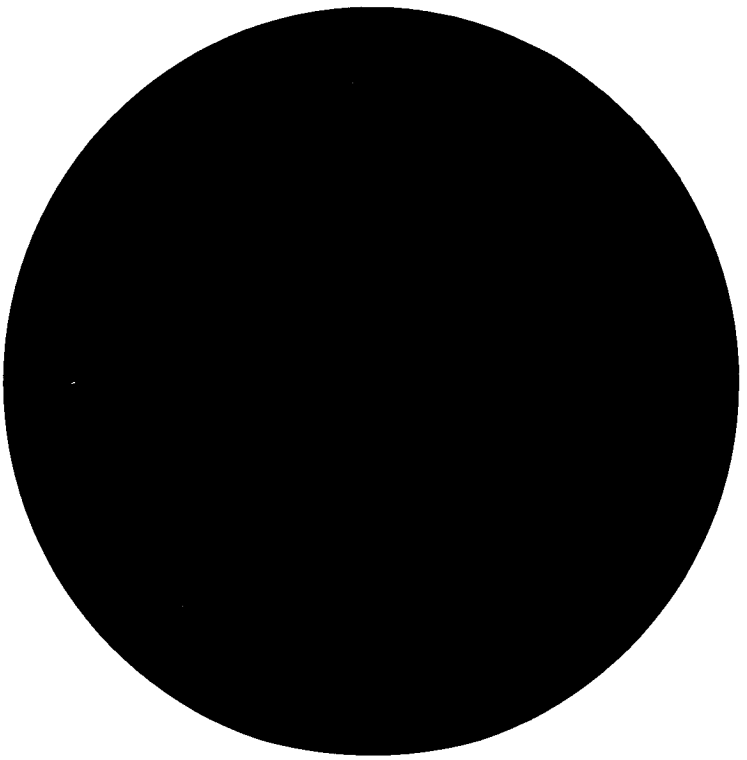
EH02/D. M. Davis

Materials Engineering Data Base

NAS 8-37780

November 10, 1995



Submitted By

BAMSI, Incorporated Box 1659
Titusville, Florida 32780

Hugh M. Brown, Chief Executive Officer

BAMSI, INC.
MATERIALS ENGINEERING DATA BASE
FINAL REPORT
NAS 8-37780

Introduction

BAMSI, Incorporated, located in Titusville, Florida was awarded the Materials Engineering Data Base Development contract on October 1, 1988. Mr. Hugh M. Brown is the CEO for BAMSI. A project management office was established off-site in Huntsville, Alabama.

The period of performance was a three year base with two one-year option periods. After the second option period, the contract was extended an additional two years.

The purpose of the Materials Engineering Data Base Contract was to compile the various types of materials related data that exist at Marshall into databases which could be accessed by all the NASA centers and by other contractors. It consisted of twelve tasks. Eleven of the tasks were related to data base development and the one remaining task was to material testing.

The data base development personnel and the project management personnel were located at an off-site office complex and the material testing personnel were located on-site in Building 4623. During the two-year extension period as a cost-saving measure, all personnel were moved on-site.

TASK 1

Development of Non-metallic Data Bases

Task 1 required the development of three data bases per year. Selection was limited to the following categories:

• Coatings	• Fabrics
• Composites	• Coated Fabrics
• Films (Non-Photographic)	• Tubing Electrical
• Foams	• Nozzle Materials
• Hose/Tubing/Duct Material	• Insulation, Thermal
• Inks/Markings	• Potting Compounds
• Laminates	• Fasteners (Non-metal)
• Sealant, Thread	• Electrical Accessories
• Wire/Cable Electrical	• Lubricants

First category selected was Tapes (adhesive/non-adhesive). The Selection List Data Base was queried to obtain a listing of the manufacturers of tape products. The manufacturers were requested to submit product literature containing data on different property values.

The literature received was evaluated by the staff Materials Engineer. He developed a list of different property values reported for tapes (i.e. tensile strength, elongation). The list was submitted to NASA COTR for approval. After approval was received, structuring of the data into acceptable computer format was begun.

Thirty-eight (38) manufacturers submitted data on over eleven hundred (1100) different tapes. Seventy (70) different property categories were selected for reporting.

The list of manufacturers, products and suggested property categories is attached. A copy of the finalized on-line data entry screens is also included at the end of the documentation on Task 1.

Tubings Data Base

The tubing data base covers heat shrinkable and electrical tubings and sleevings. Thirty manufacturers of these products responded with data on approximately four hundred different products. The following is a list of the manufacturers along with their products which are detailed in the data base. A list of all reported properties is included. A finalized version of the on-line data entry screens is included at the end of the documentation for Task 1.

Potting Compounds

The selection list was surveyed to develop a list of possible manufacturers of potting compounds. These manufacturers were contacted by BAMSI employees. Thirty-six companies supplied data on approximately five hundred and twenty-five different potting and molding compounds. A listing of these manufacturers and their products is included. A list of the property values reported is attached along with a copy of the finalized data entry screen format at the end of the Task 1 documentation.

Insulations

The Selection List Data Base was queried to develop a list of possible manufacturers of insulations. Forty-five different companies responded with product literature on approximately five hundred and fifty different materials. A list of the manufacturers and their products is provided. A list for the property values that were reported for insulations is also included. A copy of the finalized version of the on-line data entry screens is included at the end of the Task 1 documentation.

Films

The Selection List Data Base was queried to develop a listing of possible manufacturers of films. Twenty-three manufacturers provided data on approximately two hundred products. A listing of those manufacturers, their products and the property values that were reported is included. The finalized version of the on-line data entry screens is included at the end of Task 1 documentation.

MANUFACTURER	DESIGNATION
3M COMPANY	SLEEVING HEAT SHRINKABLE INSULTITE EPS-200 POLYOLEFIN
	SLEEVING HEAT SHRINKABLE INSULTITE EPS-300 POLYOLEFIN
	TUBING HEAT SHRINKABLE INSULTITE CP-221 POLYOLEFIN
	TUBING HEAT SHRINKABLE INSULTITE FP-301 TYPE 1 FLEXIBLE POLYOLEFIN
	TUBING HEAT SHRINKABLE INSULTITE FP-301 TYPE 2 FLEXIBLE POLYOLEFIN
	TUBING HEAT SHRINKABLE INSULTITE FP-301 VW FLEXIBLE POLYOLEFIN
	TUBING HEAT SHRINKABLE INSULTITE KYNAR POLYVINLIDENE FLUORIDE
	TUBING HEAT SHRINKABLE INSULTITE MW POLYOLEFIN MULTIPLE WALL
	TUBING HEAT SHRINKABLE INSULTITE NST MODIFIED NEOPRENE
	TUBING HEAT SHRINKABLE INSULTITE SR-350 TYPE 1 SEMI-RIGID POLYOLEFIN
	TUBING HEAT SHRINKABLE INSULTITE SR-350 TYPE 2 SEMI-RIGID POLYOLEFIN
	TUBING HEAT SHRINKABLE INSULTITE TP POLYOLEFIN
	TUBING HEAT SHRINKABLE INSULTITE VFP-876 TYPE 1 FLEXIBLE POLYOLEFIN
	TUBING HEAT SHRINKABLE INSULTITE VFP-876 TYPE 2 FLEXIBLE POLYOLEFIN
	TUBING HEAT SHRINKABLE INSULTITE VITON FLUOROELASTOMER
ALPHA WIRE CORPORATION	SLEEVING ELECTRICAL FIT-700 CABLE CONNECTOR SLEEVES POLYOLEFIN
	TUBING HEAT SHRINKABLE FIT-105 FLEXIBLE PVC
	TUBING HEAT SHRINKABLE FIT-130 MYLAR
	TUBING HEAT SHRINKABLE FIT-221 VC HIGHLY FLAME RETARDANT POLYOLEFIN
	TUBING HEAT SHRINKABLE FIT-221LT LOW SHRINK TEMPERATURE POLYOLEFIN
	TUBING HEAT SHRINKABLE FIT-250 NYLON
	TUBING HEAT SHRINKABLE FIT-295 SEMI-RIGID POLYOLEFIN
	TUBING HEAT SHRINKABLE FIT-300 SURFACE IRRADIATED POLYOLEFIN
	TUBING HEAT SHRINKABLE FIT-321 HIGH SHRINK RATIO POLYOLEFIN
	TUBING HEAT SHRINKABLE FIT-350 KYNAR
	TUBING HEAT SHRINKABLE FIT-400 FEP TEFLON
	TUBING HEAT SHRINKABLE FIT-421 HIGH SHRINK RATIO POLYOLEFIN
	TUBING HEAT SHRINKABLE FIT-500 TFE TEFLON
	TUBING HEAT SHRINKABLE FIT-600 NEOPRENE
	TUBING HEAT SHRINKABLE FIT-650 VITON
	TUBING HEAT SHRINKABLE FIT-675 SILICONE RUBBER
	TUBING HEAT SHRINKABLE FIT-750 ADHESIVE WALL POLYOLEFIN
	TUBING HEAT SHRINKABLE FIT-221 MULTI-PURPOSE POLYOLEFIN
	TUBING HEAT SHRINKABLE FIT-221V HIGHLY FLAME RETARDANT POLYOLEFIN
BENTLEY HARRIS	SLEEVING ELECTRICAL BEN-HAR 1062 SILICONE COATED FIBERGLASS
	SLEEVING ELECTRICAL BEN-HAR 1151XL 200 SILICONE RUBBER COATED FIBERGLASS
	SLEEVING ELECTRICAL BEN-HAR ACRYL COATED FIBERGLASS
	SLEEVING ELECTRICAL BEN HAR 1258 SILICONE RUBBER
	SLEEVING ELECTRICAL BEN-HAR 1151-FR SILICONE RUBBER COATED FIBERGLASS
	SLEEVING ELECTRICAL BEN-HAR 1151-XL SILICONE RUBBER COATED FIBERGLASS
	SLEEVING ELECTRICAL BEN-HAR 1151-XL-220 SILICONE RUBBER COATED FIBERGLASS
	SLEEVING ELECTRICAL BEN-HAR EX FLEX 1500 FIBERGLASS
	SLEEVING ELECTRICAL BEN-HAR EX FLEX FIBERGLASS
	SLEEVING ELECTRICAL BEN-HAR ST FIBERGLASS
	SLEEVING ELECTRICAL BEN-HAR ST-1250 FIBERGLASS
	SLEEVING ELECTRICAL EXPANDO 686 DM POLYPHENYLENE SULFIDE (PPS) AND POLYETHERETHERKETONE (PEEK)
	SLEEVING ELECTRICAL EXPANDO DM POLYESTER AND NYLON
	SLEEVING ELECTRICAL EXPANDO FR BRAIDED POLYESTER
	SLEEVING ELECTRICAL EXPANDO HR ECTFE
	SLEEVING ELECTRICAL EXPANDO PT BRAIDED POLYESTER
	SLEEVING ELECTRICAL EXPANDO PT ZIP CONSTRUCTION POLYESTER
	SLEEVING ELECTRICAL EXPANDO TIGHTWEAVE FR POLYESTER

MANUFACTURER	DESIGNATION
	SLEEVING ELECTRICAL EXPANDO TIGHTWEAVE HR ECTFE
	SLEEVING ELECTRICAL EXPANDO TIGHTWEAVE PT POLYESTER
	SLEEVING ELECTRICAL BEN-HAR 1151-XL-FR-1 SILICONE RUBBER COATED FIBERGLASS
	SLEEVING ELECTRICAL BEN-HAR VINYL GLASS POLYVINYL CHLORIDE COATED FIBERGLASS
BUNDY CORP/BUNNELL PLASTICS	TUBING HEAT SHRINK KYNAR MODIFIED
	TUBING HEAT SHRINK MODIFIED NEOPRENE
	TUBING HEAT SHRINK PT-V M-W POLYOLEFIN
	TUBING HEAT SHRINK PT-V POLYOLEFIN
	TUBING HEAT SHRINK VITON MODIFED
	TUBING HEAT SHRINKABLE SMT TEFLON FEP FLUOROCARBON RESIN
	TUBING HEAT SHRINKABLE SPT TEFLON FEP FLUOROCARBON RESIN
	TUBING HEAT SHRINKABLE SST TEFLON FEP FLUOROCARBON RESIN
	TUBING HEAT SHRINKABLE TEFLON PFA
	TUBING HEAT SHRINKABLE TEFLON PTFE
	TUBING HEAT SHRINKABLE TEFZEL ETFE
	TUBING HEAT SHRINKABLE WTF DUAL-WALL TFE/FEP
CONSOLIDATED ELECTRONIC WIRE AND CABLE	SLEEVING ELECTRICAL CIF-130 FIBERGLASS COATED WITH VINYL
	SLEEVING ELECTRICAL CIF-150 FIBERGLASS COATED WITH ACRYLIC
	SLEEVING ELECTRICAL CIF-200 FIBERGLASS COATED WITH SILICONE RUBBER
	SLEEVING ELECTRICAL CIF-240 FIBERGLASS
	TUBING ELECTRICAL CFT-200 TFE TEFLON
	TUBING ELECTRICAL CFT-250 TFE TEFLON
	TUBING ELECTRICAL CVC-105 PLASTIC
	TUBING HEAT SHRINKABLE CIT-105 POLYVINYL CHLORIDE
	TUBING HEAT SHRINKABLE CIT-221 CLEAR POLYOLEFIN
	TUBING HEAT SHRINKABLE CIT-221 COLORS POLYOLEFIN
	TUBING HEAT SHRINKABLE CIT-350 KYNAR
	TUBING HEAT SHRINKABLE CIT-500 TFE TEFLON
DABURN ELECTRONIC AND CABLE CORP	SLEEVING ELECTRICAL DAFLEX D1200
	SLEEVING ELECTRICAL DAFLEX D130
	TIBING HEAT SHRINKABLE DAFLON SM450 TEFLON
	TUBING ELECTRICAL DAFLEX D105 SERIES
	TUBING ELECTRICAL DAFLEX D74
	TUBING ELECTRICAL DAFLON DTT 500
	TUBING ELECTRICAL DAFLON DTT 550
	TUBING ELECTRICAL DAFLON DUT
	TUBING HEAT SHRINKABLE DABURN SH 267
	TUBING HEAT SHRINKABLE DABURN SH265
	TUBING HEAT SHRINKABLE DAFLEX KYNAR SH350
	TUBING HEAT SHRINKABLE DAFLEX SH275 CLEAR
	TUBING HEAT SHRINKABLE DAFLEX SH275 COLORS
	TUBING HEAT SHRINKABLE DAFLEX SH277
	TUBING HEAT SHRINKABLE DAFLEX SH290 CLEAR
	TUBING HEAT SHRINKABLE DAFLEX SH290 COLORS
	TUBING HEAT SHRINKABLE DAFLEX SH321
	TUBING HEAT SHRINKABLE DAFLEX SM270
	TUBING HEAT SHRINKABLE DAFLON SH400 FEP
	TUBING HEAT SHRINKABLE DAFLON SH421 PTFE
	TUBING HEAT SHRINKABLE DAFLON SH620 PTFE
	TUBING HEAT SHRINKABLE DAFLON SH621 PTFE
	TUBING HEAT SHRINKABLE DAPRENE SH162 NEOPRENE
DEARBORN WIRE AND CABLE INC	TUBING HEAT SHRINK DWC/SHRINK 105

MANUFACTURER	DESIGNATION
	TUBING HEAT SHRINK IRRADIATED ST-601 NEOPRENE
DORCO	TUBING ELECTRICAL G10
ESSEX GROUP INC	SLEEVING ELECTRICAL ACRYFLEX-F ACRYLIC COATED FIBERGLASS BRAID SLEEVING ELECTRICAL EXTENDO HAL MONOFILAMENT EXPANDABLE ECTFE SLEEVING ELECTRICAL EXTENDO PETFR MONOFILAMENT EXPANDABLE POLYETHYLENE TEREPHTHALATE SLEEVING ELECTRICAL EXTENDO PETNF MONOFILAMENT EXPANDABLE POLYETHYLENE TEREPHTHALATE SLEEVING ELECTRICAL SILICONE RUBBER COATED FIBERGLASS SLEEVING SLEEVING ELECTRICAL VINYLGLAS POLYVINYL CHLORIDE COATED FIBERGLASS BRAID SLEEVING INSULATION ELECTRICAL EXTENDO PET MONOFILAMENT EXPANDABLE SLEEVING INSULATION ELECTRICAL FLEXICONE 200 SILICONE RUBBER COATED FIBERGLASS SLEEVING INSULATION ELECTRICAL SILICONE RESIN COATED FIBERGLASS SLEEVING TUBING ELECTRICAL ASTRA 703/105 POLYVINYL CHLORIDE TUBING HEAT SHRINK ASTRAMELT LINER MELTABLE POLYOLEFIN TUBING HEAT SHRINK ASTRATITE ACP FLEXIBLE POLYOLEFIN TUBING HEAT SHRINK ASTRATITE AF CLEAR FLEXIBLE POLYOLEFIN TUBING HEAT SHRINK ASTRATITE ASR BLACK SEMI-RIGID POLYOLEFIN TUBING HEAT SHRINK ASTRATITE ASR TRANSLUCENT SEMI-RIGID POLYOLEFIN TUBING HEAT SHRINK ASTRATITE ASR-C SEMI-RIGID POLYOLEFIN TUBING HEAT SHRINK ASTRATITE DWSR POLYOLEFIN WITH ADHESIVE TUBING HEAT SHRINK ASTRATITE VC POLYVINYL CHLORIDE TUBING HEAT SHRINK ASTRATITE VC-TW POLYVINYL CHLORIDE TUBING HEAT SHRINK ASTRATITE VCB POLYVINYL CHLORIDE TUBING HEAT SHRINKABLE ASTRATITE ADM TUBING HEAT SHRINKABLE ASTRATITE ATR POLYOLEFIN TUBING HEAT SHRINKABLE ASTRATITE VTR POLYVINYL CHLORIDE
GRACE (WR) AND COMPANY	TUBING HEAT SHRINK CHO-SHRINK
HIGH VOLTAGE ENGINEERING CORP	TUBING ELECTRICAL 361/363 LOW TEMPERATURE VINYL TUBING ELECTRICAL 362 LOW TEMPERATURE VINYL
ICO RALLY CORPORATION	SLEEVING ELECTRICAL SLV-1200 FIBERGLASS TUBING ELECTRICAL SLV-105 CHLORINATED VINYL TUBING ELECTRICAL SLV-130 FIBERGLASS AND VINYL COATING TUBING ELECTRICAL SLV-40 VINYL CHLORIDE BASE TUBING ELECTRICAL TTF TEFLON TFE TUBING HEAT SHRINKABLE HCG CLEAR IRRADIATED POLYOLEFIN TUBING HEAT SHRINKABLE HCG COLORS IRRADIATED POLYOLEFIN TUBING HEAT SHRINKABLE HCX FLEXIBLE IRRADIATED VINYL CHLORIDE BASE TUBING HEAT SHRINKABLE HIM DUAL WALL POLYOLEFIN WITH MELTABLE INNER WALL TUBING HEAT SHRINKABLE HIX CLEAR FLEXIBLE IRRADIATED POLYOLEFIN TUBING HEAT SHRINKABLE HIX COLOR FLEXIBLE IRRADIATED POLYOLEFIN TUBING HEAT SHRINKABLE HKX IRRADIATED POLYVINYLIDENE FLUORIDE (KYNAR) TUBING HEAT SHRINKABLE HNT POLYCHLOROPRENE (NEOPRENE) TUBING HEAT SHRINKABLE HRX CLEAR IRRADIATED POLYOLEFIN TUBING HEAT SHRINKABLE HRX COLOR IRRADIATED POLYOLEFIN TUBING HEAT SHRINKABLE HTX TETRAFLUOROETHYLENE TUBING HEAT SHRINKABLE HVX POLYVINYLCHLORIDE TUBING HEAT SHRINKABLE HXT IRRADIATED POLYOLEFIN TUBING HEAT SHRINKDABLE HFX FLEXIBLE TFE TUBING RALLY-RAP SPIRAL-CUT SWN BLACK NYLON TUBING RALLY-RAP SPIRAL-CUT SWN NATURAL NYLON

MANUFACTURER	DESIGNATION
ICO RALLY CORPORATION	TUBING RALLY-RAP SPIRAL-CUT SWP BLACK POLYETHYLENE
	TUBING RALLY-RAP SPIRAL-CUT SWP NATURAL POLYETHYLENE
	TUBING RALLY-RAP SPIRAL-CUT SWT TEFLON
	TUBING ELECTRICAL STL TEFLON TFE
	TUBING ELECTRICAL STS TEFLON TFE
	TUBING ELECTRICAL STT TEFLON TFE
	TUBING HEAT SHRINKABLE 8509
	TUBING HEAT SHRINKABLE HSX TFE
INSULATION SYSTEMS INC	TUBING SHRINKABLE ELECTRICAL EGM POLYVINYL CHLORIDE
	TUBING SHRINKABLE ELECTRICAL EPDM ETHYLENE PROPYLENE RUBBER
	TUBING SHRINKABLE ELECTRICAL HTM POLYVINYL CHLORIDE
	TUBING SHRINKABLE ELECTRICAL HYP SULFOCHLORINTED PE
	TUBING SHRINKABLE ELECTRICAL IGM POLYVINYL CHLORIDE
	TUBING SHRINKABLE ELECTRICAL INDUSTRIAL GRADE SRI SILICONE RUBBER
	TUBING SHRINKABLE ELECTRICAL LTM POLYVINYL CHLORIDE
	TUBING SHRINKABLE ELECTRICAL MEDICAL GRADE SRM SILICONE RUBBER
	TUBING SHRINKABLE ELECTRICAL NEO POLYCHLOROPRENE
	TUBING SHRINKABLE ELECTRICAL SRC SILICONE RUBBER
	TUBING SHRINKABLE ELECTRICAL SSV POLYVINYL CHLORIDE
	TUBING SHRINKABLE ELECTRICAL STF SILICONE RUBBER
	TUBING SHRINKABLE ELECTRICAL STH SILICONE RUBBER
	TUBING SHRINKABLE ELECTRICAL STM SILICONE
	TUBING SHRINKABLE ELECTRICAL THM POLYVINYL CHLORIDE
	TUBING SHRINKABLE ELECTRICAL U POLYURETHANE
	TUBING SHRINKABLE ELECTRICAL VIT HEXA FLUOROPROPYLENE
MARKEL CORPORATION	SLEEVING ELECTRICAL HYGRADE CONFORM-A-SLEEVE FIBERGLASS COATED WITH SILICONE RUBBER
	SLEEVING ELECTRICAL HYGRADE POLYTUBE 463 FIBERGLASS COATED WITH MODIFIED ACRYLIC
	SLEEVING ELECTRICAL HYGRADE SR-398 SILICONE RUBBER COATED FIBERGLASS
	SLEEVING ELECTRICAL HYGRADE THERMOFLEX FIBERGLASS BRAID
	SLEEVING ELECTRICAL HYGRADE VF FIBERGLASS COATED WITH VINYL
	TUBING ELECTRICAL E 5150 VINYL CHLORIDE BASE
	TUBING ELECTRICAL FLEXITE 6031 TETRAFLUOROETHYLENE
	TUBING ELECTRICAL FLEXITE 6032 TETRAFLUOROETHYLENE
	TUBING ELECTRICAL FLEXITE 6033 TETRAFLUOROETHYLENE
	TUBING HEAT SHRINKABLE FLEXITE AL/PO-135 POLYOLEFIN WITH INNER WALL POLYAMIDE ADHESIVE
	TUBING HEAT SHRINKABLE FLEXITE CG-105 POLYVINYLCHLORIDE
	TUBING HEAT SHRINKABLE FLEXITE CG-135 CLEAR POLYOLEFIN
	TUBING HEAT SHRINKABLE FLEXITE CG-135 COLORS POLYOLEFIN
	TUBING HEAT SHRINKABLE FLEXITE HA-150 POLYVINYLIDENE FLUORIDE
	TUBING HEAT SHRINKABLE FLEXITE HM-140 CLEAR POLYOLEFIN
	TUBING HEAT SHRINKABLE FLEXITE HM-140 COLORS POLYOLEFIN
	TUBING HEAT SHRINKABLE FLEXITE HM-140 CP CLEAR POLYOLEFIN
	TUBING HEAT SHRINKABLE FLEXITE HM-140 CP COLORS POLYOLEFIN
	TUBING HEAT SHRINKABLE FLEXITE HT-105 POLYVINYLCHLORIDE
	TUBING HEAT SHRINKABLE FLEXITE HT-105C POLYVINYL CHLORIDE
	TUBING HEAT SHRINKABLE FLEXITE LM 145 CLEAR MODIFIED POLYOLEFIN
	TUBING HEAT SHRINKABLE FLEXITE LM 145 COLORS MODIFIED POLYOLEFIN
	TUBING HEAT SHRINKABLE FLEXITE PO-135 CLEAR POLYOLEFIN
	TUBING HEAT SHRINKABLE FLEXITE PO-135 COLORS POLYOLEFIN
	TUBING HEAT SHRINKABLE FLEXITE PO-135 HEAVY WALL POLYOLEFIN
	TUBING HEAT SHRINKABLE FLEXITE TE-250 MODIFIED POLYTETRAFLUOROETHYLENE

MANUFACTURER	DESIGNATION
MARKEL CORPORATION	TUBING HEAT SHRINKDABLE FLEXITE HT-105 HEAVY WALL POLYVINYLCHLORIDE
NATVAR COMPANY/DIV. HIGH VOLTAGE ENGINEERING CORP.	SLEEVING ELECTRICAL 1400 NYLON
	SLEEVING ELECTRICAL ACRYLIGLAS 727N ACRYLIC COATED FIBERGLASS
	SLEEVING ELECTRICAL ARAMID WOVEN NOMEX FIBERS
	SLEEVING ELECTRICAL CERASLEEVE CERAMIC NEXTEL 312 BRAIDED FIBERS
	SLEEVING ELECTRICAL E-MF GP/E-MF HD BRAIDED EXPANDABLE MONOFILAMENT POLYETHYLENE TEREPHTHALATE
	SLEEVING ELECTRICAL E-MF HT EXPANDABLE MONOFILAMENT ECTFE HALAR
	SLEEVING ELECTRICAL E-MF PPS POLYPHENYLENE SULFIDE EXPANDABLE MONOFILAMENT
	SLEEVING ELECTRICAL SILICONE RUBBER-COATED FIBERGLASS
	SLEEVING ELECTRICAL VINYL-COATED FIBERGLASS
	TUBING ELECTRICAL 241/261 POLYVINYL CHLORIDE
	TUBING ELECTRICAL 400/461 POLYVINYL CHLORIDE
	TUBING ELECTRICAL 500 OIL-RESISTANT VINYL
	TUBING ELECTRICAL HS400 PVC HEAT SHRINKABLE POLYVINYL CHLORIDE
	TUBING ELECTRICAL SC-600 SPIRAL CUT POLYETHYLENE
	TUBING ELECTRICAL SC-601 SPIRAL CUT POLYETHYLENE
	TUBING ELECTRICAL SC-602 SPIRAL CUT FLAME RETARDANT POLYETHYLENE
	TUBING ELECTRICAL SC-604 SPIRAL CUT NYLON
	TUBING ELECTRICAL SC-605 SPIRAL CUT NYLON
	TUBING ELECTRICAL SC-606 SPIRAL CUT TEFLON
PRECISION PAPER TUBE COMPANY	TUBING ELECTRICAL CELLULOSE ACETATE
	TUBING ELECTRICAL KAPTON
	TUBING ELECTRICAL MYLAR
	TUBING ELECTRICAL NOMEX
	TUBING ELECTRICAL RESINITE RB-8111
	TUBING ELECTRICAL RESINITE RG-8108
	TUBING ELECTRICAL RESINITE RS-8717
	TUBING ELECTRICAL THERMOFORM-255
	TUBING ELECTRICAL THINWALL P-100
	TUBING ELECTRICAL VULCANIZED FIBRE
	TUBING HEAT SHRINKABLE MYLAR
RAYCHEM CORPORATION	TUBING ELECTRICAL THERMOFIT CONVOLEX ALTERNATE NAME RT-1150
	TUBING ELECTRICAL THERMOFIT RT-375
	TUBING HEAT SHRINKABLE THERMOFIT ATUM ALTERNATE NAME RK-6025
	TUBING HEAT SHRINKABLE THERMOFIT CRN ALTERNATE NAME RT-360 CLEAR
	TUBING HEAT SHRINKABLE THERMOFIT CRN ALTERNATE NAME RT-360 COLORS
	TUBING HEAT SHRINKABLE THERMOFIT DR-25 ALTERNATE NAME RT-1116
	TUBING HEAT SHRINKABLE THERMOFIT KYNAR ALTERNATE NAME RT-850
	TUBING HEAT SHRINKABLE THERMOFIT NT ALTERNATE NAME RT-510
	TUBING HEAT SHRINKABLE THERMOFIT NT-FR ALTERNATE NAME RT-511
	TUBING HEAT SHRINKABLE THERMOFIT NYLON ALTERNATE NAME RT-1170
	TUBING HEAT SHRINKABLE THERMOFIT PVC ALTERNATE NAME RT-800
	TUBING HEAT SHRINKABLE THERMOFIT RNF-100 COLORS ALTERNATE NAME RT-350 T1
	TUBING HEAT SHRINKABLE THERMOFIT RP-4800 ALTERNATE NAME RT-1122
	TUBING HEAT SHRINKABLE THERMOFIT RT-102
	TUBING HEAT SHRINKABLE THERMOFIT RT-876
	TUBING HEAT SHRINKABLE THERMOFIT SCL ALTERNATE NAME RT-1301
	TUBING HEAT SHRINKABLE THERMOFIT SFR ALTERNATE NAME RT-1140
	TUBING HEAT SHRINKABLE THERMOFIT SRFR ALTERNATE NAME RT-1142
	TUBING HEAT SHRINKABLE THERMOFIT TAT-125 CLEAR
	TUBING HEAT SHRINKABLE THERMOFIT TAT-125 COLORS
REHAU INCORPORATED	SLEEVING HEAT SHRINK RAU-SIK 8410 SILICONE

MANUFACTURER	DESIGNATION
REHAU INCORPORATED	SLEEVING HEAT SHRINK RAUCROSS DO RAU-VPE 140 FLEXIBLE POLYOLEFIN
	SLEEVING HEAT SHRINK RAUCROSS DON RAU-VPE 145 FLEXIBLE POLYOLEFIN
	SLEEVING HEAT SHRINK RAUCROSS DON3 RAU-VPE 145 FLEXIBLE POLYOLEFIN
	SLEEVING HEAT SHRINK RAUCROSS DOU RAU-VPE 144 FLEXIBLE POLYOLEFIN
	SLEEVING HEAT SHRINK RAUCROSS DS RAU-VPE 142 FLEXIBLE POLYOLEFIN
	SLEEVING HEAT SHRINK RAUCROSS DS3 RAU-VPE 142 FLEXIBLE POLYOLEFIN
	SLEEVING HEAT SHRINK RAUCROSS DSK RAU-VPE 142/RAUCOL 21 FLEXIBLE POLYOLEFIN WITH ADHESIVE COATING
	SLEEVING HEAT SHRINK RAUCROSS DSN RAU-VPE 1422 FLEXIBLE POLYOLEFIN
	SLEEVING HEAT SHRINK RAUCROSS DSNG RAU-VPE 1422 FLEXIBLE POLYOLEFIN
	SLEEVING HEAT SHRINK RAUCROSS DSNK 3 RAU-VPE 1420/RAUCOL 22 SEMI-RIGID POLYOLEFIN WITH ADHESIVE
	SLEEVING HEAT SHRINK RAUCROSS DSNK 4 RAU-VPE 1420/RAUCOL 22 SEMI-RIGID POLYOLEFIN WITH ADHESIVE
	SLEEVING HEAT SHRINK RAUCROSS MO RAU-VPE 340 MEDIUM-WALLED POLYOLEFIN
	SLEEVING HEAT SHRINK RAUCROSS MOK RAU-VPE 340 MEDIUMLLED POLYOLEFIN WITH ADHESIVE COATING
	SLEEVING HEAT SHRINK RAUCROSS WS RAU-VPE 342 THICK-WALLED POLYOLEFIN
	SLEEVING HEAT SHRINK RAUCROSS WSK RAU-VPE 342 THICK-WALL POLYOLEFIN WITH ADHESIVE COATING
REMTEK CORPORATION	SLEEVING HEAT SHRINKABLE TEKFIT MWS SEMI-RIGID POLYOLEFIN
	SLEEVING HEAT SHRINKABLE TEKFIT MWSF FLEXIBLE POLYOLEFIN
	TUBING HEAT SHRINKABLE TEKFIT CFR-125 FLEXIBLE POLYOLEFIN
	TUBING HEAT SHRINKABLE TEKFIT CFR-TW FLEXIBLE POLYOLEFIN
	TUBING HEAT SHRINKABLE TEKFIT CGPE-105 FLEXIBLE POLYOLEFIN
	TUBING HEAT SHRINKABLE TEKFIT DWP-125 ADHESIVE COATED POLYOLEFIN
	TUBING HEAT SHRINKABLE TEKFIT FRC-3X POLYMER
	TUBING HEAT SHRINKABLE TEKFIT FRC-TW POLYMER
	TUBING HEAT SHRINKABLE TEKFIT GPO-135 CLEAR FLEXIBLE POLYOLEFIN
	TUBING HEAT SHRINKABLE TEKFIT GPO-135 COLOR FLEXIBLE POLYOLEFIN
	TUBING HEAT SHRINKABLE TEKFIT GPO-TW CLEAR FLEXIBLE POLYOLEFIN
	TUBING HEAT SHRINKABLE TEKFIT GPO-TW COLORS FLEXIBLE POLYOLEFIN
	TUBING HEAT SHRINKABLE TEKFIT GPR-135 SEMI-RIGID CLEAR POLYOLEFIN
	TUBING HEAT SHRINKABLE TEKFIT GPR-135 SEMI-RIGID COLOR POLYOLEFIN
	TUBING HEAT SHRINKABLE TEKFIT NT-120 MODIFIED NEOPRENE
	TUBING HEAT SHRINKABLE TEKFIT PVF-175 SEMI-RIGID POLYVINYLIDENE FLUORIDE KYNAR
	TUBING HEAT SHRINKABLE TEKFIT RET-125 SEMI-RIGID POLYOLEFIN
	TUBING HEAT SHRINKABLE TEKFIT RN-125 SEMI-RIGID NYLON
	TUBING HEAT SHRINKABLE TEKFIT RRT-135 FLEXIBLE POLYOLEFIN
	TUBING HEAT SHRINKABLE TEKFIT RSF-175 FLEXIBLE SILICONE
	TUBING HEAT SHRINKABLE TEKFIT RTA-125 POLYOLEFIN THERMOPLASTIC ADHESIVE INNER LINER
	TUBING HEAT SHRINKABLE TEKFIT RTI-125 SEMI-RIGID POLYOLEFIN
	TUBING HEAT SHRINKABLE TEKFIT RV-200 VITON
	TUBING HEAT SHRINKABLE TEKFIT SSF-200 FLEXIBLE SILICONE RUBBER
RUSSELL INDUSTRIES INC	TUBING HEAT SHRINKABLE DUB SERIES CLASS 1 DUAL WALL ADHESIVE COATED POLYOLEFIN
	TUBING HEAT SHRINKABLE DUB SERIES CLASS 2 DUAL WALL ADHESIVE COATED POLYOLEFIN
SIGMAFORM CORPORATION	TUBING HEAT SHRINKABLE NEMOSYNE 30 SST

MANUFACTURER	DESIGNATION
SINCLAIR AND RUSH INC	TUBING SHRINK-LOC GPF-135 CLEAR
	TUBING SHRINK-LOC GPF-135 COLORS
	TUBING SHRINK-LOC MSP-125
	TUBING SHRINK-LOC TGP-135
SUFLEX PRODUCTS ESSEX INC	TUBING ELECTRICAL ASTRA 601 PVC
	TUBING ELECTRICAL ASTRA 701 PVC
	TUBING HEAT SHRINK ASTRATITE AF COLORS FLEXIBLE POLYOLEFIN
	TUBING HEAT SHRINK ASTRATITE AVF CLEAR FLEXIBLE POLYOLEFIN
	TUBING HEAT SHRINK ASTRATITE AVF COLORS FLEXIBLE POLYOLEFIN
SUMITOMO ELECTRIC INTERCONNECT PRODUCTS INC	TUBING HEAT SHRINKABLE SUMITUBE A2 POLYOLEFIN
	TUBING HEAT SHRINKABLE SUMITUBE A4 POLYOLEFIN
	TUBING HEAT SHRINKABLE SUMITUBE B2 POLYOLEFIN
	TUBING HEAT SHRINKABLE SUMITUBE B2 YELLOW/GREEN STRIPED POLYOLEFIN
	TUBING HEAT SHRINKABLE SUMITUBE B2(3X) POLYOLEFIN
	TUBING HEAT SHRINKABLE SUMITUBE B2(4X) POLYOLEFIN
	TUBING HEAT SHRINKABLE SUMITUBE B8 POLYOLEFIN
	TUBING HEAT SHRINKABLE SUMITUBE C2 POLYOLEFIN
	TUBING HEAT SHRINKABLE SUMITUBE D POLYOLEFIN
	TUBING HEAT SHRINKABLE SUMITUBE D2 POLYOLEFIN
	TUBING HEAT SHRINKABLE SUMITUBE F POLYOLEFIN
	TUBING HEAT SHRINKABLE SUMITUBE F2 FLEXIBLE POLYOLEFIN
	TUBING HEAT SHRINKABLE SUMITUBE F4(TW) THIN WALL POLYOLEFIN
	TUBING HEAT SHRINKABLE SUMITUBE F5 POLYOLEFIN
	TUBING HEAT SHRINKABLE SUMITUBE K POLYVINLIDENE FLUORIDE
	TUBING HEAT SHRINKABLE SUMITUBE K2 POLYVINYLIDENE FLUORIDE
	TUBING HEAT SHRINKABLE SUMITUBE NF POLYOLEFIN
	TUBING HEAT SHRINKABLE SUMITUBE NF4 THIN WALL POLYOLEFIN
	TUBING HEAT SHRINKABLE SUMITUBE O2 POLYOLEFIN WITH THIN WALL ADHESIVE LINER
	TUBING HEAT SHRINKABLE SUMITUBE O2B2 POLYOLEFIN WITH POLYAMIDE ADHESIVE
	TUBING HEAT SHRINKABLE SUMITUBE O2C POLYOLEFIN WITH POLYAMIDE ADHESIVE
	TUBING HEAT SHRINKABLE SUMITUBE O2F2 POLYOLEFIN WITH POLYAMIDE ADHESIVE
	TUBING HEAT SHRINKABLE SUMITUBE R10 CHLORINATED POLYOLEFIN
	TUBING HEAT SHRINKABLE SUMITUBE V POLYVINYL CHLORIDE
	TUBING HEAT SHRINKABLE SUMITUBE W3B2 POLYOLEFIN WITH POLYAMIDE ADHESIVE
	TUBING HEAT SHRINKABLE SUMITUBE W3C POLYOLEFIN WITH POLYAMIDE ADHESIVE
	TUBING HEAT SHRINKABLE SUMITUBE W3F2 POLYOLEFIN WITH POLYAMIDE ADHESIVE
	TUBING HEAT SHRINKABLE SUMITUBE W5DL POLYOLEFIN
	TUBING SUMITUBE K3
TELEFLEX INCORPORATED	TUBING ELECTRICAL FEP
	TUBING ELECTRICAL PTFE
	TUBING HEAT SHRINKABLE TELEFLEX FEP
	TUBING HEAT SHRINKABLE TELEFLEX PTFE
THOMAS AND BETTS CORPORATION	TUBING HEAT SHRINKABLE SHRINK-KON CPO SERIES
TYTON CORPORATION	TUBING HEAT SHRINKABLE TYHW
	TUBING SPIRAL CUT FRP
	TUBING SPIRAL CUT N
	TUBING SPIRAL CUT N-O
	TUBING SPIRAL CUT NFP
	TUBING SPIRAL CUT NFP-O
	TUBING SPIRAL CUT P
VARFLEX CORPORATION	SLEEVING ELECTRICAL SILFLEX
	SLEEVING ELECTRICAL VARFIL

MANUFACTURER	DESIGNATION
VARFLEX CORPORATION	SLEEVING ELECTRICAL VARFLO
	SLEEVING ELECTRICAL VARGLAS 343
	SLEEVING ELECTRICAL VARGLAS A397
	SLEEVING ELECTRICAL VARGLAS SILICONE RESIN COATED
	SLEEVING ELECTRICAL VARGLAS SILICONE RUBBER
	SLEEVING ELECTRICAL VARGLAS SILICONE RUBBER ES-4400
	SLEEVING VARGLAS VITON 231 FIBERGLASS WITH VITON COATING
	TUBING ELECTRICAL SYNTHOLVAR 120/210
	TUBING ELECTRICAL SYNTHOLVAR 200
	TUBING ELECTRICAL SYNTHOLVAR 302/203
	TUBING ELECTRICAL SYNTHOLVAR SHH-3A AND 6A
WEICO WIRE AND CABLE INC	SLEEVING ELECTRICAL XFR
	SLEEVING ELECTRICAL XPT
	TUBING ELECTRICAL FG
	TUBING ELECTRICAL PV
	TUBING ELECTRICAL RSF
	TUBING ELECTRICAL TEFLON
	TUBING HEAT SHRINKABLE SKY KYNAR
	TUBING HEAT SHRINKABLE SMW
	TUBING HEAT SHRINKABLE SNE NEOPRENE
	TUBING HEAT SHRINKABLE SPO CLEAR
	TUBING HEAT SHRINKABLE SPO COLORS
	TUBING HEAT SHRINKABLE SPV
ZEUS INDUSTRIAL PRODUCTS INC	TUBING HEAT SHRINKABLE FEP TEFLON
	TUBING HEAT SHRINKABLE PFA TEFLON
	TUBING HEAT SHRINKABLE TEFZEL
	TUBING HEAT SHRINKABLE TFE TEFLON

377 rows selected.

TUBINGS - 377 MATERIALS

MATERIAL PROPERTIES

PROPERTY	COUNT(*)
ABRASION RESISTANCE	15
ARC RESISTANCE	2
BOND STRENGTH	1
BRITTLE POINT	65
BURST PRESSURE	8
COEF OF FRICTION	13
COMPRESSION SET	1
COMPRESSIVE STRENGTH ULTIMATE	8
CONTINUOUS SERVICE TEMP MAX	345
CONTINUOUS SERVICE TEMP MIN	262
DEFLECTION TEMP	7
DEFORMATION PERCENT	268
DENSITY	14
DIELECTRIC BREAKDOWN	115
DIELECTRIC CONSTANT	116
DIELECTRIC STRENGTH	382
DISSIPATION FACTOR	45
ELECTRICAL RATING	16
ELONGATION	317
FLEXURAL MODULUS	15
FLEXURAL STRENGTH	2
HARDNESS	58
HEAT DISTORTION	1
IMPACT STRENGTH	8
INSULATION RESISTANCE	4
INTERMIT SERVICE TEMP MAX	49
INTERMIT SERVICE TEMP MIN	7
LOW TEMPERATURE FLEXIBILITY	101
MELT POINT	37
OPTICAL TRANSMITTANCE	1
PEEL STRENGTH	25
REFRACTIVE INDEX	1
SHELF LIFE	15
SHRINK	271
SOFT POINT	4
SPECIFIC GRAVITY	228
SPECIFIC HEAT	3
SURFACE RESISTIVITY	2
TEAR STRENGTH	11
TENSILE ELASTIC MODULUS	124
TENSILE STRENGTH ULTIMATE	343
TENSILE STRENGTH YIELD	5
THERMAL CONDUCTIVITY	3
THERMAL EXPANSION COEF	7
VOLUME RESISTIVITY	217
WATER ABSORPTION	210
sum	3752

46 rows selected.

CHEMICAL RESISTANCE PROPERTIES

PROPERTY	COUNT(*)

DIELECTRIC STRENGTH	369
ELONGATION @ RUP	228
ELONGATION @ YLD	10
C[redacted]ERVED CHANGE	501
T[redacted]SILE STRENGTH	594
WEIGHT CHANGE	2
sum	1704

6 rows selected.

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MANUFACTURER	DESIGNATION
3M COMPANY	POTTING COMPOUND SCOTCH-WELD 3439 HS AF
ABLESTIK LABORATORIES	ABLEBOND 380-5
	ABLEBOND 957-2
AREMCO PRODUCTS INC	MOLDING COMPOUND CERAMACAST 510
	MOLDING COMPOUND CERAMACAST 575
	MOLDING COMPOUND CERAMACAST 576
	MOLDING COMPOUND CERAMACAST 583
	MOLDING COMPOUND CERAMACAST 584
	MOLDING COMPOUND CERAMACAST 645
	MOLDING COMPOUND CERAMACAST 646
BACON INDUSTRIES INC	POTTING COMPOUND C-84
	POTTING COMPOUND CI-2
	POTTING COMPOUND CI-3
	POTTING COMPOUND CI-6
	POTTING COMPOUND FA-14
	POTTING COMPOUND P-11
	POTTING COMPOUND P-14 EPOXY WITH FILLER
	POTTING COMPOUND P-175
	POTTING COMPOUND P-178
	POTTING COMPOUND P-19
	POTTING COMPOUND P-20
	POTTING COMPOUND P-24
	POTTING COMPOUND P-38
	POTTING COMPOUND P-51
	POTTING COMPOUND P-56
	POTTING COMPOUND P-56A
	POTTING COMPOUND P-70
	POTTING COMPOUND P-80C
	POTTING COMPOUND P-80F
	POTTING COMPOUND P-82C
	POTTING COMPOUND P-82F
	POTTING COMPOUND P-85
	POTTING COMPOUND P-86
	POTTING COMPOUND SC-10
	POTTING COMPOUND SC-17
BIWAX CORPORATION	POTTING COMPOUND 101
	POTTING COMPOUND 112
	POTTING COMPOUND 118
	POTTING COMPOUND 122
	POTTING COMPOUND 124
	POTTING COMPOUND 142
	POTTING COMPOUND 145
	POTTING COMPOUND 148
	POTTING COMPOUND 152
	POTTING COMPOUND 165
	POTTING COMPOUND 168
	POTTING COMPOUND 169
	POTTING COMPOUND 170
	POTTING COMPOUND 171
	POTTING COMPOUND 172
	POTTING COMPOUND 173
	POTTING COMPOUND 411
	POTTING COMPOUND 440
	POTTING COMPOUND 467

MANUFACTURER	DESIGNATION
BIWAX CORPORATION	POTTING COMPOUND 622
	POTTING COMPOUND 628
	POTTING COMPOUND 638
	POTTING COMPOUND 639
	POTTING COMPOUND 648
	POTTING COMPOUND 649
	POTTING COMPOUND 650
	POTTING COMPOUND 651
CASTALL INC	CASTALL E1530/E-34
	CASTALL E301AD/E-34
	CASTALL E341FR
	CASTALL E464A&B/E-34
	POTTING COMPOUND 480 A/B
	POTTING COMPOUND E301/E34
	POTTING COMPOUND E482 A/B
CHASE CORPORATION	POTTING COMPOUND HUMISEAL TYPE 2B76
	POTTING COMPOUND HUMISEAL TYPE 2B78
	POTTING COMPOUND HUMISEAL TYPE 2B80
	POTTING COMPOUND HUMISEAL TYPE 2B82
	POTTING COMPOUND HUMISEAL TYPE 2B84
CHEMTREX INC	POTTING COMPOUND EMBEDDING RESTECH 013/012
	POTTING COMPOUND EMBEDDING RESTECH 024/027
	POTTING COMPOUND EMBEDDING RESTECH 148/027
	POTTING COMPOUND EMBEDDING RESTECH 162/027
	POTTING COMPOUND RESTECH 210/194
	POTTING COMPOUND RESTECH 266/194
	POTTING COMPOUND RESTECH 294/194
CONAP INC	CONAP CONATHANE DPEN-8536
	CONAP CONATHANE EN-10
	CONAP CONATHANE EN-11
	CONAP CONATHANE EN-2
	CONAP CONATHANE EN-20
	CONAP CONATHANE EN-21
	CONAP CONATHANE EN-2523
	CONAP CONATHANE EN-2525
	CONAP CONATHANE EN-2526
	CONAP CONATHANE EN-2527
	CONAP CONATHANE EN-2528
	CONAP CONATHANE EN-4
	CONAP CONATHANE EN-5
	CONAP CONATHANE EN-6
	CONAP CONATHANE EN-7
	CONAP CONATHANE EN-8
	CONAP CONATHANE EN-9
	CONAP CONATHANE EN-9 (OZR)
	CONAP CONATHANE UC-31
	CONAP CONATHANE UC-32
	CONAP CONATHANE UC-33
	CONAP CONATHANE UC-34
	CONAP EN-23
	CONAP EN-24
	CONAP EN-30
	CONAP TU-4010
	CONAPOXY AD-12

MANUFACTURER	DESIGNATION
CONAP INC	CONAPOXY AD-17
	CONAPOXY TE-1257/EA-071
	CONAPOXY TE-1257/EA-08
	CONAPOXY TE-1257/EA-113
	CONAPOXY TE-1257/EA-116
	CONAPOXY TE-1257/EA-117
	CONATHANE EN-22
	CONATHANE EN-2541
	CONATHANE EN-2543
	CONATHANE EN-2545
	CONATHANE EN-2547
	CONATHANE EN-2548
	CONATHANE TU-400
	CONATHANE TU-500
	CONATHANE TU-50A
	CONATHANE TU-600
	CONATHANE TU-65A
	CONATHANE TU-700
	CONATHANE TU-79
	CONATHANE TU-80
	CONATHANE TU-800
	CONATHANE TU-89
	CONATHANE TU-900
	CONATHANE TU-955
	CONATHANE UC-17
	CONATHANE UC-21
	CONATHANE UC-22
	CONATHANE UC-23
	CONATHANE UC-24
	CONATHANE UC-25
	CONATHANE UC-26
	CONATHANE UC-27
	CONATHANE UC-30
	CONATHANE UF-3
	CONOTHANE TU-960
COTRONICS CORPORATION	POTTING COMPOUND DURAPOT 801
	POTTING COMPOUND DURAPOT 804
	POTTING COMPOUND DURAPOT 805
	POTTING COMPOUND DURAPOT 808
	POTTING COMPOUND DURAPOT 809
	POTTING COMPOUND DURAPOT 814
	POTTING COMPOUND DURAPOT 820
	POTTING COMPOUND DURAPOT 861
	POTTING COMPOUND DURAPOT 862
	POTTING COMPOUND DURAPOT 863
	POTTING COMPOUND DURAPOT 864
	POTTING COMPOUND DURAPOT 865
	POTTING COMPOUND DURAPOT 866
DOLPH (JOHN C) CO	DOLPHON CB-1069
	DOLPHON CB-1076
	DOLPHON CB-1078
	DOLPHON CB-1078/RE-2000
	DOLPHON CB-1078/RE-2001
	DOLPHON CB-1078/RE-2009
	DOLPHON CB-1078/RE-2010
	DOLPHON CB-1109

MANUFACTURER	DESIGNATION
DOLPH (JOHN C) CO	DOLPHON CB-1112-A/CB-1112-B
	DOLPHON CB-1116
	DOLPHON CC-1024-A W/RE 2005
	DOLPHON CC-1024-A W/RE-2000
	DOLPHON CC-1079/RE-2000
	DOLPHON CC-1079/RE-2005
	DOLPHON CC-1080
	DOLPHON CC-1080-L
	DOLPHON CC-1096
	DOLPHON CC-1099
	DOLPHON CC-1105
	DOLPHON CC-1126
	DOLPHON CC1106
	DOLPHON CR-1035
	DOLPHON CR-1050
DOW CORNING CORP	DOW CORNING 96-082
	SYLGARD 170
	SYLGARD 170 FAST CURE
	SYLGARD 182
	SYLGARD 184
	SYLGARD 186
	POTTING COMPOUND DOW CORNING 93-500
EPOXYLITE CORP	EPOXYLITE 8164
	EPOXYLITE 8705
FIBER-RESIN CORP	FR-14/#5 HARDENER
	FR-14/#6 HARDENER
	FR-337
FORMULATED RESINS INC	AR-1005
	AR-1009
	ER-2020
	ER-2023
	ER-2027
	ER-2028
	ER-2036
	ER-2047
	ER-2205
	ER-2220
	ER-2300
	ER-2380
	ER-2381
	ER-2400
	TCR-12-100
	TCR-12-151
	TCR-2773
	TCR-2820
GENERAL CERAMICS INC	POTTING COMPOUND BE-0033 ALTERNATE E-33
	POTTING COMPOUND BE-0037 ALTERNATE E-302
	POTTING COMPOUND BE-0038 ALTERNATE E-38
	POTTING COMPOUND BE-0303 ALTERNATE E-303
	POTTING COMPOUND BE-0305 ALTERNATE E-305
	POTTING COMPOUND BE-0345 ALTERNATE E-345
	POTTING COMPOUND BE-0347 ALTERNATE E-347

MANUFACTURER	DESIGNATION
GENERAL CERAMICS INC	POTTING COMPOUND BE-0383 ALTERNATE E-383
	POTTING COMPOUND BE-0385 ALTERNATE E-385
	POTTING COMPOUND BE-0387 ALTERNATE E-387
	POTTING COMPOUND BS-0201 ALTERNATE S-201
	POTTING COMPOUND BS-0202 ALTERNATE S-202
	POTTING COMPOUND BS-0203 ALTERNATE S-203
	POTTING COMPOUND BS-0205 ALTERNATE S-205
GENERAL ELECTRIC	RTV 11
	RTV 12B
	RTV 41
	RTV 511
	RTV 560
	RTV 577
	RTV 615
	RTV 6157
	RTV 627
	RTV 630
	RTV 655
	RTV 8111
	RTV 8112
	RTV 8262
	SEALANT RTV 112
	SEALANT RTV 31
	SEALANT RTV 60
GENERAL FIBERGLASS SUPPLY INC	CASTING COMPOUND EPIC R1002/H5001
	CASTING COMPOUND EPIC R1008/H5000
	CASTING COMPOUND EPIC R1009/H5017
	CASTING COMPOUND EPIC R1015/H5016
	CASTING COMPOUND EPIC R1048/H4019
	CASTING COMPOUND EPIC R1049/H5027
	CASTING COMPOUND EPIC S7006
	POTTING COMPOUND EPIC 0118
	POTTING COMPOUND EPIC R1004/H5000
	POTTING COMPOUND EPIC R1015/H5005
	POTTING COMPOUND EPIC R1016/H5008
	POTTING COMPOUND EPIC R1017/H4003
	POTTING COMPOUND EPIC R1022/H5010
	POTTING COMPOUND EPIC R1024/H5011
	POTTING COMPOUND EPIC R1033/5022
	POTTING COMPOUND EPIC R1035/H5033
	POTTING COMPOUND EPIC R1037/H5016
	POTTING COMPOUND EPIC R1037/H5039
	POTTING COMPOUND EPIC R1045/H5062
	POTTING COMPOUND EPIC R1046/H5025
	POTTING COMPOUND EPIC R1055/H5039
	POTTING COMPOUND EPIC R1060/H4026
	POTTING COMPOUND EPIC S7001
	POTTING COMPOUND EPIC S7003
	POTTING COMPOUND EPIC S7004
	POTTING COMPOUND EPIC S7009
	POTTING COMPOUND EPIC S7012
	POTTING COMPOUND EPIC S7049
	POTTING COMPOUND EPIC S7054
	POTTING COMPOUND EPIC S7065
	POTTING COMPOUND EPIC S7069
	POTTING COMPOUND EPIC S7070

MANUFACTURER	DESIGNATION
GENERAL FIBERGLASS SUPPLY INC	POTTING COMPOUND EPIC S7079
	POTTING COMPOUND EPIC S7080
	POTTING COMPOUND EPIC S7081
	POTTING COMPOUND EPIC S7083
	POTTING COMPOUND EPIC S7090
	POTTING COMPOUND EPIC S8017
	POTTING COMPOUND EPIC-CAST S7093
	POTTING COMPOUND EPIC-CAST S7107
GOODRICH (BF) CO, ADHESIVES PRODUCTS DIV	SEALANT PL 420
GRACE (WR) AND COMPANY	STYCAST 2651MM
	STYCAST 2850FT
HEXCEL CORPORATION	POTTING COMPOUND 185N
	POTTING COMPOUND EPOLITE 1475
HYSOL/DEXTER	POTTING COMPOUND HYSOL C9-4210/HD3561
	POTTING COMPOUND HYSOL EE0004/HD3561
	POTTING COMPOUND HYSOL EE4215/HD3561
ISOCHEM RESINS CO	EP 1200 H100
	EP 1300 A/B
	EP 1330 A/B
	EP 1350 A/B
	EP 1400
	EP 1400 H 100
	EP 1400 H 300
	EP 1470 H 100
	EP 1470 H 300
	EP 1500 A/B
	EP 1505 A/B
	EP 1525 A/B
	EP 1548 A/B
	EP 1561 A/B
	EP 1562 A/B
	EP 1800 A/B
	EP 4200 H 100
	EP 4200 H 300
	EP 4213
	POTTING COMPOUND EP 1200 H130
	POTTING COMPOUND EP 1200 H135
	POTTING COMPOUND EP 1200 H150
	POTTING COMPOUND EP 1200 H170
	POTTING COMPOUND EP 1200 H180
	POTTING COMPOUND EP 1200 H190
	POTTING COMPOUND EP 1200 H300
	POTTING COMPOUND EP 1200 H350
	POTTING COMPOUND EP 1200 H400
	POTTING COMPOUND EP 1200 H500
	POTTING COMPOUND EP 1200 H600
	POTTING COMPOUND EP 1200 H650
	POTTING COMPOUND EP 1200 H670
	POTTING COMPOUND EP 1205 H300
	POTTING COMPOUND EP 1210 H300
	POTTING COMPOUND EP 1215 H300
	POTTING COMPOUND EP 1220 H300
	POTTING COMPOUND EP 1230 H300

MANUFACTURER	DESIGNATION
ISOCHEM RESINS CO	POTTING COMPOUND EP 1240 H300
	POTTING COMPOUND EP 1251 H300
	POTTING COMPOUND EP 1255 H300
	POTTING COMPOUND EP 1260 H300
J P TECH INC/MICRO ENGINEERING II DIVISION	EPOXYLITE 813
MCGHAN NUSIL CORPORATION	MCGHAN NUSIL CV-2500
	MCGHAN NUSIL CV-2564
	MCGHAN NUSIL CV-2567
	POTTING COMPOUND CV-2187
	POTTING COMPOUND CV-2501
	POTTING COMPOUND CV-2502
	POTTING COMPOUND CV-8151
	POTTING COMPOUND CV1-2500
	POTTING COMPOUND CV2-2566
	POTTING COMPOUND CV3-2500
	POTTING COMPOUND CV4-2500
	POTTING COMPOUND CV7-2500
	SEALANT MCGHAN NUSIL CV-2510
	SEALANT MCGHAN NUSIL CV-2520
	SEALANT MCGHAN NUSIL CV-2566
	SEALANT MCGHAN NUSIL CV-2568
PERMAGILE INDUSTRIES INC	POTTING COMPOUND INSULCAST 100M
	POTTING COMPOUND INSULCAST 116
	POTTING COMPOUND INSULCAST 116 FR
	POTTING COMPOUND INSULCAST 117
	POTTING COMPOUND INSULCAST 118
	POTTING COMPOUND INSULCAST 125
	POTTING COMPOUND INSULCAST 128
	POTTING COMPOUND INSULCAST 129
	POTTING COMPOUND INSULCAST 135 MM
	POTTING COMPOUND INSULCAST 136
	POTTING COMPOUND INSULCAST 136 HV
	POTTING COMPOUND INSULCAST 136-40
	POTTING COMPOUND INSULCAST 140
	POTTING COMPOUND INSULCAST 141
	POTTING COMPOUND INSULCAST 147
	POTTING COMPOUND INSULCAST 174
	POTTING COMPOUND INSULCAST 333
	POTTING COMPOUND INSULCAST 501
	POTTING COMPOUND INSULCAST 502
	POTTING COMPOUND INSULCAST 771
	POTTING COMPOUND INSULCAST 772
	POTTING COMPOUND INSULCAST 772 FR
	POTTING COMPOUND INSULCAST 781
	POTTING COMPOUND INSULCAST 782
	POTTING COMPOUND INSULCAST 961
	POTTING COMPOUND INSULCAST 980
	POTTING COMPOUND INSULCAST 981
	POTTING COMPOUND INSULCAST 982
	POTTING COMPOUND INSULCAST 982 S.E.
	POTTING COMPOUND INSULCAST 985
	POTTING COMPOUND INSULCAST RTVS 1-289-3
	POTTING COMPOUND INSULCAST RTVS 11
	POTTING COMPOUND INSULCAST RTVS 12
	POTTING COMPOUND INSULCAST RTVS 13

MANUFACTURER	DESIGNATION
PERMAGILE INDUSTRIES INC	POTTING COMPOUND INSULCAST RTVS 14
	POTTING COMPOUND INSULCAST RTVS 16
	POTTING COMPOUND INSULCAST RTVS 25
	POTTING COMPOUND INSULCAST RTVS 27
	POTTING COMPOUND INSULCAST RTVS 27 HTC
	POTTING COMPOUND INSULCAST RTVS 27 LV
	POTTING COMPOUND INSULCAST RTVS 27-17
	POTTING COMPOUND INSULCAST RTVS 3-165
	POTTING COMPOUND INSULCAST RTVS 3-95-1
	POTTING COMPOUND INSULCAST RTVS 42
	POTTING COMPOUND INSULCAST RTVS 46
	POTTING COMPOUND INSULCAST RTVS 49
	POTTING COMPOUND INSULCAST RTVS 51
	POTTING COMPOUND INSULCAST RTVS 56
	POTTING COMPOUND INSULCAST RTVS 61
	POTTING COMPOUND INSULCAST RTVS 69
	POTTING COMPOUND INSULGEL 25
	POTTING COMPOUND INSULGEL 30
	POTTING COMPOUND INSULGEL 50
	POTTING COMPOUND INSULGEL 70
	POTTING COMPOUND INSULGEL 70 CC
	POTTING COMPOUND INSULGEL 90
PRODUCTS RESEARCH CHEMICAL CO	MOLDING COMPOUND PR-1520
	MOLDING COMPOUND PR-1564
	POTTING COMPOUD MOLDING P/S 799
	POTTING COMPOUND MOLDING PR-1527
	POTTING COMPOUND MOLDING PR-1535
	POTTING COMPOUND MOLDING PR-1538
	POTTING COMPOUND MOLDING PR-1547
	POTTING COMPOUND MOLDING PR-1570
	POTTING COMPOUND MOLDING PR-1574
	POTTING COMPOUND MOLDING PR-1590
	POTTING COMPOUND MOLDING PR-1592
	POTTING COMPOUND MOLDING PR-1594
	POTTING COMPOUND MOLDING PR-1660
	POTTING COMPOUND MOLDING PR-1665
	POTTING COMPOUND PR-1201-Q
	POTTING COMPOUND PR-1201-RLS
	POTTING COMPOUND PR-1546
	POTTING COMPOUND PR-1578
ROBERTSON (H H) CO/FREEMAN CHEMICAL CORP	NUPOL 46-4008
	STYPOL 40-1021
	STYPOL 40-1037
	STYPOL 40-1507
	STYPOL 80-1120
SHELL CHEMICAL COMPANY	POTTING COMPOUND EPON 9405/EPON 9470
SYMPLASTICS INC	POTTING COMPOUND ARALDITE 506/SYMPOXY CA-803
	POTTING COMPOUND SYMPOXY 1003-3 A/B
	POTTING COMPOUND SYMPOXY 1004-201 A/B
	POTTING COMPOUND SYMPOXY 1004-812
	POTTING COMPOUND SYMPOXY 1005 A-B-C
	POTTING COMPOUND SYMPOXY 1006-284
	POTTING COMPOUND SYMPOXY 1006-35
	POTTING COMPOUND SYMPOXY 1006-74

MANUFACTURER	DESIGNATION
SYMPLASTICS INC	POTTING COMPOUND SYMPOXY 1006-803
	POTTING COMPOUND SYMPOXY 1007-201 A/B
	POTTING COMPOUND SYMPOXY 1007-213 A/B
	POTTING COMPOUND SYMPOXY 1007-728 A/B
	POTTING COMPOUND SYMPOXY 1010-201 A/B
	POTTING COMPOUND SYMPOXY 1010-35
	POTTING COMPOUND SYMPOXY 1010-6
	POTTING COMPOUND SYMPOXY 1010-802
	POTTING COMPOUND SYMPOXY 1010-803
	POTTING COMPOUND SYMPOXY 1010-807
	POTTING COMPOUND SYMPOXY 1010-809 A/B
	POTTING COMPOUND SYMPOXY 1010FR ABC
	POTTING COMPOUND SYMPOXY 1064-561
	POTTING COMPOUND SYMPOXY 1064-809
	POTTING COMPOUND SYMPOXY 1225-20
	POTTING COMPOUND SYMPOXY 1225-35
	POTTING COMPOUND SYMPOXY 1225FR-284
	POTTING COMPOUND SYMPOXY 1225FR-803
	POTTING COMPOUND SYMPOXY 1230-201
	POTTING COMPOUND SYMPOXY 1230-56 A/B
	POTTING COMPOUND SYMPOXY 1230-561
	POTTING COMPOUND SYMPOXY 1230/1010B/1010C
	POTTING COMPOUND SYMPOXY 1230/284
	POTTING COMPOUND SYMPOXY 1250-213
	POTTING COMPOUND SYMPOXY 1250-50
	POTTING COMPOUND SYMPOXY 1250-8
	POTTING COMPOUND SYMPOXY 1273-20
	POTTING COMPOUND SYMPOXY 1281-284
	POTTING COMPOUND SYMPOXY 1281-9
	POTTING COMPOUND SYMPOXY 1282-201
	POTTING COMPOUND SYMPOXY 1282-2213
	POTTING COMPOUND SYMPOXY 1282-284
	POTTING COMPOUND SYMPOXY 1282-56 A/B
	POTTING COMPOUND SYMPOXY 1282-561
	POTTING COMPOUND SYMPOXY 1320-85
	POTTING COMPOUND SYMPOXY 1350-2218
	POTTING COMPOUND SYMPOXY 1350-50
	POTTING COMPOUND SYMPOXY 1350-6
	POTTING COMPOUND SYMPOXY 1350-728 A/B
	POTTING COMPOUND SYMPOXY 1350-8
	POTTING COMPOUND SYMPOXY 1350-803
	POTTING COMPOUND SYMPOXY 1425-213
	POTTING COMPOUND SYMPOXY 1425-284
	POTTING COMPOUND SYMPOXY 1425/56
	POTTING COMPOUND SYMPOXY 1426-596
	POTTING COMPOUND SYMPOXY 1454-596
	POTTING COMPOUND SYMPOXY 1610 -74
	POTTING COMPOUND SYMPOXY 1871
	POTTING COMPOUND SYMPOXY 1873
	POTTING COMPOUND SYMPOXY 18752
	POTTING COMPOUND SYMPOXY 18755 A/B
	POTTING COMPOUND SYMPOXY 1877
	POTTING COMPOUND SYMPOXY 1949
	POTTING COMPOUND SYMPOXY 1950
	POTTING COMPOUND SYMPOXY 1951
	POTTING COMPOUND SYMPOXY 1954
	POTTING COMPOUND SYMPOXY 2100-810
	POTTING COMPOUND SYMPOXY 2202

MANUFACTURER	DESIGNATION
SYMPLASTICS INC	POTTING COMPOUND SYMPOXY 2205
	POTTING COMPOUND SYMPOXY 2218 A/B
	POTTING COMPOUND SYMPOXY 2221FR A/B
	POTTING COMPOUND SYMPOXY 2285 A/B
	POTTING COMPOUND SYMPOXY 5415
	POTTING COMPOUND SYMPOXY 5710
	PTOTING COMPOUND SYMPOXY 1230-803
SYNAIR	MONOTHANE A-10
	MONOTHANE A-100
	MONOTHANE A-20
	MONOTHANE A-30
	MONOTHANE A-40
	MONOTHANE A-50
	MONOTHANE A-60
	MONOTHANE A-70
	MONOTHANE A-80
	MONOTHANE A-90
	POTTING COMPOUND MONOTHANE D-65
TACC INTERNATIONAL CORPORATION	POTTING COMPOUND ER-2042
TRANSENE CO INC	POLY-CLEAR
	SSE SELF-CATALYZED ELASTOMER
[illegible]	POTTING COMPOUND THERMASIL-TYPE 1
	POTTING COMPOUND THERMASIL-TYPE 2
	POTTING COMPOUND ABLECAST 402
	POTTING COMPOUND ABLECAST 403
	POTTING COMPOUND ABLESTIK 724-1
	POTTING COMPOUND ABLETHERM 7-1
	POTTING COMPOUND EPOCAP 13111
	POTTING COMPOUND EPOCAP 13341
	POTTING COMPOUND EPOCAP 16129
	POTTING COMPOUND EPOCAP 16358
	POTTING COMPOUND EPOCAP 19071
	POTTING COMPOUND EPOCAP 19284
	POTTING COMPOUND EPOCAP 2404
	POTTING COMPOUND EPOCAP 2420
	POTTING COMPOUND EPOCAP 7960

528 rows selected.

POTTING COMPOUNDS - 528 MATERIALS

MATERIAL PROPERTIES

PROPERTY	COUNT(*)
ABRASION RESISTANCE	12
APPLICATION TEMP MAXIMUM	1
APPLICATION TEMP MINIMUM	1
ARC RESISTANCE	43
BOND STRENGTH	48
BRITTLE POINT	11
COMPRESSION SET	31
COMPRESSIVE ELASTIC MODULUS	32
COMPRESSIVE STRENGTH ULTIMATE	223
COMPRESSIVE STRENGTH YIELD	6
CONTINUOUS SERVICE TEMP MAX	248
CONTINUOUS SERVICE TEMP MIN	163
CREEP STRENGTH	37
DEFLECTION TEMP	9
DENSITY	213
DIELECTRIC CONSTANT	840
DIELECTRIC STRENGTH	439
DISSIPATION FACTOR	825
ELONGATION	283
FLASH POINT	33
FLEXURAL MODULUS	66
FLEXURAL STRENGTH	173
GEL TIME	116
GLASS TRANSITION TEMP	78
HARDNESS	551
HEAT DISTORTION	116
IMPACT RESILLIENCE	10
IMPACT STRENGTH	42
INSULATION RESISTANCE	120
INTERMIT SERVICE TEMP MAX	77
INTERMIT SERVICE TEMP MIN	14
LOW TEMPERATURE FLEXIBILITY	3
OPTICAL TRANSMITTANCE	2
PEEL STRENGTH	65
PENETRATION	1
POT LIFE	591
REFRACTIVE INDEX	11
SHEAR STRENGTH	55
SHELF LIFE	371
SHRINK	284
SOLIDS PERCENT	47
SPECIFIC GRAVITY	414
SPECIFIC HEAT	37
SURFACE RESISTIVITY	90
SURFACE TENSION	4
TACK FREE TIME	62
TEAR STRENGTH	114
TENSILE ELASTIC MODULUS	65
TENSILE STRENGTH ULTIMATE	374
THERMAL CONDUCTIVITY	343
THERMAL EXPANSION COEF	356
VISCOSITY	626
VOLUME RESISTIVITY	668
WATER ABSORPTION	313
sum	9757

MANUFACTURER	DESIGNATION
ACCESSIBLE PRODUCTS COMPANY	INSULATION ACOUSTAZIP ACZ 650
	INSULATION ACOUSTAZIP ACZ 675
	INSULATION ACOUSTAZIP ACZ 679
	INSULATION THERMAZIP 50
	INSULATION THERMAZIP 60
	INSULATION THERMAZIP 61
	INSULATION THERMAZIP 75
	INSULATION THERMAZIP HI-TEMP BLANKET #2000
	INSULATION THERMAZIP HI-TEMP BLANKET #3000
	INSULATION THERMAZIP TECHLITE 79
	INSULATION THERMAZIP TMZ 150
	INSULATION THERMAZIP TMZ 175
	INSULATION THERMAZIP TMZ 179
	INSULATION THERMAZIP TMZ 250
	INSULATION THERMAZIP TMZ 275
	INSULATION THERMAZIP TMZ 279
	INSULATION THERMAZIP TMZ 350
	INSULATION THERMAZIP TMZ 353
	INSULATION THERMAZIP TMZ 375
	INSULATION THERMAZIP TMZ 375
	INSULATION THERMAZIP TMZ 379
	INSULATION THERMAZIP TMZ 379
	INSULATION THERMAZIP TMZ 450
	INSULATION THERMAZIP TMZ 475
	INSULATION THERMAZIP TMZ 479
	INSULATION THERMAZIP TMZ 550
	INSULATION THERMAZIP TMZ 560
	INSULATION THERMAZIP TMZ 579
	INSULATION THERMAZIP TMZ 850
	INSULATION THERMAZIP TMZ 875
	INSULATION THERMAZIP TMZ 879
ALBANY INTERNATIONAL CORP	INSULATION PYROLOFT A
	INSULATION PYROLOFT C
	INSULATION PYROPEL LD-6
	INSULATION PYROPEL MD-18
	INSULATION THERMAL PYROPEL MD-12
AMERICAN CYANAMID COMPANY	INSULATION DAPCO #2030
AREMCO PRODUCTS INC	INSULATION AREMCOLOX 502-1100
	INSULATION AREMCOLOX 502-1200
	INSULATION AREMCOLOX 502-1250
	INSULATION AREMCOLOX 502-1400
	INSULATION AREMCOLOX 502-400
	INSULATION AREMCOLOX 502-600
	INSULATION CERA-FAB 635
	INSULATION SUPER-GRAPH 700
	INSULATION SUPER-GRAPH 705
	INSULATION SUPER-GRAPH 710
	INSULATION SUPER-GRAPH 720
	INSULATION SUPER-GRAPH 725
	INSULATION SUPER-GRAPH 730
ARMSTRONG WORLD INDUSTRIES INCORPORATED	INSULATION AP ARMAFLEX
	INSULATION ARMAFLEX II
BARRACUDA TECHNOLOGIES	INSULATION IPN 20-649

MANUFACTURER	DESIGNATION
BERGQUIST COMPANY (THE)	INSULATION POLY-PAD 1000
	INSULATION POLY-PAD 400
	INSULATION POLY-PAD K-10
	INSULATION POLY-PAD K-4
	INSULATION Q-PAD II
	INSULATION SIL-PAD 1000
	INSULATION SIL-PAD 1000 TUBE
	INSULATION SIL-PAD 1500
	INSULATION SIL-PAD 2000
	INSULATION SIL-PAD 400
	INSULATION SIL-PAD 400 TUBE
	INSULATION SIL-PAD 600
	INSULATION SIL-PAD K-10
	INSULATION SIL-PAD K-4
	INSULATION SIL-PAD K-6
BRIN-MONT CORPORATION	INSULATION 83-A-55
	INSULATION SYSTEM 55
CARBORUNDUM COMPANY THE	INSULATION DURABACK BLANKET (MADE FROM FIBERFRAX)
	INSULATION DURABLANKET 2600
	INSULATION DURABLANKET HP-S (MADE FROM FIBERFRAX)
	INSULATION DURABLANKET S (MADE FROM FIBERFRAX)
	INSULATION DURABOARD 2600
	INSULATION DURABOARD 3000 (MADE FROM FIBERFRAX AND FIBERMAX)
	INSULATION DURABOARD GH (MADE FROM FIBERFRAX)
	INSULATION DURABOARD HD (MADE FROM FIBERFRAX)
	INSULATION DURABOARD LD (MADE FROM FIBERFRAX)
	INSULATION DURABOARD RG (MADE FROM FIBERFRAX)
	INSULATION DURASET FELT (MADE FROM FIBERFRAX)
	INSULATION FIBERFRAX 110 PAPER
	INSULATION FIBERFRAX 440 PAPER
	INSULATION FIBERFRAX 550 PAPER
	INSULATION FIBERFRAX 880 PAPER
	INSULATION FIBERFRAX 882-H PAPER FORMERLY 880-H
	INSULATION FIBERFRAX 970 PAPER
	INSULATION FIBERFRAX 972-H PAPER FORMERLY 970-H
	INSULATION FIBERFRAX CLOTH L-126
	INSULATION FIBERFRAX CLOTH L-144
	INSULATION FIBERFRAX HSA PAPER
	INSULATION FIBERFRAX HSA/OF PAPER
	INSULATION FIBERFRAX LO-CON FELT
	INSULATION FIBERFRAX PH BLANKET
	INSULATION FIBERFRAX ROLLBOARD PAPER
	INSULATION FIBERFRAX SLEEVING HP-126
	INSULATION FIBERFRAX SLEEVING HP-144
	INSULATION FIBERFRAX TAPE L-126
	INSULATION FIBERFRAX TAPE L-144
	INSULATION FIBERMAT MAT (MADE FROM FIBERFRAX)
	INSULATION FIBERMAX MAT
	INSULATION FIBERSIL CLOTH (MADE FROM FIBERFRAX)
	INSULATION FLEXWEAVE 1000 CLOTH
	INSULATION FLEXWEAVE 1000 TAPE
	INSULATION MOIST-PACK D (MADE FROM FIBERFRAX)
	INSULATION SPACE FELT MAT (MADE FROM FIBERFRAX)
DODGE-REGUPOL INCORPORATED	INSULATION CORK B-380FA

MANUFACTURER	DESIGNATION
DOW CHEMICAL U S A	INSULATION ETHAFOAM 200LC
	INSULATION ETHAFOAM 220 ANTI-STATIC
	INSULATION ETHAFOAM 221
	INSULATION ETHAFOAM 221 ANTI-STATIC
	INSULATION ETHAFOAM 222
	INSULATION ETHAFOAM 4101
	INSULATION ETHAFOAM HS-45
	INSULATION ETHAFOAM HS-600
	INSULATION ETHAFOAM HS-900
	INSULATION STYROFOAM
	INSULATION STYROFOAM 115 HIGH LOAD
	INSULATION STYROFOAM 40 HIGH LOAD
	INSULATION STYROFOAM 60 HIGH LOAD
	INSULATION TRYMER 9501
EHV WEIDMANN	INSULATION NOMEX T-992
	INSULATION NOMEX T-993
	INSULATION NOMEX T-994
ETHYL CORPORATION	INSULATION SOLIMIDE AC-406
	INSULATION SOLIMIDE TA-301
EXPANDED RUBBER AND PLASTICS CORP	INSULATION STATHANE G-502 SE
FOAM ENTERPRISES, INC.	INSULATION FE-226
FURON COMPANY	INSULATION COHRLASTIC F12
	INSULATION COHRLASTIC SILICONE FOAM
	INSULATION STRIP-N-STICK TAPE 100S
	INSULATION STRIP-N-STICK TAPE 200A
	INSULATION STRIP-N-STICK TAPE 220A
	INSULATION STRIP-N-STICK TAPE 300AR
	INSULATION STRIP-N-STICK TAPE 440A
	INSULATION STRIP-N-STICK TAPE 440S
	INSULATION STRIP-N-STICK TAPE 512AF
GLOBAL TECHNOLOGY SYSTEMS	INSULATION P-50
GRACE (WR) AND COMPANY	INSULATION CHO-THERM 1677 REPLACES 1667
	INSULATION CHO-THERM 1678 REPLACES 1673R
	INSULATION CHO-THERM T274
	INSULATION CHO-THERM T386
	INSULATION ECCOFOAM FPH
GUDEBROD INC	INSULATION NOMEX T CABLE WRAP P/N 200B
HUNTSMAN CHEMICAL CORPORATION	INSULATION EPS GRADE 86 TYPE 4486
	INSULATION HUNTSMAN EPS GRADE 16 TYPE 4716
	INSULATION HUNTSMAN EPS GRADE 51 TYPE 251
	INSULATION HUNTSMAN EPS GRADE 51 TYPE 451
	INSULATION HUNTSMAN EPS GRADE 51 TYPE 551
	INSULATION HUNTSMAN EPS GRADE 51 TYPE 751
	INSULATION HUNTSMAN EPS GRADE 54 TYPE 254
	INSULATION HUNTSMAN EPS GRADE 54 TYPE 454
	INSULATION HUNTSMAN EPS GRADE 54 TYPE 554
	INSULATION HUNTSMAN EPS GRADE 54 TYPE 754
	INSULATION HUNTSMAN EPS GRADE 54 TYPE 900

MANUFACTURER	DESIGNATION
HUNTSMAN CHEMICAL CORPORATION	INSULATION HUNTSMAN EPS GRADE 75 TYPE 4775
	INSULATION HUNTSMAN EPS GRADE 75 TYPE 5775
	INSULATION HUNTSMAN EPS GRADE 86 TYPE 3486
	INSULATION HUNTSMAN EPS GRADE 86 TYPE 4786
ILLBRUCK INC	INSULATION MINISONEX
	INSULATION SONEX
	INSULATION SONEX 1
	INSULATION SONEX 200
	INSULATION SUPERSONEX
	INSULATION SUPERSONEX 1
IMPERIAL CHEMICAL INDUSTRIES	INSULATION THERMOCOMP RF-1006 FR HS
KINETICS NOISE CONTROL INCORPORATED	INSULATION KINETICS KUA-100M
	INSULATION KINETICS KUA-100T
	INSULATION KINETICS KUA-100U
	INSULATION KINETICS KUA-200
	INSULATION KINETICS KUA-200U
	INSULATION KINETICS KUA-25
	INSULATION KINETICS KUA-50
	INSULATION KNM-100B
	INSULATION KNM-100C
	INSULATION KNM-100F1
	INSULATION KNM-100RB
	INSULATION KNM-50B
	INSULATION KNM-50C
	INSULATION KNM-50RB
	INSULATION KUA-100
KLEERDEX COMPANY	INSULATION KYDEX 100
	INSULATION KYDEX 120
	INSULATION KYDEX 160
KNOLL INTERNATIONAL HOLDINGS INC	INSULATION AEROFONIC
	INSULATION AESTHETIC
	INSULATION AFONIC ACOUSTICAL FOAM
	INSULATION ARESTO 2
	INSULATION CUSTOM
	INSULATION CUSTOM FELT HIGH FIRM 12-900
	INSULATION CUSTOM FELT LOW FIRM 4-900
	INSULATION CUSTOM FELT MED. FIRM 8-900
	INSULATION DIELECTRIC 250
	INSULATION DRI-FAST ALL GRADES
	INSULATION HYFONIC 1
	INSULATION LP FOAM
	INSULATION M150-34
	INSULATION PVC-COATED
	INSULATION PYRELL
	INSULATION PYROCUSHION HF300-18
	INSULATION PYROCUSHION HF300-28
	INSULATION PYROCUSHION HF325-38
	INSULATION PYROCUSHION HF325-48
	INSULATION SIF ESTER GRADE
	INSULATION SIF FELT
	INSULATION SIF INDUSTRIAL FOAM
LTV CORPORATION	INSULATION CARBON/CARBON

MANUFACTURER	DESIGNATION
LUNAR PRODUCTS INC	INSULATION LUNAR F-20 A AND B
MANVILLE CORPORATION	INSULATION EXACT-O-MAT
	INSULATION MICROLITE AA PHENOLIC BLANKET
	INSULATION MICROLITE AA UNCURED PLAIN PHENOLIC
	INSULATION MICROLITE AA UNCURED SILICONE
	INSULATION MICROLITE AA UNCURED WATER REPELLENT PHENOLIC
	INSULATION MICROLITE AA WATER REPELLENT PHENOLIC BLANKET
	INSULATION MIN-K 1301
	INSULATION MIN-K 2000
	INSULATION MIN-K FLEXIBLE HIGH TEMPERATURE
	INSULATION MIN-K FLEXIBLE INSULATING TAPES
	INSULATION MIN-K FLEXIBLE LIGHTWEIGHT
	INSULATION MIN-K FLEXIBLE MID-RANGE
	INSULATION MIN-K FLEXIBLE STANDARD
	INSULATION MIN-K TE 1200
	INSULATION MIN-K TE 1400
	INSULATION MIN-K TE 1800
MERRYWEATHER FOAM INCORPORATED	INSULATION UNIFOAM S82N
NVF COMPANY	INSULATION LAMICOR GP-9306
OWENS-CORNING FIBERGLAS CORP	INSULATION SOUND ATTENUATION BATTS
PITTSBURGH CORNING CORPORATION	INSULATION FOAMGLAS CELLULAR
POLYMER DEVELOPMENT LABORATORIES INC	INSULATION PDL 4034-2.5 POUR
PREMIUM POLYMERS INCORPORATED	INSULATION TEXTHANE 221-25
ROGERS CORPORATION	INSULATION PORON 4701-01
	INSULATION PORON 4701-05
	INSULATION PORON 4701-09
	INSULATION PORON 4701-12
	INSULATION PORON 4701-59
	INSULATION PORON 4716-01
	INSULATION PORON 4716-16
	INSULATION PORON 4720-20
	INSULATION PORON 4720-22
	INSULATION PORON 4723-23
SCHENECTADY CHEMICALS INCORPORATED	INSULATION 300 RED
SEKISUI AMERICA CORPORATION	INSULATION MINICEL L200
	INSULATION MINICEL L300
SHOCK-TECH INC	INSULATION VHDS 33 DIDC
STEPAN COMPANY	INSULATION STEPANFOAM A-206
	INSULATION STEPANFOAM A-210
	INSULATION STEPANFOAM A-216
	INSULATION STEPANFOAM BH-610
	INSULATION STEPANFOAM BH-614
	INSULATION STEPANFOAM BX-105-C-14
	INSULATION STEPANFOAM BX-105-C-6
	INSULATION STEPANFOAM BX-249

MANUFACTURER	DESIGNATION
STEPAN COMPANY	INSULATION STEPANFOAM BX-249-N
	INSULATION STEPANFOAM BX-250A
	INSULATION STEPANFOAM BX-273-8
	INSULATION STEPANFOAM BX-345-N
	INSULATION STEPANFOAM BX-402
	INSULATION STEPANFOAM BX-443R
	INSULATION STEPANFOAM BX-445
	INSULATION STEPANFOAM C-605
	INSULATION STEPANFOAM C-608
	INSULATION STEPANFOAM C-614
	INSULATION STEPANFOAM CA-620
	INSULATION STEPANFOAM F-202
	INSULATION STEPANFOAM F-302
	INSULATION STEPANFOAM F-403
	INSULATION STEPANFOAM F-506
	INSULATION STEPANFOAM F-516
	INSULATION STEPANFOAM G-302
	INSULATION STEPANFOAM G-302 MODIFIED
	INSULATION STEPANFOAM G-304
	INSULATION STEPANFOAM G-304 MODIFIED
	INSULATION STEPANFOAM G-306
	INSULATION STEPANFOAM G-306 MODIFIED
	INSULATION STEPANFOAM G-308
	INSULATION STEPANFOAM G-308 MODIFIED
	INSULATION STEPANFOAM G-502
	INSULATION STEPANFOAM G-504
	INSULATION STEPANFOAM G-506
	INSULATION STEPANFOAM G-508
	INSULATION STEPANFOAM H-102-N
	INSULATION STEPANFOAM H-103
	INSULATION STEPANFOAM H-104
	INSULATION STEPANFOAM H-106
	INSULATION STEPANFOAM H-402-N
	INSULATION STEPANFOAM H-602-N
	INSULATION STEPANFOAM HW-7/50
	INSULATION STEPANFOAM J-108
	INSULATION STEPANFOAM P-502
	INSULATION STEPANFOAM P-506
	INSULATION STEPANFOAM RI-9301
	INSULATION STEPANFOAM SX-195
THERMAL CERAMICS	INSULATION AIR-SET
	INSULATION CEASE-FIRE 2000
	INSULATION CEASE-FIRE 2400D
	INSULATION CERABLANKET
	INSULATION CERABLOK 1100
	INSULATION CERABLOK 870
	INSULATION CERABOARD 100
	INSULATION CERABOARD 85
	INSULATION CERACHEM
	INSULATION CERACHROME
	INSULATION CERACHROME FELT OVEN
	INSULATION CERACHROME FELT PRESSED
	INSULATION CERAFELT OVEN
	INSULATION CERAFELT PRESSED
	INSULATION CERAFIBER
	INSULATION CERAFORM 102
	INSULATION CERAFORM 103

MANUFACTURER	DESIGNATION
THERMAL CERAMICS	INSULATION CERAFORM 106R
	INSULATION CERAFORM 126
	INSULATION CERAFORM 130
	INSULATION CERAFORM 141
	INSULATION CERAFORM 143
	INSULATION CERAMILL 60
	INSULATION CEROX 1000
	INSULATION CEROX 120
	INSULATION CEROX 1300
	INSULATION CEROX 200
	INSULATION CEROX 700
	INSULATION CEROX 720 (1A)
	INSULATION CEROX 900
	INSULATION FIREBRICK 80
	INSULATION FIREBRICK 80-D
	INSULATION HIGH-TEMP
	INSULATION INSALCOR
	INSULATION K-20
	INSULATION K-23
	INSULATION K-25
	INSULATION K-26 LI
	INSULATION K-28
	INSULATION K-30
	INSULATION K-3000
	INSULATION KAO-PLAS C 45
	INSULATION KAO-PLAS C 65
	INSULATION KAO-PLAS C 85
	INSULATION KAO-PLAS G 45
	INSULATION KAO-PLAS G 65
	INSULATION KAO-PLAS G 85
	INSULATION KAO-TAB 95
	INSULATION KAO-TAB 95-GUN
	INSULATION KAO-TAB SR
	INSULATION KAO-TEX 1000
	INSULATION KAO-TEX 1800
	INSULATION KAO-TEX 1900
	INSULATION KAO-TEX 2000
	INSULATION KAO-TEX 2200
	INSULATION KAO-TEX 2500
	INSULATION KAO-TUFF 110 C
	INSULATION KAO-TUFF 110 G
	INSULATION KAO-TUFF C
	INSULATION KAO-TUFF CFB
	INSULATION KAO-TUFF CV
	INSULATION KAO-TUFF CVX
	INSULATION KAO-TUFF G
	INSULATION KAOCAST
	INSULATION KAOCRETE 28-LI
	INSULATION KAOCRETE 30
	INSULATION KAOCRETE 32-CM
	INSULATION KAOCRETE A
	INSULATION KAOCRETE B
	INSULATION KAOCRETE D
	INSULATION KAOCRETE HDHS-50
	INSULATION KAOCRETE HDHS-70
	INSULATION KAOCRETE HDHS-98
	INSULATION KAOCRETE HPM 45
	INSULATION KAOCRETE HPM 65

MANUFACTURER	DESIGNATION
THERMAL CERAMICS	INSULATION KAOCRETE HPM 85
	INSULATION KAOCRETE HPM 90
	INSULATION KAOCRETE HPM 90 TR
	INSULATION KAOCRETE HS
	INSULATION KAOGUN 26 RFT
	INSULATION KAOGUN 28 RFT
	INSULATION KAOGUN 30 RFT
	INSULATION KAOGUN 32 RFT
	INSULATION KAOGUN PH
	INSULATION KAOLITE 1600
	INSULATION KAOLITE 1800
	INSULATION KAOLITE 2000-HS
	INSULATION KAOLITE 2200
	INSULATION KAOLITE 2200-HS
	INSULATION KAOLITE 2300-LI
	INSULATION KAOLITE 2500-HS
	INSULATION KAOLITE 2500-LI
	INSULATION KAOLITE 2600-LI
	INSULATION KAOLITE 2800
	INSULATION KAOLITE 3000-C
	INSULATION KAOLITE 3000-G
	INSULATION KAOLITE 3300
	INSULATION KAOMUL 55T
	INSULATION KAOMUL AZ
	INSULATION KAOWOOL 12C
	INSULATION KAOWOOL 14C
	INSULATION KAOWOOL 15C
	INSULATION KAOWOOL 17C
	INSULATION KAOWOOL 2400HD
	INSULATION KAOWOOL 2600
	INSULATION KAOWOOL 3000
	INSULATION KAOWOOL B
	INSULATION KAOWOOL BLANKET
	INSULATION KAOWOOL BULK A LUBRICATED
	INSULATION KAOWOOL BULK C
	INSULATION KAOWOOL BULK D UNLUBRICATED
	INSULATION KAOWOOL FIREMASTER BLANKET
	INSULATION KAOWOOL FIREMASTER BOARD
	INSULATION KAOWOOL FIREMASTER FP-60 BLANKET
	INSULATION KAOWOOL HIGH PURITY
	INSULATION KAOWOOL HP
	INSULATION KAOWOOL HS
	INSULATION KAOWOOL HS-45
	INSULATION KAOWOOL M
	INSULATION KAOWOOL MB-822
	INSULATION KAOWOOL MB-830
	INSULATION KAOWOOL S
	INSULATION KAOWOOL SAFFIL
	INSULATION KAOWOOL ZR
	INSULATION KROMALOX P
	INSULATION MAFTEC
	INSULATION MUL-SET F
	INSULATION PAPER 2300
	INSULATION PAPER 3000
	INSULATION PYRO-BLOC E
	INSULATION PYRO-BLOC M (MADE WITH ZR GRADE PYRO-LOG)
	INSULATION PYRO-BLOC PLUS WITH UNIFELT IT BACKED WITH ZR GRADE
	INSULATION PYRO-BLOC PLUS WITH UNIFELT XT BACKED WITH ZR GRADE

MANUFACTURER	DESIGNATION
THERMAL CERAMICS	INSULATION PYRO-BLOC Y (MADE WITH R GRADE PYRO-LOG)
	INSULATION PYRO-LOG FIBER R GRADE
	INSULATION PYRO-LOG FIBER ZR GRADE
	INSULATION ROLLBOARD
	INSULATION SABER BLOC 2 (MADE WITH KAOWOOL ZR BLANKET)
	INSULATION SABER BLOC 2 (MADE WITH SAFFIL MAT)
	INSULATION SMOOTHSET
	INSULATION SR-90
	INSULATION SR-99
	INSULATION SUPEREX 2000
	INSULATION SUPERWOOL
	INSULATION TR-19
	INSULATION ULTRAFELT PAPER
	INSULATION UNIBLOC (MADE WITH CERABLANKET)
	INSULATION UNIBLOC (MADE WITH KAOWOOL HIGH PURITY BLANKET)
	INSULATION UNIFELT 3000 (HT)
	INSULATION UNIFELT XT
	INSULATION UNIPREP
	INSULATION VALCOR G
	INSULATION VALCOR G-AZ
	INSULATION VALCOR G-DT
	INSULATION Z-BLOK (MADE WITH CERACHEM BLANKET)
	INSULATION Z-BLOK (MADE WITH CERACHROME BLANKET)
	INSULATION Z-BLOK (MADE WITH MAFTEC BLANKET)
THERMAL MATERIALS CORP	INSULATION AIRCELL PIPE COVERING
	INSULATION DUCT WRAP
	INSULATION EASY-ON FIBERGLASS
	INSULATION FLEXO F/R
	INSULATION FLEXO FOAM INSULATION TAPE
	INSULATION INSUL-SAFE CEMENT
	INSULATION NU-THERM
	INSULATION STIK RITE-AF
	INSULATION SUPER-STIK
	INSULATION SWEAT PRUF CORK INSULATION TAPE
	INSULATION THERMO-12/BLUE
	INSULATION ZESTON 2000 PVC
UNIROYAL PLASTICS COMPANY INC	INSULATION ENSOLITE AHC FORMERLY ENSOLITE AH
	INSULATION ENSOLITE ALC FORMERLY ENSOLITE AL
UNITED MCGILL CORPORATION	INSULATION SOUNDSCREEN ACOUSTICAL FOAM FOA-P FORMERLY FOA-1
	INSULATION SOUNDSCREEN FIBERSORB
	INSULATION WEDGE FOAM CLASS 1
	INSULATION WEDGE FOAM CLASS 1 WITH HYPALON COATING
	INSULATION WEDGE FOAM STANDARD
VESUVIUS MCDANEL	INSULATION ZYALOX 998
	INSULATION ZYALOX AP35
	INSULATION ZYALOX AV30
	INSULATION ZYALOX MV20
	INSULATION ZYALOX MV30
	INSULATION ZYAZIRC Z105
	INSULATION ZYAZIRC Z328
	INSULATION ZYAZIRC Z340
ZIRCAR PRODUCTS INC	INSULATION ZIRCAR ZIRCONIA GROG ZG
	INSULATION ZIRCAR ZIRCONIA SINGLE CRYSTAL GROG TYPE ZOG 1 AND ZOG 2

MANUFACTURER	DESIGNATION
ZIRCAR PRODUCTS INC	INSULATION ZIRCAR ZIRCONIA TYPE ZYF100
	INSULATION ZIRCAR ZIRCONIA TYPE ZYFB3
	INSULATION ZIRCAR ZIRCONIA TYPE ZYFB6
	INSULATION ZIRCAR ZIRCONIA TYPE ZYK-15
	INSULATION ZIRCAR ZIRCONIA TYPE ZYK-15H
	INSULATION ZIRCAR ZIRCONIA TYPE ZYW-30A
	INSULATION ZIRCAR ZIRCONIA TYPE ZYZ3
	INSULATION ZIRCAR ALUMINA BLANKET
	INSULATION ZIRCAR ALUMINA PAPER TYPE APA-1
	INSULATION ZIRCAR ALUMINA PAPER TYPE APA-2
	INSULATION ZIRCAR ALUMINA PAPER TYPE APA-3
	INSULATION ZIRCAR ALUMINA TYPE AL-20A
	INSULATION ZIRCAR ALUMINA TYPE AL-20B
	INSULATION ZIRCAR ALUMINA TYPE AL-30
	INSULATION ZIRCAR ALUMINA TYPE AL-30AAH
	INSULATION ZIRCAR ALUMINA TYPE ALBF-1
	INSULATION ZIRCAR ALUMINA TYPE ALC
	INSULATION ZIRCAR ALUMINA TYPE ECO-15A
	INSULATION ZIRCAR ALUMINA TYPE ECO-15B
	INSULATION ZIRCAR ALUMINA TYPE ECO-25A
	INSULATION ZIRCAR ALUMINA TYPE ECO-25B
	INSULATION ZIRCAR ALUMINA TYPE ECO-40A
	INSULATION ZIRCAR ALUMINA TYPE ECO-40B
	INSULATION ZIRCAR ALUMINA TYPE SALI
	INSULATION ZIRCAR ALUMINA TYPE SALI MOLDABLE
	INSULATION ZIRCAR ALUMINA TYPE SALI-2
	INSULATION ZIRCAR ALUMINA TYPE ZAL-15
	INSULATION ZIRCAR ALUMINA TYPE ZAL-45
	INSULATION ZIRCAR ALUMINA-SILICA TYPE ASH
	INSULATION ZIRCAR ALUMINA-SILICA TYPE ASQ
	INSULATION ZIRCAR ALUMINA-SILICA TYPE B MOLDABLE
	INSULATION ZIRCAR ALUMINA-SILICA TYPE C MOLDABLE
	INSULATION ZIRCAR ALUMINA-SILICA TYPE ECO-1200A
	INSULATION ZIRCAR ALUMINA-SILICA TYPE ECO-1200B
	INSULATION ZIRCAR BUBBLE ALUMINA
	INSULATION ZIRCAR BUBBLE IB-100
	INSULATION ZIRCAR BUBBLE IB-80
	INSULATION ZIRCAR CERAMIC FIBER TYPE AS 1260
	INSULATION ZIRCAR EXOTIC REFRACTORY TEXTILE TAF-80
	INSULATION ZIRCAR EXOTIC REFRACTORY TEXTILE TAK-10
	INSULATION ZIRCAR EXOTIC REFRACTORY TEXTILE TAW-30
	INSULATION ZIRCAR REFRACTORY CLOTH
	INSULATION ZIRCAR REFRACTORY TAPE
	INSULATION ZIRCAR REFRACTORY TYPE 100
	INSULATION ZIRCAR REFRACTORY TYPE 101
	INSULATION ZIRCAR REFRACTORY TYPE 99R
	INSULATION ZIRCAR REFRACTORY TYPE 99W
	INSULATION ZIRCAR REFRACTORY TYPE A
	INSULATION ZIRCAR REFRACTORY TYPE A MOLDABLE
	INSULATION ZIRCAR REFRACTORY TYPE DD
	INSULATION ZIRCAR REFRACTORY TYPE DM
	INSULATION ZIRCAR REFRACTORY TYPE DR
	INSULATION ZIRCAR REFRACTORY TYPE R-1
	INSULATION ZIRCAR SAFFIL ALUMINA LD MAT
	INSULATION ZIRCAR ZIRCONIA TYPE FBC
	INSULATION ZIRCAR ZIRCONIA TYPE FBD
	INSULATION ZIRCAR ZIRCONIA TYPE ZYBF-2

MANUFACTURER	DESIGNATION
ZIRCAR PRODUCTS INC.	INSULATION ZIRCAR ZIRCONIA TYPE ZYC
	INSULATION ZIRCAR ZIRCONIA TYPE ZYF50
	INSULATION ZIRCAR ZIRCONIA TYPE ZYW-15
	INSULATION ZIRCAR ZIRCONIA TYPE ZYW-15H

539 rows selected.

INSULATIONS - 539 MATERIALS

MATERIAL PROPERTIES

PROPERTY	COUNT(*)
ABRASION RESISTANCE	33
ABSORPTION COEFFICIENT	173
ARC RESISTANCE	4
BOND STRENGTH	3
BRITTLE POINT	5
BURST PRESSURE	7
COMPRESSION SET	101
COMPRESSIVE DEFLECTION	221
COMPRESSIVE ELASTIC MODULUS	51
COMPRESSIVE STRENGTH ULTIMATE	521
COMPRESSIVE STRENGTH YIELD	2
CONTINUOUS SERVICE TEMP MAX	415
CONTINUOUS SERVICE TEMP MIN	76
DEFLECTION TEMP	7
DEFORMATION PERCENT	30
DENSITY	536
DIELECTRIC BREAKDOWN	27
DIELECTRIC CONSTANT	66
DIELECTRIC STRENGTH	48
DISSIPATION FACTOR	36
ELONGATION	144
FLASH POINT	16
FLEXURAL MODULUS	20
FLEXURAL STRENGTH	414
GEL TIME	5
GLASS TRANSITION TEMP	5
HARDNESS	82
IMPACT STRENGTH	27
INSULATION RESISTANCE	1
INTERMIT SERVICE TEMP MAX	101
INTERMIT SERVICE TEMP MIN	2
LOW TEMPERATURE FLEXIBILITY	6
MELT POINT	206
NOISE REDUCTION COEFFICIENT	36
PEEL STRENGTH	9
POISSONS RATIO	1
POT LIFE	3
SELF IGNITION TEMPERATURE	15
SHEAR MODULUS	27
SHEAR STRENGTH	72
SHELF LIFE	29
SHRINK	376
SOFT POINT	10
SOLIDS PERCENT	6
SOUND TRANSMISSION COEFFICIENT	8
SOUND TRANSMISSION LOSS	87
SPECIFIC GRAVITY	69
SPECIFIC HEAT	69
TACK FREE TIME	8
TEAR STRENGTH	136
TENSILE ELASTIC MODULUS	75
TENSILE STRENGTH ULTIMATE	338
TENSILE STRENGTH YIELD	4
THERMAL CONDUCTIVITY	775
THERMAL EXPANSION COEF	100
THERMAL RESISTANCE	284

THERMAL RESISTIVITY	2
VAPOR PRESSURE	7
VISCOSITY	239
V (VOLATILE ORGANIC CONTENT)	1
VOLATILES PERCENT	1
VOLUME RESISTIVITY	37
WATER ABSORPTION	134
WITHSTAND VOLTAGE	5
	17
sum	6371

65 rows selected.

CHEMICAL RESISTANCE PROPERTIES

PROPERTY	COUNT(*)
OBSERVED CHANGE	542
TENSILE STRENGTH	100
THICKNESS CHANGE	12
VOL CHANGE	179
WEIGHT CHANGE	12
sum	845

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MANUFACTURER	DESIGNATION
3M COMPANY	FILM SCOTCH-CORE SC 350
	FILM SCOTCH-WELD AF- 191
	FILM SCOTCH-WELD AF-130
	FILM SCOTCH-WELD AF-143-2
	FILM SCOTCH-WELD AF-3109-2K
	FILM SCOTCH-WELD AF-3109-2U
	FILM SCOTCH-WELD AF-3113-5
	FILM SCOTCHCAL 530
	FILM SCOTCHCAL 639
	FILM SCOTCHCAL SERIES 3650
	FILM XC-453
ABLESTIK LABORATORIES	ABLEFILM 501
	ABLEFILM 517
	ABLEFILM 550 K
	ABLEFILM 561
	ABLEFILM 561K
	ABLEFILM 563
	ABLEFILM 564A
	ABLEFILM ECF561
	ABLEFILM ECF564AHF
	FILM ABLEFILM 506
	FILM ABLEFILM 517K
	FILM ABLEFILM 551
	SEALANT ABLEFILM 550
	SEALANT ABLEFILM ECF550
ADHESIVES RESEARCH, INC.	FILM ARCLAD AR-8559 FORMERLY AR559
ALLIED SIGNAL TECHNOLOGIES	FILM ACLAR 22A
	FILM ACLAR 22C
	FILM ACLAR 33C
	FILM CAPRAN 518
	FILM CAPRAN 980
AMERICAN CYANAMID COMPANY	FILM FM 32
	FILM FM 400
	FILM FM 73
	FILM HT424
BASF STRUCTURAL MATERIALS INC	FILM M2555
	FILM METLBOND 1113-2
	FILM METLBOND 1515-2
	FILM METLBOND 1515-3
	FILM METLBOND 6607
	FILM METLBOND X1146
CLEAN ROOM PRODUCTS INC	FILM NYLON AND ANTI-STATIC NYLON
	FILM POLYETHYLENE ANTI-STATIC POLY
DEXTER CORP, HYSOL DIV	FILM EA 9628 NW
DON V DAVIS COMPANY	FILM 30-W-47
DOW CHEMICAL U S A	FILM SARAN WRAP 18L
	FILM SARAN WRAP 8
	FILM SARANEX 15
	FILM SARANEX 23

MANUFACTURER	DESIGNATION
DOW CHEMICAL U S A	FILM SARANEX 24
	FILM SARANEX 25
DUPONT	FILM TEDLAR 150BL30WH
	FILM TEDLAR 200BS30WH
EASTMAN CHEMICAL PRODUCTS INC	KODAR PETG COPOLYSTER 6763
GOODRICH (BF) CO, ADHESIVES PRODUCTS DIV	PLASTILOCK 601
	PLASTILOCK 639
	PLASTILOCK 653EX
	PLASTILOCK 654GD
	PLASTILOCK 659
	PLASTILOCK 717
	PLASTILOCK 729-3
	PLASTILOCK 731 WITH 727
	PLASTILOCK 750A
	PLASTILOCK 751A
	PLASTILOCK 770
	PLASTILOCK 776
	PLASTILOCK 777
GOODRICH (BF) CO, CHEMICAL GROUP	PLASTILOCK 637
	PLASTILOCK 717B
LORD CORPORATION	FILM TUFTANE TF-310
	FILM TUFTANE TF-410
ORCON CORPORATION	FILM ORCOFILM AN-16
QUANTUM CHEMICAL CORPORATION	FILM EMA 20 PCT MA
	FILM ENATHENE EA 705-009
	FILM ENATHENE EA 719-009
	FILM ENBA 20 PCT NBA
	FILM EVA 20 PCT VA
	FILM PETROTHENE LM 6186-00 FORMERLY HD 6186
	FILM PETROTHENE LM 6187-00 FORMERLY HD 6187
	FILM PETROTHENE LP 5102-00 FORMERLY HD 5102
	FILM PETROTHENE LR 9230-00 FORMERLY LR 923
	FILM PETROTHENE LT 6180-00 FORMERLY HD 6180
	FILM PETROTHENE LY 5200-00 FORMERLY LY 520
	FILM PETROTHENE LY 6000-00 FORMERLY LY 600
	FILM PETROTHENE LY 6600-00 FORMERLY LY 660
	FILM PETROTHENE LY 9550-00 FORMERLY LY 955
	FILM PETROTHENE NA 154
	FILM PETROTHENE NA 155 FORMERLY PE 955
	FILM PETROTHENE NA 272
	FILM PETROTHENE NA 274 FORMERLY NA TR039
	FILM PETROTHENE NA 285
	FILM PETROTHENE NA 304 FORMERLY PE 3004
	FILM PETROTHENE NA 314 FORMERLY PE 3104
	FILM PETROTHENE NA 316 FORMERLY PE 3106
	FILM PETROTHENE NA 320 FORMERLY PE 320
	FILM PETROTHENE NA 321 FORMERLY NA 153
	FILM PETROTHENE NA 334 FORMERLY PE 334
	FILM PETROTHENE NA 336 FORMERLY PE 336
	FILM PETROTHENE NA 340 FORMERLY PE 3040
	FILM PETROTHENE NA 341 FORMERLY PE 3401

MANUFACTURER	DESIGNATION
QUANTUM CHEMICAL CORPORATION	FILM PETROTHENE NA 342 FORMERLY PE 3400
	FILM PETROTHENE NA 345 FORMERLY PE 3404
	FILM PETROTHENE NA 346 FORMERLY PE 3405C
	FILM PETROTHENE NA 348 FORMERLY PE 3408
	FILM PETROTHENE NA 351 FORMERLY PE 3503
	FILM PETROTHENE NA 355 FORMERLY PE 3505
	FILM PETROTHENE NA 357 FORMERLY PE 3507
	FILM PETROTHENE NA 358-002
	FILM PETROTHENE NA 362 FORMERLY PE 3350
	FILM PETROTHENE NA 420 FORMERLY PE 420
	FILM PETROTHENE NA 440 FORMERLY PE 440
	FILM PETROTHENE NA 441 FORMERLY PE 441
	FILM PETROTHENE NA 480 FORMERLY PE 480
	FILM PETROTHENE NA 495 FORMERLY PE 4954
	FILM PETROTHENE NA 496 FORMERLY PE 4955
	FILM PETROTHENE NA 940 FORMERLY PE 940
	FILM PETROTHENE NA 951 FORMERLY NA 344
	FILM PETROTHENE NA 952 FORMERLY PE 952
	FILM PETROTHENE NA 957 FORMERLY PE 957
	FILM PETROTHENE NA 960 FORMERLY NA 142
	FILM PETROTHENE NA 980 FORMERLY PE 980
	FILM PETROTHENE NA 985 FORMERLY PE 983-6
	FILM PLEXAR PX 1
	FILM PLEXAR PX 104B
	FILM PLEXAR PX 105
	FILM PLEXAR PX 106
	FILM PLEXAR PX 107
	FILM PLEXAR PX 108
	FILM PLEXAR PX 130
	FILM PLEXAR PX 158
	FILM PLEXAR PX 160
	FILM PLEXAR PX 169
	FILM PLEXAR PX 175
	FILM PLEXAR PX 232
	FILM PLEXAR PX 3
	FILM PLEXAR PX 5
	FILM PLEXAR PX 6
	FILM ULTRATHENE 660-000
	FILM ULTRATHENE 662-000
	FILM ULTRATHENE UE 632-000
	FILM ULTRATHENE UE 651-000
	FILM ULTRATHENE UE 652-000
	FILM ULTRATHENE UE 675-000
RICHMOND TECHNOLOGY INC	FILM RCAS 2400
RUCO POLYMER CORPORATION	FILM RUCOTHANE CO-A-769
SHELDAHL	FILM AKC-021
	T-100
	T-1401
	T-1633
	T-1650
	T-300
	T-320
	T-340
	T-400

MANUFACTURER	DESIGNATION
SOLVAY POLYMERS INC	FILM FORTIFLEX PE J60-500C-147 FORMERLY XF-822
	FILM FORTILENE PP 2107
	FILM FORTILENE PP 2108
	FILM FORTILENE PP 2301
	FILM FORTILENE PP 2401
	FILM FORTILENE PP 2435
	FILM FORTILENE PP 2436
	FILM FORTILENE PP 4112
	FILM FORTILENE PP 4114
	FILM FORTILENE PP 4209
	FILM FORTILENE PP 4340
	FILM FORTILENE PP 4440
	FORTIFLEX PE J36-25-142 FORMERLY FORTIFLEX XF-591H
	FORTIFLEX PE J44-30-142 FORMERLY FORTIFLEX F-469A
	FORTIFLEX PE J60-100-130
	FORTIFLEX PE J60-110-157 FORMERLY FORTIFLEX XF-480A
	FORTIFLEX PE J60-800C-147 FORMERLY FORTIFLEX XF-337G
	FORTILENE PP 2104
	FORTILENE PP 4207
	FORTILENE PP 4208
THERMALLOY INC	FILM THERMAFLFILM 4500-5
W H BRADY COMPANY	FILM B-684
W.H. BRADY COMPANY	FILM BRADY XB-652
WESTLAKE PLASTICS CO	KYNAR

178 rows selected.

FILMS - 178 MATERIALS

MATERIAL PROPERTIES

PROPERTY	COUNT(*)
ABRASION RESISTANCE	9
APPLICATION TEMP MAXIMUM	1
APPLICATION TEMP MINIMUM	8
ARC RESISTANCE	2
BOILING POINT	1
BOND STRENGTH	25
BRITTLE POINT	10
BURST PRESSURE	2
COEF OF FRICTION	10
COMPRESSIVE STRENGTH ULTIMATE	7
CONTINUOUS SERVICE TEMP MAX	52
CONTINUOUS SERVICE TEMP MIN	43
CREEP RUPTURE	8
CREEP STRENGTH	9
DEFLECTION TEMP	19
DENSITY	94
DIELECTRIC BREAKDOWN	1
DIELECTRIC CONSTANT	72
DIELECTRIC STRENGTH	22
DISSIPATION FACTOR	71
ELONGATION	240
ENDURANCE LIFE	6
FATIGUE LIMIT	3
FATIGUE STRENGTH	4
FLASH POINT	4
FLEXURAL MODULUS	18
FLEXURAL STRENGTH	55
GEL TIME	4
GLASS TRANSITION TEMP	22
HARDNESS	29
IMPACT STRENGTH	85
INSULATION RESISTANCE	3
INTERMIT SERVICE TEMP MAX	18
INTERMIT SERVICE TEMP MIN	2
LOW TEMPERATURE FLEXIBILITY	1
MELT POINT	22
PEEL STRENGTH	311
POT LIFE	25
SHEAR MODULUS	1
SHEAR STRENGTH	456
SHELF LIFE	74
SHRINK	29
SOFT POINT	39
SOLIDS PERCENT	41
SPECIFIC GRAVITY	20
SPECIFIC HEAT	3
STIFFNESS	1
STRESS CRACKING	3
SURFACE RESISTIVITY	11
TACK FREE TIME	5
TEAR STRENGTH	118
TENSILE ELASTIC MODULUS	129
TENSILE STRENGTH ULTIMATE	342
TENSILE STRENGTH YIELD	75
THERMAL CONDUCTIVITY	20
THERMAL EXPANSION COEF	32

VISCOSITY	6
VOLATILES PERCENT	27
VOLUME RESISTIVITY	25
W[redacted]R ABSORPTION	12
sum	2787

60 rows selected.

CHEMICAL RESISTANCE PROPERTIES

PROPERTY	COUNT(*)
ADHESION	14
BOND STRENGTH	76
COMPRESSIVE STRENGTH	7
ELONGATION @ RUP	60
ELONGATION @ YLD	5
FLEXURAL STRENGTH	3
HARDNESS	6
MODULUS	125
OBSERVED CHANGE	241
TENSILE STRENGTH	331
VOL CHANGE	42
WEIGHT CHANGE	225
sum	1135

12 rows selected.

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MANUFACTURER	DESIGNATION
3M COMPANY	COATING KEL F 800
	COATING SCOTCHCAST 5133
	COATING SCOTCHCAST 8
ACHESON COLLOIDS	COATING AQUADAG E
	COATING ELECTRODAG 106
	COATING ELECTRODAG 213
	COATING ELECTRODAG 442
ADHESIVE ENGINEERING CO	CONCRESIVE 1170
	CONCRESIVE 1305
AKZO AEROSPACE FINISHES	COATING 463-12-8
AMERICAN CYANAMID COMPANY	COATING BR 127
AMERON	COATING AMERSHIELD WHITE
	COATING DIMETCOTE 3
	COATING DIMETCOTE 6
BF GOODRICH COMPANY	COATING AEROCOAT AR-7
BORDEN INC	COATING KRYLON CRYSTAL CLEAR 1301
CASTALL INC	CASTALL A-343
	COATING 1295
CHASE CORPORATION	COATING HUMISEAL 1A33
	COATING HUMISEAL 1B31
	COATING HUMISEAL TYPE 1A20
	COATING HUMISEAL TYPE 1A27
	COATING HUMISEAL TYPE 1B12
	COATING HUMISEAL TYPE 1B73
	COATING HUMISEAL TYPE 2A64
CHILDERS PRODUCTS COMPANY	COATING VI-CRYL CP-11
CHOMERICS INC	COATING CHO-SHIELD 4076-50A
	COATING CHO-SHIELD 596 A/B
CONAP INC	COATING CONATHANE CE-1155
CROWN METRO AEROSPACE COATINGS INC	COATING URAMET 4-1W-12
D AIRCRAFT PRODUCTS INC	COATING DAPCO 2030
	COATING DAPCO 2031
	COATING DAPCO 3400/SC
DAP INC	COATING 511 HI-GLOSS ENAMEL
DEFT CHEMICAL COATINGS	COATING 02-GY-3
	COATING 03-BK-28
	COATING 03-BK-29
	COATING 03-BL-51
	COATING 03-GY-62
	COATING 03-W-127A
	COATING 03-W-40

MANUFACTURER	DESIGNATION
DEFT CHEMICAL COATINGS	COATING 44-GN-11
	COATING 44-GN-7
	COATING DEFTHANE GLOSS #1
DENNIS CHEMICAL CO	DENFLEX 1169
DEVCON CORP	BRUSHABLE CERAMIC COMPOUND
	DEVCON FLEXANE BRUSHABLE URETHANE
	FLOOR GRIP
	FLOOR PATCH
DEXTER CORPORATION	COATING HYSOL DK4-03
	COATING HYSOL PC17/17M
	COATING HYSOL PC18/18M
DOLPHIN PAINT AND CHEMICAL CO	SEALANT DOLCHEM 6010
	SEALANT DOLCHEM 6021
	SEALANT DOLCHEM 6029
	SEALANT DOLCHEM 6067
DOW CORNING CORP	DOW CORNING 3-6550
	DOW CORNING 3140
	DOW CORNING 92-009
	DOW CORNING 92-010
	SEALANT DOW CORNING 1890
	SEALANT DOW CORNING 92-007
	COATING DC Z-6020 SILANE
	COATING DC 1-2577 WITH CATALYST 176
	COATING DC 1107 FLUID
	COATING DC 1201 RTV
	COATING DC 1204
	COATING DC 1205
	COATING DC 997
	COATING DC R4-3117
	COATING DC Z-6070
	COATING DOW CORNING 1200 RTV
	COATING DOW CORNING Z-6040
DU PONT COMPANY	COATING TEFLON 850-204
	COATING TEFLON 851-204
	COATING TEFLON 851-214
	COATING TEFLON 851-224
	COATING TEFLON 851-256
	COATING TEFLON 856-204
	COATING TEFLON 954-407
	COATING TEFLON 958-203
	COATING TEFLON 959-203
EL PASO PRODUCTS CO	REXENE PE 5032 FORMERLY PE 181
	REXENE PE 5050 FORMERLY PE 171
	REXENE PE 5080 FORMERLY PE 172
FIBER MATERIALS INC	COATING FLEXFRAM 605
	COATING FLEXFRAM 705
	COATING FLEXFRAM 905 NS
FULLER O'BRIEN CORPORATION	COATING 421-03 GRAY

MANUFACTURER	DESIGNATION
FUTURA COATINGS INC	COATING FUTURA-FLEX 550
	COATING FUTURA-THANE 5007
GACO WESTERN INC	COATING GACOFLEX HFR-22,NOC
GENERAL ELECTRIC	COATING SEA 200
	COATING SHC 1200
	COATING SS4004
	COATING SS4120
	COATING SS4155
GRACE (WR) AND COMPANY	COATING ECCOCOAT D-35
	COATING ECCOCOAT EC210
	COATING STYCAST 3020SC WITH CATALYST 11
	COATING STYCAST 3020SC WITH CATALYST 9
	COATING UNICOAT 2081-31A
HEXCEL CORPORATION, RESIN CHEMICALS GROUP	URALITE 3139
JOHN C. DOLPH COMPANY	COATING HI-THERM BB-346-A
	COATING HI-THERM BB-353
LORD CORPORATION	COATING CHEMGLAZE V021
MACDERMID INCORPORATED	COATING MACUMASK 9446
MIDWEST PAINT MFG CO	COATING MASTER-KOTE MC 7755-03
MILLER-STEPHENSON CHEMICAL CO INC	COATING MS-462
	COATING MS-467
	COATING MS-470
	COATING MS-485
	COATING MS-490
	COATING MS-495
OIL CENTER RESEARCH INC.	COATING WONDER 900
PELMOR LABORATORIES, INC	SEALANT PELMOR PLV-2000
PETERSON CHEMICAL CORPORATION	COATING 11136 RED
	COATING BLACK 37038 EPOXY
PHILLIPS CHEMICAL CO, PLASTICS DIV	MARLEX HHM TR-230
	MARLEX HHM TR-232
	MARLEX HHM TR-250
	MARLEX HHM TR-416
PITTSBURGH CORNING CORPORATION	COATING PITTCOTE 404
PPG INDUSTRIES INC	COATING POLYCLUTCH WASH PRIMER
PRODUCTS RESEARCH & CHEMICAL CORP	PRC PR-1710
	COATING PR-1120
	COATING PR-1506
	COATING PR-1568
	COATING PR-420

MANUFACTURER	DESIGNATION
PRODUCTS RESEARCH AND CHEMICAL CORPORATION	COATING PR-475-S
	COATING PR-484
	COATING PR-486
	COATING PR-6154-F
	COATING PRC PRIMER 19
	COATING PRC PRIMER 41
PRODUCTS/TECHNIQUES INC	COATING PT-111
	COATING PT-401
	COATING PT-404
	COATING PT-750 SERIES
	COATING PT-805
QUANTUM CHEMICAL CORPORATION	COATING PETROTHENE NA 1103
	COATING PETROTHENE NA 204
	COATING PETROTHENE NA 206
	COATING PETROTHENE NA 215
	COATING PETROTHENE NA 216
	COATING PETROTHENE NA 217
	COATING PETROTHENE NA 3012
	COATING PETROTHENE NA 3060
	COATING PETROTHENE NA 3070
	COATING PETROTHENE NA 3080
	COATING PETROTHENE UE 652
ROY ANDERSON PAINT COMPANY	COATING RAPCO
RPM CARBOLINE COMPANY	COATING CARBOLINE 1037 WP
	COATING CARBOLINE 1340
	COATING CARBOLINE 193 PRIMER
RUST-OLEUM CORPORATION	COATING 9300
	COATING RUST-OLEUM X-60 RED BARE
	COATING ZINC-SELE 9334
SAUEREISEN CEMENTS	COATING CEMENT 78
SCHENECTADY CHEMICALS INC	COATING ISONEL 31
SPEREX COMPANY	COATING SP-101
	COATING SP-102
	COATING SP-109
STANCHEM INC	COATING ALBI-COTE FRL
	COATING ALBI-COTE TC SEMI-GLOSS
TELEFLEX INCORPORATED / SERMATECH INTERNATIONAL	COATING SERMETEL W
THE EPOXYLITE CORPORATION	COATING EPOXYLITE 9653
THE GOOD YEAR TIRE AND RUBBER COMPANY	COATING FLEXCLAD VPE-4670
	COATING FLEXCLAD VPE-5253C
	COATING VITEL PE-100
	COATING VITEL PE-200
	COATING VITEL PE-222
	COATING VITEL VPE-5987A
TRANSENE CO INC	MOISTURE BARRIER SILICONE

MANUFACTURER	DESIGNATION
U S PAINT	COATING ALUMIGRIP G1001
	COATING ALUMIGRIP G2002
	COATING ALUMIGRIP G5011
	COATING ALUMIGRIP G8003
	COATING MS2119-8-01
UNION CARBIDE CORP	UNION CARBIDE HFDA-0581 BLACK 55
USI CHEMICALS CO	PETROTHENE 5405
WHITFORD CORPORATION	COATING XYLAN 1010/870 BLACK
WILLIAM F NYE INC	COATING NYEBAR TYPE CT
WISCONSIN PROTECTIVE COATINGS CORP	COATING PLASITE 7200
	COATING CHEMGLAZE 9922
	COATING CHEMGLAZE 9924
	COATING CHEMGLAZE A170
	COATING CHEMGLAZE A276
	COATING CHEMGLAZE A471
	COATING CHEMGLAZE A571
	COATING CHEMGLAZE A971
	COATING CHEMGLAZE H322
	COATING CHEMGLAZE L300

193 rows selected.

COATINGS - 193 MATERIALS

MATERIAL PROPERTIES

PROPERTY	COUNT(*)
ABRASION RESISTANCE	18
APPLICATION TEMP MAXIMUM	49
APPLICATION TEMP MINIMUM	51
ARC RESISTANCE	1
BOILING POINT	28
BOND STRENGTH	7
BRITTLE POINT	2
COEF OF FRICTION	1
COMPRESSIVE ELASTIC MODULUS	3
COMPRESSIVE STRENGTH ULTIMATE	8
COMPRESSIVE STRENGTH YIELD	1
CONTINUOUS SERVICE TEMP MAX	80
CONTINUOUS SERVICE TEMP MIN	42
DEFLECTION TEMP	4
DEFORMATION PERCENT	1
DENSITY	135
DIELECTRIC BREAKDOWN	10
DIELECTRIC CONSTANT	92
DIELECTRIC STRENGTH	47
DISSIPATION FACTOR	81
ELONGATION	62
FIRE POINT	1
FLASH POINT	102
FLEXURAL MODULUS	7
FLEXURAL STRENGTH	5
GEL TIME	4
GLASS TRANSITION TEMP	6
HARDNESS	62
IMPACT RESILLIENCE	1
IMPACT STRENGTH	36
INSULATION RESISTANCE	35
INTERMIT SERVICE TEMP MAX	29
INTERMIT SERVICE TEMP MIN	2
LOW TEMPERATURE FLEXIBILITY	5
MELT POINT	2
OPTICAL ABSORPTANCE	1
OPTICAL EMISSIVITY	4
OPTICAL REFLECTANCE	2
OPTICAL TRANSMITTANCE	2
PEEL STRENGTH	35
POT LIFE	83
REFRACTIVE INDEX	8
SELF IGNITION TEMPERATURE	1
SHEAR STRENGTH	16
SHELF LIFE	115
SHRINK	4
SOFT POINT	18
SOLIDS PERCENT	126
SPECIFIC GRAVITY	75
SPECIFIC HEAT	3
STIFFNESS	6
STRESS CRACKING	5
SURFACE RESISTIVITY	22
TACK FREE TIME	59
TEAR STRENGTH	9
TENSILE ELASTIC MODULUS	8

TENSILE STRENGTH ULTIMATE	53
TENSILE STRENGTH YIELD	11
THERMAL CONDUCTIVITY	12
THERMAL EXPANSION COEF	13
VAPOR PRESSURE	7
VISCOSITY	130
VOC (VOLATILE ORGANIC CONTENT)	23
VOLATILES PERCENT	29
VOLUME RESISTIVITY	47
WATER ABSORPTION	18
WEAR	4
WITHSTAND VOLTAGE	10
sum	1979

68 rows selected.

CHEMICAL RESISTANCE PROPERTIES

PROPERTY	COUNT(*)
ELONGATION @ RUP	1
ELONGATION @ YLD	3
HARDNESS	1
HARDNESS CHANGE	7
OBSERVED CHANGE	696
TENSILE STRENGTH	3
THICKNESS CHANGE	3
WEIGHT CHANGE	12
sum	726

8 rows selected.

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MANUFACTURER	DESIGNATION
AIRTECH INTERNATIONAL INC.	TAPE TEFLEASE MG3 TEFLON FILM WITH SILICONE ADHESIVE
	TAPE TEFLEASE MG5 TEFLON FILM WITH SILICONE ADHESIVE
	TAPE TOOLTEC CA10 TEFLON FILM WITH ACRYLIC ADHESIVE
	TAPE TOOLTEC CA5 TETRAFLUOROETHYLLENE FILM WITH ACRYLIC ADHESIVE
	TAPE TOOLTEC CR5 TETRAFLUOROETHYLENE FILM WITH RUBBER ADHESIVE
	TAPE TOOLTEC CS10 TEFLOM FILM WITH SILICONE ADHESIVE
	TAPE TOOLTEC CS5 TEFLON FILM WITH SILICONE ADHESIVE
	TAPE WRIGHTLON 7400 PS NYLON FILM WITH RUBBER BASE ADHESIVE
ALLIED SIGNAL, INC. / FLUORGLAS	TAPE 2042 SKIVED PTFE / ACRYLIC ADHESIVE
	TAPE 2045 SKIVED PTFE / SILICONE ADHESIVE
	TAPE 2242 HIGH MODULUS PTFE / ACRYLIC ADHESIVE
	TAPE 2245 HIGH MODULUS PTFE / SILICONE ADHESIVE
	TAPE 2255 HIGH MODULUS PTFE / SILICONE ADHESIVE
	TAPE 2285 HIGH MODULUS PTFE / SILICONE ADHESIVE
	TAPE 2302 UHMW POLYETHYLENE / ACRYLIC ADHESIVE
	TAPE 2342 POLYIMIDES / ACRYLIC ADHESIVE
	TAPE 2345 POLYIMIDES / SILICONE ADHESIVE
	TAPE 2352 FEP / ACRYLIC ADHESIVE
	TAPE 2355 FEP / SILICONE ADHESIVE
	TAPE 2812 PTFE COATED GLASS FABRIC / ACRYLIC ADHESIVE
	TAPE 2815 PTFE COATED GLASS FABRIC / SILICONE ADHESIVE
	TAPE 2852 CONDUCTIVE PTFE COATED GLASS FABRIC / ACRYLIC ADHESIVE
	TAPE 2855 CONDUCTIVE PTFE COATED GLASS FABRIC / SILICONE ADHESIVE
	TAPE 2905 GLASS CLOTH DOUBLE FACE / SILICONE ADHESIVE
	TAPE 2925 DEAD SOFT ALUMINUM FOIL/GLASS / SILICONE ADHESIVE
	TAPE 2975 SILICONE/GLASS / SILICONE ADHESIVE / WITH A RELEASE LINER
ALPHA WIRE CORPORATION	TAPE LC-132 NYLON FLAT BRAIDED
	TAPE LC-134 NYLON FLAT BRAIDED WITH WAX FINISH
	TAPE LC-136 NYLON FLAT BRAIDED / WAX FINISH
	TAPE LC-140 NYLON FLAT BRAIDED / SYNTHETIC RUBBER FINISH
	TAPE LC-143 NYLON FLAT BRAIDED / THERMOPLASTIC SYNTHETIC RESIN FINISH
	TAPE LC-162 DACRON FLAT BRAIDED / WAX FINISH
ARMSTRONG WORLD INDUSTRIES, INC.	TAPE AP ARMAFLEX AND ARMAFLEX II
CHR INDUSTRIES	TAPE ELECTRICAL TEMP-R-TAPE G550 GLASS FABRIC / ACRYLIC ADHESIVE
	TAPE CHR G-550 ELECTRICAL GRADE GLASS FABRIC / COATED WITH ACRYLIC ADHESIVE
	TAPE TEMP-R-TAPE M789 SMOBC PLATERS PROTECTIVE / POLYESTER FILM / PS RUBBER ADHESIVE
	TAPE ELECTRICAL CONDUCTIVE TEMP-R-TAPE C642 AL DEPOSITED ON GLASS FABRIC WITH SILICONE ADHESIVE
	TAPE ELECTRICAL TEMP-R-GLAS A2005 TEFLON COATED FIBERGLASS / SILICONE ADHESIVE
	TAPE ELECTRICAL TEMP-R-GLAS A2007 TEFLON COATED FIBERGLASS / SILICONE ADHESIVE
	TAPE ELECTRICAL TEMP-R-GLAS A2008 TEFLON COATED FIBERGLASS / SILICONE ADHESIVE
	TAPE ELECTRICAL TEMP-R-GLAS A2012 TEFLON COATED FIBERGLASS / SILICONE ADHESIVE
	TAPE ELECTRICAL TEMP-R-GLAS A2205 TEFLON COATED FIBERGLASS / SILICONE ADHESIVE
	TAPE ELECTRICAL TEMP-R-GLAS A2207 TEFLON COATED FIBERGLASS / SILICONE ADHESIVE
	TAPE ELECTRICAL TEMP-R-TAPE C FEP TEFLON FILM / SILICONE ADHESIVE
	TAPE ELECTRICAL TEMP-R-TAPE G540 FIBERGLASS / SILICONE ADHESIVE
	TAPE ELECTRICAL TEMP-R-TAPE G551 FIBERGLASS / THERMOSETTING RUBBER ADHESIVE

MANUFACTURER	DESIGNATION
CHR INDUSTRIES, INC.	TAPE ELECTRICAL TEMP-R-TAPE G561 FIBERGLASS / SILICONE ADHESIVE TAPE ELECTRICAL TEMP-R-TAPE G564 FIBERGLASS / BOTH SIDES SILICONE ADHESIVE TAPE ELECTRICAL TEMP-R-TAPE G565 FLAME RETARDANT / FIBERGLASS / SILICONE ADHESIVE TAPE ELECTRICAL TEMP-R-TAPE G569 FIBERGLASS / ACRYLIC ADHESIVE TAPE ELECTRICAL TEMP-R-TAPE HM225 HIGH MODULUS TFE TEFLON FILM / SILICONE ADHESIVE TAPE ELECTRICAL TEMP-R-TAPE HM350 HIGH MODULUS TFE TEFLON FILM / SILICONE ADHESIVE TAPE ELECTRICAL TEMP-R-TAPE HM352 BONDABLE HIGH MODULUS TFE TEFLON FILM / SILICONE ADHESIVE TAPE ELECTRICAL TEMP-R-TAPE HM426 HIGH MODULUS TFE TEFLON FILM / SILICONE ADHESIVE TAPE ELECTRICAL TEMP-R-TAPE HM430 HIGH MODULUS TFE TEFLON FILM / ACRYLIC ADHESIVE TAPE ELECTRICAL TEMP-R-TAPE HM650 HIGH MODULUS TFE TEFLON FILM / SILICONE ADHESIVE TAPE ELECTRICAL TEMP-R-TAPE K100 KAPTON POLYIMIDE / BOTH SIDES SILICONE ADHESIVE TAPE ELECTRICAL TEMP-R-TAPE K102 KAPTON POLYIMIDE / ACRYLIC ADHESIVE TAPE ELECTRICAL TEMP-R-TAPE K103 KAPTON POLYIMIDE / ACRYLIC ADHESIVE TAPE ELECTRICAL TEMP-R-TAPE K104 KAPTON POLYIMIDE / SILICONE ADHESIVE TAPE ELECTRICAL TEMP-R-TAPE K245 KAPTON / SILICONE POLYMER ADHESIVE TAPE ELECTRICAL TEMP-R-TAPE K250 FLAME RETARDANT / KAPTON POLYIMIDE / SILICONE ADHESIVE TAPE ELECTRICAL TEMP-R-TAPE K350 FLAME RETARDANT / KAPTON POLYIMIDE / SILICONE ADHESIVE TAPE ELECTRICAL TEMP-R-TAPE M50 POLYESTER FILM / SILICONE ADHESIVE TAPE ELECTRICAL TEMP-R-TAPE M52 POLYESTER FILM / SILICONE ADHESIVE TAPE ELECTRICAL TEMP-R-TAPE M54 POLYESTER FILM / THERMOSETTING RUBBER ADHESIVE TAPE ELECTRICAL TEMP-R-TAPE M56 POLYESTER FILM / THERMOSETTING RUBBER ADHESIVE TAPE ELECTRICAL TEMP-R-TAPE M57 POLYESTER FILM / THERMOSETTING RUBBER ADHESIVE TAPE ELECTRICAL TEMP-R-TAPE M60 POLYESTER FILM / ACRYLIC ADHESIVE TAPE ELECTRICAL TEMP-R-TAPE M64 POLYESTER FILM / HIGH PERFORMANCE T. S. RUBBER ADHESIVE TAPE ELECTRICAL TEMP-R-TAPE M66 POLYESTER FILM / SILICONE ADHESIVE TAPE ELECTRICAL TEMP-R-TAPE M69 POLYESTER FILM / BOTH SIDES ACRYLIC ADHESIVE TAPE ELECTRICAL TEMP-R-TAPE M705 POLYESTER FILM / ACRYLIC ADHESIVE TAPE ELECTRICAL TEMP-R-TAPE M706 FLAME RETARDANT / POLYESTER FILM / ACRYLIC ADHESIVE TAPE ELECTRICAL TEMP-R-TAPE M97 PRINTABLE POLYESTER FILM / ACRYLIC ADHESIVE TAPE ELECTRICAL TEMP-R-TAPE M99 POLYESTER FILM / ACRYLIC ADHESIVE TAPE ELECTRICAL TEMP-R-TAPE T TFE TEFLON FILM / SILICONE ADHESIVE TAPE ELECTRICAL TEMP-R-TAPE TH TFE TEFLON FILM / SILICONE ADHESIVE TAPE ELECTRICAL TEMP-R-TAPE TV TFE TEFLON FILM / SILICONE ADHESIVE TAPE ELECTRICAL TEMP-R-TAPE TV350 TFE TEFLON FILM / SILICONE ADHESIVE TAPE STRIP-N-STICK 100S SILICONE SPONGE / PRESSURE SENSITIVE SILICONE ADHESIVE TAPE STRIP-N-STICK 200A SILICONE SPONGE / PRESSURE SENSITIVE ACRYLIC ADHESIVE

MANUFACTURER	DESIGNATION
CHR INDUSTRIES, INC.	TAPE STRIP-N-STICK 300AR SILICONE SPONGE / PRESSURE SENSITIVE ACRYLIC ADHESIVE
	TAPE STRIP-N-STICK 440S SILICONE SHEET / PRESSURE SENSITIVE SILICONE ADHESIVE
	TAPE TEMP-R-TAPE 630 UHMW POLYOLEFIN / ORGANIC RUBBER ADHESIVE
	TAPE TEMP-R-TAPE 631 UHMW POLYOLEFIN / ORGANIC RUBBER ADHESIVE
	TAPE TEMP-R-TAPE 632 UHMW POLYOLEFIN / ACRYLIC ADHESIVE
	TAPE TEMP-R-TAPE 633 UHMW POLYOLEFIN / ACRYLIC ADHESIVE
	TAPE TEMP-R-TAPE ELECTRICAL M730 POLYESTER FILM / SILICONE ADHESIVE
	TAPE TEMP-R-TAPE ELECTRICAL M765 POLYESTER FILM / ACRYLIC ADHESIVE
	TAPE TEMP-R-TAPE ELECTRICAL M787 POLYESTER FILM / RUBBER ADHESIVE
	TAPE TEMP-R-TAPE M716 FUME / POLYESTER FILM / SILICONE ADHESIVE
	TAPE TEMP-R-TAPE M717 PLATING / POLYESTER FILM / SILICONE ADHESIVE
	TAPE TEMP-R-TAPE M727 PLATING/ POLYESTER FILM / SILICONE ADHESIVE
	TAPE TEMP-R-TAPE M734 PRESSURE SENSITIVE / ORGANIC RUBBER ADHESIVE
	TAPE TEMP-R-TAPE M737 PLATING / POLYESTER FILM / SILICONE ADHESIVE
	TAPE TEMP-R-TAPE M782 POLYESTER FILM / HIGH TEMPERATURE RUBBER RESIN ADHESIVE
	TAPE TEMP-R-TAPE M783 POLYESTER FILM / HIGH TEMPERATURE RUBBER RESIN ADHESIVE
	TAPE TEMP-R-TAPE M784 PLATING / POLYESTER FILM / NON-SILICONE ADHESIVE
	TAPE TEMP-R-TAPE M786 POLYESTER FILM / HIGH TEMPERATURE RUBBER RESIN ADHESIVE
	TAPE TEMP-R-TAPE M797 POLYESTER FILM / RUBBER ADHESIVE
	TAPE TEMP-R-TAPE MECHANICAL C661 COPPER FOIL / ACRYLIC ADHESIVE
	TAPE TEMP-R-TAPE MECHANICAL C662 ALUM. FOIL / ACRYLIC ADHESIVE
	TAPE TEMP-R-TAPE MECHANICAL C665 COPPER FOIL / CONDUCTIVE ACRYLIC ADHESIVE
	TAPE TEMP-R-TAPE MECHANICAL C680 HIGH TEMP. PAPER / RUBBER BLEND ADHESIVE
	TAPE TEMP-R-TAPE RU COMPOUNDED TEFLON TFE / SILICONE ADHESIVE
	TAPE ELECTRICAL TEMP-R-TAPE K109 KAPTON FILM / ACRYLIC PS ADHESIVE
DEVON TAPE CORPORATION	TAPE DEVOSEAL 10T MATTE ACETATE FILM / INVISIBLE MENDING / ACRYLIC ADHESIVE
	TAPE DEVOSEAL 11VP UPVC FILM / UNPLASTICIZED POLYVINYL CHLORIDE FILM / RUBBER ADHESIVE
	TAPE DEVOSEAL 124X BOPP FILM / BIAXIALLY ORIENTED POLYPROPYLENE FILM / RUBBERYLIC PLUS ADHESIVE
	TAPE DEVOSEAL 125WS BOPP FILM / BIAXIALLY ORIENTED POLYPROPYLENE FILM / RUBBERYLIC PLUS ADHESIVE
	TAPE DEVOSEAL 125X BOPP FILM / BIAXIALLY ORIENTED POLYPROPYLENE FILM / RUBBERYLIC PLUS ADHESIVE
	TAPE DEVOSEAL 129X BOPP FILM / BIAXIALLY ORIENTED POLYPROPYLENE FILM / RUBBERYLIC PLUS ADHESIVE
	TAPE DEVOSEAL 12CP UPVC PRINTABLE FILM / UNPLASTICIZED POLYVINYL CHLORIDE FILM / RUBBER ADHESIVE
	TAPE DEVOSEAL 130X BOPP FILM / BIAXIALLY ORIENTED POLYPROPYLENE FILM / RUBBERYLIC PLUS ADHESIVE
	TAPE DEVOSEAL 13C BOPP FILM / BIAXIALLY ORIENTED POLYPROPYLENE FILM / ACRYLIC ADHESIVE
	TAPE DEVOSEAL 13T BOPP FILM / BIAXIALLY ORIENTED POLYPROPYLENE FILM / ACRYLIC ADHESIVE
	TAPE DEVOSEAL 1508 BOPP FILM / BIAXIALLY ORIENTED POLYPROPYLENE FILM / ACRYLIC ADHESIVE

MANUFACTURER	DESIGNATION
DEVON TAPE CORPORATION	TAPE DEVOSEAL 15C BOPP FILM / BIAXIALLY ORIENTED POLYPROPYLENE FILM / ACRYLIC ADHESIVE
	TAPE DEVOSEAL 15T BOPP FILM / BIAXIALLY ORIENTED POLYPROPYLENE FILM / ACRYLIC ADHESIVE
	TAPE DEVOSEAL 15T-10 BOPP FILM / BIAXIALLY ORIENTED POLYPROPYLENE FILM / ACRYLIC ADHESIVE
	TAPE DEVOSEAL 15T-12 BOPP FILM / BIAXIALLY ORIENTED POLYPROPYLENE FILM / ACRYLIC ADHESIVE
	TAPE DEVOSEAL 15T-8 BOPP FILM / BIAXIALLY ORIENTED POLYPROPYLENE FILM / ACRYLIC ADHESIVE
	TAPE DEVOSEAL 15T-R BOPP FILM / BIAXIALLY ORIENTED POLYPROPYLENE FILM / RUBBER ADHESIVE
	TAPE DEVOSEAL 16HT CELLOPHANE FILM / SUPER HIGH TACK / RUBBER ADHESIVE TAPE DEVOSEAL 1802T MATTE POLYESTER FILM / ACRYLIC ADHESIVE TAPE DEVOSEAL 1813 POLYESTER FILM / RUBBER ADHESIVE TAPE DEVOSEAL 191T BOPP FILM / GLASS REINFORCED FILAMENT / POLYPROPYLENE BACKING / RUBBER ADHESIVE
	TAPE DEVOSEAL 196TM BOPP FILM / GLASS REINFORCED FILAMENT / POLYPROPYLENE FILM / RUBBER ADHESIVE
	TAPE DEVOSEAL 197A MOPP STRAPPING FILM / RUBBERYLIC PLUS ADHESIVE TAPE DEVOSEAL 197R MOPP STRAPPING FILM / RUBBERYLIC PLUS ADHESIVE TAPE DEVOSEAL 200A MOPP STRAPPING FILM / RUBBERYLIC PLUS ADHESIVE TAPE DEVOSEAL 200AR MOPP STRAPPING FILM / RUBBERYLIC PLUS ADHESIVE TAPE DEVOSEAL 229 BOPP FILM / BIAXIALLY ORIENTED POLYPROPYLENE FILM / RUBBERYLIC PLUS ADHESIVE
	TAPE DEVOSEAL 321 BOPP FILM / BIAXIALLY ORIENTED POLYPROPYLENE FILM / RUBBERYLIC PLUS ADHESIVE
	TAPE DEVOSEAL 3210SE BOPP FILM / BIAXIALLY ORIENTED POLYPROPYLENE FILM / ACRYLIC ADHESIVE
	TAPE DEVOSEAL 3210T BOPP FILM / BIAXIALLY ORIENTED POLYPROPYLENE FILM / ACRYLIC ADHESIVE
	TAPE DEVOSEAL 3212 BOPP FILM / BIAXIALLY ORIENTED POLYPROPYLENE FILM / RUBBERYLIC PLUS ADHESIVE
	TAPE DEVOSEAL 321C BOPP FILM / BIAXIALLY ORIENTED POLYPROPYLENE FILM / RUBBERYLIC PLUS ADHESIVE
	TAPE DEVOSEAL 341 BOPP FILM / BIAXIALLY ORIENTED POLYPROPYLENE FILM / RUBBERYLIC PLUS ADHESIVE
	TAPE DEVOSEAL 341WS BOPP FILM / BIAXIALLY ORIENTED POLYPROPYLENE FILM / RUBBERYLIC PLUS ADHESIVE
	TAPE DEVOSEAL 343 BOPP FILM / BIAXIALLY ORIENTED POLYPROPYLENE FILM / RUBBER RESIN ADHESIVE

MANUFACTURER	DESIGNATION
DEVON TAPE CORPORATION	TAPE DEVOSEAL 3813 POLYESTER FILM / RUBBERYLIC PLUS AN ACRYLIC BLEND ADHESIVE TAPE DEVOSEAL 4 VINYL PLASTIC / RUBBER ADHESIVE TAPE DEVOSEAL 41 CREPE MASKING / RUBBER RESIN ADHESIVE TAPE DEVOSEAL 4T VINYL PLASTIC / RUBBER ADHESIVE TAPE DEVOSEAL 54Y OVERLAMINATED SAFETY STRIPES / VINYL FILM / ACRYLIC ADHESIVE TAPE DEVOSEAL 55-S POLYCLOTH DUCT SEALING / RUBBER RESIN ADHESIVE TAPE DEVOSEAL 6A POLYETHYLENE FILM / ACRYLIC ADHESIVE TAPE DEVOSEAL 7512 COTTON CLOTH CARRIER / COATED BOTH SIDES / RUBBER RESIN ADHESIVE TAPE DEVOSEAL 7586 KRAFT FLATBACK / RUBBER ADHESIVE TAPE DEVOSEAL 7592 BIAXIALLY ORIENTED POLYPROPYLENE FILM / RUBBER ADHESIVE TAPE DEVOSEAL 7592DE BOPP FILM / RUBBER ADHESIVE / KRAFT PAPER LINER TAPE DEVOSEAL 7592DT BOPP FILM / RUBBER ADHESIVE / CLEAR POLY LINER TAPE DEVOSEAL 75P PRINTABLE PAPER / RUBBER RESIN ADHESIVE TAPE DEVOSEAL SL-553 CELLOPHANE LITHOGRAPHERS / PLASTICIZED CELLULOSE FILM / RUBBER RESIN ADHESIVE TAPE TRANSFER DEVOSEAL 7572 / TISSUE REINFORCED / ACRYLIC ADHESIVE TAPE TRANSFER DEVOSEAL 7573 / TISSUE REINFORCED / RUBBER ADHESIVE TAPE TRANSFER DEVOSEAL 7573DE / TISSUE REINFORCED / RUBBER ADHESIVE / KRAFT PAPER LINER TAPE TRANSFER DEVOSEAL 7573DT / TISSUE REINFORCED / RUBBER ADHESIVE / CLEAR POLY LINER
DEWAL INDUSTRIES, INC.	TAPE D/W 214 TEFLON FILM / PRESSURE SENSITIVE ACRYLIC ADHESIVE TAPE D/W 304 KAPTON / PRESSURE SENSITIVE SILICONE ADHESIVE TAPE D/W 314 KAPTON / PRESSURE SENSITIVE ACRYLIC ADHESIVE TAPE D/W 469 GLASS FABRIC / SILICONE PRESSURE SENSITIVE ADHESIVE TAPE D/W 704 FEP TEFLON FILM / PRESSURE SENSITIVE SILICONE ADHESIVE TAPE DW204 TEFLON / PS SILICONE ADHESIVE TAPE FLUOROLIN 101T TEFLON / PS SILICONE ADHESIVE TAPE FLUOROLIN 403 UHMW POLYETHYLENE FILM / PRESSURE SENSITIVE ADHESIVE TAPE FLUOROLIN 407 ALUMINUM AND GLASS LAMINATE / P/S SILICONE ADHESIVE TAPE FLUOROLIN 409 ALUMINUM AND GLASS LAMINATE / P/S SILICONE ADHESIVE TAPE FLUOROLIN 410 SILICONE RUBBER GLASS FABRIC / P/S SILICONE ADHESIVE TAPE FLUOROLIN 904-1 POLYESTER FILM / P/S SILICONE ADHESIVE
DIELECTRIC POLYMERS, INC.	TAPE NELTAPE 100 ACRYLIC PS TRANSFER ADHESIVES / SILICONE RELEASE COATED KRAFTGLASSINE PAPER LINER TAPE NELTAPE 601 HEAT AND OR SOLVENT ACTIVATED DRY FILM / SILICONE RELEASE TREATED FLAT STOCK LINER TAPE NT-100AP ACRYLIC TRANSFER FILM ADHESIVE / WITH RELEASE LINER TAPE NT-140AP ACRYLIC TRANSFER FILM ADHESIVE / WITH RELEASE LINER TAPE NT-381 POLYAMIDE / DRY FILM ADHESIVE TAPE NT-383 ETHYLENE ACRYLIC COPOLYMER / DRY FILM ADHESIVE TAPE NT-4511 HIGH TEMPERATURE SPLICING POLYESTER FILM / SILICONE ADHESIVE TAPE NT-511 SPLICING POLYESTER FILM / SILICONE ADHESIVE TAPE NT-511FM FUME MASK POLYESTER FILM / SILICONE ADHESIVE TAPE NT-580 PLATERS POLYESTER FILM / SILICONE ADHESIVE TAPE NT-583 PRINTED CIRCUIT BOARD POLYESTER FILM / SILICONE ADHESIVE TAPE NT-590 POLYIMIDE FILM / SILICONE ADHESIVE
FLUORGLAS, AN ALLIED SIGNAL CO.	TAPE FLUORGLAS 2915 SINGLE FACED GLASS CLOTH / SILICONE ADHESIVE

MANUFACTURER	DESIGNATION
FLUORGLAS/ALLIED SIGNAL, INC.	TAPE MYSTIK 7000 SINGLE FACE GLASS CLOTH PS SILICONE ADHESIVE TAPE MYSTIK 7001 SINGLE FACE GLASS CLOTH PS SILICONE ADHESIVE TAPE MYSTIK 7020 SINGLE FACE GLASS CLOTH PS RUBBER ADHESIVE TAPE MYSTIK 7021 SINGLE FACE GLASS CLOTH PS ACRYLIC ADHESIVE TAPE MYSTIK 7100 DOUBLE FACE GLASS CLOTH PS SILICONE ADHESIVE TAPE MYSTIK 7300 POLYESTER PS SILICONE ADHESIVE TAPE MYSTIK 7331 POLYESTER PS SILICONE ADHESIVE TAPE MYSTIK 7361 POLYIMIDE PS SILICONE ADHESIVE TAPE MYSTIK 7362 POLYIMIDE PS SILICONE ADHESIVE TAPE MYSTIK 7367 POLYIMIDE PS ACRYLIC ADHESIVE TAPE MYSTIK 7430 LEAD FOIL PS THERMOSETTING RUBBER ADHESIVE TAPE MYSTIK 7452 ALUMINUM FOIL PS ACRYLIC ADHESIVE TAPE MYSTIK 7453 ALUMINUM FOIL PS ACRYLIC ADHESIVE TAPE MYSTIK 7455 ALUMINUM FOIL WITH GLASS PS SILICONE ADHESIVE TAPE MYSTIK 7459 ALUMINUM FOIL WITH GLASS PS SILICONE ADHESIVE TAPE MYSTIK 7503 SKIVED TEFLON PS SILICONE ADHESIVE TAPE MYSTIK 7505 SKIVED TEFLON PS SILICONE ADHESIVE TAPE MYSTIK 7510 SKIVED TEFLON PS SILICONE ADHESIVE TAPE MYSTIK 9710 SILICONE RUBBER WITH GLASS CLOTH PS SILICONE ADHESIVE
GARLAND MFG. CO.	TAPE GAR DUR PLASTIC PS WEAR UHMW POLYETHYLENE
GENERAL ELECTRIC	TAPE FUSA-FLEX 76593 B-STAGED EPOXY-COATED POLYESTER GLASS
GRACE (WR) AND COMPANY	TAPE CHO-FOIL CCH 101 EMI/RFI SHIELDING COPPER FOIL / CONDUCTIVE ACRYLIC ADHESIVE TAPE CHO-FOIL CCH 301 EMI/RFI SHIELDING COPPER FOIL / NON-CONDUCTIVE ACRYLIC ADHESIVE TAPE CHO-FOIL CCJ 201 EMI/RFI SHIELDING ALUMINUM FILM / CONDUCTIVE ACRYLIC ADHESIVE TAPE CHO-FOIL CCK 101 TINNED EMI/RFI SHIELDING COPPER FOIL / CONDUCTIVE ACRYLIC ADHESIVE
GUDEBROD, INC.	TAPE LACING "SUPER" GUDE-SPACE PT DACRON FIBER / SPECIAL COMPOSITE FINISH TAPE LACING FYR-LACE R DACRON FIBER / VINYL COATING TAPE LACING GUDE-GLASS GLASS / SYNTHETIC RUBBER COATING TAPE LACING GUDE-GLASS S GLASS / SILICONE FINISH TAPE LACING GUDE-GLASS T GLASS / TEFLON FINISH TAPE LACING GUDE-NYLACE NYLON YARN / NYLON COATING TAPE LACING GUDE-SPACE DACRON FIBER / SYNTHETIC RUBBER FINISH TAPE LACING GUDE-TEMP G NOMEX YARN / NYLON POLYMER TAPE LACING GUDE-TEMP H NOMEX YARN / SYNTHETIC RUBBER FINISH TAPE LACING GUDE-TEMP P NOMEX YARN / POLYCARBONATE FINISH TAPE LACING GUDE-TEMP S NOMEX YARN / SILICONE RESIN FINISH TAPE LACING GUDE-TEMP U NOMEX YARN TAPE LACING GUDE-TEMP Z NOMEX YARN / SYNTHETIC RUBBER FINISH TAPE LACING GUDELACE H NYLON YARN / SYNTHETIC RUBBER FINISH TAPE LACING GUDELACE NYLON YARN / MICROCRYSTALLINE WAX TAPE LACING GUDELACE U NYLON YARN TAPE LACING IMPROVED FYR-LACE Z DACRON FIBER / SYNTHETIC RUBBER FINISH TAPE LACING STUR-D-LACE B DACRON FIBER / POLYAMIDE NYLON COATING TAPE LACING STUR-D-LACE DACRON FIBER / MICROCRYSTALLINE WAX TAPE LACING STUR-D-LACE H DACRON FIBER / SYNTHETIC RUBBER FINISH

MANUFACTURER	DESIGNATION
GUDEBROD, INC.	TAPE LACING STUR-D-LACE U DACRON FIBERS
	TAPE LACING TEMP-LACE H TEFLON FIBER / SYNTHETIC RUBBER FINISH
	TAPE LACING TEMP-LACE P TEFLON FIBER / WITH OR WITHOUT SYNTHETIC RUBBER FINISH
	TAPE LACING TEMP-LACE S TEFLON FIBER / SILICONE FINISH
	TAPE LACING TEMP-LACE U TEFLON FIBER
	TAPE LACING TUF-TEST NYLON YARN / COMPOUNDED WAX
HARDCAST, INC.	TAPE 1902-FR FLANGE GASKETING / BUTYL AND EPDM RUBBER ADHESIVE / RELEASE LINER
	TAPE AFG-1402 FOIL-GRIP ALUMINUM / MODIFIED BUTYL RUBBER ADHESIVE / RELEASE LINER
	TAPE AFT-701 ALUMA-GRIP ALUMINUM / MODIFIED BUTYL RUBBER ADHESIVE / RELEASE LINER
	TAPE AM-401 ALUMINUM BONDED TO ALUMINIZED MYLAR / BUTYL RUBBER PS ADHESIVE / RELEASE LINER
	TAPE AP-1602 SONTARA / MODIFIED BUTYL RUBBER ADHESIVE / RELEASE LINER
	TAPE P-301 PEEL N SEAL EXTENDABLE POLYETHYLENE / BUTYL RUBBER PS ADHESIVE / RELEASE LINER
HERCULES INCORPORATED	TAPE HERCULES AS4/3501-6 PREPREG CARBON FIBER AMINE EPOXY RESIN
INTERNATIONAL PLASTIC PRODUCTS, INC./AIRTECH INTER	TAPE WRIGHTCAST 8500 PS NYLON 6/6 FILM WITH RUBBER BASE ADHESIVE
	TAPE WRIGHTLON 4500 PS HALOHYDROCARBON FILM WITH CURED SILICONE ADHESIVE
	TAPE WRIGHTLON 4500 PS WHITE HALOHYDROCARBON FILM WITH ACRYLIC ADHESIVE
	TAPE WRIGHTLON 4600W PS WITH ACRYLIC ADHESIVE
LAKE CITY INDUSTRIAL PRODUCTS CO.	TAPE THREAD SEAL TEFLON VIRGIN PTFE
LAMART CORPORATION	TAPE ELECTRICAL 701 POLYESTER FILM / ACRYLIC ADHESIVE
	TAPE ELECTRICAL 702 POLYESTER FILM / ACRYLIC ADHESIVE
	TAPE ELECTRICAL 703 POLYESTER FILM / ACRYLIC ADHESIVE
	TAPE ELECTRICAL 704 POLYESTER FILM / ACRYLIC ADHESIVE
	TAPE ELECTRICAL 707 POLYESTER FILM / ACRYLIC ADHESIVE
	TAPE ELECTRICAL 708 POLYESTER FILM / ACRYLIC ADHESIVE
	TAPE ELECTRICAL 720 POLYESTER FILM / SILICONE ADHESIVE
	TAPE ELECTRICAL 731 POLYESTER FILM / RUBBER ADHESIVE
	TAPE ELECTRICAL 732 POLYESTER FILM / RUBBER ADHESIVE
	TAPE ELECTRICAL 733 POLYESTER FILM / RUBBER ADHESIVE
	TAPE ELECTRICAL 734 POLYESTER FILM / RUBBER ADHESIVE
	TAPE ELECTRICAL 735 POLYESTER FILM / RUBBER ADHESIVE
	TAPE ELECTRICAL 737 POLYESTER FILM / RUBBER ADHESIVE
	TAPE ELECTRICAL 738 POLYESTER FILM / RUBBER ADHESIVE
	TAPE ELECTRICAL 771 KAPTON FILM / ACRYLIC ADHESIVE
	TAPE ELECTRICAL 772 KAPTON FILM / ACRYLIC ADHESIVE
	TAPE ELECTRICAL 773 KAPTON FILM / SILICONE ADHESIVE
	TAPE ELECTRICAL 817-L COPPER/POLYESTER LAMINATE / ACRYLIC ADHESIVE / WITH RELEASE LINER
	TAPE ELECTRICAL 850-10 410 NOMEX FILM / ACRYLIC ADHESIVE
	TAPE ELECTRICAL 850-15 410 NOMEX FILM / ACRYLIC ADHESIVE
	TAPE ELECTRICAL 850-2 410 NOMEX FILM / ACRYLIC ADHESIVE
	TAPE ELECTRICAL 850-20 410 NOMEX FILM / ACRYLIC ADHESIVE
	TAPE ELECTRICAL 850-3 410 NOMEX FILM / ACRYLIC ADHESIVE
	TAPE ELECTRICAL 850-5 410 NOMEX FILM / ACRYLIC ADHESIVE
	TAPE ELECTRICAL 850-7 410 NOMEX FILM / ACRYLIC ADHESIVE

MANUFACTURER	DESIGNATION
LAMART CORPORATION	TAPE ELECTRICAL 881-L 1 OZ. COPPER / ACRYLIC ADHESIVE / WITH RELEASE LINER TAPE ELECTRICAL 891-L ALUMINUM FILM / ACRYLIC ADHESIVE / WITH RELEASE LINER TAPE INDUSTRIAL 213 ALUMINUM FOIL / ACRYLIC ADHESIVE TAPE METAL FOIL 211-L ALUMINUM FOIL / ACRYLIC ADHESIVE / WITH RELEASE LINER TAPE METAL FOIL 213 ALUMINUM FOIL / ACRYLIC ADHESIVE TAPE METAL FOIL 213-L ALUMINUM FOIL / ACRYLIC ADHESIVE / WITH RELEASE LINER TAPE METAL FOIL 213-M ALUMINUM FOIL / ACRYLIC ADHESIVE TAPE METAL FOIL 214-L ALUMINUM FOIL / ACRYLIC ADHESIVE / WITH RELEASE LINER TAPE METAL FOIL 215 ALUMINUM FOIL / ACRYLIC ADHESIVE TAPE METAL FOIL 215-L ALUMINUM FOIL / ACRYLIC ADHESIVE / WITH RELEASE LINER TAPE METAL FOIL 222-L ALUMINUM FOIL / SILICONE ADHESIVE / WITH RELEASE LINER TAPE METAL FOIL 243-L LEAD FOIL / ACRYLIC ADHESIVE / WITH RELEASE LINER TAPE METAL FOIL 244 LEAD FOIL / ACRYLIC ADHESIVE TAPE METAL FOIL 245-L LEAD FOIL / ACRYLIC ADHESIVE / WITH RELEASE LINER TAPE METAL FOIL 246 LEAD FOIL / ACRYLIC ADHESIVE TAPE METAL FOIL 321-L ALUMINUM FOIL/POLYESTER / ACRYLIC ADHESIVE / WITH RELEASE LINER TAPE METAL FOIL 325 ALUMINUM FOIL/POLYESTER / ACRYLIC ADHESIVE TAPE METAL FOIL 370-L ALUMINUM FOIL/TEFLON / ACRYLIC ADHESIVE / WITH RELEASE LINER TAPE METAL FOIL 390 ALUMINUM FOIL/GLASS CLOTH / SILICONE ADHESIVE
MANCO INC	TAPE CW-3 POLYETHYLENE BACKING ACRYLIC ADHESIVE
MARKEL CORPORATION	TAPE SELF-ADHERING TRIANGULAR GUIDE LINE WRAPPING FLEXITE 4529 SILICONE RUBBER
MOXNESS PRODUCTS, INC.	TAPE MOX-TAPE 600-R SERIES SILICONE RUBBER RECTANGULAR TAPE MOX-TAPE 600-T SERIES SILICONE RUBBER TRIANGULAR GUIDELINE TAPE MOX-TAPE SA SERIES SILICONE RUBBER ENCAPSULATED FIBERGLASS-REINFORCED CONTROLLED STRETCH TAPE MOX-TAPE SB SERIES SILICONE RUBBER ENCAPSULATED FIBERGLASS-REINFORCED CONTROLLED STRETCH
NASHUA TAPE PRODUCTS/DIVISION OF NASHUA CORP.	TAPE DUCT 322 ALUMINUM FOIL / RUBBER ADHESIVE
NATVAR COMPANY/DIV. HIGH VOLTAGE ENGINEERING CORP.	TAPE 241 EXTRUDED VINYL TAPE 400 EXTRUDED VINYL
NORTON PERFORMANCE PLASTIC	TAPE T1002 PTFE SKIVED FILM / ACRYLIC ADHESIVE TAPE T1003 PTFE SKIVED FILM / ACRYLIC ADHESIVE TAPE T1005 PTFE SKIVED FILM / ACRYLIC ADHESIVE TAPE T1010 PTFE SKIVED FILM / ACRYLIC ADHESIVE TAPE T1102 PTFE SKIVED FILM / SILICONE ADHESIVE TAPE T1103 PTFE SKIVED FILM / SILICONE ADHESIVE TAPE T1105 PTFE SKIVED FILM / SILICONE ADHESIVE TAPE T1110 PTFE SKIVED FILM / SILICONE ADHESIVE TAPE T1202 PTFE HIGH MODULUS FILM / SILICONE ADHESIVE TAPE T1203 PTFE HIGH MODULUS FILM / SILICONE ADHESIVE TAPE T1205 PTFE HIGH MODULUS FILM / SILICONE ADHESIVE TAPE T1502 FEP FILM / SILICONE ADHESIVE TAPE T1510 FEP FILM / SILICONE ADHESIVE TAPE T5001 POLYIMIDE FILM / ACRYLIC ADHESIVE TAPE T5002 POLYIMIDE FILM / ACRYLIC ADHESIVE TAPE T5101 KAPTON FILM / SILICONE ADHESIVE

MANUFACTURER	DESIGNATION
NORTON PERFORMANCE PLASTIC	TAPE T5102 KAPTON FILM / SILICONE ADHESIVE
	TAPE T5301 SPLICING POLYESTER FILM / SILICONE ADHESIVE
	TAPE T5305 SPLICING POLYESTER FILM / SILICONE ADHESIVE / WITH RELEASE LINER
	TAPE THERM-A-LECTRIC T2601 KORTON CTFE FLUOROPOLYMER FILM / SILICONE ADHESIVE
	TAPE THERM-A-LECTRIC T2602 KORTON CTFE FLUOROPOLYMER FILM / SILICONE ADHESIVE
	TAPE THERM-A-LECTRIC T3001 KORTON PVDF FILM / ACRYLIC ADHESIVE
	TAPE THERM-A-LECTRIC T3002 KORTON PVDF FILM / ACRYLIC ADHESIVE
	TAPE THERM-A-LECTRIC T4601 KEMID PEI FILM / SILICONE ADHESIVE
	TAPE THERM-A-LECTRIC T4602 KEMID PEI FILM / SILICONE ADHESIVE
	TAPE T6005 UHMW POLYETHYLENE FILM / RUBBER RESIN ADHESIVE
	TAPE T6010 UHMW POLYETHYLENE FILM / RUBBER RESIN ADHESIVE
	TAPE T6020 UHMW POLYETHYLENE FILM / RUBBER RESIN ADHESIVE
	TAPE T7503 PTFE COATED GLASS CLOTH / SILICONE ADHESIVE
	TAPE T7505 PTFE COATED GLASS CLOTH / SILICONE ADHESIVE
	TAPE T7506 PTFE COATED GLASS CLOTH / SILICONE ADHESIVE
	TAPE T7510 PTFE COATED GLASS CLOTH / SILICONE ADHESIVE
	TAPE THERM-A-LECTRIC T64052 UHMW PE FILM URETHANE FOAM ACRYLIC ADHESIVE
	TAPE THERM-A-LECTRIC T64053 UHMW PE FILM URETHANE FOAM ACRYLIC ADHESIVE
	TAPE THERM-A-LECTRIC T64054 UHMW PE FILM URETHANE FOAM ACRYLIC ADHESIVE
	TAPE THERM-A-LECTRIC T64102 UHMW PE FILM URETHANE FOAM ACRYLIC ADHESIVE
	TAPE THERM-A-LECTRIC T64103 UHMW PE FILM URETHANE FOAM ACRYLIC ADHESIVE
	TAPE THERM-A-LECTRIC T64104 UHMW PE FILM URETHANE FOAM ACRYLIC ADHESIVE
	TAPE THERM-A-LECTRIC T8601 KORTON E-CTFE COPOLYMER FILM / SILICONE ADHESIVE
	TAPE THERM-A-LECTRIC T8602 KORTON E-CTFE COPOLYMER FILM / SILICONE ADHESIVE
OKONITE COMPANY	TAPE OKONITE 35 JACKETING TAPE
ORCON CORPORATION	TAPE ORCON OT-20 KAPTON/NYLON YARN / ACRYLIC ADHESIVE
	TAPE ORCOTAPE OT-10 TEDLAR FILM/REINFORCED 10X10 NYLON 70d YARN / ACRYLIC ADHESIVE
	TAPE ORCOTAPE OT-12 TEDLAR FILM/REINFORCED 16X16 NYLON 70D YARN / ACRYLIC ADHESIVE
	TAPE ORCOTAPE OT-22 TEDLAR FILM/REINFORCED 16X16 NYLON YARN / ACRYLIC ADHESIVE
	TAPE ORCOTAPE OT-26 POLYESTER FILM REINFORCED 6X6 70D NYLON YARN WITH ACRYLIC ADHESIVE
	TAPE ORCOTAPE OT-26B POLYESTER FILM REINFORCED 6X6 70D NYLON YARN WITH ACRYLIC ADHESIVE
	TAPE ORCOTAPE OT-6 FORMERLY OT-5 TEDLAR AL COATED REINFORCED WITH 6X6 NYLON YARN ACRYLIC ADHESIVE
	TAPE ORCOTAPE OT-6C TEDLAR FILM REINFORCED WITH 6X6 NYLON YARN WITH ACRYLIC ADHESIVE
	TAPE ORCOTAPE OT-9 POLYESTER FILM/REINFORCED 16X16 NYLON YARN / ACRYLIC ADHESIVE
	TAPE ORCOTAPES OT-7 TEDLAR FILM AL COATED REINFORCED 16X16 140D NYLON YARN WITH ACRYLIC ADHESIVE
	TAPE ORCOTAPES OT-7C TEDLAR FILM REINFORCED 16X16 140D NYLON YARN WITH ACRYLIC ADHESIVE
PERMACEL / A NITTO DENKO COMPANY	TAPE ADHESIVE TRANSFER P155 / ACRYLIC ADHESIVE / SILICONE RELEASE LINER
	TAPE APPLIANCE APLIFAST 2 POLYESTER FILM GLASS FILAMENT REINFORCED / SYNTHETIC

MANUFACTURER	DESIGNATION
	RUBBER RESIN ADHESIVE
PERMACEL / A NITTO DENKO COMPANY	TAPE BONDING/SPLICING P049 POLYESTER FILM DOUBLE FACED / ACRYLIC ADHESIVE / SILICONED LINER
	TAPE CARPET P52 POLYVINYLCHLORIDE FILM DOUBLE FACED / RUBBER RESIN ADHESIVE / LINER
	TAPE CARTON SEALING AND LABEL PROTECTION P925 POLYESTER FILM / SYNTHETIC RUBBER RESIN ADHESIVE
	TAPE CARTON SEALING P915 POLYPROPYLENE FILM / SYNTHETIC RUBBER RESIN ADHESIVE TAPE CARTON SEALING P917 POLYPROPYLENE FILM / SYNTHETIC RUBBER RESIN ADHESIVE TAPE CARTON SEALING P919 BIAXIALLY-ORIENTED POLYPROPYLENE FILM / SYNTHETIC RUBBER RESIN ADHESIVE
	TAPE CARTON SEALING P929 POLYESTER FILM / SYNTHETIC RUBBER RESIN ADHESIVE TAPE CLEAR J-LAR 2 BIAXIALLY-ORIENTED POLYPROPYLENE FILM / ACRYLIC ADHESIVE TAPE CLEAR J-LAR 910 TM BIAXIALLY-ORIENTED POLYPROPYLENE FILM / ACRYLIC ADHESIVE TAPE CLOTH P64 COTTON CLOTH / SYNTHETIC RUBBER RESIN ADHESIVE TAPE CLOTH P665 VINYL COATED COTTON CLOTH / SYNTHETIC RUBBER RESIN ADHESIVE TAPE CLOTH P670 POLYETHYLENE COATED COTTON CLOTH / SYNTHETIC RUBBER RESIN ADHESIVE
	TAPE CLOTH P672 VINYL COATED COTTON CLOTH / SYNTHETIC RUBBER RESIN ADHESIVE TAPE CLOTH P68 VINYL COATED COTTON CLOTH / SYNTHETIC RUBBER RESIN ADHESIVE TAPE CLOTH P69 POLYETHYLENE COATED COTTON CLOTH / SYNTHETIC RUBBER RESIN ADHESIVE
	TAPE DUCT P685 POLYETHYLENE COATED COTTON CLOTH / RUBBER RESIN ADHESIVE TAPE ELECTRICAL AW8.5 VINYL / THERMOPLASTIC RUBBER RESIN ADHESIVE TAPE ELECTRICAL INSULATING P100 ALUMINUM FOIL/GLASS CLOTH / SILICONE ADHESIVE TAPE ELECTRICAL P201 COTTON CLOTH / THERMOSETTING RUBBER RESIN ADHESIVE TAPE ELECTRICAL P21 GLASS CLOTH / THERMOSETTING RUBBER RESIN ADHESIVE TAPE ELECTRICAL P212HD GLASS CLOTH / SILICONE ADHESIVE TAPE ELECTRICAL P213 GLASS CLOTH / THERMOSETTING ACRYLIC ADHESIVE TAPE ELECTRICAL P214 FLAME RETARDANT GLASS / FLAME RETARDANT ACRYLIC ADHESIVE TAPE ELECTRICAL P215 DOUBLE-COATED GLASS / SILICONE ADHESIVE TAPE ELECTRICAL P221 KAPTON FILM / SILICONE ADHESIVE TAPE ELECTRICAL P222 KAPTON FILM / SILICONE ADHESIVE TAPE ELECTRICAL P223 DOUBLE-FACE KAPTON FILM / SILICONE ADHESIVE / FABRIC LINER TAPE ELECTRICAL P224 KAPTON FILM / THERMOSETTING ACRYLIC ADHESIVE TAPE ELECTRICAL P231 POLYVINYL FLUORIDE / ACRYLIC ADHESIVE TAPE ELECTRICAL P232 POLYESTER FILM / SILICONE ADHESIVE TAPE ELECTRICAL P234 POLYPROPYLENE FILM / THERMOPLASTIC ACRYLIC ADHESIVE TAPE ELECTRICAL P235 POLYESTER FILM/PAPER / THERMOSETTING RUBBER RESIN ADHESIVE TAPE ELECTRICAL P236 POLYESTER FILM/PAPER / THERMOSETTING RUBBER RESIN ADHESIVE TAPE ELECTRICAL P24 ACETATE TAFFETA CLOTH / THERMOSETTING RUBBER RESIN ADHESIVE TAPE ELECTRICAL P242 ACETATE TAFFETA CLOTH / THERMOSETTING RUBBER RESIN ADHESIVE TAPE ELECTRICAL P243 POLYESTER FILM / THERMOSETTING RUBBER RESIN ADHESIVE TAPE ELECTRICAL P244 POLYESTER FILM/PAPER / RUBBER ADHESIVE TAPE ELECTRICAL P245 POLYESTER FILM/NON-WOVEN / THERMOSETTING RUBBER RESIN ADHESIVE
	TAPE ELECTRICAL P246 POLYESTER FILM/GLASS FILAMENT / THERMOSETTING RUBBER RESIN ADHESIVE
	TAPE ELECTRICAL P247 POLYESTER FILM/GLASS FILAMENT / THERMOSETTING ACRYLIC

MANUFACTURER	DESIGNATION
	ADHESIVE
PERMACEL / A NITTO DENKO COMPANY	TAPE ELECTRICAL P248 POLYESTER FILM/PAPER / THERMOSETTING RUBBER RESIN ADHESIVE TAPE ELECTRICAL P250 POLYESTER FILM / RUBBER ADHESIVE TAPE ELECTRICAL P252 POLYESTER FILM / THERMOSETTING RUBBER RESIN ADHESIVE TAPE ELECTRICAL P253 POLYESTER FILM / THERMOSETTING RUBBER RESIN ADHESIVE TAPE ELECTRICAL P254 POLYESTER FILM / THERMOSETTING RUBBER RESIN ADHESIVE TAPE ELECTRICAL P255 POLYESTER FILM / THERMOSETTING RUBBER RESIN ADHESIVE TAPE ELECTRICAL P256 POLYESTER FILM / THERMOSETTING RUBBER RESIN ADHESIVE TAPE ELECTRICAL P257 POLYESTER FILM DOUBLE-FACE / THERMOSETTING RUBBER RESIN ADHESIVE / PAPER LINER TAPE ELECTRICAL P258 PRINTABLE POLYESTER FILM / THERMOSETTING RUBBER RESIN ADHESIVE TAPE ELECTRICAL P259 PRINTABLE POLYESTER FILM / THERMOSETTING RUBBER RESIN ADHESIVE TAPE ELECTRICAL P262 FLATBACK NOMEX/NON-WOVEN / THERMOSETTING ACRYLIC ADHESIVE TAPE ELECTRICAL P263 CREPED NOMEX/NON-WOVEN / THERMOSETTING ACRYLIC ADHESIVE TAPE ELECTRICAL P2650 SELF-BONDING SILICONE RUBBER / NON-ADHESIVE-FUSIBLE TAPE ELECTRICAL P277 CREPED KRAFT PAPER / THERMOSETTING RUBBER RESIN ADHESIVE TAPE ELECTRICAL P278 HIGH-TENSILE KRAFT PAPER / ACRYLIC ADHESIVE TAPE ELECTRICAL P280 PRINTABLE POLYESTER FILM / THERMOSETTING ACRYLIC ADHESIVE TAPE ELECTRICAL P281 PRINTABLE POLYESTER FILM / THERMOSETTING ACRYLIC ADHESIVE TAPE ELECTRICAL P286 FLAME RETARDANT / POLYESTER FILM / THERMOSETTING ACRYLIC ADHESIVE TAPE ELECTRICAL P286HD FLAME RETARDANT / POLYESTER FILM / THERMOSETTING ACRYLIC ADHESIVE TAPE ELECTRICAL P29 PLUS VINYL / RUBBER RESIN ADHESIVE TAPE ELECTRICAL P29 VINYL PLASTIC / THERMOPLASTIC RUBBER RESIN ADHESIVE TAPE ELECTRICAL P30 VINYL / RUBBER PLUS ADHESIVE TAPE ELECTRICAL P30-105 VINYL / THERMOSETTING RUBBER ADHESIVE TAPE ELECTRICAL P310 VINYL / RUBBER PLUS ADHESIVE TAPE ELECTRICAL P421 TEFLON FILM / SILICONE ADHESIVE TAPE ELECTRICAL P422 TEFLON FILM / SILICONE ADHESIVE TAPE ELECTRICAL P423 BONDABLE TEFLON FILM / SILICONE ADHESIVE TAPE ELECTRICAL P424 TEFLON FILM / SILICONE ADHESIVE TAPE ELECTRICAL P427 TEFLON FILM / SILICONE ADHESIVE TAPE ELECTRICAL P430 TEFLON FILM / THERMOSETTING ACRYLIC ADHESIVE TAPE ELECTRICAL P440 TEFLON COATED GLASS CLOTH / SILICONE ADHESIVE TAPE ELECTRICAL P621 GLASS CLOTH / SYNTHETIC RUBBER RESIN ADHESIVE TAPE ELECTRONIC MASKING P361X HYDRO-TECH POLYVINYL ALCOHOL FILM / WATER SOLUBLE ADHESIVE TAPE ELECTRONIC P325 POLYESTER FILM / CURED RUBBER ADHESIVE TAPE ELECTRONIC P345 POLYESTER FILM / CURED RUBBER ADHESIVE TAPE ELECTRONIC P355 POLYESTER FILM / SILICONE BLENDED ADHESIVE TAPE ELECTRONIC P365 POLYESTER FILM / SILICONE-FREE ADHESIVE TAPE ELECTRONIC SOLDER-MASK IMPREGNATED CREPE PAPER / SILICONE ADHESIVE TAPE EMI/RFI SHIELDING P111 ALUMINUM FOIL / ACRYLIC ADHESIVE TAPE EMI/RFI SHIELDING P389 COPPER FOIL / THERMOSETTING ACRYLIC ADHESIVE TAPE EMI/RFI SHIELDING P391 COPPER FOIL / ACRYLIC ADHESIVE TAPE FILM P2500 POLYESTER FILM DOUBLE FACED / SYNTHETIC RUBBER ADHES / ACRYLIC ADHES / LINER SIDE

MANUFACTURER	DESIGNATION
PERMACEL / A NITTO DENKO COMPANY	TAPE GAFFERS VINYL-COATED COTTON CLOTH / SYNTHETIC RUBBER RESIN ADHESIVE TAPE GRAPHIC/ART P993 MATTE ACETATE FILM/IMPREGNATED FIBRE / SYNTHETIC RUBBER RESIN ADHESIVE TAPE GRAPHIC/ART P997 POLYESTER FILM/IMPREGNATED FIBRE / SYNTHETIC RUBBER RESIN ADHESIVE TAPE LABEL PROTECTION P911 POLYPROPYLENE FILM / ACRYLIC ADHESIVE TAPE MARKING " SAFETY STRIPES " VINYL FILM / NATURAL RUBBER RESIN ADHESIVE TAPE MARKING P32 VINYL FILM / NATURAL RUBBER RESIN ADHESIVE TAPE MASKING P70 IMPREGNATED PAPER / SYNTHETIC RUBBER RESIN ADHESIVE TAPE MASKING P703 IMPREGNATED CREPE KRAFT PAPER / NATURAL RUBBER RESIN ADHESIVE TAPE MASKING P705 IMPREGNATED PAPER / NATURAL RUBBER RESIN ADHESIVE TAPE MASKING P72 FLAT KRAFT IMPREGNATED PAPER / SYNTHETIC RUBBER RESIN ADHESIVE TAPE MASKING P733 IMPREGNATED PAPER / NATURAL RUBBER RESIN ADHESIVE TAPE MASKING P743 IMPREGNATED PAPER / SYNTHETIC RUBBER ADHESIVE TAPE MASKING P771 IMPREGNATED SMOOTH CREPE PAPER / NATURAL RUBBER RESIN ADHESIVE TAPE MASKING P781 IMPREGNATED SMOOTH CREPE PAPER / NATURAL RUBBER RESIN ADHESIVE TAPE MASKING P787 IMPREGNATED SMOOTH CREPE PAPER / SYNTHETIC RUBBER RESIN ADHESIVE TAPE MASKING P791 IMPREGNATED PAPER / SYNTHETIC RUBBER RESIN ADHESIVE TAPE MENDING ACCUCLEAR TM MATTE ACETATE FILM / ACRYLIC ADHESIVE TAPE MOUNTING P50 COTTON CLOTH DOUBLE FACED / NATURAL RUBBER RESIN ADHESIVE / SILICONED PAPER LINER TAPE P07L DEAD SOFT ALUMINUM FOIL / SILICONE ADHESIVE / W/LINER TAPE P11 AND P11L DEAD SOFT ALUMINUM FOIL / ACRYLIC ADHESIVE / WITH OR WITHOUT LINER TAPE P12 AND P12L ALUMINUM FOIL/WOVEN CLOTH / SYNTHETIC RUBBER RESIN ADHESIVE / WITH/WITHOUT LINER TAPE PACKAGING P17 FLAT KRAFT IMPREGNATED PAPER / SYNTHETIC RUBBER RESIN ADHESIVE TAPE PACKAGING P71 FLATBACK PAPER / SYNTHETIC RUBBER RESIN ADHESIVE TAPE PACKAGING P99 POLYESTER FILM/PAPER FIBRE / SYNTHETIC RUBBER RESIN ADHESIVE TAPE PACKAGING/MASKING P786 IMPREGNATED CREPE KRAFT PAPER / SYNTHETIC RUBBER RESIN ADHESIVE TAPE PIPE WRAP P306 AND P306L VINYL FILM / NATURAL RUBBER ADHESIVE / WITH AND WITHOUT LINER TAPE PLASMA MASKING P10 ALUMINUM FOIL LAMINATED TO GLASS CLOTH / SILICONE ADHESIVE TAPE PRINTABLE P724 IMPREGNATED KRAFT PAPER / SYNTHETIC RUBBER RESIN ADHESIVE TAPE PRINTABLE P726 HIGH-STRENGTH COLOR IMPREGNATED ROPE PAPER / SYNTHETIC RUBBER RESIN ADHESIVE TAPE REINFORCED P166 POLYESTER FILM MONOFILAMENT GLASS / NATURAL RUBBER RESIN ADHESIVE TAPE REINFORCED STRAPPING P162 POLYESTER FILM MONOFILAMENT GLASS / SYNTHETIC RUBBER RESIN ADHES TAPE REINFORCED STRAPPING P167 POLYESTER FILM MONOFILAMENT GLASS / SYNTHETIC

MANUFACTURER	DESIGNATION
	RUBBER RESIN ADHES
PERMACEL / A NITTO DENKO COMPANY	TAPE REINFORCED STRAPPING P169 POLYESTER FILM MONOFILAMENT GLASS / SYNTHETIC RUBBER RESIN ADHES
	TAPE REINFORCED STRAPPING P172 GLASS / PERMA-TAC ADHESIVE
	TAPE SPLICING P03 PLUS TISSUE DOUBLE FACED / WATER SOLUBLE SYNTHETIC ADHESIVE / SILICONED LINER
	TAPE SPLICING P035 60 LB. COATED KRAFT RELEASE PAPER / WATER SOLUBLE ACRYLIC ADHESIVE
	TAPE SPLICING P05 IMPREGNATED CREPE PAPER DOUBLE FACED / SYNTHETIC RUBBER ADHESIVE / LINER
	TAPE SPLICING P051 TISSUE PAPER DOUBLE FACED / ACRYLIC ADHESIVE / EASY-TO-RELEASE LINER
	TAPE SPLICING P052 TISSUE PAPER DOUBLE FACED / SYNTHETIC RUBBER RESIN ADHESIVE / SILICONED LINER
	TAPE SPLICING P55 COTTON CLOTH DOUBLE FACED / RUBBER RESIN ADHESIVE / SILICONED LINER
	TAPE SPLICING P904 HD POLYESTER FILM / SILICONE ADHESIVE
	TAPE SPLICING P904 POLYESTER FILM / SILICONE ADHESIVE
	TAPE SPLICING P905 POLYESTER FILM DOUBLE FACED / SILICONE ADHESIVE / RELEASE CLOTH LINER
	TAPE SPLICING P921 POLYESTER FILM / CURED NATURAL RUBBER RESIN ADHESIVE
	TAPE SPLICING P941 POLYESTER FILM DOUBLE FACED / NATURAL RUBBER RESIN ADHESIVE / SILICONED LINER
	TAPE SPLICING/MOUNTING P02 FLAT KRAFT PAPER DOUBLE FACED / SYNTHETIC RUBBER RESIN ADHESIVE / LINER
	TAPE STRAPPING P170 POLYESTER FILM GLASS REINFORCED / SYNTHETIC RUBBER RESIN ADHESIVE
	TAPE STRIPPING/PLATING SUPERPLATE STOP / POLYESTER FILM / SILICONE ADHESIVE
	TAPE SUPER CLEAR J-LAR BIAXIALLY-ORIENTED POLYPROPYLENE FILM / ACRYLIC ADHESIVE
	TAPE TEXTILE P77 FLAT KRAFT IMPREGNATED PAPER / ACRYLIC ADHESIVE
	TAPE TRANSPARENT P404 TRANSPARENT CLEAR FILM / SYNTHETIC RUBBER RESIN ADHESIVE
	TAPE TRANSPARENT VINYL P402 UNPLASTICIZED POLYVINYLCHLORIDE FILM / SYNTHETIC RUBBER RESIN ADHESIVE
	TAPE ELECTRICAL P205 PRINTABLE POLYESTER FILM / THERMOSETTING RUBBER RESIN ADHESIVE
	TAPE ELECTRICAL P206 PRINTABLE POLYESTER FILM / THERMOSETTING RUBBER RESIN ADHESIVE
	TAPE ELECTRICAL P211 SILICONE RESIN-COATED GLASS CLOTH / SILICONE ADHESIVE
	TAPE ELECTRICAL P212 GLASS CLOTH / SILICONE ADHESIVE
	TAPE ELECTRICAL P216 VINYL COATED COTTON CLOTH / SYNTHETIC RUBBER RESIN ADHESIVE
	TAPE ELECTRICAL P249 POLYESTER FILM / GLASS FILAMENT / RUBBER ADHESIVE
	TAPE ELECTRICAL P295 VINYL PLASTIC / THERMOPLASTIC RUBBER RESIN ADHESIVE

NON-METALLIC PROPERTIES - MECHANICAL PROPERTIES DATA ENTRY SCREEN

Sequence: _____ Matcd: _____ Data Source #: _____ Cure #: ____

Property: _____ Operator: ___ Value: _____ Unit: _____

Prop Code: _____

Temp. Min: _____ Temp. Max: _____ Unit: _

Time: _____ Unit: _____ RH Pct: _____

Thickness: _____ Unit: _____ Substrate: _____

App. Load: _____ Unit: _____ Direction: ___

Test Mthd: _____ Deflection: _____ Pct

Test Spec: _____

Comment #: _____
Comment: _____

Count: *0 <Replace>

NON-METALLIC PROPERTIES - WEAR PROPERTIES DATA ENTRY SCREEN

Sequence: _____ Matcd: _____ Data Source #: _____ Cure #: ____

Property: _____ Operator: ___ Value: _____ Unit: _____

Temp. Min: _____ Temp. Max: _____ Unit: _

Time: _____ Unit: _____

RH Pct: _____

App. Load: _____ Unit: _____ Cycles: _____

Test Mthd: _____

Abrasive: _____

Test Spec: _____

Comment #: _____

Comment: _____

Count: *0 <Replace>

NON-METALLIC PROPERTIES - STRESS CRACKING PROPERTIES DATA ENTRY SCREEN

Sequence: _____ Matcd: _____ Data Source #: _____

Property: STRESS_CRACKING__ Operator: ___ Value: _____ Unit: _____

Temp. Min: _____ Temp. Max: _____ Unit: _

Time: _____ Unit: _____

RH Pct: _____ Limit Strain: _____ Pct Direction: ___

Media: _____

Test Method: _____

Test Spec: _____

Comment #: _____

Comment: _____

Count: *0 <Replace>

NON-METALLIC PROPERTIES - FRICTION PROPERTIES DATA ENTRY SCREEN

Sequence: _____ Matcd: _____ Data Source #: _____ Cure #: ____

Property: COEF_OF_FRICTION_ Operator: ___ Value: _____ Unit: _____

Temp. Min: _____ Temp. Max: _____ Unit: _

Time: _____ Unit: _____

RH Pct: _____

Pressure: _____ Unit: _____

Rate: _____ Unit: _____

Test Mthd: _____

Res. Mtrl: _____

Comment #: _____
Comment: _____

Count: *0 <Replace>

NON-METALLIC PROPERTIES - TEMPERATURE PROPERTIES DATA ENTRY SCREEN

Sequence: _____ Matcd: _____ Data Source #: _____ Cure #: ____

Property: _____ Operator: ___ Value: _____ Unit: _____

Amount of Deflection: _____ Unit: _____

RH Pct: _____

Applied Load: _____ Unit: _____

Test Mthd: _____

Test Spec: _____

Comment #: _____

Comment: _____

Count: *0 <Replace>

NON-METALLIC PROPERTIES - OPTICAL PROPERTIES DATA ENTRY SCREEN

Sequence: _____ Matcd: _____ Data Source #: _____ Cure #:

Property: _____ Operator: ___ Value: _____ Unit: _____

Temp. Min: _____ Temp. Max: _____ Unit: _

Wave Length: _____ Units: _____

Angle of Incidence: ___ Polar: _ (S, P)

Radiation Source: _____ Color of Material: _____

Test Spec: _____

Comment #: _____
Comment: _____

Count: *0 <Replace>

NON-METALLIC PROPERTIES - CREEP PROPERTIES DATA ENTRY SCREEN

Sequence: _____ Matcd: _____ Data Source #: _____ Cure #: ____

Property: _____ Operator: ___ Value: _____ Unit: _____

Temp. Min: _____ Temp. Max: _____ Unit: _

Time: _____ Unit: _____

RH Pct: _____

Thickness: _____ Unit: _____

Creep Pct: _____ Rup: _ (Y,N) Direction: ___

Test Mthd: _____

Test Spec: _____

Comment #: _____

Comment: _____

Count: *0 <Replace>

NON-METALLIC PROPERTIES - IMPACT PROPERTIES DATA ENTRY SCREEN

Sequence: _____ Matcd: _____ Data Source #: _____ Cure #: ____

Property: _____ Operator: ___ Value: _____ Unit: _____

Temp. Min: _____ Temp. Max: _____ Unit: _

Width: _____ Unit: _____

RH Pct: _____

Specimen Type: _____ Direction: ___

Test Mthd: _____

Test Spec: _____

Comment #: _____

Comment: _____

Count: *0 <Replace>

MANUFACTURER	DESIGNATION
POLYKEN TECHNOLOGIES / DIVISION OF KENDALL CO.	TAPE DUCT POLYKEN 234A POLYETHYLENE BACKED COTTON CLOTH / PRESSURE SENSITIVE ADHESIVE
SAUNDERS	TAPE S-111 FEP FILM TAPE S-12-2C 2 SIDES ETCHED SKIVED TFE TAPE S-12-C 1 SIDE ETCHED SKIVED TFE TAPE S-161 PFA FILM TAPE S-980 POLYOLEFIN TAPE S-985 POLYOLEFIN / SYNTHETIC VINYL BASED ADHESIVE TAPE S-990 POLYOLEFIN / SYNTHETIC VINYL BASED ADHESIVE TAPE S47 KAPTON POLYIMIDE FILM TAPE THERMOSEAL S12 SKIVED TFE TEFLON / NON-ADHESIVE
SHELDAHL	T-1502 TAPE G143900 VACUUM DEPOSITED GOLD ON TFE TEFLON COATED GLASS WITH 3M 5451 SILICONE PS ADHESIVE TAPE G143902 TAPE G148000 VACUUM DEPOSITED ALUMINUM WITH 0.5 MIL KAPTON WITH 3P ADHESIVE TAPE G148020 TAPE G400100 2MIL TYPE A FEP TEFLON VACUUM DEPOSITED SILVER AND INCONEL 966 ACRYLIC ADHESIVE TAPE G400200 2 MIL TYPE A FEP TEFLON VACUUM DEPOSITED ALUMINUM 966 ACRYLIC ADHESIVE TAPE G400300 2.0 MIL TYPE A FEP TEFLON VACUUM DEPOSITED SILVER VACUUM DEPOSITED INCONEL TAPE G400600 .5 MIL TYPE A FEP TEFLON VACUUM DEPOSITED SILVER AND INCONEL 966 ACRYLIC ADHESIVE TAPE G400800 5 MIL TYPE A FEP TEFLON VACUUM DEPOSITED ALUMINUM 966 ACRYLIC ADHESIVE TAPE G401000 VACUUM DEPOSITED ALUMINUM ON 1 MIL KAPTON WITH 966 ACRYLIC PS ADHESIVE TAPE G401100 1MIL KAPTON WTIH 966 ACRYLIC PS ADHESIVE TAPE G401900 5 MIL TYPE A FEP TEFLON VACUUM DEPOSITED SILVER AND INCONEL 966 ACRYLIC ADHESIVE TAPE G401902 TAPE G402410 VACUUM DEPOSITED ALUMINUM WITH 1.0 MIL KAPTON WITH VACUUM DEPOSITED ALUMINUM TAPE G402500 1MIL TYPE A FEP TEFLON VACUUM DEPOSITED SILVER AND INCONEL 966 ACRYLIC ADHESIVE TAPE G402600 VACUUM DEPOSITED GOLD ON 1MIL KAPTON W/MYSTIC 7361 SILICONE PS ADHESIVE TAPE G402800 .5 MIL TYPE A FEP TEFLON VACUUM DEPOSITED ALUMINUM 966 ACRYLIC ADHESIVE TAPE G402900 1MIL TYPE A FEP TEFLON VACUUM DEPOSITED ALUMINUM 966 ACRYLIC

NON-METALLIC PROPERTIES - MAGNETIC PROPERTIES DATA ENTRY SCREEN

Sequence: _____ Matcd: _____ Data Source #: _____

Property: _____ Operator: ___ Value: _____ Unit: _____

Prop Code: _____

Temp. Min: _____ Temp. Max: _____ Unit: _

Field Strength: _____ Unit: _____

Test Mthd: _____

Test Spec: _____

Comment #: _____

Comment: _____

Count: *0 <Replace>

========= NON-METALLIC PROPERTIES: - PROPERTY COMMENT TABLE =========

The property comment table is intended to contain distinct comments from the property tables using the comment number as the key to join the tables. Changes made in this screen will also be reflected in ALL property tables containing the coresponding comment number.

Comm #:	Comments:

Count: *0 <Replace>

NON-METALLIC PROPERTIES - RESISTANCE CHARACTERISTICS DATA ENTRY SCREEN

Sequence: _____ Matcd: _____ Data Source #: _____

Property: _____ Operator: ___ Value: _____ Unit: _____

Temp. Min: _____ Temp. Max: _____ Unit: _ RH Pct: _____

Time: _____ Unit: _____

Pressure: _____ Unit: _____

Medium: _____

Observation: _____

Test Mthd: _____

Test Spec: _____

Comment #: _____

Comment: _____

Count: *0 <Replace>

NON-METALLIC PROPERTIES: - RESISTANCE CHARACTERISTICS COMMENT TABLE

The resistance characteristics comment table is intended to contain distinct comments from the resistance characteristics table using the comment number to join the tables. Changes made in this screen will also be reflected in the resistance characteristics table containing the coresponding comment number.

Comm #:	Comments:

Count: *0 <Replace>

NON-METALLIC MATERIAL PROPERTIES - CURE ENTRY/UPDATE FORM

Sequence: _____ Matcd: _____ Data Source #: _____ Cure #: __

Ph __ Blends 1)_____ 2)_____
3)_____ 4)_____

W/V/B: _____ Time: _____hr Temp: _____f Pressure:_____psia

Comm #: _____
Comment: _____

Sequence: _____ Matcd: _____ Data Source #: _____ Cure #: __

Ph __ Blends 1)_____ 2)_____
3)_____ 4)_____

W/V/B: _____ Time: _____hr Temp: _____f Pressure:_____psia

Comm #: _____
Comment: _____

Count: *0 <Replace>

========= NON-METALLIC PROPERTIES: - CURE COMMENT TABLE =========

The cure comment table is intended to contain distinct comments from the cure table using the comment number as the key to join the tables. Changes made in this screen will also be reflected in the cure table containing the coresponding comment number.

Comm #: Comments:

Count: *0 <Replace>

======== NON-METALLIC PROPERTIES DATA SOURCES ========

DATA SOURCE # _____

DATA SOURCE _____

DOCUMENT ID _____

DOCUMENT DATE _____

COMMENTS _____

Enter a query; press KP-, to execute, PF4 to cancel.
Count: *0 ENTER QUERY <Replace>

NON-METALLIC MATERIALS PROPERTIES - COMPOSITION BREAKDOWN ENTRY/UPDATE FORM

Sequence: _____ Matcd: _____ Data Source #: _____ Cure #: _____

Part Description: _____

Generic Type: _____

Form: _____

Parts By Weight: _____ Parts By Volume: _____

Thickness: _____ Unit: _____

Filler: _____ Pct

Composition: _____ Pct

Count: *0 <Replace>

NON-METALLIC MATERIALS PROPERTY UNIT CONVERSIONS

Description	Property Name	Pre-Unit	Oper.	Factor	Post-Unit	Comments

Enter_Property_Description.____Valid_values_are_PROPERTY_or_RES_CHAR._____
Count: *0 <Replace>

MAPTIS NON-METALLIC PROPERTIES GENERAL ENTRY/UPDATE FORM

Sequence #: _____ Matcd: _____ Generic ID: _____ Data Srce: _____
Use Type: _____
Use Temperature - Min: _____f Max: _____f
Designation: _____
Composition: _____
Proc Method: _____
Color Cured: _____
Comments: _____

Specification: _____ Data Srce: _____

Manufacturer/Supplier (M/S): _
Name: _____
Division: _____
Addr1: _____ Addr2: _____
City: _____ State: __ Zip: _____
Country: _____ Phone: _____

Count: *0 <Replace>

NON-METALLIC PROPERTIES GENERAL MATERIAL COMMENTS ENTRY/UPDATE FORM

Sequence: _____ Matcd: _____ Data Srce: _____

Property Name: _____
Seq: _____
Comment: _____

Sequence: _____ Matcd: _____ Data Srce: _____

Property Name: _____
Seq: _____
Comment: _____

Sequence: _____ Matcd: _____ Data Srce: _____

Property Name: _____
Seq: _____
Comment: _____

Count: *0 <Replace>

TASK 2

Standards Data Base

Task requirement was to modify existing Standards Data Base to include a user's manual, report formats, additions of other specifications, etc.

Accomplishment include development of a user's manual that describes methodology and procedures for accessing the data. Specifications and Standards for the Air Force, Lewis Research Center (LeRC), Goddard Space Flight Center (GSFC) and Space Station have been input into the MAPTIS system.

The master table was modified to display Document Major Category, Document Discipline, Document Secondary Category as well as codes for each. A User's Table was created to display Document Users. Document User's List was reduced to Johnson Space Center (JSC), Marshall Space Flight Center (MSFC), Kennedy Space Center (KSC) and Lewis Research Center (LeRC).

All appropriate changes to the entry/update screen, search criteria, help screens and report formats were included in the data base.

The finalize data screens are attached.

STANDARDS DATABASE

DOCUMENT AND REVISION NUMBERS | DEL | REV. DATE | DOCUMENT TYPE | FSC | CUSTODIAN | MET

CODE 1ST MAJOR CATEGORY | CODE DISCIPLINE | CODE 2ND MAJOR CATEGORY

TITLE:

+---- USERS ----+

+---------------+

ABSTRACT

ENTER_DOCUMENT_AND_REVISION_NUMBERS_IN_THIS_FIELD

Count: *0 <Replace>

TASK 3

Provide Research to Update Data in MAPTIS

Sub-Task 1 - Minimum and Maximum Operating Temperature.

Manufacturer's product literature for all Selection List Nonmetallic materials was reviewed. All information relating to minimum and maximum operating temperature was identified and input on-line into the Selection List Data Base. As new materials are included into the data base, the minimum and maximum operating temperatures are included if that information is available. However, many manufacturers do not supply this information.

A report on minimum and maximum operating temperatures that was submitted to NASA by another contractor(Grumman) was reviewed. Any product data (not found in Selection List) referenced in that report was included in the data base. In those cases where both sources had data but the data did not correspond, additional research was performed to validate the data. Data was submitted from other shuttle contractors. This data was specific to their specific projects and was included where possible.

Of the 23,689 material codes in the Selection List Data Base, minimum and maximum temperatures have been identified for 9431 of them.

Sub-Task 2 - Directory Data Sheets

On-line entry was determined to be more efficient both with speed and accuracy. Therefore, on-line data entry screens were developed for all the data bases. BAMSI provided personnel capable of providing instructions and training to any one requiring assistance. All hardware was provided by NASA.

TASK 4

Metallic Materials Data Bases

BAMSI was tasked to develop properties databases Nonferrous and ferrous alloys. BAMSI personnel used to develop these databases was a metallurgist, computer programmer and two data analyst.

Source material was Aerospace Structural Metals Handbook and Mil-HDBK-5. The format and procedures developed by BAMSI on contract NAS 8-36360 was used for these databases.

Properties data bases were developed for Nickel, Cobalt, Titanium and Magnesium. All source material was evaluated to obtain mechanical, magnetic, physical, stress, electrical and H_2 properties.

A list is attached of all properties reported to the specific alloys. A copy of the on-line data entry screens are also attached.

NICKEL ALLOYS - 40

H2 PROPERTIES

PROPERTY_NAME	COUNT(*)
ELONGATION IN OTHER GAS	9
H2 ELONGATION	10
H2 REDUCTION OF AREA	10
H2 TENSILE STRENGTH	41
H2 TENSILE YIELD	7
RATIO	12
REDUCTION OF AREA IN OTHER GAS	10
TENSILE STRENGTH IN OTHER GAS	43
TENSILE YIELD IN OTHER GAS	5
sum	147

9 rows selected.

MAGNETIC PROPERTIES

PROPERTY_NAME	COUNT(*)
COERCIVE FORCE	4
CURIE TEMPERATURE	5
PERMEABILITY	20
RESIDUAL INDUCTION	4
SATURATION INDUCTION	1
sum	34

MECHANICAL PROPERTIES

PROPERTY_NAME	COUNT(*)
BEARING ULTIMATE STRENGTH - DRY PIN VALUES	95
BEARING YIELD STRENGTH - DRY PIN VALUES	92
BEND RADIUS - 180 DEG	20
COMPRESSIVE ELASTIC MODULUS	71
COMPRESSIVE YIELD STRENGTH	99
CREEP RUPTURE	518
CREEP STRENGTH	18
ELONGATION	1183
FATIGUE STRENGTH	121
HARDNESS - BRINELL	119
HARDNESS - BRINELL - 3000 KG LOAD	36
HARDNESS - ROCKWELL - A	3
HARDNESS - ROCKWELL - B	86
HARDNESS - ROCKWELL - C	225
HARDNESS - VICKERS	12
IMPACT - CHAPRY V-NOTCH	22
IMPACT - CHARPY KEYHOLE	17
IMPACT - CHARPY U-NOTCH	4
IMPACT - CHARPY V-NOTCH	115
IMPACT - IZOD	4
IMPACT - KEYHOLE NOTCH	5
PLANE - STRAIN FRACTURE TOUGHNESS	33
REDUCTION OF AREA	516
SHEAR RIGIDITY MODULUS	73
SHEAR STRENGTH	104

TENSILE ELASTIC MODULUS	90
TENSILE YIELD STRENGTH	1236
ULTIMATE TENSILE STRENGTH	1756
sum	6673

28 rows selected.

PHYSICAL PROPERTIES

PROPERTY_NAME	COUNT(*)
ELEC COND - IACS %(VOL)	38
ELECTRICAL RESISTIVITY	48
LIMIT SERVICE TEMP - DEG F	4
SPECIFIC HEAT	6
THERMAL CONDUCTIVITY	2
THERMAL EXPANSION COEFFICIENT	3
sum	101

6 rows selected.

STRESS PROPERTIES

PROPERTY_NAME	COUNT(*)
CORROSION RATE	142
DEPTH OF PITTING	42
STRESS CORROSION THRESHOLD	16
sum	200

****

TITANIUM ALLOYS - 21

H2 PROPERTIES

MAGNETIC PROPERTIES

PROPERTY_NAME	COUNT(*)
PERMEABILITY	6

MECHANICAL PROPERTIES

PROPERTY_NAME	COUNT(*)
BEARING ULTIMATE STRENGTH - DRY PIN VALUES	286
BEARING YIELD STRENGTH - DRY PIN VALUES	254
BEND RADIUS	63
BEND RADIUS - 105 DEG	40
COMPRESSIVE ELASTIC MODULUS	105
COMPRESSIVE YIELD STRENGTH	344
CREEP RUPTURE	320
CREEP STRENGTH	600
ELONGATION	3133
FATIGUE STRENGTH	521
HARDNESS - BRINELL	8
HARDNESS - BRINELL - 3000 KG LOAD	3
HARDNESS - ROCKWELL - B	4
HARDNESS - ROCKWELL - C	85
IMPACT - CHAPRY V-NOTCH	13
IMPACT - CHARPY - V	33
IMPACT - CHARPY - V - NOTCH	155
IMPACT - CHARPY V	5
IMPACT - CHARPY-V	74
IMPACT - CHARPY-V NOTCH	18
IMPACT - DROP WEIGHT	42
PLANE - STRAIN FRACTURE TOUGHNESS	150
REDUCTION OF AREA	2179
SHEAR RIGIDITY MODULUS	68
SHEAR STRENGTH	162
TENSILE ELASTIC MODULUS	356
TENSILE YIELD STRENGTH	3412
ULTIMATE TENSILE STRENGTH	3441
sum	15874

28 rows selected.

PHYSICAL PROPERTIES

PROPERTY_NAME	COUNT(*)
ELECTRICAL RESISTIVITY	2
SPECIFIC HEAT	2
THERMAL CONDUCTIVITY	2
THERMAL EXPANSION COEFFICIENT	2
sum	8

STRESS PROPERTIES

PROPERTY_NAME	COUNT(*)
RROSION RATE	28
FTU % CHANGE - CORROSION	12
FTU CHANGE - STRESS CORROSION	36
FTY % CHANGE - CORROSION	1
FTY CHANGE - STRESS CORROSION	17
RESIDUAL ELONGATION - STRESS CORROSION	36
STRESS CORROSION THRESHOLD	28
sum	158

7 rows selected.

****

MAGNESIUM ALLOYS - 22

H2 PROPERTIES

MAGNETIC PROPERTIES

0

MECHANICAL PROPERTIES

PROPERTY_NAME	COUNT(*)
BEARING ULTIMATE STRENGTH - DRY PIN VALUES	218
BEARING YIELD STRENGTH - DRY PIN VALUES	221
BEND RADIUS	5
COMPRESSIVE ELASTIC MODULUS	103
COMPRESSIVE YIELD STRENGTH	402
CREEP RUPTURE	29
CREEP STRENGTH	93
ELONGATION	541
FATIGUE STRENGTH	254
HARDNESS - BRINELL	30
HARDNESS - BRINELL - 1000 KG LOAD, 10 MM BALL	12
HARDNESS - BRINELL - 1000 KG LOAD, 9/16 IN BALL	10
HARDNESS - BRINELL - 500 KG LOAD, 10 MM BALL	38
HARDNESS - ROCKWELL - E	36
IMPACT - CHARPY - UNNOTCHED	3
IMPACT - CHARPY KEYHOLE NOTCH	5
IMPACT - CHARPY UNNOTCHED	3
IMPACT - CHARPY V - NOTCH	5
IMPACT - IZOD	1
SHEAR RIGIDITY MODULUS	109
SHEAR STRENGTH	154
TENSILE ELASTIC MODULUS	111
TENSILE YIELD STRENGTH	647
ULTIMATE TENSILE STRENGTH	646
sum	3676

24 rows selected.

PHYSICAL PROPERTIES

PROPERTY_NAME	COUNT(*)
ELEC COND - IACS %(VOL)	58
ELECTRICAL RESISTIVITY	107
SPECIFIC HEAT	30
THERMAL CONDUCTIVITY	65
THERMAL EXPANSION COEFFICIENT	38
sum	298

STRESS PROPERTIES

PROPERTY_NAME	COUNT(*)

ELONGATION % CHANGE - CORROSION	5
FTU % CHANGE - CORROSION	5
sum	10

****

ALUMINUM - 137 ALLOYS

H2 PROPERTIES

PROPERTY_NAME	COUNT(*)
ELONGATION IN OTHER GAS	2
H2 ELONGATION	1
H2 REDUCTION OF AREA	2
H2 TENSILE STRENGTH	1
H2 TENSILE YIELD	1
REDUCTION OF AREA IN OTHER GAS	4
TENSILE STRENGTH IN OTHER GAS	4
TENSILE YIELD IN OTHER GAS	3
sum	18

8 rows selected.

MAGNETIC PROPERTIES

0

MECHANICAL PROPERTIES

PROPERTY_NAME	COUNT(*)
BEARING ULTIMATE STRENGTH - DRY PIN VALUES	3370
BEARING YIELD STRENGTH - DRY PIN VALUES	3221
BEND RADIUS - 90 DEG	615
COMPRESSIVE ELASTIC MODULUS	656
COMPRESSIVE YIELD STRENGTH	3184
CREEP RUPTURE	123
CREEP STRENGTH	469
ELONGATION	5018
FATIGUE STRENGTH	123
FATIGUE STRENGTH - AXIAL	18
FATIGUE STRENGTH - DIRECT STRESS	54
FATIGUE STRENGTH - REPEAT FLEXURE	20
FATIGUE STRENGTH - REVERSE BEND	6
FATIGUE STRENGTH - ROTATING BEAM	278
HARDNESS - BRINELL - 500 KG LOAD, 10 MM BALL - 65 - AVG	1
HARDNESS - BRINELL - 500KG LOAD, 10MM BALL	206
HARDNESS - BRINELL - 500KG LOAD, 10MM BALL, 30 SECONDS	5
HARDNESS - DPH - 100 GM LOAD	2
HARDNESS - ROCKWELL - B	41
HARDNESS - ROCKWELL - B SCALE	2
HARDNESS - ROCKWELL - E	21
HARDNESS - ROCKWELL - E SCALE	2
HARDNESS - VICKERS	8
IMPACT	58
IMPACT - 90 NOTCH SPECIMEN	2
IMPACT - CHARPY - V-NOTCH	16
IMPACT - CHARPY V-NOTCH	15
IMPACT - KEYHOLE SPECIMEN	2
IMPACT - UNNOTCHED SPECIMEN	2
PLANE - STRAIN FRACTURE TOUGHNESS	683
REDUCTION OF AREA	291
SHEAR RIGIDITY MODULUS	561
SHEAR STRENGTH	2020

TENSILE ELASTIC MODULUS	855
TENSILE YIELD STRENGTH	6534
ULTIMATE TENSILE STRENGTH	7342
sum	35824

36 rows selected.

PHYSICAL PROPERTIES

PROPERTY_NAME	COUNT(*)
ELEC COND - IACS %(VOL)	152
ELEC COND - IACS %(WT)	8
ELECTRICAL RESISTIVITY	177
OPTICAL - EMISSIVITY	8
SPECIFIC HEAT	38
THERMAL CONDUCTIVITY	191
THERMAL EXPANSION COEFFICIENT	230
sum	804

7 rows selected.

STRESS PROPERTIES

PROPERTY_NAME	COUNT(*)
CORROSION RATE	133
DEPTH OF PITTING	66
ELONGATION % CHANGE - CORROSION	29
FTU % CHANGE - CORROSION	27
FTU CHANGE - STRESS CORROSION	45
FTY % CHANGE - CORROSION	17
RESIDUAL ELONGATION - STRESS CORROSION	43
STRESS CORROSION THRESHOLD	257
sum	617

8 rows selected.

****

STEEL ALLOYS - 99

H2 PROPERTIES

PROPERTY_NAME	COUNT(*)
ELONGATION IN OTHER GAS	20
H2 ELONGATION	12
H2 REDUCTION OF AREA	20
H2 TENSILE STRENGTH	8
H2 TENSILE STRENGTH - NOTCHED	8
H2 TENSILE STRENGTH - UNNOTCHED	4
H2 TENSILE YIELD	5
REDUCTION OF AREA IN OTHER GAS	36
TENSILE STRENGTH IN OTHER GAS	3
TENSILE STRENGTH IN OTHER GAS - NOTCHED	16
TENSILE STRENGTH IN OTHER GAS - UNNOTCHED	17
TENSILE YIELD IN OTHER GAS	7
sum	156

12 rows selected.

MAGNETIC PROPERTIES

PROPERTY_NAME	COUNT(*)
COERCIVE FORCE	12
COERCIVITY	1
CURIE TEMPERATURE	1
INDUCTION	11
INITIAL PERMEABILITY	4
MAXIMUM PERMEABILITY	42
PERMEABILITY	143
RESIDUAL ELONGATION	1
RESIDUAL INDUCTION	8
RETENTIVITY	1
SATURATION INDUCTION	13
sum	237

11 rows selected.

MECHANICAL PROPERTIES

PROPERTY_NAME	COUNT(*)
BEARING ULTIMATE STRENGTH - DRY PIN VALUES	693
BEARING YIELD STRENGTH - DRY PIN VALUES	685
BEND RADIUS	13
BEND RADIUS - 110 DEG	1
BEND RADIUS - 135 DEG	11
BEND RADIUS - 140 DEG	1
BEND RADIUS - 180 DEG	26
BEND RADIUS - 90 DEG	11
COMPRESSIVE ELASTIC MODULUS	327
COMPRESSIVE YIELD STRENGTH	523
CREEP RUPTURE	238
CREEP STRENGTH	243
ELONGATION	3637
FATIGUE STRENGTH	141

FATIGUE STRENGTH - AXIAL LOAD	365
FATIGUE STRENGTH - CANTILEVER BEAM	10
FATIGUE STRENGTH - DIRECT STRESS	36
FATIGUE STRENGTH - FLEXURE	74
FATIGUE STRENGTH - REVERSE BEND	38
FATIGUE STRENGTH - REVERSE BENDING (RAYFLEX)	4
FATIGUE STRENGTH - ROTAING BEAM	4
FATIGUE STRENGTH - ROTATING BEAM	256
HARDNESS	2
HARDNESS - BRINELL	424
HARDNESS - BRINELL - 3000 KG	4
HARDNESS - BRINELL - ROCKWELL B	8
HARDNESS - ROCKWELL	1
HARDNESS - ROCKWELL - B	224
HARDNESS - ROCKWELL - C	643
HARDNESS - ROCKWELL B - BRINELL	8
HARDNESS - ROCKWELL-C	3
HARDNESS - VHN - 10KG	2
IMPACT	1085
IMPACT - CHARPY V	1
IMPACT - CHARPY V-NOTCH	22
IMPACT - NRL BULGE EXPLOSION	3
PLANE - STRAIN FRACTURE TOUGHNESS	185
REDUCTION OF AREA	1633
SHEAR RIGIDITY MODULUS	324
SHEAR STRENGTH	513
TENSILE ELASTIC MODULUS	409
TENSILE YIELD STRENGTH	3471
ULTIMATE TENSILE STRENGTH	3880
sum	20182

45 rows selected.

PHYSICAL PROPERTIES

PROPERTY_NAME	COUNT(*)
ELEC COND - IACS %(VOL)	28
ELECTRICAL RESISTIVITY	99
LIMIT SERVICE TEMP - DEG F	59
SPECIFIC HEAT	45
THERMAL CONDUCTIVITY	57
THERMAL EXPANSION COEFFICIENT	64
sum	352

6 rows selected.

STRESS PROPERTIES

PROPERTY_NAME	COUNT(*)
CORROSION RATE	173
DEPTH OF PITTING	14
ELONGATION % CHANGE - CORROSION	16
FTU % CHANGE - CORROSION	14
FTU CHANGE - STRESS CORROSION	21
FTY % CHANGE - CORROSION	8
RESIDUAL ELONGATION - STRESS CORROSION	17
STRESS CORROSION THRESHOLD	92

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                                                          ----------
sum                                                              355

8 rows selected.

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======== RESTRAINED THERMAL GROWTH ========

MATERIAL CODE _____ DATA SOURCE ____ PROJECT NUMBER _____

RUN NUMBER _____ BILLET ID _____

TEST TYPE ____ ORIENTATION ____ SPECIMEN # ____ LOT ____ PLATE ____

FAILURE MODE _____ FIBER FRACTURE _____

HEAT RATE _____ f/sec DENSITY _____ g/cc

PRE-TEST CONDITIONING _____ TEST TEMPERATURE _____ f

FIRST PEAK TEMPERATURE _____ f FIRST PEAK STRESS _____ psi

FINAL PEAK TEMPERATURE _____ f FINAL PEAK STRESS _____ psi

INITIAL MODULUS _____ msi SECONDARY MODULUS _____ msi

REMARKS _____

Count: *0 <Replace>

======== SHEAR ========

MAT. CODE	DS	FAIL MODE	BILLET ID	RUN #	TEST TYPE	ORIENTATION

SPECIMEN #	LOT	PLATE	TEST TEMP.	TIME AT TEMP.	MAX TEMP.	CENTER TEMP
			f	sec	f	f

SPECIMEN LEN. _____ in

========== GAGE ==========

LEN _____ in WDTH _____ in THK _____ in DIA _____ in

DENSITY	GAGE SECT. AREA	SONIC MOD.	PEAK VELOCITY	BREAK VELOCITY
g/cc	in x in	msi	in/usec	in/usec

SHEAR STRGTH	STRAIN AT STRGTH	SHEAR MOD.	QUALIFIER	STRESS RATE
psi	in/in	msi		psi/in

========== PAGANO'S MODULUS ==========

QUALIFIER	1ST LABEL	1ST MODULUS	2ND LABEL	2ND MODULUS
		msi		msi

REMARKS _____

Count: *0 <Replace>

======== STRESS STRAIN ========

MATERIAL CODE _____ DATA SOURCE ____ PROJECT NUMBER _____

TEST TEMP. _____ f RUN NUMBER _____ BILLET ID _____

TEST TYPE ____ ORIENTATION ____ SPECIMEN NUMBER ____ LOT ____ PLATE ____

MAXIMUM STRAIN _____ mil/in STRESS AT MAXMIUM STRAIN _____ psi

STRAIN _____ mil/in STRESS _____ psi

REMARKS _____

Count: *0 <Replace>

======== THERMAL CONDUCTIVITY ========

MATERIAL CODE _____ DATA SOURCE ____ PROJECT NUMBER _____

N NUMBER _____ BILLET ID _____

REFERENCE ROD _____ PRE-CHAR SPECIFICATION _____

TEST TYPE ____ ORIENTATION ____ SPECIMEN NUMBER ____ LOT ____ PLATE ____

INITIAL THICKNESS _____ in INITIAL WEIGHT _____ gm

FINAL THICKNESS _____ in FINAL WEIGHT _____ gm

DENSITY _____ g/cc SPECIMEN DIAMETER _____ in

REFERENCE GAUGE _____ in SPECIMEN GUAGE _____ in

TEST TEMPERATURE _____ f THERMAL CONDUCTIVITY _____ btu-in/hr/sqft/f

REMARKS _____

Count: *0 <Replace>

======== THERMAL EXPANSION =======

MATERIAL CODE _____ DATA SOURCE ____ PROJECT NUMBER _____

N NUMBER _____ BILLET ID _____

PRE-TEST CONDITION _____ PRE-CHAR SPECIFICATION _____

TEST TYPE CTE_ ORIENTATION ____ SPECIMEN NUMBER ____ LOT ____ PLATE ____

INITIAL LENGTH _____ in INITIAL WEIGHT _____ gm

FINAL LENGTH _____ in FINAL WEIGHT _____ gm

DENSITY _____ g/cc DILATOMETER _____

TIME _____ sec TEST TEMPERATURE _____ f

HEAT RATE _____ f/sec THERMAL EXPANSION _____ 10-3 in/in

REMARKS _____

Count: *0 <Replace>

======== TENSION ========

MAT. CODE	DS	FAIL MODE	BILLET ID	RUN #	TEST TYPE	ORIENTATION
_____	____	_____	_____	_____	TN__	____

SPECIMEN #	LOT	PLATE	TEST TEMP.	TIME AT TEMP.	MAX TEMP.	DENSITY
____/	____	____	_____ f	_____ sec	_____ f	_____ g/cc

SPECIMEN LEN. ========== GAGE ==========

_____ in LEN _____ in WDTH _____ in THK _____ in DIA _____ in

ULT. STRGTH	YLD STRGTH	ULT STRAIN	STRAIN AT STRGTH	INT ELASTIC MOD
_____ psi	_____ psi	_____ mil/in	_____ mil/in	_____ msi

SECANT MOD	QUALIFIER	SHEAR MOD	2NDARY MOD	SONIC MOD	PEAK VELOCITY
_____ msi	_____	_____ msi	_____ msi	_____ msi	_____ in/usec

BREAK VELOCITY ========== POISSON'S RATIO ==========

_____ in/usec 1ST LABEL __ 1ST RATIO _____ 2ND LABEL __ 2ND RATIO _____

STRESS RATE REMARKS

_____ psi/min _____

Count: *0 <Replace>

======== THERMAL HEAT CAPICITY / SPECIFIC HEAT ========

MATERIAL CODE _____ DATA SOURCE ____ PROJECT NUMBER _____

N NUMBER _____ BILLET ID _____

SPECIMEN NUMBER _____ LOT _____ PLATE _____

TEST TEMPERATURE _____ f HEAT CAPICITY _____ btu/lb/f

REMARKS _____

Count: *0 <Replace>

======== THERMAL RESPONSE ========

MATERIAL CODE _____ DATA SOURCE ____ BILLET ID _____

PRE-TEST CONDITIONING _____ RUN NUMBER _____

ORIENTATION _____ SPECIMEN NUMBER _____ LOT _____ PLATE _____

HEAT SOURCE _____

DISTANCE OF SAMPLE FROM HEAT SOURCE _____ in

DISTANCE OF THERMOCOUPLE FROM HEATED FACE OF SAMPLE _____ in

APPLIED HEAT FLUX _____ btu/sqft/sec

TIME _____ sec

TEST TEMPERATURE _____ f

REMARKS _____

Count: *0

<Replace>

======== METALS GENERAL TABLE: ALUMINUMS =======

SEQUENCE # _____ ALLOY _____

ALLOY TYPE _____

CATEGORY _____ UNS DESIGNATION _____

ALT DESIGNATION-1 _____

ALT DESIGNATION-2 _____

ALT DESIGNATION-3 _____

	VALUE	UNITS	REFERENCE
DENSITY	_____	_____	_____
MELTING RANGE-MAX	_____	_____	_____
MELTING RANGE-MIN	_____	_____	_____
POISSONS RATIO	_____	_____	_____

Count: *0 <Replace>

======== H2 EMBRITTLEMENT TABLE: ALUMINUMS ========

=== UNITS ===

REFERENCE TIME TEMP SEQUENCE # ALLOY

CONDITION _____ FORM _____

COMMENTS _____

========== PROPERTY ==========

__ NAME _____ VALUE _____ UNIT _____ QUAL _____

========== OTHER ==========

GAS _____ PRESSURE _____ UNIT KSI__

H2 PRESS _____ UNIT KSI_

EXP TIME _____ EXP TEMP _____

SPECIMEN TYPE _ NOTCH (Y/N)

****

* PROPERTY NUMBERS (P#):
* 1 - H2 ELONGATION
* 2 - H2 RED AREA
* 3 - H2 TNSL STRN
* 4 - H2 TNSL YLD
* 5 - ELONG OTH GAS
* 6 - RED OTH GAS
* 7 - FTU OTH GAS
* 8 - FTY OTH GAS
* 9 - RATIO

Count: *0 <Replace>

TASK 5

Lubricant Data Base

The Lubricant Data Base residing on the PDP at contract start was evaluated. After a lengthy review, the decision was made to develop a new lubricants data base.

The usable data on the old database was transferred to the new database residing on MAPTIS. Then a listing of lubricant manufacturers was obtained from the Selection List.

These manufacturers were contacted and asked to provide properties data on their products. They were informed that any information they provided would be entered on a NASA database that would be accessed by any of the NASA centers and also by contractors who had applied for an been granted access.

Forty manufacturers responded with data on more than 650 products. This data was reviewed an included in the database.

The TM/TMX Handbooks for lubricants were also evaluated and all data deemed necessary was input into the database.

A listing of all the manufacturers and their products is attached along with a list of all property values reported for lubricants.

All on-line input screens can be accessed through Nonmetals Properties Data Base using the "data maintenance" option.

MANUFACTURER	DESIGNATION
ACHESON COLLOIDS INCORPORATED	LUBRICANT GP 1904 EMERALON
	LUBRICANT AQUADAG
	LUBRICANT AQUADAG E
	LUBRICANT DAG 137
	LUBRICANT DAG 143
	LUBRICANT DAG 154
	LUBRICANT DAG 155
	LUBRICANT DAG 156
	LUBRICANT DAG 170
	LUBRICANT DAG 197
	LUBRICANT DAG 213
	LUBRICANT DAG 230
	LUBRICANT DAG 2404
	LUBRICANT DAG 2412
	LUBRICANT DAG 243
	LUBRICANT DAG 245
	LUBRICANT DAG 35
	LUBRICANT DAG 99
	LUBRICANT EMRALON 305
	LUBRICANT EMRALON 310
	LUBRICANT EMRALON 311
	LUBRICANT EMRALON 312
	LUBRICANT EMRALON 313
	LUBRICANT EMRALON 314
	LUBRICANT EMRALON 317
	LUBRICANT EMRALON 320
	LUBRICANT EMRALON 321
	LUBRICANT EMRALON 328
	LUBRICANT EMRALON 329
	LUBRICANT EMRALON 330
	LUBRICANT EMRALON 331
	LUBRICANT EMRALON 333
	LUBRICANT EMRALON 334
	LUBRICANT EMRALON 335
	LUBRICANT EMRALON 336
	LUBRICANT EMRALON 351
	LUBRICANT MOLYDAG 200
	LUBRICANT MOLYDAG 204
	LUBRICANT MOLYDAG 206
	LUBRICANT MOLYDAG 207
	LUBRICANT MOLYDAG 208
	LUBRICANT MOLYDAG 210
	LUBRICANT MOLYDAG 211
	LUBRICANT MOLYDAG 214
	LUBRICANT MOLYDAG 232
	LUBRICANT MOLYDAG 250
	LUBRICANT MOLYDAG 254
	LUBRICANT MOLYDAG 261
	LUBRICANT MOLYDAG 299
	LUBRICANT OILDAG
	LUBRICANT PRODAG
	LUBRICANT SLA 1261
	LUBRICANT SLA 1275
	LUBRICANT SLA 1286
	LUBRICANT SLA 2208
	LUBRICANT SLA 2239

MANUFACTURER	DESIGNATION
ACHESON	LUBRICANT DAG 206
	LUBRICANT DAG 244
AEROSPACE LUBRICANTS INC	LUBRICANT TRIBOLUBE 15
	LUBRICANT TRIBOLUBE 15MS
	LUBRICANT TRIBOLUBE 15RP
	LUBRICANT TRIBOLUBE 16
AMOCO OIL COMPANY	LUBRICANT AMDEX GREASE 2 EP
	LUBRICANT AMOCO 200 GRADE 30
	LUBRICANT AMOCO 300 GRADE 15W-40
	LUBRICANT AMOCO MP 80W-90
	LUBRICANT AMOCO MP 85W-140
	LUBRICANT RYKON PREMIUM GREASE 2 EP
	LUBRICANT SUPERMIL GREASE NO. 1371
	LUBRICANT SUPERMIL GREASE NO. A-72832
ATLANTIC RICHFIELD CO	LUBRICANT ARCOFLEET S3 PLUS SAE 30
BFM AEROSPACE CORPORATION	LUBRICANT FABROID 1
	LUBRICANT FABROID 2
	LUBRICANT FABROID IIG2
	LUBRICANT FABROID X ALSO KNOWN AS FABROID 10
	LUBRICANT FIBERGLIDE 3
	LUBRICANT FIBERGLIDE 5
	LUBRICANT FIBERGLIDE 6
	LUBRICANT FIBRILOID
BIDDLE INSTRUMENTS	LUBRICANT APIEZON GREASE AP 100
	LUBRICANT APIEZON GREASE AP 101
	LUBRICANT APIEZON GREASE H
	LUBRICANT APIEZON GREASE L
	LUBRICANT APIEZON GREASE M
	LUBRICANT APIEZON GREASE N
	LUBRICANT APIEZON GREASE T
	LUBRICANT APIEZON OIL A
	LUBRICANT APIEZON OIL B
	LUBRICANT APIEZON OIL C
	LUBRICANT APIEZON OIL J
	LUBRICANT APIEZON OIL K
BTR VALVE SEALANTS INC	LUBRICANT BTR 147 VALVE SEALANT BULK
	LUBRICANT BTR 147 VALVE SEALANT STICK
	LUBRICANT BTR 167 VALVE SEALANT BULK
	LUBRICANT BTR 167 VALVE SEALANT SS
	LUBRICANT BTR 167 VALVE SEALANT STICK
	LUBRICANT BTR 234 VALVE SEALANT
	LUBRICANT BTR 281 VALVE SEALANT
	LUBRICANT BTR 357 VALVE SEALANT BULK
	LUBRICANT BTR 380-M
	LUBRICANT BTR 386 VALVE SEALANT BULK
	LUBRICANT BTR 386 VALVE SEALANT STICK
	LUBRICANT BTR 421 VALVE SEALANT BULK
	LUBRICANT BTR 421 VALVE SEALANT STICK
	LUBRICANT BTR 555 VALVE SEALANT BULK
	LUBRICANT BTR 555 VALVE SEALANT SS
	LUBRICANT BTR 555 VALVE SEALANT STICK
	LUBRICANT BTR 555WG VALVE SEALANT BULK

MANUFACTURER	DESIGNATION
BTR VALVE SEALANTS INC	LUBRICANT BTR 555WG VALVE SEALANT STICK
	LUBRICANT BTR 654 VALVE SEALANT BULK
	LUBRICANT BTR 654 VALVE SEALANT STICK
	LUBRICANT BTR 660 VALVE SEALANT BULK
	LUBRICANT BTR 755 VALVE SEALANT BULK
	LUBRICANT BTR 755 VALVE SEALANT STICK
	LUBRICANT BTR 833 VALVE SEALANT BULK
	LUBRICANT BTR 852 VALVE SEALANT BULK
	LUBRICANT BTR 862 VALVE SEALANT BULK
	LUBRICANT BTR 862 VALVE SEALANT STICK
	LUBRICANT BTR 921 VALVE SEALANT BULK
	LUBRICANT BTR 921 VALVE SEALANT STICK
	LUBRICANT BTR 950 VALVE SEALANT BULK
	LUBRICANT BTR 950 VALVE SEALANT SS
	LUBRICANT BTR 950 VALVE SEALANT STICK
	LUBRICANT BTR 960 VALVE SEALANT BULK
CASTALL INC	LUBRICANT CASTALL G-800
CASTROL INC	LUBRICANT BRAYCO 300
	LUBRICANT BRAYCO 363
	LUBRICANT BRAYCO 441 SAE 10
	LUBRICANT BRAYCO 443 SAE 30
	LUBRICANT BRAYCO 445 SAE 50
	LUBRICANT BRAYCO 460
	LUBRICANT BRAYCO 461
	LUBRICANT BRAYCO 463
	LUBRICANT BRAYCO 482
	LUBRICANT BRAYCO 483
	LUBRICANT BRAYCO 490
	LUBRICANT BRAYCO 689
	LUBRICANT BRAYCO 717
	LUBRICANT BRAYCO 756
	LUBRICANT BRAYCO 759
	LUBRICANT BRAYCO 771
	LUBRICANT BRAYCO 777
	LUBRICANT BRAYCO 783
	LUBRICANT BRAYCO 810
	LUBRICANT BRAYCO 811
	LUBRICANT BRAYCO 812
	LUBRICANT BRAYCO 813
	LUBRICANT BRAYCO 814
	LUBRICANT BRAYCO 815Z
	LUBRICANT BRAYCO 880
	LUBRICANT BRAYCO 883
	LUBRICANT BRAYCO 899
	LUBRICANT BRAYCO MICRONIC 882
	LUBRICANT BRAYCO NPT 3A
	LUBRICANT BRAYCO NPT 4
	LUBRICANT BRAYCOTE 103
	LUBRICANT BRAYCOTE 137
	LUBRICANT BRAYCOTE 153
	LUBRICANT BRAYCOTE 194
	LUBRICANT BRAYCOTE 248
	LUBRICANT BRAYCOTE 265
	LUBRICANT BRAYCOTE 600
	LUBRICANT BRAYCOTE 601
	LUBRICANT BRAYCOTE 631A

MANUFACTURER	DESIGNATION
CASTROL INC	LUBRICANT BRAYCOTE 640AC
	LUBRICANT BRAYCOTE 804
	LUBRICANT BRAYCOTE 805
	LUBRICANT BRAYCOTE 806
	LUBRICANT BRAYCOTE 806RP
	LUBRICANT CASTROLEASE AI
CHEMED CORPORATION	LUBRICANT MPG-2
CHEVRON U S A INC	LUBRICANT CHEVRON AERO OIL 120
	LUBRICANT CHEVRON ATF SPECIAL
	LUBRICANT CHEVRON AUTOMATIC TRANSMISSION FLUID
	LUBRICANT CHEVRON AVIATION HYDRAULIC FLUIDS A
	LUBRICANT CHEVRON AVIATION OIL UNCOMPOUNDED 100
	LUBRICANT CHEVRON AW HYDRAULIC OIL 32
	LUBRICANT CHEVRON AW HYDRAULIC OIL 68
	LUBRICANT CHEVRON AW HYDRAULIC OIL MV
	LUBRICANT CHEVRON AW HYDRAULIC OIL MV 46
	LUBRICANT CHEVRON AW MACHINE OIL 150
	LUBRICANT CHEVRON AW MACHINE OIL 22
	LUBRICANT CHEVRON AW MACHINE OIL 220
	LUBRICANT CHEVRON AW MACHINE OIL 320
	LUBRICANT CHEVRON C.P. OIL 22X
	LUBRICANT CHEVRON C.P. OIL 46X
	LUBRICANT CHEVRON CUSTOM MOTOR OIL SAE 10W-30
	LUBRICANT CHEVRON CUSTOM MOTOR OIL SAE 15W-50
	LUBRICANT CHEVRON CUSTOM MOTOR OIL SAE 5W-30
	LUBRICANT CHEVRON CUSTON MOTOR OIL SAE 10W-40
	LUBRICANT CHEVRON CYLINDER OIL 1000X
	LUBRICANT CHEVRON CYLINDER OIL 460X
	LUBRICANT CHEVRON CYLINDER OIL 680X
	LUBRICANT CHEVRON DELO 100 MOTOR OIL SAE 10W
	LUBRICANT CHEVRON DELO 100 MOTOR OIL SAE 20
	LUBRICANT CHEVRON DELO 100 MOTOR OIL SAE 30
	LUBRICANT CHEVRON DELO 100 MOTOR OIL SAE 40
	LUBRICANT CHEVRON DELO 100 MOTOR OIL SAE 50
	LUBRICANT CHEVRON DELO 1000 MARINE OIL SAE 30
	LUBRICANT CHEVRON DELO 1000 MARINE OIL SAE 40
	LUBRICANT CHEVRON DELO 2000 MARINE OIL SAE 30
	LUBRICANT CHEVRON DELO 2000 MARINE OIL SAE 40
	LUBRICANT CHEVRON DELO 300 MOTOR OIL SAE 10W
	LUBRICANT CHEVRON DELO 300 MOTOR OIL SAE 40
	LUBRICANT CHEVRON DELO 3000 MARINE OIL SAE 40
	LUBRICANT CHEVRON DELO 400 MOTOR OIL SAE 10W
	LUBRICANT CHEVRON DELO 400 MOTOR OIL SAE 20W-20
	LUBRICANT CHEVRON DELO 400 MOTOR OIL SAE 40
	LUBRICANT CHEVRON DELO 400 MOTOR OIL SAE 50
	LUBRICANT CHEVRON DELO 6000 OIL SAE 40
	LUBRICANT CHEVRON EP INDUSTRIAL OIL 100X
	LUBRICANT CHEVRON EP INDUSTRIAL OIL 150X
	LUBRICANT CHEVRON EP INDUSTRIAL OIL 220X
	LUBRICANT CHEVRON EP INDUSTRIAL OIL 460X
	LUBRICANT CHEVRON EP INDUSTRIAL OIL 46X
	LUBRICANT CHEVRON FM LUBRICATING OIL 100X
	LUBRICANT CHEVRON FM LUBRICATING OIL 105X
	LUBRICANT CHEVRON FM LUBRICATING OIL 460X
	LUBRICANT CHEVRON GAS ENGINE OIL HDAX SAE 30
	LUBRICANT CHEVRON GAS ENGINE OIL HDAX SAE 40

MANUFACTURER	DESIGNATION
CHEVRON U S A INC	LUBRICANT CHEVRON GAS ENGINE OIL SAE 30
	LUBRICANT CHEVRON GAS ENGINE OIL TGX 35
	LUBRICANT CHEVRON GST OIL 100
	LUBRICANT CHEVRON GST OIL 32
	LUBRICANT CHEVRON GST OIL 46
	LUBRICANT CHEVRON GST OIL 68
	LUBRICANT CHEVRON HANDY OIL 15
	LUBRICANT CHEVRON HEAT TRANSFER OIL 1
	LUBRICANT CHEVRON MARINE OIL 150X
	LUBRICANT CHEVRON MARINE OIL 220X
	LUBRICANT CHEVRON METALWORKING FLUID 502
	LUBRICANT CHEVRON METALWORKING FLUID 503
	LUBRICANT CHEVRON METALWORKING FLUID 504
	LUBRICANT CHEVRON METALWORKING FLUID 505
	LUBRICANT CHEVRON MULTI-MACHINE OIL R AND O 100
	LUBRICANT CHEVRON MULTI-MACHINE OIL R AND O 32
	LUBRICANT CHEVRON MULTI-MACHINE OIL R AND O 68
	LUBRICANT CHEVRON RPM DELO MOTOR OIL SAE 10W
	LUBRICANT CHEVRON RPM DELO MOTOR OIL SAE 15W-40
	LUBRICANT CHEVRON RPM DELO MOTOR OIL SAE 30
	LUBRICANT CHEVRON RPM DELO MOTOR OIL SAE 40
	LUBRICANT CHEVRON SPECIAL MOTOR OIL SAE 30
	LUBRICANT CHEVRON SUB-ZERO FLUID SAE 0W-30
	LUBRICANT CHEVRON TORQUE FLUID 5
	LUBRICANT CHEVRON TRACTOR HYDRAULIC FLUID
	LUBRICANT CHEVRON UTILITY OIL 100
	LUBRICANT CHEVRON UTILITY OIL 100X
	LUBRICANT CHEVRON UTILITY OIL 150
	LUBRICANT CHEVRON UTILITY OIL 150X
	LUBRICANT CHEVRON UTILITY OIL 22
	LUBRICANT CHEVRON UTILITY OIL 22X
	LUBRICANT CHEVRON UTILITY OIL 46
	LUBRICANT CHEVRON UTILITY OIL 68
	LUBRICANT CHEVRON VISTAC OIL 100X
	LUBRICANT CHEVRON VISTAC OIL 150X
	LUBRICANT CHEVRON VISTAC OIL 220X
	LUBRICANT CHEVRON VISTAC OIL 320X
	LUBRICANT CHEVRON VISTAC OIL 68X
CONOCO INC	LUBRICANT CONOCO FLEET HD 10 TBN GRADE 10W-30
	LUBRICANT CONOCO FLEET HD 10 TBN GRADE 15W-40
	LUBRICANT CONOCO FLEET HD 10 TBN GRADE 30
	LUBRICANT CONOCO FLEET HD 10 TBN GRADE 40
	LUBRICANT CONOCO FLEET HD 7.5 TBN GRADE 10W
	LUBRICANT CONOCO FLEET HD 7.5 TBN GRADE 10W-30
	LUBRICANT CONOCO FLEET HD 7.5 TBN GRADE 15W-40
	LUBRICANT CONOCO FLEET HD 7.5 TBN GRADE 20W-20
	LUBRICANT CONOCO FLEET HD 7.5 TBN GRADE 30
	LUBRICANT CONOCO FLEET HD 7.5 TBN GRADE 40
	LUBRICANT CONOCO FLEET HD 7.5 TBN GRADE 50
	LUBRICANT CONOCO SUPER ALL SEASON GRADE 10W30
	LUBRICANT CONOCO SUPER GRADE 30
DAUBERT CHEMICAL COMPANY INC	LUBRICANT NOX RUST 208
	LUBRICANT NOX RUST 507
	LUBRICANT NOX RUST 509
	LUBRICANT NOX RUST 518
	LUBRICANT NOX RUST X-275

MANUFACTURER	DESIGNATION
DIXON FACILITY	LUBRICANT PENNLON
	LUBRICANT RULON AR
	LUBRICANT RULON II
	LUBRICANT RULON J
DOW CORNING CORPORATION	LUBRICANT 55M GREASE
	LUBRICANT DOW CORNING 111
	LUBRICANT DOW CORNING 210H
	LUBRICANT DOW CORNING 33
	LUBRICANT DOW CORNING 340 HEAT SINK
	LUBRICANT DOW CORNING 3400A
	LUBRICANT DOW CORNING 4 COMPOUND
	LUBRICANT DOW CORNING 44 GREASE
	LUBRICANT DOW CORNING 5
	LUBRICANT DOW CORNING 550
	LUBRICANT DOW CORNING 710
	LUBRICANT DOW CORNING 7400
	LUBRICANT DOW CORNING FS-1265
	LUBRICANT DOW CORNING G-N
	LUBRICANT DOW CORNING Z
	LUBRICANT FS-1292
	LUBRICANT MOLYKOTE 321 (DOW-CORNING 1-3931)
	LUBRICANT MOLYKOTE 557 (DOW CORNING 1-3944)
	LUBRICANT MOLYKOTE 7409
DRILUBE COMPANY	LUBRICANT DRILUBE 101
	LUBRICANT DRILUBE 107
	LUBRICANT DRILUBE 108
	LUBRICANT DRILUBE 1A
	LUBRICANT DRILUBE 2
	LUBRICANT DRILUBE 272
	LUBRICANT DRILUBE 273
	LUBRICANT DRILUBE 33F
	LUBRICANT DRILUBE 6A
	LUBRICANT DRILUBE 701
	LUBRICANT DRILUBE 702
	LUBRICANT DRILUBE 703
	LUBRICANT DRILUBE 805N
	LUBRICANT DRILUBE 822
	LUBRICANT DRILUBE 831
	LUBRICANT DRILUBE 842
	LUBRICANT DRILUBE 90
E F HOUGHTON AND COMPANY	LUBRICANT ABSORBED OILS DL-21
	LUBRICANT COSMOLINE 1058
	LUBRICANT COSMOLINE 1060
	LUBRICANT COSMOLINE 1062
	LUBRICANT COSMOLINE 1102
	LUBRICANT COSMOLINE 1116
	LUBRICANT COSMOLUBE 102
	LUBRICANT COSMOLUBE 2EP
	LUBRICANT COSMOLUBE 615
	LUBRICANT COSMOLUBRIC HF-130
	LUBRICANT HI-TEMP OIL 305
	LUBRICANT HI-TEMP OIL 309
	LUBRICANT HI-TEMP OIL 550
	LUBRICANT HI-TEMP. 101

MANUFACTURER	DESIGNATION
E F HOUGHTON AND COMPANY	LUBRICANT HOUGHTO-SAFE 1055
	LUBRICANT HOUGHTO-SAFE 1115
	LUBRICANT HOUGHTO-SAFE 1120
	LUBRICANT HOUGHTO-SAFE 1130
	LUBRICANT HOUGHTO-SAFE 620
	LUBRICANT HYDRO-DRIVE HP-150
	LUBRICANT HYDRO-DRIVE HP-200
	LUBRICANT HYDRO-DRIVE HP-300
	LUBRICANT HYDRO-DRIVE HP-500
	LUBRICANT HYDRO-DRIVE HP-750
	LUBRICANT HYDROLUBRIC 120-B
E I DU PONT DE NEMOURS AND COMPANY INC	LUBRICANT KRYTON 143AD
	LUBRICANT KRYTOX 143AA
	LUBRICANT KRYTOX 143AB
	LUBRICANT KRYTOX 143AC
	LUBRICANT KRYTOX 143AX
	LUBRICANT KRYTOX 143AY
	LUBRICANT KRYTOX 143AZ
	LUBRICANT KRYTOX 240 AC
	LUBRICANT KRYTOX 250 AC
	LUBRICANT KRYTOX 280 AC
	LUBRICANT KRYTOX GPL103
	LUBRICANT VYDAX 1000
	LUBRICANT VYDAX AR
EXXON COMPANY U S A	LUBRICANT 1209 TURBINE
	LUBRICANT AVIATION OIL EE 120
	LUBRICANT AVIATION OIL EE 80
	LUBRICANT AVIATION OIL GRADE 100
	LUBRICANT BEACON GRADE 325
	LUBRICANT TURBO OIL 2380
	LUBRICANT TURBO OIL 2389
FEL-PRO INCORPORATED	LUBRICANT FEL-PRO C-100
	LUBRICANT FEL-PRO C-102
	LUBRICANT FEL-PRO C-200
	LUBRICANT FEL-PRO C-300
	LUBRICANT FEL-PRO C-601-S
	LUBRICANT FEL-PRO C-638
	LUBRICANT FEL-PRO C-652
	LUBRICANT FEL-PRO C-670
	LUBRICANT FEL-PRO C5-A
	LUBRICANT FEL-PRO FOOD GRADE AA
	LUBRICANT FEL-PRO FOOD MACHINERY E.P. GREASE
	LUBRICANT FEL-PRO MULTI-EP GREASE
	LUBRICANT FEL-PRO N-1000
	LUBRICANT NICKEL-EASE
GENERAL ELECTRIC	LUBRICANT INSUL GREASE G-624
	LUBRICANT SF 1147
	LUBRICANT SF 18 (350)
	LUBRICANT SF 96
	LUBRICANT SF 97-50
	LUBRICANT VERSILUBE G 300
	LUBRICANT VERSILUBE G 351
	LUBRICANT VISCASIL

MANUFACTURER	DESIGNATION
GREAT LAKES CHEMICAL CORP./ E/M CORPORATION	LUBRICANT CP-29 ANTI-SEIZE COMPOUND
	LUBRICANT ECOALUBE 642
	LUBRICANT EVERLUBE 620
	LUBRICANT EVERLUBE 620C
	LUBRICANT EVERLUBE 690
	LUBRICANT EVERLUBE 810
	LUBRICANT EVERLUBE 811
	LUBRICANT EVERLUBE 812
	LUBRICANT EVERLUBE 823
	LUBRICANT EVERLUBE ESNALUBE 382
	LUBRICANT CP-35
	LUBRICANT E/M 9003
	LUBRICANT EVERLOX 16
	LUBRICANT EVERLOX 17
	LUBRICANT EVERLOX 18
	LUBRICANT EVERLUBE 6102-G
	LUBRICANT EVERLUBE 6107
	LUBRICANT EVERLUBE 6150
	LUBRICANT EVERLUBE 620-B1
	LUBRICANT EVERLUBE 626
	LUBRICANT EVERLUBE 629
	LUBRICANT EVERLUBE 860
	LUBRICANT EVERLUBE 967
	LUBRICANT INLOX 44
	LUBRICANT INLOX 88
	LUBRICANT K-70
	LUBRICANT KRONAGOLD 150100 HEAVY
	LUBRICANT KRONAGOLD 15032 LIGHT
	LUBRICANT KRONAGOLD 15068 MEDIUM
	LUBRICANT KRONAGOLD 400
	LUBRICANT KRONAGOLD 40020
	LUBRICANT KRONAGOLD 40030
	LUBRICANT KRONAGOLD 40040
	LUBRICANT KRONAGOLD 400M
	LUBRICANT KRONAGOLD 460
	LUBRICANT KRONAGOLD 460M
	LUBRICANT KRONAKOTE 5900
	LUBRICANT KRONAPLATE 100
	LUBRICANT KRONAPLATE 1217
	LUBRICANT KRONAPLATE 176
	LUBRICANT KRONAPLATE 222
	LUBRICANT KRONAPLATE 333
	LUBRICANT KRONAPLATE 444
	LUBRICANT KRONAPLATE 50
	LUBRICANT KRONAPLATE 558
	LUBRICANT KRONAPLATE 610
	LUBRICANT LUBE-LOK 1000
	LUBRICANT LUBE-LOK 2006
	LUBRICANT LUBE-LOK 2109
	LUBRICANT LUBE-LOK 2306
	LUBRICANT LUBE-LOK 2396
	LUBRICANT LUBE-LOK 4306
	LUBRICANT LUBE-LOK 4396
	LUBRICANT LUBE-LOK 5306
	LUBRICANT LUBE-LOK 5396 (5306)
	LUBRICANT LUBE-LOK 66C
	LUBRICANT LUBRI-BOND 220

MANUFACTURER	DESIGNATION
GREAT LAKES CHEMICAL CORPORATION	LUBRICANT LUBRI-BOND 320
	LUBRICANT LUBRI-BOND A
	LUBRICANT LUBRI-BOND B
	LUBRICANT LUBRI-BOND HT
	LUBRICANT LUBRI-BOND K
	LUBRICANT LUBRI-BOND N
	LUBRICANT MICROSEAL 100-1
	LUBRICANT MICROSEAL 200-1
	LUBRICANT MICROSEAL 300-1
	LUBRICANT P/S
	LUBRICANT PERMA-SLIK C
	LUBRICANT PERMA-SLIK G
GUARDSMAN PRODUCTS INC	LUBRICANT DRI-SLIDE
	LUBRICANT DRI-SLIDE 00390 WHEEL BEARING GREASE
	LUBRICANT DRI-SLIDE 04180 SPRAY WHITE LUBE
	LUBRICANT DRI-SLIDE 90/140 GEAR OIL
	LUBRICANT DRI-SLIDE CHAIN LUBE 1000
	LUBRICANT DRI-SLIDE CHAIN LUBE WB
	LUBRICANT DRI-SLIDE CLEAR
	LUBRICANT DRI-SLIDE E.P. LIQUID GREASE
	LUBRICANT DRI-SLIDE FIFTH WHEEL LUBE
	LUBRICANT DRI-SLIDE FXR
	LUBRICANT DRI-SLIDE HDMP GREASE
	LUBRICANT DRI-SLIDE HDMP HI-TEMP GREASE
	LUBRICANT DRI-SLIDE HDMP LO-TEMP GREASE
	LUBRICANT DRI-SLIDE HI-TEMP
	LUBRICANT DRI-SLIDE P-116
	LUBRICANT DRI-SLIDE ROBOT GREASE
	LUBRICANT DRI-SLIDE SILICONE MOLD RELEASE 04175
	LUBRICANT DRI-SLIDE SILICONE SPRAY LUBE 04170
	LUBRICANT DRI-SLIDE STOP SQUEEK
HALOCARBON PRODUCTS CORPORATION	LUBRICANT 11B3
	LUBRICANT 25-10M
	LUBRICANT 25-10MS
	LUBRICANT 25-20M
	LUBRICANT 25-5S
	LUBRICANT OIL 6.3
	LUBRICANT X90-10M
HOHMAN PLATING AND MFG INC	LUBRICANT SURF-KOTE A-1625
	LUBRICANT SURF-KOTE A-2178A
	LUBRICANT SURF-KOTE LOB-1800-G
	LUBRICANT SURF-KOTE M-1284
	LUBRICANT SURF-KOTE M-2049
LUBECO INC	LUBRICANT LUBECO 2023B
	LUBRICANT LUBECO 2123
	LUBRICANT LUBECO 905
	LUBRICANT LUBECO M390
	LUBRICANT LUBECO N350A
MCGHAN NUSIL CORPORATION	LUBRICANT CV-9042
	LUBRICANT CV-9052
MILLER-STEPHENSON CHEMICAL CO INC	LUBRICANT MS-143

MANUFACTURER	DESIGNATION
NATIONAL PROCESS INDUSTRIES INCORPORATED	LUBRICANT MRIONITE NPI-2500
	LUBRICANT NPI-14
	LUBRICANT NPI-16
	LUBRICANT NPI-425 (MLR-2)
	LUBRICANT VITRO-LUBE NPI-1220
PRODUCTS TECHNIQUES INC	LUBRICANT TECLUBE L-67
	LUBRICANT TECLUBE PT-101 (MOLY SPRAY)
	LUBRICANT TECLUBE PT-14
	LUBRICANT TECLUBE PT-17
	LUBRICANT TECLUBE PT-24
	LUBRICANT TECLUBE PT-26M
PURE INDUSTRIES INCORPORATED	LUBRICANT PUREBON P-3W
	LUBRICANT PUREBON P-5
	LUBRICANT PUREBON P-5AG
	LUBRICANT PUREBON P-5AG2
	LUBRICANT PUREBON P-5J
	LUBRICANT PUREBON P-5NR
	LUBRICANT PUREBON P-5R
	PUREBON LUBRICANT P-03
	PUREBON LUBRICANT P-03AG
	PUREBON LUBRICANT P-03CF
	PUREBON LUBRICANT P-03XHT
	PUREBON LUBRICANT P-15
	PUREBON LUBRICANT P-15-2
	PUREBON LUBRICANT P-19
	PUREBON LUBRICANT P-19-2
	PUREBON LUBRICANT P-2003
	PUREBON LUBRICANT P-2080
	PUREBON LUBRICANT P-29
	PUREBON LUBRICANT P-3310
	PUREBON LUBRICANT P-4168
	PUREBON LUBRICANT P-4229
	PUREBON LUBRICANT P-55
	PUREBON LUBRICANT P-5600
	PUREBON LUBRICANT P-56HT
	PUREBON LUBRICANT P-5732
	PUREBON LUBRICANT P-5735
	PUREBON LUBRICANT P-5759
	PUREBON LUBRICANT P-59BH
	PUREBON LUBRICANT P-5N
	PUREBON LUBRICANT P-6038C
	PUREBON LUBRICANT P-6038C-2
	PUREBON LUBRICANT P-65
	PUREBON LUBRICANT P-652
	PUREBON LUBRICANT P-658RC
	PUREBON LUBRICANT P-658RCH
	PUREBON LUBRICANT P-65NR
	PUREBON LUBRICANT P-69
	PUREBON LUBRICANT P-692
	PUREBON LUBRICANT P-6J
	PUREBON LUBRICANT P-7454
	PUREBON LUBRICANT P-7620
	PUREBON LUBRICANT P-8412
	PUREBON LUBRICANT P-8764
	PUREBON LUBRICANT P-8765
	PUREBON LUBRICANT P-9

MANUFACTURER	DESIGNATION
PURE INDUSTRIES INCORPORATED	PUREBON LUBRICANT P-9D
	PUREBON LUBRICANT PM-103
ROGERS CORPORATION	LUBRICANT ENVEX 1000
	LUBRICANT ENVEX 1115
	LUBRICANT ENVEX 1228
	LUBRICANT ENVEX 1315
	LUBRICANT ENVEX 1330
	LUBRICANT RT/DUROID 4000
	LUBRICANT RT/DUROID 4300
	LUBRICANT RT/DUROID 5801
	LUBRICANT RT/DUROID 5813
	LUBRICANT RT/DUROID 5813M
ROYAL LUBRICANTS COMPANY INC	LUBRICANT ROYCO 13D
	LUBRICANT ROYCO 195
	LUBRICANT ROYCO 1R
	LUBRICANT ROYCO 22
	LUBRICANT ROYCO 22MS
	LUBRICANT ROYCO 27A
	LUBRICANT ROYCO 308
	LUBRICANT ROYCO 315
	LUBRICANT ROYCO 32
	LUBRICANT ROYCO 363
	LUBRICANT ROYCO 37
	LUBRICANT ROYCO 43
	LUBRICANT ROYCO 44
	LUBRICANT ROYCO 45
	LUBRICANT ROYCO 482
	LUBRICANT ROYCO 483
	LUBRICANT ROYCO 49B
	LUBRICANT ROYCO 581
	LUBRICANT ROYCO 586V
	LUBRICANT ROYCO 586W
	LUBRICANT ROYCO 64
	LUBRICANT ROYCO 717
	LUBRICANT ROYCO 756A
	LUBRICANT ROYCO 756E
	LUBRICANT ROYCO 770
	LUBRICANT ROYCO 782
	LUBRICANT ROYCO 783
	LUBRICANT ROYCO 808H
	LUBRICANT ROYCO 808HR
	LUBRICANT ROYCO 81MS
	LUBRICANT ROYCO 885
SANDSTROM PRODUCTS CO	LUBRICANT POXYLUBE 420
	LUBRICANT SANDSTROM 26A
	LUBRICANT SANDSTROM 9A
	LUBRICANT SANDSTROM HI-T 650
	LUBRICANT SANDSTROM LC-300
TEXACO REFINING AND MARKETING INC	LUBRICANT AEO 100
	LUBRICANT AEO PREMIUM AD 120
	LUBRICANT CAPELLA OIL PREMIUM 68 FORMERLY CAPELLA OIL D
	LUBRICANT LOW TEMP GREASE EP 2346
	LUBRICANT MULTIGEAR EP 2316 80W-90

MANUFACTURER	DESIGNATION
TEXACO REFINING AND MARKETING INC	LUBRICANT PREMIUM RB GREASE
	LUBRICANT REGAL AFB 2
THERMALLOY INC	LUBRICANT THERMALCOTE 1
	LUBRICANT THERMALCOTE 2
TIODIZE CO INC	LUBRICANT TIOLON 1000
	LUBRICANT TIOLON A20
	LUBRICANT TIOLON E20
	LUBRICANT TIOLUBE 1175
	LUBRICANT TIOLUBE 29
	LUBRICANT TIOLUBE 460
	LUBRICANT TIOLUBE 70
U S GRAPHITE INC	LUBRICANT GRADE 114
	LUBRICANT GRADE 14
	LUBRICANT GRADE 30-A
	LUBRICANT GRADE 39
	LUBRICANT GRADE 86
	LUBRICANT GRAPHITAR GRADE 101
	LUBRICANT GRAPHITAR GRADE 102
	LUBRICANT GRAPHITAR GRADE 103
	LUBRICANT GRAPHITAR GRADE 105
	LUBRICANT GRAPHITAR GRADE 107
	LUBRICANT GRAPHITAR GRADE 108
	LUBRICANT GRAPHITAR GRADE 109
	LUBRICANT GRAPHITAR GRADE 110
	LUBRICANT GRAPHITAR GRADE 113
	LUBRICANT GRAPHITAR GRADE 18
	LUBRICANT GRAPHITAR GRADE 2413
	LUBRICANT GRAPHITAR GRADE 2690
	LUBRICANT GRAPHITAR GRADE 2767
	LUBRICANT GRAPHITAR GRADE 2887
	LUBRICANT GRAPHITAR GRADE 2980
	LUBRICANT GRAPHITAR GRADE 3
	LUBRICANT GRAPHITAR GRADE 3030
	LUBRICANT GRAPHITAR GRADE 3048
	LUBRICANT GRAPHITAR GRADE 34
	LUBRICANT GRAPHITAR GRADE 35
	LUBRICANT GRAPHITAR GRADE 38
	LUBRICANT GRAPHITAR GRADE 40
	LUBRICANT GRAPHITAR GRADE 47
	LUBRICANT GRAPHITAR GRADE 48
	LUBRICANT GRAPHITAR GRADE 64
	LUBRICANT GRAPHITAR GRADE 67
	LUBRICANT GRAPHITAR GRADE 70
	LUBRICANT GRAPHITAR GRADE 77
	LUBRICANT GRAPHITAR GRADE 80
	LUBRICANT GRAPHITAR GRADE 84
	LUBRICANT GRAPHITAR GRADE 88
	LUBRICANT GRAPHITAR GRADE 92
	LUBRICANT GRAPHITAR GRADE 94
	LUBRICANT GRAPHITAR GRADE 95
WILLIAM F NYE INC	LUBRICANT NYE FLUOROETHER GREASE 899
WITCO CORPORATION	LUBRICANT SRG-160

MANUFACTURER	DESIGNATION
	LUBRICANT CITGARD 500 SAE 10W FORMERLY CITGO C-510
	LUBRICANT CITGARD 500 SAE 30W FORMERLY CITGO C-530
	LUBRICANT CITGO PREMIUM GEAR OIL (MP) SAE 80W-90
	LUBRICANT CITGO PREMIUM GEAR OIL (MP) SAE 85W-140
	LUBRICANT FLUOROGLIDE FB
	LUBRICANT HATCOL 1278
	LUBRICANT HATCOL 3211
	LUBRICANT INSULUBE 448
	LUBRICANT MOLYLUBE 1200
	LUBRICANT MOLYLUBE N
	LUBRICANT MOLYLUBE SPRAYCOTE
	LUBRICANT MS-122
	LUBRICANT MS-136
	LUBRICANT NYE RHEOLUBE 738
	LUBRICANT QUAKER STATE HIGH PERFORMANCE GEAR 80W-90
	LUBRICANT QUAKER STATE HIGH PERFORMANCE GEAR 85W-140
	LUBRICANT QUAKER STATE QUADROLUBE GEAR 140
	LUBRICANT QUAKER STATE QUADROLUBE GEAR 90

671 rows selected.

LUBRICANTS - 671 MATERIALS

MATERIAL PROPERTIES

PERTY	COUNT(*)
ABRASION RESISTANCE	10
ARC RESISTANCE	6
BOILING POINT	19
BOMB OXIDATION	29
BORDERLINE PUMP	6
BULK MODULUS	56
COEF OF FRICTION	131
COMPRESSION SET	2
COMPRESSIVE ELASTIC MODULUS	24
COMPRESSIVE STRAIN	4
COMPRESSIVE STRENGTH ULTIMATE	126
COMPRESSIVE STRENGTH YIELD	19
CONTINUOUS SERVICE TEMP MAX	377
CONTINUOUS SERVICE TEMP MIN	257
CREEP STRENGTH	7
DEFLECTION TEMP	16
DEFORMATION PERCENT	18
DENSITY	381
DIELECTRIC BREAKDOWN	9
DIELECTRIC CONSTANT	39
DIELECTRIC STRENGTH	29
DISSIPATION FACTOR	31
DROPPING POINT	81
ELECTRICAL RATING	2
GATION	30
ENDURANCE LIFE	78
FATIGUE LIMIT	4
FIRE POINT	69
FLASH POINT	386
FLEXURAL MODULUS	20
FLEXURAL STRENGTH	24
FLOW POINT	2
GEL TIME	9
HARDNESS	110
IMPACT RESILLIENCE	1
IMPACT STRENGTH	26
INSULATION RESISTANCE	2
INTERMIT SERVICE TEMP MAX	30
INTERMIT SERVICE TEMP MIN	14
LIMITING PV	4
MELT POINT	44
OPTICAL EMISSIVITY	2
PEEL STRENGTH	1
PENETRATION	222
POT LIFE	3
POUR POINT	218
REFRACTIVE INDEX	15
SELF IGNITION TEMPERATURE	3
SHEAR STRENGTH	9
SHELF LIFE	171
SOFT POINT	5
SOLIDS PERCENT	88
SPECIFIC GRAVITY	311
SPECIFIC HEAT	76
SURFACE RESISTIVITY	2
SURFACE TENSION	11
TACK FREE TIME	3

TEAR STRENGTH	39
TENSILE ELASTIC MODULUS	107
TENSILE STRENGTH ULTIMATE	166
THERMAL CONDUCTIVITY	144
THERMAL EXPANSION COEF	190
T[redacted]QUE STRENGTH	37
V[redacted]OR PRESSURE	129
VISCOSITY	743
VISCOSITY INDEX	134
VOC (VOLATILE ORGANIC CONTENT)	11
VOLATILES PERCENT	87
VOLUME RESISTIVITY	33
WATER ABSORPTION	10
WEAR	310
	11
sum	5823

72 rows selected.

CHEMICAL RESISTANCE PROPERTIES

PROPERTY	COUNT(*)
OBSERVED CHANGE	1208
WEIGHT CHANGE	179
	2
um	1389

****

TASK 6

Technical Personnel (Computer)

Task required technical personnel capable of interacting

with a Relational Data Base Management System. BAMSI provided form one (1) to two (2) computer programmers and a computer assistant during the seven year contract.

Computer programmers were given Oracle training and training on Digital Equipment. Each time Oracle was upgraded they received additional training.

BAMSI technical support personnel provided the programming for all the metals and non-metals properties databases.

In addition to those databases, the following databases and/or tables have been created during this contract. The databases have been created using the ORACLE RDBMS using DCL for the menus. Each database has a menus to access the canned queries, which have several report and search options, data entry/update screens and help screens;

1. **Nozzle Data Base** - A program was written to read the data tape supplied by Thiokol. This data was generated by Southern Research Institute (DRI) of FM 5834 carbon phenolic, FM 5055 carbon phenolic, FM 5839 carbon, FM 5064 carbon.
2. **Atomic Oxygen Data Base**
3. **Long Duration Exposure Facility (LDEF) Data Base** - This data was generated from technical research papers written by the investigators of each experiment. A M/Vision version of this database has also been created to gain additional exposure and take advantage of new software innovations. A program was written to read the data from the MAPTIS Data Base and create a M/Vision input file which is then read directly into the M/Vision Data Base.
4. **Material Usage Agreements (MUA) Data Base**
5. **Structural Materials Failure Analysis Data Base**
6. **High Temperature Data Base** - This Data was loaded from disks sent to us from Oak Ridge National Laboratory.
7. **Magnetic Materials Data Base** - The Magnetic Materials Data Base is divided into two parts, high permeability and permanent magnetic alloys. The data is from Metals Progress Data Sheet complied by R.A. Chegwidden and Magnet Sales and Manufacturing Company.
8. **Metals Selection List Data Base**
9. **Goddard VCM Table** - This data is loaded from files set to use from Goddard Space Flight Center on disks and through internet. A Data Entry/Maintenance screen has been created to update current data and prepare it to be transferred into the production (Test Report) database. A COBOL program was written to perform the data transfer.
10. **Intercenter Agreement Certification Letters**
11. **MAPTIS Change Requests**
12. **NEIS Data Base (Environmental Replacement Technology)**

A copy of on-line data input screens are attached.

MUA DATABASE SCREEN ***** FOR CORRECTIONS ONLY *****

CL MUA NUMBER PROJECT SYSTEM SUB-SYSTEM APPROVAL EFFECTIVITY-FLIGHT
FOR PART #(S) SPECIFIED
ITEM DESCRIPTION AC # CONTRACTOR SPECIFICATION ISSUE
CORR FL SCC TVS TOX
MATERIAL LOCATION PRESSURE TEMP TEMP2
OTHER
MEDIA DISPOSITION REC DATE ACT DATE
SAMPLE REQ. (Y):
MATCD APPLICATION RATIONALE TBD
DISPOSITION MEMO
C
<NEXT BLOCK> ********** MATERIAL CODES **********
MATERIAL CODE MATERIAL SPECIFICATION
<NEXT BLOCK> ********** USING ASSEMBLIES **********
PART NUMBER USING ASSEMBLY PART NUMBER
<NEXT BLOCK>********** COMMENTS **********
SEQ COMMENT
*** (Press next record key <4> to check for more records) ***
Count: *0 <Replace>

======== MUA MATERIAL CODES ========

MUA NUMBER _____

PROJECT _____

MATERIAL CODE _____

MATERIAL _____

SPECIFICATION _____

Count: *0

<Replace>

======== MUA PROJECTS / CONTACTS ========

MUA_PROJECT _____

MANAGER _____

CHIEF_ENG _____

LEAD_ENG _____

COMMENTS _____

Count: *0

<Replace>

======== PREVIOUS ACTIONS ON MUA'S ========

***** Enter MUA # as is exists in database, then commit. *****
*
* MUA NUMBER _____ *
*
*

PROJECT _____

CONTRACTOR CODE _____

DISPOSITION _____

DISPOSITION MEMO _____

MUA NUMBER	PROJECT	COMMENTS

Count: *0

<Replace>

======== MUA CONTRACTORS ========

CONTRACTOR NUMBER

____

CONTRACTOR CODE

_____

CONTRACTOR NAME

_____

Count: *0 <Replace>

MUA DATABASE SCREEN ***** FOR CLASS II MUA'S ONLY *****

CL MUA NUMBER PROJECT SYSTEM SUB-SYSTEM APPROVAL EFFECTIVITY-FLIGHT
2 FOR PART #(S) SPECIFIED
ITEM DESCRIPTION AC # CONTRACTOR SPECIFICATION ISSUE
CORR FL SCC TVS TOX
MATERIAL LOCATION PRESSURE TEMP TEMP2
OTHER
MEDIA DISPOSITION REC DATE ACT DATE
TBD
MATCD APPLICATION RATIONALE SAMPLE REQ. (Y):
DISPOSITION MEMO
C
(Type 'TABLE' if material has more than one matcd.)

********** PARTS ASSEMBLY **********

MUA NUMBER PROJECT PART # / DRAWING # USING ASSEMBLY

********** MUA COMMENTS **********

MUA NUMBER PROJECT CODE SEQ COMMENTS

*** (Press next record key <4> to check for more records) ***

Count: *0 <Replace>

Failure Analysis Data Entry/Update Screens

======== FAILURE ANALYSIS ========

REPORT NUMBER _____ PROJECT _____

SYSTEM _____ SUBSYSTEM _____

PART _____ UNS NUMBER _____

MATERIAL _____

ENVIRONMENT _____ FAIL MODE _____

TYPE MISHAP ANALYSIS LOC. ANALYST

_ _____ _____ _____

========== ABSTRACT ==========

Count: *0 <Replace>

======== HIGH-TEMPERATURE DATABASE: FATIGUE TABLE ========

MATERIAL	_____	CONDITION	_____
TEMP (C)	_____	CONTROL MODE	_____
STRS STRN RNG	_____	STRAIN RATE	_____
STRESS	_____	ELASTIC STRN	_____
PLASTIC STRN	_____	FREQUENCY	_____
CYCLES TO FAIL	_____	CYCLES DISCONT	_____
HOLD MODE	_____	HOLD TIME (HOURS)	_____
DS (REFERENCE)	_____		

Count: *0

<Replace>

======== HIGH-TEMPERATURE DATABASE: CREEP/TENSILE TABLE ========

MATERIAL	_____	PROPERTY NAME	_____
CONDITION	_____	TEMP (C)	_____
STRESS	_____	STRAIN	_____
STRAIN RATE	_____	YIELD STRESS	_____
ELONG UNIFORM	_____	ELONG TOTAL	_____
REDUCT AREA	_____	TIME (HOURS)	_____
RUPTURE TIME	_____	DS (REFERENCE)	____

Count: *0

<Replace>

======== HIGH-TEMPERATURE DATABASE: PROPERTY-TABLE ========

MATERIAL _____

PROPERTY: # __ _____ PARAMETER NAME _____

PROPERTY VALUE _____ PROPERTY UNIT _____

CONDITION _____ TEMP (C) _____ DS ____

========== PROPERTY NAMES: ==========

01. Thermal Treatments	02. Specific Heat	03. Thermal Conductivity
04. Thermal Expansion	05. Emissivity	06. Electrical Resist
07. Tensile	08. Creep	09. Fatigue
10. Compressive	11. Elasticity	12. Poissons Ratio
13. Hardness	14. Vapor Pressure	15. Compatibility
16. Material ID	17. Availability	18. Thermal Shock
19. DBTT	20. Toughness	21. Crystal
22. Other Properties		

Count: *0 <Replace>

======== HIGH-TEMPERATURE DATABASE: DATA SOURCE TABLE ========

MATERIAL _____

DS (REFERENCE) ____

SEQ __

REFERENCE _____

Count: *0 <Replace>

======== HIGH-TEMPERATURE DATABASE: TEXT TABLE ========

MATERIAL _____

PROPERTY NAME _____

SEQ __

TEXT _____

DS (REFERENCE #) ____

Count: *0

<Replace>

======== HIGH-TEMPERATURE DATABASE: GENERAL TABLE ========

MATERIAL _____

COMMON NAME _____

UNS _____

DENSITY _____

DATA SOURCE _____

Count: *0

<Replace>

======== MAGNETIC DATA FOR PERMANENT MAGNET ALLOYS ========

MATERIAL _____

MPOSITION _____

HEAT TREATMENT _____ (deg C) DENSITY _____ (LBS/CU. IN.)

MAGNETIZING FORCE (H max) _____ (oersteds)

COERCIVE FORCE (H c) _____ (oersteds)

RESIDUAL INDUCTION (B r) _____ (gauss)

ENERGY PRODUCT (BH max) _____

CURIE POINT _____ (deg C)

MAX PRACTICAL OPER. TEMP. _____ (deg C)

MECHANICAL PROP. _____ METHOD OF FABRIC. _____

Count: *0 <Replace>

======== MAGNETIC DATA FOR HIGH-PERMEABILITY MATERIALS ========

MATERIAL _____ FORM _____

COMPOSITION _____

HEAT TREATMENT _____ (DEG C)

PERMABILITY @B=20 _____ (GAUSSES)

MAX PERMEABILITY _____

SAT. FLUX DENSITY _____ (GAUSSES)

HYSTERESIS LOSS _____ (ERGS PER CU. CM.)

COERCIVE FORCE _____ (OERSTEDS)

RESISTIVITY ___ (RESISTIVITY) DENSITY ____ (G. PER CU.CM.)

Count: *0

<Replace>

MAPTIS NONMETALS TEST REPORT
CONFIGURATION THERMAL VACUUM STABILITY ENTRY/UPDATE

TRP: _

Test Rpt: _____ Matcd: _____ Source: _____ Tst Date: _____
Pressure: _____torr NHB: CTVS_ Type: CTVS_
Substrate - Thick: _____in Mtrl: _____
Sample Temp: _____ Duration: ___hrs Collection Temp: ____f
Pretest Wgt: _____ Post Wgt: _____gram WVR Wgt: _____gram
Sample no: _
Condensation Rates -
Max: _____ Min: _____ 24 Hrs: _____
Cure No: __ Rating: __ Reference: __ Skew Flag: _____

Type	Seq	Remark	Matcd	Test Rpt

Count: *0

<Replace>

VCM Data Entry/Update Screens

========= GODDARD CVCM TEST DATA FROM BILL CAMPBELL =========

Ctrl Code: _____ Category: __
Use Type: _____
Designation: _____

Test Report: _____ TWL: _____ VCM: _____ WVR: _____

Cure Steps: _
Cure Number: ___

	Time	Temp	Atomsphere
Phase 1:	____	___	____
2:	____	___	____
3:	____	___	____
4:	____	___	____

======== MATERIAL MANUFACTURER PER GODDARD ========

Name: _____
Division: _____
Addr1: _____
Addr2: _____
City: _____ State: __
Country: _____

Count: *0 <Replace>

INTERCENTER AGREEMENT CERTIFICATION LETTERS

LETTER NUMBER _____ ORIGINATING ORGANIZATION _____ ORIGINATOR LAST NAME _____ RELEASE DATE _____

MISSION _____ ID # / EXPERIMENT # _____

TITLE _____

SEQ	ITEM	PART NUMBER
___	_____	_____
___	_____	_____
___	_____	_____
___	_____	_____
___	_____	_____
___	_____	_____
___	_____	_____
___	_____	_____

Count: *0

<Replace>

CR No: _____-____

MAPTIS CHANGE REQUEST (MCR)

Initiated By:
Name: _____
Org: _____
Date: _____
Phone: _____

Submitted By:
Name: _____
Org: _____
Date: _____
Phone: _____

Chairman: _____ Date: _____ Disposition: _____

Change Title: _____
Program(s) Affected: _____ Matcds: _____

Change Type:
_ Material Code _ Use Type _ Manufacturer _ Programming
_ Test Report _ Specification _ Designation _ Other
_ Composition _ Generic ID _ SMAC Value

Description of Change (From-To): _____
Justification of Change: _____
Impact of Change: _____

SUBMIT: _ PRINT: _____

Enter a query; press KP-, to execute, PF4 to cancel. _____
Count: *0 ENTER QUERY <Replace>

MCRD NR: _____ _____ BOARD DATE: _____
CHAIRMAN: _____ DATE: _____
PRINT: _____ SEND NOTICE TO: BCSS _ BAMSI _

REQUESTED BY: _____ ORGANIZATION: _____
TASK TITLE: _____
DB AFFECTED: _____
COORDINATOR: _____ DUE DATE: _____

TASK DESCRIPTION:

_____

PROGRAMMER DOCUMENTATION:

_____

DATE/TIME	STATUS	REMARK
13-MAY-1993 07:45:56	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Enter a query; press KP-, to execute, PF4 to cancel. _____
Count: *0 ENTER QUERY <Replace>

NEIS Data Entry/Update Screens

======== RTT PROPERTIES ========

Chemical: _____

CAS Number: _____

Application: _____

Density: _____ Gm/cc at 77 F

Toxicity: _____ ppm (v/v) Code: ___ TLV or AEL

Ozone Depletion Potential: _____

Enter_a_CHEMICAL_or_choose_from_the_list..._PRESS_CTRL_F_____
Count: *0 <List><Replace>

STANDARDS AND SPECIFICATIONS USING OZONE DEPLETING SUBSTANCES

DOCUMENT NUMBER AND REVISION _____ CUSTODIAN _____ DOCUMENT TYPE _____

TITLE _____
USAGE _____
SUBSTANCE CONSTRAINTS (FORBIDDEN/ALTERNATIVE) _____
ABSTRACT _____

+----- USERS -----+
| _____ |
| _____ |
| _____ |
+-----------------+

+-------------- CHEMICALS AND PRIORITY ---------------+
| _____ _____ |
| _____ _____ |
| _____ _____ |
+---+

+ REFERENCED DOCUMENTS +
| _____ |
| _____ |
| _____ |
+----------------------+

Count: *0 <Replace>

======== NOET CONTACTS MATRIX ========

Operational Capabilities _____

Facility _____

Contact Name _____

Office _____ Phone _____

Count: *0 <Replace>

ENVIRONMENTAL REPLACEMENT TECHNOLOGY KNOWLEDGE BASE Page 1 of 2

RTT Unique Identification: _____ Date of Last Update: 17-MAY-93

Tracking Number: _____
User/Contractor Name: _____ Funding Status: _____
Point of Contact: _____ Initiation Date: _____
Phone Number: _____ Completion Date: _____

Associated Documents / Reports:

Title: _____

Project Summary:

Press NEXT BLOCK key to go to page 2 (chemicals and usage).

Count: *0 <Replace>

ENVIRONMENTAL REPLACEMENT TECHNOLOGY KNOWLEDGE BASE Page 2 of 2

Chemical: _____ Priority: _____
Synonym: _____

CAS Number: _____ Objective: _____

Environmental Area: _____ _____

Most Stringent Applicable Law or Regulation:

<NEXT BLOCK>========== USAGE ==========

Process: Potential Alternative Process:

Application: Potential Replacement Chemical:

General Equipment Type: NASA/Center Specs/Standards Affected:

Enter_a_CHEMICAL_or_choose_from_the_list..._PRESS_CTRL_F_____
Count: *0 <List><Replace>

NEIS - TIM PRESENTATIONS

SUBJECT	LOCATION	BEGIN DTE	END DTE	ATTENDEES

<NEXT BLOCK>----------

AGENDA

NO.	DATE	TIME	TOPIC	TOPIC DESCRIPTION

Count: *0

<Replace>

TASK 7

Data Capture System for Graphical Materials Properties and Other Information

BAMSI in cooperation with Boeing studied the possibilities of hardware that was compatible with the VAX from Digital that was in operation at that time.

After reviewing documentation on several graphics, BAMSI and Boeing representatives went to Atlanta, Georgia to watch a demonstration of the Ricoh Image Scanner.

This scanner seemed to be the one that would perform most of the functions required by NASA. The scanner was purchased and connected to a VAX 3400 Workstation to accomplish this task. The image can be scanned, then it is rendered into a sixel format and display it on the workstation and VT graphics terminals.

TASK 8

Age Life Data Base Development

The program was initiated to provide research, compile and analyze static and heat aging, and determine if a database was feasible. This task began with a literature survey of available data. BAMSI began a literature search at the Redstone Scientific Information Center on the NASA Recon and DTIC. In addition, Sverdrup provided technical support by performing a literature survey on the Metadex Data Base (industrial database of technical paper, some reviewed. Likewise, Severdrup obtained 41 references out of 1576 abstracts that were reviewed. BAMSI then evaluated all the technical paper references identified as being applicable to this task.

The above described search was performed on the database systems at RSIC via a key-words search and categories combinations. An example of the key-words and categories used are as follows:

Category 1 - age, aging, shelf life, long term, etc.

Category 2 - polymer, plastics, rubbers, elastomers, nylon, acrylic, polyester, urethane, silicone, PVC, epoxy, chloride, nitrile, non-metal, material, etc.

Category 3 - deterioration, degradation, effects, testing, etc.

The data that was founded in the technical paper was very limited and applied to generic composition of the material. There was minimal traceability to the actual product(s) tested. The majority of long term aging (shelf, storage) was on o-ring and gasket materials. The majority of the papers did not provide property degradation data (except for the published studies on o-ring and gasket materials. The majority of the papers did not provide property theory. The basis set by NASA for evaluation was degradation of mechanical and/or physical properties. This type of data was minimal; and when found, it was usually for short periods of time or for heat accelerated aging. True static shelf life data was very minimal. The majority of the effects reported were appearance changes (surface texture, color, cracking, etc.). This data type was discussed with NASA/EH02, and was not the type of data desired.

A letter requesting information on all tasks assigned by contract was written and distributed to all NASA centers Materials and Processes directors or representatives. They were requested to forward any information, points of contact, data, etc., on the data topics, and ensure the letter was distributed to all applicable branches. There was a very poor response for aging effects; the information received applied to environmental effects of aging such as UV and radiation (this data was very limited with minimal mechanical and/or physical properties degradation data).

Additionally, age life data was discussed with EH33/Dr. Patterson of NASA/MSFC. A technical paper on aging of rubber and plastic (IN-ASTM-M-71) was obtained from Dr. Petterson and references of Mil-Std-695 were discussed as providing mostly testing and storage requirements. IN-ASTM-M-71 was the majority of the data obtained, other than that obtained from Mosites Rubber Company. IN-ASTM-M-71 provided long term aging data on various rubber compounds per Mil-P-5315, Mil-G-5510, and Mil-P-5316. Most of the property degradation data was provided on bomb oxidation studies. The long term aging data provided in the technical paper was based on the sealing ability of the rubber pressure seals at different pressures, tested semiannually over a 10 year period. This data did not provide the property degradation effects desired. However, the data was useful and would be entered into the database, if a database was generated.

Due to obtaining minimal static long term aging data, the data collection focus changed to accelerated aging data (heat aging). The literature survey performed by BAMSI and Severdrup, mentioned above, incorporated accelerated aging. The data found on this area was among the 52 applicable documents/technical papers with data. Also, MSFC had purchased a software package that predicted the application life of materials using Arrhenious Theory with heat aging data from Digital Engineering called System 1000. This system was designed for the nuclear power plant industry to evaluate replacement times required for soft goods in valves, lines, etc., based on 50 percent property degradation. An evaluation of the system and Digital Engineering's place of business. Sverdrup reviewed many of the references, finding little actual data but they find Arrhenious coefficients of the materials. Therefore, a subcontracting effort with Digital Engineering to obtain the data was evaluated. The cost for subcontracting exceeded BAMSI consulting funds and the proposal did not state that the data would be released to NASA for storage in MAPTIS; therefore, NASA declined additional funding for the limited product. Even though the literature survey and Digital Engineering references did not provide vast amounts of data, it did provide information on the accelerated aging testing per Underwriters Laboratories' UL746B for commercial products. UL 746B is a testing specification for the determination of a thermal index on electrical and thermal insulation materials. Arrhenious theory is used to predict the thermal index of the materials via heat accelerated aging property effects data over three (3) or four (4) temperature data points. NASA/EH02 wanted to obtain more information on this testing and the resultant data.

All research efforts focused on obtaining UL746B data. After contacting Underwriters Laboratories and providing information on the task, UL746B data was requested. Underwriters Laboratory stated that they did not maintain a database that was readily accessible to only the UL746B

data. Products and materials submitted for testing were tested for many different aspects, and UL746B may be only one (1) of the tests performed on the material in question. In addition, the data was purchased, and therefore owned, by the material manufacturer. However, UL mentioned that though the recognized component directory (a published 3 volume set of UL recognized materials and components) the general thermal index of a material type may be correlated to the specific RTI of a component. This may give the manufacturer and the material. This led to a print-out of all plastics, rubbers, and insulators by manufacturer, material name and composition from the Test Report Data Base on MAPTIS.

Solicitation of the manufacturers for heat aging effects data (UL746B) data, etc., began as follows:

- 218 out of 381 companies were contacted from July 1990 to March 1991
- 465 contacts were made via phone, with approximately 4000 of the 5700 products that had data requested. Data was requested on single constituent products and not on assemblies or configurations (i.e. Kel-F, nylon, Scotch 650 and not on Mil's or connectors or electrical assemblies, etc.)
- 60 memos were submitted to manufacturers, per their request, identifying our task and desires. A list of the products for that manufacturing division from MAPTIS was attached, and examples of aging data attached to provide a better explanation of what was desired
- obtained data on 77 of the 4000 products from 20 of the 218 companies contacted. Thirteen of the products were true static aging data, 21 of the products were accelerated heat aging data with three (3) or more temperature points, nine (9) of the products were UL cards submitted listing the thermal index, 29 of the products were accelerated heat aging data at only one (1) or two (2) temperature points, and the remaining products has non-applicable data.

From this data, an Arrhenious application was life data available. The static age life data was not a direct correlation to the property used for evaluating the accelerated aging. However, this would provide a ballpark estimate of life comparison of the material. The Arrhenious Equation was used in the following manner:

K = A exp.[Ea./RT.] transformed to the equation of a line.

In K= In A - Ea./RT.

where K = Reaction Rate (life)

A = Frequency Factor (a constant)

Ea. = Activation Energy

R = Boltzman's Constant (8.6175E-5 e V/K)

T = Absolute Temperature in °K

Using the equation with the obtained data at three (3) different temperatures, the activation energy (Ea.) and the frequency factor (A) can be obtained from plotting the data as In (hours) vs. (1/T). The slope (Ea./R) of the best fit line through the data will provide EA. After obtaining Ea. and A, the predicted life of the material can be obtained at a given temperature. However, it is suggested that temperatures above the highest test temperature not be evaluate.

This application was feasible to design a database, if enough data could be obtained. The response from the manufacturers was slow, and it would take many years to obtain and compile. The other alternative is to generate a heat aging test program at MSFC. This idea and application of the Arrhenious Theory was of extreme interest to EH02. A presentation was made to the Materials and Processes Laboratories branch chiefs on the application of the Arrhenious Theory for approval to pursue the possible proposed in-house test program. The test program was proposed with a slight modification to the contract for additional personnel. The consensus from NASA, with the major emphasis voiced from the Engineering Physics Division, was that no funding was available and that more interest was present at that time in the environmental effects. Therefore NASA concluded that sufficient manpower had been utilized on the feasibility of an age life database for static aging (static life defined here as "shelf life" and "installed life" and does not include "operation environment"). The task was closed and considered complete. A memo was submitted to the COTR for any further action required on BAMSI's part for the age life task. A verbal response was provided, stating that no more manpower needed to be used on age life, that there were other areas where that manpower was required.

A compilation of technical papers and manufacturers' aging data obtained in the research, along with Digital Engineering's proposal, are included in Appendix XXXXX. The preliminary data storage format that was updated from the forms in the contract's appendix are attached and were generated with the assistance of the database supervisor and BCSS programmers. BAMSI believes that an age life database can be generated via the Arrhenious Theory and the effort and solicitation of data will take a great deal of manpower, or an excellent PR program from NASA, to promote the MAPTIS system and the manufacturers' products.

Fungus Data Base Development

The program was initiated with a NASA point of contact Dr. Elizabeth Rogers and followed-up with a literature survey of available data. BAMSI began a literature search at the Redstone Scientific Information Center on the NASA RECON and DTIC. In addition, Severdrup provided technical support by performing a literature survey on the Metadex Data Base (industrial database of technical papers, some paper abstracts provided). This provided approximately 322 technical papers/reports from the key-words search. The searches were performed using the following words:

Category 1- Fungal, Fungi, Mildew, Mil-Std-810

Category 2 - Polymer, Plastics, Rubbers, Elastomers, Nylon, Acrylic, Polyester, Urethane, Silicone, PVC, Epoxy, Chloride, Nitrile, Metal, Material, etc.

Category 3 -Deterioration, Degradation, Effects, Testing, Growth, etc.

The abstracts were overviewed for paper selection and applicability. Thirty-six documents out of the original 322 were obtained and actual data reviewed. Most of the papers that provided data were from Natick Research Center. Many documents were government distribution limited. Letters of request to have the privileges to view and extract data from the government distribution limited documents were generated. One of the distribution limited documents provided the majority of the data found to be useful. However, many of the papers and biodeterioration conference documents were on testing methodology and biocides and their effects, or soil burial effects.

A letter requesting information on all tasks assigned by contract was written and distributed to all NASA centers Materials and Processes directory or representatives. They were requested to forward information points of contact, data, etc. on the data topics, and ensure the letter was distributed to all applicable branches. There was very poor response for fungal effects; no information was received, and no points of contact provided.

Additional research and technical support was provided from Sverdrup through their attempts to contact those originators of the Mil-Std-454 Fungi Susceptibility of Materials Table, and any points of contact who originated the Mil-Std-810. The originators were either retired or deceased, and the personnel over the current branch responsible for the documents had no additional information t provide, and implied they wish they had the data. In addition, Sverdrup began to contract testing laboratories to identify those that perform the ASTM or Mil-Std-810 Fungal Growth Tests or any fungal effects testing. They found a few that performed the testing. One laboratory in California was contacted by Sverdrup, and they stated that this testing was performed but the data was proprietary to the customer and the customer owned the data. They were asked if a list of customers that had this testing performed could be provided, and obtained the same answers.

Another avenue of data was pursued by contacting materials engineering groups that performed work on past flight hardware which had the requirement for the materials to meet Fungal Effects per Mil-Std-810. The Titan II program, the most significant, points of contact Chuck Toth and John Walker stated that the fungus was the least of the concerns on the program and that little testing was performed, and the requirements were waived.

After spending numerous man-hours of research, NASA and BAMSI came to a conclusion to compile the available data and design a data storage format for MAPTIS. The data was not mechanical or physical degradation effects, but more of a fungal growth effect and whether the material was nutrient or non-nutrient. The database was designed based on the quantity of fungal growth (heavy, moderate, light, sparse, trace, no growth), depending on the nutrients, type of organisms, duration of the test, temperature, humidity, and test specification followed. The design was similar to that initially provided in the contract's appendix. The existing design resides on MAPTIS. The storage format was presented to Dr. Rogers of NASA/MSFC. From this point in the program, NASA directed us to complete the database and rely on the test data to be obtained from Space Station. Therefore, the compiled list was reviewed for applicable NASA material identification codes (material codes, a five digit numeric code) in MAPTIS for data entry.

It was discussed with the NASA Biochemistry group (EH31 and EH32/Dr. Rogers) if it would be plausible to utilize the base generic composition of the materials with the same generic composition without fungal growth data. It was concluded that the transfer of data on a similarity basis using generic base composition would not be plausible due to the fact that two (2) materials with a PVC base had extremely different test results. The difference is probably due to the various additives (fungicides, UV stabilizers, pigments, fillers, antioxidants, etc.) in the materials being tested.

The majority of the data was obtained from a Redstone Technical Report, NASA/MSFC Interoffice Memorandum of the Materials Lab, and Natick Research Center. The compiled data is attached, as well as the listing of fungus reference documents. A great deal more research is required in order to make the database worthwhile since no voluminous amounts of data will be provided via the Space Station Program. An alternate path that was suggested to NASA was to contact manufacturers that listed their products as non-nutrient to fungus, and query them about their test data to support this statement on the product. The

idea was not supported by NASA since other tasks in the contract required additional manpower. Essentially, the database research and compilation was completed in January of 1992.

Nozzles Data Base

The Nozzles Properties Data Base task was to evolve from composite materials used in the fabrication of rocket nozzle materials. A kickoff meeting was held with the NASA/MSFC EH02 office to discuss the use of manufacturers' data, as well as other sources. It was emphasized that the data desired was that which had and is being generated under contract with Thiokol and Southern Research Institute (SoRI) on carbon-phonolic materials. This data was to be transferred electronically to MAPTIS, and Thiokol was generating the "universal format" data tape for the data transfer. NASA/EH34/Dr. R. Clinton was the point of contact for the nozzle data contract.

BAMSI (engineer and programmer) participated in several meetings held with Thiokol, NASA, and other users interested in this data. The meeting mostly discussed the progress of testing and the Thiokol data tape. The data tape format was created by Thiokol/Mark Warner, and was not specifically generated for the MAPTIS system. BAMSI learned that the format was set a year earlier, which was during a time frame when BAMSI was not involved yet. Due to the Thiokol contract nearing an end and no format requirements received, the format was not going to be changed. Thiokol's data tape was promoted as being generated with a "universal format" that could be downloaded into any system, and this would allow the data tape to be sent and used by Rocketdyne, Pratt & Whitney, etc. The "universal format" was not a database, it was simply a data file and required an interface software program to be written to load the data into Oracle.

The data tape for the four (4) composite materials (FM5834,FM5055, FM5064, and FM5839) was received and copied to a storage file in the BAMSI account on the VAX system. The format was reviewed by the BAMSI programmer and engineer. In addition, the format reports from SoRI were obtained for a more thorough review of the data, and better understanding of the testing methods and data acronyms used. BAMSI strived to ensure the data entered on the database was accurate and usable, and problems with the data tape format, as listed below:

- tape received 29 April 89 did not include a full description of each nozzle material (i.e., fabric yearn type, style, weave, warp and fill counts, prepreg resign, pitch resin, etc.)
- data tape did not include pretest material conditioning (as did the final report released)
- inconsistent use in attribute format and sequence
- inconsistent delimiting of names and values
- inconsistent property naming, no standardized convention (from material and orientation to material and orientation)
- test parameters used in a remark field
- test properties and data stored in a remark field (Poisson's Ratio and Sec. Modulous)
- inconsistent identification of lay-up, generating multiple names for the same type of lay-up
- redundant raw data header and attributes with different data points
- omission of specific heat, thermal conductivity, thermal response, thermal expansion and enthalpy data
- not all data attributes/parameters provided for attained properties (i.e., reference temperatures, reference conductivity's, etc.)

The problems were submitted to NASA/EH34/R. Clinton and forwarded to Thiokol. Many of the data problems were resolved in the revision of the data tape. Some of the errors originated from SoRI and therefore were discussed with Dr. Koeing and Rick Cull (project engineers overseeing the testing at SoRI), and the input was forwarded to M. Warner of Thiokol for updating of the data tape. However, the non-standardized attribute convention, additional data in remarks fields. and reference point data was not resolved.

During this revision the interface software loading program was being developed. There were many problems in generating a routine to transfer the information into a usable format due to the additional attempt to modify the data tape was coordinated with Dr. Clinton/NASA and Mark Warner/Thiokol. A second revision was submitted on two of the materials, and some pointers and suggestions from Mr. Warner applied. Finally, an operator interactive software interface program was generated to transfer the data file into a usable format. The programmer answered questions and generated the table format as each unique item arrived. In some cases , the "universal" data tape file was broken down into separate files for each material to simplify the transfer of data. The work was very time consuming since many accommodations had to be made to standardize the data and format. Although an interactive to routine was developed and used successfully in loading the data, omitted data and extraction of information from the remarks fields required entry by hand and manipulation via data maintenance screens.

During generation of the interface software routine, the NASA/MSFC resident thermal and mechanical analysts were conferred with to determine the type of data and parameters they wanted to view. They specifically wanted the ability to pull the data by query and create an ASCII file in a comma delimited format to allow them to read the query answer(s) into their analysis system(s). The analysts were kept informed of the status of the data. During these

conferences, it was learned that some data that was required for adequate thermal analysis was not provided in the data tape of the final reports. This was brought to the attention of Dr. Koenig and Rick Culls (both of SoRI). They replied that the data was probably available and could be compiled, but it was not in the contract. This data was not obtained (specifically Density vs. Temperature data).

It was concluded by NASA/EH02 that the data received was to be entered and displayed and that BAMSI did not meet to spend any further time on verification of the data. The validity of the data was the responsibility of SoRI and Thiokol. Therefore, the existing data was loaded and verified for usability and applicability, and verified for MAPTIS integrity. The data that was omitted from the data tape, but present in the final reports, were entered via data maintenance screens. Those properties that were placed in remarks fields were extracted and placed into the appropriate data fields.

The preliminary database was finally developed and presented to EH34, EH02, and the thermal and mechanical analysts prior to completing the data updates via data maintenance screens. However, some constructive criticism was obtained on the query limitations and ordering of data. These suggestions were implemented. A final presentation was made of the Nozzle Data Base structure, query format, and update format to NASA/EH02 and EH34.

Ann Pucket, initially an employee of Thiokol/Huntsville who became a NASA employee prior to the completion of the database, was instrumental in relaying to the analysts and materials engineers for NASA that the "universal" data tape was not a database and that a great deal of work was to be required to create a queriable system. Her assistance and knowledge was greatly required. However, BAMSI suggests that future databases of the magnitude should be co-designed with database design engineers and programmers.

The data base is complete and resides at choice 1H on the MAPTIS main menu. Data maintenance and canned query screens and options are available. A memo requesting further direction was submitted to the COTR. The letter requested any additional sources of data that NASA desired to have in the system.

Radiation Effects Data Base

The objective of the task was to evaluate the feasibility of generating a radiation effects data base, and if feasible, creating the table structure, query format, and data maintenance update screens. The feasibility study began with a RSIC literature search on the DTIC and NASA Recon systems and conferring with the Engineering Physics Branch/EH11. In addition, letters were sent to the NASA Centers requesting information, documentation, and points of contact for radiation effects.

The literature survey provided approximately 200 possible courses from a key words and category combination search. Twelve of the 200 abstracts reviewed appeared to have applicable specific materials effects data. Most of the papers discussed satellite and configuration effects, and this did not allow property degradation data on specific materials to be extracted. Those papers that were found to have applicable data via the abstract were obtained and reviewed. The majority of the information provided in the papers were generic composition related and provided physical appearance changes only. There were a few documents that provided excellent data, but for only one (1) or two (2) materials.

Dr. Ann Whitaker and Jim Zweiner of NASA/EH11 provided some references for radiation effects. However, most of these references were component effects or mirror effects. Even the testing that was performed on materials for radiation effects did not provide the material name and property degradation effects. The radiating of the samples and components was performed, but the analysis was done by the parties requesting the radiating of samples. The test logs did not typically identify the requestor, and therefore could not be traced. The data obtained here was very minimal.

A response was received from JPL that informed BAMSI of a proposal that had been made to NASA/MSFC to generate a radiation data base for the MAPTIS system several years earlier. JPL had forwarded the final report XXXXXX on a radiation study that they had performed to Mr. C.F. Key/EH02. It was concluded by NASA that the JPL report should set the basis for the design of the radiation effects data base. The document was requested from NASA/EH02, being submitted through the COTR, but was not received. Therefore, a call was made to JPL/T. Odonnell to identify the technical paper number such that a document could be ordered through RSIC. The document was received approximately six months after the request to EH02. When the document arrived, it was reviewed and analyzed. The data was referred to in the body of the report and was to be in an attached appendix. The appendix did not accompany the document.

During the search for the JPL document, a literature search was stated on the Dialogue Metadex System at RSIC using a key words and category combination search. The search was started and was halted after four hours, providing over 3000 hits and costing thousands of dollars, because it had pulled only a small percentage of the entire search criteria. SIC called BAMSI requesting if the search should be continued, due to the cost of the search and the lack of faith that all this materials could be covered and reviewed without a great deal of additional manpower. This information was forwarded to NASA for their decision on

whether to continue the search or place a stop order. NASA informed BAMSI to stop the search and only use the data from the DUPLE report for the radiation data base. If sufficient manpower remained on the contract and the data base was at a point for update, BAMSI would be tasked to perform the update function.

The DUPLE data was never entered due to the inability of obtaining Appendix XX of the final JPL report.

The following list is an inventory of all reference materials on-hand at building 4623 that pertain to the efforts to build a Radiation Effects Data Base. This list was compiled on 26 March 1993 by John W. Strickland:

- JPL D-816 "Radiation Data for the Design/Qualification of Nuclear Plant Equipment", Research Project 1707-7, final report dated July 1983, prepared by Jet Propulsion Laboratory
- NASA-CR-132493 "Fundamental Investigation of Ultraviolet Radiation Effects on Polymeric Film-Forming Materials", done under contract number NAS1-12549, dated 13 July 1973, prepared IIT Research Institute
- NASA-CR-132740 "Investigation of Space Radiation Effects in Polymeric Film-Forming Materials", done under contract NAS1-13292-13292, dated Oct. 1975, prepared by IIT Research Institute
- unbound print-out of literature search performed some time during FY 1990, stack bound with rubber band, stack approximately two inches thick
- two folders containing various notes and pieces of correspondence between JPL and Marshall Space Flight Center, most dated during the mid and late 1980's.

Atomic Oxygen Effects

The objective of the Atomic Effects Research and Development Data Base task was to compile effects data and generate a database. The task was kicked-off with a literature search. Initially a search was performed on the DTIC and NASA Recon systems. Following the request for the literature search, resident MSFC NASA experts on Atomic Oxygen (A-O) were contacted. Then a NASA-wide (JSC, KSC, GSFC, LeRC, LRC, JPL) memo was submitted to NASA's Materials and Processes Laboratory Directors or representatives, requesting data and points of contact for Atomic Oxygen Effects data.

The contract with the MSFC NASA resident A-O effects experts, allowed a meeting to be coordinated to discuss and overview the key properties that were used tocharacterize and evaluate the A-O effects. MSFC/EH11 division representatives met with BAMSI's engineer and programmer. The meeting and the attached table structure for A-O effects provided in the contract's appendix, provided a preliminary start for the design. Data references consisting of STS-5, 8, and 17 A-O effects flight data were supplied by EH11. The references were a compilation of conference papers on the findings of A-O effects data from flight experiments and post flight experiment and shuttle inspections.

The literature survey provided the same papers, or additional papers that covered the same data by the same author. There was limited additional data on the A-O effects, since it was a relatively new phenomena occurring in low earth orbit.

The technical paper's data was over viewed and the characteristic properties and parameters were identified. These properties and parameters provided the baseline for the data entry forms. The data entry forms were reviewed with EH02 and EH11. However, due to the identification of materials used in the space flight experiments lacking 100 percent traceability, the data table structure was set-up as an independent entity, and not related to the Selection List (Test Report All Data) Data Base. The selection List uses the material code (a five digit code assigned by NASA to a material, trade name or specification dependent) as the key field linking all data tables, where the A-O effects data tables uses an eight digit sequence number unique to a material to link the tables. This allowed entry of data for those materials that did not have material codes, nor were desired to have a material code assigned at this time. The NASA material code; if applicable, was linked to the sequence number in the basic data table (Table identifying the material designation, composition, use type, etc.). This structure met EH02's request to segregate the data at this time and not to have additional material codes assigned for the limited amount of data found, unless decided upon at a later date. The forms were approved, and data table structures and data maintenance screens were generated for on-line entry of the data by the engineer. Once the data maintenance screens were complete, the technical papers were analyzed and data extracted and placed in the database. The data was tied to the data source by a four digit numeric code generated for each reference.

Due to the poor traceability of some materials identifications in the technical papers, memos written to the authors requesting the identification of the material. The memo was sent to the author, and would reference the paper, page number, the effects data discussed, and an explanation of BAMSI's task. There was a good response, which provided better material identification and database integrity. Of course, there were a few authors that did not respond.

During the data entry process, canned query report formats were generated providing selective property degradation effects, all data, listing of materials with data, and basic data. Once sufficient data was entered and the canned

query was verified, a demonstration of the database was presented to EH02 and EH11. EH02 provided some constructive criticism, where EH11 asked many questions on its operation and made comments that it was difficult to read the data. EH02's comments were implemented, while a hands on demonstration with EH11 followed. Several menu option changes and canned query select criteria changes were made to enhance the user friendliness of the system.

Upon completion of the data entry and modifications to the system, a final demonstration of the database was presented to EH02. NASA/EH02 was pleased with the database, but requested additional data to be added, such as ground base simulation data. However, EH11 did not want to add this type of data to the system due to the lack of direct correlation to the actual phenomena, and since the ground based testing had not been standardized. Therefore, simulation testing performed on the plasma asher, etc., was not to be entered. However, a quarterly search was being performed by BAMSI on NASA Recon, DTIC and Metadex to catch any recent released papers. EH02 then requested BAMSI to demonstrate and have a hands on session with EH11 prior to approval and acceptance of the database. A meeting with EH11 was coordinated through the COTR/J. Davis. There were three persons who were given the hands on demonstration. EH11 was not pleased with the printing format, and the changes they recommended would have caused the A-O Effects Data Base not to conform with the other MAPTIS Data Bases formats. This was explained and demonstrated to EH11, and they accepted the format. One additional comment they had was the use of the data and the presentation using A-O flux, instead of fluence. The presentation of the data versus flux or fluence depended on what center or person you talked to. However, the flux was obtained by using the exposure time for the experiments and the fluence the material was exposed to. Therefor, the flux or fluence relationship was applicable to the data, since it was linearized for uniformity of the data and lack of additional information from the papers. Upon conclusion of the meeting the database was considered complete.

400 — — —

TEST — AGE DATA

10. TEST DATE DAY MONTH YEAR

MATERIAL CODE: TEST REPORT NO: 20. DATA SOURCE:

30. NHB TEST: 40. TYPE: 50. SPECIFICATION:

60. RELATIVE HUMIDITY: % 70. TEST TIME: (HRS)

80. ENVIRONMENT – MEDIA: 90. TEMPERATURE: (°F) 100. PRESSURE: (PSIA)

	PROPERTY	INITIAL VALUE	FINAL VALUE	UNITS	% CHANGE
110.					

120. CURE NO: 130. RATING: 140. REFERENCE:

SEQ	999. REMARKS

TEST — AGE OVERALL EVALUATION

410- ___

MATERIAL CODE: ⌊_____⌋ 10. NHB TEST: ⌊_____⌋ 20. TYPE: ⌊_____⌋

30. TEST SPECIFICATION: ⌊_____⌋

40. RELATIVE HUMIDITY: ⌊_____⌋ % 50. TEST TIME: ⌊_____⌋ (HRS)

60. ENVIRONMENT - MEDIA: ⌊_____⌋ 70. TEMPERATURE: ⌊_____⌋ (°F) 80. PRESSURE: ⌊_____⌋ (FSIA)

90. PROPERTY: ⌊_____⌋ 100. CHANGE: ⌊_____⌋ %

110. CURE NO: ⌊__⌋ 120. RATING: ⌊__⌋ 130. REFERENCE: ⌊__⌋

SEQ 999. REMARKS

⌊__⌋ ⌊_____⌋

⌊__⌋ ⌊_____⌋

⌊__⌋ ⌊_____⌋

======== LDEF - PROPERTY COMMENT TABLE ========

This table contains a single entry for every distinct property comment Records between the tables LDEF_COMMENT and LDEF property are tied together via COMMENT_NUMBER. Changes made in this screen will also be reflected in records of the LDEF property table containing the cooresponding comment_number.

COMMENT NUMBER _____

COMMENT

Count: *0

<Replace>

======== LDEF - ATOMIC CONCENTRATION ========

SEQNUM	GRP	LOCATION	MATRL	SIDE	DS #

Ag	Al	C	Cl	Cu	F	In	K	N	Na	O	Pb	S	Si	Sn	Zn

SEQNUM	GRP	LOCATION	MATRL	SIDE	DS #

Ag	Al	C	Cl	Cu	F	In	K	N	Na	O	Pb	S	Si	Sn	Zn

SEQNUM	GRP	LOCATION	MATRL	SIDE	DS #

Ag	Al	C	Cl	Cu	F	In	K	N	Na	O	Pb	S	Si	Sn	Zn

Count: *0 <Replace>

======== LDEF DATA SOURCES ========

DS # ____

FACILITY _____

DOCUMENT TYPE _____

IDENTIFIER _____

DOCUMENT TITLE _____

DOCUMENT DATE _____

REMARKS _____

Count: *0

<Replace>

======== LDEF GENERAL PROPERTY TABLE ========

SEQNUM _____ MATCD _____ DS _____ GRP _ (M/N) EXPERIMENT # _____

___ (ev) SAMPLE THICK _____ (mil) LOCATION _____ MATERIAL SIDE _____ EXP TIME ____ (yrs) AOI _____ (deg)

A-O FLUX _____ (atom/sq.cm*s) A-O FLUENCE _____ (atom/sq.cm*s)

EST. SUN HRS SUBSTRATE

_____ _____

PROPERTY NAME QUALIFIER

_____ _____

PRE-FLT POST-FLT UNITS SAMPLE TEMP

_____ _____ _____ (cu.cm/atom) _____ (f)

COMMENTS _____

Count: *0

<Replace>

======== LDEF OPTICAL PROPERTY TABLE ========

SEQNUM _____ MATCD _____ DS _____ GRP _ (M/N) EXPERIMENT # _____

___ (ev) SAMPLE THICK _____ (mil) LOCATION _____ MATERIAL SIDE _____ EXP TIME ____ (yrs) AOI _____ (deg)

A-O FLUX _____ (atom/sq.cm*s) A-O FLUENCE _____ (atom/sq.cm*s)

EST. SUN HRS SUBSTRATE

_____ _____

NAME QUALIFIER

_____ _____

PRE-FLT POST-FLT UNITS TEST WAVELENGTH (nm) SAMPLE TEMP (f)

_____ _____ _____ _____ _____

TEST APPARATUS _____

COMMENTS _____

Count: *0

<Replace>

======== LDEF MECHANICAL PROPERTY TABLE ========

SEQNUM _____ MATCD _____ DS _____ GRP _ (M/N) EXPERIMENT # _____

E___ (ev) SAMPLE THICK _____ (mil) LOCATION _____ MATERIAL SIDE _____ EXP TIME ____ (yrs) AOI _____ (deg)

A-O FLUX _____ (atom/sq.cm*s) A-O FLUENCE _____ (atom/sq.cm*s)

EST. SUN HRS SUBSTRATE

_____ _____

PROPERTY NAME QUALIFIER

_____ _____

PRE-FLT POST-FLT UNITS SAMPLE TEMPERATURE _____ (f)

_____ _____ _____

COMMENTS _____

Count: *0

<Replace>

======== LDEF ELECTRICAL PROPERTY TABLE ========

SEQNUM _____ MATCD _____ DS _____ GRP _ (M/N) EXPERIMENT # _____

___ (ev) SAMPLE THICK _____ (mil) LOCATION _____ MATERIAL SIDE _____ EXP TIME ____ (yrs) AOI _____ (deg)

A-O FLUX _____ (atom/sq.cm*s) A-O FLUENCE _____ (atom/sq.cm*s)

EST. SUN HRS _____ SUBSTRATE _____

PROPERTY NAME _____ QUALIFIER _____

PRE-FLT _____ POST-FLT _____ UNITS _____ SAMPLE TEMPERATURE _____ f

COMMENTS _____

Count: *0

<Replace>

MAPTIS LDEF MATERIALS ENTRY/UPDATE

Sequence #: _____ Matcd Code: _____ Grp: _ Generic Id: _____
Use Type: _____
Temperature - Min: _____f Max: _____f
Designation: _____
Composition: _____
Comments: _____

Specification: _____

Manufacturer/Supplier (M/S): _ H4ID: _____
Name: _____
Division: _____
Addr1: _____ Addr2: _____
City: _____ State: __ Zip: _____
Country: _____ Phone: _____

Count: *0 <Replace>

MAPTIS ATO MATERIALS ENTRY/UPDATE

Sequence #: _____ Matcd Code: _____ Grp: _ Generic Id: _____
Use Type: _____
Use Temperature - Min: _____f Max: _____f
Designation: _____
Composition: _____
Comments: _____

Specification: _____

Manufacturer/Supplier (M/S): _ H4ID: _____
Name: _____
Division: _____
Addr1: _____ Addr2: _____
City: _____ State: __ Zip: _____
Country: _____ Phone: _____

Count: *0

<Replace>

======== ATOMIC OXYGEN DATA SOURCES ========

DATA SOURCE NUMBER ____ DOCUMENT DATE _____

TESTING FACILITY _____

DOCUMENT TYPE _____

IDENTIFIER _____

DOCUMENT TITLE _____

REMARKS _____

Count: *0 <Replace>

======== ATOMIC OXYGEN EXPOSURE CODE ASSIGNMENT SCREEN ========

EXPOSURE
CODE _____

CENTER _____

TEST FACILITY
(LAB or SPACE) _____

ENVIRONMENT

Count: *0

<Replace>

========= ATOMIC OXYGEN EFFECTS COMMENT TABLE =========

This table contains a single entry for every distinct comment. Records between the tables and the ATO_COMMENT table are tied together via COMMENT_NUMBER. Changes made in this screen will also be reflected in records of the other tables containing the cooresponding comment_number.

COMMENT #	COMMENT

Count: *0

<Replace>

======== ATOMIC OXYGEN EFFECTS CURE TABLE ========

MATERIAL CODE _____ SEQNUM _____ DATA SOURCE _____

GROUP (M/N) _ CURE STEP __ CURE PHASE __

TIME VALUE MIN _____ TIME VALUE MAX _____ TIME UNIT _____

TEMP VALUE _____ TEMP UNIT _____ (deg)

PRESSURE VALUE _____ PRESSURE UNIT _____

QUANTITY VALUE _____ QUANTITY UNIT _____

R.H. % _____

COMMENTS

Count: *0

<Replace>

===== ATOMIC OXYGEN EFFECTS ELECTRICAL PROPERTIES =====

SEQUENCE # _____ MATERIAL CODE _____ DATA SOURCE # _____ GRP _ (M/N)

SAMPLE THICKNESS _____ (mils) SURFACE AREA _____ (sqin) SUBSTRATE _____ APPLICATION METHOD _____

EXPOSURE TIME _____hrs) SAMPLE TEMP. DURING EXPOSURE _____ (f) MATERIAL SIDE EXPOSED _____ EXPOSURE CODE _____

E ___eV) FLUX _____ (atom/sqcm*s) ANGLE OF INCIDENCE _____(deg)

PROPERTY NAME _____ QUALIFIER _____ TEST METHOD _____

UNEXPOSED _____ EXPOSED _____ UNITS _____

REMARKS

_____

Count: *0

<Replace>

===== ATOMIC OXYGEN EFFECTS MECHANICAL PROPERTIES =====

SEQUENCE # _____ MATERIAL CODE _____ DATA SOURCE # _____ GRP _ (M/N)

SAMPLE THICKNESS _____ (mils) SURFACE AREA _____ (sqin) SUBSTRATE _____ APPLICATION METHOD _____

EXPOSURE TIME _____hrs) SAMPLE TEMP. DURING EXPOSURE _____ (f) MATERIAL SIDE EXPOSED _____ EXPOSURE CODE _____

E ___eV) FLUX _____ (atom/sqcm*s) ANGLE OF INCIDENCE _____(deg)

PROPERTY NAME _____ QUALIFIER _____ TEST METHOD _____

UNEXPOSED _____ EXPOSED _____ UNITS _____

REMARKS

_____

Count: *0 <Replace>

===== ATOMIC OXYGEN EFFECTS OPTICAL PROPERTIES =====

SEQUENCE # _____ MATERIAL CODE _____ DATA SOURCE # _____ GRP _ (M/N)

SAMPLE THICKNESS _____ (mils) SURFACE AREA _____ (sqin) SUBSTRATE _____ APPLICATION METHOD _____

EXPOSURE TIME _____hrs) SAMPLE TEMP. DURING EXPOSURE _____ (f) MATERIAL SIDE EXPOSED _____ EXPOSURE CODE _____

E ___eV) FLUX _____ (atom/sqcm*s) ANGLE OF INCIDENCE _____(deg)

PROPERTY NAME _____ QUALIFIER _____ TEST METHOD _____

UNEXPOSED _____ EXPOSED _____ UNITS _____

APPARATUS _____ WAVELENGTH _____(nm)

REMARKS

_____

Count: *0 <Replace>

===== ATOMIC OXYGEN EFFECTS OBSERVED CHANGES =====

SEQUENCE # _____ MATERIAL CODE _____ DATA SOURCE # _____ GRP _ (M/N)

SAMPLE THICKNESS _____ (mils) SURFACE AREA _____ (sqin) SUBSTRATE _____ APPLICATION METHOD _____

EXPOSURE TIME _____hrs) SAMPLE TEMP. DURING EXPOSURE _____ (f) EXPOSURE CODE _____

E ___eV) FLUX _____ (atom/sqcm*s) ANGLE OF INCIDENCE _____(deg)

OBSERVED CHANGES _____

REMARKS _____

Count: *0 <Replace>

===== ATOMIC OXYGEN EFFECTS GENERAL PROPERTIES =====

SEQUENCE # _____ MATERIAL CODE _____ DATA SOURCE # _____ GRP _ (M/N)

SAMPLE THICKNESS _____ (mils) SURFACE AREA _____ (sqin) SUBSTRATE _____ APPLICATION METHOD _____

EXPOSURE TIME _____hrs) SAMPLE TEMP. DURING EXPOSURE _____ (f) MATERIAL SIDE EXPOSED _____ EXPOSURE CODE _____

E ___eV) FLUX _____ (atom/sqcm*s) ANGLE OF INCIDENCE _____(deg)

PROPERTY NAME _____ QUALIFIER _____ REACTION EFFICIENCY _____ (cu.cm/atom)

UNEXPOSED _____ EXPOSED _____ UNITS _____

REMARKS

_____

Count: *0

<Replace>

TASK 9

Copper and Copper Alloy Data Base

BAMSI developed a properties data base for Copper and Copper Alloys. Source material included Aerospace Structural Metals Handbook, Mil-HDBK-5, and the Copper Development Association (CDA). BAMSI personnel included one metallurgist, a programmer and a data analyst, Data was compiled on over 260 different coppers. These included divisions allowing for several form variations (i.e., bar, sheet, wire).

An evaluation of the data was performed by the metallurgist. Thirty-six reportable property values were identified. The list of properties was submitted to NASA for approval. Upon approval, it was determined that the format developed on NAS 8-36360 could be used for coppers.

The data was entered on-line in MAPTIS. All data was referenced to the source document. A list of the properties reported on copper and copper alloys is attached along with a copy of the data entry forms.

COPPER ALLOYS - 261

H2 PROPERTIES

0

MAGNETIC PROPERTIES

0

MECHANICAL PROPERTIES

PROPERTY_NAME	COUNT(*)
BEARING ULTIMATE STRENGTH - DRY PIN VALUES	62
BEARING YIELD STRENGTH - DRY PIN VALUES	62
COMPRESSIVE ELASTIC MODULUS	3
COMPRESSIVE YIELD STRENGTH	133
CREEP STRENGTH	35
ELONGATION	8434
FATIGUE STRENGTH	1117
FATIGUE STRENGTH - ROTATING BEAM	13
HARDNESS	4
HARDNESS - -	10
HARDNESS - BRINELL - 3000 KG LOAD	79
HARDNESS - BRINELL - 500 KG LOAD	91
HARDNESS - ROCKWELL	27
HARDNESS - ROCKWELL - 30T	4293
HARDNESS - ROCKWELL - 500 KG LOAD	6
HARDNESS - ROCKWELL - B	5075
HARDNESS - ROCKWELL - C	315
HARDNESS - ROCKWELL - F	3732
HARDNESS - VICKERS	69
IMPACT	16
IMPACT - CHARPY	7
IMPACT - CHARPY V	1
IMPACT - CHARPY V - NOTCH	27
IMPACT - CHARPY V-NOTCH	1
IMPACT - IZOD	75
SHEAR RIGIDITY MODULUS	772
SHEAR STRENGTH	4586
TENSILE ELASTIC MODULUS	960
TENSILE YIELD STRENGTH	9333
ULTIMATE TENSILE STRENGTH	8529
sum	47867

30 rows selected.

PHYSICAL PROPERTIES

PROPERTY_NAME	COUNT(*)
ELEC COND - IACS %(VOL)	293
ELEC COND - IACS %(WT)	11
ELECTRICAL RESISTIVITY	160
SPECIFIC HEAT	247
THERMAL CONDUCTIVITY	247
THERMAL EXPANSION COEFFICIENT	308

sum

1266

6 rows selected.

RESS PROPERTIES

0

****

======== RESTRAINED THERMAL GROWTH ========

MATERIAL CODE _____ DATA SOURCE ____ PROJECT NUMBER _____

[redacted] NUMBER _____ BILLET ID _____

TEST TYPE ____ ORIENTATION ____ SPECIMEN # ____ LOT ____ PLATE ____

FAILURE MODE _____ FIBER FRACTURE _____

HEAT RATE _____ f/sec DENSITY _____ g/cc

PRE-TEST CONDITIONING _____ TEST TEMPERATURE _____ f

FIRST PEAK TEMPERATURE _____ f FIRST PEAK STRESS _____ psi

FINAL PEAK TEMPERATURE _____ f FINAL PEAK STRESS _____ psi

INITIAL MODULUS _____ msi SECONDARY MODULUS _____ msi

REMARKS _____

Count: *0 <Replace>

======== SHEAR ========

MAT. CODE	DS	FAIL MODE	BILLET ID	RUN #	TEST TYPE	ORIENTATION

SPECIMEN #	LOT	PLATE	TEST TEMP.	TIME AT TEMP.	MAX TEMP.	CENTER TEMP
			f	sec	f	f

SPECIMEN LEN. _____ in

========== GAGE ==========
LEN _____ in WDTH _____ in THK _____ in DIA _____ in

DENSITY	GAGE SECT. AREA	SONIC MOD.	PEAK VELOCITY	BREAK VELOCITY
g/cc	in x in	msi	in/usec	in/usec

SHEAR STRGTH	STRAIN AT STRGTH	SHEAR MOD.	QUALIFIER	STRESS RATE
psi	in/in	msi		psi/in

========== PAGANO'S MODULUS ==========

QUALIFIER	1ST LABEL	1ST MODULUS	2ND LABEL	2ND MODULUS
		msi		msi

REMARKS _____

Count: *0 <Replace>

======== STRESS STRAIN ========

MATERIAL CODE _____ DATA SOURCE ____ PROJECT NUMBER _____

TEST TEMP. _____ f RUN NUMBER _____ BILLET ID _____

TEST TYPE ____ ORIENTATION ____ SPECIMEN NUMBER ____ LOT ____ PLATE ____

MAXIMUM STRAIN _____ mil/in STRESS AT MAXMIUM STRAIN _____ psi

STRAIN _____ mil/in STRESS _____ psi

REMARKS _____

Count: *0 <Replace>

======== THERMAL CONDUCTIVITY ========

MATERIAL CODE _____ DATA SOURCE ____ PROJECT NUMBER _____

R NUMBER _____ BILLET ID _____

REFERENCE ROD _____ PRE-CHAR SPECIFICATION _____

TEST TYPE ____ ORIENTATION ____ SPECIMEN NUMBER ____ LOT ____ PLATE ____

INITIAL THICKNESS _____ in INITIAL WEIGHT _____ gm

FINAL THICKNESS _____ in FINAL WEIGHT _____ gm

DENSITY _____ g/cc SPECIMEN DIAMETER _____ in

REFERENCE GAUGE _____ in SPECIMEN GUAGE _____ in

TEST TEMPERATURE _____ f THERMAL CONDUCTIVITY _____ btu-in/hr/sqft/f

REMARKS _____

Count: *0 <Replace>

======== THERMAL EXPANSION =======

MATERIAL CODE _____ DATA SOURCE ____ PROJECT NUMBER _____

[redacted] NUMBER _____ BILLET ID _____

PRE-TEST CONDITION _____ PRE-CHAR SPECIFICATION _____

TEST TYPE CTE_ ORIENTATION ____ SPECIMEN NUMBER ____ LOT ____ PLATE ____

INITIAL LENGTH _____ in INITIAL WEIGHT _____ gm

FINAL LENGTH _____ in FINAL WEIGHT _____ gm

DENSITY _____ g/cc DILATOMETER _____

TIME _____ sec TEST TEMPERATURE _____ f

HEAT RATE _____ f/sec THERMAL EXPANSION _____ 10-3 in/in

REMARKS _____

Count: *0 <Replace>

======== TENSION ========

MAT. CODE	DS	FAIL MODE	BILLET ID	RUN #	TEST TYPE	ORIENTATION
_____	____	_____	_____	_____	TN__	____

SPECIMEN #	LOT	PLATE	TEST TEMP.	TIME AT TEMP.	MAX TEMP.	DENSITY
____	____	____	_____ f	_____ sec	_____ f	_____ g/cc

SPECIMEN LEN. ========== GAGE ==========

_____ in LEN _____ in WDTH _____ in THK _____ in DIA _____ in

ULT. STRGTH	YLD STRGTH	ULT STRAIN	STRAIN AT STRGTH	INT ELASTIC MOD
_____ psi	_____ psi	_____ mil/in	_____ mil/in	_____ msi

SECANT MOD	QUALIFIER	SHEAR MOD	2NDARY MOD	SONIC MOD	PEAK VELOCITY
_____ msi	_____	_____ msi	_____ msi	_____ msi	_____ in/usec

BREAK VELOCITY ========== POISSON'S RATIO ==========

_____ in/usec 1ST LABEL __ 1ST RATIO _____ 2ND LABEL __ 2ND RATIO _____

STRESS RATE REMARKS

_____ psi/min _____

Count: *0 <Replace>

======== THERMAL HEAT CAPICITY / SPECIFIC HEAT ========

MATERIAL CODE _____ DATA SOURCE ____ PROJECT NUMBER _____

[redacted] NUMBER _____ BILLET ID _____

SPECIMEN NUMBER _____ LOT _____ PLATE _____

TEST TEMPERATURE _____ f HEAT CAPICITY _____ btu/lb/f

REMARKS _____

Count: *0 <Replace>

======== THERMAL RESPONSE ========

MATERIAL CODE _____ DATA SOURCE ____ BILLET ID _____

PRE-TEST CONDITIONING _____ RUN NUMBER _____

ORIENTATION _____ SPECIMEN NUMBER _____ LOT _____ PLATE _____

HEAT SOURCE _____

DISTANCE OF SAMPLE FROM HEAT SOURCE _____ in

DISTANCE OF THERMOCOUPLE FROM HEATED FACE OF SAMPLE _____ in

APPLIED HEAT FLUX _____ btu/sqft/sec

TIME _____ sec

TEST TEMPERATURE _____ f

REMARKS _____

Count: *0

<Replace>

======== MPROP_VALIDA (VALID ALLOYS) ========

CAT _____ SEQ _____

ALLOY _____

Count: *0 <Replace>

======== MPROP_VALIDC (VALID CONDITIONS) ========

CAT _____ SEQ _____

COND _____

Count: *0

<Replace>

======== MPROP_VALIDF (VALID FORMS) ========

CAT _____ SEQ _____

FORM _____

Count: *0 <Replace>

======== MATERIAL INFORMATION ========

MATERIAL CODE _____ DATA SOURCE ____

DESIGNATION _____

MANUFACTURER _____

FABRIC _____ FABRIC WEIGHT _____ OZ/SQ YARD

YARN TYPE _____

WEAVE _____

FILL YARN COUNT _____ YARNS/IN. WARP YARN COUNT _____ YARNS/IN.

RESIN _____

COMPOSITE DENSITY _____ G/CC PLY THICKNESS _____ IN.

Count: *0

<Replace>

======== ENTHALPY ADIABATIC CALORIMETER ========

MATERIAL CODE _____ DATA SOURCE ____ PROJECT NUMBER _____

RUN NUMBER _____ BILLET ID _____

TEST TYPE SH____ SPECIMEN NUMBER _____ LOT _____ PLATE _____

PRE-CHAR SPECIFICATION _____

INITIAL CUP TEMPERATURE _____ f FINAL CUP TEMPERATURE _____ f CHANGE IN CUP TEMPERATURE _____ f

INITIAL WEIGHT _____ gm FINAL WEIGHT _____ gm

INITIAL SAMPLE TEMPERATURE _____ f ENTHALPY TO 32 DEGREES F _____ btu/lb

REMARKS _____

Count: *0 <Replace>

======== CHAR ========

MATERIAL CODE _____ DATA SOURCE ____ PROJECT NUMBER _____

[redacted]T TYPE ____ ORIENTATION ____ SPECIMEN NUMBER ____ LOT ____ PLATE ____

PEAK VELOCITY _____ in/usec BREAK VELOCITY _____ in/usec

MIN TEST TEMP. _____ f MAX TEST TEMP. _____ f

PRE-CHAR DENSITY _____ g/cc POST-CHAR DENSITY _____ g/cc

CHAR TEMP. _____ f WEIGHT LOSS _____ %

REMARKS _____

Count: *0 <Replace>

======== COMPRESSION ========

MAT. CODE _____ DS ____ FAIL MODE _____ BILLET ID _____ RUN # _____ TEST TYPE CM__ ORIENTATION ____

SPECIMEN # ____ LOT ____ PLATE ____ TEST TEMP. _____ f TIME AT TEMP. _____ sec MAX TEMP. _____ f DENSITY _____ g/cc

SPECIMEN LEN. _____ in ========== GAGE ==========
LEN _____ in WDTH _____ in THK _____ in DIA _____ in

ULT. STRGTH _____ psi YLD STRGTH _____ psi ULT STRAIN _____ mil/in STRAIN AT STRGTH _____ mil/in INT ELASTIC MOD _____ msi

SECANT MOD _____ msi QUALIFIER _____ SHEAR MOD _____ msi 2NDARY MOD _____ msi SONIC MOD _____ msi PEAK VELOCITY _____ in/usec

BREAK VELOCITY _____ in/usec ========== POISSON'S RATIO ==========
1ST LABEL __ 1ST RATIO _____ 2ND LABEL __ 2ND RATIO _____

STRESS RATE _____ psi/min REMARKS _____

Count: *0 <Replace>

======== DATA SOURCE ========

DATA SOURCE IDENTIFICATION NUMBER ____

REPORT DATE _____

DOCUMENT NUMBER _____

DOCUMENT TITLE _____

CONTRACT NUMBER _____ PURCHASE ORDER NUMBER _____

Count: *0

<Replace>

======== EMITTANCE ========

MATERIAL CODE _____ DATA SOURCE ____ PROJECT NUMBER _____

[redacted]LET ID _____ LOT _____ PLATE _____

TEST TYPE E_____ ORIENTATION _____ SPECIMEN NUMBER _____

TEST TEMPERATURE _____ f EMITTANCE _____

REMARKS _____

Count: *0

<Replace>

======== ENTHALPY ICE CALORIMETER ========

MATERIAL CODE _____ DATA SOURCE ____ PROJECT NUMBER _____

RUN NUMBER _____ BILLET ID _____

TEST TYPE SH____ SPECIMEN NUMBER _____ LOT _____ PLATE _____

PRE-CHAR SPECIFICATION _____

INITIAL WEIGHT _____ gm FINAL WEIGHT _____ gm

INITIAL SAMPLE TEMPERATURE _____ f ENTHALPY TO 32 DEGREES F _____ btu/lb

REMARKS _____

Count: *0 <Replace>

======== PERMEABILITY ========

MATERIAL CODE _____ DATA SOURCE ____ PROJECT NUMBER _____

FRACTURE TYPE _____ BILLET ID _____

LOT _____ PLATE _____

TEST TYPE P_____ ORIENTATION _____ SPECIMEN NUMBER _____

TEST TEMPERATURE _____ f PERMEABILITY _____ 1E -9 sq cm

REMARKS _____

Count: *0 <Replace>

======== RING COMPRESSION ========

MATERIAL CODE _____ DATA SOURCE ____ PROJECT NUMBER _____

F[redacted] MODE _____ BILLET ID _____

TEST TYPE RCM_ ORIENTATION ____ SPECIMEN NUMBER ____

TEST TEMPERATURE _____ f DENSITY _____ g/cc

INSIDE DIAMETER _____ in OUTSIDE DIAMETER _____ in HEIGHT _____ in

MAXIMUM PRESSURE _____ psig LAME STRENGTH _____ psi

SECANT MODULUS _____ msi QUALIFIER _____ STRAIN AT STRENGTH _____ in/in

STRESS RATE _____ psi/min POISSON'S RATIO LABEL __ POISSON'S RATIO _____

REMARKS _____

Count: *0 <Replace>

TASK 10

MATCO Usage Data Sheets/MIUL (Where Used)

BAMSI personnel updated and added new data to the MIUL Data Base using the criteria outlined in MSFC-PROC-2095.

BAMSI added over 2000 records to the database including data on AEDC, ATO and others.

A copy of the desk instructions and data entry format is attached.

DESK INSTRUCTIONS FOR PROCESSING MATERIALS USAGE EVALUATION SHEETS (MUES)

This document provides the desk instructions for completing new and revised Materials Usage File prepared for the Marshall Space Flight Center.

Material usage and evaluation data, reported in accordance with these instructions, will meet the data definition requirements of the materials automated reporting system.

Questions and suggestions pertaining to these instructions should be directed to Materials and Processes Laboratory, Code EH01, Phone Number: (205) 544-2483.

DOCUMENTS UTILIZED

The following are engineering forms, reports and documents which are utilized in the reporting of material usage and evaluation data:

FORMS

Materials Usage Evaluation Sheets (MUES), Sheet 1 and 2

Materials Usage Modification (MUES)/Update Sheet 3

Standard/Commercial Parts Data (Use MUES Sheets)

MATERIAL SELECTION REPORTS

MSFC-HDBK-527/
JSC 09604
(Latest Revision)

Material Code directory by material code metals

Material Code directory by material specification - metals

Material code directory by material code - nonmetals

Material code directory by material specification - nonmetals

Material code directory by material manufacturer - nonmetals

Material code directory by material description - nonmetals

Material code directory by material description - metals

Material selection rating and criteria report - metals

Material selection rating and criteria report - nonmetals

OTHER REPORTS

Standard/commercial parts report

GUIDELINES FOR EVALUATION DRAWINGS

GENERAL INFORMATION

There is no standard Engineering Drawing System used. However all Materials and Processes are specified on the face of drawings via notes and in parts lists. For each drawing the procedures herein are general and should cover all drawing systems.

1. Materials & Processes Information - General

Materials and processes usages are identified from drawings and entered on the MUES sheet as follows:

1.a. Read through the general notes beginning with Note 1 and itemize all material call outs on the MUES. All materials invoked by specifications must be included.

1.b. Review parts list and itemize all materials specified on parts list.

1.c. A separate line entry must be made for each individual material. These entries are tabulated against each dash number configuration of the basic part or assembly.

Note: Adhesives and coatings with their catalyst are to be entered as one material.

2. Standard Commercial Parts

2.a. Complete separate MUES sheets 1 and 2 for each unique standard/ commercial part. Enter part name in Field 13, Sheet 1. Part number for standard/commercial parts should only contain information sufficient to identify materials. Size codes must not be included. A standard/commercial part number/designation is entered as a document part number in Field (4), Sheets 1 & 2 the using assembly(s) are entered in Field (17), (20) & (23) on sheet 1.

2.b. Also, enter code 80000 in Field 7 of MUES, Sheet 2. (Document part number that specifies a standard commercial part.)

2.b.1 Enter in field 21 Support Document, Sheet 2 the complete standard commercial part number, using only the basic number and the dash numbers that are specifieid on the drawing or in the engineering parts list (e.g., NAS1955C12, VN324NP048, MS25083-7AB6, etc.).

2.c. Enter overall rating for fastener in field 8, acceptable ratings are as follows:

2.c.1 Letter "A" - Materials with this rating are acceptable for "A" or "A*". Also this rating may be used for any "B" rated material which has had the necessary controls imposed to meet the "A" rating requirements, (e.g., Aluminum Alloy which has been coated with an approved corrosion protection coating).

2.c.2 Letter "X" - Ratings for the Standard/Commercial Parts (S/C Parts) are dependent upon the rating for each material of the part. If the rating for a material is other than the above "A" rating, the overall rating of the S/C Part is listed as "X" and is not acceptable for use until an MUA has been approved for each specific design application.

2.c.3 Letter "O" - Rating is used to indicate that there is no requirement for that particular category. For example, materials used on the SRB do not have TVS requirements, etc.

3. MUES Sheets - General Information

3.a. Materials usages for drawing numbers called out in the parts list of drawings will be reported on the detail drawing level.

3.b. Each MUES Worksheet may contain six materials per drawing. For more than six materials, use additional MUES sheets. Number material, next assemblies, line entries and worksheet pages consecutively.

4. Processing Materials

Processing materials such as cleaning solvents and any other materials which do not become a part of the end item hardware are listed on the MUES Worksheet if the fabrication (i.e., "BUILD") paper specifies the exact solvent used. Code 80009 (not for flight) should be entered.

5. Specification Control Drawing

Material usages for Specification Control Drawings called out in the parts list of drawings shall be reported on their own individual worksheet. On Sheet 1, the next assembly number(s) are entered in Fields (17), (20) and (23), with respective dash number(s) entered in (18), (21) and (24).

6. Finishes

Most coating materials are applied per specification, enter in Field (25).

7. Hole Plugging

The materials used for the plugging of unused holes, such as rivets, epoxy, corrosion protection, etc., shall be reported on MUES Worksheet. Hole plugging information may appear on a change Engineering Order (EO), preceded with the words "REWORK INFORMATION" and shown blocked in.

8. Electrical/Electronic Parts

Some electrical/electronic parts are listed in the parts list for which materials are not reported; these are capacitors, filters, resistors, transistors, diodes and microcircuits. Components mounted on printed circuit boards need to be listed, but a note so stating will be placed on the application worksheet using appropriate code listed below on the MIUES.

9. Specific Conditions, Use of Codes

00000	Materials shown on lower assembly/no materials added by this part number.
20900	40M XXXXX Connections
20901	EEE Part Non Operational
20902	EEE Operation part
30888	Material/Parts to be changed metals
20888	Material/Parts to be changed nonmetal
40000	One Time Usage/Insufficient Data
50075	Materials Aged or Heat Treated At Later Assembly
80000	Standard Commercial Parts
80001	Material ID on Subcontractor Worksheet

80004	Evaluation at Configuration Level, all materials not identified
80005	Government Furnished Equipment (GFE)
80006	Non-Hazardous Fluid
88900	Metals non flight
88846	Nonmetals non flight
80008	Material ID on Production Part
80009	Not for Flight

9.a. Use of "00000" Code

Enter the digits "00000" in field "7" of MUES Worksheet 2 for a part number that does not add any materials in the parts list or general notes (i.e., assembly drawing). In addition, letter "O" must be entered in Fields 8 of Sheet 2 and Field 30 of Sheet 3 as applicable.

9.b. Use of "20900" Code

Material code "20900" shall be used to report electrical hardware procured to NASA/MSFC 40MXXXXX documents. These numbers are shown in Data Column of parts list.

Note: Actual part numbers are not to be reported.

Reporting of "20900" onto MUES Worksheets is shown below:

SHEET NO./FIELD NO./TITLE	INSTRUCTIONS	REMARKS
Sheet 2, Field 6-Line No.	Enter applicable sequential number	
Sheet 2, Field 7-Material Code	Enter 20900	

Sheet 2, Field 8-Overall	1. Enter "A" or rating from MAPTIS in columns for which material control requirement applies 2. Enter Letter "O" for not applicable	
Sheet 2, Field 21-Document	Enter NASA/MSFC procurement specification	Enter complete number, i.e. (40M3877) as applicable
Sheet 1, Field 15 - Remarks	Enter additional numbers within parenthesis Example: (40M39569)	

10. SUBSTITUTED ON EQUIVALENT MATERIAL/PART

Material code "80002" shall be used to identify materials/parts which may be substituted or are judged equivalent for those that appear in the Parts List (P/L).

Substitution information appears in the Notes of the drawing and is normally "flagged" (X) to the affected part(s) in the P/L.

SHEET NO./FIELD NO./TITLE	INSTRUCTIONS	REMARKS
Sheet 2, Field 6-Line No.	Enter applicable sequential number	
Sheet 2, Field 7-Material Code	Enter Material Code from MSFC-HDBK-527/JSC 09604 or MAPTIS	
Sheet 2, Field 8-Overall Evaluation	Enter rating from MSFC-HDBK-527/JSC 09604	
Sheet 2, Line 21-Material/Spec Support Document	Enter applicable document and/or material	
Sheet 1, Field 15-Remarks	Add substituted or equivalent as applicable. Also enter applicable document.	

10.a Use of "80005" Code

Material code "80005" shall be used to identify and track part numbers (VXXX) that contain Government Furnished Equipment (GFE). GFE part number(s) on production drawings are identified in parts in list with one of the following:

SHEET NO./FIELD NO./TITLE	INSTRUCTIONS	REMARKS
Sheet 2, Field 6-Line No.	Enter applicable sequential number	
Sheet 2, Field 7-Material Code	80005	
Sheet 2, Field 8-Overall Evaluation	Enter where applicable if item is certified, Enter letter "O" if not affected. Enter "C" if not certified.	
Sheet 2, Field 21-Material/Spec Support Document	Enter certification letter or MUAS.	
Sheet 1, Line 15-Remarks	Add if necessary	

MUES SHEET 1 (HEADER/NEXT ASSEMBLY INFORMATION)

(Required fields are specified by "*")

FIELD NO.	DESCRIPTION
3	Associate Contractor (Sheet 1, Field 3) - Enter contractor code number provided by NASA. (4 character code) See page 1.
4	Document Part Number (Sheet 1, Field 4) - Enter document part number from drawing/part for which MUES is being prepared. Entry must be left justified and contain dash numbers if part of system. Where system uses dash number for minor design modifications in a system (example: left and right hand bracket enter P/N with dash number in field) separate sheets must be submitted for each dash number. Also enter standard commercial part number where applicable.
5	Revision Level (R/L) (Sheet 1, Field 5) - Enter latest revision letter shown in drawing revision block. If the drawing is an initial release, do not enter anything in R/L block.
6	Fracture (FRAC) (Sheet 1, Field 6) - Enter applicable fracture control status as indicated on the drawing. F = Fracture Critical Part/Control = Not Fracture Critical/Controlled
7	Project (Sheet 1, Field 7) - Enter project from codes provided by NASA. Contact NASA/MSFC Materials and Processes Laboratory, Code EH01 for appropriate code.
8	System (Sheet 1, Field 8) - Enter system from codes given by NASA Contact same as listed in 7 above for appropriate code. Example: Thermal Control System (TCS) Recovery System (RS) Propulsion (P) Thrust Vector Control System (TVCS)
9	Subsystem (Sheet 1, Field 9) - Enter subsystem from code provided by NASA. See above, Field 7. Example: High Pressure Oxidizer Turbo Pump (HPOTP) Range Safety Receiver (RSR)

MUES SHEET 1 (HEADER/NEXT ASSEMBLY INFORMATION) (Continued)

(Required fields are specified by "*")

FIELD NO.	DESCRIPTION
10 & 11	Temp/Range (Sheet 1, Field 10, 11) - Minimum/maximum temperature range part experience in operation.
12	Environment (Sheet 1, Field 12) - Enter design environment (O_2, N_2, PSIA) for part being evaluated.
13	Document Title (Sheet 1, Field 13) - Enter document title from name block.
14	Criticality (Sheet 1, Field 14) - Enter part criticality.
15	Remarks (Sheet 1, Field 15) - Enter any pertinent remarks on face of drawings that support Materials and Processes evaluation.
16, 19 & 22	Sequence Number (Sheet 1, Field 16, 19 and 22) - Enter line/sequence number. Start with 0001 for each unique part number.
17, 20, 23 18, 21, & 24	Next Assembly (Field 17, 20 & 23) - Enter next assembly revision letter and dash number (18, 21, & 24). Enter document part number where standard commercial part is specified.
17, 20 & 23	Multiple Next Assembly and Multiple Dash Numbers (Sheet 1, Fields 17, 20 and 23) - Review the next assembly for similar applicable material control requirements. If dissimilar, prepare a new MUES Worksheet; otherwise, review the new dash number for similarity in material usage data. If dissimilar material usage data, prepare a new MUES Worksheet; otherwise, add next assembly and dash number to existing worksheet as follows:
17, 20 & 23	Multiple Next Assemblies - Same Dash Numbers (Sheet 1, Fields 17, 20 and 23) - Each different next assembly number shall be evaluated for similarity in material control requirements. Dissimilarity will result only from a new part usage that has different application.

SHEET 2 - MATERIALS INFORMATION SHEET

FIELD NO.	DESCRIPTION

3 — Associate Contractor (Field 3) - Enter contractor code number provided by NASA.

4 — Document Part Number (Field 4) - Enter document part number from drawing/part for which MUES is prepared. Also, enter standard commercial part number where applicable.

5 — Revision Letter (R/L) (Field 5) - Enter revision letter of document part number.

6-17, 18-23 & 24-26 — Line Number (Field 6) - The line number refers to a material entry. Start with 0001 for each unique part number.

NOTE: Each material line extends from Field (6) across through Field (17) then continues from Field (18) across through Field (23). Field (24) across through Field (26).

7 — Material Code (Field 7) - As follows:

Metallic Material - Enter the corresponding material code for the material by comparing Material/Manufacturer's Designation on drawing to that in MSFC-HDBK-527/JSC 09604 or MAPTIS.

Nonmetallic Material - Enter the corresponding material code for material by comparing to that listed in MSFC-HDBK-527/JSC 09604 or MAPTIS.

Standard/Commercial Part - Enter 80000 if standard commercial part is specified. (See page 3)

SHEET 2 - MATERIALS INFORMATION SHEET (Continued)

FIELD NO.	DESCRIPTION

8 Overall Evaluation (Field 8) - Determine material control requirements (e.g., flammability, age, etc.) that are applicable to metals and nonmetals for the part usage. Nonmetals must have either (FLAM and TOX) or (FLAM and TVS) Ratings, except if there is a rating in fluid systems. Metals must have either SCC and CORR rating.

Example:

FLAM	=	Flammability
TOX	=	Toxicity
TVS	=	Thermal Vacuum Stability
AGE	=	Age Life
FSC	=	Fluid System Compatibility
SCC	=	Stress Corrosion
CORR	=	Corrosion
AO	=	Atomic Oxygen
SEE	=	Space Environmental Effects
HEE	=	Hydrogen Environment Embrittlement

Using the same materials selection that was used to obtain the material code, determine the overall evaluation code for each of the above material control requirements that are applicable as follows:

8.a. Enter material rating.

8.b. For materials rated other than "A", enter MUA number in Field (20).

8.c. When thickness values are shown in the MSFC-HDBK-527/JSC 09604 or MAPTIS directory for a given material code, the material is considered thickness sensitive (for flammability). The value shown in the handbook is the minimum thickness acceptable for that material. Enter applicable rating.

Enter Letter "O" in each of the remaining columns to indicate that those material control requirements do not apply.

8.A FSC = Fluid System Compatibility

8.A.a. Fluid systems compatibility not a requirement, add "O" to Field (8) for FSC. If fluid systems is a requirement, see Field (13).

SHEET 2 - MATERIALS INFORMATION SHEET (Continued)

FIELD NO.	DESCRIPTION

9 Material Weight (Field 9) - For metallic materials, leave this field blank.

NOTE: Material weight (all applications) to be estimated calculations.

For nonmetallic materials, estimation of total weight is required for all material usages in crew cabin, payload bay, or if material rating for an applicable material control requirement is other than "A". Estimate the total weight of material expressed in pounds. Make estimation to nearest 0.001 lbs. or to three significant digits. The decimal point is fixed within the field. See Appendix C for densities. This field may be left blank only if the following apply:

9.a. Metallic Material

9.b. Inorganic material such as ceramics, glasses, Add "9" in field left justified.

10 Material Surface Area (Field 10) - Material surface area shall be expressed in square inches. Make calculations to nearest 0.01 in^2 or two significant digits, if area is less than 100 square inches. If greater then 100 square inches, round to whole number.

When material surface area rounded-off is less than 0.01 in^2, report it as .01. If material is unexposed, designate this condition by entering a "9" in this field left justified.

10.a. For metallic materials, leave this field blank.

10.b. For nonmetallic materials, estimation of exposed surface area is required for all material usages in crew cabin payload bay.

This field may be left blank only if:

10.b.a. Field 8 is not applicable i.e. letters "O" or "N"

10.b.b. Inorganic Material/Metallic Material

SHEET 2 - MATERIALS INFORMATION SHEET (Continued)

FIELD NO.	DESCRIPTION

11 Material Thickness (Field 11) - When a thickness for a nonmetallic material is shown in the directory, the material is thickness sensitive if usage is in the form of the following:

- Films
- Foams
- Laminates
- Sheets
- Conformal Coatings
- or used in Fluid System

The minimum material thickness of the production part (in inches) shall then be entered.

If not used in any of the above forms, enter "9", left justified, in the thickness field.

NOTE: MUES Worksheets are to reflect material thickness changes (for materials listed above) as a result of drawing revisions or EO's.

12 Overall Configuration Test Report (Field 12) - Enter configuration test report when applicable. Ex: White Sands Test Facility (WSTF) 87-19724, Enter: W 19724.

System Environment Data (13, 14, 15, 16 and 17)

When entry in field 8 FSC is Letter "O", leave field 13 blank. However, fields 14, 15, 16 and 17 must be completed. Otherwise complete the following:

13 Fluid Type (Field 13) - Enter fluid type (LOX, GOX, GH2, N204, etc.) whenever a material is to be evaluated for more than one fluid. Assign a new Line Number 6, 18 & 24, then repeat the material code for the fluid and overall evaluation in Field 8 (FSC). Enter applicable information in Field (13, 14, 15, 16 & 17). This may be repeated as many times as necessary to report all fluids that have been identified.

SHEET 2 - MATERIALS INFORMATION SHEET (Continued)

FIELD NO. DESCRIPTION

Enter abbreviation of fluid type, left justified as follows:

Fluids Requiring Detailed Evaluation

Abbreviation	Fluid System
GOX (metals only)	Gaseous Oxygen
LGOX (nonmetals only)	Gaseous Oxygen (≤ 20 psi)
HGOX (nonmetals only)	Gaseous Oxygen (> 20 psi)
LOX	Liquid Oxygen
N2O4	Nitrogen Tetroxide (N_2O_4)
HDZE	Hydrazine
MMH	Mono Methyl Hydrozine
HYD	Hydraulic Oil
LOH	Low Press GH (≤ 450 psi)
HIH (metals only)	High Press GH (> 450 psi)
LH2 (metals only)	Liquid Hydrogen (LH_2)

SHEET 2 - MATERIALS INFORMATION SHEET (Continued)

Field No.	Description	
13. (Continued):	FC40	Freon 40
	FR21	Freon 21
	FR13	Freon 1301
	LOH2	Low Press GH_2 ($\leq$ 450 psi)
	HIH2	High Press GH_2 ($>$ 450 psi)
	CO2	Carbon Dioxide
	Lube	Lube Oil (MIL-L-23699G)
	O2N2 (Below 1 Atmosphere)	Oxygen-Nitrogen
	HE	Helium
	H2O	Water
	N2	Nitrogen
	NH3	Amonia

NOTE: Fluid information for materials exposed to a fluid as a result of a single barrier failure must be included. Enter "S" preceding fluids, indicates single barrier. Example: SLOX

13.A. Rating Field 8 - If fluid reported in Field (13). Transcribe from MSFC-HDBK-527/JSC 09604, as applicable, the material rating for fluid in Field (8). However, if the "SYSTEM PRES" Fields (14 and 15) are greater than the pressure listed in MSFC-HDBK-527/JSC 09604 for the fluid listed in Field (13) enter "U" for rating in Field (8) FSC.

Note: Rating must be a function of temperature, pressure and thickness. Enter overall configuration test in Field (12) if applicable.

SHEET 2 - MATERIALS INFORMATION SHEET (Continued)

Field No.	Description

14, 15, 16, and 17 Maximum/Minimum Pressure and Temperature

NOTE: These fields (14, 15, 16 and 17) must be completed for all materials.

System Pressure (Fields 14 & 15) - Enter system maximum/minimum operating pressure, right justified expressed in psia.

System Temperature (Fields 16 & 17) - Enter maximum/minimum temperature that the material will be exposed to, in degrees (Fahrenheit).

Metallic Material Exposed to Fluid If fluid is LOX, show -297°F; if LH_2, show - 423°F.

Nonmetallic Material Exposed to Fluid If fluid is LOX, show -297°F, if LH_2, show -423°F.

NOTE: (1) If temperature is a negative figure, precede it with a negative sign (-). Do not use (+) for positive temperature. (2) Enter temperature right justified.

19 Test Waiver (T/W) (Field 19) - These fields are used to report a Material Usage Agreement.

Enter the following for a Material Usage Agreement

P	=	Pending
A	=	Approved
R	=	Rejected
W	=	Waiver
D	=	Deferred

20 Test MUA Document (Field 20) - Enter Material Usage Agreement number that has been assigned. Example: ECLS-001

SHEET 2 - MATERIALS INFORMATION SHEET (Continued)

Field No.	Description

21 Material Specification/Support Document (Field 21) - Enter material specification or other support document for material as shown in parts list or drawing AMS 5046. Items must be left justified, no dashes or spaces.
Example: MILW80604TIC3
Enter standard commercial part number if applicable.

22 Manufacturer's Designation/Materials Header Information - (Field 22) - Enter designation exactly as shown in parts list or general notes. No attempt should be made to describe the item as it appears in the selection reports. Must be left justified.

23 Cure Codes (Field 23) Enter cure codes specified in MAPTIS, metal shall be left blank, cure data is in a two digit number 01-99.

24 Field 24 - Line Number - Enter line number as in Field (6) & (18).

25 Process Specification - (Field 25) - Enter process specification as shown in parts list or drawing notes. Enter "C" preceding specification number if critical; must be left justified. Example: MILW21646. .1F

26 Prepared By & Date, Approvals - (Fields 1, 2 & 26) - Enter initials of transcriber and date.

SHEET 3 - MATERIALS INFORMATION SHEET

Field No.	Description

Instructions to Complete the "Materials Usage Modification/Update Form" - (Sheet 3) - This form is used to make any modifications or additions to a part that already exists on the "Where Used" data base. The contractor code, document/part number and revision letter must be completed for each sheet submitted. These three fields are used as the key to access and modify the data base.

The procedure to complete the form is as follows:

3, 4, and 5 To change any or all the key information (contractor code, document/part number and revision letter) complete all three of the existing fields (5, 6, and 7) and the fields that need to be modified. If only one field needs to be changed, complete only the appropriate field with the new information. A "$" may be placed in the first position of any field to blank out the existing data. However, see items 6 and 7 for information on deleting a next assembly number or a material code.

9-18 To change the general information (fields fracture code through remarks, 9 thru 18) complete the existing contractor code, document/part number and revision letter and the new or updated information. The environment oxygen, nitrogen and pressure, and the lower and upper temperature range fields must be either numeric or contain a "$" in the first position. Scientific notation is permitted to measure the environment pressure.

20-26 To change a next assembly (fields 20, 23 and 26) complete the existing contractor code, document/part number, revision, next assembly sequence number and the new or updated next assembly and/or dash. All next assemblies must have a sequence number and a next assembly number. If the next assembly sequence number submitted on the form does not already exist for the document/part number, it is assumed to be a new next assembly. The sequence number cannot be changed.

28-47 To change the material information (line number through process specification, 28 thru 47) complete the existing contractor code, document/part number as originally entered, revision/line number as originally entered and the new or updated material information. All new material information must have a line number and a material code. Complete the data to be changed. If the line number submitted on the form does not already exist for the document/part number, it is assumed to be a new line number and will be added to the data base.

SHEET 3 - MATERIALS INFORMATION SHEET (Continued)

Field No.	Description

The line number, weight, surface area, thickness, maximum and minimum pressures, and maximum and minimum temperatures are required to be numeric, or contain a "$" in the first position. The line number cannot be changed.

A. To delete ALL data for a document/part number, complete the existing contractor code, document/part number and revision letter and enter the word "DELETE" in the document part number field. If ALL revisions are to be deleted enter "$$" in the existing revision letter field.

B. To delete all data related to a next assembly complete the three existing key fields and the next assembly sequence number and a "$" in the first position of the next assembly field.

C. To delete all data related to a material code complete the three existing key fields and are the line number, and enter a "$" in the first position of the material code field.

GENERAL

A. MATERIAL REVIEW/DISPOSITION RECORDS (MR/DR)

Use Update Sheet for this Entry

a. MUES worksheets are prepared only for MR/DR's which add materials, except materials are not reported under the following conditions:

A.a.1. Original finish is being restored

A.a.2. General usage materials previously reported are specified

b. Worksheets are prepared independent of the production drawing

Normally selection of materials/parts by MR/DR's do not require action; however, when materials/parts removal would affect materials's overall evaluation (e.g., removal of a protective coating used to approve flammability) revision of the production MUES Worksheet is required.

SHEET 3 - MATERIALS INFORMATION SHEET (Continued)

Field No. Description

c. Since MR/DR's have no P/L, some fasteners may only be identified by the fastener coding system. See page 3, General Information.

d. Worksheets are prepared similar to production drawings except for the following:

d.1.	Document Number	Prefix document number with "MR"
d.2.	Revision Letter (R/L)	Always enter "NC"
d.3	Next Assembly	Enter MR/DR number
d.4.	Support Document	

B. REWORK ENGINEERING ORDER (EO)

MUES worksheet(s) are to be prepared only for rework EO's that add new materials, parts or change in environment.

To determine what materials and parts are new, rework EO information is compared with that shown on the MUES Worksheet for the production drawing.

H1146

MSFC-PROC-2095
Sheet 1

MATERIALS USAGE ENTRY SHEET
HEADER/NEXT ASSEMBLY INFORMATION

PREPARED BY ①		DATE ②					TEMP RANGE	
ASSOC CONTR ③	DOCUMENT/PART NO. ④	R/L ⑤	FRAC ⑥	PROJECT ⑦	SYSTEM ⑧	SUBSYSTEM ⑨	MIN DEG F ⑩	MAX DEG F ⑪

ENVIRONMENT ⑫			
% O_2	% N_2	PRESSURE – PSIA	DOCUMENT TITLE ⑬

CRITI-CALITY ⑭	REMARKS ⑮

A SEQ ⑯	NEXT ASSEMBLY ⑰	DASH ⑱

NA SEQ ⑲	NEXT ASSEMBLY ⑳	DASH ㉑

NA SEQ ㉒	NEXT ASSEMBLY ㉓	DASH ㉔

EH 1144

MSFC-PROC-2095
Sheet 2

MATERIALS USAGE ENTRY SHEET
MATERIALS INFORMATION

PREPARED BY (1)	DATE (2)

ASSOC CONTR (3)	DOCUMENT/PART NO. (4)	R/L (5)

LINE NO (6)	MATERIAL CODE (7)	OVERALL EVALUATION (8) FLAM	TOX	TVS	AGE	ESC	SCC	CORR	AO	SEE	HEE	MATERIAL WEIGHT LBS (9)	MATERIAL SURFACE AREA SQ IN (10)	MATERIAL THICKNESS IN (11)	OVERALL CONFIG TEST REPORT (12)	SYSTEM ENVIRONMENT DATA: FLUID TYPE (13)	MAX SYS PRES PSIA (14)	MIN SYS PRES PSIA (15)	MAX MATL TEMP DEG F (16)	MIN MATL TEMP DEG F (17)

LINE NO (18)	T/W (19)	TEST MUA DOCUMENT (20)	MATERIALS SPECS SUPPORT DOCUMENT (21)	MANUFACTURER'S DESIGNATION (22)	CURE CODES (23) FL	TOX	TVS	FSC

LINE NO (24)	PROCESS SPECIFICATION (25)

APPROVALS (26)		
ORIGINAL	INIT	DATE
METALS		
NONMETALS		

MATERIALS USAGE MODIFICATION/UPDATE SHEET

MSFC-PROC-2095
Sheet 3

REVISED BY (1)	DATE (2)
EXISTING ASSOC CONTR CODE	(3)
EXISTING DOCUMENT/PART NO	(4)
EXISTING REVISION LETTER	(5)

ASSOC CONTR (6)	DOCUMENT/PART NO (7)	R/L (8)	FAD (9)	PROJECT (10)	SYSTEM (11)	SUBSYSTEM (12)	TEMP RANGE MIN DEG F (13)	TEMP RANGE MAX DEG F (14)

ENVIRONMENT (15) % O2	% N2	PRESSURE - PSIA	DOCUMENT TITLE (16)

CRITICALITY (17)	REMARKS (18)

SEQ (19)	NEXT ASSEMBLY (20)	DASH (21)	NA SEQ (22)	NEXT ASSEMBLY (23)	DASH (24)	NA SEQ (25)	NEXT ASSEMBLY (26)	DASH (27)

NE (28)	MATERIAL CODE (29)	OVERALL EVALUATION (30) FLAM	TOX	TVS	AGE	ESC	SCC	CORR	AO	SEE	HEE	MATERIAL WEIGHT LBS (31)	MATERIAL SURFACE AREA SQ IN (32)	MATERIAL THICKNESS IN (33)	OVERALL CONFIG TEST REPORT (34)	SYSTEM ENVIRONMENT DATA FLUID TYPE (35)	MAX SYS PRES PSIA (36)	MIN SYS PRES PSIA (37)	MAX MATL TEMP DEG F (38)	MIN MATL TEMP DEG F (39)

T/W (41)	TEST MUA DOCUMENT (42)	MATERIALS SPECS SUPPORT DOCUMENT (43)	MANUFACTURER'S DESIGNATION (44)	CURE CODES (45) FL	TOX	TVS	FSC

PROCESS SPECIFICATION (47)	APPROVALS (48) REVISION	INIT	DATE
	METALS		

TASK 11

Selection List Data Base

BAMSI provided a supervisor and six to nine analyst to evaluate non-metallic test data from all the NASA facilities. A metallurgist and one analyst evaluated and input test data on metals. A consultant was also used to provide expertise in the area of stress corrosion of metals.

The format developed in NAS 8-36360 was used as the basis for all data entry on metals and non-metals. However, when reporting requirements changed , the formats were revised.

The following sections describe;

(A) Procedures for Data Entry of Nonmetallics
(B) "Skew" Methodology for Nonmetallics

(A) Procedure for Data Entry of Nonmetallics Data Maintenance

All tests are now being rated by computer, except test 4B and fluid system.

Note: Some of these test are new and we do not have all the information concerning them There will be more information about these test and their rating criteria later, ex. New Test 2 heat and Visible Smoke release rates.

When writing individual test reports:

WSTF Ambient is 12.5
MSFC Ambient Pressure is 14.7
WSTF Default on Tox is 25.9
'Missile Grade Air' is 20.9 oxygen
Lox Temperature is -297
Ambient Gox Temperature is 70

Write all individual test reports as they are—Differences will be accounted for in skewing.

"Test Material Entry/Update" Screen (Option 1) (Generates Material Codes)

Check Init: Shows the initials of NASA/BAMSI Data Review Team, indicating the data has been reviewed on test report and that the data is correct.

TRP: Indicates that you had a test report.

Material Code: Consist of a five digit number (computer generated) that has been assigned to that specific material.

Class: Indicates what from this material code will be printed in the next version on MSFC-HDBK-527/JSC 09604. Example: A - Print everything,, B - Print header information only , and C - Print nothing.

General ID: Consist of six litters - The first two being the use type of the material, EX. Coating 'AK', Adhesives 'AB'. The second set of two letters are major composition of the material, EX. Epoxy 'BG'. The third set of two letters are additional composition of the material EX. Glass 'IA'.

Use Type: Consist of what the material actually is, EX. Coating, Adhesive, Potting Compound, Wire Electrical. These should always be spelled out.

Use Temperature Min/Max: Enter in degrees Fahrenheit. List the min. and max. temperature at which the material can be used. Ex. Min. 45, Max. 120. This is sometimes provided on manufactures literature and some may be found on the Properties Nonmetallic Data Base.

Manufactured Designation: Consist of the name of the material with all the manufacturers, identification numbers included, Ex. Sycast 2850GT, or 515x349 base with 910x533 catalyst. Spell out designation, ex. 85% wool/15% Kevlar should be written 85 percent wool and 15 percent Kelvar. However, in components, assemblies, black boxes, and valves write part numbers as given.

Composition: Consist of the make-up of the material, ex. epoxy , glass or silicone. Sometimes this will be the same as the designation, but everything must have a composition.

Specification: Consist of number that refers to the exact material and the criteria it meets , it may be military or commercial. Ex. Mil-P-18177, QQ-A-250, MSFC-Spec-522. Omit revision number on specifications, but always use the latest revision unless otherwise noted. Slashes are used to indicate differences in type or composition or special treatment on the same specification. Ex. Mil-P-18177/9. (all specifications must list their dashes.)

Manufacturers Table: Consist of information about the manufacturer.

Manufacturer/supplier: Requires that a 'M' for manufacturer or a 'S' for supplier be placed in the field.

H4ID: Consist of four digit number referencing the manufacturer, the division and location of the plant. (This became so time consuming it was decided to not enter it at this time.)

Name, address, city, state, country and phone number: Should be obtained from manufacturer's data sheet and entered on the database.

Sequence number: Consist of the consecutive numbers assigned to each line of the remarks entered on the general record. Ex. 001.

Remarks: Consist of anything not covered in designation, composition or for special comments concerning the material.

Note: Material codes that appear in the specification and remark sections are checks to be sure any changes to header will keep all other data intact.

Test material entry/update query (Opt. 2)

(Call up records for correction)

Check Init.: Shows the initials of NASA/BAMSI data review team, indicating the data has been reviewed test report and that the data is correct.

TRP: Indicates that you had a test report.

Material Code: Consist of a five digit number (computer generated) that has been assigned to that specific material.

Class: Indicates what from this material code will be printed in the next version on MSFC-HDBK-527/JSC 09604. Ex. 'A' = Print everything, 'B' = print header information only. 'C' = Print nothing.

Generic ID: Consist of six letters—The first two being the use type of the material, Ex. Coating 'AK', Adhesives 'AB'. The second set of two letters are major composition of the material, Ex. Epoxy 'BG'. The third set of two letters are additional composition of the material Ex. Glass 'IA'.

Use Type: Consist of what the material actually is, Ex. Coating, Adhesive, Potting Compound, Wire Electrical. These should always be spelled out.

Use Temperature Min./Max.: Enter in degrees Fahrenheit. List the minimum and maximum temperature at which the material can be used. Ex. min. 45, ax 120. This is sometimes provided on manufactures literature and some may be found on the 'properties-nonmetallic' database.

Manufacture Designation: Consist of the name of the material with all the manufacturers' identification numbers included, Ex. Stycast 2850GT, or 515X349 base with 910X533 catalyst. Spell out designation, Ex. 85% wool/15% kevlar should be written 85 percent wool and 15 percent kevlar. However; in components, assemblies, black boxes, and valves—write part numbers as given.

Composition: Consist of the makeup of the material, Ex. epoxy or glass or silicone. Sometimes this will be the same as the designation, but everything must have a composition.

Specification: Consist of a number that refers to the exact material and the criteria it meets, it may be military or commercial. Ex. MIL-P-18177, QQ-A-250, MSFC-SPEC-522. Omit rev. number on specifications but always use the latest rev. unless otherwise noted. Slashes are used to indicate differences in type or composition or special treatment on the same specification. Ex. MIL-P-18177/9. (All specifications must list their dashes.)

Manufacturers Table: Consist of information about the manufacturer.

Manufacture/Supplier: Requires that a 'M' for manufacturer or a 'S' for supplier be placed in the field.

H4ID: Consist of four digit number referencing the manufacture, the division and location of the plant. (this became so time consuming it was decided to not enter it at this time.)

Name, address, city, state, country and phone number: Should be obtained from manufacture's data sheet and entered on the database.

Sequence Number: Consist of the consecutive numbers assigned to each line of the remarks entered on the general record. Ex. 001.

Remarks: Consist of anything not covered in designation, composition or for special comments concerning the material.

Note: Material codes that appear in the specification and remark sections are checks to be sure any changes to header will keep all other data intact.

Flammability Data (Opt. 3)

TRP: Indicates that you had a test report.

Test Report Number: The number assigned to each test report, we preceed it by a letter to indicate the test facility at which the test was conducted. Ex. "W" for White Sands test facility and "M" for Marshall test facility.

Material Code: Consist of a five digit number (computer generated) that has been assigned to that specific material.

Source: Indicates data source or the test facility at which the test was conducted. Write as follows:

White Sands Test Facility = 'WSTF'
Marshall Space Flight Center = 'MSFC'
Goddard Space Flight Center = 'GSFC
'

Test Date: Indicates the date the test was completed -- it is listed on the front of each test report.

Pressure: Indicates the pressure at which the test was conducted in psia. Ex. 9.0, 14.7 (Ambient in pressure is considered "14.7.)

NHB: Test is the 8060.1C test number. Ex. 1, 2, 8, 10, 13.

Type: Is a key word description of the test. Ex. upw, dwn, fuse.

Percent Oxygen: Indicates the level of oxygen concentration at which the material was tested Ex. 25.90, 23.80. (Air in percent oxygen is considered "20.90".)

Gas Pct: Percent second gas, usually nitrogen but not always. This is what remains after the percent oxygen is subtracted form 100 percent. Ex. 30.00 oxygen, 70.00 nitrogen.

Gas Name: Indicates name of the second gas written out. Ex. Nitrogen.

Substrate Information:

Thick: Indicates the thickness of the substrate the material was placed on for testing. It is given in mill thickness and converted to inches for the database. Ex. 3 mill will be 0.003.

MTRL: Indicates the thickness of the substrate the material was placed on for testing. Some common substrate are Teflon, aluminum, or aluminum foil.

Cure No: Indicates the cure the material has been through prior to testing. Ex. 01.

Rating: Indicates letter rating per 8060.1c. Computer rates -- valid ratings are "A", "B", "C", "I", "X".

VF: Indicates the rating of this test in MSFC-HDBK-527/JSC 09604 version "F". This is for a quick comparison of any rating change since 527f and present database.

VX: Indicates or will indicate the rating in MSFC-HDBK-527/JSC 09604 next version. This will then be a quick comparison of any rating changes from 527f and 527g and present database.

Reference: Indicates the way in which the data is reviewed and ties all data to be reviewed together with the same reference number. Ex. All data at 30 percent oxygen at thickness .062 would be reference "03" and would all be evaluated together to get an overall rating.

Skew Flag: Indicates the level of review the data has received, final print selection will make up the next MSFC-HDBK-527/JSC 09606 rev. g. Ex. "S" = computer skew, "M" = MSFC skew selection (see attachment "MAPTIS configuration logic diagram codes' for all codes.)

Sample Information:

Note: List all three samples as indicates by "1". "2". & "3". The actual rating given to the entire test is indicates by line "9" record. This line is used to obtain the ratings for the whole test, and only the "9" record is printed in MSFC-HDBK-527/JSC 09604.

Sample Number: Number of the sample, usually three for flammability.

Sample Width: Width in inches, standard sample width is 2.5 inches.

Sample Length: Length in inches, standard sample length is 12.0 inches.

Sample Thickness: Thickness is inches. Ex. 0.010.

Burn Length: Indicates length the sample burned in inches. Ex. 6.2

Rating Explanation --- Computer rates as follows. If any of the samples ignited k10 paper or has burn dripping, it is considered the worst sample. If k10 paper ignites or the burn dripping is moderate or large the sample is rated "X" regardless of the burn length. If the burn dripping is listed as only small then the sample is rated by the burn length.

Note: If all samples ignited K10 paper, or have moderate or large burn dripping -- always use the worst burn length as "9" record.

If all the burn length are less than six inches (there is no moderate to large burn dripping), then take the worst sample according to burn length.

If one or all the burn lengths are over six inches (there is no moderate or large burn dripping), then take the worst sample according to burn length.

T/B: Total burn field should be used only when the sample is a total burn, then a "T" should be placed by appropriate sample or samples.

Burn Time: Indicates time the material burned in seconds. Ex. 15.9.

I/N/D: Is indicator. Ex. =, <, >.

Propagation Rate: Indicates inches per second that the material burned, this will be listed on the test for each sample with a burn length of more than six inches. Ex. 0.03.

K10: Indicates if K10 paper ignited. Ex. "Y" = yes, "N" = no, and blank = K10 not used.

F/J: Indicates flame jets. Ex. "N" = None, "S" = Small, "M" = Moderate, "L" = Large. Place by the appropriate sample.

S/P: Indicates sparks. Ex. "N" = None, "S" = Small, "M" = Moderate, and "L" = Large. Place by the appropriate sample.

D/B: Indicates burn dripping. Ex. "N" = None, "S" = Small, "M" = Moderate, "L" = Large. Place by the appropriate sample.

Note: Although flame jets, sparks, and burn dripping are all indicates when present only moderate or large burn dripping can affect the rating of a material. Moderate or large burn dripping always caused the material to get a "X" rating no matter what the burn length.

OXY/After/Test: Indicates the remaining oxygen after testing. Ex. 24.7.

Type: Indicates the type of statement, either remark or sample description.

Sequence Number: Consist of the consecutive numbers assigned to each line of the remarks entered on the general record. Ex. 001.

Remarks: This field can be either a remark or a sample description, and consist of anything not covered in the above information. Special comments about sample orientation or burning effects on sample can also be placed in this field. Ex. Front face of sample number 3 fell off during testing.

Note: Material codes and test numbers that appear in the sample information and remark sections are checks to be sure any changes to header will keep all other data intact.

Flash and Fire (Opt. 4)

TRP: Indicates that you have a test report.

Test Report Number: The number assigned to each test report, we preceded it by a letter to indicate the test facility at which the test was conducted. Ex. "W" for White Sands Test Facility and "M" for Marshall Test Facility.

Material Code: Consist of a five digit number (computer generated) that has been assigned to that specific material.

Source: Indicates data source or the test facility at which the test was conducted. Write as follows:

White Sands Test Facility = 'WSTF'
Marshall Space Flight Center = 'MSFC'
Goddard Space Flight Center = 'GSFC'

Test Date: Indicates the date the test was completed -- it is listed on the front of each test report.

Pressure: Indicates the pressure at which the test was conducted in psia. Ex. 9.0, 14.7 (Ambient in pressure is considered 14.7).

NHB: Test is the 8060.1C test number, in this case test #3. Ex 3.

Type: Is a key word description of the test, in this case flash/fire or F/F.

Percent Oxygen: Indicates the level of oxygen concentration at which the material was tested. Ex. 25.90, 23.80 (Air in percent oxygen is considered 20.90).

Gas Pct.: Percent second gas, usually nitrogen but not always. This is what remains after the percent oxygen is subtracted from 100 percent. Ex. 30.00 oxygen, 70.00 nitrogen.

Gas Name: Indicates name of the second gas written out. Ex. Nitrogen.

Substrate Information:

Thick: Indicates the thickness of the substrate the material was placed on for testing. It is given in mill thickness and converted to inches for the database. Ex. 3 mil will be 0.003.

Material: Indicates the actual material of the substrate the material was placed on for testing. Some common substrates are Teflon, aluminum, or aluminum foil.

Sample No.: Number of the sample, usually three for each test. Ex. 1.

Sample Weight: Weight of sample in grams.

Flash Point: Point of degrees at which a flash occurred, in degrees Fahrenheit.

Fire Point: Point of degrees at which a fire occurred, in degrees Fahrenheit.

Flash Rating: Either an 'A' or 'X' depending on whether the flash occurred above 400 degrees or below. Above 400 degrees is 'A' rated -- below 400 degrees is 'X' rated.

Fire Rating: Either an 'A' or 'X' depending on whether the fire occurred above 450 degrees or below. Above 450 degrees is 'A' rated -- below 450 degrees is 'X' rated.

Note: If a dash (-) is in either the flash or fire field this indicates that the sample was tested to the temperature of 1000 degrees and no flash of fire occurred; therefore, the rating would be 'A' (Ex. flash 550, fire -. Flash occurred at 550 but fire was not noted up to the end of the test at 1000 degrees. Both ratings = 'A').

Cure No.: Indicates the cure the material has been through prior to testing. Ex. 01

Reference: Indicates the way in which the data is reviewed and ties all data to be reviewed together with the same reference number. Ex. All data at 30 percent oxygen at thickness.

Skew Flag: Indicates the level of review the data has received, final print selection will make up the next MSFC-HDBK-527/JSC 09604 Rev. G. Ex. 'S' = Computer skew, 'M' MSFC skew selection (see attachment 'MAPTIS configuration logic diagram codes' for all codes).

Sequence Number: Consist of the consecutive numbers assigned to each line of the remarks entered on the general record. Ex. 001.

Remarks: This field can be either a remark or a sample description, and consist of anything not covered in the above information. Special comments about sample orientation or burning effects on sample can also be placed in this field. Ex. Front face of sample number 3 fell off during testing.

Note: Material codes and test numbers that appear in the sample information and remark sections are checks to be sure any changes to header will keep all other data intact.

Test 4B Electrical Overload

TRP: Indicates that you had a test report.

Test Report Number: The number assigned to each test report, we preceded it by a letter to indicate the test facility at which the test was conducted. Ex. 'W' for White Sands Test Facility and 'M' for Marshall Test Facility.

Material Code: Consist of a five digit number (computer generated) that has been assigned to that specific material.

Source: Indicates data source or the test facility at which the test was conducted. Write as follows:

White Sands Test Facility = 'WSTF'
Marshall Space Flight Center = 'MSFC'
Goddard Space Flight Center = 'GSFC'

Test Date: Indicates the date the test was completed -- it is listed on the front of each test report.

Pressure: Indicates the pressure at which the test was conducted in psia. Ex. 9.0, 14.7 (ambient in pressure is considered 14.7).

Start Cur: indicates initial current listed in amps. Ex. 50.

NHB: Test is the 8060.1C test number. Ex. 4B.

Type: Is a key word description of the test. Ex. fuse.

Percent Oxygen: Indicates the level of oxygen concentration at which the material was tested. Ex. 25.90, 23.80 (air in percent oxygen is considered 20.90).

Gas Percent: Percent second gas, usually nitrogen but not always. This is what remains after the percent oxygen is subtracted from 100 percent. Ex. 30.00 oxygen, 70.00 nitrogen.

Gas Name: Indicates name of the second gas written out. Ex. Nitrogen.

Ins Thick: Indicates thickness of insulation on wire. Ex. 025.

Sample Angle: Indicates the angle of the sample, if any. Ex. 15.

Gauge: Indicates the gauge of the wire in Awg. Ex. 20.

Tie Space: Indicate the spacing of the wore ties in inches. Ex. 2.

Wire Tire Material: Indicate the wore tie material. Ex. HT-30 Loc.-B, Tefzel.

Cure No.: Indicates the cure the material has been through prior to testing. Ex. 01

Rating: Indicates the cure the material has been through prior to testing. Ex. 01

Reference: Indicates the way in which the data is reviewed and ties all data to be reviewed together with the same reference number. Ex. All data at 30 percent oxygen at thickness .062 would be reference '30' and would be evaluated together to get an overall rating.

Skew Flag: Indicates the level of review the data has received, final print selection will make up the nest MSFC-HDBK-572/JSC 09604 Rev. G. Ex. "S" = Computer Skew, "M" = MSFC Skew Selection (See attachment 'MAPTIS Configuration Logic Diagram Codes' for all codes).

Sample Information:

Note: List all three samples as indicates by "1", "2", & "3". The actual rating given to the entire test is indicates by line "9" record. This line is used to obtain the ratings for the whole test, and only the "9" record is printed in MSFC-HDBK-527/JSC 09604.

Sample Number: Number of the sample, usually three for flammability.

Sample Current: Indicates the current in amp, at which fusion occurred.

Sample Time: Indicates the time at the current when fusion occurred.

Burn Length: Indicates length the sample burned in inches. Ex. 6.2.

T/B: Total Burn field should be used only when the sample is a total burn, then a "T" should be placed by appropriate sample or samples.

Burn Time: Indicates time the material burned in seconds. Ex. 15.9.

Fusion current is the current or amps at which the wire fuses. Ex. 154. Time to fusion is the number of seconds at the last current or amps until fusion occurs. Ex. 12.

IGN: Ignition noted indicates whether any type ignition such as a flash or spark occurred. Place a "Y" for yes, a "N" for not in the box (a wire can not be "A" rated if an ignition occurs).

Propagation Rate: Indicates inches per second that the material burned, this will be listed on the test for each sample with a burn length of more than six inches. Ex. 0.03.

F/J: Indicates flame jets. Ex. "N" = None, "S" = Small, "M" = Moderate , and "L" = Large. Place by the appropriate sample.

S/P: Indicates sparks. Ex. "N" = None, "S" = Small, "M" = Moderate, and "L" = Large. Place by the appropriate sample.

D/B: Indicates sparks. Ex. "N" = None, "S" = Small, "M" = Moderate, and "L" = Large. Place by the appropriate sample.

Note: Although flame jets, sparks, and burn dripping are all indicates when present only moderate or large burn dripping can affect the rating of a material. Moderate or

large burn dripping always causes the material to get a "X" rating no matter what the burn length.

Oxy/After/Test: Indicates the reaming oxygen after testing. Ex 24.7.

Damage to Adjacent wires: Indicates the damage to adjacent wires, allows 240 characters.

Type: Indicates the type of statement, either remark or sample description.

Sequence Number: Consist of the consecutive numbers assigned to each line of the remarks entered on the general record. Ex. 001.

Remarks: This field can be either a remark or a sample description, and consist of anything not covered in the above information. Special comments about sample orientation or burning effects on sample can also be placed in this field. Ex. Frond face of sample number 3 fell off during testing.

Note: Material codes and test numbers that appear in the sample information and remark sections are checks to be sure any changes to header will keep all other data intact.

Test 4A Electrical Wire Insulation (Opt. 6)

TRP: Indicates that you had a test report.

Test Report Number: The number assigned to each test report, we preceded it by a letter to indicate the test facility at which the test was conducted. Ex, "W" for White Sands Test Facility and "M" for Marshall Test Facility.

Material Code: Consist of a five digit number (computer generated) that has been assigned to that specific material.

Source: Indicates data source or the test facility at which the test was conducted. Write as follows:

White Sands Test Facility = 'WSTF'
Marshall Space Flight Center = 'MSFC'
Goddard Space Flight Center = 'GSFC'

Test Date: Indicates the date the test was completed -- it is listed on the front of each test report.

Pressure: Indicates the pressure at which the test was conducted in psia. Ex. 9.0, 14.7 (ambient in pressure is considered 14.7).

Thick: Indicates the thickness in inches of the material tested. Ex. .062

NHB: Test is the 8060.1C test number. Ex. 4A

Type: Is a key work description of the test. Ex. Angle

Percent Oxygen: Indicates the level of oxygen concentration at which the material was tested. Ex. 25.90, 23.80 (Air in percent oxygen is considered '20.90').

Gas Name: Indicates name of the second gas written out. Ex. Nitrogen

Wire Gauge: Indicated the gauge of the wire Awgs. Ex. 20

Tie Space: Indicates the spacing of the wire ties in inches. Ex. 2

Material: Indicates the wire tie material. Ex. STFE-30B

Insu Thick: Indicates thickness of insulation on wire. Ex. 006

Sam Angle: Indicates the angle of the sample, If any. Ex. 15

Ign Orient: Indicates ignitor orientation. Ex 1/4 inch below sample.

Wire: Indicates if the sample is a single wire. "X" = Yes

Bundle: Indicates if the sample is a bundle. Ex. "X" = Yes

Cure No.: Indicates the cure the material has been through prior to testing. Ex. 01

Rating: Indicates letter rating per 8060.1C. Valid ratings are "A", "B", "C", "I" and "X".

Reference: Indicates the way in which the data is reviewed and ties all data to be reviewed together with the same reference number. Ex. All data at 30 percent oxygen at thickness .062 would be reference "03" and would all be evaluated together to get an overall rating.

Skew Flag: Indicates the level of review the data has received, final print selection will make up the nest MSFC-HDBK-572/JSC 09604 Rev. G. Ex. "S" = Computer Skew, "M" = MSFC Skew Selection (See attachment 'MAPTIS Configuration Logic Diagram Codes' for all codes).

Skew Flag: Indicates the level of review the data has received, final print selection will make up the nest MSFC-HDBK-572/JSC 09604 Rev. G. Ex. "S" = Computer Skew, "M" = MSFC Skew Selection (See attachment 'MAPTIS Configuration Logic Diagram Codes' for all codes).

Smp Number: Indicates the number of the sample, usually three for flammability.

Wire Temp: Indicates the temperature to which the wire has been heated Fahrenheit. Ex. 275

Time: Indicates time in minutes that the wire was heated. Ex. 5

Crnt: Indicates the current or amps flowing to the sample. Ex. 45.

Volt: Indicates the volts flowing to the sample. Ex. 3.

Ign Time: Indicates time of ignition in seconds. Ex. 10.

Burn Length: Indicates length the sample burned in inches. Ex. 6.2.

T/B: Total Burn field should be used only when the sample is a total burn, then a "T" should be placed by appropriate sample or samples.

F/J: Indicates flame jets. Ex. "N" = None, "S" = Small, "M" = Moderate , and "L" = Large. Place by the appropriate sample

S/P: Indicates sparks. Ex. "N" = None, "S" = Small, "M" = Moderate, and "L" = Large. Place by the appropriate sample.

D/B: Indicates sparks. Ex. "N" = None, "S" = Small, "M" = Moderate, and "L" = Large. Place by the appropriate sample.

Note: Although flame jets, sparks, and burn dripping are all indicates when present only moderate or large burn dripping can affect the rating of a material. Moderate or large burn dripping always causes the material to get a "X" rating no matter what the burn length.

Oxy/After/Test: Indicates the remaing oxygen after testing. Ex 24.7.

Type: Indicates the type of statement, either remark or sample description.

Sequence Number: Consist of the consecutive numbers assigned to each line of the remarks entered on the general record. Ex. 001.

Remarks: This field can be either a remark or a sample description, and consist of anything not covered in the above information. Special comments about sample orientation or burning effects on sample can also be placed in this field. Ex. Frond face of sample number 3 fell off during testing.

Note: Material codes and test numbers that appear in the sample information and remark sections are checks to be sure any changes to header will keep all other data intact.

Fluid System (Opt. 7)

TRP: Indicates that you had a test report.

Test Report Number: The number assigned to each test report, we preceded it by a letter to indicate the test facility at which the test was conducted. Ex, "W" for White Sands Test Facility and "M" for Marshall Test Facility.

Material Code: Consist of a five digit number (computer generated) that has been assigned to that specific material.

Source: Indicates data source or the test facility at which the test was conducted. Write as follows:

White Sands Test Facility = 'WSTF'
Marshall Space Flight Center = 'MSFC'
Goddard Space Flight Center = 'GSFC'

Test Date: Indicates the date the test was completed -- it is listed on the front of each test report.

Surf Area: Indicates the surface area of material in square inched. Ex. 2.

Qty: Indicates the quantity of material in grams. Ex. 24.

NHB: Test is the 8060.1C test number. Ex. 15.

Type: Is a key word description of the test. Ex. Immer, vapor.

Substrate Information:

Thick: Indicates the thickness of the substrate the material was placed on for testing. It is given in mill thickness and converted to inches for the database. Ex. 3 mill will be 0.003.

Mtrl: Indicates the actual material of the substrate the material was placed on for testing. Some common substrates are Teflon, aluminum, or aluminum foil.

Media: Indicates the fluid or media used in the test. Ex. N204.

Vapor Vol.: Indicates the vapor volume in milliliters. Ex 10.

Pressure: Indicates the pressure at which the test was conducted in psia. Ex. 9.0, 14.7 (ambient in pressure is considered 14.7).

Liquid Vol.: Indicates the liquid volume in milliliters. Ex. 10.

Temp: Indicates the initial temperature in degrees Fahrenheit. Ex. 75.

Temp1: Indicates the ending temperature in degrees Fahrenheit. Ex. 75.

Media Spec: List media specification. Ex. Mil-X-XXXX.

Exposure Time: Indicates the exposure time in hours. Ex. 24.

Fluid Chg.: Indicates any change in the fluid or media. Ex. Color.

Cure No.: Indicates the cure the material has been through prior to testing. Ex. 01.

Rating: Indicates letter rating per 8060.1C. Computer rates -- Valid ratings are "A", "B", "I", and "X".

VF: Indicates the rating of this test in MSFC-HDBK-527/JSC 09604 version "F". This is for a quick comparison of any ratings change since 527F and present database.

VX: Indicates or will indicate the rating in MSFC-HDBK-527/JSC 09604 next version. This will then be a quick comparison of any rating changes from 527F and 527G and present database.

Reference: Indicates the way in which the data is reviewed and ties all data to be reviewed together with the same reference number. Ex. All data at 30 percent oxygen at thickness .062 would be reference "03" and would all be evaluated together to get an overall rating.

Skew Flag: Indicates the level of review the data has received, final print selection will make up the nest MSFC-HDBK-572/JSC 09604 Rev. G. Ex. "S" = Computer Skew, "M" = MSFC Skew Selection (See attachment 'MAPTIS Configuration Logic Diagram Codes' for all codes).

Type: Indicates the type of statement, either remark or sample description. Sequence Number: Consist of the consecutive numbers assigned to each line of the remarks entered on the general record. Ex. 001.

Remarks: This field can be either a remark or a sample description, and consist of anything not covered in the above information. Special comments about sample orientation or burning effects on sample can also be placed in this field. Ex. Frond face of sample number 3 fell off during testing.

Note: Material codes and test numbers that appear in the sample information and remark sections are checks to be sure any changes to header will keep all other data intact.

Mechanical Impact Lox/Gox Systems (Opt. 8)

TRP: Indicates that you had a test report.

Test Report Number: The number assigned to each test report, we preceded it by a letter to indicate the test facility at which the test was conducted. Ex, "W" for White Sands Test Facility and "M" for Marshall Test Facility.

Material Code: Consist of a five digit number (computer generated) that has been assigned to that specific material.

Source: Indicates data source or the test facility at which the test was conducted. Write as follows:

White Sands Test Facility = 'WSTF'
Marshall Space Flight Center = 'MSFC'
Goddard Space Flight Center = 'GSFC'

Test Date: Indicates the date the test was completed -- it is listed on the front of each test report.

Temp: Indicates the initial temperature in degrees Fahrenheit. Ex. 75.

Thick: Indicates thickness of material in inches. Ex. 003.

NHB: Test is the 8060.1C test number. Ex. 1, 8, 10, 13.

Type: Is a key word description of the test. Ex. Mech.

Substrate Information:

Thick: Indicates the thickness of the substrate the material was placed on for testing. It is given in mill thickness and converted to inches for the database. Ex. 3 mill will be 0.003.

Mtrl: Indicates the actual material of the substrate the material was placed on for testing. Some common substrates are Teflon, aluminum, or aluminum foil.

Fluid: List the name of fluid or media that is used in the test. Ex. Liquid Oxygen.

2nd Fluid: List the name of the second fluid, if any. Ex. Nitrogen.

Batch No.: Indicates the manufacturers Batch/Lot Number. Ex. TA114.

Pct Fluid: Indicates the percentage of main fluid or media used. Ex. 50.

2nd Pct Fluid: Indicates the percentage of the second fluid, if any. Ex. 50.

Cure No.: Indicates the cure the material has been through prior to testing Ex. 01.

SMP No.: Indicates the sample number. Ex. 3.

Rating: Indicates letter rating per 8060.1C. Computer rates -- Valid ratings are "A", "B", "C", "I", and "X".

VF: Indicates the rating of this test in MSFC-HDBK-527/JSC 09604 version "F". This is for a quick comparison of any ratings change since 527F and present database.

VX: Indicates or will indicate the rating in MSFC-HDBK-527/JSC 09604 next version. This will then be a quick comparison of any rating changes from 527F and 527G and present database.

Pressure: Indicates the pressure at which the test was conducted in psia. Ex. 9.0, 14.7 (ambient *in* pressure is considered 14.7)

Impact Energy: Indicates the impact energy in Ft. Lbs. that is used in testing. Ex. 72.

No Reactions: Indicates the number of reactions per test. Ex. 04.

No Tests: Indicates the number of tests at pressure and energy level. Ex. 20.

Reference: Indicates the way in which the data is reviewed and ties all data to be reviewed together with the same reference number. Ex. All data at 30 percent oxygen at thickness .062 would be reference "03" and would all be evaluated together to get an overall rating.

Skew Flag: Indicates the level of review the data has received, final print selection will make up the nest MSFC-HDBK-572/JSC 09604 Rev. G. Ex. "S" = Computer Skew, "M" = MSFC Skew Selection (See attachment 'MAPTIS Configuration Logic Diagram Codes' for all codes).

Sequence Number: Consist of the consecutive numbers assigned to each line of the remarks entered on the general record. Ex. 001.

Remarks: This field can be either a remark or a sample description, and consist of anything not covered in the above information. Special comments about sample orientation or burning effects on sample can also be placed in this field. Ex. Frond face of sample number 3 fell off during testing.

Note: Material codes and test numbers that appear in the sample information and remark sections are checks to be sure any changes to header will keep all other data intact.

Pneumatic Impact Fluid Systems (Opt. 9)

TRP: Indicates that you had a test report.

Test Report Number: The number assigned to each test report, we preceded it by a letter to indicate the test facility at which the test was conducted. Ex, "W" for White Sands Test Facility and "M" for Marshall Test Facility.

Material Code: Consist of a five digit number (computer generated) that has been assigned to that specific material.

Source: Indicates data source or the test facility at which the test was conducted. Write as follows:

White Sands Test Facility = 'WSTF'
Marshall Space Flight Center = 'MSFC'
Goddard Space Flight Center = 'GSFC'

Test Date: Indicates the date the test was completed -- it is listed on the front of each test report.

Temp: Indicates the initial temperature in degrees Fahrenheit. Ex. 75.

Thick: Indicates thickness of material in inches. Ex. 003.

NHB: Test is the 8060.1C test number. Ex. 14.

Type: Is a key word description of the test. Ex. Mech., Pneu.

Substrate Information:

Thick: Indicates the thickness of the substrate the material was placed on for testing. It is given in mill thickness and converted to inches for the database. Ex. 3 mill will be 0.003.

Mtrl: Indicates the actual material of the substrate the material was placed on for testing. Some common substrates are Teflon, aluminum, or aluminum foil.

Fluid: List the name of fluid or media that is used in the test. Ex. Liquid Oxygen.

2nd Fluid: List the name of the second fluid, if any. Ex. Nitrogen.

Batch No.: Indicates the manufacturers Batch/Lot Number. Ex. TA114.

Pct Fluid: Indicates the percentage of main fluid or media used. Ex. 50.

2nd Pct Fluid: Indicates the percentage of the second fluid, if any. Ex. 50.

Rating: Indicates letter rating per 8060.1C. Computer rates -- Valid ratings are "A", "B", "C","I", and "X".

VF: Indicates the rating of this test in MSFC-HDBK-527/JSC 09604 version "F". This is for a quick comparison of any ratings change since 527F and present database.

VX: Indicates or will indicate the rating in MSFC-HDBK-527/JSC 09604 next version. This will then be a quick comparison of any rating changes from 527F and 527G and present database.

Pressure: Indicates the pressure at which the test was conducted in psia. Ex. 9.0, 14.7 (Ambient in pressure is considered 14.7)

No Reactions: Indicates the number of reactions per test. Ex. 04.

No. Tests: Indicates the number of tests at pressure and energy level Ex. 20.

Cure No.: Indicates the cure the material has been through prior to testing. Ex. 01.

Reference: Indicates the way in which the data is reviewed and ties all data to be reviewed together with the same reference number. Ex. All data at 30 percent oxygen at thickness .062 would be reference "03" and would all be evaluated together to get an overall rating.

Skew Flag: Indicates the level of review the data has received, final print selection will make up the nest MSFC-HDBK-572/JSC 09604 Rev. G. Ex. "S" = Computer Skew, "M" = MSFC Skew Selection (See attachment 'MAPTIS Configuration Logic Diagram Codes' for all codes).

Sequence Number: Consist of the consecutive numbers assigned to each line of the remarks entered on the general record. Ex. 001.

Remarks: This field can be either a remark or a sample description, and consist of anything not covered in the above information. Special comments about sample orientation or burning effects on sample can also be placed in this field. Ex. Front face of sample number 3 fell off during testing.

Note: Material codes and test numbers that appear in the sample information and remark sections are checks to be sure any changes to header will keep all other data intact.

Toxic Offgassing (Opt. 10)

TRP: Indicates that you had a test report.

Test Report Number: The number assigned to each test report, we preceded it by a letter to indicate the test facility at which the test was conducted. Ex, "W" for White Sands Test Facility and "M" for Marshall Test Facility.

Material Code: Consist of a five digit number (computer generated) that has been assigned to that specific material.

Source: Indicates data source or the test facility at which the test was conducted. Write as follows:

White Sands Test Facility = 'WSTF'
Marshall Space Flight Center = 'MSFC'
Goddard Space Flight Center = 'GSFC'

Test Date: Indicates the date the test was completed -- it is listed on the front of each test report.

Pressure: Indicates the pressure at which the test was conducted in psia. Ex. 9.0, 14.7 (Ambient in pressure is considered 14.7)

Temp: Indicates the temperature at which the test was conducted. Ex. 120.

NHB: Test is the 8060.1C test number. Ex. 1, 2, 8, 10, and 13.

Typ: Is a key word description of the test. Ex. UPW, DWN, and Fuse.

Percent Oxygen: Indicates the level of oxygen concentration at which the material was tested. Ex. 25.90, 23.80 (Air in percent oxygen is considered "20.90").

Gas Pct.: Percent second gas, usually nitrogen but not always. This is what remains after the percent oxygen is subtracted from 100 percent. Ex. 30.00 oxygen, 70.00 nitrogen.

Gas Name: Indicates name of the second gas written out. Ex. Nitrogen.

Substrate Information:

Thick: Indicates the thickness of the substrate the material was placed on for testing. It is given in mill thickness and converted to inches for the database. Ex. 3 mill will be 0.003.

Mtrl: Indicates the actual material of the substrate the material was placed on for testing. Some common substrates are Teflon, aluminum, or aluminum foil.

Sample Weight: Indicates the weight of the material in grams. Ex 37.5.

Analysis Criteria: Indicates which analysis criteria to be used in evaluating the test results. (A) Micrograms/Grams for non-assembled material. (B) Total micrograms for assembled articles.

Surface Area: Indicates surface area of material in square inches. Ex. 2.

ML WT: Indicates the maximum limit weight of material that can be used without exceeding summation of T. This field also indicates the number of units that can be used also. Computer calculates.

Skew Flag: Indicates the level of review the data has received, final print selection will make up the nest MSFC-HDBK-572/JSC 09604 Rev. G. Ex. "S" = Computer Skew, "M" = MSFC Skew Selection (See attachment 'MAPTIS Configuration Logic Diagram Codes' for all codes).

Reference: Indicates the way in which the data is reviewed and ties all data to be reviewed together with the same reference number. Ex. All data at 30 percent oxygen at thickness .062 would be reference "03" and would all be evaluated together to get an overall rating.

Cure No.: Indicates the cure the material has been through prior to testing. Ex. 01.

Shuttle Rtg: Indicates letter rating per 8060.1C, for shuttle. Computer rates --Valid ratings are "K", "H", "A", "V", and "X".

VF: Indicates the rating of this test in MSFC-HDBK-527/JSC 09604 version "F". This is for a quick comparison of any ratings change since 527F and present database.

VX: Indicates or will indicate the rating in MSFC-HDBK-527/JSC 09604 next version. This will then be a quick comparison of any rating changes from 527F and 527G and present database.

SSF Rtg: Indicates letter rating per 8060.1C for Space Station Freedom. Computer Rates -- Valid ratings are "K", "H", "A", "V", and "X".

Gas Code: NASA assigned gas code (6 digit) for each constituent a material offgassed. Ex. 16100.

Amount: Indicated the amount of each constituent the material offgassed. Ex. 26.

ML WT: Indicates the maximum limit that can be used in pounds of the material without exceeding the summation of T. Computer calculates. Ex. 50.

Milgr/M3: Indicates the SMAC limit for each constituent. Computer pulls from gas table. Ex. 26.

TX2/Mac: Indicates the offgassed amount in milligrams/M3 over Mac. Ex. 020.

Type: Indicates the type of statement, either remark or sample description.

Sequence Number: Consist of the consecutive numbers assigned to each line of the remarks entered on the general record. Ex. 001.

Remarks: Consist of anything not covered in designation, composition or for special comments concerning the material.

Note: Material codes that appear in the specification and remark sections are checks to be sure any changes to header will keep all other data intact.

Odor Data (Opt. 11)

TRP: Indicates that you had a test report.

Test Report Number: The number assigned to each test report, we preceed it by a letter to indicate the test facility at which the test was conducted. Ex. "W" for White Sands test facility and "M" for Marshall test facility.

Material Code: Consist of a five digit number (computer generated) that has been assigned to that specific material.

Source: Indicates data source or the test facility at which the test was conducted. Write as follows:

White Sands Test Facility = 'WSTF'
Marshall Space Flight Center = 'MSFC'
Goddard Space Flight Center = 'GSFC'

Test Date: Indicates the date the test was completed -- it is listed on the front of each test report.

Pressure: Indicates the pressure at which the test was conducted in psia. Ex. 9.0, 14.7 (Ambient in pressure is considered "14.7.)

NHB: Test is the 8060.1C test number. Ex. 1, 2, 8, 10, 13.

Type: Is a key word description of the test. Ex. upw, dwn, fuse.

Percent Oxygen: Indicates the level of oxygen concentration at which the material was tested Ex. 25.90, 23.80. (Air in percent oxygen is considered "20.90".)

Gas Pct: Percent second gas, usually nitrogen but not always. This is what remains after the percent oxygen is subtracted form 100 percent. Ex. 30.00 oxygen, 70.00 nitrogen.

Gas Name: Indicates name of the second gas written out. Ex. Nitrogen.

Substrate Information:

Thick: Indicates the thickness of the substrate the material was placed on for testing. It is given in mill thickness and converted to inches for the database. Ex. 3 mill will be 0.003.

Mtrl: Indicates the actual material of the substrate the material was placed on for testing. Some common substrates are Teflon, aluminum, or aluminum foil.

Sample Weight: Indicates the weight of the material in grams. Ex 37.5.

Odor: Indicates the amount in numeric value from the test report. Ex. 2.0.

Cure No.: Indicates the cure the material has been through prior to testing. Ex. 01.

Rtg: Indicates letter rating per 8060.1C. Computer rates -- Valid ratings are "A", "I", and "X".

VF: Indicates the rating of this test in MSFC-HDBK-527/JSC 09604 version "F". This is for a quick comparison of any ratings change since 527F and present database.

VX: Indicates or will indicate the rating in MSFC-HDBK-527/JSC 09604 next version. This will then be a quick comparison of any rating changes from 527F and 527G and present database.

Skew Flag: Indicates the level of review the data has received, final print selection will make up the nest MSFC-HDBK-572/JSC 09604 Rev. G. Ex. "S" = Computer Skew, "M" = MSFC Skew Selection (See attachment 'MAPTIS

Type: Indicates the type of statement, either remark or sample description.

Sequence Number: Consist of the consecutive numbers assigned to each line of the remarks entered on the general record. Ex. 001.

Remarks: Consist of anything not covered in designation, composition or for special comments concerning the material.

Note: Material codes that appear in the specification and remark sections are checks to be sure any changes to header will keep all other data intact.

Thermal Vacuum Outgassing (Opt. 12)

TRP: Indicates that you had a test report.

Test Report Number: The number assigned to each test report, we preceded it by a letter to indicate the test facility at which the test was conducted. Ex. "W" for White Sands test facility and "M" for Marshall test facility.

Material Code: Consist of a five digit number (computer generated) that has been assigned to that specific material.

Source: Indicates data source or the test facility at which the test was conducted. Write as follows:

White Sands Test Facility = 'WSTF'
Marshall Space Flight Center = 'MSFC'
Goddard Space Flight Center = 'GSFC'

Test Date: Indicates the date the test was completed -- it is listed on the front of each test report.

Pressure: Indicates the pressure at which the test was conducted in psia. Ex. 9.0, 14.7 (Ambient in pressure is considered "14.7.)

NHB: Test is the 8060.1C test number. Ex. 1, 2, 8, 10, 13.

Type: Is a key word description of the test. Ex. TVS.

Duration: Indicates the time in hours the test lasted . Ex. 24.

Substrate Information:

Thick: Indicates the thickness of the substrate the material was placed on for testing. It is given in mill thickness and converted to inches for the database. Ex. 3 mill will be 0.003.

Sample No.: Indicates the number of sample. Ex. 2.

TML: Indicates percentage of total mass loss. Ex. 02.

VCM%: Indicates percentage of volatile condensable materials. Ex. 11.

RML/WVR%: Indicates percentage recovered mass loss/water vapor recover. Ex. 02.

Cure No.: Indicates the cure the material has been through prior to testing. Ex. 01.

Rating: Indicates latter rating per SP-R-0022/ASTM 595. Computer rates -- Valid ratings are "A", "C", "I", and "X".

VF: Indicates the rating of this test in MSFC-HDBK-527/JSC 09604 version "F". This is for a quick comparison of any ratings change since 527F and present database.

VX: Indicates or will indicate the rating in MSFC-HDBK-527/JSC 09604 next version. This will then be a quick comparison of any rating changes from 527F and 527G and present database

Reference: Indicates the way in which the data is reviewed and ties all data to be reviewed together with the same reference number. Ex. All data at 30 percent oxygen at thickness .062 would be reference "03" and would all be evaluated together to get an overall rating.

Skew Flag: Indicates the level of review the data has received, final print selection will make up the nest MSFC-HDBK-572/JSC 09604 Rev. G. Ex. "S" = Computer Skew, "M" = MSFC Skew Selection (See attachment 'MAPTIS Configuration Logic Diagram Codes' for all codes).

Sequence Number: Consist of the consecutive numbers assigned to each line of the remarks entered on the general record. Ex. 001.

Remarks: This field can be either a remark or a sample description, and consist of anything not covered in the above information. Special comments about sample orientation or burning effects on sample can also be placed in this field. Ex. Frond face of sample number 3 fell off during testing.

Note: Material codes and test numbers that appear in the sample information and remark sections are checks to be sure any changes to header will keep all other data intact.

Lox/Gox Promoted Ignition (Opt. 13)

TRP: Indicates that you had a test report.

Test Report Number: The number assigned to each test report, we preceded it by a letter to indicate the test facility at which the test was conducted. Ex, "W" for White Sands Test Facility and "M" for Marshall Test Facility.

Material Code: Consist of a five digit number (computer generated) that has been assigned to that specific material.

Source: Indicates data source or the test facility at which the test was conducted. Write as follows:

White Sands Test Facility = 'WSTF'
Marshall Space Flight Center = 'MSFC'
Goddard Space Flight Center = 'GSFC'

Test Date: Indicates the date the test was completed -- it is listed on the front of each test report.

Pressure: Indicates the pressure at which the test was conducted in psia. Ex. 9.0, 14.7 (Ambient in pressure is considered "14.7.)

NHB: Test is the 8060.1C test number. Ex. Prom..

Type: Is a key word description of the test. Ex. Upw.

Ignitor: Indicates the type of ignitor used for the test. Ex. ***.

IGN WGT: Indicated the weight in grams of the ingnitor used. Ex. 24.

2nd Gas: Percent second gas, usually nitrogen but not always. This is what remains after the percent oxygen is subtracted from 100 percent. Ex. 30.00 Oxygen, 70.00 Nitrogen.

Substrate Information:

Thick: Indicates the thickness of the substrate the material was placed on for testing. It is given in mill thickness and converted to inches for the database. Ex. 3 mill will be 0.003.

Cure No.: Indicates the cure the material has been through prior to testing Ex. 01.

Rating: Indicates latter rating per SP-R-0022/ASTM 595. Computer rates -- Valid ratings are "A", "B", "C", "I", and "X".

Reference: Indicates the way in which the data is reviewed and ties all data to be reviewed together with the same reference number. Ex. All data at 30 percent oxygen at thickness .062 would be reference "03" and would all be evaluated together to get an overall rating.

Skew Flag: Indicates the level of review the data has received, final print selection will make up the nest MSFC-HDBK-572/JSC 09604 Rev. G. Ex. "S" = Computer Skew, "M" = MSFC Skew Selection (See attachment 'MAPTIS Configuration Logic Diagram Codes' for all codes).

VF: Indicates the rating of this test in MSFC-HDBK-527/JSC 09604 version "F". This is for a quick comparison of any ratings change since 527F and present database.

VX: Indicates or will indicate the rating in MSFC-HDBK-527/JSC 09604 next version. This will then be a quick comparison of any rating changes from 527F and 527G and present database

Sample Information:

No: Indicates the sample number. Ex. 3.

Length Indicates the length in inches of the sample. Ex. 12.

Diameter: Indicates the diameter in inches of the sample. Ex. .25.

Weight: Indicates the weight in grams of the sample. Ex. 24.

Burn Length: Indicates the burn length in inches the sample burned. Ex. 6.

Burn Time: Indicates time the material burned in seconds. Ex. 15.6.

Propagation Rate: Indicates inches per second that the material burned, this will be listed on the test for each sample with a burn length of more than six inched. Ex. 0.03.

Sequence Number: Consist of the consecutive numbers assigned to each line of the remarks entered on the general record. Ex. 001.

Remarks: This field can be either a remark or a sample description, and consist of anything not covered in the above information. Special comments about sample orientation or burning effects on sample can also be placed in this field. Ex. Frond face of sample number 3 fell off during testing.

Note: Material codes and test numbers that appear in the sample information and remark sections are checks to be sure any changes to header will keep all other data intact.

Fungi Data (Opt. 15)

TRP: Indicates that you had a test report.

Test Report Number: The number refers to the document where data was found.

Material Code: Consist of a five digit number (Computer generated) that has bees assigned to that specific materials.

Source: Indicates document which is cross referenced with test report number to give actual location of data. Ex. ***.

Test Date: Indicates the date the test was completed -- it is listed on the front of each test report.

Temp: Indicates the temperature in degrees Fahrenheit that the material was tested. Ex. 75.

Time: Indicated the duration in hours the test was conducted. Ex. 24.

NHB: Test is the 8060.1C test number. Ex Base.

Type: Is a key word description of the test. Ex. Base.

Results: Indicates the results of the test. Ex. Experienced light brown.

Method: Indicates the method of testing conducted. Ex. Plate Test.

Test Spec.: List any applicable test specification. Ex. ASTM-G21-70.

RH%: Indicated the percentage of relative humidity produced during testing. Ex. 98.

Cure No.: Indicates the cure the materials has been through prior to testing Ex. 01.

Rating: Indicated letter rating per 8060.1C. Ex. "A" and "X".

Reference: Indicates the way in which the data is reviewed and ties all data to be reviewed together with the same reference number. Ex. All data at 30 percent oxygen at thickness .062 would be reference "03" and would all be evaluated together to get an overall rating.

Organisms Used: Indicates the organisms used in the test. Ex. Asperigillus Niger.

ATCC: Indicates amount of ATCC during testing. Ex. 9642.

MYCO: Indicates amount of MYCO during testing. Ex. 386.

Nutrients Used: Indicates the nutrients used in the test. Ex. N-H4-N-03.

Grams: Indicates the amount in grams that was used. Ex. 1.

Type: Indicates the type of statement, either remark or sample description.

Sequence Number: Consist of the consecutive numbers assigned to each line of the remarks entered on the general record. Ex. 001.

Remarks: Consist of anything not covered in designation, composition or for special comments concerning the material.

Note: Material codes that appear in the specification and remark sections are checks to be sure any changes to header will keep all other data intact.

Fungi Reference Table (Opt. 16)

DOC Title: Indicates document title. Ex. Environmental Rest Report.

DOC Source: Indicates document source> Ex. U.S.B.I. Booster Production Company.

DOC RPT NO.: Indicates the document report number. Ex. 117035.

Author: Indicates the author of the document. Ex. M Gross, R. Rostohar.

Date: Indicates the date the document was published. Ex. 25-Jan-88.

Configuration Thermal Vacuum Stability (Opt. 17)

There is no official screen for CTVS at this time -- the rating criteria and testing procedure in under review by EH41. Upon completion a new screen will be established to reflect the rating criteria and other pertinent information.

The screen on this option will under go major changes.

Cure Table Entry Screen (Opt. 18)

Material Code: Consist of a five digit number (Computer generated) that has been assigned to that specific material.

Cure No.: Assigned to each individual cure (not to phase). Ex. Cure 01, Phase 01 = 24 hours @ 120 -- Cure 01, Phase 02 = 4 hours @ 70. This number will be used whenever this cure is needed regardless of the type of test (within the material code). The same number is used in the overall cures also, Ex. 09.

Phase Number: Indicates the order of the cure, if there is more than one phase. Cure 01, Phase 01.

Blends: Indicates what is blended and at what ration, Ex. 50 parts A to 10 parts B.

W/V/B: Indicates if the mixture is by weight, volume or both.

Cure Time: Indicates the number of hours the sample was cured. Ex. 24.

Cure Temperature: Indicates the temperature at which the sample was cured in degrees Fahrenheit. Ex. 150.

Cure Pressure: Indicates the pressure at which the sample was cured in psia. Ex. 50.

Note: Indicates any additional preparation done to the material that can not be stated in the usual cure statements.

The cure number bust be checked each time a test is added to the material code, because if the test has the same cure the same number can be used regardless of the type of test.

Non-Standard Test Numbers (Opt. 19)

Test Number: Indicates the test number. Ex. W24976.

Tester Organization: Indicates the tester organization. Ex. WSTF.

Test Type: Indicates the test type. Ex. Flammability.

Material Designation: Indicates the material tested. Ex. Stycast 2850.

Non-Standard Test Type (Opt. 20)

Type: Indicates the letter given for each type of non-standard test type. Ex. C, P.

Description: Indicates the description or type of non-standard test type. Ex. Canceled, Procurement.

Valid Test (Opt. 21)

Test Type: Indicates the abbreviated test type. Ex. Flam, Lox.

Test: Indicates the spelled out test type. Ex. Flammability, Liquid Oxygen.

Rating Summary (Opt. 22)

Type: Indicates the abbreviated test types. Ex. Flam, Tox.

RT: Indicates the ratings. Ex. A.

Seq.: Indicates the sequence number of the test. Ex. 1.

Text: Explains the rating criteria for the ratings. Ex. Material that burns less than 6 inches.

Gas Table (Opt. 23)

No.: Indicates NASA 6 digit code for each constituent. Ex. 16100.

Name: List the name (spelled out) of each constituent. Ex. Carbon Monoxide.

General Table (Opt. 24)

This table is the same as option 1 and 2, except it does not contain specifications nor manufacturers.

Cure Query (Opt. 25)

This is a query --when chosen it will prompt you for a material code. It produces the cures that exist on that material code.

Generic ID (Opt. 26)

This option will prompt you for a the Generic ID Table you wish: 1) Use type 2) Major composition and 3) Additional composition.

ID: Indicates the two character code for generic ID. Ex. AB.

Definition: List the actual name for the generic ID. Ex. Adhesive.

Option 27 and 28 are Processes

Opt. 27: Combine material codes or move test reports to other material codes.

Opt. 28: Copies test reports from one material code to another.

(B) "Skew" Methodology

If there is a conflict in data and it can not be resolved by reviewing the test reports -- always use the latest test report.

Establish separate material codes for manufacturers when the product has a trade name or number. If sold only through generic name or number they can be grouped into general code with 'NOC'. Ex. Nylon 6/6 NOC.

'9' Record is worst case record (except TVS) and will be reported on skew.

Flammability Information:

1. Skew worst case per oxygen concentration, sample thickness, per pressure, per substrate material/thickness.
2. Flammability varies inversely with thickness in absence substrate.
3. Metallic substrates act as heat sinks. Nonmetals to less extent --except ceramics, Teflon's and glass.
4. If a material is non-flammable at higher oxygen concentration. Conversely if material is flammable at lower oxygen concentration, same thickness or less would be flammable at higher oxygen concentration.
5. Beware of conflicting data regarding same composition of materials. i.e., Polyethylene should burn regardless of manufacturer -- PTFE should not.
6. For skewing purposes only: Up to 6.5 inches rate "A". Greater than 6.5 inches, but less than 7 inches talk to Mr. Key.
7. Special test or configuration, in sheet form but not standard dimensions shall be used for tests data where no standard test 1 data is available.
8. Any time there is a significant difference in bur length between the three samples tested, put a remark explaining the cause. If test report states 'there is no apparent reason for difference in burn length of Sample 1 and Sample 2' include that in remarks.

Substrates:

There is usually a minimum material thickness for a specified substrate thickness that is 'non flammable'. If you decrease thickness of materials further -- the material will not burn; however, if you increase thickness of material -- the material may become flammable.

Generally material becomes more flammable at a given thickness when substrate thickness is decreased. Thicker material is usually more flammable because of less heat sink effect of substrate;

If substrate thickness remains the same -- thicker material is more flammable. If materials thickness remains the same -- the thinner substrate becomes more flammable.

Note: As substrate thickness or substrate material is changed above will also be modified. i.e., Thicker substrates (metal) less flammable is sample thickness is not modified.

Thickness Groupings (Consider, but do not do!):

A. Thickness up to 12 mils consider individually..

B. Thickness above 12 mils group -.003, +.005 (if flammability results are not different.

C. Always show different substrate material and thickness.

Flammability Data Selection:

A. Standard sample (no substrate) if material burns: Use the thickest sample tested. Assume all thinner samples burns.

B. Standard sample (no substrate) if material does not burn: Use the thinnest sample tested. Assume thicker samples will not burn, beware of smoldering.

C. Flammability is rated 'X' if K10 paper ignites. If K10 paper is not used, flammability is rated 'X' if moderate or large burn dripping.

D. If material is tested more than once: One observation has small burn dripping, other has moderate or large burn dripping (without K10 paper). Use small burn dripping or latest test. However, if results available with K10 paper, use results from K10 paper test -- This is usually latest test report. If K10 paper ignites test must be rated 'X'.

E. If conflict in data between WSTF and MSFC under same conditions, use WSTF data unless MSFC is later test report. If still a conflict, ask Mr. Key to decide. If data changes overall rating, prepare MAPTIS change request for board action.

F. Ceramic glasses, Anodize, Alodine, BE and FEO Oxides, Silica, Quartz, Pure Fiberglass, Beta Fiber fabrics, are non flammable and non toxic. 'A' rated in flammability -- "K' rated in toxicity.

G. Paints (.5 mil - 2 mil) generally are non-flammability on substrates >10 mil. However, some data shows otherwise, check substrates.

H. Refset coating applied to flammable material may make then 'non-flammable'. Thickness of coating and material is a factor.

I. Materials generally become more flammable as oxygen percentage is increased. May show up as propagation rate increase only.

J. If rating is different for two test under the same conditions -- report both tests. Use latest report for skew.

K. Disregard flammability data where substrate thickness is not given, if substrate is present.

Flammability Tendency Per Thickness -- Substrate and Material:

	Substrate Thickness	Material Thickness	Flammability (General)
A.	.003	.001	Tendency towards non-flammable
B.	.003	.003	More flammable than A
C.	.003	.010	Much more flammable than A or B
D.	.010	.001	Less flammable than A thru C
E.	.010	.003	More flammable than D, <A thru C
F.	.010	.010	More flammable than A, B, E, <C
G.	.063	.001	Less flammable than A thru F
H.	.063	.010	More flammable A, B, D, E, <F, C
I.	.063	.062	More flamm H, C, F, A, B, <D, E

Rating -- Standard Sample Length

A. On materials 2.5 x 12.

'A' Rated if sample burns less than 6 inches.

'B' Rated if sample burns more than 6 inches but 12 inches.

'C' Rated if sample burns totally in Test 1 -- (Test 2 no longer has to be considered). If only one sample it must burn totally to be rated 'C'.

'I' Rated if less than three samples and no total burn.

'X' Rated if moderate or large burn dripping. (Moderate or Large burn dripping is rated 'X' -- regardless of burn length)

Note: You can fail a material with less than three samples tested, but you can not pass the material. i.e., You can not rate it 'A' or 'B', the rating should be either a 'C', 'X' or 'I'.

Rating -- Non-Standard Sample Length (Need 3 samples)

A sample length of less than 6 inches can not fail because of a total burn, unless there is moderate or large drip burning. It should be rated 'I'. A sample >6 inches bur <12 inches can not fail because of a total burn should be rated 'I'.

TEST MATERIAL ENTRY/UPDATE

Mtrl Code: _____ Check Init: ___ ___ TRP: _
Use Type: _____ Class: _ Generic Id: _____
Use Temperature - Min: _____(F) Max: _____(F)
Designation: _____
Composition: _____

Specification: _____ Mcd: _____ TRP: _

Manufacturer/Supplier (M/S): _ H4ID: _____ Mcd: _____ TRP: _
Name: _____
Division: _____
Addr1: _____ Addr2: _____
City: _____ State: __ Zip: _____
Country: _____ Phone: _____

Type	Seq	Remarks	Mcd
_____	__	_____	_____
_____	__	_____	_____
_____	__	_____	_____

Count: *0

<Replace>

MAPTIS NONMETALS TEST REPORT
FLAMMABILITY ENTRY/UPDATE

Tst Rpt: _____ Matcd: _____ Source: _____ Tst Date: _____ TRP: _

Pressure: _____psia Sample Temp: _____f NHB: _____ Type: _____

Pct Oxy: ____ Gas Pct: ____ Gas Name: NITROGEN_____

Substrate - Thick:_____in Mtrl: _____

Cure No: __ Rating: __ VF: __ VX: __ Reference: __ Skew Flag: _____

Count: *0 <Replace>

Test Rpt: _____ MATCD: _____ NHB: ____ Type: ____

No	Width	Lgth	Thick	Oxy Rmn	K10	FJ	SP	DB	TB	Burn Time	Matcd	Test Rpt	*
_													

** Vertical Burn ***				* Horizontal Burn **				** Diagonal Burn ***			
Lgth	Time	Prop	Rt	Lgth	Time	Prop	Rt	Lgth	Time	Prop	Rt
		-				-				-	

No	Width	Lgth	Thick	Oxy Rman	K10	FJ	SP	DB	TB	Burn Time	Matcd	Test Rpt	_
_													

** Vertical Burn ***				* Horizontal Burn **				** Diagonal Burn ***			
Lgth	Time	Prop	Rt	Lgth	Time	Prop	Rt	Lgth	Time	Prop	Rt
		-				-				-	

No	Width	Lgth	Thick	Oxy Rman	K10	FJ	SP	DB	TB	Burn Time	Matcd	Test Rpt	_
_													

** Vertical Burn ***				* Horizontal Burn **				** Diagonal Burn ***			
Lgth	Time	Prop	Rt	Lgth	Time	Prop	Rt	Lgth	Time	Prop	Rt
		-				-				-	

Count: *0 <Replace>

TEST RPT: _____ MATCD: _____ NHB: ____ Type: ____

PE	Seq	Remarks	Matcd	Test Rpt

Enter_D-Description,_R-Remark,_O-Opt.Note,_A-Add.Note,_P-Prep,_OBS-Observation__
Count: *0 <Replace>

MAPTIS NONMETALS TEST REPORT
FLASH AND FIRE ENTRY/UPDATE

Tst Rpt: _____ Matcd: _____ Source: _____ Tst Date: _____ TRP: _
Pressure: _____psia NHB: 03___ Type: F/F__
Pct Oxy : _____ Pct Gas: ____ Gas Name: _____
Substrate - Thickness: _____in Mtrl: _____
Sample No: _ Weight: _____grams Flash Pt: ____f Fire Pt: _____f
Flash Rt: __ Fire Rt: __ Cure No: __ Reference: __
Skew Flag: _____

TYPE	Seq	Remark	Matcd	Test Rpt

Count: *0

<Replace>

MAPTIS NONMETALS TEST REPORT
ELECTRIC OVERLOAD ENTRY/UPDATE

TRP: P

Test Rpt: _____ Matcd: _____ Source: _____ Tst Date: _____
Pressure: _____psia Start Cur: ___amp NHB: 04B__ Type: FUSE_
Pct Oxy : _____ Gas Pct: _____ Gas: _____
Ins Thick: _____ Sample Angle: _____ Guage: ____awg
Tie Space: ____in Wire Tie Mtrl: _____ Spec: _____
Cure No: __ Rating: __ Reference: __ Skew Flag: _____

S N	-- Fusion - Cur amp	Time sec	Burn Lgth in	T B	Burn Time sec	I g n	Prop rate in/sc	K 1 0	F J	S P	D B	Oxy After Test	Damage to Adjacent Wires (upto 240 ch)	Matcd	Test Rpt
_	___	_____	_____	_	_____	_	_____	_	_	_	_	_____	_____	_____	_____
_	___	_____	_____	_	_____	_	_____	_	_	_	_	_____	_____	_____	_____
_	___	_____	_____	_	_____	_	_____	_	_	_	_	_____	_____	_____	_____

Type	Seq	Remarks	Matcd	Test Rpt
_____	___	_____	_____	_____
_____	___	_____	_____	_____
_____	___	_____	_____	_____

Count: *0

<Replace>

MAPTIS NONMETALS TEST REPORT
ELECTRICAL WIRE INSULATION ENTRY/UPDATE

TRP: _

Test Rpt : _____ Matcd: _____ Source: _____ Tst Date: _____
Pressure: _____psia Thick: _____in NHB: 04A__ Type: ANGLE
Pct Oxy: _____ Gas Pct: _____ Gas Name: _____
Wire Guage: ____awg Tie Space: ____in Mtrl: _____
Insu Thick: _____ Sam Angle: ____ Ign.Orient: ____ Wire: Bundle: _
Cure No: __ Rating: __ Reference: __ Skew Flag: _____
Specification: _____

Sm No	Wire Temp f	--- Heater --- Time min	Crnt amp	Volt	Ign Time sec	Burn Lgth in	T B	Burn Time sec	Prop Rate in/sec	K 1 0	F J	S P	D B	Oxy After Test	Matcd	Test Rpt
_							_			_	_	_	_			
_							_			_	_	_	_			
_							_			_	_	_	_			

Type	Seq	Remarks	Matcd	Test Rpt

Count: *0

<Replace>

MAPTIS NONMETALS TEST REPORT
FLUID SYSTEMS ENTRY/UPDATE

Tst Rpt : _____ Matcd: _____ Source: _____ Tst Date: _____ TRP: _
Eff Area: _____sq in Qty: _____gram NHB: 15___ Type: _____
Substrate - Thick: _____ Mtrl: _____
Media: _____ Vapor Vol: _____ml
Pressure: _____psia Press1: _____psia Liquid Vol: _____ml
Temp: _____f Temp1: _____f
Media Spc: _____ Exposure Time: _____hrs
Material Change Flag: _ (Y/N) Fluid Change Flag: _ (Y/N)
Fluid Chg: _____
Cure No: __ Rtg: __ VF: __ VX: __ Reference: __ Skew Flag: _____

Type	Seq	Remarks	Matcd	Test Rpt

Count: *0

<Replace>

TEST REPORT MECHANICAL IMPACT LOX/GOX FLUID SYSTEMS

TRP: _

Test Rpt: _____ Matcd: _____ Source: _____ Test Date: _____

Temp: _____f Thick: _____in NHB: _____ Type: MECH_

Substrate - Thick: _____in Mtrl: _____

Fluid: _____ 2nd Fluid: _____ Batch No: _____

Pct Fluid: _____ 2nd Pct Fluid: _____ Cure No: __

Smp No	RTG	V F	V X	Pressure psia	Impact Energy	No. Reactions	No. Tests	Ref	Skew Flag	Matcd	Test Rpt
___	__	__	__	_____	_____	____	_____	___	_____	_____	_____
___	__	__	__	_____	_____	____	_____	___	_____	_____	_____
___	__	__	__	_____	_____	____	_____	___	_____	_____	_____

Type	Seq	Remarks	Matcd	Test Rpt
_____	___	_____	_____	_____
_____	___	_____	_____	_____
_____	___	_____	_____	_____
_____	___	_____	_____	_____

Count: *0

<Replace>

MAPTIS NONMETALS TEST REPORT
PNEUMATIC IMPACT ENTRY/UPDATE

Rpt: _____ Matcd: _____ Source: _____ Tst Date: _____ TRP: _

Temp: _____f Thick: _____in NHB: 14___ Type: PNEU_

Substrate - Thick: _____in Mtrl: _____

Fluid: _____ 2nd Fluid: _____ Batch: _____

Pct Fluid: _____ 2nd Pct Fluid: _____

Rating: __ VF: __ VX: __ Pressure: _____psia Reaction: ____ Tests: _____

Cure No: __ Reference: __ Skew Flag: _____

Type	Seq	Remarks	Matcd	Test Rpt

Count: *0 <Replace>

MAPTIS NONMETALS TEST REPORT
TOXICITY ENTRY/UPDATE

Test Rpt: _____ Matcd: _____ Source: _____ Tst Date: _____ TRP: _
Pressure: _____psia Temp: _____f NHB: _____ Type: TOX__
Pct Oxy: _____ Gas Pct: _____ Gas Name: NITROGEN_____
Substrate - Thick: _____in Mtrl: _____
Sample Weight: _____gram Analysis Criteria: _____
Surface Area : _____sq.in Chamber Vol _____ltr ML Wt:_____ Skw Flg
Ref: __ Cure: __ SHUTTLE-Rtg:__ VF:__ VX:__ SSF-Rtg:__ VF:__ VX:__ _____
Items Per Unit (if more than 1): ___ Item Descript: _____
Coating Flag: _

Gas Code	Amount	ML WT	MATCD	TEST RPT	Milgr/m3	TX2/MAC
		_____lbs				

Type	SEQ	REMARKS	Matcd	Test Rpt

Count: *0

<Replace>

MAPTIS NONMETALS TEST REPORT
ODOR ENTRY/UPDATE

Test Rpt: _____ Matcd: _____ Source: _____ Test Date: _____ TR Flg: _

Pressure: _____psia Temp: _____f NHB: 06___ Type: ODOR_

Pct Oxy: ____ Gas Pct: ____ Gas Name: _____

Substrate - Thick: _____in Mtrl: _____

Weight: _____grm Odor: ____ Chamber Vol: _____ liter
Cure: __ Rtg: __ VF: __ VX: __ Ref: __ Skew: ____

Type	Seq	Remarks	Matcd	Test Rpt

Count: *0 <Replace>

MAPTIS NONMETALS TEST REPORT
THERMAL VACUUM STABILITY ENTRY/UPDATE

TRP: _

Test Rpt: _____ Matcd: _____ Source: _____ Tst Date: _____
Pressure: _____ torr Temp: _____ C NHB: TVS__ Type: TVS__
Duration: _____ hrs Substrate - Thick: _____ in Mtrl: _____
Cure No: __ Rating: __ VF: __ VX: __
Reference: __ Skew Flag: _____

Sample No	Tml	VCM	RML/WVR	Test Report	Material Code
_	_____	_____	_____	_____	_____
_	_____	_____	_____	_____	_____
_	_____	_____	_____	_____	_____
_	_____	_____	_____	_____	_____

Type	Seq	Remark	Matcd	Test Rpt
_____	___	_____	_____	_____
_____	___	_____	_____	_____
_____	___	_____	_____	_____
_____	___	_____	_____	_____
_____	___	_____	_____	_____

Count: *0

<Replace>

TEST REPORT LOX/GOX PROMOTED IGNITION

TRP: _

Test Rpt: _____ Matcd: _____ Source: _____ Req Date: _____
Pressure: _____(psia) Temp: _____(f) NHB: 17___ Test Typ: PROM_
Ignitor : _____ Ign Wgt: _____(gram) Oxygen: ____
2nd Gas : ____% _____ Substrate: _____(in) _____
Cure No: __ Rating: __ Reference: __ Skew Flag: _____

Sample No.	Length (in)	Diameter (in)	Weight (gram)	Burn Length (in.)	Total Burn Ind	Burn Time (SEC)	Prop Rate (IN/SEC)
_	_____	_____	_____	_____	_	_____	_____
_	_____	_____	_____	_____	_	_____	_____
_	_____	_____	_____	_____	_	_____	_____

Type	Seq	Remarks
_____	___	_____
_____	___	_____
_____	___	_____
_____	___	_____
_____	___	_____

Count: *0

<Replace>

MAPTIS NONMETALS TEST REPORT
FUNGI ENTRY/UPDATE

Test Rpt: _____ Matcd: _____ Source: DOCUMENT__ Tst Date: _____ TRP: _
Temp: _____f Time: _____hrs NHB: BASE_ Type: BASE_
Results: _____
Method: _____ Test Spec: _____
RH%: ____ Cure No: __ Rating: __ Reference: __

Test Rpt	Organisms Used	ATCC	MYCO	Nutrients Used	(grams)

Type	Seq	Remark	Matcd	Test Rpt

Count: *0

<Replace>

MAPTIS NONMETALS TEST REPORT
FUNGI REFERENCE ENTRY/UPDATE

Doc Title : _____ Doc Source: _____
Doc Rpt No: _____ Author: _____ Date: _____

Reference no: ___

Doc Title : _____ Doc Source: _____
Doc Rpt No: _____ Author: _____ Date: _____

Reference No: ___

Doc Title : _____ Doc Source: _____
Doc Rpt No: _____ Author: _____ Date: _____

Reference No: ___

Count: *0 <Replace>

MAPTIS NONMETALS TEST REPORT
FUNGI REFERENCE ENTRY/UPDATE

Doc Title : _____ Doc Source: _____
Doc Rpt No: _____ Author: _____ Date: _____

Reference no: ___

Doc Title : _____ Doc Source: _____
Doc Rpt No: _____ Author: _____ Date: _____

Reference No: ___

Doc Title : _____ Doc Source: _____
Doc Rpt No: _____ Author: _____ Date: _____

Reference No: ___

Count: *0 <Replace>

MAPTIS NONMETALS TEST REPORT
THERMAL VACUUM STABILITY ENTRY/UPDATE

Test Rpt: _____ Matcd: _____ Source: _____ Tst Date: _____ TRP: _
Pressure: _____torr Chamber Vol: _____l NHB: CTVS_ Type: CTVS_
Substrate - Thick: _____in Mtrl: _____
Oxygent Pct: ____ 2nd Gas Pct: ____ 2nd Gas Name: _____
Weights - Pretest: _____g Posttest: _____g WVR: _____g
Cure No: __ Rating: __ Reference: __ Skew Flag: _____

SMP NR	Temp C	Request Temp C	Collct Temp C	Time Hrs	Time Hrs	Condensation Values Minimum	Maximum	24 Hours	Average
__	_____	_____	_____	____	____	_____	_____	_____	_____
__	_____	_____	_____	____	____	_____	_____	_____	_____
__	_____	_____	_____	____	____	_____	_____	_____	_____
__	_____	_____	_____	____	____	_____	_____	_____	_____

Type	Seq	Remark	Matcd	Test Rpt
_____	___	_____	_____	_____
_____	___	_____	_____	_____
_____	___	_____	_____	_____
_____	___	_____	_____	_____
_____	___	_____	_____	_____

Count: *0 <Replace>

TEST REPORT ARC TRACKING

TRP: __

Test Report No. _____ Mtrl Cd. _____ Data Source MSFC_____ Test Date _____ NHB Tst 18___ Tst Typ ARC__

Press (psia)	Pct Oxy	Pct	2nd Gas Name	CHMB Vol (ft)	Wire Gauge	Single Wire	Outside Diameter
14.7__	20.9	79.1	NITROGEN_____	10.3____	____	____in	_____in

Insul Thk(in)	Total Wgt(grm)	Appl Vots	Appl. Time	Null Time	Reappl. time	Mounting Device
_____	_____	200_	10___sec	10___sec	30___sec	STANDARD__

Specification _____ Rating __ Ref __ Cure Seq __

ARC Cnts: Init _ Track _

*** Results ***

Samp No		Leg A W1	Leg A W4	Leg B W2	Leg B W5	Leg C W3	Leg C W6	Null Wire	Worst Case Burn
_	Arc RMS Current -	____	____	____	____	____	____		
	Propagation Lgth -	____	____	____	____	____	____	____	____

*** Remarks ***

Type	Seq	Remark
_____	___	_____
_____	___	_____

Count: *0

<Replace>

MAPTIS NONMETALS TEST REPORT
CURE-BLEND ENTRY/UPDATE

Material Code: _____ Cure No.: __ TRP: _

Ph: __ Blends 1)_____ 2)_____
3)_____ 4)_____

W/V/B: _____ Time: _____hr Temp: _____f Pressure:_____psia
Note: _____

Material Code: _____ Cure No.: __ TRP: _

Ph __ Blends 1)_____ 2)_____
3)_____ 4)_____

W/V/B: _____ Time: _____hr Temp: _____f Pressure:_____psia
Note: _____

Count: *0

<Replace>

MAPTIS NONMETALS TEST REPORT
GAS TABLE ENTRY/UPDATE

NO: _____ NAME: _____ PREF: _
UG/GR ------ Proposed ------- ------- Current ------- Approval WP1
_____ SMAC: _____ Stat: _ SMAC: _____ Stat: _ Flag: _
Molecular Weight: _____ Sensitivity Factor: _____ Temp SMAC: _

--NEXT RECORD--
NO: _____ NAME: _____ PREF: _
UG/GR ------ Proposed ------- ------- Current ------- Approval WP1
_____ SMAC: _____ Stat: _ SMAC: _____ Stat: _ Flag: _ _
Molecular Weight: _____ Sensitivity Factor: _____ _

--NEXT RECORD--
NO: _____ NAME: _____ PREF: _
UG/GR ------ Proposed ------- ------- Current ------- Approval WP1
_____ SMAC: _____ Stat: _ SMAC: _____ Stat: _ Flag: _ _
Molecular Weight: _____ Sensitivity Factor: _____ _

Count: *0 <Replace>

MAPTIS NONMETALS TEST REPORT
NONSTANDARD TEST NUMBERS NOT IN SYSTEM ENTRY/EDIT

TEST NUMBER	TESTER ORG	TEST TYPE	MATERIAL DESIGNATION

***** IF DATA IS CORRECT PRESS THE COMMIT KEY *****

Count: *0

<Replace>

MAPTIS NONMETALS TEST REPORT
NONSTANDARD TEST TYPE CODES ENTRY/UPDATE

TYPE	DESCRIPTION

** IF DATA IS CORRECT PRESS THE COMMIT KEY **

Count: *0

<Replace>

MAPTIS NONMETALS TEST REPORT
VALID TESTS ENTRY/UPDATE

TEST TYPE	TEXT

Count: *0

<Replace>

MAPTIS NONMETALS TEST REPORT
GENERIC ID USE TYPE ENTRY/UPDATE

DEFINITION

Count: *0

<Replace>

MAPTIS NONMETALS TEST REPORT
SYNOPSIS ENTRY/UPDATE

RL CODE: _____
DESIGNATION: _____

NHB: _____ MATCD: _____

NHB: _____ MATCD: _____

NHB: _____ MATCD: _____

NHB: _____ MATCD: _____

NHB: _____ MATCD: _____

Count: *0

<Replace>

Metals Selection List Data Entry/Update Screens

HEAT TREATMENT/TEMPER GENERIC ID DATA ENTRY

ID	DEFINITION

Count: *0 <Replace>

MAJOR ALLOY DESIGNATION GENERIC ID DATA ENTRY

ID	DEFINITION

Count: *0 <Replace>

FORM/USE TYPE GENERIC ID DATA ENTRY

ID	DEFINITION

Count: *0 <Replace>

METALS TEST MATERIAL ENTRY/UPDATE

TRP: _

Matcd Code: _____ Class: A Generic Id: _____

Use Type: _____

Use Temperature - Min: _____(F) Max: _____(F)

Designation: _____

Composition: _____

Count: *0 <Replace>

METAL TEST REPORT VALID PROPERTIES

PROPERTY CODE	PROPERTY NAME

*** IF ALL DATA IS CORRECT THEN PRESS THE COMMIT KEY ***

Count: *0 <Replace>

METAL SELECTION LIST PROPERTIES RATING DATA

MATRL CODE	PROP CODE	RTG	DATA REFERENCE	PRESS	PNEU THRES	MECH IMPT	IMPT	DECM	IMPT	SCC	CORR	TEMP

**** IF ALL DATA IS CORRECT THEN PRESS THE COMMIT KEY ****

Count: *0

<List><Replace>

METALS DATA SOURCE

Description	Source

Count: *0

<Replace>

METALS STRESS CORROSION

---------- TRP: _

Test Rpt: _____ Matcd: _____ Source: _____ Test Date: _____

Temp1: ____(f) Temp2: ____(f) NHB: _____ Type: _____ Pressure: _____ psia

Scc Resistance: _____ Scc Threshold: ___ Threshold level: _

Environment: _____

Rating: __ Reference: ___ Cure No: __

Sam No.	Stress Dir	Appl. (ksi)	Stress % Y.S.	No. Tst	No. Fail	Exp Time (days)	Days to Failure	Pct Loss In T.S.	Remark
__	_____	_____	_____	___	___	_____	_____	____	_____
__	_____	_____	_____	___	___	_____	_____	____	_____
__	_____	_____	_____	___	___	_____	_____	____	_____
__	_____	_____	_____	___	___	_____	_____	____	_____
__	_____	_____	_____	___	___	_____	_____	____	_____
__	_____	_____	_____	___	___	_____	_____	____	_____
__	_____	_____	_____	___	___	_____	_____	____	_____
__	_____	_____	_____	___	___	_____	_____	____	_____
__	_____	_____	_____	___	___	_____	_____	____	_____
__	_____	_____	_____	___	___	_____	_____	____	_____
__	_____	_____	_____	___	___	_____	_____	____	_____

Enter a query; press KP-, to execute, PF4 to cancel._____

Count: *0 ENTER QUERY <Replace>

METALS PROMOTED IGNITION

---------- TRP: _

Test Rpt: _____ Matcd: _____ Source: _____ Req Date: _____

Pressure: _____(psia) Temp: _____(f) NHB: _____ Test Typ: _____

Ignitor : _____(gram) Oxygen: _____

2nd Gas : ____% _____ Substrate: _____(in) _____

Cure No: __ Rating: __ _ Reference: __ Combined Rating: _

No.	Sample Length (in)	Sample Diameter (in)	Sample Weight (gram)	Burn Length (in.)	Burn Time (SEC)	Prop Rate (IN/SEC)
_	_____	_____	_____	_____	_____	_____
_	_____	_____	_____	_____	_____	_____
_	_____	_____	_____	_____	_____	_____
_	_____	_____	_____	_____	_____	_____
_	_____	_____	_____	_____	_____	_____

Type	Seq	Remarks
_____	___	_____
_____	___	_____
_____	___	_____

Enter_a_query;__press_KP-,_to_execute,_PF4_to_cancel._____

Count: *0 ENTER QUERY <Replace>

METALS FLUID SYSTEMS TRP: _

Test Report: _____ Matcd: _____ Source: _____ Test Date: _____

Media: _____ Media Spec: _____ NHB: 15___ Test Type: _____

Rating: __ Old Rating: _ Reference: ___

********** <NEXT BLOCK> **********

Sample No	Exp Time (days)	Temp (degF)	Pressure (psia)	Wgt Change (mg)	Vol Evolved (cc)	Evolution Rate
__	_____	_____	_____	_____	_____	_____

Decomp %	Corr Rate	Corr Unit	Surf Area (sq in)	Wgt (gm)	Liquid Vol (ml)
_____	_____	_____	_____	_____	_____

Observed Changes _____ Remarks _____

Count: *0 <Replace>

METALS CORROSION

TRP: _

Test Rpt : _____ Matcd: _____ Source: _____ Tst Date: _____
Temp : _____(f) Pressure: _____(psia) NHB: _____ Type: _____
Media: _____
Surf Area: _____(sq.in.) Exp Time: _____(hrs)
Corr Rate _____ Unit: _____ Pitting Depth: _____ Unit: _____
Matrl Chg: _____
Cure No: __ Rtg: __ Reference: ___

Type	Seq	Remarks
_____	___	_____
_____	___	_____
_____	___	_____
_____	___	_____
_____	___	_____
_____	___	_____

Enter a query; press KP-, to execute, PF4 to cancel._____
Count: *0 ENTER QUERY <Replace>

METALS PNEUMATIC FLUID SYSTEMS

TRP: _

Tst Rpt: _____ Matcd: _____ Source: _____ Tst Date: _____

Temp: _____(f) Thick: _____(in) NHB: _____ Type: _____

Substrate - Thickness: _____(in) Material: _____

Fluid: _____ 2nd Fluid: _____ Batch: _____

Rating: __ Press: _____(psia) Reaction: ____ Tests: _____

Cure #: __ Reference: ___

Type	Seq	Remarks
_____	___	_____
_____	___	_____
_____	___	_____
_____	___	_____
_____	___	_____
_____	___	_____

Enter a query; press KP-, to execute, PF4 to cancel.

Count: *0 ENTER QUERY <Replace>

METALS MECHANICAL IMPACT LOX/GOX FLUID SYSTEMS

---------- TRP: _

Test Rpt: _____ Matcd: _____ Source: _____ Test Date: _____

Temp: _____(f) Thick: _____(in) Diameter: _____(in) NHB:_____ Type:_____

Substrate - Thick: _____(in) Substr Mtrl: _____

Fluid: _____ 2nd Fluid: _____ Batch No: _____

Cure No: __

Sample No.	Rating		Pressure (psia)	Impact Engery	No. Reactions	No. Tests	Test Report	Matcd
___	__	_	_____	_____	____	_____	_____	_____
___	__	_	_____	_____	____	_____	_____	_____
___	__	_	_____	_____	____	_____	_____	_____

Type	Seq	Remarks
_____	___	_____
_____	___	_____
_____	___	_____
_____	___	_____

Enter_a_query;__press_KP-,_to_execute,_PF4_to_cancel._____

Count: *0 ENTER QUERY <Replace>

METALS CREEP-RUPTURE

TRP: _

Test Rpt: _____ Matcd: _____ Source: _____ Test Date: _____
NHB: _____ Type: _____ Temp: _____(f) Press: _____(psia)
Fluid: _____ Test Fluid: _____
Rating: __ Reference: ___ Cure No: __

Sam No.	Fluid Type	Appl. Stress (ksi)	Time To Creep (hr) 0.5%	1.0%	2.0%	Rupture Time (hr)	EL Pct	RA Pct	Test Rpt	Matcd
___	_	_____	_____	_____	_____	_____	_____	_____	_____	_____
___	_	_____	_____	_____	_____	_____	_____	_____	_____	_____
___	_	_____	_____	_____	_____	_____	_____	_____	_____	_____

Type	Seq	Remarks
_____	___	_____
_____	___	_____
_____	___	_____
_____	___	_____

Enter a query; press KP-, to execute, PF4 to cancel._____
Count: *0 ENTER QUERY <Replace>

METALS FRACTURE TOUGHNESS

---------- TRP: _

Test Rpt: _____ Matcd: _____ Source: _____ Test Date: _____
NHB: _____ Type: _____ Temp: _____(f) Press: _____(psia)
Fluid: _____ Test Fluid: _____
Rating: __ Reference: ___ Cure No: __

Sam No.	Fld Typ	Notch Orien	B Thick (in)	W width (in)	a Crack Lgth	Str Rto	Size Fact	Frac Tough (ksi)	TSI TSI	CSI CIS	Frac APP %obq	Test Rpt	Matcd
___	_	_	_____	_____	_____	____	_____	____	____	____	____	_____	_____
___	_	_	_____	_____	_____	____	_____	____	____	____	____	_____	_____
___	_	_	_____	_____	_____	____	_____	____	____	____	____	_____	_____

Type	Seq	Remarks
_____	___	_____
_____	___	_____
_____	___	_____
_____	___	_____

Enter_a_query;__press_KP-,_to_execute,_PF4_to_cancel._____
Count: *0 ENTER QUERY <Replace>

METALS CRACK GROWTH

---------- TRP: _

Test Rpt: _____ Matcd: _____ Source: _____ Test Date: _____
NHB: _____ Type: _____ Temp: _____(f) Press: _____(psia)
Fluid: _____ Test Fluid: _____
Rating: __ Reference: ___ Cure No: __

Sample No.	Fluid Type	Stress Intensity (ksi)	Dwell Time (sec)	Max Load (lb)	Cycles To Failure	Test Rpt	Matcd
___	_	_____	_____	_____	_____	_____	_____
___	_	_____	_____	_____	_____	_____	_____
___	_	_____	_____	_____	_____	_____	_____

Type	Seq	Remarks
_____	___	_____
_____	___	_____
_____	___	_____
_____	___	_____

Enter a query; press KP-, to execute, PF4 to cancel._____
Count: *0 ENTER QUERY <Replace>

METALS HIGH CYCLE FATIGUE

TRP: _

Test Rpt: _____ Matcd: _____ Source: _____ Test Date: _____
NHB: _____ Type: _____ Temp: _____(f) Press: _____(psia)
Fluid: _____ Test Fluid: _____
Rating: __ Reference: ___ Cure No: __

Sam No.	Fluid Type	Stress Level Max (ksi)	Min (ksi)	Total Strain (%)	Cycles To Failure	Test Report No	Matrl Cd
___	_	_____	_____	_____	_____	_____	_____
___	_	_____	_____	_____	_____	_____	_____
___	_	_____	_____	_____	_____	_____	_____

Type	Seq	Remarks
_____	___	_____
_____	___	_____
_____	___	_____
_____	___	_____

Enter_a_query;__press_KP-,_to_execute,_PF4_to_cancel._____
Count: *0 ENTER QUERY <Replace>

METALS LOW CYCLE FATIGUE

TRP: _

Test Rpt: _____ Matcd: _____ Source: _____ Test Date: _____
NHB: _____ Type: _____ Temp: _____(f) Press: _____(psia)
Fluid: _____ Test Fluid: _____
Rating: __ Reference: ___ Cure No: __

Sam No.	Flu Typ	Dwel Time (sec)	Strain percent Tot	Elas	Plastic Strain Avg	Min	Max	Cycles To Fail	Test Rpt	Matcd
___	_	___	_____	_____	_____	_____	_____	_____	_____	_____
___	_	___	_____	_____	_____	_____	_____	_____	_____	_____
___	_	___	_____	_____	_____	_____	_____	_____	_____	_____

Type	Seq	Remarks
_____	___	_____
_____	___	_____
_____	___	_____
_____	___	_____

Enter a query; press KP-, to execute, PF4 to cancel._____
Count: *0 ENTER QUERY <Replace>

METALS TENSILE PROPERTIES

TRP: _

Test Rpt: _____ Matcd: _____ Source: _____ Test Date: _____
NHB: _____ Type: _____
Fluid: _____ Test Fluid: _____ Pct: _____
Temp: ____(f) Press: _____(psi) ___ Ratio (Test/Control): _____
Rating: __ Ref: ___ Cure No: __

Sam No	Fluid Type	Sample Type	Kt	EL PCT	RA PCT	FTY (ksi)	FTU (ksi)	Matcd	Test Rpt
___	_	_____	___	_____	_____	_____	_____	_____	_____
___	_	_____	___	_____	_____	_____	_____	_____	_____
___	_	_____	___	_____	_____	_____	_____	_____	_____
___	_	_____	___	_____	_____	_____	_____	_____	_____
___	_	_____	___	_____	_____	_____	_____	_____	_____
___	_	_____	___	_____	_____	_____	_____	_____	_____

Type	Seq	Remarks
_____	___	_____
_____	___	_____

Enter a query; press KP-, to execute, PF4 to cancel._____
Count: *0 ENTER QUERY <Replace>

METALS FRICTIONAL HEAT

Rotary - Matcd: _____ Cure: __ Desig: _____
Stationary - Matcd: _____ Cure: __ Desig: _____
Data Source: _____ Test Rpt: _____ NHB: _____ TST TYPE: _____
Test Date: _____ Pressure: _____(psia)
Test Fluid: _____ _____% 2nd Fluid: _____ _____%
Coolant: _____ Coolant Press: _____(psia) Rating: __

No.	****Max Temp**** @50 Mil (f)	@200 Mil (f)	Rot. Rate (rpm)	Load Rate (lbs/sec)	MAX AXIAL/RXN (lbs)	Max Torq. (lbs)	Wear Displ. (mils)	RXN y/n	PV X 1E-5 (in-lbs/sec) /(sq.in)
No.									
__	_____	_____	_____	_____	_____	_____	_____	_	_____
__	_____	_____	_____	_____	_____	_____	_____	_	_____
__	_____	_____	_____	_____	_____	_____	_____	_	_____
__	_____	_____	_____	_____	_____	_____	_____	_	_____
__	_____	_____	_____	_____	_____	_____	_____	_	_____
__	_____	_____	_____	_____	_____	_____	_____	_	_____

Type Seq Remarks

_____ ___ _____
_____ ___ _____

Enter a query; press KP-, to execute, PF4 to cancel._____
Count: *0 ENTER QUERY <Replace>

METALS TEST MATERIAL ENTRY/UPDATE

TRP: _

Matcd Code: _____ Class: A Generic Id: _____

Use Type: _____

Use Temperature - Min: _____(F) Max: _____(F)

Designation: _____

Composition: _____

Specification: _____ TRP: _ Matcd: _____

Manufacturer/Supplier (M/S): _ H4ID: _____ TRP: _ Matcd: _____

Name: _____

Division: _____

Addr1: _____ Addr2: _____

City: _____ State: __ Zip: _____

Country: _____ Phone: _____

Seq	Remarks	Matcd
__	_____	_____
__	_____	_____
__	_____	_____

Count: *0 <Replace>

TASK 12

Material Combustion Testing

The initial task objective was to support flammability and mechanical impact sensitivity testing (Test 1, 4, 13B of NHB 8060.1B), and support the operation of these testers in building 4623. Testing tasks were assigned to BAMSI from NASA/EH02 representatives. Two technicians were assigned to Building 4623, and the technicians performed the maintenance of the equipment and flammability and mechanical impact sensitivity lox/gox testing. The tests were performed via the Standard Operating Procedures (SOR) demonstrated to the BAMSI technicians by the NASA technicians to meet the intent of the NHB 8060.1B specification. The technicians provided testing support only; the material was identified by NASA, and the results were validated by the data analysts. During this period, three research tasks were supported (Task 1 - Effect of Long Term Storage on Flammability, Task 2 - Effect of Temperature or Flammability of Selected Materials, Task 3 - Flammability of Materials in Various Oxygen Concentrations). Task 1 was not initiated, but was discussed with NASA on the number of storage chambers that were going to be required for the storage. Task 1 was postponed, since a work order would need to be submitted to fabrication for the small chambers. The number of chambers and size were provided to the COTR, and facility manager of Building 4623. No chambers were received. As for the other two tasks, the technicians supported the testing, and provided the data to NASA/EH02 Representative for evaluation and compilation. On Task 2, some of the materials had heat distortion temperatures relatively close to the 250° F test temperature, and therefore, were not tested above the 150°F temperature (which is not listed in the task, but was chosen after the fact). Copies of some data, retained by the technicians, and photographs reside in the file cabinets in Building 4623.

From October of 1988 to January of 1990, NASA logged and verified all test samples. The MSFC database was in its inception, and had the test request table for tracking materials received. NASA logged the sample in to the electronic data base, and performed the preliminary data evaluation prior to submitting to BAMSI for data entry into the Test Report All Data Base. Preliminary results, "Pass" or "Fail" were entered in the test request comments field. However, during this period, BAMSI made modifications to the test data sheets for promoted combustion.

In December 1989/January 1990, the support of materials testing was modified and approved adding four additional technicians and one data analysts to the operations of the test facility. This modification placed BAMSI in charge of the flammability testers promoted combustion tester, frictional heating tester, ambient pressure lox mechanical impact tester, and one high pressure Lox/Gox Mechanical tester. BAMSI provided sample preparation, testing (includes operation and maintenance of the equipment), and reporting of the test data (included video taping, recording data, analyzing data, and entry of data into MAPTIS). BAMSI received the test request, with test instructions from NASA Facility Managers.

In August 1990, the draft of NHB 8060.1C was distributed, with equipment and testing procedures being modified to meet the intent of the specification. In May 1991, the specification was formally released. This required oxygen monitoring of the flammability test chambers for oxygen depletion. BAMSI provided the research to determine the type of monitor required. After attempting to use an electrochemical cell and zirconia heated element cell type analyzers, paramagnetic analyzers were determined the best for the application. The electrochemical cell and zirconia heated element cell provided very erroneous and unstable data due to the hydrocarbons from the combustion by products interacting with the chemical or burning in the presence of the heated element. The paramagnetic analyzer was not effected by the hydrocarbons, CO, CO2, etc. However, the paramagnetic analyzer was not as accurate as the electrochemical or zirconia type analyzer , abut it did meet the requirements of the specification tolerance. In addition to the oxygen analyzer, the Rev. C provided three new tests (Test 4A - Wire Flammability, Test 17, and Test 18). The test 17 was not much different than what was being performed prior to the release of the specification, other than a minimum of five samples were to be tested instead of three. For Test 4, a new stand was sketched and built by BAMSI for the 75° angle mounting of the 17 center inches of the 48 inch wire (or bundle). Also, for Test 4 two power supplies were required, one for regulating the current through the conductor wire to induce heat and the other for the promotion of the ignitor. Therefore, BAMSI provided the research into obtaining four new power supplies, with two having the ability to be slaves to the other two DC power supplies. This provided the facility with spare power supplies, since the originals could no longer obtain spare parts, and provided the higher current and power requirements for testing up to eight gage wire. For Test 18, BAMSI initiated research with Lambda Company to design a power supply to deliver 75 KVA at 400 hertz, converting from 60 hertz, and 480 A/C power input. This design was provided to the COTR/J. Davis, and current Facility Manager, Steve Hollich. BAMSI was informed that WSTF was building us a turn key system to run the Test 18. In addition to the introduction of the new revised NHB 8060.1 and the new tests and process and equipment requirements, MSFC/NASA wanted to have data entry performed by the data analysts on the system, and wanted the system to mimic WSTF's. BAMSI created all the pertinent data entry screens and canned query's for entry of the test data, as well as an administrative record to list the tests that were

performed and when. At this juncture, BAMSI (Data Analysts) became responsible for researching the database for a materiel code and any existing data (if data did not exist for the specific designation, then a data search was pulled on the use type and composition for similarity basis), logging the samples into the MSFC Data Base, assigning the item number (six digit numeric assigned by the computer, and became the test number for each test performed on the material, using an 'M' before the number and a "-" followed by a letter suffix on the item number), verifying the samples received (by the label on the product, MSDS, Invoice, or product data sheet), creating the test request form (without test instructions), analysis and entry of the test data, and archiving the test data. Of course, as the MDFC Data Base system was used, it continued to evolve from data storage requirements and management status requests. The system was still hand manipulation intensive, and did not pull data from other tables.

In April 1990, BAMSI became responsible for sample receipt, which improved the efficiency of tracking the sample status. At this point, another change was made in tracking of the samples, due to the misplacement of the test folder information in the transfer back and forth from BAMSI to NASA, for the test instructions. BAMSI, instituted an original file, which was a file that was maintained by the data analyst containing the original requester's request and all support data (Product Data Sheet, MSDS, Purchase Order, Invoices, Letters of Request or Identification, etc.). A work folder for each test request was instituted, containing a copy of everything the original contained, plus the data search from MAPTIS. These folders were forwarded to NASA for work instructions. Upon completion of each folder, the data and the test request form for that test with the test instructions was merged into the original folder, along with photographs.

BAMSI instituted a sample preparation form in late 1990, to resolve a concern that NASA had with the description of the before prepared material. The preparation form was created for the purpose of describing the material received (description, color, weight, size, etc.), and the preparation method (cleaning, cutting, curing, mixing, weighing, etc.) which was not clearly defined on the test data sheets. This form would also allow one to evaluate the preparation of the materials, such that the material or similar materials could be prepared consistently the same as before. In addition to instituting a sample preparation form, BAMSI created a dedicated area for sample preparation, using the old accelerometer room in Building 4623. Equipment was obtained from excess, river, and ordering to provide a somewhat clean area to prepare samples. A laminar flow bench was obtained and fixed for the preparation of Lox/Gox test samples (Test 13).

In April to May 1991, and engineer was placed on-site at the Test Facility to review the test data, and implement some process control. In additions to this task, the engineer was to kick-off the operation of the Friction Heat Tester (FHT). After three months of dedicated work, the tester became characterized for instantaneous and ramp applied lox testing. A WSTF training session was requested to NASA prior to having the system operational, and by the time WSTF personnel arrived for the training, BAMSI had the system 100 percent operational and 90 percent understood. The WSTF training provided some insight to the tester, that would not have been obtained. BAMSI maintained operation of the tester, and began and a test program for Pratt and Whitney materials used in the SSME turbopump. The test data and criteria of evaluating the data was correlated with WSTF data, and the data was running the same trends as that obtained by WSTF. The FHT system evolved while performing tests. A programming effort was instituted by BAMSI with requirements to BCSS on improving the friendliness of the software interface. The system was updated with a menu driven package, which enhanced the operations and down loading of data tremendously. In addition, the programming requirements included the down loading of the data to a spreadsheet system using IEEE cables routed from the FHT system to the proposed central control viewing area (was F. Lowery's office area and PC). This allowed the data to be manipulated and calculated to provide the coefficient of friction, and allowed the data to be graphed using whatever parameter combinations desired. A supplemental manual to the FHT system, and the complete programming code was provided to document the software changes. The two operating manuals must be used together. The NASA EH42 secretary began typing the manuals in one large word processing file, for future manipulation and consolidation for the EH42-06 standard operating procedure.

The engineer assignment changed the aspect of the facility, placing testing and tester maintenance (all testers) in the responsibility of BAMSI. NASA still controlled the facility and maintenance of the facility, the priority of testing, and the testing instructions. BAMSI provided engineering support in the testing instructions, monitored daily testing progress and anomalies, and began updating the Standard Operating Procedures (SOP). The SOP's were given generic in focus and procedures, and referred to the specification for actual testing procedures. There were many questions and concerns that testing was not standardized, that the processes varied from one technician to another, and that basic processes and safety policies were not general knowledge to everyone. Therefore, specifically flammability, was updated to include detailed step wise procedures, contingencies, and instituted safety policies. Detailed SOP's have been written for all test equipment.

Including the changes in software to the FHT system, there was the acquisition of a Keithley Data Acquisition and

Control system for High Pressure Impact Tester (HPIT) II. BAMSI and MSI recommended the system. Since the accurex was written in unique code and the system was becoming antiquated and would no longer control the system. The new system took two years to obtain, took over nine months to install.

Many changes have evolved, and have fallen in-line with the continuous improvement ideology NASA strives for. Additional improvements (changes, and new designs) were made to the MSFC Data Base to include management data bases for more effective tracking, such as tester parts inventory (Parts Inventory), Gaseous Oxygen and Nitrox gases bottle inventory (Gas Inventory), Machine Shop and Cleaning Lab Work Orders (Lox Cleaning), Valve Shop Work Orders (Valve Shop), Calibration (Calibration), 424/Purchase Request (Purchase Request) and excess stored materials, with location and size and quantity, that can be used for testing or testing support (Storage/Stock Materials). Management tracking queries were developed to flag tests that were complete and data was entered. But no test memo was generated (Tested material without response memo), materials that did have administrative records (Materials without administrative records), ordering of the test schedule log by proposed test type and date (Test scheduling by test type), and printout of all materials scheduled for test ordered numerically by the item number (Test Scheduling). BAMSI (Engineer, of Materials Testing), assisted in creating the combustion by products data entry screen, calculation, and canned query. The combustion by products mimicked the toxicity data but did not use an oven exposure, but the volume of a combustion chamber and the burned sample data. The same rating criteria is used per toxicity, but the calculation for quantity of material to burn and induce a toxic environment has not yet been ironed out. These additions to the MSFC Data Base was only the beginning, many modifications have been made to the software to reduce the hands on checks and balances, and sets the logic for the computer to perform these functions. One large change, and still requires enhancement, is the cure table. The MSFC cure table is independent from the test report all data cure table. However, the test report all data cure table sets the precedence on the cures, and the cure number (cure seq.) that must be entered in the header of the results such that the cure will correlate with the material and results when it is transferred over to test report from MSFC. Although the MSFC cure table did not require the cure number to match, and was configured where the analysts was required to enter or choose the cure from test report cure table, and then enter the cure for every record (enter the time, temperature, pressure, mixtures, etc.) These were redundant, and was resolved with the BCSS programmer to pull the cure from the test report cure table and insert in the MSFC cure table based on the material code and cure number. The MSFC cure table stores the cure per item number, cure number, and phase. The material code is not required. The test request form can have a cure entered at the cure block, when a materiel code does not exist; but the results records have been set-up as of late 1992, to pull the cure from the test report base on the material code and cure number entered in the first block of the results data maintenance screens. The cure is displayed in the fourth block of the results data maintenance screens, but cannot be modified nor entered from the results record. The cure can be changed in the MSFC cure table menu option only. Attempting to default the cure to the results tables by pulling that cure from the request will not work, since the cure may not be entered in the test report cure table; and multiple cures (not phases) may exist for the same request number and must be handled by an appropriate cure number which is associated to the test request number by the associated material code. The basic purpose for the MSFC cure table, was for the ability to store the requested cure with the possibility of not having a material code. This requires some modification, such that handling of the data can be minimized.

Not only was the database modified and updated, but so were the test data and tester set-up sheets. The current sheets and proposed cone calorimeter, and Arc Tracking data sheets are attached. Files for special research on oxygen concentration study, smolder study, residue contamination, Velcro fasteners, flammability; etc. are in Building 4623.

All test equipment are operational, all SOP's have been updated.

Process for Post Mixing Enriched Oxygen for Flammability Testing

Purpose: To generate the appropriate oxygen concentration at the corresponding test pressure via partial pressures with oxygen and nitrogen in the test chamber.

Calculation: For the calculation the following must be known:

1. Purity of oxygen to be used

2. Purity of nitrogen to be used (must have only trace amounts of oxygen or other oxidizer)

With these considerations, the following equation will calculate the partial pressure of oxygen to be placed in the chamber for the appropriate test environment:

Since Volume is constant, and assuming pure GN2

P(pur oxygen) = The pressure (PSI) of pure oxygen to add to chamber to obtain test environment oxygen concentration

Y(env) = The oxygen concentration of the proposed test environment in fraction notation (i.e. 25.9% is .259)

P(env) = The pressure (psi) of the proposed test environment correlating to the test oxygen concentration for test

P(resid) = The residual pressure left in the test chamber after vacuum

C(pure oxy) = The traction value of the concentration of oxygen being used

Mixing Process: After calculating/obtaining the partial pressure for the proposed test environment based on the residual test chamber pressure after vacuum, the mixing can be initiated. Flow the oxygen in first until the pressure gage reads the calculated partial pressure plus the residual chamber pressure, then backfill with GN2 to the appropriate test pressure. Upon completion of adding the oxygen and nitrogen, turn the fans on in the test chamber (large and small if applicable) to allow the gases to reach a balanced equilibrium. After five minutes, turn the fans off, and take a reading with the oxygen monitor to ensure mixture concentration is within +.6/-0 percent of the desired oxygen concentration. Ensure the oxygen monitor has been calibrated to air (20.9%) with less than .2 deviation. Also due to the sensitive of the electrochemical cell monitors, care should be taken to follow all precautions listed in the manufacturer's brochure. Prior to initiation of the ignitor, allow soak of three minutes. Note: The mix and soak time may need to be extended for foam or sponge type materials (bring to supervisor's attention).

Note - Flash expansion of compressed gases creates a cooling effect and will cause variations in the pressure read after stabilization. Ensure the flow of the gases are regulated to a very low pressure to minimize this effect, or monitor the chamber temperature to ensure it has equalized with it prefill temperature. If a noticeable increase in chamber pressure is observed after stabilization, then modify the post mix process as follows: Backfill with GN2 within one psi, mix with fans and allow stabilization. Upon stabilization, backfill remaining difference with GN2. Then follow as above for monitoring the concentration.

Flammability Test Calculation for Post Gas Analysis When Pressure Below Ambient

Objective 1:

To back calculate the post test oxygen, remaining oxygen, from a test environment at a pressure below ambient causing the analyzer not to respond.

Procedure: If the analyzer is not drawing an acceptable sample from the chamber due to a large enough variance in pressure, as has been experienced at the 10.2 psia environments. Once the test is complete, document post test pressure, then add a known oxygen percentage to backfill the pressure to 15 psia. Then turn on the analyzer following the procedures in the applicable SOP, to draw a gas sample. Record the decimal reading at the 15.o psia pressure (or actually filled pressure, not to exceed 15.2 psia) of the oxygen analyzer.

The following calculation can be applied to back calculate the remaining oxygen to report.

X02F = Pct. value of oxygen remaining at test environment (This is what you want to find)

P1 = Pressure of test chamber after being filled with the known percent oxygen

B = Decimal value (certified bottle value) of known enriched oxygen bottle used to backfill in test chamber

PT = Pressure of post test environment (Pressure prior to filling with known percent oxygen

PD = P1 Minus PT

O2R = Decimal value oxygen monitor/analyzer reading when at pressure P1

X02F = 100 * [(P1 * O2R) - (PD *B)]

Calculation for Post Oxygen Analysis

Objective 2:

If the analyzer is receiving an acceptable flow as indicates by the flow meter, then a ratio calculation can be performed to determine the post test oxygen (oxygen remaining). Record the post test pressure, and the reading of the analyzer during a post test sampling (refer to applicable SOP for operation for sampling test environment from test chambers). The below equation is to be used to calculate the remaining oxygen value for the post test environment. Please note, if the reading, say at 10.2 psia for 30% oxygen environment, is .209, this is correct (the partial pressure of 30% oxygen at 10.2 (.3 * 10.2) is equivalent to the partial pressure

quantity of 20.9 % oxygen at 14.7 psia (.209 * 14.7)).

(Rem. O2 value desired) = (Decimal value O2 Analyzer at post test pressure) * 14.7 psia / (post test pressure reading)

Example

rem. O2 value desired = (.190 * 14.7 psia) / 10.3 psia = .271.

TESTCELL FLAMMABILTIY

Item No: _____

Test Report No: _____

Test Date: _____

Pressure: _____ (psia)

Percent Oxygen: ____

Second Gas - Percent: ____

Chamber Volume: _____ (cuft)

Substrate - Thick: _____

Rating: __ Cure No: __

Data Source: MSFC_____

Material Code: _____

NHB Test: 01___ Test Type: UPW__

Pre-Heat Temp: _____ f

Name: _____

Sealed/Vented: _ (S/V)

Material: _____

Item: _____ Data Source: MSFC_____ MATCD: _____ NHB: 01___ Type: UPW__

No.	Width	Lngth	Thick	Oxy	Rmn	K10	(y/n) FJ	SP	DB	TB	Burn Time	Test Rpt
_	_____	_____	_____	_____	_____	_____	_	_	_	_	_____	_____

** Vertical Burn *** Lngth	Time	Prop Rt	* Horizontal Burn ** Lngth	Time	Prop Rt	** Diagonal Burn *** Lngth	Time	Prop Rt
_____	_____	- _____	_____	_____	- _____	_____	_____	- _____

No.	Width	Lngth	Thick	Oxy	Rmn	K10	FJ	SP	DB	TB	Burn Time	Test Rpt
_	_____	_____	_____	_____	_____	_____	_	_	_	_	_____	_____

** Vertical Burn *** Lngth	Time	Prop Rt	* Horizontal Burn ** Lngth	Time	Prop Rt	** Diagonal Burn *** Lngth	Time	Prop Rt
_____	_____	- _____	_____	_____	- _____	_____	_____	- _____

No.	Width	Lngth	Thick	Oxy	Rmn	K10	FJ	SP	DB	TB	Burn Time	Test Rpt
_	_____	_____	_____	_____	_____	_____	_	_	_	_	_____	_____

** Vertical Burn *** Lngth	Time	Prop Rt	* Horizontal Burn ** Lngth	Time	Prop Rt	** Diagonal Burn *** Lngth	Time	Prop Rt
_____	_____	- _____	_____	_____	- _____	_____	_____	- _____

* Length in Inches Time in Seconds

Item: _____ Data Source: MSFC_____ MATCD: _____ NHB: 01___ Type: UPW__

REMARKS

Item	Type	Seq	Remark
_____	_____	___	_____
_____	_____	___	_____
_____	_____	___	_____
_____	_____	___	_____
_____	_____	___	_____
_____	_____	___	_____
_____	_____	___	_____
_____	_____	___	_____

CURE DATA

Nr Ph Blends

__ __ 1) _____ 2) _____

3) _____ 4) _____

W/V: _____ Time: _____(hr) Temperature: ____(f) Pressure: _____(psia)

Note: _____

**** END OF FORM ****

D-Descrip, R-Remark, O-Opt.Note, A-Add.Note, P-Prep, OBS-Observtn, X-Process

Item ____ Data Source ____ Test Report No. ____ Mtrl Cd. ____ Test Date ____ NHB Tst 04A__ Tst Typ ANGLE

Press (psia) ____ MSFC Pct Oxy ____ ********** Pct ____ 2nd Gas ******* Name ____ CHMB Vol (uft) ____ Wire Gauge ____ Tie Space ____ Tie Material ____

Insul Thk(in) ____ Samp Angle ____ Ignitor Material ____ Orient ____ Wire ____ Bundle ____ Rtg ____ Cur ____ Specification ____

No	Wire Temp (f)	**** Time (min)	Heater Curr (amp)	**** Volt	Ignt Time (sec)	Burn Lgth (in)	T B	Burn Time (sec)	Prop Rate (in/sec)	Oxy Aft Test	K10 Y/N	*Observations* Flm Jet	Spk	Drp Brn
_	___	___	____	___	____	_____	_	_____	_ _____	____	_	___	___	___
_	___	___	____	___	____	_____	_	_____	_ _____	____	_	___	___	___
_	___	___	____	___	____	_____	_	_____	_ _____	____	_	___	___	___

Type ____ Seq ____ Remark ____

TESTCELL ELECTRICAL WIRE INSULATION Page 2 of 2

CURE DATA

No ____ Ph ____ Blends

1) ____ 2) ____

3) ____ 4) ____

W/V: ____ Time: ____(hr) Temperature: ____(f) Pressure: ____(psia)

Note: ____

**** END OF FORM ****

Count: *0 <Replace>

TESTCELL ELECTRIC OVERLOAD

Item _____ Data Source MSFC_____ Test Report No. _____ Mtrl Cd. _____ Test Date _____ NHB Tst 04B__ Tst Typ FUSE_

Press (psia) _____ Preheat Temp(f) _____ Pct Oxy _____ ******* 2nd Gas **** Pct _____ Name _____ Cham Vol (cuft) _____ Wire Gauge ____ Tie Space ____ Tie Material _____

Starting crnt(amp) ___ Insul Thk(in) _____ Sample Angle ____ Step Crnt (amp/min) _____ Specification _____ Rtg __ Cur __

No	Fusn Curr (amp)	Time to Fusion (sec)	Burn Lgth (in)	T B	Burn Time (sec)	I N	Prop Rate in/sec	Oxy Aft Test	K-10 Y/N	Observations Flm Jet	Sprk	Drp Brn	Damage to Adj Wires
_	___	_____	_____	-	_____	-	_____	____	-	___	___	___	_____
_	___	_____	_____	-	_____	-	_____	____	-	___	___	___	_____
_	___	_____	_____	-	_____	-	_____	____	-	___	___	___	_____

Type	Seq	Remark
_____	___	_____
_____	___	_____
_____	___	_____

TESTCELL ELECTRIC OVERLOAD

CURE DATA

Nr	Ph	Blends
__	__	1) _____ 2) _____
		3) _____ 4) _____

W/V: _____ Time: _____(hr) Temperature: ____(f) Pressure: _____(psia)

Note: _____

**** END OF FORM ****

Count: *0

<Replace>

Item	Data Source	Test Report No.	Mtrl Cd.	Test Date	NHB Tst	Tst Typ
	MSFC				18	ARC

Specification: _____

Press (psia)	CHMB Vol (ft)	Insul Thk(in)	Wire Gauge	Single Wire	Outside Diameter	Mounting Device
14.7	10.3			in	in	STANDARD

Pct Oxy	********* Pct	2nd Gas ******* Name	Total Wgt(grm)
20.9	79.1	NITROGEN	

Appl Vots	Appl. Time	Delay Time	Reappl. time	Rating	Ref	Cure Seq	Initial Arc Cnt	Arc Track Cnt
200	10 sec	10 sec	30 sec					

SMP NO	Length (in)	Burn Lgth (in)	Null Wire (in)	Init Arc (Y/N)	Restrike (Y/N)	Track (Y/N)	Track Rate (in/s)	O2 Rem (%)

Leg A					Leg B					Leg C				
Init ARC amps	1st Aply amps	2nd Aply amps	1st Burn Lgth	2nd Burn Lgth	Init ARC amps	1st Aply amps	2nd Aply amps	1st Burn Lgth	2nd Burn Lgth	Init ARC amps	1st Aply amps	2nd Aply amps	1st Burn Lgth	2nd Burn Lgth

SMP NO	Length (in)	Burn Lgth (in)	Null Wire (in)	Init Arc (Y/N)	Restrike (Y/N)	Track (Y/N)	Track Rate (in/s)	O2 Rem (%)

Leg A					Leg B					Leg C				
Init ARC amps	1st Aply amps	2nd Aply amps	1st Burn Lgth	2nd Burn Lgth	Init ARC amps	1st Aply amps	2nd Aply amps	1st Burn Lgth	2nd Burn Lgth	Init ARC amps	1st Aply amps	2nd Aply amps	1st Burn Lgth	2nd Burn Lgth

REMARKS

Type	Seq	Remark

CURE DATA

No	Ph	Blends
		1) _____ 2) _____
		3) _____ 4) _____

W/V: _____ Time: _____(hr) Temperature: ____(f) Pressure: _____(psia)

Note: _____

**** END OF FORM ****

D-Descrip, R-Remark, O-Opt.Note, A-Add.Note, P-Prep, OBS-Observatn, X-Process
Count: *0 <Replace>

TESTCELL MECHANICAL IMPACT Page 1 of 2

Item	Data Source	Test Report No.	Mtrl Cd.	Test Date	NHB Tst	Tst Typ
	MSFC				13A	MECH

********** Sample ********** **********Substrate**********

Temperature	Diameter	Length	Wdth/Thck	Thickness	Material
(f)	(in)	(in)	(in)	(in)	

Fluid: Fluid2: Batch #: Cur Sq:
Pct Fluid: Pct Fluid2: Impct. Qty: (g)

Pressure (psia)	Impact Energy	No. Reactions	No. Tests	Rating

Type	Seq	Remark

TESTCELL MECHANICAL IMPACT Page 2 of 2

CURE DATA

SEQ: 89115 MTRL CD: 89115 TEST RPT: M104181-B

No Ph Blends
1 1) 2)
3) 4)

W/V: Time: 24 (hr) Temperature: 75 (f) Pressure: 14.7 (psia)

Note:

**** END OF FORM ****

Count: 1 v

<Replace>

TESTCELL PROMOTED IGNITION Page 1 of 2

Item	Data Source	Test Report No.	Mtrl Cd.	Test Date	NHB Tst	Tst Typ
	MSFC				17	PROM

Press (psia)	Temp (f)	Chamber Volume	******** Ignitor ********** Material	Weight	Pct Oxy	****** 2nd Gas ****** Pct	Name
			AL_6061_T6/PYROFUSE				

Substrate - Thick: _____(in) Material: _____ Rtg: __ Cur: __

No.	********** Sample ********** Length (in)	Width (in)	Diam/Thick (in)	Weight (gram)	Burn Length (in.)	Total Burn Ind	Burn Time (sec)	Prop Rate (in/sec)
__			_			_		
__			_			_		
__			_			_		

Type	Seq	Remark

TESTCELL PROMOTED IGNITION Page 2 of 2

---------- CURE DATA ----------

No	Ph	Blends
__	__	1) _____ 2) _____
		3) _____ 4) _____

W/V: _____ Time: _____(hr) Temperature: ____(f) Pressure: _____(psia)

Note: _____

**** END OF FORM ****

Count: *0 <Replace>