



Synchronous Belts for Oil Applications

1 Introduction

Note: Nothing in this standard supercedes applicable laws and regulations.

Note: In the event of conflict between the English and domestic language, the English language shall take precedence.

1.1 Purpose. This standard describes the material and construction requirements for synchronous belts (timing belts) that run inside the engine housing with permanent oil contact used in automotive engine applications. Specification covers as well double sided timing belts.

1.1.1 Material Description. Belt consist of Hydrogenated Nitrile Rubber (HNBR) with glass fiber tension members and fabric layer of polyamides on tooth side and if required a PTFE coating. Timing belt can have a fabric on the back side.

1.2 Applicability. For all Synchronous belts inside the engine housing.

1.3 Remarks. Not applicable.

2 References

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

2.1 External Standards/Specifications.

ASTM D1415	ISO 48	ISO 188	ISO 1817
ISO 11357-2	ISO 11358	ISO 12046	

2.2 GM Standards/Specifications.

B 044 0064	GMW3059	GMW16955
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3 Test Preparation and Evaluation

3.1 Resources.

3.1.1 Facilities. Conforming to the relevant test procedure and to the test sketches on the part drawings.

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

3.1.1.2 Alternatives. Alternative test facilities and equipment may also be used. However, all measuring variables as specified in this standard shall be determined correctly with respect to their physical definition.

3.1.2 Equipment. Conforming to the relevant test procedure and to the test sketches on the part drawings.

3.1.5 Test Vehicle/Test Piece. Unless otherwise specified, the shape, size and number of test pieces shall be in accordance with the relevant test procedures.

Samples are finished parts or sections from finished parts.

If not otherwise stated, mechanical properties in delivery state and after or oil heat immersion shall be tested at $(+23 \pm 5) ^\circ\text{C}$ and with the same test methods. Unless otherwise stated, ambient temperature test conditions shall be held to $(+23 \pm 5) ^\circ\text{C}$. Unless otherwise stated, all other temperatures except $(+23 \pm 5) ^\circ\text{C}$ shall be held to $\pm 3 ^\circ\text{C}$.

3.1.1.1 A minimum of three (3) test samples are required for initial sample testing. A minimum two (2) test samples are required for inspection testing.

3.1.1.2 For Design and Product Validation, test pieces shall be cut from at least three (3) finished parts; for routine quality control from at least one (1) finished part.

3.1.4 Test Time. Not applicable.

3.1.5 Test Required Information. As specified in the relevant Test Methods.

3.1.6 Personnel/Skills. As specified in the relevant Test Methods.

3.2 Preparation. As specified in the relevant Test Methods.

3.3 Conditions. The minimum time between manufacturing and testing shall be 72 h. The test pieces shall be maintained at a temperature of $(+23 \pm 5) ^\circ\text{C}$ for at least 8 h prior to test and shall be free from strain during this period.

3.3.1 Environmental Conditions. Conditioning shall be as specified in the relevant Test Methods.

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

3.4 Instructions. Not applicable.

3.5 Data. Not applicable.

3.6 Safety. This standard may involve hazardous materials, operations, and equipment. This standard does not propose to address all the safety problems associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

3.7 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 manufacture 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.

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

4 Requirements and Procedure

4.1 General. The minimum time between vulcanization / coating and testing of elastomers shall be 72 h.

4.2 Material and Performance Requirements. Material and performance requirements are summarized in Table 1. Table 1 uses International Rubber Hardness Degrees (IRHD) as a unit of measure.

4.3 Design Validation Testing. Material properties (material approval) are summarized in Table 1. For full approval of a construction compliance to the requirements of Table 1 is needed.

4.4 Product Validation Testing. If not defined otherwise, the following testing should be done for production audit testing: Tooth Sheering Strength, Tensile Strength Test, Tension Cord Adhesion, Fabric Adhesion.

4.5 Audit/Inspection Testing. If not defined otherwise, the following testing should be done for production audit testing: Tooth Sheering Strength, Tensile Strength Test, Tension Cord Adhesion, Fabric Adhesion.