



FLUOROELASTOMER

ESP-M2D294-A1
ESP-M2D294-A2

1. SCOPE

The material defined by these specifications is a high temperature and oil resistant fluoroelastomer.

2. APPLICATION

These specifications were released originally for material used as a ball shuttle valve in automatic transmissions, or as specified on engineering drawing.

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	Color	As specified on engineering drawing	
3.1.2	Original Properties	A1	A2
	Hardness, Durometer "A" (ASTM D 2240)	70 - 80	75 - 85
	Tensile Strength, min (ASTM D 412, Die "C")	7 MPa	
	Ultimate Elongation, min (ASTM D 412, Die "C")	150%	
3.1.3	Heat Aged (ASTM D 573, 168 h at 150 +/- 2 °C)		
	Hardness, Durometer "A" Change	+/- 4	
	Tensile Strength Change, max	-15%	
	Elongation Change, max	-35%	
3.1.4	Immersion in ASTM #1 Oil (ASTM D 471, 168 h at 150 +/- 2 °C)		
	Hardness, Durometer "A" Change	+/- 3	
	Tensile Strength Change, max	-20%	
	Elongation Change, max	-35%	
	Volume Change	+/- 3%	

Date	Action	Revisions
2004 07 15	Revised	Para 3.0 inserted; para 3.3, 3.4 & 4 deleted
1980 04 29	Released	PCR-IR-830931P

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- 3.1.5 Immersion in ASTM #3 Oil
(ASTM D 471, 168 h at 150 +/- 2 °C)

Hardness, Durometer "A" Change	-4 to +2
Tensile Strength Change, max	-25%
Elongation Change, max	-35%
Volume Change	0 to +7%

- 3.1.6 Immersion in Designated Automatic
Transmission Fluids
(ASTM D 471, 168 h at 150 +/- 2 °C) (See Note 1)

Hardness, Durometer "A" Change	+/- 4
Tensile Strength Change, max	-40%
Elongation Change, max	-60%
Volume Change	0 to +5%

- 3.1.7 Compression Set, max
(ASTM D 395, Method "B",
70 h at 150 +/- 2 °C)
- 40%

- 3.1.8 Cold Flexibility
(original material)
- No checks

Test Method

Condition five samples (ASTM D 412, Die "C") and a mandrel (25 mm in diameter) in a cold box at -30 +/- 1 °C. After 5 h the samples are to be bent around the mandrel within one second. The tests are to be carried out in the cold box.

3.2 MOLDED PART

- 3.2.1 Color
- As specified on
engineering drawing

- | 3.2.2 | Original Properties | A1 | A2 |
|-------|--------------------------------------|---------|---------|
| | Microhardness, IRHD
(ASTM D 1415) | 70 - 80 | 75 - 85 |

- 3.2.3 Heat Aged
(ASTM D 573, 168 h at 150 +/- 2 °C)

Hardness Change	+/- 4 IRHD
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- 3.2.4 Immersion in Designated
Automatic Transmission Fluids
(ASTM D 471, 168 h at 150 +/- 2 °C) (See Note 1)

Hardness Change	+/- 4 IRHD
Volume Change	0 to +5%