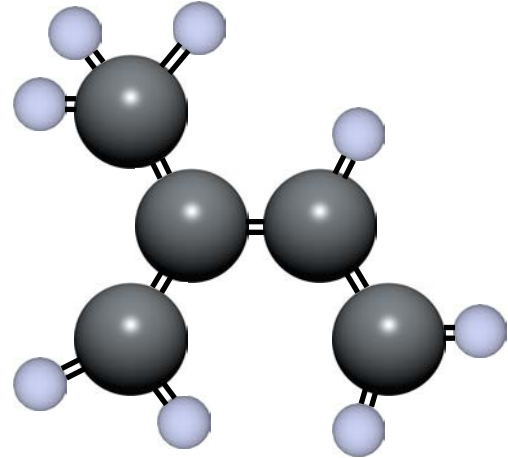


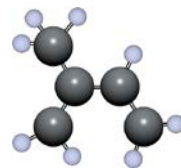


Specification Guide





Specification Guide



THIS DOCUMENT SHOULD BE USED AS A DESIGN GUIDE FOR SELECTING SUITABLE ELASTOMERIC MATERIALS FOR YOUR APPLICATION. IT IS DIVIDED INTO TWO SECTIONS:

POLYMERS

The polymers used by Precision Associates are listed on the next page. Included are the common names, the ASTM designations, chemical names, our number, and the polymer shrink range.

Our tooling is commonly cut for 2.0% shrinkage. Many compounds have shrinkage rates that will cause them to be outside of the normal tolerance range for a given size. Due to the elastic nature of rubber, products will often function well even though they are under/over sized. When designs requiring close tolerances are necessary, engineers should contact Precision Associates for specific guidelines. We may already have, or may suggest, special tooling to compensate for non-standard materials.

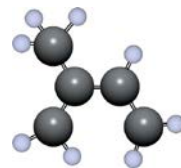
SPECIFICATIONS

This section contains a listing of specifications with an abbreviated description. When the specification describes a rubber material, we have included the Precision Associates compound number of first choice for evaluation. Other materials may be suitable as well.

Many Military specifications have Lot Testing requirements in addition to meeting the original property tests. These Lot Tests require additional cost and are added as one-time charges for each shipment. If a product is required to meet a specification, the specification number and all required tests must be noted when requesting pricing and when placing an order. Also, many Military specifications have size tolerance requirements that may necessitate special tooling.

PLEASE NOTE:

The compounds listed in this guide are recommendations only. Customers should determine the suitability of our compounds in their own applications.



POLYMERS USED BY PRECISION ASSOCIATES

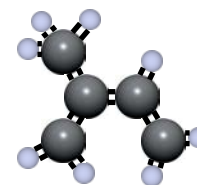
Common or Trade Name	ASTM Abbr	Chemical Name	PAI Cpd Series	Shrink Range %
Acrylic	ACM	Polyacrylate	21xxx	2.0 - 4.0
Aflas®	FEPM	Tetrafluoroethylene Propylene	25xxx	3.0 - 4.5
Blend		Various Polymer Blends	6xxx	
Buna N, Nitrile	NBR	Butadiene Acrylonitrile	3xxx	1.5 - 3.5
			5xxx	
			7xxx	
Buna S	SBR	Styrene Butadiene	15xxx	2.0 - 3.0
Butyl	CIIR	Chlorobutyl	13xxx	1.1 - 2.3
	IIR	Isobutylene Isoprene		
Carboxylated Nitrile	XNBR	Carboxylic Acrylonitrile Butadiene	77xxx	2.0 - 3.0
Chlorinated	CM	Chloro-Polyethylene	16xxx	2.0 - 3.0
EPDM	EPDM	Ethylene Propylene Diene Terpolymer	23xxx	1.9 - 3.5
FKM	FKM	Fluoroelastomer	8/9/10xxx	2.0 - 4.5
Fluorosilicone	FVMQ	Fluoro Methyl Vinyl Silicone	20xxx	2.8 - 4.7
Highly Saturated Nitrile	HNBR	Hydrogenated NBR	55xxx	2.0 - 3.0
Hydrin	ECO	Epichlorohydrin	32xxx	2.0 - 3.0
Hypalon®	CSM	Chlorosulfonated Polyethylene	14xxx	1.8 - 3.0
Natural Rubber	IR	Isoprene	1xxx	2.0 - 3.5
Neoprene®	CR	Chloroprene	4xxx	1.0 - 3.0
P-REX™	FFKM	Perfluoroelastomer	34xxx	3.0 - 4.0
Silicone	PVMQ	Methyl Phenyl Vinyl Silicone	19xxx	2.0 - 5.0
	VMQ	Methyl Vinyl Silicone		
Silicone, Medical			49xxx	
Teflon®	PTFE	Tetrafluoroethylene	18xxx	N/A
Urethane	AU	Polyester Urethane	35xxx	1.6 - 3.3
	EU	Polyether Urethane		
Vamac®	AEM	Ethylene Acrylate	22xxx	2.0 - 4.0
Viton®	FKM	Fluoroelastomer	8xxx	2.0 - 4.5

COMPOUND NOMENCLATURE

Precision Associates compound numbers are typically four or five digits. The number(s) in the thousand position(s) specify the base polymer. The digit in the hundred position signifies the durometer in multiples of ten. The last two digits separate like-compounds within a given polymer/durometer group.

Examples for compounds 5747 and 19711 follow:

5	7	4	7	70 Durometer Butadiene Acrylonitrile
1	9	5	1 1	50 Durometer Silicone
Polymer Group	Duro	File Number		



SPECIFICATIONS

The following pages contain brief descriptions of over 365 military and industrial specifications that relate to O-Rings. For more complete information on these or other specifications please call our manufacturing facility. We are continually updating our files and developing new compounds to meet customer requirements.

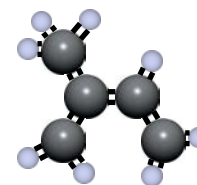
- (A4)** Age control, no more than 4 quarters old at time of delivery.
- (B)** Specification requires certification and testing of each lot and/or batch. There is an additional charge for this service when required. Customer must request Batch Certification when placing order.
- (P1)** Specification calls out individual packaging and identification per AMS 2817. This service is available at extra cost; quoted prices do not include individual packaging unless specifically stated.
- (P2)** Specification calls out individual packaging per MIL-P-4861.
- (Q)** QPL specification
- (T)** Qualification testing required.

- AIR** Aeronautical Information Report
- AMS** Aerospace Material Specification
- AN** Airforce-Navy Aeronautical Standard
- ARP** Aeronautical Recommended Practice
- AS** Aerospace Standard
- ASTM** American Society for Testing and Materials
- BSI** British Standards Institute
- DIN** German Institute for Standardization
- ISO** International Organization for Standardization
- JIS** Japanese Industrial Standard
- MIL** Military Specification
- MS** Military Standard
- NAS** National Aerospace Standard
- N/A** Not Available
- SAE** Society of Automotive Engineers

MIL SPEC	PAI CPD	DESCRIPTION OF SPECIFICATION
CLHX3		Seal, Oil type ML - is a metal encased seal with spring-loaded leather or neoprene sealing member. Superseded by mil. specs.
SAE J 14		Canceled. Superseded by SAE J200 and ASTM D2000.
AIR 63		"O-Ring Size and Part Number Cross Reference Chart". Cross references many of the O-Ring sizes found on the various drawings: CKCX2 CKCX3 AS568 AN6227 AN 6230 MX9021 MS28775 MS28784 MS29513 AN123870 AN12391 AN123970 AN124014
AFLCM71		Preservation, Packaging methods and instructions for coding.
AN-P-79		Superseded by MIL-P-5516B O-Rings class B Nitrile.
AIR 81		"Hydraulic Fluid Characteristics"
Fed. Std. 90		Describes the principle synthetic rubber specification limits sampling and testing.
MIL-STD-100		"Engineering Drawing Practices".



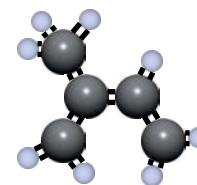
Specification Guide



MIL SPEC	PAI CPD	DESCRIPTION OF SPECIFICATION
MIL-STD-105		"Sampling Procedures and Tables for Inspection by Attributes".
H 106		"Multi-Level continuous sampling procedures and instructions for selection and administration of sampling inspection procedures".
H 107		"Single-Level Continuous Sampling Procedures and Tables for Inspection by Attributes".
MIL-P-116		"Methods of Preservation" to protect against corrosion, mechanical and physical damage.
MIL-B-117		"Heat sealable, interior packaging bags, sleeves and tubing required by Military Services for the protection of supplies".
SAE J 120 (Obsolete)		"Rubber Automotive Applications" Dash numbers correspond with AS 568 series. Dash number "R1" denotes O-rings;"R2" denotes square cross-section rings. Class I - Oil resistant service Class II - Gasoline Resistant service
MIL-P-121		Flexible, greaseproofed, waterproofed barrier material used for protection of supplies and equipment during transportation and storage.
MIL-STD-129		"Marking for Shipment and Storage".
MIL-STD-130		"Identification Marking of US Military Property".
MIL-HDBK-149		"Rubber" 500 page Handbook of Rubber Properties.
HH-P-151		"Cloth-Insert Rubber-Sheet Packing" Intended for flange joints for water or brine services up to 250 pounds pressure and ventilating systems.
HH-G-156		General Purpose Rubber Gasket Material. Type I - Soft 35-45 durometer Type II - Medium 50-60 durometer Type III - Hard 75-85 durometer
MIL-STD-177		"Terms for Visible Defects of Rubber Products".
NACE TM 0187		Standard test Method for Evaluating Elastomeric Materials in Sour Gas Environments
SAE J200		"Classification System for Rubber Materials for Automotive Applications" Same nomenclature system as ASTM D2000. See ASTM D2000 for more details.
MIL-STD-289		"Visual Inspection Guide for Rubber Sheet Material".
MIL-STD-298		"Visual Inspection Guide for Rubber Extruded Goods".
L-P-390		Polyethylene and copolymers for general purpose, dielectric and weather resistant uses in low, medium and high density.
MIL-STD-407		"Visual Inspection Guide for Rubber Molded Items".
MIL-STD-413		"Visual Inspection Guide for Rubber Molded O-Rings".
MIL-STD-417		Nomenclature system for specifying the properties of a wide range of compounds with many classes and grades. Supersedes MIL-R-3065.
MIL-G-432		"Synthetic Rubber Gaskets-Nonmetallic" Five types of synthetic rubber gaskets.
ANA 438		Canceled. Superseded by MIL-STD-1523.
MIL-STD-454		"Standard General Requirements for Electronic Equipment".
TT-C-490		"Cleaning Methods for Ferrous Surfaces & Pretreating for Organic Coatings".
L-P-512		"Requirements for Polyethylene Sheets" .
SAE J 514		"Straight Thread Tube Fitting Boss Gasket Gland Dimensions".
SAE J 515	7915	"Hydraulic O-Ring" Sizes correspond with AS 568 straight thread tube fitting boss gaskets: Type CH Petroleum base and nonflammable waterbase hydraulic fluids 85-95 durometer.



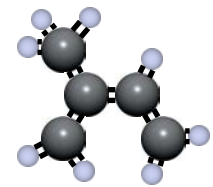
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MIL SPEC	PAI CPD	DESCRIPTION OF SPECIFICATION
AS 568A	23811	Type CA Nonflammable phosphate ester base hydraulic fluid 75-85 durometer.
	8959	Type HK High Temperature for Hydraulic Fluids 85 -95 Durometer
		Standardized dash numbering system for O-Rings. Dimensions for 379 sizes are published as the minimum and maximum cross section and inside diameter for each dash number and expressed both in millimeters and inches.
L-P-590		"Requirements for Polyethylene Molding and Extrusion Plastic Compounds".
FED-STD-601		Federal Test Method standard for sampling and testing rubber.
NAS 617		Thirteen standard size O-rings. Dash numbers correspond with AS 568 straight thread tube fitting boss gaskets (900 series). Material 65-75 durometer nitrile per MIL-R-7362 Type 1, Composition A.
MIL-STD-670		"Classification System and Tests for Cellular Elastomeric Materials".
MIL-HDBK-695		Shelf storage of rubber products.
AS 708		Special O-ring surface condition requirements (top quality).
NORSOK M-710		"Qualification of non-metallic sealing materials and manufacturers"
ZZ-R-710		Vulcanized rubber gasket material of 35 durometer hardness.
MIL-STD-726		"Packaging Requirements Code".
ASTM D735		Canceled. Superseded by SAE J200 and ASTM D2000.
TT-S-735	*	"Hydrocarbon Standard Test Fluids" Supersedes MIL-S-3136B Type I - Iso-octane (ASTM Ref. Fuel A) Type II - Iso-octane and aromatic mixture Type III - Iso-octane and toluene mixture (ASTM Ref. Fuel B) Type IV - Petroleum base oil, low swell characteristics (ASTM Oil #1) Type V - Petroleum base oil, medium swell characteristics (ASTM Oil #2) Type VI - Petroleum base oil, high swell characteristics (ASTM Oil #3) Type VII - Cyclohexane and aromatic mixture (Mercaptan added)
AS 757		Straight thread boss dimensions.
ZZ-R-765 (B) (A-A-55801) (A-A-59588)	See Table	"Silicone Rubber" Specifications for 3 classes with various grades (durometers). Class 1a Low temperature resistant Class 1b Low temperature resistant and low compression set high temperature Class 2a High temperature resistant Class 2b High temperature resistant and low compression set Class 3a Low temperature, tear and flex resistant Class 3b Flex and tear resistant Durometer: 30 40 50 60 70 80 Class 1a -- 19454 19566 19601 19701 19801 Class 1b -- 19454 19501 19601 19701 19801 Class 2a -- 19411 19511 19611 19711 19811 Class 2b -- 19411 19511 19611 19711 19811



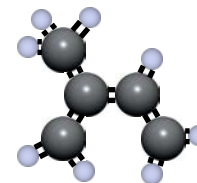
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MIL SPEC	PAI CPD	DESCRIPTION OF SPECIFICATION																				
		Class 3a -- -- -- -- -- Class 3b -- -- -- -- --																				
ZZ-R-768 AIR 786		"Rubber for Mountings (Unbounded Spool and Compression Types)" Used for shock protection. Rubber-fluid compatibility information.																				
ZZ-C-796		"Inflatable Ring Cushion".																				
MIL-STD-810		"Environmental Test Methods" for accelerated aging tests.																				
MIL-STD-831		"Preparation of Test Reports"																				
AS 871		O-Ring dimensional inspection guide.																				
MIL-R-900		"45 Durometer Hardness Rubber Gasket Material" for watertight and airtight enclosures. - 20° to 130°F.																				
MIL-G-1086 (B)	7886 7586	"Gasket Material, Synthetic Rubber" for Bolted Steel Tanks. Type I - 70-80 durometer Type II - 45-55 durometer																				
MIL-PRF-1149 (B) (MIL-G-1149)	See Table	"50 and 65 Durometer Hardness Synthetic Rubber Gasket Materials". Type I - 45-55 Type II - 60-70 Class 1 - Oil resistant chloroprene polymer Class 2 - Non-oil resistant styrene-butadiene copolymer Class 3 - Phosphate ester resistant isoprene-isobutylene copolymer Class 4 - None Class 5 - Fuel resistant acrylonitrile-butadiene copolymer <table border="0" style="margin-left: 40px;"> <tr> <td></td> <td>Class 1</td> <td>Class 2</td> <td>Class 3</td> <td>Class 5</td> </tr> <tr> <td></td> <td>Chloroprene</td> <td>SBR</td> <td>Butyl</td> <td>NBR</td> </tr> <tr> <td>Type I</td> <td>4503</td> <td></td> <td>13501</td> <td>7501</td> </tr> <tr> <td>Type II</td> <td></td> <td>15605</td> <td>13666</td> <td>5606</td> </tr> </table>		Class 1	Class 2	Class 3	Class 5		Chloroprene	SBR	Butyl	NBR	Type I	4503		13501	7501	Type II		15605	13666	5606
	Class 1	Class 2	Class 3	Class 5																		
	Chloroprene	SBR	Butyl	NBR																		
Type I	4503		13501	7501																		
Type II		15605	13666	5606																		
MIL-STD-1188		"Commercial Packaging of Supplies and Equipment".																				
MIL-STD-1189		"Standard Department of Defense Bar Code Symbology".																				
ARP 1231		O-ring gland design considerations.																				
ARP 1232		O-ring gland design for static, radial squeeze.																				
ARP 1233		O-ring gland design for dynamic, radial squeeze.																				
ARP 1234		O-ring gland design for static and dynamic axial squeeze.																				
NAS 1515		Washers - Plastic and Synthetic Rubber.																				
SMS 1586		Swedish Military Standard Dimensions for (metric) O-Rings																				
SMS 1587		"Sealing elements - O-rings - Material"																				
SMS 1588		"Sealing elements - O-rings - Housings"																				
NAS 1593		Two hundred and forty-nine standard O-ring sizes. Dash numbers correspond with AS 568. Material is a high-temperature, fluid-resistant, fluorocarbon rubber per MIL-R-83248 Type 1, Class 1 (70-80 durometer).																				
NAS 1594		Two hundred and forty-nine standard O-ring sizes. Dash numbers correspond with AS 568. Material is a high-temperature, fluid-resistant, fluorocarbon rubber per MIL-R-83248 Type 1,																				



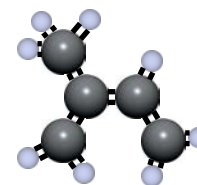
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MIL SPEC	PAI CPD	DESCRIPTION OF SPECIFICATION
		Class 2 (85-95 durometer).
NAS 1595		Twenty standard O-ring sizes. Dash numbers correspond with AS 568 straight thread tube fitting boss gaskets (900 series). Material is a high-temperature, fluid-resistant, fluorocarbon rubber per MIL-R-83248 Type 1, Class 1 (70-80 durometer).
NAS 1596		Twenty standard O-ring sizes. Dash numbers correspond with AS 568 straight thread tube fitting gasket (900 series). Material is a high-temperature, fluid-resistant, fluorocarbon rubber per MIL-R-83248 Type 1, Class 2 (85-95 durometer).
NAS 1598		"Sealing washer" Metal washer with synthetic rubber O-ring bonded to inside diameter.
SAE J 1601		"Rubber Cups for Hydraulic Actuating Cylinders" .
SAE J 1603		"Rubber Seals for Hydraulic Disc Brake Cylinders".
SAE J 1604		"Rubber Boots for Drum Type Hydraulic Brake Wheel Cylinders".
SAE J 1605		"Brake Master Cylinder Reservoir Diaphragm Gasket".
NAS 1611 (T)		Two hundred and forty-nine standard O-ring sizes. Dash numbers correspond with AS 568. Material is ethylene propylene per NAS 1613.
NAS 1612 (T)		Twenty standard O-ring sizes. Dash numbers correspond with AS 568 straight thread tube fitting boss (900 series). Material is ethylene propylene per NAS 1613.
NAS 1613 (T)		"Phosphate Ester Resistant O-ring Packing" Qualification testing procedures and material specifications.
BIS BS 1806		"Specification for dimensions of toroidal sealing rings (O-Rings) and their housings (inch series)"
ASTM D2000		"Standard Classification System for Rubber Products in Automotive Applications" Establishes a nomenclature system for 'line call-outs' for commercially available elastomeric materials. Following is a partial list of the polymer type usually used for a given Type-Class. Precision Associates has compounds to meet nearly all specifications. Please call us with your specific call-out for more details and our compound number.
AA	1xxx 15xxx 13xxx	Natural Rubber, Polyisoprene SBR Butyl
AK	17xxx	Polysulfide (Thiokol®)
BA	23xxx 15xxx 13xxx	Ethylene Propylene High temperature SBR Butyl
BC	4xxx	Chloroprene (Neoprene®)
BE	4xxx	Chloroprene (Neoprene®)
BF	3xxx, 5xxx	Nitrile (Buna N)
BG	3xxx, 5xxx 35xxx	Nitrile Urethane, Millable gum
BK	17xxx	Polysulfide (Thiokol®)
CA	23xxx	Ethylene Propylene (EPDM)
CE	14xxx	Chlorosulfonated Polyethylene (Hypalon®)
CH	3xxx, 5xxx	Nitrile
DA	23xxx	Ethylene Propylene (EPDM)
DE	4xxx 14xxx	Chloroprene (Neoprene®) CSM (Hypalon®)
DF	21xxx	Polyacrylic (butyl-actylate type)
DH	21xxx	Polyacrylic
EE	22xxx	AEM (Vamac®)
EH	21xxx	ACM (Polyacrylic)



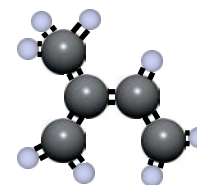
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MIL SPEC	PAI CPD	DESCRIPTION OF SPECIFICATION
FC	19xxx	Silicones (high strength)
FE	19xxx	Silicones
FK	20xxx	Fluorinated silicones (Fluorosilicone)
GE	19xxx	Silicones
HK	8,9, or 10xxx	Fluorinated elastomers (Viton®)
KK	34xxx	Perfluorinated elastomers (P-REX™)
MIL-STD-2073		Standard Practice for Military Packaging
ISO 2230		"Rubber products – Guidelines for storage"
JIS B 2401 (T)	See Table	Japanese Industrial Standard O-Rings Class 1A 5767 Class 2 5767 Class 4C 19711 Class 1B 5916 Class 3 23711 Class 4D 10746
MIL-R-2765		Synthetic rubber material for use as gaskets where resistance to oil and serviceability to temperatures above -20°F are required.
AMS 2817		"Packaging and Identification of Preformed Packings" Individual packaging and marking of O-ring in heat-sealed envelopes. Type I envelope - Polyethylene-lined natural kraft paper of 30lb. min. wt. per ream (opaque both sides). Type II envelope - One side as Type I, one side 300 gage cellophane coated with polyethylene.
MIL-P-2911 (Q)		"Hydraulic Conical and V Types Packing Assembly" Fiber reinforced at least 40% by weight. Type I - Hydraulic Conical Type II - Hydraulic V
MIL-G-3036		"Hot-Oil and Coolant Resistant Rubber Grommet".
MIL-R-3065		"Fabricated Rubber Products" Establishes the requirements for fabricated products of synthetic rubber together with procedures for the inspection of such products. Any material specification is per MIL-STD-417 nomenclature.
AN 3067		"3/8 Inch Conduit Boss Seal Assembly".
AS 3084		Twenty Standard O-ring sizes. Dash numbers correspond to AS 568 straight fluorocarbon rubber per AMS 7280.
AS 3085		"Preformed Packing" Three hundred and forty-nine standard size O-rings. Dash numbers correspond with AS 568. Material is a 70-80 durometer fluorocarbon per AMS 7280.
MIL-T-3100 (Q)		"Solid Rubber Tires".
MIL-S-3136		"Hydrocarbon Standard Test Fluids" Supplanted by TT-S-735.
AMS 3195		"Medium Closed Cell Silicone Rubber Sponge".
AMS 3196		"Firm Closed Cell Silicone Rubber Sponge".
AMS 3197		"Soft Chloroprene-Rubber Sponge".
AMS 3198		"Medium Chloroprene Type Synthetic Rubber Sponge".
AMS 3199		"Firm Chloroprene Type Synthetic Rubber Sponge".
AMS 3200 (B)	5606	"Petroleum-Base Hydraulic Fluid Resistant Nitrile Rubber 55-65 Durometer".
AMS 3201 (B)	3447	"Dry Heat Resistant Synthetic Rubber 35-45 Durometer".
AMS 3202 (B)		"Dry Heat Resistant Synthetic Rubber 55-65 Durometer".
AMS 3204 (B)		"Low Temperature Resistant Synthetic Rubber 25-35 Durometer".
AMS 3205 (B)		"Low Temperature Resistant Synthetic Rubber 45-55 Durometer".



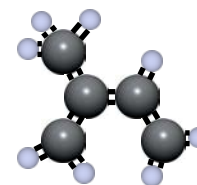
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MIL SPEC	PAI CPD	DESCRIPTION OF SPECIFICATION
AMS 3206		"Extreme Pressure Lubricant Resistant Synthetic Rubber 65-75 Durometer".
AMS 3207 (B)		"Weather Resistant Chloroprene Rubber 25-35 Durometer".
AMS 3208 (B)	4503	"Weather Resistant Chloroprene Type Synthetic Rubber 45-55 Durometer".
AMS 3209 (B)	4753	"Weather Resistant Chloroprene Type Synthetic Rubber 65-75 Durometer".
AS 3209 (B)		Preformed Packing. Material is a 70-80 durometer, high temperature, fluid resistant, low compression fluorocarbon per AMS7276.
AMS 3210 (B)		"Electrical Resistant Chloroprene Rubber 65-75 Durometer".
AMS 3212 (B)		"Aromatic Fuel Resistant Acrylonitrile Butadiene (NBR) Rubber 55-65 Durometer".
AMS 3213 (B)	3847	"Aromatic Fuel Resistant Acrylonitrile Butadiene (NBR) Rubber 75-85 Durometer".
AMS 3214 (B)		"Aromatic Fuel Resistant Acrylonitrile Butadiene (NBR) Rubber 35-45 Durometer".
AMS 3215 (B)	3740	"Aromatic Fuel Resistant Acrylonitrile Butadiene (NBR) Rubber 65-75 Durometer".
AMS 3216 (B)	8876	"Fluorocarbon Rubber – Fuel and Oil Resistant".
AMS 3220 (B)	4624	"Synthetic Rubber 55-65 Durometer".
AMS 3222 (B)	4522	"High Swell Hot Oil Resistant Synthetic Rubber 45-55 Durometer".
AMS 3226 (B)		"Low Swell Hot Oil and Coolant Resistant Synthetic Rubber 45-55 Durometer".
AMS 3227 (B)	7627	"Low Swell Hot Oil and Coolant Resistant Synthetic Rubber 55-65 Durometer".
AMS 3228 (B)	7728	"Low Swell Hot Oil and Coolant Resistant Synthetic Rubber 65-75 Durometer".
AMS 3229 (B)		"Low Swell Hot Oil Resistant Synthetic Rubber 75-85 Durometer".
AMS 3230		"Oil Resistant Gasket".
AMS 3231		"Synthetic Rubber Binder Oil Resistant Gasket".
AMS 3237 (B)		"Phosphate Ester Resistant Butyl Rubber 35-45 Durometer".
AMS 3238 (B)		"Phosphate Ester Resistant Butyl Type Synthetic Rubber 65-75 Durometer".
AMS 3239 (B)		"Phosphate Ester Resistant Butyl Type Synthetic Rubber 85-95 Durometer".
AMS 3240 (B)	4409	"Weather Resistant Chloroprene Rubber 35-45 Durometer".
AMS 3241 (B)		"Weather Resistant Chloroprene Type Synthetic Rubber 55-65 Durometer".
AMS 3242 (B)	4844	"Weather Resistant Chloroprene Type Synthetic Rubber 75-85 Durometer".
AMS 3243 (B)	4651	"Flame Resistant Chloroprene Type Synthetic Rubber 55-65 Durometer".
AMS 3244 (B)	4753	"Flame Resistant Chloroprene Type Synthetic Rubber 65-75 Durometer".
AMS 3248 (B)		"Phosphate Ester Resistant Ethylene Propylene Type Synthetic Rubber 55-65 Durometer".
AMS 3249 (B)		"Hydrazine Base Fluid Resistant Ethylene Propylene Type Synthetic Rubber 75-85 Durometer".
AMS 3260 (B)	23551	"General Purpose Ethylene Propylene Terpolymer Synthetic Rubber Sheet".
AMS 3301 (B)	19411	"General Purpose Silicone Rubber 35-45 Durometer".
AMS 3302 (B)	19511	"General Purpose Silicone Rubber 45-55 Durometer".
AMS 3303 (B)	19611	"General Purpose Silicone Rubber 55-65 Durometer".
AMS 3304 (B)	19711	"General Purpose Silicone Rubber 65-75 Durometer".



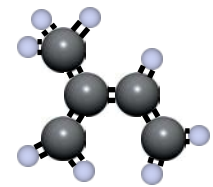
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MIL SPEC	PAI CPD	DESCRIPTION OF SPECIFICATION
AMS 3305 (B)	19811	"General Purpose Silicone Rubber 75-85 Durometer".
AMS 3306		"High Modulus Silicone Rubber 55-65 Durometer"
AMS 3307 (B)	19711	"Non-Oil Resistant Low Compression Set Silicone Rubber 70-80 Durometer".
AMS 3325 (B)	20662	"Fuel and Oil Resistant Fluorosilicone Rubber 55-65 Durometer".
AMS 3326 (B)	20662	"Fuel and Oil Resistant Fluorosilicone Rubber 50-65 Durometer".
AMS 3327 (B)		"High Temp. Fuel and Oil Resistant Fluorosilicone (FVMQ) Rubber 70-80 Durometer".
AMS 3328 (B)	20463	"Fuel and Oil Resistant Fluorosilicone (FVMQ) Rubber 35-45 Durometer".
AMS 3329 (B)	20563	"Fuel and Oil Resistant, Fluorosilicone (FVMQ) Rubber 45-55 Durometer, High Strength".
AMS 3330 (B)	20563	"Fuel and Oil Resistant, Fluorosilicone (FVMQ) Rubber 45-55 Durometer".
AMS 3331 (B)		"Fuel and Oil Resistant, Fluorosilicone (FVMQ) Rubber 65-75 Durometer".
AMS 3334 (B)	19454	"Extreme Low Temperature Resistant Silicone Rubber 35-45 Durometer".
AMS 3335 (B)	19566	"Extreme Low Temperature Resistant Silicone Rubber 45-55 Durometer".
AMS 3336 (B)	19601	"Extreme Low Temperature Resistant Silicone Rubber 55-65 Durometer".
AMS 3337 (B)	19701	"High and Extreme Low Temperature Resistant Silicone Rubber 65-75 Durometer".
AMS 3338 (B)		"High and Extreme Low Temperature Resistant Silicone Rubber 75-85 Durometer".
AMS 3344 (B)		"1800psi Tensile Strength Silicone Rubber 45-55 Durometer".
AMS 3345 (B)	19524	"1000psi Tensile Strength Silicone Rubber 45-55 Durometer".
AMS 3346 (B)	19624	"1000psi Tensile Strength Silicone Rubber 55-65 Durometer".
AMS 3347 (B)	19559	"High Modulus 1200psi Tensile Strength Silicone Rubber 45-55 Durometer".
AMS 3348 (B)	19325	"High Resiliency 1150psi Tensile Strength Silicone Rubber".
AMS 3349 (B)		"High Resiliency 1100psi Tensile Strength Silicone Rubber 55-75 Durometer".
AMS 3356 (B)		"Lubricating Oil and Compression Set Resistant, Electrical Grade Silicone Rubber 55-65 Durometer".
AMS 3357 (B)	19711	"Lubricating Oil and Compression Set Resistant Silicone Rubber 65-75 Durometer".
MIL-D-3377		"Synthetic Rubber Diaphragms". Type I - Synthetic rubber composition without reinforcement Type II - Synthetic rubber reinforced with fabric
AMS 3384 (B)	8703	"Rubber, Fluorocarbon Elastomer (FKM), 70 to 80 Hardness, Low Temperature Sealing Tg -22 °F (-30 °C). For Elastomeric Shapes or Parts in Gas Turbine Engine Oil, Fuel and Hydraulic Systems."
MS 3420		"Adapter, Clamp to Cable, Bushing, Telescoping".
MIL-R-3533		"Sheet, Strip and Molded Synthetic Rubber" Oil and salt water resistant. Type I & II - Grade A, 75-85 durometer Type I & II - Grade B, 65-75 durometer
MIL-G-3545	*	"High Temperature Aircraft Grease".
AS 3569		"Packing, Preformed - O-Ring Seal". Material per AMS 7270
AS 3570		"Packing, Preformed - O-Ring Seal". Material per AMS 7274
ISO 3601/1		"Fluid Power Systems - O-Rings". Inside diameters, cross sections, tolerances and size identification code.



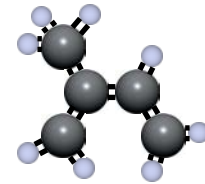
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MIL SPEC	PAI CPD	DESCRIPTION OF SPECIFICATION
ISO 3601/2		"Fluid Power Systems - O-Rings". Housing dimensions for general applications.
ISO 3601/3		"Fluid Power Systems - O-Rings". Quality acceptance criteria.
SO 3601/4		"Fluid Power Systems - O-Rings". Anti-extrusion rings (back-up rings).
ISO 3601/5		"Fluid Power Systems - O-Rings". Suitability of elastomeric materials for industrial applications.
AMS 3651		"Polytetrafluoroethylene".
DIN 3771		"O-Rings for use in fluid power systems."
MIL-P-3803		"Plastic, Polyethylene, Molded and Extruded Shapes, Sheets and Tubing".
ASTM D 3951		"Standard Practice for Commercial Packaging". Level A - Individual packaging in opaque bags, in accordance with MIL-P-116 Level C - Good commercial practice, 1, 5, 50, or 100 per bag
BIS BS 4518		"Specification for Metric dimensions of toroidal sealing rings (O-Rings) and their housings"
MIL-P-4861		"Packaging of Preformed Rubber Packing".
MIL-S-5049 (Q)		"Piston Rod Scrapers" Performance requirements and qualification tests. Type M - all metal Type R - containing rubber Class 2 - usable temperature range -65° to 275°F
MIL-P-5315 (Q)		"Hydrocarbon Fuel Resistant Preformed Packaging" Material is 60-70 durometer nitrile.
ARP 5316		"Storage of Elastomer Seals and Seal Assemblies Which Include an Elastomer Element Prior to Hardware Assembly."
MIL-B-5423		"General Specifications for Boots, Dust and Water Seal (for Toggle and Push Button Switches, Circuit Breaker and Rotary Actuated Parts)".
MIL-G-5510 (Q)		"Straight Thread Tube Fitting Boss Preformed Packings" Material is 88 durometer nitrile.
MIL-G-5514		"Gland design recommendations for standard size O-rings. Complete engineering design consideration for O-ring installation.
AMS-P-5516 (Q)		Specifies two classes of preformed packings for use where resistance to hydraulic fluid is required at temperatures from -65° to 160°F. Class A - Low Flexibility 83-93 durometer nitrile Class B - High Flexibility 63-72 durometer nitrile
MIL-W-5521 (Q)		"Aircraft Hydraulic Packing Backup Washer" Leather.
MIL-F-5566	*	"Anti-Icing Fluid (isopropyl alcohol)".
MIL-G-5572	*	"Aviation Gasoline Grades 80/87, 100/130, 115/145".
MIL-H-5606	*	"Petroleum Base Hydraulic Fluid".
MIL-T-5624	*	"Aviation Turbine Fuel Grades JP-4 and JP-5".
MIL-R-5847		"Silicone Rubber Low-and High-Temperature and Tear Resistant" Supplanted by ZZ-R-765. All Classes, grades and requirements remain the same. See ZZ-R-765 for PAI compounds that qualify.
MIL-L-6081	*	"Jet Engine Lubricating Oil".
MIL-L-6082	*	"Aircraft Reciprocating Engine (Piston) Lubricating Oil".
MIL-H-6083	*	"Petroleum Base Hydraulic Fluid for Preservation and Testing".



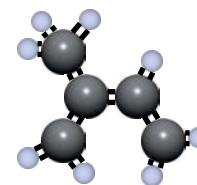
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MIL-L-6085	*	"Low Volatility Aircraft Instrument Lubricating Oil".																																																	
MIL-A-6091		"Specially Denatured Ethyl Alcohol".																																																	
MIL-R-6130		"Chemically Blown Cellular Rubber".																																																	
ISO 6149		"Connections for hydraulic fluid power and general use -- Ports and stud ends with ISO 261 metric threads and O-ring sealing."																																																	
MIL-C-6183		"Cork and Synthetic Rubber Composition Sheets for Aromatic Fuel and Oil Resistant Gaskets".																																																	
AN 6225		V-Ring Dimensions. PAI manufactures most of the 80 sizes shown. Material specified is a 70 durometer nitrile per MIL-P-5516. However, V-Rings are available in other 90 durometer nitrile and Fluoroelastomer compounds.																																																	
AN 6226		U-Cup Dimensions. PAI manufactures all 53 sizes shown plus over 170 other U-Cup sizes. Material specified is a 70 durometer nitrile per MIL-P-5516 Class B. However, U-Cups are available in a wide range of compounds to meet your specific needs.																																																	
AN 6227		Eighty-eight O-ring sizes corresponding with AS 568 but dash numbers are different. Material specified is a 70 durometer nitrile per MIL-P-5516.																																																	
AN 6228		"V-Ring, Female Adapters" Sizes correspond to AN 6225. Material specified is aluminum alloy.																																																	
AN 6229		"V-Ring, Male Adapters" Sizes correspond to AN 6225. Material specified is aluminum alloy.																																																	
AN 6230		Fifty-two O-ring sizes corresponding with AS 568 but dash numbers are different. Material specified is a 70 durometer nitrile per MIL-P-5516. Entire size group has cross section 1/8" nominal, .139" actual.																																																	
AN 6231		"Hydraulic Piston Rod Scraper" Superseded by MS28776.																																																	
AN 6238		"Hydraulic Replacement Reservoir Type Filler Element Gasket" Material per MIL-P-5516 Class B. Flat Gaskets - 1 5.25" OD x 3.50" ID x 0.063" thick.																																																	
AN 6290 (Q)		"Box Gaskets, for use with MIL-H-5606 Hydraulic Fluid" Material is an 88+ durometer nitrile per MIL-P-5510.																																																	
MIL-L-6387	*	"Synthetic Base Lubricant Oil".																																																	
MIL-PRF-6855 (B) (AMS-R-6855) (B) (MIL-R-6855) (B)	See Table	<p>"Synthetic Rubber, Sheets, Strips, Molded or Extruded Shapes".</p> <p>Low - Temperature Synthetic Rubber</p> <p>Class 1 - Fuel and Petroleum oil resistant</p> <p>Class 2 - Petroleum oil, weather and ozone resistant</p> <p style="padding-left: 40px;">Type A - High Ozone concentration</p> <p style="padding-left: 40px;">Type B - Low Ozone concentration</p> <p>Class 3 - Non-oil resistant</p> <p>Class 4 - Petroleum oil, weather and Ozone resistant (for use in contact with acrylic plastics)</p> <p style="padding-left: 40px;">Type A - High Ozone concentration</p> <p style="padding-left: 40px;">Type B - Low Ozone concentration</p> <p>Class 5 - Non-oil resistant (for use in contact with acrylic plastics durometers)</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Durometer:</th> <th>30</th> <th>40</th> <th>50</th> <th>60</th> <th>70</th> <th>80</th> </tr> </thead> <tbody> <tr> <td>Class 1</td> <td>--</td> <td>3447</td> <td>7555</td> <td>7655</td> <td>3740</td> <td>--</td> </tr> <tr> <td>Class 2a</td> <td>--</td> <td>4403</td> <td>4503</td> <td>4603</td> <td>4705</td> <td>4845</td> </tr> <tr> <td>Class 2b</td> <td>--</td> <td>4403</td> <td>4503</td> <td>4603</td> <td>4705</td> <td>4845</td> </tr> <tr> <td>Class 3</td> <td>--</td> <td>--</td> <td>--</td> <td>15606</td> <td>23711</td> <td>15805</td> </tr> <tr> <td>Class 4</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> </tr> <tr> <td>Class 5</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> </tr> </tbody> </table>	Durometer:	30	40	50	60	70	80	Class 1	--	3447	7555	7655	3740	--	Class 2a	--	4403	4503	4603	4705	4845	Class 2b	--	4403	4503	4603	4705	4845	Class 3	--	--	--	15606	23711	15805	Class 4	--	--	--	--	--	--	Class 5	--	--	--	--	--	--
Durometer:	30	40	50	60	70	80																																													
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MIL-R-6891		"Anodic Rubber".																																																	
MIL-H-7083	5747	Nonflammable water-base hydraulic fluid for aircraft use.																																																	



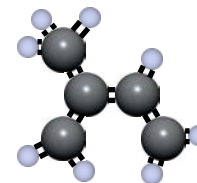
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MIL SPEC	PAI CPD	DESCRIPTION OF SPECIFICATION
AMS 7255 (B)	25796	"Rings, Sealing, Tetrafluoroethylene/Propylene Rubber (FEPM), Hydraulic Oil and Synthetic Oil Resistant 70 to 80".
AMS 7259 (B)		"Very Low Compression Set High-Temperature-Fluid Resistant Fluorocarbon Rubber Sealing Rings 85-95 Durometer".
AMS 7260 (B)		"Fuel and Low Temperature Resistant Synthetic Rubber Packing Rings 70-80 Durometer".
AMS 7263 (B)		"Phosphate Ester Hydraulic Fluid Resistant, Butyl Type Synthetic Rubber Packing Rings 85-95 Durometer".
AMS 7266 (B)	20766	"General Purpose High Temperature Fuel and Oil Resistant Fluorosilicone Rubber Sealing Rings".
AMS 7267 (B)	19720	"Heat Resistant, Low Compression Set Silicone Rubber Sealing Rings 70-80 Durometer".
AMS 7268 (B)	19711	"Non-Oil Resistant Low Compression Set Silicone Rubber Sealing Rings 65-75 Durometer".
AMS 7269 (B)		"Space and Vacuum Service Low Out Gassing Silicone Rubber Sealing Rings 45-55 Durometer".
AMS 7270 (Q)		"Fuel Resistant Synthetic Rubber Sealing Rings 65-75 Durometer".
AMS 7271 (B, P1)		"Fuel and Low Temperature Resistant Synthetic Rubber Sealing Rings 60-70 Durometer".
AMS 7272 (B)	3772	"Synthetic Lubricant Resistant NBR Type Synthetic Rubber Sealing Rings 65-75 Durometer".
AMS 7273 (B)		"High Temperature Fuel and Oil Resistant Fluorosilicone Rubber Sealing Rings 70-80 Durometer".
AMS 7274 (B)	3774	"Oil Resistant Synthetic Rubber Sealing Rings 65-75 Durometer".
AMS 7275		"Synthetic Lubricant Resistant Fluorocarbon Type Synthetic Rubber Sealing Rings 65-85 Durometer".
AMS 7276 (Q)		"High-Temperature Fluid Resistant, Very Low Compression Set, Fluorocarbon Rubber Sealing Rings 70-80 Durometer".
AMS 7277		"Phosphate Ester Hydraulic Fluid Resistant Butyl Type Synthetic Rubber Sealing Rings 70-85 Durometer".
AMS 7278 (B)		"High Temperature Fluid Resistant Fluorocarbon Type Synthetic Rubber Sealing Rings 70-80 Durometer" NONCURRENT for new design AMS 7276 and AMS 7280 should be used where AMS 7278 material would have been suitable.
AMS 7279 (B)		"High Temperature Fluid Resistant Fluorocarbon Type Synthetic Rubber Sealing Rings 85-95 Durometer".
AMS 7280 (B)	8876	"High Temperature Fluid Resistant, Low Compression Set Fluorocarbon Rubber Sealing Rings 70-80 Durometer".
AMS 7287 (Q)		"Fluorocarbon Elastomer (FKM) High Temperature"
MIL-R-7362		"Diester Synthetic Oil Resistant Synthetic Rubber". Type I - O-Rings Type II - Molded parts, sheets, strips and extruded parts
MIL-L-7808		"Synthetic Base Aircraft Turbine Engine Lubricating Oil".
MIL-A-8243		"Anti-Icing and Deicing-Defrosting Fluid".
MIL-H-8446		"Aircraft Non-Petroleum Base Hydraulic Fluid".
MIL-C-8603		"Support Loop Type Clamps" for electrical wire bundles and other non-hydraulic uses".
MIL-S-8660		"Silicone, Compound NATO Code Number S-763".
MIL-R-8791		Tetrafluoroethylene resin (TFE) retainers intended for use in hydraulic and pneumatic system components as anti-extrusion devices in conjunction with packings and gaskets.
MIL-R-8913		"Piston Rod Wiper Ring" Sizes per MS 28903. Type I - Rubber rings Type II - Polytetrafluoroethylene rings (PTFE)



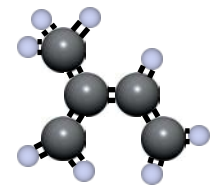
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MIL SPEC	PAI CPD	DESCRIPTION OF SPECIFICATION
		Type III - Metallic rings
MS 9020 (P2)		Twenty O-ring sizes. Dash numbers correspond with AS 568 straight thread tube fitting boss gaskets (900 series). Material per AMS 7271.
MS 9021 (P2)		Three-hundred and twenty O-ring sizes. Dash numbers correspond with AS 568 series. Material per AMS 7271.
MS 9058		Scarf cut split Back-up rings. Eighteen sizes for straight thread tube fitting boss gaskets (900 series). Material is PTFE per AMS 3651.
MS 9068 (P2)	19711	Two-hundred and twenty-nine O-ring sizes. Dash numbers correspond to AS 568. Material is a 65-75 durometer silicone rubber per AMS 3304.
MS 9136		"Engine Accessory Drive Gasket" Asbestos and synthetic rubber.
MS 9203		Metal O-ring, .094" tube by .006" wall.
MS 9204		Metal O-ring, .094" tube by .010" wall.
MS 9205		Metal O-ring, .125" tube by .010" wall.
MS 9241 (P1, A4)	3772	Three-hundred and fifty-nine standard O-ring sizes. Dash numbers correspond to AS 568. Material is a 65-75 durometer nitrile per AMS 7272.
MS 9355 (P1)	3772	Twenty standard O-ring sizes. Dash numbers correspond to AS 568 straight thread tube fitting boss gaskets (900 series). Material is a 65-75 durometer nitrile per AMS 7272.
MS 9373		Silver plated metal O-Ring: .062" tube by .010" wall.
MS 9374		Silver plated metal O-Ring: .094" tube by .006" wall.
MS 9375		Silver plated metal O-Ring: .094" tube by .010" wall.
MS 9376		Silver plated metal O-Ring: .125" tube by .010" wall.
MS 9385		Twenty standard O-ring sizes. Dash numbers correspond to AS 568 straight thread tube fitting boss gaskets (900 series). Material is a 70-80 durometer silicone per AMS 7267.
MS 9386		Three-hundred and fifty-nine standard O-ring sizes. Dash numbers correspond to AS 568. Material is a 70-80 durometer silicone per AMS 7267.
MS 9387 (P1)		Twenty standard O-ring sizes. Dash numbers correspond to AS 568 straight thread tube fitting boss gaskets (900 series) but tolerances are not as large. Material is a 70-80 durometer fluorocarbon per AMS 7278.
MS 9388 (P1)		Three-hundred and fifty-nine standard O-ring sizes. Dash numbers correspond to AS 568, but tolerances are not as large. Material is a 70-80 durometer fluorocarbon per AMS 7278.
MS 9484		Eighteen sizes of scarf cut split Back-up rings for straight thread tube fitting boss gaskets. Material is polytetrafluoroethylene (PTFE) per AMS 3651.
MIL-Q-9858		"Quality Program Requirements".
MS 9966 (P1)		Twenty standard O-ring sizes. Dash numbers correspond to AS 568 straight thread tube fitting boss gaskets (900 series). Material is a 70-80 durometer Fluorosilicone rubber per AMS 7273.
MS 9967 (P1)		Three-hundred and fifty-nine standard O-ring sizes. Dash numbers correspond to AS 568. Material is a 70-80 durometer Fluorosilicone rubber per AMS 7273.
MS 9968 (P1)	8876	"Internal Straight Thread Boss" Material 70-80 durometer fluorocarbon per AMS 7280.
MS 9970 (P1)		Three-hundred and fifty-nine standard size O-rings. Dash numbers correspond to AS 568, but tolerances are not as large. Material is an 85-95 durometer fluorocarbon rubber per AMS 7279.
ISO 10423		Petroleum and natural gas industries -- Drilling and production equipment -- Wellhead and christmas tree equipment.
MIL-L-10547		"Flexible Water-Vaporproof or Waterproof Case Liners. Overwraps and Sheets".



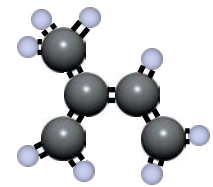
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MIL SPEC	PAI CPD	DESCRIPTION OF SPECIFICATION
MIL-F-10870		"Insulated Food Container with Inserts" Elastomeric gasket per MIL-R-3065 and ASTM D2000.
MIL-G-10924		"Automotive and Artillery Grease".
ISO 10993		"Biological evaluation of medical devices". A twenty part series of standards.
MIL-R-11512		Synthetic rubber seals for pure petroleum insulating oil.
MIL-P-11719		"Preformed Rubber Packing for use with Pneumatic Hose Couplings".
MIL-G-12803		"Non-metallic Gasket Material" Does not cover molded gaskets.
MIL-M-12863		"Vibration Mounts".
MIL-G-13210		"Rubber Gaskets" intended for use in making gas-tight connections in the assembly of gas mask canisters.
ISO 13485		Medical devices - Quality management systems - Requirements for regulatory purposes
MIS 13937		"Ethylene Propylene Rubber Sheets, Molded and Cut Shapes". Type I - Molded sheets or parts Type II - Precision molded O-rings, gaskets and packing Type III - Extruded molds
ISO 14001		Environmental management systems -- Requirements with guidance for use
MIL-C 14055 (Q)		"Synthetic Rubber Hydraulic Brake Actuating Cylinder Cup".
MIL-R-14328		"General Purpose Gasket Material (for Extreme Climatic Conditions) Medium Soft Synthetic Rubber Sheet".
MIL-P-14401		"Vehicular Personnel-Protection Cushioning Pads".
ISO 14644		"Cleanrooms and associated controlled environments". A nine part series of standards.
MIL-P-14574		"Cloth Insertion Synthetic Rubber Packing (Wiper Ring)" Fiber reinforced rubber rod wiper.
MIL-R-15624		Medium soft synthetic rubber for shipboard gasket use except low temperature application. Class 1 - Chloroprene Class 2 - Butadiene-styrene (SBR) Class 3 - Butadiene-acrylonitrile (NBR)
MS 17413 (P1)		Two hundred and thirty-nine standard size O-rings. Dash numbers to AS 568. Material is a 70-80 durometer fluorocarbon rubber per AMS 7278.
MIL-G-17553 (Q)		"O-Ring Gasket for Rockets".
MIL-D-17650		"Insert Type Rubber Valve Disk".
MIL-P-18484		"Synthetic Rubber Hydraulic-Seal Preformed Packing".
MIL-G-18586 (Q)		"Shipboard Electrical Junction Box O-ring Gaskets" -20°F and above. Class 1 - Butadiene-styrene copolymer (non-oil resistant) Class 2 - Butadiene-acrylonitrile copolymer (oil resistant)
MIL-P-19152		"High Pressure Hydraulic Packings (for Hydropneumatic Systems)".
MIL-H-19457		"Non-Neurotoxic Fire-Resistant Hydraulic Fluid".
MIL-G-19655		High-pressure gasket material for use where petroleum or phosphate ester hydraulic fluids are used.
MIL-G-19769		"Slide Valve Oil Resistant Synthetic Rubber Gaskets".
MIL-P-19918		"V-Ring Packing" material and Filler Ring Material.



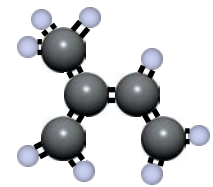
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MIL SPEC	PAI CPD	DESCRIPTION OF SPECIFICATION
MIL-S-21558		"Oil, Plain or Plain Encase Seals".
MIL-G-21569 (B)		Synthetic Rubber Cylinder Liner Seal Gaskets. Class I - Oil resistant 55-75 durometer butadiene and acrylonitrile copolymer Class II - High temperature resistant 55-75 durometer elastomeric polysiloxanes
MIL-G-21610 (B)	19611	Synthetic rubber gaskets of various cross sections for use in heat exchangers, 60-75 durometer. Type II - Elastomeric Polysiloxanes base material
MIL-S-21923		"Ozone Resistant Butadiene-Styrene Type Synthetic Rubber Compound for Low Temperature Service".
MIL-G-22004		"Lighting Fixture High Temperature Gasket".
MIL-G-22050 (B)		"Rubber Gasket, Packing Seals and Sheet Rubber Material, for use with Polar Fluids, Steam and Air at Moderately High Temperatures". Grade 1 - 60-70 durometer hardness Grade 2 - 75-85 durometer hardness Grade 3 - 85-95 durometer hardness
MIL-S-23190		"Plastic Straps, Clamps and Mounting Hardware for Cable Hardness Tying and Support".
MIL-M-23573		This specification covers chelated-Monethanolamine (MEA) for use in equipment for the removal of carbon dioxide from the air using a regenerative absorption process. Rubber gasket and packing material intended for use in 300psig hydraulic systems. The material is compatible with both petroleum base fluids and phosphate ester fluid. Specification requires either color coding of parts or individual packaging. Type I - for use in hydraulic systems up to 300psig pressure 65-75 durometer. Type II - for use in hydraulic systems up to 5200psig pressure 85-95 durometer.
MIL-G-23652		
ISO 239236-2		Petroleum, petrochemical and natural gas industries -- Non-metallic materials in contact with media related to oil and gas production -- Part 2: Elastomers (under development)
MIL-I-24063		"Insert Sets, Sound Isolation for RISIC-I Flexible Connectors".
MS 24690 (Q)		"Preformed High Pressure Air Valve Packing" One size only, 0.070" c/s x 0.551" ID. Material per MIL-P-5516, Class B.
MIL-P-25732 (Q) (Obsolete)		O-Ring packings for use with petroleum based hydraulic fluid over the temperature range of 65° to 275°F. Sizes conform to MS 28775 (same as AS 568 dash numbers). "High Temperature Fluid Resistant Fluorocarbon Elastomeric Rubber". Type I - O-Ring and compression seals Type II - Molded parts (other than sealing devices) sheets, strips and extruded shapes Class I (70-80 durometer) Type I & II Class II (85-95 durometer) Type I & II
MIL-R-25897 (Obsolete)		
AMS-R-25988 (MIL-R-25988) (B) (MIL-DTL-25988) (C)	See Table	
		"Oil and Fuel Resistant Fluorosilicone Elastomer Rubber Sheets, Strips, Molded Parts and Extruded Shapes". Type I - O-Rings Type II - Other Molded parts Class 1 - general purpose Class 2 - high-strength general purpose



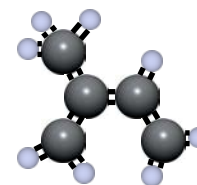
Specification Guide



MIL SPEC	PAI CPD	DESCRIPTION OF SPECIFICATION
		Class 3 - high modulus, increased temperature resistant <u>Type I O-Rings</u> Durometer: 40 50 60 70 80 90 Class 1 20662 20763 20863 Class 2 Class 3 <u>Type II Molded Parts</u> Durometer: 40 50 60 70 80 Class 1 20463 20563 20662 20763 Class 2 20563 Class 3
MIL R-25988/1 (B)	20763	"Grade 70 Class 1 O-Rings Oil and Fuel-Resistant Fluorosilicone Elastomer Rubber".
MIL-R-25988/2 (B)		"Grade 70 Class 3 O-Rings Oil and Fuel-Resistant Fluorosilicone Elastomer Rubber".
MIL-R-25988/3 (B)	20662	"Grade 60 Class 1 O-Rings Oil and Fuel-Resistant Fluorosilicone Elastomer Rubber".
MIL-R-25988/4 (B)		"Grade 80 Class 1 O-Rings Oil and Fuel-Resistant Fluorosilicone Elastomer Rubber".
MS 26577	19811	"Airport Marker Light Base Gasket" Material is a heat resistant silicone rubber per ZZ-R-765 Class 2a, Grade 80.
MS 27030		"Gasket-Coupling half, Quick Disconnect, Cam-locking Type" 10 sizes, flat gaskets.
MS 27198		Metal retainer with molded in rubber seal, material per MIL-R-25988.
MS 27290	19511	"Cable Adapter Bushing" Material is a silicone rubber per MIL-R-5847 Class 2b, Grade 50.
MS 27488		"Electric Connector Sealing Plug".
MS 27595		"Tetrafluoroethylene Continuous Ring Packing Backing Retainer" One-hundred and sixty-four sizes for standard O-Rings. Material per MIL-R-8791 Rectangular cross section.
MS 28772 (Q)		"D-Ring Preform Packing Shock Strut" material per MIL-P-5516.
MS 28773		"Straight Thread Tube Fitting Boss Tetrafluoroethylene Packing Backup Retainer" Thirteen sizes of 22-degree scarf cut backups for 900 series O-Rings. Rectangular cross section. Material per MIL-R-8791.
MS 28774		"Tetrafluoroethylene Single Turn Packing Backup Retainer" One-hundred and sixty-four sizes of 22 degree scarf cut backups for standard O-Ring sizes. Rectangular cross section, material per MIL-R-8791.
MS28775 (Q)		Three-hundred and fifty-nine standard O-ring sizes. Dash numbers correspond with AS 568. Material is a 68+ durometer nitrile per MIL-P-25732.
MS 28776		"Piston Rod Scraper" PAI manufactures many of the 71 dash sizes in the dimensional style but not to the material specification in both 70 and 90 durometer nitrile.
MS 28777		"Aircraft Hydraulic Packing Backup Washer" Thirteen sizes of uncut rectangular cross section backups for 900 series O-rings. Material specified is leather. PAI can supply in Teflon.
MS 28778 (Q)		"Straight Thread Tube Fitting Boss Preformed Packing" Dash numbers correspond with AS 568 straight thread tube fitting boss gaskets (900 series) Material per MIL-P-5510.
MS 28782		"Teflon Backup Packing Retainer" Eighty-eight sizes of spiral cut, double turn backups, dash numbers correspond to the dash numbers of AN 6227 packings. Material per MIL-R-8791.
MS 28783		"Teflon Backup Gasket Ring" Twenty-five sizes of spiral cut double turn backup rings. Dash numbers correspond to AN 6230 gaskets. Material per MIL-R-8791.
MS 28784		Canceled. Superseded by MS 28775.
MS 28900	4753	"Preformed Packings for Electrical Use" Material is a 65-75 durometer chloroprene per AMS 3209



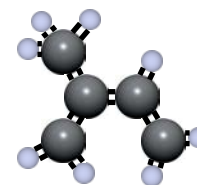
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		Dash #	PAI Size	Dash #	PAI Size	Dash#	PAI Size	
		-8	31-332	-20	31-984	-38	1-110	
		-10	31-410	-22	31-1.109	-40	1-111	
		-12	31-526	-24	31-1.226	-42	1-112	
		-14	31-643	-28	47-1.453	-44	1-113	
		-16	31-779	-32	47-1.672	-46	1-114	
		-18	31-915	-36	47-1.891	-48	1-115	
MS 28903		"Hydraulic and Pneumatic Piston Rod Dirt Wiper Ring" Material per MIL-R-8913.						
MS 29512		"Fuel Resistant Straight Thread Tube Fitting Boss Gasket" Thirteen standard size O-rings. Dash numbers correspond to AS 568 straight thread tube fitting boss gaskets (900 series), Material per MIL-P-5315.						
MS 29513 (Q)		"Hydrocarbon Fuel Resistant Packing O-Ring" One-hundred and seventy-four standard size O-rings. Dash numbers correspond to AS 568. Material per MIL-P-5315.						
MS 29531		"Aircraft Engine Exhaust Port Closure Plug" Material per MIL-R-6855 Class I or II Grade 40, Color yellow.						
MS 29561 (P2)		"Synthetic Lubricant Resistant Preformed O-Ring Packing" One-hundred ninety-one standard size O-rings. Dash numbers correspond to AS 568. Material is a 65-75 durometer nitrile per MIL R-7362 Type I.						
MS 33649		"Straight Thread Tube Fitting Boss Gasket Gland Dimensions".						
MS 33666		"Range of Sizes Aeronautical Elastomer Preformed Packing" Two-hundred and fifty-six standard size O-rings. Dash numbers correspond to AS 568. No material specification.						
MS 33675		"Packing Gland Ring Scrapper Installation" No material specification.						
MS 33688		"Range of Sizes Elastomeric Tube Fitting Preformed Packing" Twenty standard dash sizes for straight thread tube fitting boss gaskets (900 series). No material specification.						
MS 35133		"Preformed Packing" Five dash sizes inactive for design after 11/6/64.						
MS 35489		"Hot Oil and Coolant Resistant Rubber Grommet" Material 50 durometer nitrile per MIL-STD-417 Grade SB-515-A1, B1, C2, E3, F2.						
MS 35769		"Copper and Asbestos Annular Metallic-Encased Gasket".						
MS 35796		"Hot Galvanized (Pole-Line) Thimble Eye (Straight) Bolt".						
MS 35803 (Q)		"Leather Backup Ring Packing Retainer" Material per MIL-R-5521.						
MIL-S-45005		Spring-loaded single and multiple lip oil seal. The seal incorporates either a leather or synthetic elastomer sealing member.						
MIL-I-45208		"Inspection System Requirements".						
MIL-C-45662		"Calibration System Requirements".						
MIL-R-46089		"Closed Cell Silicone Sponge Rubber".						
MIL-L-46167 (O)		"Arctic Internal Combustion Engine Lubricating Oil".						
MIL-H-46170		"Fire Resistant Rush Inhibited Synthetic Hydrocarbon Base Hydraulic Fluid".						
MIL-B-46176		"Operational and Preservation Automotive All Weather Silicone Brake Fluid".						
NF T47-501		"Rubber O-Ring – Designation, sizes and tolerances." Published by AFNOR, the French standards association						
MIL-C-50072		"Voicemitter-Outlet Valve Cover".						
MS 51920		Steel encased rod seals.						
MIL-S-52000		"Synthetic Rubber Gasket".						
MIL-C-52211		"Packing of Components and Assemblies for Industrial Gas".						



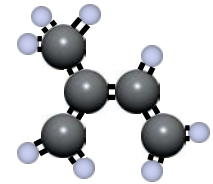
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MIL SPEC	PAI CPD	DESCRIPTION OF SPECIFICATION																																																	
A-A-55801		"Silicone Rubber" Specifications for 3 classes with various grades (durometers). See A-A-59588 (below)																																																	
A-A-59588	See Table	<p>"Silicone Rubber" Specifications for 3 classes with various grades (durometers).</p> <p>Class 1a Low temperature resistant</p> <p>Class 1b Low temperature resistant and low compression set</p> <p>Class 2a High temperature resistant</p> <p>Class 2b High temperature resistant and low compression set</p> <p>Class 3a Low temperature, tear and flex resistant</p> <p>Class 3b Flex and tear resistant</p> <table border="1"> <thead> <tr> <th>Durometer:</th> <th>30</th> <th>40</th> <th>50</th> <th>60</th> <th>70</th> <th>80</th> </tr> </thead> <tbody> <tr> <td>Class 1a</td> <td>--</td> <td>19454</td> <td>19501</td> <td>19601</td> <td>19701</td> <td>19801</td> </tr> <tr> <td>Class 1b</td> <td>--</td> <td>19454</td> <td>19501</td> <td>19601</td> <td>19701</td> <td>19801</td> </tr> <tr> <td>Class 2a</td> <td>--</td> <td>19411</td> <td>19511</td> <td>19611</td> <td>19711</td> <td>19811</td> </tr> <tr> <td>Class 2b</td> <td>--</td> <td>19411</td> <td>19511</td> <td>19611</td> <td>19711</td> <td>19811</td> </tr> <tr> <td>Class 3a</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> </tr> <tr> <td>Class 3b</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> </tr> </tbody> </table>	Durometer:	30	40	50	60	70	80	Class 1a	--	19454	19501	19601	19701	19801	Class 1b	--	19454	19501	19601	19701	19801	Class 2a	--	19411	19511	19611	19711	19811	Class 2b	--	19411	19511	19611	19711	19811	Class 3a	--	--	--	--	--	--	Class 3b	--	--	--	--	--	--
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Class 2b	--	19411	19511	19611	19711	19811																																													
Class 3a	--	--	--	--	--	--																																													
Class 3b	--	--	--	--	--	--																																													
MIL-R-83248 (B)		<p>"High Temperature, Fluid and Compression Set Resistant, Fluorocarbon Elastomer Rubber".</p> <p>Type I - O-rings and compression seals</p> <p>Type II - Molded parts (other than sealing devices) sheets, strips and extruded shapes.</p> <p>Class 1 - 70-80 durometer</p> <p>Class 2 - 85-95 durometer</p>																																																	
MIL-R-83248/1		"Rubber, Fluorocarbon Elastomer, High Temperature, Fluid and Compression Set Resistant, O-Rings, Class 1, 75 Durometer".																																																	
MIL-R-83248/2		"Rubber, Fluorocarbon Elastomer, High Temperature, Fluid and Compression Set Resistant, O-Rings, Class 2, 90 Durometer".																																																	
MIL-R-82385		<p>"General Purpose Ethylene-Propylene Rubber".</p> <p>Class I - 60-70 durometer hardness</p> <p>Class II - 85-95 durometer hardness</p>																																																	
MIL-R-83322		"Nitrogen Tetroxide (N2O4) Resistant Carboxy-Nitroso Rubber".																																																	
MIL-R-83397		"Humidity Resistant Castable Polyurethane Rubber".																																																	
MIL-R-83412		<p>"Hydrazine Resistant Ethylene-Propylene Rubber".</p> <p>Type I - Seal Material</p> <p>Type II - Bladder and diaphragm material</p> <p>Type III - Valve seal material</p>																																																	
MIL-P-83461 (Q, B)		"Petroleum Hydraulic Fluid Resistant Preformed Packing Improved Performance at 275°F (136°C)".																																																	
MS 83461 (Q)		Standard O-ring sizes corresponding to AS 568. Material per MIL P-83461.																																																	
AMS-R-83485 (B) (MIL-P-83485) (Obsolete)	8703	"Fluorocarbon, Improved Performance at Low Temperature". <i>Superseded by AMS 3384 and AMS 7287</i>																																																	
MIL-P-87175 (Q)		"Petroleum Hydraulic Fluid Resistant Phosphonitrilic Fluoroelastomer Preformed Packing".																																																	



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MIL SPEC	PAI CPD	DESCRIPTION OF SPECIFICATION																																								
		Grade 70 65-75 durometer Grade 80 75-85 durometer																																								
A-A-55549 (MS 90064)	19511 19711	"Round Preformed Packing for use with Waveguide Flanges and Dummy Loads". Waveform guides - material is a 45-55 durometer silicone per AMS 3302 Dummy loads - material is a 65-75 durometer silicone per AMS 3304																																								
Note that the dash number must be referenced with the specification to determine the correct O-Ring.		<table border="0"> <thead> <tr> <th><u>Dash #</u></th> <th><u>PAI size</u></th> <th><u>Dash #</u></th> <th><u>PAI size</u></th> </tr> </thead> <tbody> <tr><td>-1</td><td>1-012</td><td>-10</td><td>1-013</td></tr> <tr><td>-2</td><td>60-575</td><td>-11</td><td>60-575</td></tr> <tr><td>-3</td><td>1-115</td><td>-12</td><td>1-213</td></tr> <tr><td>-4</td><td>1-212</td><td>-13</td><td>92-1.338</td></tr> <tr><td>-5</td><td>92-1.338</td><td>-14</td><td>92-1.550</td></tr> <tr><td>-6</td><td>92-1.550</td><td>-15</td><td>1-227</td></tr> <tr><td>-7</td><td>2-227</td><td>-16</td><td>115-2.683</td></tr> <tr><td>-8</td><td>115-2.683</td><td>-17</td><td>1-346</td></tr> <tr><td>-9</td><td>1-345</td><td></td><td></td></tr> </tbody> </table>	<u>Dash #</u>	<u>PAI size</u>	<u>Dash #</u>	<u>PAI size</u>	-1	1-012	-10	1-013	-2	60-575	-11	60-575	-3	1-115	-12	1-213	-4	1-212	-13	92-1.338	-5	92-1.338	-14	92-1.550	-6	92-1.550	-15	1-227	-7	2-227	-16	115-2.683	-8	115-2.683	-17	1-346	-9	1-345		
<u>Dash #</u>	<u>PAI size</u>	<u>Dash #</u>	<u>PAI size</u>																																							
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-8	115-2.683	-17	1-346																																							
-9	1-345																																									
MS 90065	19511	"Gaskets (Rectangular, for use with Waveguide Flanges)" Material unless otherwise specified is a silicone per MIL-R-5847 Class 2b, Grade 50.																																								
AN 123020		"Aluminum-Asbestos Annular Gaskets".																																								
AN 123851 thru (B) AN 123950	3774	One hundred standard size O-rings. Sizes correspond with AS 568 but numbers are different. Material is a 65-75 durometer nitrile per AMS 7274.																																								
AN 123951 thru (B) AN 124050	3720	One-hundred standard size O-rings. Sizes correspond with AS 568 but numbers are different. Material is a 65-75 durometer nitrile per AMS 7270.																																								

* Specification is for Fluid. See Chemical Compatibility Chart for recommended compound.



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