



TUBING, SILICONE (VMQ), HIGH TEMPERATURE, HOT AIR RESISTANT

WSS-M2D486-A

1. SCOPE

The material defined by this specification is a long life, high temperature oil resistant, ozone resistant, moderate to low pressure silicone rubber hose with ability to service low temperature down to -40 °C.

2. APPLICATION

This specification was released originally for material used in connectors for the engine charge air and or Turbo Charged connections. The tubing is not recommended for engine coolant or engine oil.

The hose construction shall consist of silicone rubber coated on woven aramid (Nomex) cloth.

3. REQUIREMENTS

Material specification requirements are to be used for initial qualification of materials.

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 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 INFRARED SPECTROPHOTOMETRY AND/OR THERMAL ANALYSIS

IR spectra and thermograms from initial material approval shall constitute the reference standard and shall be kept on file at the designated material laboratory. The material supplier shall ensure that all future material supplied to the specification shall produce IR spectra and thermograms that correspond to the reference standard when tested under the same conditions.

3.4 SAMPLE SIZE

Refer to Table 1 for number of samples required for each test to establish conformance to specification limits

3.5 MATERIAL TESTING

3.5.1 Preparation of Test Specimens

Date	Action	Revisions	Rev 04
2017 06 27	Editorial	Corrected footer	A. Collins, NA
2016 07 05	Revised	See Summary of revision	D. Souza, SA
1996 06 13	Activated		T. Covert



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

3.6 ORIGINAL PROPERTIES

3.6.1	Density (ISO 1183, Method A/ASTM D 297)	1.11 - 1.35 g/cm ³
3.6.2	Hardness, Durometer A (ISO 868/ASTM D 2240)	40 - 55
3.6.3	Tensile Strength at Break (ISO 37/ASTM D 412, Die C, 500 mm/minute test speed)	6 MPa min
3.6.4	Elongation at Break (ISO 37/ASTM D 412, Die C, 500 mm/minute test speed)	200% min
3.6.5	Tensile Modulus at 100% Elongation (ISO 37/ASTM D 412, Die C, 500 mm/minute test speed)	0.86 MPa min
3.6.6	Tear Strength (ISO 34, Method B, procedure (a)/ ASTM D 624, Die B)	9 kN/m min
3.6.7	Low Temperature Brittleness (ISO 812, Type B specimen/ASTM D 2137, Method A) 9.3.2, non-brittle after 3 min at -55 °C	pass
3.6.8	Ozone Resistance (FLTM BP 101-01, Procedure A)	"0" Rating
3.6.9	Compression Set (ISO 815/ASTM D 395, Method B, except 25% compression, plied-up specimens, 22 h at 175 +/- 2 °C)	50% max

3.7 HEAT AGED

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

3.7.1	Hardness Change	+10
3.7.2	Tensile Strength Change	+30% max
3.7.3	Elongation Change	-40% max
3.7.4	Visual Evaluation	

No surface tackiness or cracks when folded flat against itself.