



## ETHYLENE/ACRYLIC (AEM) RUBBER, OIL AND ACIDIC AQUEOUS CONDENSATE RESISTANT, 70 HARDNESS

WSD-M2D447-A

### 1. SCOPE

The material defined by this specification is an ethylene/acrylic rubber with a nominal hardness of 70 IRHD. It is capable of continuous operation at temperatures up to 150 °C and withstanding peak temperatures up to 175 °C. The material remains serviceable at -40 °C.

### 2. APPLICATION

The material was released originally for use as grommets and static seals for emission control, vacuum and crankcase ventilation systems where good resistance to ozone and oil containing acidic aqueous condensate is required.

### 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).

#### 3.4 MATERIAL TESTING

The following tests shall be performed on finished parts and/or test specimens cut from them. The test specimens shall be die-cut from the finished parts and buffed or slit to the required thickness where necessary. When not feasible, specimens cut from molded test slabs manufactured from the same material with an equivalent state of cure shall be used. The test slabs shall have the following dimensions:

150 x 150 mm, min x 2.0 +/- 0.2 mm

#### 3.5 ORIGINAL PROPERTIES

|       |                                                                                                                                  |              |
|-------|----------------------------------------------------------------------------------------------------------------------------------|--------------|
| 3.5.1 | Hardness, International<br>(ISO 48/ASTM D 1415)                                                                                  | 65 - 75 IRHD |
| 3.5.2 | Hardness, Durometer A<br>(ISO 868/ASTM D 2240, instantaneous,<br>plied-up specimens. Hand held<br>durometers shall not be used.) | 65 - 75      |
| 3.5.3 | Tensile Strength, min<br>(ISO 37/ASTM D 412, Die C)                                                                              | 10.0 MPa     |
| 3.5.4 | Elongation at Break, min<br>(Test Method according to para 3.5.3)                                                                | 200%         |

| Date       | Action   | Revisions                                     |
|------------|----------|-----------------------------------------------|
| 2004 09 29 | Revised  | Inserted 3.0; Deleted 3.1, 3.2, 3.3, 3.11 & 4 |
| 1991 08 16 |          | Revised Para 3.10, updated C10156429          |
| 1991 01 03 | Released | C10112984                                     |



|       |                                                                                                                                |                |
|-------|--------------------------------------------------------------------------------------------------------------------------------|----------------|
| 3.5.5 | Modulus at 100% Elongation, min<br>(Test Method according to para 3.5.3)                                                       | 4.0 to 7.5 MPa |
| 3.5.6 | Tear Strength, min<br>(ISO 34, Method b, procedure (a)/<br>ASTM D 624, Die C)                                                  | 30 kN/m        |
| 3.5.7 | Brittleness Point, max<br>(ISO 812, Type B specimen/<br>ASTM D 2137, Method A)                                                 | -40 °C         |
| 3.5.8 | Ozone Resistance<br>(FLTM BP 101-01, Procedure A)                                                                              | Rating 0       |
| 3.5.9 | Compression Set, max<br>(ISO 815/ASTM D 395, Method B,<br>except 25% compression, plied-up<br>specimens, 70 h at 150 +/- 2 °C) | 50%            |

**3.6 HEAT AGED**

(ISO 188/ASTM D 573, 150 +/- 50 air  
changes/h, 1000 h at 150 +/- 2 °C)

|       |                                     |      |
|-------|-------------------------------------|------|
| 3.6.1 | Hardness, International Change, max | +15  |
| 3.6.2 | Tensile Strength Change, max        | -20% |
| 3.6.3 | Elongation at Break Change, max     | -50% |
| 3.6.4 | Visual Evaluation                   |      |

No surface tackiness or cracks when folded flat against itself.

**3.7 HEAT AGED**

(ISO 188/ASTM D 573, 150 +/- 50 air  
changes/h, 168 h at 175 +/- 2 °C)

|       |                                     |      |
|-------|-------------------------------------|------|
| 3.7.1 | Hardness, International Change, max | +15  |
| 3.7.2 | Tensile Strength Change, max        | -20% |
| 3.7.3 | Elongation at Break Change, max     | -50% |
| 3.7.4 | Visual Evaluation                   |      |

No surface tackiness or cracks when folded flat against itself.

**3.8 IMMERSION IN OIL No.1**

(ISO 1817/ASTM D 471, 168 h at 150 +/- 2 °C)

|       |                                |                |
|-------|--------------------------------|----------------|
| 3.8.1 | Hardness, International Change | -10 to +5 IRHD |
| 3.8.2 | Tensile Strength Change, max   | -40%           |