GM	WORLDWIDE ENGINEERING STANDARDS	Test Procedure	GMW14739

Determination of the Tensile Strength and Elongation to Failure of Elastomeric Components

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. The determination of the tensile strength and elongation to failure shown by elastomeric components used in vehicles when strained at a constant velocity within the temperature range-30 °C to +150 °C.

1.1.1 Objectives. The determination of the tensile force and deformation to failure. These values are dependent upon the elastomer properties.

1.2 Applicability. All elastomeric components.

2 References

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

2.1 External Standards/Specifications.

DIN 862	DIN 51220	ISO 7500-2	ISO 7500-4
DIN 878	ISO 7500-1	ISO 7500-3	ISO 7500-5

2.2 GM Standards/Specifications.

None

3 Resources

3.1 Facilities.

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

3.1.2 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.

3.2 Equipment.

3.2.1 Test Equipment.

3.2.1.1 A universal testing machine, capable of stressing elastomeric components to a force of 50 kN maximum at a constant velocity deviation of ± 10% maximum, hereafter referred to as **the testing machine**. The testing machine shall comply with DIN 51220 and ISO 7500-1, ISO 7500-2, ISO 7500-3, ISO 7500-4, ISO 7500-5 and also comply with the following requirements in Table 1.

Table 1: Accuracy of Testing Machine

The force measuring equipment:	± 1.5% of the measured value
Displacement measuring equipment:	± 0.05 mm

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3.2.1.2 Environmental Chamber for Use on the Testing Machine. The environmental chamber shall be of the air-circulating type, and comply with the following requirements in Table 2.

Table 2: Requirements for Test Chamber

Temperature range:	- 30 °C to +150 °C continuously adjustable
Temperature variation:	± 2 °C
Temperature change rate:	≥ 1.5 °C/minute for empty cabinet (recommended)

3.2.1.3 Preconditioning Chamber for Test Samples. The preconditioning chamber shall be of the air-circulating type and comply with the following requirements in Table 3.

Table 3: Requirements for Preconditioning Chamber

Temperature range:	-30 °C to +150 °C continuously adjustable
Temperature variation:	± 2 °C
Temperature change rate:	≥ 1.5 °C/minute for empty cabinet (recommended)

3.2.1.4 Suitable fixtures for locating and attaching the elastomeric components to the testing machine.

3.2.1.5 Timer with a recording range of 168 h and a reading accuracy of 1 minute.

3.2.1.6 Dimensional Measuring Equipment.

3.2.1.6.1 Dimensional change measuring equipment, e.g., a linear dial gauge to DIN 878, with a range of 10 mm an accuracy of ± 0.01 mm, and exerting a relatively constant force of ≤ 2 N over its range of travel.

3.2.1.6.2 Dimensional measuring equipment, e.g., gauge blacks to DIN 862.

3.2.1.6.3 Dimensional measuring equipment, e.g., precision height vernier accurate to 0.1 mm, height 500 mm maximum.

3.2.1.7 Inspection of Test Equipment. The test equipment shall be calibrated at intervals not exceeding one (1) year, and certification retained.

3.3 Test Vehicle/Test Piece.

3.3.1 Test Material.

3.3.1.1 Test Sample Form. The test samples shall be elastomeric components, as assembled into the vehicle.

3.3.1.2 Test Sample Quantity. Three (3) test samples minimum shall be tested.

3.4 Test Time. Per Section 4.

3.5 Test Required Information. Not applicable.

3.6 Personnel/Skills. Author: Conform to company and/or laboratory requirements. Technician training records must be available upon request.

4 Procedure

4.1 Preparation.

4.1.1 Test Sample Preparation. For initial sample approval and arbitration purposes, the time period between vulcanization and testing shall be 7 days minimum.

4.1.1.1 For quality control purposes the period shall be 72 h minimum. The test samples shall remain at a temperature of +23 °C ± 5 °C for 8 h minimum before testing, and shall be free from strain during this period.

4.2 Conditions.

4.2.1 Environmental Conditions. Not applicable.

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