

**FLUOROELASTOMER (FKM), 70 – 75 IRHD HARDNESS****WSS-M2D440-B3****1. SCOPE**

The material defined by this specification is a fluoroelastomer (FKM) material with good resistance to fuels and oil.

2. APPLICATION

This specification was released originally for material used in an intake manifold gasket. The material has good resistance to automotive fuels including those that have become oxidized ("Sour") and to engine oil. The material is not recommended for use in contact with flexfuels and/or oxygenated fuels when good dimensional stability is required. The material will withstand temperatures up to 150 °C for extended periods.

3. REQUIREMENTS**3.1 APPROVED SOURCES**

This specification requires the use of approved sources. Only the sources identified on the Ford Approved Source List (ASL) can be used when this specification is listed on the drawing, CAD file, or other documents. The list of approved sources is located within Ford at www.mats.ford.com or available externally through a Ford Materials Engineer.

3.2 MATERIAL TESTING**3.2.1 Preparation of Test Specimens**

Whenever possible, all test specimens shall be die-cut from the finished parts. When not feasible, specimens cut from molded test sheets manufactured from the same material and with equivalent cure to molded parts are recommended. The test sheets shall have the following dimensions: 150 x 150 mm, min x 2.0 ± 0.2 mm

3.2.2 Conditioning and Test Conditions

All test values are based on material conditioned for not less than 24 h prior to testing in a controlled environment of 23 +/- 2 °C and 50 +/- 5% relative humidity. Testing of the material should occur in the conditioning environment or soon after removal.

3.3 ORIGINAL PROPERTIES

3.3.1	Hardness, International (ISO 48, Macro method)	68 - 78 IRHD
3.3.2	Tensile Strength at break (ISO 37, Type 2 Specimen at 500 mm/min)	6 MPa min
3.3.3	Elongation at Break (ISO 37, Type 2 Specimen at 500 mm/min)	160% min
3.3.4	Modulus at 100% Elongation (ISO 37, Type 2 Specimen at 500 mm/min)	2.5 - 7 MPa

Date	Action	Revisions	Rev.0
2017 02 04	Released		

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3.3.5	Compression Set (ISO 815, except 25% compression, Type B, as-molded or plied-up specimens, 70 h at 150 ± 2 °C)	20% max
3.3.6	Ozone Resistance (FLTM BP 101-01, Procedure A)	Rating 0 max
3.3.7	Low Temperature Brittleness (ISO 812, Type B specimen / ASTM D2137, Method A, after 3 minutes at -25 °C)	Non-brittle
3.4	HEAT AGED (ISO 188, 150 +/- 50 air changes/h, 1000 h at 150 ± 2 °C)	
3.4.1	Hardness Change	+6 IRHD max
3.4.2	Tensile Strength Change	-20% max
3.4.3	Elongation at Break Change	-40% max
3.5	HEAT AGED (ISO 188, 150 +/- 50 air changes/h, 168 h at 200 ± 2 °C)	
3.5.1	Hardness Change	+5 IRHD max
3.5.2	Tensile Strength Change	-20% max
3.5.3	Elongation at Break Change	-35% max
3.6	IMMERSION IN ASTM FUEL C (ISO 1817, 70 h at 23 ± 2 °C)	
3.6.1	Hardness Change	-10 IRHD max
3.6.2	Tensile Strength Change	-50% max
3.6.3	Elongation at Break Change	-50% max
3.6.4	Volume Change	0 to +15% max
3.7	IMMERSION IN ASTM FUEL C +15% METHANOL (ISO 1817, 70 h at 23 ± 2 °C)	
3.7.1	Hardness	50 IRHD min
3.7.2	Tensile Strength Change	-75% max
3.7.3	Elongation at Break Change	-90% max
3.7.4	Volume Change	0 to +35%
3.8	IMMERSION IN OXIDIZED FUEL (SOUR FUEL) (ISO 1817, 336 h at 60 ± 2 °C, PN 180, fuel according to FLTM AZ 105-01)	
3.8.1	Hardness	40 IRHD min
3.8.2	Tensile Strength Change	-90% max
3.8.3	Elongation at Break Change	-40% max