



Fabric Abrasion Test for Body Weatherstrips

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 procedure to test and evaluate the resistance to wear/scuff of a coated weatherstrip.

1.2 Applicability. This standard is applicable to body weatherstrips.

2 References

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

2.1 External Standards/Specifications.

ISO 12947-1

2.2 GM Standards/Specifications.

GMW14125

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 Wear Test Machine/Fixture. Wear test machine capable of 50 cycles/minute to 60 cycles/minute (**see Note**), stroke length 80 mm to 100 mm, and cycle counting device (e.g., APG1000 with various test heads supplied by Maag Flockmaschinen GmbH or equivalent equipment to GMW14125 with suitable fixtures). See Appendix A, Figure A1.

Note: A cycle is defined as one forward and one backward stroke. Test speed of 50 cycles/minute identifies the speed, where the fifty (50) forward movements and fifty (50) backward movements (in total 100 strokes) occur within 1 minute.

3.2.2 Test Fabric. Martindale Wool Abradant Fabric to ISO 12947-1 shall be obtained from Sächsisches Textil Forschungs Institut e.V., D-09125 Chemnitz, designation MD100, (www.stfi.de/dienstleistungen/bestellung-von-hilfsmitteln-und-geraeten.html). Length of fabric shall be 500 mm and width as specified in Table 1; if no code is specified, Code 1 shall be used. A new fabric sample must be used for each test. Alternatively, a longer piece of fabric with 50 mm width can be cut and a fresh section for each test must be used.

Table 1: Coding for Test Fabric Width

Coding	Width of test fabric
1	50 mm (default)
2	60 mm
3	See drawing

3.2.3 Test Weight. One (1) 1000 g weight.

3.2.4 Test Piece Support: Metal flange 150 mm minimum in length, with production representative thickness.

3.3 Test Vehicle/Test Piece. Three (3) weatherstrip sections approximately 150 mm in length; cut from finished weatherstrips.

3.4 Test Time. Reference the lab test procedure(s) in Section 4 for timing details.

3.5 Test Required Information. Not applicable.

3.6 Personnel/Skills. Per laboratory accreditation requirements.

4 Procedure

4.1 Preparation. Not applicable.

4.2 Conditions.

4.2.1 Environmental Conditions. The minimum time between manufacturing and testing shall be 72 h. The test pieces shall be maintained at a temperature of $+23^{\circ}\text{C} \pm 5^{\circ}\text{C}$ and $50\% \pm 5\%$ relative humidity for at least 24 h prior to test, and shall be free from strain during this period.

4.2.2 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.

4.3 Instructions.

4.3.1 Cut test fabric along the thread. To achieve a test fabric with persistent longitudinal strands over the complete length, it may be necessary to prepare a wider strip and remove lateral strands until specified width is achieved. Install the wear fabric securely onto the test fixture. Fabric shall be free of wrinkles, folds, or tears.

4.3.2 If the weatherstrip specimen has a tear strip (pull cord), remove it prior to testing.

4.3.3 Mount the weatherstrip sample securely on the test fixture, perpendicular to the fabric. Position the sealing bulb away from the test machine as shown on respective part drawing including angle of test fixture (see Table 2). Ensure that the weatherstrip sample does not move or rock on the fixture. Drape the fabric over the seal, with the residual length of fabric hanging loosely over the seal. Securely attach the 1000 g weight to the end of the fabric. The angle between the weatherstrip specimen and the abrasion fabric shall be as specified in Table 3. (See set-up example in Appendix A, Figure A2). An angle of 45 degrees may be agreed to; e.g., when the bulb is deformed too much at 90 degrees and/or the bulb moves during the test, (test setup for 90 degree angle, see Figure A3 in Appendix A; alternate test setup, see Figure A4 in Appendix A).

Table 2: Coding for Angle of Test Fixture

Coding	Angle of Test Fixture
A	90 degrees (default)
B	45 degrees
C	0 degrees
D	See drawing

Table 3 Coding for Angle between Weatherstrip Specimen and Abrasion Fabric

Coding	Deflection
1	90 degrees(default)
2	45 degrees
3	See drawing

4.3.4 Set the machine to run at 1000 cycle intervals; inspect sample for abrasion after each interval of 1000 cycles. Repeat this process until the required number of cycles (as defined in Table 1) is complete or coating wear through occurs. One (1) cycle is one (1) to-and-fro movement.

Table 4: Coding for Test Cycles

Coding	Number of Cycles
A	2500
B	5000 (default)
C	10 000
D	See part drawing

4.3.5 Repeat 4.3.1 through 4.3.4 for each remaining weatherstrip specimen.

5 Data

5.1 Calculations. Not applicable.

5.2 Interpretation of Results. Due to edge effect of the fabric, only rate the inner 30 mm of the weatherstrip test piece. The substrate must not be damaged. Slight running tracks are permissible. See Appendix A, Figure A5 and Figure A6.

Table 5: Abrasion Rating

Abrasion Grade	Appearance	Evaluation
0	Only change in appearance	OK
1	Slight wear of coating, not exposing rubber substrate	OK
2	Wear at fabric edges only	OK
3	Wear of coating away from the edges of the test fabric	NOK
4	Coating completely worn, substrate exposed	NOK

Note: OK = Okay, NOK = Not Okay

5.3 Test Documentation. With reference to this test procedure, the results shall be represented in a test report. The test report shall include the following:

- Complete identification of the specimen.
- Conditioning of the test specimen.
- Test conditions.
- Any deviations to the test procedure.
- Observations of the condition of each tested area.