GM	WORLDWIDE ENGINEERING STANDARDS	Material Specification	GMW17504

Oil Resistant Ethylene Propylene Diene Terpolymer (EPDM) Elastomer for Molded Air Ducts

1 Scope

1.1 Material Description. This specification describes the requirements of a black Ethylene Propylene Diene Terpolymer (EPDM) with low to intermediate fuel and oil resistance for molded ducts in air intake systems. Temperature range is -30 °C to 125 °C continuous and 150 °C excursion.

1.2 Symbols. Not applicable.

1.3 Applicability. Typical applications include the following: Clean air ducts with Positive Crank Ventilation (PCV) ports.

1.4 Remarks. Materials supplied to this specification for molded air ducts must meet the requirements of GMW15143.

2 References

Note: Only the latest approved standards are applicable unless otherwise specified.

2.1 External Standards/Specifications.

ASTM D395	ASTM D1329	ISO 188	ISO 11357-2
ASTM D412	ASTM D2240	ISO 815	ISO 23529
ASTM D471	ASTM D7426-08	ISO 1431-1	
ASTM D624	ISO 34-1	ISO 1817	
ASTM D1149	ISO 37	ISO 7619-1	

2.2 GM Standards/Specifications.

GMW3059	GMW14270	GMW15143	GMW17245

3 Requirements

3.1 Requirements on Test Specimens. Tests shall be conducted using the latest issue of the test methods indicated. Suitable precautions should be taken to ensure that applicable safe limits are not exceeded when conducting test procedures, processes and/or handling the materials required by this specification.

3.2 Test Preparation and Evaluation Resources.

3.2.1 Calibration. The test facilities and equipment shall be in good working order and shall have a valid calibration label.

3.2.2 Test Samples. Unless otherwise specified, the shape, size and number of test pieces shall be in accordance with the relevant test procedure. For Design and Product Validation, test pieces for material test shall be cut from at least three (3) finished parts, for routine quality control from at least one (1) finished part.

3.2.2.1 Samples are finished parts or to be taken from finished parts. Where the dimensions on the finished parts do not allow preparing of test pieces, tests are to be performed on sheet material of same production batch. The same state of cure between slabs or buttons and finished parts must be ensured by appropriate tests, which must be described in the test report.

3.2.2.2 If not otherwise stated, mechanical properties in delivery state and after heat or fluid immersion, are to be tested at 23 °C ± 5 °C and with the same test procedures. Unless otherwise stated, ambient temperature test conditions shall be held to 23 °C ± 5 °C. Unless otherwise stated, all other temperatures except 23 °C ± 5 °C shall be held to ± 3 °C.

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3.2.2.3 Conditioning. Conditioning shall be as specified in the relevant test procedure. The minimum time between vulcanization and testing of elastomers shall be 72 h.

3.2.3 Equipment. Conforming to the relevant test procedure.

3.2.4. Facilities. Conforming to the relevant test procedure.

3.2.5 Alternatives. Alternative test facilities and equipment may also be used. All measuring variables as specified in this specification shall be determined correctly with respect to its physical definition.

3.2.6 Test Required Documentation. Samples of components or material released to this standard shall be tested for conformity with the requirements of this standard and approved by the responsible GM department prior to the start of delivery of production level components or materials.

Any change to the component or material, e.g., design, function, properties, manufacturing process and/or location of manufacturer, requires a new release of the product. It is the sole responsibility of the supplier to provide the customer, unsolicited, with documentation of any change or modification to the product/process, and to apply for a new release.

If not otherwise agreed to, the entire verification test shall be repeated and documented by the supplier prior to start of delivery of the modified or changed product. In some cases, a shorter test can be agreed to between the responsible GM department and the supplier.

3.2.7 Test Results. With reference to this standard, the test results shall be presented in a test report.

3.2.8 Deviations from this Standard. Deviations from the requirements of this standard shall have been agreed upon. Such requirements shall be specified on component drawings, test certificates, reports, etc.

3.3 All materials supplied to this standard must comply with GMW3059, **Restricted and Reportable Substances**, including the requirement to obtain a GM-approved International Material Data System (IMDS) submission.

3.3.1 Design or Product Validation Testing. Material and performance properties are summarized in Table 1. For full approval of a hose, compliance to the requirements of Table 1 is needed. Three (3) samples of material shall be tested to each of the requirements for Design or Product Validation Testing.

3.3.2 Audit/Inspection Testing. If not defined otherwise, the following testing shall be done for production audit testing. Three (3) samples of material shall be tested to each of the requirements for Audit/Inspection Testing.

All tests shall be completed per Table 1, except Long Term Aging Resistance, Ozone Resistance, and Cold Tests.

Table 1: Material Properties for Elastomeric Parts

Property	Test Procedure	Unit	Value
Hardness			
	ISO 7619-1 or ASTM D2240	Shore A	70 ± 5
Elongation at Break			
	ISO 37, Type 4 dumbbell, 200 mm/minute ± 20 mm/minute or ASTM D412, Die C	%	200 minimum
Tensile Strength			
	ISO 37, Type 4 dumbbell, 200 mm/minute ± 20 mm/minute or ASTM D412, Die C	MPa	8.0 minimum
Tensile Modulus 100%			
	ISO 37, Type 4 dumbbell, 200 mm/minute ± 20 mm/minute or ASTM D412, Die C	MPa	4.0 minimum
Tear Strength			
	ASTM D624, Die Cor ISO 34-1, Method A	kN/m N/mm	15 minimum 2 minimum

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