

MILITARY STANDARDIZATION HANDBOOK

RUBBER PRODUCTS: RECOMMENDED SHELF LIFE

TO ALL HOLDERS OF MIL-HDBK-695C

1. THE FOLLOWING PAGES OF MIL-HDBK-695C HAVE BEEN REVISED AND SUPERSEDE THE PAGES LISTED:

NEW PAGE	DATE	SUPERSEDED PAGE	DATE
5	14 November 1986	5	27 March 1985
6	27 March 1985	6	REPRINTED WITHOUT CHANGE
7	14 November 1986	7	27 March 1985
8	27 March 1985	8	REPRINTED WITHOUT CHANGE
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2. RETAIN THIS NOTICE AND INSERT BEFORE TABLE OF CONTENTS.

3. Holders of MIL-HDBK-695C will verify that page changes and additions indicated above have been entered. This notice page will be retained as a check sheet. This issuance, together with appended pages, is a separate publication. Each notice is to be retained by stocking points until the military handbook is completely revised or cancelled.

Custodians:

Army - MR
Navy - SH
Air Force - 99

Preparing activity:

Army - MR

(Project 9320-0501)

Review activities:

Army - GL, MI, ME, AR
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**TABLE I. Age resistance generally associated with products
 fabricated from various rubbers.**

Type of Rubber	Common or Trade Name	ASTM D1418 Abbreviation	ASTM D2000 Abbreviation	MIL-STD-417 Designation
Up to 20 Years				
Silicone	Silicone	Q	FE	TA
Fluorosilicone	Silastic LS	FVMQ	FK	TA
Polysulfide	Thiokol	T	BK	SA
Fluorocarbons	Fluorel, Viton	FKM	HK	-
Polyacrylate	Acrylic	ACM, ANM	DF, DH	TB
Fluorophosphonitrilic	¹ PNF, Eypel-F	FZ	-	TB
Perfluorocarbon	KALREZ	FFKM	-	-

5 to 10 Years

² Butadiene/ acrylonitrile	Nitrile, NBR	NBR	BF, BG, CH	SB
Chlorosulfonated polyethylene	Hypalon	CSM	CE	-
Isobutylene/ Isoprene	Butyl	IIR	AA, BA	RS
Polychloroprene	Neoprene	CR	BC, BE	SC
Polyether Urethane	Urethane	EU	BG	-
Polypropylene oxide	Propylene oxide	GPO	-	-
Ethylene/propylene diene	Ethylene propylene terpolymer	EPDM	BA, CA	-
Ethylene/propylene	Ethylene propylene copolymer	EPM	BA, CA	-
Epichlorohydrin homopolymer	Hydrin 100, Herclor H	CO	-	-
Epichlorohydrin ethylene oxide	Hydrin 200, Herclor C	ECO	-	-

3 to 5 Years

² Butadiene/ acrylonitrile	Nitrile, NBR	NBR	BF, BG, CH	SB
Butadiene/styrene	SBR	SBR	AA, BA	RS
Cis-polybutadiene	Butadiene	BR	AA	RN
Cis 1, 4, poly- isoprene	Natural, pale crepe	NR	AA	RN
Cis 1, 4, poly- isoprene	Synthetic natural	IR	AA	RN
³ polyester urethane	Urethane	AU	-	-

1. Common or Trade Name "PNF" no longer being produced.
2. See table II through VIII.
3. Some polyester urethanes have very poor resistance to water and humidity.

TABLE II. Military Specifications.

Number	Title	Elastomers ¹ Required	Elastomers ² Commonly Used	Expected Shelf Storage Life, Years
MIL-C-17	Cables, Radiofrequency; Coaxial, Dual Coaxial, Twin Conductor, & Twin Lead Core Dielectric: Types D, E and H Type J Type L Jacket: Type IV Type VI Type VIII	- IIR Q CR Q CR	- - - - - -	3 10 20 8 20 8
MIL-H-370	Hose and Hose Assemblies, Non- Metallic; Rubber Liquid Fuel, Non Collapsible Types I and 2	NBR (Tube) -	- NBR	3 3
MIL-W-432	Gasket Nonmetallic, Synthetic Rubber	-	-	
MIL-C-442	Cable, (Wire), Two Conductor, Parallel (Ripcord) Types IV, V and VI	SBR SBR	- -	3 3
MIL-L-741	Leads, Electrical, Arc Welding	SBR	-	3
MIL-O-836	Overshoe, Rubber (Man's, 5 Buckle Type) Type I and II	NR or SYN ³	-	3
MIL-C-882	Cloth, (Cotton Duck), Laminated, Synthe- tic Rubber Impregnated, Oil Resistant Class I Class II	CR NBR	- -	5 3
MIL-R-900	Rubber Gasket Material, 45 Durometer Hardness	-	SBR	3

NOTES:

¹If no elastomer is listed, none is required by the specification.

²If no elastomer is listed, the elastomer commonly used is unknown.

³SYN = synthetic (for other abbreviations see Table I).

TABLE II. Military specifications (cont'd).

Number	Title	Elastomers ¹ Required	Elastomers ² Commonly Used	Expected Shelf Storage Life, Years
MIL-M-910	Mats, Floor, Standing	-	-	3
MIL-C-915	Cable and Cord, Electrical for Shipboard Use, (Gen. Spec. for)			
	Type CVSF	SYN & CR	-	5
	Type DOPD	SYN & CR	-	5
	Type DHOF	IIR & CR	-	8
	Type DSS	SYN & CR	-	5
	Type DLT	NR & CR	-	5
	Type FSCF	IIR & CR	-	8
	Type FHOF	IIR & CR	-	8
	Type FSS	SYN & CR	-	5
	Type JAS	IIR & CR	-	8
	Type MCSC	SYN & CR	-	5
	Type MOOS	CR	-	8
	Type MSS	SYN & CR	-	5
	Type SDU	IIR & CR	-	8
	Type SSF	SYN & CR	-	5
	Type TOOP	SYN & CR	-	5
	Type THOF	IIR & CR	-	8
	Type TRF	SYN & CR	-	5
	Type TRXF	CR	-	8
	Type TSS	SYN & CR	-	5
MIL-G-1086	Gasket Material, Synthetic Rubber (For Bolted Steel & Aluminum Tanks)			
	Type I	-	CR	8
	Type II	-	NBR	3
MIL-G-1149	Gasket Material Synthetic Rubber, 50 and 65 Durometer Hardness			
	Class 1 - Types I & II	CR	-	8
	Class 2 - Types I & II	SBR	-	3
	Class 3 - Types I & II	IIR	-	10
	Class 5 - Types I & II	NBR	-	3
MIL-R-1229	Rubber Sheet Packing, Solid, Wire Cloth Inserted Symbol 2354		SBR	3

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TABLE II. Military specifications (cont'd).

Number	Title	Elastomers ¹ Required	Elastomers ² Commonly Used	Expected Shelf Storage Life, Years
MIL-R-1632	Rubber Band, Parachute Suspension Line Type I	NR	-	3
MIL-T-1956	Tarpaulin, Waterproof, Special Purpose, 10 Feet Long by 8 Feet Wide All Classes	-	-	3
MIL-H-2217	Hose Assemblies, Wire-Reinforced Rubber, Submarine Rescue Chamber	NR (Tube)	-	3
MIL-C-2486	Cable, Special Purpose, Electrical WM-46/U	SBR	-	3
MIL-P-2693	Packing Material, Cold Storage Door Gasketing, Nonwatertight Type A Type B	- - -	CR NR (core) NBR	8 2 3
MIL-R-2765	Rubber Sheet, Strip, Extruded, & Molded Shapes, Synthetic, Oil Resistant	-	-	3
MIL-H-2815	Hose Assemblies, Rubber, Diver's Breath- ing Air and Gas Supply	NR (Tube)	-	3
MIL-J-2829	Joint Sealing Packing Types I & II - Classes 1 & 2	-	CR	8
MIL-B-2885	Boots, Firemen's	NR or SYN	-	3
MIL-P-2911	Packing Assembly, Hydraulic, Conical & V Types	-	-	3
MIL-S-2912	Synthetic Rubber Compound, Acid & Oil Resistant (For Lining Battery compart- ments on Submarines) Class 1 - Types I & II Class 2 - Types I & II	CR NBR	- -	5 3
MIL-D-2921	Disks, Rubber (Cellular, Hard) Type A Type B - Class a Type B - Class b	Reclaim SBR NBR	- - -	3 3 3
MIL-G-3036	Grommets - Elastic, Hot-Oil & Coolant- Resistant	-	NBR	3
MIL-R-3065	Rubber, Fabricated Products (see MIL-STD-417)	-	NBR	3

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TABLE II. Military Specifications (cont'd).

Number	Title	Elastomers ¹ Required	Elastomers ² Commonly Used	Expected Shelf Storage Life Years
MIL-B-50015	Bulb, Aspirator	NR	-	3
MIL-F-50070	Faceblank, C17	NR	-	3
MIL-H-51059	Hose, Fuel, Flame Thrower, M8	NBR (Tube)	-	5
MIL-F-51109	Faceblank, Protective Mask C12R4	NR	-	3
MIL-H-52079	Hose, Preformed: Semi-Flexible, Reinforced	-	-	3
MIL-H-52262	Hose Assembly, Rubber, Lightweight, Collapsible, 4-inch	NBR (Tube) SYN (Cover)	-	3
MIL-C-52286	Cable & Assemblies, Power, Electrical (with Molded on Terminations)	-	-	
MIL-H-52471	Hose & Hose Assemblies, Rubber, Hydraul- ic Pressure Type (Gen. Spec. for)	NBR (Tube) CR (Cover)	-	3
MIL-H-52544	Hose Rubber, Oil Suction, Wire Reinforced	CR (Tube) NBR (Cover)	-	3
MIL-B-52761	Beltting, Flat: Conveyor, Rubber Industrial Synthetic Reinforcement:	NBR (Cover) CR (Tube) NBR (Cover) NR-SYN	-	3
MIL-C-55036	Cable, Telephone, WM-130 ()/G	CR (Jacket)	-	5
MIL-C-55040	Cable, Special Purpose, Electrical (Retractable)	-	-	5
MIL-C-55479 ³	Cable, Assembly CX-162 & CX-163	-	CR	8
MIL-C-55480	Cable, Telephone WC-534	-	CR	8
MIL-C-55483	Cable Power Electrical Flat Three Conductor	-	-	
MIL-T-62118	Tread, Rubber, Strip Form Stock For Retreading Pneumatic Tires	CR NR, IR, SBR, BR	-	8 3
MIL-T-62129	Tire, Pneumatic, For Truck, Logistical Type	-	-	3
MIL-W-62136	Wheel & Tire Assemblies, Foam Inflated Low Speed Highway & Off-Road	-	-	3
MIL-T-62157	Tire, Pneumatic, With Flap, 1400-20 Run Flat	-	-	3
MIL-R-81090 ³	Rubber, Electrically Conductive Fuel Resistant	-	NBR	3
MIL-H-81581	Hose Assembly, Breathing Oxygen & Air	Q	-	20
MIL-P-81716	Packing, Preformed, Straight Thread Tube Fitting Boss, Type II Hydraulic (Minus 65 F to Plus 275 F)	-	-	10

NOTES:

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²If no elastomer is listed, the elastomer commonly used is unknown.

³Cancelled, no replacement.

TABLE II. Military specifications (cont'd).

Number	Title	Elastomers ¹ Required	Elastomers ² Commonly Used	Expected Shelf Storage Life Years
MIL-R-81628	Rubber, Chlorosulfonated Polyethylene Elastomer, Sheet & Molded Shapes, Ozone Resistant	CSM	-	10
MIL-H-82127	Hose Assembly, Rubber (Synthetic): Fuel, Discharge, Collapsible	SYN	-	3
MIL-H-82142	Hood, Rain, Woman's: Nylon, Rubber Coated Green	NBR	-	3
MIL-R-82190	Raincoat, Woman's, Nylon, Rubber coated Green	NBR	-	3
MIL-G-82242	Glove Shells, Radioactive Contaminants, Protective	NR	-	3
MIL-C-82255	Cloth, Coated, Synthetic Rubber (Nitrile & Polychloroprene)	CR	-	5
	Types I, II, IV	NBR	-	3
	Type III	NR or IR	-	3
MIL-S-82258	Swim Fins, Rubber	CR	-	3
MIL-T-82270	Trousers, Wet Suit (Chloroprene Foam)	CR	-	3
MIL-M-82272	Mittens, Wet Suit (Chloroprene Foam)	CR	-	3
MIL-C-830083	Cloth, Coated, Cotton & Nylon, Polyurethane (Microporus) Coated	AU or EU	-	3
MIL-R-83248	Rubber, Fluorocarbon Elastomer; High Temperature Fluid & Compression Set Resistant	FKM	-	20
MIL-R-83285	Rubber, Ethylene-Propylene, General Purpose	EPDM	-	5
MIL-R-83322	Rubber, Carboxy-Nitroso; Nitrogen Tetroxide (N2O4) Resistant	SYN	-	5
MIL-R-83397	Rubber, Polyurethane, Castable, Humidity Resistant	AU or EU	-	3
MIL-C-83398	Cloth, Coated, Stretch, Polychloroprene Knitted Nylon	CR	-	5
MIL-R-83412	Rubber, Ethylene-propylene, Hydrazine Resistant	EPDM	-	5
MIL-P-83461	Packing, Preformed, Petroleum Hydraulic Fluid Resistant, Improved Performance at 275 F (135 C)	-	-	10

NOTES:

- 1 If no elastomer is listed, none is required by the specification.
- 2 If no elastomer is listed, the elastomer commonly used is unknown.
- 3 Cancelled, no replacement.

TABLE V. Aerospace Materials Specifications (cont'd).

Number	Title	Elastomers1 Required	Elastomers2 Commonly Used	Expected Shelf Storage Life Years
AMS 3248	Synthetic Rubber, Phosphate Ester Resistant Ethylene Propylene Type (55-65)	EPDM	-	8
AMS 3249	Synthetic Rubber, Hydrazine Base Fluid Resis- tant Ethylene Propylene Type (75-85)	EPDM	-	8
AMS 3260	Rubber, Ethylene-Propylene-Diene, EPDM Type	EPDM	-	8
AMS 3270	Chlopoprene Rubber Sheet, Cotton Fabric Rein- forced, Weather Resistant	CR	-	5
AMS 3273	Chlopoprene Rubber Sheet, Nylon Fabric Rein- forced, Weather Resistant	CR	-	5
AMS 3274	Nitrile Rubber Sheet, Nylon Fabric Rein- forced, Aromatic Fuel Resistant	NBR	-	3
AMS 3301	Silicone Rubber, General Purpose (35-45)	Q	-	20
AMS 3302	Silicone Rubber, General Purpose (45-55)	Q	-	20
AMS 3303	Silicone Rubber, General Purpose (55-65)	Q	-	20
AMS 3304	Silicone Rubber, General Purpose (65-75)	Q	-	20
AMS 3305	Silicone Rubber, General Purpose (75-85)	Q	-	20
AMS 3307	Silicone Rubber, Low Compression Set, Non- Oil Resistant (65-75)	Q	-	20
AMS 3315	Silicone Rubber Sheet, Glass Fabric Rein- forced, VMQ Type	Q	-	20
AMS 3320	Silicone Rubber Sheet, Glass Fabric Rein- forced, Heat & Weather Resistant (60-80)	Q	-	20
AMS 3325	Silicone Rubber, Fuel & Oil Resistant (55-65) FVMQ	FVMQ	-	20
AMS 3326	Silicone Rubber, Fuel & Oil Resistant (50-65) FVMQ	FVMQ	-	20
AMS 3327	Silicone Rubber, High Temperature Fuel & Oil Resistant (70-80)	FVMQ	-	20
AMS 3332	Silicone Rubber, Extreme Low Temperature Resistant (15-30)	Q	-	20
AMS 3334	Silicone Rubber, Extreme Low Temperature Resistant (35-45)	Q	-	20

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TABLE V. Aerospace Materials Specifications (cont'd).

Number	Title	Elastomers ¹ Required	Elastomers ² Commonly Used	Expected Shelf Storage Life Years
AMS 3335	Silicone Rubber, Extreme Low Temperature Resistant (45-55)	Q	-	20
AMS 3336	Silicone Rubber, Extreme Low Temperature	Q	-	20
AMS 3337	Silicone Rubber, High & Extreme Low Temperature Resistant (65-75)	Q	-	20
AMS 3338	Silicone Rubber, Extreme Low Temperature Resistant (75-85)	Q	-	20
AMS 3344 ³	Silicone Rubber - 1800 psi (45-55)	Q	-	20
AMS 3345	Silicone Rubber - 1000 psi (45-55)	Q	-	20
AMS 3346	Silicone Rubber - 1000 psi (55-65)	Q	-	20
AMS 3347	Silicone Rubber, 1200 psi, High Modulus (45-55)	Q	-	20
AMS 3348	Silicone Rubber, 1150 psi, High Resiliency	Q	-	20
AMS 3349	Silicone Rubber, 1100 psi, High Resilience (65-75)	Q	-	20
AMS 3356	Silicone Rubber, Lubricating Oil & Compression Set Resistant Electrical Grade (55-65)	Q	-	20
AMS 3357	Silicone Rubber, Lubricating Oil & Compression Set Resistant (65-75)	Q	-	20
AMS 3386	Hose, Synthetic Rubber, Aircraft Fueling, Textile Reinforced Collapsing	-	NBR	3
AMS 3387	Hose, Nitrile Rubber, Aircraft Fueling, Textile Reinforced, Chloroprene Covered Noncollapsing	NBR	-	3
AMS 3388	Hose, Synthetic Rubber, Aircraft Fueling, Single Wire Braid Reinforced, Noncollapsing	-	NBR	3
AMS 3389	Hose, Synthetic Rubber, Aircraft Fueling, Double Wire Braid Reinforced, Noncollapsing	-	NBR	3
AMS 3570	Foam, Flexible Polyurethane Open Cell, Medium Flexibility	AU, EU	-	3
AMS 7257	Rings, Sealing, Perfluorocarbon, Rubber, High-Temperature-Fluid Resistant (75-85)	FFKM	-	20
AMS 7259	Rings, Sealing, Fluorocarbon Rubber, High-Temperature-Fluid Resistant, Very Low Compression Set (85-95)	FKM	-	20

NOTE:

- 1 If no elastomer is listed, none is required by the specification.
- 2 If no elastomer is listed, the elastomer commonly used is unknown.
- 3 Standard inactive for design purposes.