	828.0	516							T	15	DZCDCK
TAPE 67	3M CO. ST. PAUL		71-2529	MMH	754.0	498							T	15	EBBGIA
TAPE 67	3M CO. ST. PAUL		71-2529-1	MMH	778.0	507							T	15	EBBGIA
TAPE 74	3M CO. ST. PAUL		71-2445	A-50	725.0	500							T	15	EBCBXX
TAPE 74	3M CO. ST. PAUL		71-2445-1	A-50	591.0	464							T	15	EBCBXX
TAPE 74	3M CO. ST. PAUL		71-2530	MMH	801.0	511							T	15	EBCBXX
TAPE 74	3M CO. ST. PAUL		71-2530-1	MMH	817.0	514							T	15	EBCBXX
TAPE 74	3M CO. ST. PAUL		71-2686	MMH	773.0	498							T	15	EBCBXX
TAPE 74	3M CO. ST. PAUL		71-2686-1	MMH	789.0	541							T	15	EBCBXX
TEFLON (.25GLASS FILLED)	DIXON CORP		10-78	GOX	6.2	1000			N999	N999			Y	13	FJCPIA
TEFLON (.25GLASS FILLED)	DIXON CORP		10-78	GOX	6.2	1000			N999	N999			Y	13	FJCPIA

MFGR S DESIGNATION	MANUFACTURER	SPEC. THICK.	TEST RPT NO.	TEST ENVR	TEST PRES	TEST TEMP	IMPT ENER	NO OF REACT	FLASH POINT	FIRE PT	PROP DIST	WT LOSS	R I	T T	MATL CODE
TEFLON (.25GLASS FILLED)	DIXON CORP		10-78-1	GOX	16.5	1000			961	N999			Y	13	FJCPIA
TEFLON (.25GLASS FILLED)	DIXON CORP		10-78-1	GOX	16.5	1000			961	N999			Y	13	FJCPIA
TEFLON (.25GLASS FILLED)	DIXON CORP	.0750	70-2099	GOX	1500.0		50	00/04					A	11	DKCPIA
TEFLON (.25GLASS FILLED)	DIXON CORP	.0750	70-2099-1	GOX	1500.0			00/04					A	10	DKCPIA
TEFLON (.25GLASS FILLED)	DIXON CORP		70-2099-2	GOX	1000.0				786	786			D	13	DKCPIA
TEFLON (.25GLASS FILLED)	DIXON CORP		70-2099-3	GOX	1000.0				778	778			D	13	DKCPIA
TEFLON (.25GLASS FILLED)	DIXON CORP	.0750	70-2099-3	GOX	1500.0		50	00/04					A	11	DKCPIA
TEFLON (.25GLASS FILLED)	LIQUID NITROGEN CORP	.0750	10-78-10	GOX	1500.0		200	01/01					D	11	FJCPIA
TEFLON (.25GLASS FILLED)	LIQUID NITROGEN CORP	.0750	10-78-11	GOX	2000.0		200	01/01					D	11	FJCPIA
TEFLON (.25GLASS FILLED)	LIQUID NITROGEN CORP	.0750	10-78-12	GOX	2500.0		200	01/01					D	11	FJCPIA
TEFLON (.25GLASS FILLED)	LIQUID NITROGEN CORP	.0750	10-78-13	GOX	3000.0		200	01/02					D	11	FJCPIA
TEFLON (.25GLASS FILLED)	LIQUID NITROGEN CORP	.0750	10-78-14	GOX	3500.0		200	04/04					D	11	FJCPIA
TEFLON (.25GLASS FILLED)	LIQUID NITROGEN CORP	.0750	10-78-15	GOX	4000.0		200	01/01					D	11	FJCPIA
TEFLON (.25GLASS FILLED)	LIQUID NITROGEN CORP	.0750	10-78-2	GOX	2500.0			00/04					A	10	FJCPIA
TEFLON (.25GLASS FILLED)	LIQUID NITROGEN CORP	.0750	10-78-3	GOX	3000.0			01/01					D	10	FJCPIA
TEFLON (.25GLASS FILLED)	LIQUID NITROGEN CORP	.0750	10-78-4	GOX	3500.0			01/01					D	10	FJCPIA
TEFLON (.25GLASS FILLED)	LIQUID NITROGEN CORP	.0750	10-78-5	GOX	4000.0			01/03					D	10	FJCPIA
TEFLON (.25GLASS FILLED)	LIQUID NITROGEN CORP	.0750	10-78-6	GOX	4500.0			01/02					D	10	FJCPIA
TEFLON (.25GLASS FILLED)	LIQUID NITROGEN CORP	.0750	10-78-7	GOX	5000.0			01/02					D	10	FJCPIA
TEFLON (.25GLASS FILLED)	LIQUID NITROGEN CORP	.0750	10-78-8	GOX	500.0		200	01/02					D	11	FJCPIA
TEFLON (.25GLASS FILLED)	LIQUID NITROGEN CORP	.0750	10-78-9	GOX	1000.0		200	01/02					D	11	FJCPIA
TEFLON (.25GLASS FILLED)	LIQUID NITROGEN CORP		70-1923	GOX	1500.0			00/04					A	10	FJCPIA
TEFLON (.25GLASS FILLED)	LIQUID NITROGEN CORP		70-1923	GOX	1500.0		500	00/04					A	11	FJCPIA
TEFLON (.25GLASS FILLED)	LIQUID NITROGEN CORP		70-1923	GOX	1500.0		50	00/04					A	11	FJCPIA
TEFLON (.25GLASS FILLED)	LIQUID NITROGEN CORP		70-1923	GOX	1500.0			00/04					A	10	FJCPIA
TEFLON (.25GLASS FILLED)	LIQUID NITROGEN CORP	.0750	70-1923-1	GOX	1500.0			00/04					A	10	FJCPIA
TEFLON (.25GLASS FILLED)	LIQUID NITROGEN CORP	.0750	70-1923-2	GOX	1000.0		200	00/04					T	11	FJCPIA
TEFLON (.25GLASS FILLED)	LIQUID NITROGEN CORP	.0750	70-1923-3	GOX	1500.0		200	01/03					T	11	FJCPIA
TEFLON (.25GLASS FILLED)	LIQUID NITROGEN CORP		70-1923-4	A-50	802.0	526							T	15	FJCPIA
TEFLON (.25GLASS FILLED)	LIQUID NITROGEN CORP		70-1923-5	A-50	771.0	509							T	15	FJCPIA
TEFLON (.25GLASS FILLED)	LIQUID NITROGEN CORP		70-1923-6	GOX	1500.0				687	687			D	13	FJCPIA
TEFLON (VIRGIN)	CADILLAC PLASTICS	.0750	10-41	GOX	4000.0			00/04					A	10	CHCNXX
TEFLON (VIRGIN)	CADILLAC PLASTICS	.0750	10-41-1	GOX	4500.0			04/04					D	10	CHCNXX
TEFLON (VIRGIN)	CADILLAC PLASTICS	.0750	10-41-2	GOX	5000.0		50	00/04					A	11	CHCNXX
TEFLON (VIRGIN)	CADILLAC PLASTICS		10-41-3	GOX	16.5	1000			N999	N999			Y	13	CHCNXX
TEFLON (VIRGIN)	CADILLAC PLASTICS		10-41-4	GOX	1000.0	736							D	15	CHCNXX
TEFLON (VIRGIN)	CADILLAC PLASTICS		10-41-5	GOX	1000.0				736	736			D	13	CHCNXX
TEFLON AMS 3651C	HOKE INC		71-2842	GOX	5000.0		50	00/04					A	11	AZCOXX
TEFLON AMS 3651C	HOKE INC		71-2842-1	GOX	3000.0			01/01					D	10	AZCOXX
TEFLON AMS 3651C	HOKE INC		71-2842-2	GOX	2000.0			01/01					D	10	AZCOXX
TEFLON AMS 3651C	HOKE INC		71-2842-3	GOX	1500.0			00/04					A	10	AZCOXX
TEFLON FEP	E.I. DUPONT CO.,INC.		70-1962	A-50	754.0	500							T	15	DUBOXX
TEFLON FEP	E.I. DUPONT CO.,INC.		70-1962-1	A-50	771.0	504							T	15	DUBOXX
TEFLON FEP	E.I. DUPONT CO.,INC.		70-1962-2	A-50	739.0	490							T	15	DUBOXX

MFGR S DESIGNATION	MANUFACTURER	SPEC. THICK.	TEST RPT NO.	TEST ENVR	TEST PRESS	TEST TEMP	IMPT ENER	NO OF REACT	FLASH POINT	FIRE PT	PROP DIST	WT LOSS	R I	T T	MATL CODE
TEFLON FEP	E.I. DUPONT CO.,INC.		70-1962-3	A-50	730.0	502							T	15	DUBOXX
TEFLON FEP	E.I. DUPONT CO.,INC.		70-1962-4	MMH	818.0	567							T	15	DUBOXX
TEFLON FEP	E.I. DUPONT CO.,INC.		70-1962-5	MMH	790.0	506							T	15	DUBOXX
TEFLON FRICTION WASHER	VICTOR EQUIPMENT CO.		71-2776-1	GOX	2500.0			02/02					D	10	CHCNXX
TEFLON FRICTION WASHER	VICTOR EQUIPMENT CO.		71-2776-2	GOX	2000.0			01/01					D	10	CHCNXX
TEFLON FRICTION WASHER	VICTOR EQUIPMENT CO.		71-2776-3	GOX	1500.0			01/02					D	10	CHCNXX
TEFLON FRICTION WASHER	VICTOR EQUIPMENT CO.		71-2776-4	GOX	1000.0			00/04					A	10	CHCNXX
TEFLON IMPREG GLASS FAB	DODGE FIBERS CORP.		71-2406	GOX	250.0			00/04					A	10	BFCNIA
TEFLON IMPREG GLASS FAB	DODGE FIBERS CORP.		71-2406-1	GOX	75.0				828	828			D	13	BFCNIA
TEFLON IMPREG GLASS FAB	DODGE FIBERS CORP.		71-2406-10	GOX	50.0	1000			N999	N999			J	13	BFCNIA
TEFLON IMPREG GLASS FAB	DODGE FIBERS CORP.		71-2406-11	GOX	100.0				773	773			D	13	BFCNIA
TEFLON IMPREG GLASS FAB	DODGE FIBERS CORP.		71-2406-12	GOX	500.0				734	734			D	13	BFCNIA
TEFLON IMPREG GLASS FAB	DODGE FIBERS CORP.		71-2406-13	GOX	1000.0				684	684			D	13	BFCNIA
TEFLON IMPREG GLASS FAB	DODGE FIBERS CORP.		71-2406-14	GOX	1500.0				675	675			D	13	BFCNIA
TEFLON IMPREG GLASS FAB	DODGE FIBERS CORP.		71-2406-15	GOX	2000.0				650	650			D	13	BFCNIA
TEFLON IMPREG GLASS FAB	DODGE FIBERS CORP.		71-2406-16	GOX	5000.0		50	00/04					A	11	BFCNIA
TEFLON IMPREG GLASS FAB	DODGE FIBERS CORP.		71-2406-2	GOX	2500.0			01/01					T	10	BFCNIA
TEFLON IMPREG GLASS FAB	DODGE FIBERS CORP.		71-2406-3	GOX	1500.0			01/02					T	10	BFCNIA
TEFLON IMPREG GLASS FAB	DODGE FIBERS CORP.		71-2406-4	GOX	1000.0			01/01					T	10	BFCNIA
TEFLON IMPREG GLASS FAB	DODGE FIBERS CORP.		71-2406-5	GOX	500.0			00/04					A	10	BFCNIA
TEFLON IMPREG GLASS FAB	DODGE FIBERS CORP.		71-2406-8	GOX	25.0	1000			N999	N999			F	13	BFCNIA
TEFLON IMPREG GLASS FAB	DODGE FIBERS CORP.		71-2406-9	GOX	50.0				788	788			D	13	BFCNIA
TEFLON LINER HOSE 919	PARKER-HANNIFIN CORP		71-2947	GOX	2500.0		50	00/04					A	11	EFCOXX
TEFLON LINER HOSE 919	PARKER-HANNIFIN CORP		71-2947-1	GOX	2000.0		50	00/01					A	11	EFCOXX
TEFLON LINER HOSE 919	PARKER-HANNIFIN CORP		71-2947-2	GOX	1500.0		50	00/01					A	11	EFCOXX
TEFLON LINER HOSE 919	PARKER-HANNIFIN CORP		71-2947-3	GOX	2500.0			01/01					W	10	EFCOXX
TEFLON LINER HOSE 919	PARKER-HANNIFIN CORP		71-2947-4	GOX	2000.0			01/03					W	10	EFCOXX
TEFLON LINER HOSE 919	PARKER-HANNIFIN CORP		71-2947-5	GOX	1500.0			00/04					A	10	EFCOXX
TEFLON SEATS + SEALS	JAMESBURY CORP		71-2834	GOX	2500.0		50	00/04					A	11	CHCOXX
TEFLON SEATS + SEALS	JAMESBURY CORP		71-2834-1	GOX	2500.0			01/01					D	10	CHCOXX
TEFLON SEATS + SEALS	JAMESBURY CORP		71-2834-2	GOX	2000.0			01/03					D	10	CHCOXX
TEFLON SEATS + SEALS	JAMESBURY CORP		71-2834-3	GOX	1500.0			00/04					A	10	CHCOXX
TEFLON TAPE			70-1958	A-50	723.0	486							T	15	DYCNXX
TEFLON TAPE			70-1958-1	A-50	754.0	515							T	15	DYCNXX
TEFLON TAPE	DODGE INDUSTRIES,INC.		71-2485	A-50	758.0	500							T	15	DYCNXX
TEFLON TAPE	DODGE INDUSTRIES,INC.		71-2485-1	A-50	532.0	451							T	15	DYCNXX
TEFLON TAPE	DODGE INDUSTRIES,INC.		71-2485-2	A-50	801.0	511							T	15	DYCNXX
TEFLON TAPE	DODGE INDUSTRIES,INC.		71-2485-3	A-50	746.0	510							T	15	DYCNXX
TEFLON TAPE	DODGE INDUSTRIES,INC.		71-2485-4	A-50	757.0	520							T	15	DYCNXX
TEFLON TFE	E.I. DUPONT CO.,INC.		68-1106	GOX	5.0	1000			846	N999			J	13	DKCNXX
TEFLON TFE	E.I. DUPONT CO.,INC.		68-1106-1	GOX	25.0	1000			827	N999			Y	13	DKCNXX
TEFLON TFE	E.I. DUPONT CO.,INC.		68-1106-2	GOX	50.0				928	965			D	13	DKCNXX
TEFLON TFE	E.I. DUPONT CO.,INC.		68-1106-3	GOX	50.0				655	765			D	13	DKCNXX
TEFLON TFE	E.I. DUPONT CO.,INC.		68-1106-4	GOX	100.0				759	759			D	13	DKCNXX

MFGR S DESIGNATION	MANUFACTURER	SPEC. THICK.	TEST RPT NO.	TEST ENVR	TEST PRESS	TEST TEMP	IMPT ENER	NO OF REACT	FLASH POINT	FIRE PT	PROP WT DIST LOSS	R T T	MATL CODE
TEFLON TFE	E.I. DUPONT CO.,INC.		68-1106-5	GOX	500.0				712	712		D 13	DKCNXX
TEFLON TFE	E.I. DUPONT CO.,INC.		68-1106-6	GOX	1000.0				699	699		D 13	DKCNXX
TEFLON TFE	E.I. DUPONT CO.,INC.		68-1106-7	GOX	1500.0				692	692		D 13	DKCNXX
TEFLON TFE	E.I. DUPONT CO.,INC.		68-1106-8	GOX	2000.0				718	718		D 13	DKCNXX
TEFLON TFE	E.I. DUPONT CO.,INC.		70-19[illegible]	A-50	347.0	450						T 15	DKCNXX
TEFLON TFE	E.I. DUPONT CO.,INC.		70-1959-1	A-50	758.0	502						T 15	DKCNXX
TEFLON TFE	E.I. DUPONT CO.,INC.		70-1959-2	A-50	771.0	502						T 15	DKCNXX
TEFLON TFE	E.I. DUPONT CO.,INC.		70-1959-3	MMH	761.0	500						T 15	DKCNXX
TEFLON TFE	E.I. DUPONT CO.,INC.		70-1959-4	MMH	767.0	504						T 15	DKCNXX
TEFLON TFE	E.I. DUPONT CO.,INC.		70-1974	A-50	202.0	333						T 15	DUCNXX
TEFLON TFE	E.I. DUPONT CO.,INC.		70-1974-1	A-50	786.0	499						T 15	DUCNXX
TEFLON TFE	E.I. DUPONT CO.,INC.		70-1974-2	A-50	771.0	500						T 15	DUCNXX
TEFLON TFE	E.I. DUPONT CO.,INC.		70-1974-3	A-50	748.0	494						T 15	DUCNXX
TEFLON TFE AMS-3651			67-0146	GOX	1027.0				596	596		D 13	DKCOXX
TEFLON TFE AMS-3651			67-0146-1	GOX	1087.0				583	583		D 13	DKCOXX
TEFLON TFE AMS-3651			67-0146-2	GOX	1110.0				619	619		D 13	DKCOXX
TEFLON TFE AMS-3651			67-0146-3	GOX	1565.0				677	677		D 13	DKCOXX
TEFLON TFE AMS-3651	NR DOWNEY	.0750	70-2091	GOX	1500.0		50	00/04				A 11	DKCNXX
TEFLON TFE AMS-3651	NR DOWNEY	.0750	70-2091-1	GOX	1500.0			00/04				A 10	DKCNXX
TEFLON TFE AMS-3651	NR DOWNEY		70-2091-2	GOX	1000.0				782	782		D 13	DKCNXX
TEFLON TFE HEAT SHRINK	INSULECTRO CORP		70-2030	GOX	1500.0		50	00/04				A 11	EHCNXX
TEFLON TFE HEAT SHRINK	INSULECTRO CORP		70-2030-1	GOX	1500.0			00/04				A 10	EHCNXX
TEFLON TFE HEAT SHRINK	INSULECTRO CORP		70-2030-2	GOX	500.0				741	741		D 13	EHCNXX
TEFLON TFE HEAT SHRINK	INSULECTRO CORP		70-2030-3	GOX	1000.0				781	781		D 13	EHCNXX
TEFLON TFE.RESIN 79	E.I. DUPONT CO.,INC.		70-1994	GOX	1500.0		50	00/04				A 11	DKCNXX
TEFLON TFE.RESIN 79	E.I. DUPONT CO.,INC.		70-1994	GOX	1500.0			00/04				A 10	DKCNXX
TEFLON TFE.RESIN 79	E.I. DUPONT CO.,INC.		70-1994-1	GOX	1500.0				599	599		D 13	DKCNXX
TEFLON TFE.9-18 WHITE	SPARTA MANUFACTORING CO		71-2699	GOX	6500.0		50	00/04				A 11	DKCNXX
TEFLON TFE.9-18 WHITE	SPARTA MANUFACTORING CO		71-2699-1	GOX	6500.0			01/01				D 10	DKCNXX
TEFLON TFE.9-18 WHITE	SPARTA MANUFACTORING CO		71-2699-2	GOX	5000.0			01/01				D 10	DKCNXX
TEFLON TFE.9-18 WHITE	SPARTA MANUFACTORING CO		71-2699-3	GOX	4000.0			01/01				D 10	DKCNXX
TEFLON 3651	GAC		71-2279	A-50	809.0	502						T 15	DKCNXX
TEFLON 3651	GAC		71-2279-1	A-50	830.0	511						T 15	DKCNXX
TEFLON(.18 GLASS FILLED)	JAMESBURY CORP		71-2833	GOX	2500.0		50	00/04				A 11	CHCOFW
TEFLON(.18 GLASS FILLED)	JAMESBURY CORP		71-2833-1	GOX	2500.0			01/01				D 10	CHCOFW
TEFLON(.18 GLASS FILLED)	JAMESBURY CORP		71-2833-2	GOX	2000.0			01/01				D 10	CHCOFW
TEFLON(.18 GLASS FILLED)	JAMESBURY CORP		71-2833-3	GOX	1500.0			00/04				A 10	CHCOFW
TEFLON-GLASS FILLED			71-2424	LOX	14.7		50	00/04				A 16	FJCPIA
TEFLON-GLASS FILLED			71-2424-1	LOX	14.7		200	00/04				A 16	FJCPIA
TEFLON-GLASS FILLED			71-2424-2	GOX	1000.0		50	00/04				A 11	FJCPIA
TEFLON-GLASS FILLED			71-2424-3	GOX	1000.0		200	00/04				A 11	FJCPIA
TEFLON-GLASS FILLED	DIXON CORP		70-1921	GOX	1500.0		50	00/04				A 11	FJCPIA
TEFLON-GLASS FILLED	DIXON CORP		70-1921	GOX	1500.0			01/02				T 10	FJCPIA
TEFLON-GLASS FILLED	DIXON CORP	.0050	70-1921-1	GOX	1500.0			00/04				A 10	FJCPIA

MFGR S DESIGNATION	MANUFACTURER	SPEC. THICK.	TEST RPT NO.	TEST ENVR	TEST PRESS	TEST TEMP	IMPT ENER	NO OF REACT	FLASH POINT	FIRE PT	PROP DIST	WT LOSS	R T	MATL CODE
TEFLON-GLASS FILLED	DIXON CORP		70-1921-10	GOX	25.0	1000			N99[illegible]	N99[illegible]			Y 13	FJCPIA
TEFLON-GLASS FILLED	DIXON CORP		70-1921-11	GOX	50.0				954	95[illegible]			D 13	FJCPIA
TEFLON-GLASS FILLED	DIXON CORP		70-1921-12	GOX	5000.0		50	00/04					A 11	FJCPIA
TEFLON-GLASS FILLED	DIXON CORP		70-1921-13	GOX	1000.0			00/04					A 10	FJCPIA
TEFLON-GLASS FILLED	DIXON CORP		70-1921-14	GOX	1500.0			01/01					T 10	FJCPIA
TEFLON-GLASS FILLED	DIXON CORP		70-1921-15	GOX	2500.0			01/01					T 10	FJCPIA
TEFLON-GLASS FILLED	DIXON CORP		70-1921-16	GOX	1500.0				642	642			D 13	FJCPIA
TEFLON-GLASS FILLED	DIXON CORP		70-1921-17	GOX	1000.0	702							D 15	FJCPIA
TEFLON-GLASS FILLED	DIXON CORP		70-1921-18	GOX	100.0				742	742			D 13	FJCPIA
TEFLON-GLASS FILLED	DIXON CORP	.0050	70-1921-2	GOX	1500.0		200	01/03					T 11	FJCPIA
TEFLON-GLASS FILLED	DIXON CORP		70-1921-3	GOX	50.0				778	778			D 13	FJCPIA
TEFLON-GLASS FILLED	DIXON CORP		70-1921-4	GOX	1000.0				742	742			D 13	FJCPIA
TEFLON-GLASS FILLED	DIXON CORP		70-1921-5	GOX	500.0				714	714			D 13	FJCPIA
TEFLON-GLASS FILLED	DIXON CORP		70-1921-6	GOX	1000.0				693	693			D 13	FJCPIA
TEFLON-GLASS FILLED	DIXON CORP		70-1921-7	GOX	2000.0				662	662			D 13	FJCPIA
TEFLON-GLASS FILLED	DIXON CORP		70-1921-8	GOX	1500.0	642							D 15	FJCPIA
TEFLON-GLASS FILLED	DIXON CORP		70-1921-9	GOX	1000.0	702							D 15	FJCPIA
TEFLON-HALON G700	PARKER-HANNIFIN CORP		71-2832	GOX	2500.0		50	00/01					A 11	CHCOXX
TEFLON-HALON G700	PARKER-HANNIFIN CORP		71-2832-1	GOX	5000.0		50	00/04					A 11	CHCOXX
TEFLON-HALON G700	PARKER-HANNIFIN CORP		71-2832-2	GOX	5000.0			01/01					D 10	CHCOXX
TEFLON-HALON G700	PARKER-HANNIFIN CORP		71-2832-3	GOX	4000.0			01/01					D 10	CHCOXX
TEFLON-HALON G700	PARKER-HANNIFIN CORP		71-2832-4	GOX	3000.0			01/01					D 10	CHCOXX
TEFLON-HALON G700	PARKER-HANNIFIN CORP		71-2832-5	GOX	2500.0			01/03					D 10	CHCOXX
TEFLON-HALON G700	PARKER-HANNIFIN CORP		71-2832-6	GOX	2000.0			01/01					D 10	CHCOXX
TEFLON-HALON G700	PARKER-HANNIFIN CORP		71-2832-7	GOX	1500.0			00/03					A 10	CHCOXX
TEFLON/ALUMINUM	GAC		71-2254	A-50	820.0	513							T 15	DTCNMA
TEFLON/ALUMINUM	GAC		71-2254-1	A-50	779.0	504							T 15	DTCNMA
TEFLON+CERAMIC FILLED	UNKNOWN		71-2886-1	COX	6000.0		500	00/04					A 11	HZEOHO
TEFLON+CERAMIC FILLED	UNKNOWN		71-2886-2	GOX	6000.0			02/02					D 10	HZEOHO
TEFLON+CERAMIC FILLED	UNKNOWN		71-2886-3	GOX	5500.0			02/02					D 10	HZEOHO
TEFLON+CERAMIC FILLED	UNKNOWN		71-2886-4	GOX	5000.0			00/01					A 10	HZEOHO
TEFLON+CERAMIC FILLED	UNKNOWN		-2886-5	GOX	4500.0			01/01					D 10	HZEOHO
TEFLON+CERAMIC FILLED	UNKNOWN		71-2886-6	GOX	4000.0			01/02					D 10	HZEOHO
TEFLON+CERAMIC FILLED	UNKNOWN		71-2886-7	GOX	3500.0			01/02					D 10	HZEOHO
TEFLON+CERAMIC FILLED	UNKNOWN		71-2886-8	GOX	3000.0			00/04					A 10	HZEOHO
TEF30N TFE+9-18 WHITE	SPARTA MANUFACTORING CO		71-2699-4	GOX	3000.0			01/01					D 10	DKCNXX
TEF30N TFE+9-18 WHITE	SPARTA MANUFACTORING CO		71-2699-5	GOX	2500.0			01/01					D 10	DKCNXX
TEF30N TFE+9-18 WHITE	SPARTA MANUFACTORING CO		71-2699-6	GOX	2000.0			00/04					A 10	DKCNXX
TEMP SENSOR SHEATH COND	CONTROL PRODUCTS+INC.		71-2249	GOX	1500.0		50	00/04					A 11	EQMIMN
TEMP SENSOR SHEATH COND	CONTROL PRODUCTS+INC.		71-2249-1	GOX	1500.0			00/04					A 10	EQMIMN
TFE COATED FIBERGLASS			71-2599	A-50	804.0	492							T 15	BGCNXX
TFE COATED FIBERGLASS			71-2599-1	A-50	823.0	471							T 15	BGCNXX
TFE/FIBERGLAS TAPE	NR		70-2064	MMH	763.0	448							T 15	DYCNFV
TFE/FIBERGLAS TAPE	NR		70-2064-1	MMH	534.0	459							T 15	DYCNFV

MFGR S DESIGNATION	MANUFACTURER	SPEC. THICK.	TEST RPT NO.	TEST ENVR	TEST PRESS	TEST TEMP	IMPT EMER	NO OF REACT	FLASH POINT	FIRE PT	PROP DIST	WT LOSS	R I	T T	MATL CODE
TFE/NYLON SANDWICH			71-2950	GOX	3000.0		50	00/04					A	11	DUCNBS
TFE/NYLON SANDWICH			71-2950-1	GOX	5000.0		50	00/04					A	11	DUCNBS
TFE/NYLON SANDWICH			71-2950-2	GOX	3000.0			01/01					W	10	DUCNBS
TFE/NYLON SANDWICH			71-2950-3	GOX	000.0			01/01					W	10	DUCNBS
TFE/TETRAETCH	DUPONT/W.L. GORE		71-2605	A-50	597.0	509							T	15	FJCNXX
TFE/TETRAETCH	DUPONT/W.L. GORE		71-2605-1	A-50	746.0	515							T	15	FJCNXX
TH-1167 SILICONE RUBBER	SARGENT INDUSTRIES		71-2252	GOX	100.0				571	571			D	13	DPDPXX
TH-1167 SILICONE RUBBER	SARGENT INDUSTRIES		71-2252-1	GOX	500.0		50	00/04					A	11	DPDPXX
TH-1167 SILICONE RUBBER	SARGENT INDUSTRIES		71-2252-2	GOX	500.0			00/04					A	10	DPDPXX
TITANIUM ALLOY NO 52	COAST METALS.INC.		71-2280	GOX	5000.0			00/04					A	10	DTMTXX
TITANIUM ALLOY NO 52	COAST METALS.INC.		71-2280-1	GOX	6800.0			00/04					A	10	DTMTXX
TITANIUM TUBING	REACTIVE METALS INC		70-1944	GOX	1500.0		50	00/04					A	11	DNCNXX
TITANIUM TUBING	REACTIVE METALS INC		70-1944	GOX	1500.0			00/04					A	10	DNCNXX
TITANIUM TUBING	REACTIVE METALS INC		70-1944-1	A-50	801.0	507							T	15	FFMTXX
TITANIUM TUBING	REACTIVE METALS INC		70-1944-2	A-50	805.0	478							T	15	FFMTXX
TITANIUM TUBING	REACTIVE METALS INC		70-1944-3	A-50	822.0	506							T	15	FFMTXX
TITANIUM TUBING	REACTIVE METALS INC		70-1944-4	A-50	826.0	531							T	15	FFMTXX
TITANIUM TUBING	REACYIVE METALS INC		70-1944-5	GOX	1500.0	1000			N999	N999			A	13	EFMTXX
TUNGCARBIDE SVSK0131 0-33	HAMILTON STANDARD		71-2291	GOX	6800.0		50	00/04					A	11	DMMWMJ
TUNGCARBIDE SVSK0137D-33	HAMILTON STANDARD		71-2291-1	GOX	3000.0	1000			N999	N999			A	13	DMMWMJ
VANADIUM/NICKEL	GAC		71-2506	A-50	771.0	499							T	15	FIMVMN
VANADIUM/NICKEL	GAC		71-2506-1	A-50	698.0	483							T	15	FIMVMN
VARAGLASS INSULATION	ROSEMONT ENG. CORP		70-1989	GOX	1500.0		50	00/04					A	11	FJGDXX
VARAGLASS INSULATION	ROSEMONT ENG. CORP		70-1989	GOX	1500.0			00/04					A	10	FJGDXX
VARAGLASS INSULATION	ROSEMONT ENG. CORP		70-1989-1	GOX	1500.0	1000			N999	N999			A	13	FJGDXX
VARGLASS SLEEVE	VARFLEX CORP		71-2484	A-50	777.0	501							T	15	FJCLFW
VARGLASS SLEEVE	VARFLEX CORP		71-2484-1	A-50	850.0	494							T	15	FJCLFW
VASCOMEX 300. NI PLATED	NR	.0750	70-2214	GOX	1500.0			00/04					A	10	DNNDXX
VASCOMEX 300. NI PLATED	NR	.0750	70-2214-1	GOX	1500.0		50	00/04					A	11	DNNDXX
VESPEL SP-1	E.I. DUPONT CO.,INC.		67-0808	GOX	5.0	1000			N999	N999			R	13	DKCDXX
VESPEL SP-1	E.I. DUPONT CO.,INC.		67-0808-1	GOX	25.0	1000			833	N999			R	13	DKCDXX
VESPEL SP-1	E.I. DUPONT CO.,INC.	.0750	67-0808-10	GOX	5000.0		200	00/05					A	11	DKCDXX
VESPEL SP-1	E.I. DUPONT CO.,INC.		67-0808-10	GOX	15.5	1000			N999	N999			A	13	DKCDXX
VESPEL SP-1	E.I. DUPONT CO.,INC.		67-0808-2	GOX	50.0	1000			840	N999			R	13	DKCDXX
VESPEL SP-1	E.I. DUPONT CO.,INC.		67-0808-3	GOX	50.0				901	901			D	13	DKCDXX
VESPEL SP-1	E.I. DUPONT CO.,INC.		67-0808-4	GOX	100.0				845	845			D	13	DKCDXX
VESPEL SP-1	E.I. DUPONT CO.,INC.		67-0808-5	GOX	500.0				727	727			D	13	DKCDXX
VESPEL SP-1	E.I. DUPONT CO.,INC.		67-0808-6	GOX	1000.0				657	657			D	13	DKCDXX
VESPEL SP-1	E.I. DUPONT CO.,INC.		67-0808-7	GOX	1500.0				594	594			D	13	DKCDXX
VESPEL SP-1	E.I. DUPONT CO.,INC.		67-0808-8	GOX	2000.0				587	587			D	13	DKCDXX
VESPEL SP-1	E.I. DUPONT CO.,INC.		67-0808-9	GOX	6.2	1000			N999	N999			R	13	DKCDXX
VESPEL SP-1	E.I. DUPONT CO.,INC.	.0750	67-0808-9	GOX	5000.0			00/05					A	10	DKCDXX
VESPEL SP-1	E.I. DUPONT CO.,INC.		70-1881	GOX	2000.0			00/04					A	10	DKCDXX
VESPEL SP-1	E.I. DUPONT CO.,INC.		70-1881	GOX	2000.0		50	00/04					A	11	DKCDXX

MFGR S DESIGNATION	MANUFACTURER	SPEC. THICK.	TEST RPT NO.	TEST ENVR	TEST PRESS	TEST TEMP	IMPT ENER	NO OF REACT	FLASH POINT	FIRE PT	PROP DIST	WT LOSS	S T	T T	MATL CODE
VESPEL SP-1	E.I. DUPONT CO.,INC.		70-1881-1	GOX	50.0				953	953			D	13	DKCDXX
VESPEL SP-1	E.I. DUPONT CO.,INC.		70-1881-2	GOX	100.0				912	912			D	13	DKCDXX
VESPEL SP-1	E.I. DUPONT CO.,INC.		70-1881-3	GOX	500.0				818	818			D	13	DKCDXX
VESPEL SP-1	E.I. DUPONT CO.,INC.		70-1881-4	GOX	1000.0				664	674			D	13	DKCDXX
VESPEL SP-1	E.I. DUPONT CO.,INC.		70-1881-5	GOX	1500.0				674	674			D	13	DKCDXX
VESPEL SP-1	E.I.DUPONT CO.INC.		70-1881-6	GOX	25.0				N999	N999			R	13	DKCDXX
VESPEL SP-1	E.I.DUPONT CO.INC.		70-1881-7	GOX	50.0				N999	N999			R	13	DKCDXX
VESPEL SP-1	E.I.DUPONT CO.INC.		70-1881-8	GOX	2000.0				660	660			D	13	DKCDXX
VESPEL SP-21	E.I. DUPONT CO.,INC.		M9-0399	GOX	5.0	1000			551	N999				13	DKCDGF
VESPEL SP-21	E.I. DUPONT CO.,INC.		M9-0399-1	GOX	25.0	1000			951	N999				13	DKCDGF
VESPEL SP-21	E.I. DUPONT CO.,INC.	.0750	M9-0399-10	GOX	5000.0			00/04					A	10	DKCDGF
VESPEL SP-21	E.I. DUPONT CO.,INC.	.0750	M9-0399-11	GOX	5000.0		200	00/05					A	11	DKCDGF
VESPEL SP-21	E.I. DUPONT CO.,INC.		M9-0399-12	GOX	6.2	1000			N999	N999			J	13	DKCDGF
VESPEL SP-21	E.I. DUPONT CO.,INC.		M9-0399-13	GOX	16.5	1000			N999	N999			J	13	DKCDGF
VESPEL SP-21	E.I. DUPONT CO.,INC.		M9-0399-2	GOX	50.0	1000			522	N999			J	13	DKCDGF
VESPEL SP-21	E.I. DUPONT CO.,INC.		M9-0399-3	GOX	50.0				935	935			D	13	DKCDGF
VESPEL SP-21	E.I. DUPONT CO.,INC.		M9-0399-4	GOX	100.0				921	921			D	13	DKCDGF
VESPEL SP-21	E.I. DUPONT CO.,INC.		M9-0399-5	GOX	500.0				835	835			D	13	DKCDGF
VESPEL SP-21	E.I. DUPONT CO.,INC.		M9-0399-6	GOX	1000.0				730	730			D	13	DKCDGF
VESPEL SP-21	E.I. DUPONT CO.,INC.		M9-0399-7	GOX	1500.0				645	645			D	13	DKCDGF
VESPEL SP-21	E.I. DUPONT CO.,INC.		M9-0399-8	GOX	2000.0				613	613			D	13	DKCDGF
VESPEL SP-21	E.I. DUPONT CO.,INC.	.0750	M9-0399-9	GOX	4500.0			00/01					A	10	DKCDGF
VESPEL SP-21	E.I. DUPONT CO.,INC.		70-1880	GOX	2000.0			00/04					A	10	DKCDGF
VESPEL SP-21	E.I. DUPONT CO.,INC.		70-1880	GOX	2000.0		50	00/04					A	11	DKCDGF
VESPEL SP-21	E.I. DUPONT CO.,INC.		70-1880-1	GOX	50.0				894	894			D	13	DKCDGF
VESPEL SP-21	E.I. DUPONT CO.,INC.		70-1880-2	GOX	100.0				881	881			D	13	DKCDGF
VESPEL SP-21	E.I. DUPONT CO.,INC.		70-1880-3	GOX	500.0				785	785			D	13	DKCDGF
VESPEL SP-21	E.I. DUPONT CO.,INC.		70-1880-4	GOX	1000.0				760	760			D	13	DKCDGF
VESPEL SP-21	E.I. DUPONT CO.,INC.		70-1880-5	GOX	1500.0				666	666			D	13	DKCDGF
VESPEL SP-21	E.I. DUPONT CO.,INC.		70-1880-6	GOX	2000.0				573	573			D	13	DKCDGF
VESPEL SP-21	E.I. DUPONT CO.,INC.		70-1880-7	GOX	25.0	1000			N999	N999			R	13	DKCDXX
VESPEL SP-21	E.I. DUPONT CO.,INC.		70-1880-8	GOX	50.0	1000			N999	N999			R	13	DKCDXX
VESPEL SP-21	E.I. DUPONT CO.,INC.		71-5003	GOX	5000.0		50	00/04					A	11	DKCDGF
VESPEL SP-21	E.I. DUPONT CO.,INC.		71-5003-1	GOX	5000.0			00/04					A	10	DKCDGF
VESPEL SP-21	E.I. DUPONT CO.,INC.		71-5003-2	GOX	2500.0			01/01					T	10	DKCDGE
VESPEL SP-21	E.I. DUPONT CO.,INC.		71-5003-3	GOX	2000.0			00/04					A	10	DKCDGE
VESPEL SP-21	E.I. DUPONT CO.,INC.		71-5003-4	GOX	5000.0			01/03					T	10	DKCDGE
VESPEL SP-21	E.I. DUPONT CO.,INC.		71-5003-5	GOX	4500.0			00/04					A	10	DKCDGE
VESPEL SP-21	E.I. DUPONT CO.,INC.		71-5003-6	GOX	5000.0			01/02					T	10	DKCDGE
VESPEL SP-21	E.I. DUPONT CO.,INC.		71-5003-7	GOX	4500.0			01/01					T	10	DKCDGE
VESPEL SP-21	E.I. DUPONT CO.,INC.		71-5003-8	GOX	4000.0			01/01					T	10	DKCDGE
VESPEL SP-21	E.I. DUPONT CO.,INC.		71-5003-9	GOX	3500.0			00/04					A	10	DKCDGE
VESPEL SP-21 LOT 1062	E.I. DUPONT CO.,INC.		71-2565	GOX	4000.0			01/01					T	10	DKCDGE
VESPEL SP-21 LOT 1062	E.I. DUPONT CO.,INC.		71-2565-1	GOX	2500.0			01/01					T	10	DKCDGE

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VESPEL SP-21 LOT 1062	E.I. DUPONT CO..INC.		71-2565-2	GOX	3000.0			01/03						T	10 DKCOGE
VESPEL SP-21 LOT 1062	E.I. DUPONT CO..INC.		71-2565-3	GOX	2500.0			01/03						T	10 DKCOGE
VESPEL SP-21 LOT 1062	E.I. DUPONT CO..INC.		71-2565-4	GOX	2000.0			01/04						T	10 DKCOGE
VESPEL SP-21 LOT 1068	FLODYNE CONTROLS INC		71-2697	GOX	4500.0			01/01						T	10 DKCOGE
VESPEL SP-21 LOT 1068	FLODYNE CONTROLS INC		71-2697-1	GOX	4000.0			01/01						T	10 DKCOGE
VESPEL SP-21 LOT 1068	FLODYNE CONTROLS INC		71-2697-2	GOX	3500.0			00/04						T	10 DKCOGE
VESPEL SP-211	E.I. DUPONT CO..INC.		70-1879	GOX	2000.0		50	00/04						A	11 DKCOXX
VESPEL SP-211	E.I. DUPONT CO..INC.		70-1879	GOX	2000.0			00/04						A	10 DKCOXX
VESPEL SP-211	E.I. DUPONT CO..INC.		70-1879-1	GOX	100.0				830	830				D	13 DKCOXX
VESPEL SP-211	E.I. DUPONT CO..INC.		70-1879-2	GOX	500.0				653	653				D	13 DKCOXX
VESPEL SP-211	E.I. DUPONT CO..INC.		70-1879-3	GOX	1000.0				618	618				D	13 DKCOXX
VESPEL SP-211	E.I. DUPONT CO..INC.		70-1879-4	GOX	1500.0				550	550				D	13 DKCOXX
VESPEL SP-211	E.I. DUPONT CO..INC.		70-1879-5	GOX	50.0				910	910				D	13 DKCOXX
VESPEL SP-211	E.I. DUPONT CO..INC.		70-1879-6	GOX	25.0	1000			N999	N999				A	13 DKCOXX
VESPEL SP-211	E.I. DUPONT CO..INC.		70-1879-7	GOX	50.0	1000			N999	N999				A	13 DKCOXX
VESPEL SP-211	E.I. DUPONT CO..INC.		71-2515	GOX	2500.0			01/01						T	10 DKCOXX
VESPEL SP-211	E.I. DUPONT CO..INC.		71-2515-1	GOX	2000.0			01/01						T	10 DKCOXX
VESPEL SP-211	E.I. DUPONT CO..INC.		71-2515-2	GOX	1500.0			00/04						A	10 DKCOXX
VITON A	E.I. DUPONT CO..INC.		M9-0295	GOX	5.0	1000			857	N999				J	13 DODFXX
VITON A	E.I. DUPONT CO..INC.		M9-0295-1	GOX	25.0				836	855				D	13 DODFXX
VITON A	E.I. DUPONT CO..INC.		M9-0295-10	GOX	2000.0				456	456				D	13 DODFXX
VITON A	E.I. DUPONT CO..INC.	.0750	M9-0295-11	GOX	3500.0			00/04						A	10 DODFXX
VITON A	E.I. DUPONT CO..INC.	.0750	M9-0295-12	GOX	4000.0			01/03						D	10 DODFXX
VITON A	E.I. DUPONT CO..INC.	.0750	M9-0295-13	GOX	4500.0			01/01						D	10 DODFXX
VITON A	E.I. DUPONT CO..INC.	.0750	M9-0295-14	GOX	5000.0			01/04						D	10 DODFXX
VITON A	E.I. DUPONT CO..INC.	.0750	M9-0295-15	GOX	4000.0		50	00/01						A	11 DODFXX
VITON A	E.I. DUPONT CO..INC.	.0750	M9-0295-16	GOX	5000.0		50	00/04						A	11 DODFXX
VITON A	E.I. DUPONT CO..INC.		M9-0295-17	GOX	6.2	1000			875	N999				J	13 DODFXX
VITON A	E.I. DUPONT CO..INC.		M9-0295-18	GOX	16.5				859	870				D	13 DODFXX
VITON A	E.I. DUPONT CO..INC.		M9-0295-2	GOX	50.0				826	826				D	13 DODFXX
VITON A	E.I. DUPONT CO..INC.		M9-0295-3	GOX	50.0				593	593				D	13 DODFXX
VITON A	E.I. DUPONT CO..INC.		M9-0295-4	GOX	100.0				590	590				D	13 DODFXX
VITON A	E.I. DUPONT CO..INC.		M9-0295-5	GOX	500.0				520	520				D	13 DODFXX
VITON A	E.I. DUPONT CO..INC.		M9-0295-6	GOX	900.0				506	506				D	13 DODFXX
VITON A	E.I. DUPONT CO..INC.		M9-0295-7	GOX	1000.0				485	485				D	13 DODFXX
VITON A	E.I. DUPONT CO..INC.		M9-0295-8	GOX	1000.0				482	482				D	13 DODFXX
VITON A	E.I. DUPONT CO..INC.		M9-0295-9	GOX	1500.0				480	480				D	13 DODFXX
VITON B SHEET	E.I. DUPONT CO..INC.		M9-0268-1	GOX	25.0				562	855				D	13 CHDFXX
VITON B SHEET	E.I. DUPONT CO..INC.	.0750	M9-0268-10	GOX	1500.0		200	00/01						A	11 CHDFXX
VITON B SHEET	E.I. DUPONT CO..INC.	.0750	M9-0268-11	GOX	2000.0		200	00/04						A	11 CHDFXX
VITON B SHEET	E.I. DUPONT CO..INC.		M9-0268-12	GOX	50.0				725	725				D	13 CHDFXX
VITON B SHEET	E.I. DUPONT CO..INC.		M9-0268-13	GOX	100.0				657	657				D	13 CHDFXX
VITON B SHEET	E.I. DUPONT CO..INC.		M9-0268-14	GOX	500.0				572	572				D	13 CHDFXX
VITON B SHEET	E.I. DUPONT CO..INC.		M9-0268-15	GOX	1000.0				502	502				D	13 CHDFXX

MFGR S DESIGNATION	MANUFACTURER	SPEC. THICK.	TEST RPT NO.	TEST ENVR	TEST PRESS	TEST TEMP	IMPT ENER	NO OF REACT	FLASH POINT	FIRE PT	PROP DIST	WT LOSS	R I	T I	MATL CODE
VITON B SHEET	E.I. DUPONT CO.,INC.		M9-0268-16	GOX	6.2	1000			889	N999			J	13	CHDFXX
VITON B SHEET	E.I. DUPONT CO.,INC.		M9-0268-17	GOX	16.5				885	900			D	13	CHDFXX
VITON B SHEET	E.I. DUPONT CO.,INC.		M9-0268-18	GOX	1500.0				470	490			D	13	CHDFXX
VITON B SHEET	E.I. DUPONT CO.,INC.		M9-0268-19	GOX	2000.0				515	515			D	13	CHDFXX
VITON B SHEET	E.I. DUPONT CO.,INC.		M9-0268-2	GOX	50.0				400	790			D	13	CHDFXX
VITON B SHEET	E.I. DUPONT CO.,INC.		M9-0268-3	GOX	900.0				472	472			D	13	CHDFXX
VITON B SHEET	E.I. DUPONT CO.,INC.	.0750	M9-0268-4	GOX	3500.0			00/01					A	10	CHDFXX
VITON B SHEET	E.I. DUPONT CO.,INC.	.0750	M9-0268-5	GOX	4000.0			00/01					A	10	CHDFXX
VITON B SHEET	E.I. DUPONT CO.,INC.	.0750	M9-0268-6	GOX	4500.0			00/01					A	10	CHDFXX
VITON B SHEET	E.I. DUPONT CO.,INC.	.0750	M9-0268-7	GOX	5000.0			00/01					A	10	CHDFXX
VITON B SHEET	E.I. DUPONT CO.,INC.	.0750	M9-0268-8	GOX	500.0		200	00/01					A	11	CHDFXX
VITON B SHEET	E.I. DUPONT CO.,INC.	.0750	M9-0268-9	GOX	1000.0		200	00/01					A	11	CHDFXX
VITON RUBBER	CAL-STATE SEAL CO.		70-2022	MMH	615.0	477							T	15	CHDEXX
VITON RUBBER	CAL-STATE SEAL CO.		70-2022-1	MMH	801.0	477							T	15	CHDEXX
VITON RUBBER	CAL-STATE SEAL CO.		70-2022-2	N2O4	405.0	214							T	14	CHDEXX
VITON RUBBER	CAL-STATE SEAL CO.		70-2022-3	N2O4	371.3	128							A	14	CHDEXX
VITON RUBBER	CAL-STATE SEAL CO.		70-2022-4	N2O4	358.6	73							A	14	CHDEXX
VITON RUBBER	CAL-STATE SEAL CO.		70-2022-5	N2O4	360.5	75							A	14	CHDEXX
VITON V-377-9	PARKER SEAL/LOS ANGLS		10-49	GOX	50.0				540	540			D	13	DVDFXX
VITON V-377-9	PARKER SEAL/LOS ANGLS		10-49-1	GOX	100.0				530	530			D	13	DVDFXX
VITON V-672-75	PARKER SEAL/LOS ANGLS		10-53	GOX	50.0				660	660			D	13	DVDFXX
VITON V-672-75	PARKER SEAL/LOS ANGLS		10-53-1	GOX	100.0				632	632			D	13	DVDFXX
VITON V-672-75	PARKER SEAL/LOS ANGLS		10-53-2	GOX	500.0				566	566			D	13	DVDFXX
VITON V-672-75	PARKER SEAL/LOS ANGLS		10-53-3	GOX	1000.0				529	529			D	13	DVDFXX
VITON V-672-75	PARKER SEAL/LOS ANGLS		10-53-4	GOX	1500.0				495	495			D	13	DVDFXX
VITON V-672-75	PARKER SEAL/LOS ANGLS		10-53-5	GOX	2000.0				482	482			D	13	DVDFXX
VITON V-672-75	PARKER SEAL/LOS ANGLS		70-1708	GOX	5.0	1000			832	N999			R	13	DVDFXX
VITON V-672-75	PARKER SEAL/LOS ANGLS		70-1708-1	GOX	25.0				740	825			D	13	DVDFXX
VITON V-672-75	PARKER SEAL/LOS ANGLS	.0750	70-1708-10	GOX	5000.0			04/04					T	10	DVDFXX
VITON V-672-75	PARKER SEAL/LOS ANGLS		70-1708-11	GOX	6.2	1000			857	N999			J	13	DVDFXX
VITON V-672-75	PARKER SEAL/LOS ANGLS		70-1708-12	GOX	15.5				853	853			D	13	DVDFXX
VITON V-672-75	PARKER SEAL/LOS ANGLS		70-1708-2	GOX	50.0				633	780			D	13	DVDFXX
VITON V-672-75	PARKER SEAL/LOS ANGLS	.0750	70-1708-3	GOX	1500.0			00/01					A	10	DVDFXX
VITON V-672-75	PARKER SEAL/LOS ANGLS	.0750	70-1708-4	GOX	2000.0			00/01					A	10	DVDFXX
VITON V-672-75	PARKER SEAL/LOS ANGLS	.0750	70-1708-5	GOX	2500.0			00/01					A	10	DVDFXX
VITON V-672-75	PARKER SEAL/LOS ANGLS	.0750	70-1708-6	GOX	3000.0			00/01					A	10	DVDFXX
VITON V-672-75	PARKER SEAL/LOS ANGLS	.0750	70-1708-7	GOX	3500.0			00/01					A	10	DVDFXX
VITON V-672-75	PARKER SEAL/LOS ANGLS	.0750	70-1708-8	GOX	4000.0			00/01					A	10	DVDFXX
VITON V-672-75	PARKER SEAL/LOS ANGLS	.0750	70-1708-9	GOX	4500.0			00/04					A	10	DVDFXX
VITON 77-545	PARKER SEAL/LOS ANGLS		71-2370	GOX	500.0		50	00/04					A	11	CHDFXX
VITON 77-545	PARKER SEAL/LOS ANGLS		71-2370-1	GOX	500.0			00/04					A	10	CHDFXX
VITON 77-545	PARKER SEAL/LOS ANGLS		71-2370-2	GOX	100.0				650	650			D	13	CHDFXX
VITON 77-545	PARKER SEAL/LOS ANGLS		71-2370-3	GOX	2000.0			00/04					A	10	CHDFXX
VITON 77-545	PARKER SEAL/LOS ANGLS		71-2370-4	GOX	2500.0		50	00/04					A	11	CHDFXX

MFGR S DESIGNATION	MANUFACTURER	SPEC. THICK.	TEST RPT NO.	TEST ENVR	TEST PRESS	TEST TEMP	IMPT ENER	NO OF REACT	FLASH POINT	FIRE PT	PROP DIST	WT LOSS	R I	T T	MATL CODE
VITON 77-545	PARKER SEAL/LOS ANGLS		71-2370-5	GOX	1500.0				464	464			D	13	CHDFXX
VITRIFIED ALUMINA INSUL	ROSEMONT ENG. CORP		70-1983	GOX	1500.0		50	00/04					A	11	FJMAXX
VITRIFIED ALUMINA INSUL	ROSEMONT ENG. CORP		70-1983	GOX	1500.0			00/04					A	10	FJMAXX
VITRIFIED ALUMINA INSUL	ROSEMONT ENG. CORP		70-1983-1	GOX	1500.0	1000			N999	N999			A	13	FJMAXX
VULCALOCK	B.F. GOODRICH		71-2371	GOX	500.0		50	00/04					A	11	DPHDXX
VULCALOCK	B.F. GOODRICH		71-2371-1	GOX	500.0			00/04					A	10	DPHDXX
VULCALOCK	B.F. GOODRICH		71-2371-2	GOX	100.0				621	621			D	13	DPHDXX
WESCO AL 500	WESTERN GOLD + PLATH CO.		70-2235	GOX	500.0			00/04					A	10	FIHOXX
WIRE ET	VICTOR WIRE & CABLE		71-2714	MMH	826.0	550								15	EPMCXX
WIRE ET	VICTOR WIRE & CABLE		71-2714-1	MMH	828.0	558								15	EPMCXX
WIRE ET	VICTOR WIRE & CABLE		71-2714-2	MMH	782.0	523							T	15	EPMCXX
WIRE-WELDING MIL-R-5031	NATIONAL STANDARDS		70-1927	GOX	1500.0		50	00/04					A	11	FMXXXX
WIRE-WELDING MIL-R-5031	NATIONAL STANDARDS		70-1927	GOX	1500.0			00/04					A	10	FMXXXX
WMT 33T	SIMMONS		71-2720	A-50	750.0	514							T	15	ERXXXX
WMT 33T	SIMMONS		71-2720-1	A-50	765.0	518							T	15	ERXXXX
XR-5038/MICA	3M CO. ST. PAUL		71-2602	A-50	681.0	489							T	15	AZBGHF
XR-5038/MICA	3M CO. ST. PAUL		71-2602-1	A-50	689.0	493							T	15	AZBGHF
XR-5038/MICA	3M CO. ST. PAUL		71-2602-2	A-50	761.0	514							T	15	AZBGHF
XR-5038/MICA	3M CO. ST. PAUL		71-2602-3	A-50	736.0	512							T	15	AZBGHF
007 O-RING COMP. V 377-9	FLODYNE CONTROLS INC		71-2567	GOX	3000.0			00/01					A	10	AWXXXX
007 O-RING COMP. V 377-9	FLODYNE CONTROLS INC		71-2567-1	GOX	3500.0			00/01					A	10	AWXXXX
007 O-RING COMP. V 377-9	FLODYNE CONTROLS INC		71-2567-2	GOX	4000.0			00/01					A	10	AWXXXX
007 O-RING COMP. V 377-9	FLODYNE CONTROLS INC		71-2567-3	GOX	4500.0			00/04					A	10	AWXXXX
007 O-RING COMP. V 377-9	FLODYNE CONTROLS INC		71-2567-4	GOX	5000.0			01/03					T	10	AWXXXX
008 O-RING COMP. V 377-9	FLODYNE CONTROLS INC		71-2566	GOX	2500.0			01/01					T	10	AWXXXX
008 O-RING COMP. V 377-9	FLODYNE CONTROLS INC		71-2566-1	GOX	2000.0			01/03					T	10	AWXXXX
008 O-RING COMP. V 377-9	FLODYNE CONTROLS INC		71-2566-2	GOX	1500.0			00/04					A	10	AWXXXX
011 O-RING COMP. V 377-9	FLODYNE CONTROLS INC		71-2648	GOX	550.0		50	03/03					T	11	AWXXXX
011 O-RING COMP. V 377-9	FLODYNE CONTROLS INC		71-2648-1	GOX	3050.0			01/01					T	10	AWXXXX
011 O-RING COMP. V 377-9	FLODYNE CONTROLS INC		71-2648-2	GOX	2550.0			01/02					T	10	AWXXXX
011 O-RING COMP. V 377-9	FLODYNE CONTROLS INC		71-2648-3	GOX	2050.0			00/04					A	10	AWXXXX
016 O-RING COMP. V 377-9	FLODYNE CONTROLS INC		71-2649	GOX	5000.0		50	00/04					A	11	AWXXXX
016 O-RING COMP. V 377-9	FLODYNE CONTROLS INC		71-2649-1	GOX	4500.0			01/01					T	10	AWXXXX
016 O-RING COMP. V 377-9	FLODYNE CONTROLS INC		71-2649-2	GOX	4000.0			01/03					T	10	AWXXXX
016 O-RING COMP. V 377-9	FLODYNE CONTROLS INC		71-2649-3	GOX	3500.0			01/02					T	10	AWXXXX
016 O-RING COMP. V 377-9	FLODYNE CONTROLS INC		71-2649-4	GOX	3000.0			01/03					T	10	AWXXXX
016 O-RING COMP. V 377-9	FLODYNE CONTROLS INC		71-2649-5	GOX	2500.0			00/04					A	10	AWXXXX
10R RED FIBER SHEET		.0750	SP-6931	GOX	25.0				600	600			D	13	CRBGXX
10R RED FIBER SHEET		.0750	SP-6931-1	GOX	50.0				597	597			D	13	CRBGXX
10R RED FIBER SHEET		.0750	SP-6931-10	GOX	1500.0		200	04/04					D	11	CRBGXX
10R RED FIBER SHEET		.0750	SP-6931-11	GOX	1500.0			00/04					A	10	CRBGXX
10R RED FIBER SHEET		.0750	SP-6931-12	GOX	2000.0			01/02					D	10	CRBGXX
10R RED FIBER SHEET		.0750	SP-6931-13	GOX	2500.0			01/02					D	10	CRBGXX
10R RED FIBER SHEET		.0750	SP-6931-14	GOX	3000.0			04/04					D	10	CRBGXX

MFGR S DESIGNATION	MANUFACTURER	SPEC. THICK.	TEST RPT NO.	TEST ENVR	TEST PRESS	TEST TEMP	IMPT ENER	NO OF REACT	FLASH POINT	FIRE PT	PROP DIST	WT LOSS	R I	T T	MATL CODE
10R RED FIBER SHEET		.0750	SP-6931-2	GOX	62.0	1000			567	N999			J	13	CRBGXX
10R RED FIBER SHEET		.0750	SP-6931-3	GOX	165.0				586	592			D	13	CRBGXX
10R RED FIBER SHEET		.0750	SP-6931-4	GOX	1565.0				331	331			D	13	CRBGXX
10R RED FIBER SHEET		.0750	SP-6931-5	GOX	4000.0		50	00/01					A	11	CRBGXX
10R RED FIBER SHEET		.0750	SP-6931-6	GOX	4500.0		50	00/01					A	11	CRBGXX
10R RED FIBER SHEET		.0750	SP-6931-7	GOX	5000.0		50	00/04					A	11	CRBGXX
10R RED FIBER SHEET		.0750	SP-6931-8	GOX	500.0		200	00/04					A	11	CRBGXX
10R RED FIBER SHEET		.0750	SP-6931-9	GOX	1000.0		200	00/01					A	11	CRBGXX
1018 NICKEL PLATE	GAC		71-2417	A-50	735.0	463							T	15	DMMDMN
1018 NICKEL PLATE	GAC		71-2417-1	A-50	770.0	504							T	15	DMMDMN
134115-14-16-17-KYNAR	WINTEC CORP		71-2322-1	GOX	3000.0			01/01					T	10	CHCTXX
134115-14-16-17-METAL	WINTEC CORP		71-2322	GOX	3000.0		50	00/04					A	11	DTGIXX
17-4PH SS			71-2511	A-50	767.0	516							T	15	FIMDXX
17-4PH SS			71-2511-1	A-50	786.0	514							T	15	FIMDXX
17-4PH SS	GAC	.0750	70-2112	GOX	5000.0		50	00/04					A	11	DMMDXX
17-4PH SS	GAC		70-2112-1	GOX	2000.0			00/04					A	10	DMMDXX
17-4PH SS	GAC		70-2112-2	GOX	4500.0			00/04					A	10	DMMDXX
17-4PH SS	GAC		70-2112-3	GOX	5000.0			00/04					A	10	DMMDXX
17-4PH SS	GAC		70-2112-4	GOX	6800.0			00/04					A	10	DMMDXX
17-4PH SS	GAC		71-2320	A-50	778.0	507							T	15	DTMDMN
17-4PH SS	GAC		71-2320-1	A-50	822.0	515							T	15	DTMDMN
17-4PH SS	GAC		71-2416	A-50	725.0	488							T	15	DTMDMN
17-4PH SS	GAC		71-2416-1	A-50	768.0	506							T	15	DTMDMN
17-4PH W/TFE FEP	GAC		71-2486	A-50	740.0	487							T	15	DTMDHS
17-4PH W/TFE FEP	GAC		71-2486-1	A-50	756.0	501							T	15	DTMDHS
17-4PH W/TFE FEP	GAC		71-2486-2	A-50	830.0	513							T	15	DTMDHS
17-7PH CRES	NR	.0750	70-2219	GOX	1500.0			00/04					A	10	DMMDXX
17-7PH CRES	NR	.0750	70-2219-1	GOX	1500.0		50	00/04					A	11	DMMDXX
17-7PH SS	GAC	.0750	70-2116	GOX	2000.0			00/04					A	10	DTMDXX
17-7PH SS	GAC	.0750	70-2116-1	GOX	2000.0		50	00/04					A	11	DTMDXX
17-7PH SS	GAC	.0750	70-2116-2	GOX	5000.0		50	00/04					A	11	DTMDXX
17-7PH SS	GAC		70-2116-3	GOX	5000.0			00/04					A	10	DTMDXX
17-7PH SS	GAC		70-2116-4	GOX	6800.0			00/04					A	10	DTMDXX
175043 POT. COMP.	SIMMONS		71-2716	A-50	766.0	503							T	15	BABGGS
175043 POT. COMP.	SIMMONS		71-2716-1	A-50	764.0	486							T	15	BABGGS
175047 EPOXY	SIMMONS		71-2717	A-50	771.0	514							T	15	BABGGS
175047 EPOXY	SIMMONS		71-2717-1	A-50	774.0	514							T	15	BABGGS
2T ADHESIVE	AIRESEARCH INDST DIV	.0050	SP-6930	GOX	25.0				696	696			D	13	ABXXXX
2T ADHESIVE	AIRESEARCH INDST DIV	.0050	SP-6930-1	GOX	50.0				680	680			D	13	ABXXXX
2T ADHESIVE	AIRESEARCH INDST DIV	.0050	SP-6930-10	GOX	4500.0			00/01					A	10	ABXXXX
2T ADHESIVE	AIRESEARCH INDST DIV	.0050	SP-6930-11	GOX	5000.0			00/04					A	10	ABXXXX
2T ADHESIVE	AIRESEARCH INDST DIV	.0050	SP-6930-12	GOX	2000.0		50	00/04					A	11	ABXXXX
2T ADHESIVE	AIRESEARCH INDST DIV	.0050	SP-6930-13	GOX	3000.0		50	00/01					A	11	ABXXXX
2T ADHESIVE	AIRESEARCH INDST DIV	.0050	SP-6930-14	GOX	4000.0		50	00/01					A	11	ABXXXX

MFGR S DESIGNATION	MANUFACTURER	SPEC. THICK.	TEST RPT NO.	TEST ENVR	TEST PRESS	TEST TEMP	IMPT ENER	NO OF REACT	FLASH POINT	FIRE PT	PROP DIST	WT LOSS	R I	T T	MATL CODE
2T ADHESIVE	AIRESEARCH INDST DIV	.0050	SP-6930-15	GOX	4500.0		50	00/04					A	11	ABXXXX
2T ADHESIVE	AIRESEARCH INDST DIV	.0050	SP-6930-16	GOX	5000.0		50	01/03					D	11	ABXXXX
2T ADHESIVE	AIRESEARCH INDST DIV	.0050	SP-6930-17	GOX	100.0		200	01/01					D	11	ABXXXX
2T ADHESIVE	AIRESEARCH INDST DIV	.0050	SP-6930-18	GOX	250.0		200	02/02					D	11	ABXXXX
2T ADHESIVE	AIRESEARCH INDST DIV	.0050	SP-6930-19	GOX	500.0		200	01/01					D	11	ABXXXX
2T ADHESIVE	AIRESEARCH INDST DIV	.0050	SP-6930-2	GOX	62.0				654	689			D	13	ABXXXX
2T ADHESIVE	AIRESEARCH INDST DIV		SP-6930-20	GOX	500.0		50	00/04					A	11	ABXXXX
2T ADHESIVE	AIRESEARCH INDST DIV		SP-6930-21	GOX	500.0			00/04					A	10	ABXXXX
2T ADHESIVE	AIRESEARCH INDST DIV		SP-6930-22	GOX	1500.0		50	00/04					A	11	ABXXXX
2T ADHESIVE	AIRESEARCH INDST DIV		SP-6930-23	GOX	50.0				559	559			D	13	ABXXXX
2T ADHESIVE	AIRESEARCH INDST DIV		SP-6930-24	GOX	200.0				472	472			D	13	ABXXXX
2T ADHESIVE	AIRESEARCH INDST DIV		SP-6930-25	GOX	1000.0				318	318			D	13	ABXXXX
2T ADHESIVE	AIRESEARCH INDST DIV		SP-6930-26	GOX	50.0				520	520			D	13	ABXXXX
2T ADHESIVE	AIRESEARCH INDST DIV	.0050	SP-6930-3	GOX	165.0				660	660			D	13	ABXXXX
2T ADHESIVE	AIRESEARCH INDST DIV	.0050	SP-6930-4	GOX	1500.0			00/01					A	10	ABXXXX
2T ADHESIVE	AIRESEARCH INDST DIV	.0050	SP-6930-5	GOX	2000.0			00/01					A	10	ABXXXX
2T ADHESIVE	AIRESEARCH INDST DIV	.0050	SP-6930-6	GOX	2500.0			00/01					A	10	ABXXXX
2T ADHESIVE	AIRESEARCH INDST DIV	.0050	SP-6930-7	GOX	3000.0			00/01					A	10	ABXXXX
2T ADHESIVE	AIRESEARCH INDST DIV	.0050	SP-6930-8	GOX	3500.0			00/01					A	10	ABXXXX
2T ADHESIVE	AIRESEARCH INDST DIV	.0050	SP-6930-9	GOX	4000.0			00/01					A	10	ABXXXX
2024 ALODINE			71-2860	GOX	2000.0			00/04					A	10	DTMAXX
30 AWG MAGNET WIRE	GAC		71-2514	A-50	814.0	514							T	15	ERXXXX
30 AWG MAGNET WIRE	GAC		71-2514-1	A-50	820.0	507							T	15	ERXXXX
301 CRES STEEL	MC LOUTH STEEL CO.	.0750	70-2060	GOX	1500.0		50	00/04					A	11	DTMDXX
301 CRES STEEL	MC LOUTH STEEL CO.	.0750	70-2060-1	GOX	1500.0			00/04					A	10	DTMDXX
301 SS	GAC	.0750	70-2118	GOX	5000.0		50	00/04					A	11	DTMDXX
301 SS	GAC		70-2118-1	GOX	5000.0			00/04					A	10	DTMDXX
301 SS	GAC		70-2118-2	GOX	6800.0			00/04					A	10	DTMDXX
301 SS	GAC		71-2287	A-50	826.0	514							T	15	DMMDXX
301 SS	GAC		71-2287-1	A-50	777.0	503							T	15	DMMDXX
302 CRES STEEL	UNIV. CAST IRON MFG. CO.	.0750	70-2059	GOX	1500.0		50	00/04					A	11	DTMDXX
302 CRES STEEL	UNIV. CAST IRON MFG. CO.	.0750	70-2059-1	GOX	1500.0			00/04					A	10	DTMDXX
302 SS	GAC	.0750	70-2117	GOX	2000.0		50	00/04					A	11	DTMDXX
302 SS	GAC	.0750	70-2117-1	GOX	5000.0		50	00/04					A	11	DTMDXX
302 SS	GAC		70-2117-2	GOX	5000.0			00/04					A	10	DTMDXX
302 SS	GAC		70-2117-3	GOX	6800.0			00/04					A	10	DTMDXX
302 SS	GAC		71-2283	A-50	746.0	496							T	15	DMMDXX
302 SS	GAC		71-2283-1	A-50	791.0	509							T	15	DMMDXX
302 SS	GAC		71-2283-2	A-50	770.0	503							T	15	DMMDXX
302 SS	GAC		71-2283-3	A-50	754.0	497							T	15	DMMDXX
303 CRES STEEL	NR DONNEY	.0750	70-2058	GOX	1500.0			00/04					A	10	DMMDXX
303 CRES STEEL	NR DONNEY	.0750	70-2058-1	GOX	1500.0		50	00/04					A	11	DMMDXX
303 SE	GAC	.0750	70-2114	GOX	5000.0		50	00/04					A	11	DMMDXX
303 SS	GAC	.0750	70-2141	GOX	5000.0		50	00/04					A	11	DMMDXX

MFGR S DESIGNATION	MANUFACTURER	SPEC. THICK.	TEST RPT NO.	TEST ENVR	TEST PRESS	TEST TEMP	IMPT ENER	NO OF REACT	FLASH POINT	FIRE PT	PROP DIST	WT LOSS	R T T	MATL CODE
303 SS	GAC		70-2141-1	GOX	5000.0			00/04					A 10	DMMDXX
303 SS	GAC		70-2141-2	GOX	6800.0			00/04					A 10	DMMNXX
303 SS	GAC		71-2286	A-50	719.0	489							T 15	DMMDXX
303 SS	GAC		71-2394	A-50	773.0	498							T 15	DMMDXX
303 SS	GAC		71-2394-1	A-50	791.0	508							T 15	DMMDXX
303 SS	GAC		71-2394-2	A-50	762.0	520							T 15	DMMDXX
304 CRES STEEL	UNITED STATES STEEL	.0750	70-2034	GOX	1500.0		50	00/04					A 11	DTMDXX
304 CRES STEEL	UNITED STATES STEEL	.0750	70-2034-1	GOX	1500.0			00/04					A 10	DTMDXX
304 SS	GAC		71-2284	A-50	741.0	508							T 15	DMMDXX
304 SS	GAC		71-2284-1	A-50	662.0	499							T 15	DMMDXX
304 SS	GAC		71-2419	A-50	742.0	496							T 15	DMMDXX
304 SS	GAC		71-2419-1	A-50	808.0	505							T 15	DMMDXX
304 SS	GAC		71-2427	A-50	814.0	505							T 15	DMMDXX
304 SS	GAC		71-2427-1	A-50	553.0	456							T 15	DMMDXX
304 SS	GAC		71-2427-2	A-50	693.0	504							T 15	DMMDXX
304L SS	GAC	.0750	70-2154	GOX	4500.0			00/04					A 10	DMMDXX
304L SS	GAC		70-2154-1	GOX	5000.0		50	00/04					A 11	DMMDXX
304L SS	GAC		71-2282	A-50	688.0	496							T 15	DMMDXX
304L SS	GAC		71-2282-1	A-50	803.0	514							T 15	DMMDXX
304L SS CHROME FINISH	GAC		70-2150	GOX	2000.0			00/04					A 10	DTMDHS
304L TIN PLATED	NR	.0750	70-2221	GOX	1500.0			00/04					A 10	DTMDXX
304L TIN PLATED	NR		70-2221-1	GOX	1500.0		50	00/04					A 11	DTMDXX
308 SS	GAC	.0750	70-2124	GOX	4500.0			00/04					A 10	DTMDXX
308 SS	GAC		71-2285	A-50	641.0	477							T 15	DMMDXX
308 SS	GAC		71-2285-1	A-50	703.0	490							T 15	DMMDXX
316 CRES STEEL			71-2695	GOX	1500.0		50	00/04					A 11	DTMDXX
316 CRES STEEL			71-2695-1	GOX	1500.0			00/04					A 10	DTMDXX
316 SS	GAC		71-2392	A-50	759.0	500							T 15	DTMDXX
316 SS	GAC		71-2392-1	A-50	783.0	505							T 15	DTMDXX
316 SS	GAC		71-2392-2	GOX	2000.0			00/04					A 10	DTMDXX
321	GAC	.0750	70-2104	GOX	4500.0			00/04					A 10	DMMDXX
321	GAC	.0750	70-2104-1	GOX	5000.0		50	00/04					A 11	DMMDXX
321 CRES STEEL	UNITED STATES STEEL	.0750	70-2036	GOX	1500.0		50	00/04					A 11	DTMDXX
321 CRES STEEL	UNITED STATES STEEL	.0750	70-2036-1	GOX	1500.0			00/04					A 10	DTMDXX
347 SS	GAC	.0750	70-2119	GOX	2000.0		50	00/04					A 11	DTMDXX
347 SS	GAC	.0750	70-2119-1	GOX	5000.0		50	00/04					A 11	DTMDXX
347 SS	GAC		70-2119-2	GOX	5000.0			00/04					A 10	DTMDXX
347 SS	GAC		70-2119-3	GOX	6800.0			00/04					A 10	DTMDXX
347 SS	GAC		71-2389	A-50	811.0	531							T 15	DMMDXX
347 SS	GAC		71-2389-1	A-50	740.0	499							T 15	DMMDXX
410 CRES STEEL	ALLEN FRY STEEL CO.		70-2197	GOX	500.0		50	00/04					A 11	DMMDMH
410 SS	GAC	.0750	70-2113	GOX	2000.0			00/04					A 10	DMMCXX
416 CRES STEEL	PACIFIC METALS	.0750	70-2204	GOX	1500.0			00/04					A 10	DMMDXX
416 CRES STEEL	PACIFIC METALS		70-2204	GOX	1500.0		50	00/04					A 11	DMMDXX

MFGR S DESIGNATION	MANUFACTURER	SPEC. THICK.	TEST RPT NO.	TEST ENVR	TEST PRESS	TEST TEMP	IMPT ENER	NO OF REACT	FLASH POINT	FIRE PT	PROP DIST	WT LOSS	R I	T T	MATL CODE
420 SS.00-S-763	GAC	.0750	70-2108	GOX	4500.0			00/04					A	10	DMMDXX
430 SS	GAC		71-2422	A-50	723.0	497							T	15	DMMDXX
430 SS	GAC		71-2422-1	A-50	775.0	499							T	15	DMMDXX
430F CRES STEEL	A.M. CASTLE CO.	.0750	70-2190	GOX	1500.0			00/04					A	10	DMMDXX
430F CRES STEEL	A.M. CASTLE CO.	.0750	70-2190-1	GOX	1500.0		50	00/04					A	11	DMMDXX
440 SS	GAC		71-2317	A-50	807.0	511							T	15	DMMDXX
440 SS	GAC		71-2317-1	A-50	818.0	514							T	15	DMMDXX
440C	GAC	.0750	70-2107	GOX	2000.0			00/04					A	10	DMMDXX
440C	GAC	.0750	70-2107-1	GOX	2000.0		50	00/04					A	11	DMMDXX
440C	GAC		70-2107-2	GOX	5000.0		50	00/04					A	12	DMMDXX
440C	GAC		70-2107-3	GOX	4500.0			00/04					A	10	DMMDXX
440C QQ-S-763	GAC	.0750	70-2111	GOX	5000.0		50	00/04					A	11	DMMDXX
446 SS	GAC		71-2418	A-50	717.0	495							T	15	DMMDXX
446 SS	GAC		71-2418-1	A-50	729.0	488							T	15	DMMDXX
446 SS	THE ELECTROLIZING CO		71-2425	A-50	802.0	502							T	15	DMMDXX
446 SS	THE ELECTROLIZING CO		71-2425-1	A-50	805.0	505							T	15	DMMDXX
5052-H32			71-2594	A-50	777.0	523							T	15	DTXXXX
5052-H32			71-2594-1	A-50	765.0	523							T	15	DTXXXX
52100 STEEL	ALLEN FRY STEEL CO.		70-2207	GOX	1500.0			00/04					A	10	DMMDXX
52100 STEEL	ALLEN FRY STEEL CO.		70-2207-1	GOX	1500.0		50	00/04					A	11	DMMDXX
6262/MIL-A-8625 TYPE 2	ALCOA		71-2746	GOX	2000.0			00/04					A	10	FIMAXX
7075 AL CR PLATED	GAC		70-2223	GOX	4500.0			00/04					A	10	DTMAHS
73X BLK MARKING INK	INDEPENDENT INK CO		71-2687	GOX	1500.0		50	00/04					A	11	APGTXX
73X BLK MARKING INK	INDEPENDENT INK CO		71-2687-1	GOX	1500.0			01/01					T	10	APGTXX
82 AL/18 NI	BRAZE ALLOY		71-2339	A-50	805.0	506							T	15	DTMUMN
82 AL/18 NI	BRAZE ALLOY		71-2339-1	A-50	818.0	502							T	15	DTMUMN

APPENDIX III - SELECTED SUMMARIES, CONCLUSIONS, AND RECOMMENDATIONS EXCERPTED FROM THE INDICATED REFERENCES.

Attwood and Allen (1971)

"CONCLUSIONS AND RECOMMENDATIONS

(1) The dependence of the spontaneous ignition temperature, SIT, of a material on test techniques such as heating rate and gas flow rate, and on sample conditions such as powder or block, new and clean or used and 'aged', has been demonstrated; but no consistent trends were apparent.

(2) Previously reported large decreases in SIT with increase in pressure above atmospheric are likely to have been partly caused by the change in test technique. With few exceptions the 'Pot' test gives higher SITs than the 'Bomb' test, hence the use of the 'Pot' test alone, to assess the suitability of materials for use in oxygen, cannot be recommended.

(3) Nylon is not recommended for use in high pressure oxygen. Even when new or unused its SIT can be below 300°C, and wear and 'ageing' during use can apparently lower the SIT to 155°C. These could have been contributory factors to the six fires from which this investigation stemmed.

(4) ZX32 a material suspected in one fire, did not ignite in any test.

(5) The SITs of several relatively new silicone materials have been measured and generally increase with an increase in oxygen pressure. As this is the reverse of the behaviour of many non-silicone materials tested in 1950, silicone materials might well be used more widely in high pressure oxygen systems. However, only limited tests have been made so far: further investigation would be necessary before any definite conclusions could be drawn.

(6) The need for a test or set of tests by which to define the compatibility of a material with oxygen has been discussed and a programme of work aimed at establishing such a test has been outlined. An interim standard test has been proposed and a method of interpreting any spread of results suggested."

Baum, Goobich, and Trainer (1962)

"Conclusions

1. Teflon and Kel-F are both compatible with high-pressure oxygen systems with regard to chemical reactivity, and they manifest a high degree of stability. Viton, however, shows questionable compatibility although an insufficient number of samples were tested in this program to draw firm conclusions. AiResearch also reports some failures with Viton O-rings but nevertheless they are using them as seals in the Mercury control equipment. In any case, neoprene seals were found to be incompatible with high-pressure oxygen.

Pure Teflon suffers from certain physical weaknesses. It tends to cold flow very easily, and because of its high ductility and lubricity, it is easily extruded out of shape when unconfined. Neither does a thin, unsupported Teflon disk have sufficient strength to prevent collapse when high-pressure forces are applied.

Kel-F has sufficient strength and rigidity to partially overcome the cold-flow problem for short periods and it can withstand instantaneous impacts from flow that would cause Teflon to collapse or extrude. However, Kel-F does not appear to be sufficiently ductile for seal use, nor does it provide the lubricity of Teflon. A possible solution, aside from the conventional compounding of Teflon with ceramic, glass fiber, and asbestos cloth, is use of a new compound of Teflon and Kel-F. This compound consists of 80 parts Kel-F and 20 parts Teflon. According to the developer, Minnesota Mining and Manufacturing Corporation, it is sufficiently strong to resist cold flow, is more ductile than pure Kel-F, and retains the lubricity of Teflon. However, both Kel-F and Teflon should be employed as seals only when closely confined (like O-rings) to prevent possible collapse or cold flow.

2. Apparently the hydrocarbon-oxygen mixture is a rather complex one in that merely mixing the two constituents does not appear to be the only thing necessary to initiate a chemical reaction. Case histories of storage vessels at 2000 psi or less suddenly exploding for no apparent reason seem to substantiate the suggestion that a third factor or sequence of events must be present. However, the triggering agent may not be the same in all cases. The only method whereby the explosive nature of hydrocarbon-oxygen mixtures may be properly and more fully understood is through an extensive series of carefully controlled deliberate explosions. Studies of this type have been conducted, but never at pressures of 500 atmospheres.

On the basis of the data available from the present experiments, the following can be concluded:

(1) Below 400 F concentrations of 50 ppm or less are not highly reactive and do not constitute a major danger.

(2) If a reaction did occur, it was either too rapid, too slow, or too slight to be detected by visual readings of the pressure gage or by temperature fluctuations recorded by the thermocouple.

(3) If a reaction did occur, it did not go to completion. This conclusion is supported by the fact that traces of hydrocarbon were indicated in most gas analyses. The reaction may not have been sustained for two possible reasons: (1) because of the low concentration, the gas was too finely diffused and could not sustain a flame front and (2) the total heat of reaction was small and was too quickly dissipated to "set off" the remaining unburned gases.

3. On the basis of the five evaluations just discussed, the four metals considered can be rated in the following order in terms of their possible application in high-pressure oxygen systems:

Stainless steel (Type 316)	Good+	Shows sufficient strength and ductility for pressure-vessel use; has low oxidation rate and good erosion resistance
Monel	Good-	Is less strong but sufficient where weight is not a restricting factor; has lowest oxidation rate
Brass	Poor to fair	Has insufficient strength for lightweight pressure-vessel application, but demonstrates good retention of original physical properties; good oxidation resistance in dry atmospheres but poor resistance in moist atmospheres; has only fair erosion resistance
Pure copper	Very poor	Too weak to be used for pressure vessels; poor retention of physical properties; has high autoignition temperature but also has high oxidation rate when exposed for long periods

The above rating is based on the investigation and analysis of only a small sampling of each metal. More extensive and detailed investigations are required to determine quantitative results. Qualitatively, on the basis of the experiments performed, only stainless steel and Monel are acceptable alloys. Brass and pure copper, although possessing some desirable characteristics, should not be used because of other factors which cannot be sufficiently compensated.

4. It is evident on the basis of the data gathered that electrostatic charges due to high-pressure oxygen flow are not significant in themselves. However, some factors which arise because of the flow of gas must be seriously considered. One possible problem is ozone formation caused by the cooling of the gas and the presence of electrostatic charges. The ozone molecule is much more active, chemically, than ordinary oxygen and therefore likely to lower the ignition temperature. A more important factor is the presence of dust or liquid moisture in the gas stream. It has been shown that gases passed through a pin-hole orifice under a pressure head of 1800 psi invariably show a strong electrostatic charge only when either dust or liquid moisture is present in the gas stream. These charges may be sufficiently large to cause ignition.

In the experiments performed at Battelle, some dust particles were present in the gas stream but probably they were not in sufficient quantity to increase the electrostatic charge greatly. Of course, the longest flow period was only 8 seconds and the pressure was not constant during the entire period.

Because the danger of detonation or chemical reaction being initiated by an electrostatic charge is potentially large, further investigations should be performed but with larger volumes which will permit longer flow periods. Also, attempts should be made to control and measure the amount of dust of moisture in the stream to compare the effect on the charges generated. In general, however, regardless of the negligible charge generated, equipment should be grounded wherever possible.

5. Rapid heating due to gas surging into confined spaces can produce a major hazard. During the experiments at Battelle, a pressure regulator failed and burned under surge conditions. Also Airesearch discovered that many materials including neoprene and Viton reacted chemically when impacted by a surging gas at 8000 psi.

However, there is also evidence that at lower pressures, or when the receiver volume is comparatively large, the effect of surge compression is minor. This conclusion is supported by the results of the surge experiments at Battelle and similar experiments performed at AiResearch.

On the basis of the experimental results and data available, it can be concluded that the rise in temperature due to adiabatic compression to 8000 psi is probably not sufficient to cause large masses of metal to ignite. However, the possibility of thin sectioned metal wire and of polymers such as neoprene igniting is great. Also the danger of organic or hydrocarbon contaminants chemically reacting is serious since many of these have ignition temperatures below 500 F, especially in high-pressure gaseous oxygen.

6. Since the basic aims of the research were to evaluate the relative safety of 7500-psi gaseous oxygen systems and to identify the hazards which can be expected in their operation, the conclusions listed below concern these subjects specifically.

Although some of the research results indicate that relative safety can be maintained apart from absolutely ideal conditions, it cannot be assumed that high standards of cleanliness and handling technique are not desirable. Whenever ideal conditions and procedures are possible, they must be insisted upon. However, although danger increases with less ideal conditions, certain compromises can sometimes be tolerated. Only through continued research and through accumulated engineering experience can a more confident assessment of the extent of these allowable compromises be made. Until the time that further research and engineering provides additional information for formulation of recommendations, the conclusions given below can be used as general guides:

(1) Contaminated oxygen gas at 7500 psi, as investigated in this program and under the environmental conditions imposed when considered independently of the equipment or system employed, is relatively safe from spontaneous combustion or detonation.

(2) Hazardous chemical reactions of 7500-psi oxygen gas with foreign elements seem to be dependent upon conditions other than simple mixing, proximity, or high-velocity flow. Temperature is believed to be the most critical variable and the minimum temperature at which a reaction will occur is in turn dependent upon the existing pressure.

(3) Hazards and difficulties encountered in the operation of high-pressure gaseous oxygen systems seem to be attributable primarily to poor system design and to the use of poorly designed equipment.

In addition to the general conclusions above the following more technical and specific conclusions have been drawn:

(1) Absolutely clean, dust-free atmospheres are not essential to safe operation.

(2) Concentrations of hydrocarbons in the order of 50 ppm or less are not dangerously reactive.

(3) Electrostatic charges caused by short flow periods through a small orifice appear to be negligible.

(4) Stainless steel and Monel are acceptable materials of construction.

(5) Uncoated or unplated copper appears to oxidize too readily to be used extensively.

(6) Although cases of combustion involving Teflon and Kel-F have been reported, the experiments conducted show that these are acceptable nonmetallic sealing materials.

RECOMMENDATIONS

Two primary recommendations have been formulated on the basis of the conclusions presented above.

(1) A broader, more detailed study of materials compatibility with 7500-psi oxygen gas should be pursued. This study should be an attempt to derive a more exact understanding of the conditions that initiate combustion. Extensive experimentation with stainless steel, Monel, anodized aluminum, Teflon compounds, Kel-F compounds, and various thread lubricants and sealants should be conducted to permit a proper statistical analysis. These experiments should have two objectives:

(a) Determination of the spontaneous ignition temperature under static conditions and after various periods of exposure.

(b) Determination of the spontaneous ignition temperature during surge conditions and evaluation of the influence of the volume to surface-area ratio.

(2) Because of the inadequacy of available equipment to provide reliable, long-time performance for absolutely leakproof operation, a development program should be initiated. This program should be planned to investigate critical design criteria. The components that require further study, in estimated order of priority, are:

- Fittings
- Valves, manual and remote
- Lightweight pressure vessels
- Regulators."

Guter (1967)

"SUMMARY AND DISCUSSION

Ignition temperatures in high pressure gas were determined using a stainless steel bomb in which samples could be raised to the ignition temperature in a few minutes. The effect on ignition temperature of changes in total pressure, rate of heating, "ageing", i.e. prolonged storage of material in oxygen under pressure, oxygen concentration, and the physical state of the sample were determined in the high pressure apparatus. A simpler apparatus called the 'pot' ignition apparatus was developed for the rapid determination of ignition temperatures in oxygen at atmospheric pressure.

The many materials examined have been classified in the following five groups:

1. Lubricants, including thread sealing compounds.
2. Natural and Synthetic Rubber Hose Materials.
3. Polymers.
4. Valve Seat materials.
5. Metals and Alloys.

The ignition temperatures of the materials in Class I were relatively unaffected by changes in oxygen pressure. The Aroclors (chlorinated diphenyls) were particularly resistant, and had ignition temperatures above 400°C. If their other properties are satisfactory they should prove suitable for use as lubricants and hydraulic fluids in oxygen systems. Acheson Grease G. 30 and the Ministry's anti-seize and sealing compound also had high ignition temperatures which were unaffected by pressure. For this reason they would be preferred to the silicone greases for use in oxygen.

The ignition temperatures of the rubber hose materials in Class II were all considerably reduced by increasing the oxygen pressure, except in the case of silicone rubber which ignited above 300°C. The natural and synthetic rubbers, other than silicone, were found to ignite at temperatures below 200°C in oxygen at pressures of 100 atmospheres or higher. The ignition temperatures were considerably reduced if traces of the fabric used as reinforcement in the completed hose were included with the sample. Increases in heating rate led to significant reductions in the ignition temperatures of hycar, neoprene and BTR Hose (Specification 1180). Provided certain precautions are strictly observed it is suggested that rubber hoses may be used with high pressure oxygen.

Included in Class III were Teflon, Kel-F and phosphorylated polyvinyl alcohol which were the most resistant non-metallic materials examined. They failed to ignite in oxygen at 250 atmospheres when heated to 350°C.

In the 'pot' test they sometimes ignited at temperatures above 500°C. Increasing the oxygen pressure to 175 atmospheres reduced the ignition temperature of most of the other materials included in Class III, but with polythene, nylon and perspex a further increase in pressure to 250 atmospheres caused only an insignificant increase in the ignition temperature. Polythene, red vulcanised fibre and rosin bonded fabric were also examined in air; the ignition temperatures in air were found to be rather higher than in oxygen but no definite relationship between the partial pressure of the oxygen and the ignition temperature of these materials was obtained. Special ageing experiments provided interesting results, but unfortunately did not yield general conclusions.

The materials in Class IV with the exception of GACO seating materials had relatively low ignition temperatures. The much higher ignition temperatures obtained with some of the materials in Class III suggest that they may be preferred for making valve seats, provided their mechanical properties are satisfactory.

None of the metals and alloys in Class V ignited in oxygen at 250 atmospheres when heated alone to 350°C. Copper, magnesium alloy and mild steel turnings ignited in the presence of a drop of oil if heated to about 200°C in oxygen at 250 atmospheres.

Changes in gas flowrate, oxygen concentration, heating rate and physical state had no marked effect on ignition temperature for most of the materials examined. Exceptions were some Class II materials which were affected by heating rate and Buna which in the form of shavings ignited at temperatures more than 100° below the corresponding ignition temperatures for samples in block form.

Materials in Classes II, III and IV were examined by the 'pot' test. In general, it was found that the higher the 'pot' ignition temperature the higher was the ignition temperature in high pressure oxygen. Unfortunately the 'pot' ignition temperature gave no indication of the effect of pressure in the range 50 - 250 atmospheres on ignition temperature.

No attempt was made to examine the behaviour of the materials under actual working conditions at high pressure. It is not possible therefore to relate the ignition temperatures observed under controlled conditions to the hazards associated with the everyday use of combustible materials in high pressure oxygen. However as no materials ignited at a temperature below 100°C and very few below 150°C in oxygen at pressures up to 250 atmospheres it seems highly probable that with careful selection a number of materials which are not entirely non-inflammable can be safely used in oxygen at high pressures. When using such materials it is important to avoid any sudden changes in pressure or temperature, and to ensure the absence of any inflammable dust or other material more susceptible to ignition, which might initiate combustion.

The possibility of fires in high pressure oxygen systems would be largely avoided by measures that would prevent conversion of the free energy of the compressed gas into heat. If this could be achieved in the design of equipment then the ignition characteristics of the materials that come into contact with the oxygen would be of secondary importance. Until this ideal is reached, safety in the use of high pressure oxygen will depend not only on the selection of materials with a high ignition temperature, but on careful attention to the design of the apparatus, and upon the observance of a number of elementary but essential precautions. As the starting-point of combustion will clearly be determined by the material of lowest ignition temperature which happens to be present, it is important to exclude carefully all traces or organic dust and oil. Particles of dust and fibre introduce a special hazard in connection with the temperature rise which occurs on adiabatic compression in a closed tube. In this case the rise in temperature of the gas may be considerable, but its heat capacity is small. The gas is therefore unable to raise appreciably the temperature of any massive body with which it is in contact, and its heat is rapidly dissipated. A small particle of fibre in the gas stream, however, can be raised to a temperature approaching that of the gas, and can therefore readily be ignited. When this occurs it will cause the ignition of any other inflammable material in its vicinity.

The work described in this report does not provide a basis for choice of materials for use in high pressure oxygen without regard to the circumstances of use, but it is hoped that it will serve as a useful guide for the selection of the best materials for a particular duty, and the range of conditions under which they can be safely used."

(Parts of the summary and discussion are omitted.)

Johnston (1970)

"CONCLUSIONS:

1. No great technology differences exist among the fields reviewed.

2. Breathing oxygen systems utilized today have been quite successful in meeting their intent. The majority of the relatively few failures which have occurred have been traced to poor handling practices.

3. The success of today's designs has been the result of designing by experience, largely without thorough scientific understanding.

4. Improvement in and standardization of specifications and guidelines are needed in the following areas:

a. System design requirements as a function of pressure, and use.

b. Materials requirements and a suitable list of materials for specific applications.

c. Materials test methods which will verify suitability of materials for the given applications.

d. Accurate testing methods for determination of a given systems contamination level.

e. Allowable contamination levels and materials including particle sizes for the various system pressure levels."

Kimzey (1970)

"CONCLUDING REMARKS

The literature available prior to the Apollo 13 incident indicates that little work has been performed on electrically induced ignition of metals. Much work has been done on impact ignition, particularily in LOX environments; however, much of the data are not directly usable due to the wide variety of experimental techniques employed. Sufficient work has been performed to permit the following observations:

1. The ignition temperature of a metal in LOX is independent of pressure, convection, and oxygen percentage.

2. The effect of halogen impurities on the ignition temperature of metals cannot be determined from existing data.

3. Ignition temperatures, like boiling points, or melting points, appear to be depressed by the addition of impurities."

Marzani (1968)

"CONCLUSION

The following conclusions are made with regard to material evaluation:

From a fire-resistance standpoint, TFE is superior to the other materials tested.

- CTFE is nearly as high in fire resistance. Polyvinylidene fluoride and the polyimides are intermediate. Polyurethanes, ethylene-propylene rubbers and polyethylene are lowest.

- The inclusion of fire-resistant materials in composites with less fire-resistant materials does not insure that the composite will have improved fire resistance.

- Of the parameters affecting combustion, pressure has the greatest effect on material ignition temperature. Sample size is important in determining the flammability limits. Sample geometry can be an important factor in ignition temperature and reaction kinetics.

- Materials ignite more readily at lower pressures in oxygen than in air. Above 2400 psig the difference disappears.

The following conclusions are made with regard to the method of study:

- The modified high-pressure bomb satisfactorily provided reproducible spontaneous-ignition data on small samples of solid materials in an oxygen atmosphere. Data indicate a favorable degree of correlation with published data.

- This test method should be considered in any effort to establish a standardized test procedure for determining the spontaneous-ignition temperatures of solid materials at elevated pressures.

- A standardized test will not necessarily yield a result which will be applicable under every condition of material usage."

Nihart and Smith (1964)

"CONCLUSIONS

The following conclusions are based upon the results of the present experimental test program and other data referenced in this report.

1. The spontaneous ignition temperatures of the materials tested are essentially the same in 7500 psi oxygen as in 2000 psi oxygen.

2. The relative resistance of metals and alloys to ignition and combustion in 7500 psi oxygen agrees in general with results obtained in earlier Linde test work at 2000 psi and with the results of Dean and Thompson (1961) except for aluminum.

3. Only three thread lubricants might have possible safe application in 7500 psi oxygen. These lubricants are Dixon's Flake Graphite No. 1, Burnil Brand Microplates, and Almasol Powder. Further information on their lubricating properties and thermal stability would need to be known before a complete recommendation could be made. One drawback to this type of lubricant is that there is always a possibility of particulate matter inadvertently getting into the high pressure system.

4. The only thread sealant tested in this program which might be recommended for 7500 psi oxygen service would be 50-50 soft solder (which could be used in tinning threads). TFE tape is not recommended because of the possibility of pieces getting into the gas stream.

5. Recognizing that some type of packing is needed for static and dynamic seals, glass-filled TFE would be the only material presently recommended for use. Even its use presents a hazard and it should only be used when tightly confined.

6. Inconel alloy 600, brass, Monel alloy 400, and nickel are recommended for use in 7500 psi oxygen. Other metals might be acceptable if plated with nickel, silver, or gold. Monel alloy K-500 might also be acceptable but it was not given the promoted ignition test in 7500 psi oxygen.

7. Of the materials tested, stainless steel and aluminum are the least satisfactory for use at oxygen pressures of 7500 psi.

8. Copper is not recommended because of the results of Baum, Goobich, and Trainer (1962). Other copper alloys might be acceptable material but would need to be tested.

9. Electrostatic charges developed during the charging of a small high pressure receiver were found to be negligible.

10. The simulated system was pressurized with oxygen to instantaneous pressures ranging from 665 to 7100 psi without incident. Pressurization time varied from 0.5 to 0.21 seconds.

The hazards considered to be most responsible for ignitions in oxygen systems are:

a. Adiabatic Compression - High temperatures may be produced when low pressure oxygen is suddenly brought to a high pressure, such as when a valve is suddenly opened between a high pressure and a low pressure portion of the system. These temperatures can be high enough to ignite organic materials or small particles of metal.

b. Particulate Matter - Particles may be accelerated in a high velocity stream and impacted against organic materials or metallic burrs, projections, etc. Their energy is converted to high local temperatures by this impact with subsequent ignition of associated materials. Even the particles themselves might be ignited if they were either organic or metallic in nature.

These hazards may be substantially reduced by proper cleaning of the equipment initially, use of filters (especially ahead of regulators) minimum use of organic material, and judicious operation of valves and regulators to prevent rapid increases in pressure.

There are other mechanisms by which ignition may occur but these have been well covered by Reynales (1959).

RECOMMENDATIONS

1. Further study should be made on the copper alloys to define more clearly their compatibility and applicability in 7500 psi systems.

2. More tests should be conducted on metals and alloys to determine the effect of geometric configuration on the relative ignition temperatures.

3. There is need for further investigation into thread lubricants and thread sealants. This study would need to cover their physical properties such as lubrication and sealing qualities as well as their compatibility with oxygen. Development of special lubricants and sealants might be required.

4. A program is needed to develop and build better hardware constructed of materials more compatible with high pressure oxygen. The program should cover any and all equipment which would be used in a 7500 psi oxygen system."

Ordin (1971)

"SAFETY RECOMMENDATIONS

Although the solution to many of the problems which caused the oxygen mishaps cannot be specifically prescribed without further research and development efforts, several practical safety regulations are recommended to increase the operational safety. These recommendations based on specific mishaps include the following:

(a) Prevent the cross connecting of fuel, oxygen and purge lines by means of designs and permit no subsequent uncontrolled revisions by maintenance personnel.

(b) Suitably restrain all flexible lines at specific intervals.

(c) Prevent the venting and disposal of oxygen near electrical systems or other ignition sources capable of initiating and promoting fires.

(d) Provide controlled valve operation of oxygen valves to limit generation of heat due to gas compression.

(e) Label pressure lines with values of operational, proof, and design burst pressure.

(f) Conduct pre-operational hazard analyses on liquid and gaseous pressure systems before checkout, operation or maintenance.

(g) Insure verification of pressure relief before liquid and gas lines are disconnected.

(h) Emphasize hazards of operations in oxygen systems through training. Many operating personnel are not fully aware of the hazards associated with oxygen systems.

(i) Maintain records of any rework on tanks, lines and related equipment. The operations performed should be available to evaluate continued use of equipment.

(j) Fluids used should be identified and environmental chamber operations include a verification of the composition of the gas mixtures employed.

(k) Liquid oxygen loading rates should be established commensurate with duct and equipment fatigue capacities. Material failures have been induced by low stress, high frequency vibrations caused by excessive fill rates. Instrumentation should be installed to measure and monitor induced vibrations.

Orgin (Continued)

(l) Standards should be established interfacing the electrical systems to the oxygen systems. Problems of electrical arcing of interior lights and fixtures should be resolved.

(m) Insure availability of recent information on results of testing and of field experiences on the compatibility of materials with oxygen."

Schwinghamer (1971)

"CONCLUSIONS

Without a satisfactory solution to the problem of materials reaction sensitivity in LOX and GOX, highly reliable expendable launch vehicles and non-reusable spacecraft would not have been possible. The basic test method which accomplished this end was the ABMA and MSFC-SPEC-106B. As a result of the Apollo 13 incident, increased emphasis is being placed on materials compatibility in a high pressure GOX environment.

Besides impact sensitivity of materials, approximately adiabatic compression conditions can contrive to induce materials reactivity. Tests run at high pressure using the new MSFC tester have so far shown that:

1) The materials used in the tests cited in Table II showed an inverse relationship between thickness and impact sensitivity.

2) Of the materials tested to date, several tend to indicate that impact sensitivity in GOX is more pressure dependent than in LOX.

3) The impact sensitivity of the materials tested to date in GOX at the pressures tested showed enhanced impact sensitivity with higher pressure.

4) The rank ordering of the materials tested so far in LOX up to 1000 psia (6.8×10^6 Newtons/m^2) is the same as the rank ordering resulting from tests in LOX at 14.7 psia (9.5×10^4 Newtons/m^2).

While there is agreement on the syntactical basis of probability theory as it applies to LOX/GOX compatibility testing, there is indeed the danger of a disparity between the syntactics and the explanation and interpretation of these signs in terms of the real-world. Statistics can be a useful indicator if cautiously and correctly applied. There is the distinct danger of a retreat to, or a preoccupation with, "cure all" test methods and techniques, meanwhile disregarding the necessity for hard data acquired from statistically meaningful numbers of tests.

Future plans at MSFC include investigation and research on a variety of LOX/GOX sensitivity testing methods and techniques. It is expected that configuration testing will continue to be necessary in special situations.

In the final analysis, the many questions of materials compatibility in LOX and GOX will undoubtedly continue to be crucial considerations to the aerospace designer concerned with our future space vehicles and spacecraft."

White and Ward (1966)

"SUMMARY AND CONCLUSIONS

The ignition of metals in oxygen and oxygen atmospheres was reviewed from the viewpoints of (a) methods that have been used to study behavior, (b) experimental values that have been obtained, and (c) the status of theories that permit the calculation of ignition temperatures.

While no clearcut definition of ignition temperature has been developed, it appears probable that a definite or an absolute ignition temperature does exist for a particular metal-oxygen system. In general terms, if the energy input as converted to heat is greater than the heat dissipation, a temperature will be reached at which ignition of the metal will occur. Practically, this temperature appears dependent on many factors some of which are relatively static (e.g., atmosphere, composition, purity, metal surface area and condition, etc.) and others that may be dynamic (e.g., pressure, impact, impact velocity, vibration, etc.). No standard test procedures or methods have been developed to evaluate the ignition temperatures of metals. The net result is that varying values have been reported for the same or similar metal-oxygen systems.

Despite these differences, the following generalizations can be offered on the basis of the experimental evaluations performed to date:

(1) All metals, with the possible exception of gold and platinum, can be expected to ignite in oxygen at some elevated temperature.

(2) Alloys of several systems have been shown to ignite in oxygen systems at relatively low temperatures and some at LOX temperatures if some external source of energy input is present. Generally, the presence of a fresh metal surface is also necessary to cause ignition at these low temperatures. These ignition-sensitive alloy systems include the alloys of titanium, zirconium, thorium, uranium, lead, tin, and magnesium.

(3) A number of secondary energy input sources have been shown to cause ignition of these sensitive alloys in oxygen systems. These sources also probably produce a fresh metal surface and are identified as follows:

In Gaseous Oxygen

Electric spark	Stress rupture
Puncture	Explosive shock.

In Liquid Oxygen

Mechanical impact	Puncture
Explosive shock.	

(4) A number of other methods of secondary energy input and methods of exposing fresh metal do not produce ignition. These are as follows:

In Gaseous Oxygen

High-velocity flow

Low-cycle fatigue cracking

Impact on the outside of a container without puncture

High-velocity flow through a small orifice

Rapid pressurization

In Liquid Oxygen

Impact on the outside of a container without puncture

Rapid pressurization

Machining

Friction and galling

Tensile rupture

Mechanical vibration

Sonic vibration

Ultrasonic vibration

High-velocity flow through an orifice.

(5) An increase in pressure of a gaseous oxygen system tends to promote ignition at lower temperatures or with lower secondary energy inputs. The dilution of oxygen with an inert material, gaseous or liquid, tends to reduce sensitivity of metals in oxygen systems. However, propagation is not affected much until the dilution is very great, on the order of 90 percent inert gas or liquid.

(6) A number of alloy systems have been shown to be relatively insensitive to ignition in an oxygen environment either at high temperatures or at low temperatures with high secondary energy inputs. These alloy systems include: austenitic stainless steels, nickel alloys, cobalt alloys, copper alloys, and silver alloys. Alloys of these systems show the best service record and also show the least sensitivity in laboratory tests.

(7) Another group of alloys appears to be somewhat intermediate between the sensitive and insensitive groups cited in Items 2 and 6. This group includes aluminum alloys, the 400 series stainless steels, and carbon and low-alloy high-strength steels. These materials would be expected to find limited use in relatively nonsensitive applications."

(Remaining discussion has been omitted).