



FLUOROELASTOMER, OIL SEAL - VALVE STEM - HIGH HEAT - ABRASION RESISTANT

ESE-M2D53-A2

1. SCOPE

The material defined by this specification is an abrasion resistant, high heat and oil resistant fluoroelastomer.

2. APPLICATION

This specification was released originally for material used as valve stem oil seals in automotive engines.

3. REQUIREMENTS

3.0 STANDARD REQUIREMENTS FOR PRODUCTION MATERIALS

Material suppliers and part producers must conform to the Company's Standard Requirements For Production Materials (WSS-M99P1111-A).

3.1 SLAB STOCK

3.1.1 Original Properties

Hardness, Durometer "A" (ASTM D 2240)	65 - 75
Tensile Strength, min (ASTM D 412)	9.6 MPa
Elongation, min (ASTM D 412)	180%

3.1.2 Heat Aged (ASTM D 865, 70 h at 232 °C)

Hardness, Durometer Change, max	+5
Tensile Strength Change	-10 to +25%
Elongation Change, max	-20%

3.1.3 Immersion in ASTM #1 Oil (ASTM D 471, 168 h at 149 °C)

Hardness, Durometer Change	+/- 3
Tensile Strength Change	-10 to +18%
Elongation Change	-15 to +12%

Date	Action	Revisions
2004 06 29	Revised	Para 3.0 inserted; para 3.3, 3.5 & 4 deleted
1983 05 09		Tensile & Elongation Revised CE3M-RD863100-E
1982 10 14	Released	CE3M-RD863100-E59





	Volume Change	+/- 5%
3.1.4	Immersion in ASTM #3 Oil (ASTM D 471, 168 h at 149 °C)	
	Hardness, Durometer Change	-4 to 0
	Tensile Strength Change	-15 to +8%
	Elongation Change	-10 to +15%
	Volume Change	0 to +5%
3.1.5	Compression Set, max (ASTM D 395, Method "B", 70 h at 149 °C)	15%
3.1.6	Low Temperature Test	No cracks
	Test Method: Condition 25 x 51 mm samples prior to low temperature test per following four methods. After conditioning, place in cold chamber at -29 °C for 5 h prior to bending. While still in cold chamber bend sample 180 °C over itself.	
	. As received.	
	. After heat aging at 232 °C for 70 h.	
	. After immersion in ASTM #1 oil at 149 °C for 168 h.	
	. After immersion in ASTM #3 oil at 149 °C for 168 h.	

3.2 PARTS

3.2.1	Original Properties	
	Hardness, Micro (ISO 48 and ASTM D 1415)	65 - 75 IRHD
3.2.2	Air Aged (ASTM 865, 70 h at 232 °C)	
	Hardness Change	0 to +8
	180 ° Bend Test (Bend completely flat against itself)	No cracks
3.2.3	Immersion in ASTM Oil #1 (ASTM D 471, 168 h at 149 °C)	
	Hardness Change	+/- 5
	Volume Change	0 to +8%
	180 ° Bend Test	No cracks