MIL 25988A(USAF)
AMENDMENT 3
23 April 1981
SUPERSEDING
AMENDMENT 2
4 June 1975

MILITARY SPECIFICATION

RUBBER, FLUOROSILICONE ELASTOMER, OIL- AND FUEL-RESISTANT SHEETS, STRIPS, MOLDED PARTS, AND EXTRUDED SHAPES

This amendment forms a part of Military Specification MIL-R-25988A(USAF) dated 29 July 1969.

NOTE: The purpose of this amendment is to require that the fluorosilicone procured to this specification be colored blue in order to distinguish it from non-fluorinated silicone (See 3.3.4). Fluorosilicone procured to this specification with a cure date of January 1976 and beyond must be colored blue. This does not mean that red fluorosilicone with a cure date before January 1976 is unacceptable.

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Paragraph 1.2: Clarify Type I as follows: "Type I. O-rings (Available only in certain classes and grades)."

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Paragraph 2.1: Under "Specifications, Military", add:
"MIL-R-25988/1 Rubber, Fluorosilicone Elastomer, Oil- and Fuel-Resistant, O-rings, Class 1, Grade 70
MIL-R-25988/2 Same as above, except (O-rings, Class 3)
MIL-R-25988/3 Same as above, except (O-rings, Class 1, Grade 60)
MIL-R-25988/4 Same as above, except (O-rings, Class 1, Grade 80)"
Under "Standards, Military", Add:
"MIL-STD-831 Test Report, Preparation of"

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Paragraph 2.2: Delete "ARP 568".

After the ASTM Listings, add the following:

SOCIETY OF AUTOMOTIVE ENGINEERS (SAE)

ARP 568 Aerospace Recommended Practice - Uniform Dash Numbering System for O-rings

☆ U.S. GOVERNMENT PRINTING OFFICE: 1981—703-023/2414

FSC 5330

AMS 3021 Reference Fluid for Testing Di-Ester (Polyol) Resistant Material

(Application for copies should be addressed to the Society of Automotive Engineers, Inc., 400 Commonwealth Drive, Warrendale, PA 15096.)

Paragraph 3.3.1: Delete and substitute:
"3.3.1 Sheets and strips. Unless otherwise specified (see 6.2) sheets and strips shall be supplied in the lengths and widths and to the length and width tolerances specified in 3.3.1.1 and 3.3.1.2, and the tolerance on thickness shall be as shown in Table I. The dimensions and tolerances of shapes cut from sheet and strip shall be as specified on the detail drawings.

3.3.1.1 Sheets. The width of sheet material shall be 36 ± 1 inch and the length shall be 120 inches ± 1 percent.

3.3.1.2 Strips. The width of strip shall be 4 inches ± 5 percent and the length shall be 75 feet ± 1 foot.

Paragraph 3.3.2: Change "(including O-rings)" to "(excluding O-rings)" in two places.

Paragraph 3.3.3: Delete and substitute:
"3.3.3 O-rings. Dimensions and tolerances of O-rings shall be in accordance with the applicable Military Specification Sheet. Those are as follows:

a.	Class 1, Grade 60	MIL-R-25988/3 (USAF)
b.	Class 1, Grade 70	MIL-R-25988/1 (USAF)
c.	Class 1, Grade 80	MIL-R-25988/4 (USAF)
d.	Class 3	MIL-R-25988/2 (USAF) "

Table I: Delete and substitute;

TABLE I. Thickness tolerances of sheet and strip.

Nominal thickness (inch)	Tolerances (inch)
.031 and less	± .010
over .031 to .063 inclusive	± .012
over .063 to .125 inclusive	± .016
over .125 to .188 inclusive	± .020
over .188 to .375 inclusive	± .031
over .375 to .563 inclusive	± .047
over .563 to .750 inclusive	± .063
over .750 to 1.000 inclusive	± .093
over 1.000	± 10%

Add the following:

3.3.4 Color. Unless otherwise specified, material procured to this specification shall be blue. A pigment that can be used is Ferro Blue #3247, supplied by Ferro Corporation, 4150 East 56th St., Cleveland, Ohio or 5309 South District Blvd., Los Angeles, California. A formula of 1.5 parts of this pigment per 100.0 parts of fluorosilicone is suggested.

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Table II: Delete and substitute:

TABLE II. Physical properties.

Physical property	Class 1					Class 2	Class 3
	Grade 40	Grade 50	Grade 60	Grade 70	Grade 80	Grade 50	Grade 75
Original:							
Test strength psi, min							
Type I:	---	---	700	650	750	---	700
Type II:	800	900	900	850	750	1150	800
Ultimate elongation, %, min							
Type I:	---	---	150	100	70	---	90
Type II:	225	200	175	125	70	350	100

TABLE II. Physical properties. - Continued

Physical property	Class 1					Class 2	Class 3
	Grade 40	Grade 50	Grade 60	Grade 70	Grade 80	Grade 50	Grade 75
Tensile stress at 100% elongation, psi, min (class 3 only) Type II	NA	NA	NA	NA	NA	NA	NA
Hardness, Type A Durometer, points	40±5	50±5	60±5	70±5	80±5	50±5	75±5
Tear strength, die B, ppi, min Type II	40	40	40	40	40	150	40
Temperature retraction 10% (TR-10) °F, max	-70	-70	-70	-70	-70	-70	-70
Compression set: % of original Deflection after 70 hr. at 75° ±5°F, max Type I:							
Under 0.110 in	--	--	20	25	25	--	25
Over 0.110 in	--	--	15	20	20	--	20
Type II:	15	15	15	15	15	15	15
Air-aged 70 hr. at temperatures indicated	392 ±5°F	392 ±5°F	392 ±5°F	392 ±5°F	392 ±5°F	392 ±5°F	437 ±5°F
Tensile strength decrease, % max	30	25	25	20	20	30	35
Ultimate elongation decrease, % max	25	25	25	20	20	30	45
Hardness change, Type A Durometer, points, max	+10,-5	+10,-5	+10,-5	+10,-5	+10,-5	+10,-5	+10,-5
Weight loss,%, max	2	2	2	2	2	2	2

TABLE II. Physical properties. - Continued

Physical property	Class 1					Class 2	Class 3
	Grade 40	Grade 50	Grade 60	Grade 70	Grade 80	Grade 50	Grade 75
Air-aged 22 hr. at temperatures indicated:	347 ±5°F	347 ±5°F	347 ±5°F	347 ±5°F	347 ±5°F	347 ±5°F	347 ±5°F
Compression set: % of original deflection, max							
a. Standard reading:							
Type I:							
Under 0.110 in.	--	--	45	50	50	--	45
Over 0.110 in.	--	--	40	45	45	--	35
Type II:	25	35	40	40	45	40	35
Aged 70 hr. in AMS 3021 fluid at temperatures indicated:	302° ±5°F	302° ±5°F	302° ±5°F	302° ±5°F	302° ±5°F	302° ±5°F	347° ±5°F
Tensile strength decrease, %, max	45	45	45	35	30	40	30
Ultimate elongation decrease, % max	30	30	30	20	15	30	20
Hardness change, Type A Durometer, points, max	15	15	15	15	15	15	20
Volume change, %	1 to 15	1 to 15	1 to 15	1 to 15	1 to 15	1 to 15	1 to 15
Compression set: % of original deflection, max							
a. Standard reading:							
Type I:							
Under 0.110 in.	--	--	50	55	65	--	85
Over 0.110 in.	--	--	45	45	60	--	80
Type II:	35	35	45	45	60	45	80
b. 18 hr. cooling:							
Type I:							
Under 0.110 in.	--	--	60	60	75	--	85
Over 0.110 in.	--	--	55	55	70	--	80
Type II:	45	45	55	55	70	50	80

TABLE II. Physical properties. - Continued

Physical property	Class 1					Class 2	Class 3
	Grade 40	Grade 50	Grade 60	Grade 70	Grade 80	Grade 50	Grade 75
Aged 22 hr. in IT-S-735, type III, fluid at 75° +5°F:							
Tensile strength decrease, %, max	65	55	50	45	30	40	35
Ultimate elongation decrease, %, max	60	50	40	30	30	30	30
Hardness decrease, Type A Durometer, points, max	15	15	20	20	20	25	15
Volume change, %	1 to 30	1 to 25	1 to 25	1 to 25	1 to 25	1 to 25	1 to 25

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Paragraph 4.4.2: Add following the last sentence: "If the end item is an O-ring with an inside diameter of less than 0.5 inch, -214 size O-rings should be used for test samples."

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Paragraph 4.5.1, line 2: Delete "Stauffer Blend 7700" and substitute "AMS 3021".

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Paragraph 4.6.5: Delete "70 hours" and substitute "22 hours" in second line.

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Paragraph 4.6.6.1, line 3: Delete "Stauffer Blend 7700" and substitute "AMS 3021".

Add the following paragraph: "4.7 Packaging inspection - Sample packages and packs and the inspection of the packaging, packing and marking for shipment and storage shall be in accordance with the requirements of Section 5 and the documents specified therein or as otherwise specified in the control or order."

Section 5: Delete "Preparation for Delivery" and substitute the following:

"5. PACKAGING"

Paragraph 5.1: Delete and substitute the following:

"5.1 Preservation - packaging - Preservation - packaging shall be level A or C, as specified (See 6.2).

Paragraph 5.1.1.1, line 2: Delete "level A".

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Paragraph 5.2.1.1, line 2: Delete "level A".

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Paragraph 6.2.h: Delete and substitute "Applicable levels of preservation - packaging and packing (See 5.1 and 5.2).

Paragraph 6.3: Delete and substitute:

4.3.3 Preproduction test report. Preproduction tests are required for each type, class, and grade of material furnished to this specification. After the supplier completes the preproduction inspection he shall prepare a preproduction test report in accordance with MIL-STD-831. Three copies of this report shall be furnished to the procuring activity and one copy to AFWAL/MLSE, Wright-Patterson AFB, Ohio 45433. The preproduction test need not be repeated for new orders or different parts provided the materials and processes have not been changed and a certified statement to this effect is furnished to the procuring activity. The waiving of the preproduction tests will be strictly at the discretion of the procuring activity. Test results to previous revision of this specification are not acceptable. Preproduction tests will not be acceptable if they are more than 3 years old.

Paragraph 6.4: Delete in its entirety.

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