



TUBE, PVC/NITRILE (PVC/NBR) RUBBER- UN-REINFORCED, OXYGENATED FUEL RESISTANT

WSD-M96D20-A

1. SCOPE

The material defined by this specification is a long-life, un-reinforced rubber fuel tube.

2. APPLICATION

This specification was released originally for a tube used as a flexible connection between the fuel tank and body-mounted filler-neck. The material has good resistance to oxygenated fuels and ozone, and moderate resistance to oxidised (sour) fuel. It will withstand normal operating temperatures up to 80 °C and remains flexible at -40 °C when filled with fuel.

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).

3.5 The following tests where possible, shall be performed on finished tubes and/or test specimens cut from them in accordance with ASTM D 3183 (cutting knife procedure preferred). Greater variation in test values can be anticipated when evaluating materials that are thinner than recommended by an applicable Industry Standard/Test Method.

3.6 TUBE CONSTRUCTION

The tube shall consist of a smooth bore, fuel resistant rubber extruded and shaped if necessary, or injection molded to the requirements of the Engineering Drawing.

3.7 ORIGINAL PROPERTIES

3.7.1	Hardness, International (ISO 48, micro)	65 - 75
3.7.2	Tensile Strength, min (ISO 37, Type 1 Dumbell)	10.0 MPa
3.7.3	Elongation at Break, min (Test Method According to 3.7.2)	250%
3.7.4	Modulus at 100% Elongation, min (Test Method According to 3.7.2)	3.0 to 4.5 MPa
3.7.5	Compression Set, max (ISO 815, Sample A except 25% compression. Plied-up specimens)	50% (Or 65% Copper Crystallisation Test (3.15) is required.)

Date	Action	Revisions
2006 08 22	Revised	Inserted 3.0; Deleted 3.1, 3.2, 3.4, 3.19 & 4
1994 03 31	Revised	C10348585 Renumbered 3.8 – 3.13
1988 04 13	Released	SM/ER 3740 TC

**3.8 HEAT AGED**

(ISO 188, 150 +/- 50 air changes/h
1000 h at 80 +/- 2 °C)

3.8.1	Hardness, International, max	90
3.8.2	Tensile Strength, min	10.0 MPa
3.8.3	Elongation at Break, min	150%
3.8.4	Visual Evaluation	

No surface tackiness or cracks when folded flat against itself.

3.9 HEAT AGED

(ISO 188, 150 +/- 50 air changes/h
168 h at 100 +/- 2 °C)

3.9.1	Hardness, International, max	90
3.9.2	Tensile Strength, min	10 MPa
3.9.3	Elongation at Break, min	150%
3.9.4	Visual Evaluation	

No surface tackiness or cracks when folded flat against itself.

3.10 IMMERSION IN FUEL C

(ISO 1817, 70 h at 23 +/- 2 °C)

3.10.1	Hardness, International, min	45
3.10.2	Tensile strength, min	8 MPa
3.10.3	Elongation at Break, min	150%
3.10.4	Volume Change, max	+40%
3.10.5	Shrinkage After Drying, max	-20%

Method: After measuring the volume swell, the test samples shall be dried at 80 °C for 24 hr after which the volume change is again determined.

3.11 IMMERSION IN 85% FUEL C +15% METHANOL

(ISO 1817, 70 h at 23 +/- 2 °C)

3.11.1	Hardness, International, min	40
3.11.2	Tensile Strength, min	6 MPa
3.11.3	Elongation at break, min	150%
3.11.4	Volume Change, max	+50%

