



Hook Fastener Resistance

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 procedure determines the resistance of interior materials to hook fastener abrasion. Hook fasteners on customers' clothing or consumer goods such as luggage, if left open, have small hooks or barbs that may damage the surface of interior materials through contact and movement such as ingress/egress.

1.2 Applicability. This procedure is applicable to interior materials.

1.3 Remarks. None.

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.

GMW3221

2.3 Additional References.

- Testfabrics, Incorporated, West Pittston, Pennsylvania, www.testfabrics.com.

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 Martindale Abrasion Wear Tester (e.g., Nu-Martindale 864 or Model 1609 MAXI-MARTINDALE) according to ISO 12947-1.

3.3 Test Vehicle/Test Piece.

3.3.1 Aplix Number 800 Hook, Black, 50 mm, Plain Backing, Part Number: A800R0050H008. Available from: Testfabrics, Incorporated, located in West Pittston, Pennsylvania, www.testfabrics.com. The lot number of the Hook material shall be provided to the approving GM Materials Engineer.

3.3.2 Woven wool felt pads with a diameter of 140 mm and a tolerance of +5.0 mm. The wool felt pads shall be certified in accordance with ISO 12947-1.

3.3.3 Foam pads made from polyurethane with a diameter of 38 mm and a tolerance of +5 mm. Store the foam in a dark area and maintain a temperature of 23 °C ± 5 °C.

3.4 Test Time.

Calendar time: 1 d

Test time: 1 h

Coordination time: 1 h

3.5 Test Required Information. Not applicable.

3.6 Personnel/Skills. Personnel trained in accordance with the laboratory accreditation and Standard Operating Procedure requirements.

4 Procedure

Specimens cut from the sample must be mounted on an abrading table over a wool felt pad and tightly retained by a ring. A hook type fastener material is mounted over a foam pad tightly retained by a ring. The specimen is exposed to a specified number of rubs (Lissajous Figure (60.5 mm stroke)) when in contact with the hook type fastening material. After the prescribed number of rubs the material must be evaluated for damage from abrasion. When rating specimens, observe the damage at the worst viewing angle to display the damage.

4.1 Preparation. Prior to testing, condition all test specimens for a minimum of 24 h to the requirements of GMW3221, Code A. Cut all test specimens to 140 mm in diameter with a tolerance of +0.5 mm.

4.2 Conditions.

4.2.1 Environmental Conditions. Not applicable.

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 Mount specimen over a woven wool felt pad, placing a weight on the center of the specimen to ensure it lays flat. Center the specimen and tightly clamp with the retaining ring.

4.3.2 Mount hook fastener material in holder over a foam pad. Center the hook fastener material and tighten by hand. Check that the hook fastener material does not have surface creases which would prevent uniform contact with the sample material. Never compress hook fastener material when installing it in the holder. Pressure on the hook material can flatten the barbs. Damage to the hook fastener material from compression may affect the consistency of the test results.

4.3.3 Ensure that the Martindale Abrasion Tester is configured to run the abrasion test. All drive rollers shall be set to allow a Lissajous Figure to be produced during testing.

4.3.4 Slowly lower the top plate over the sample. Insert the spindle through the top plate and into the hook fastener holder prepared in procedure 4.3.2.

4.3.5 Attach standard 12 kPa weight to the spindle.

4.3.6 Set the machine to complete the desired number of cycles and run the test continuously.

4.3.7 As samples may show relaxation over time, samples shall be evaluated within 10 minutes of test completion.

4.3.8 It is recommended to only perform this test using one station on the Martindale. An attempt to use multiple stations may overload the equipment and it will not operate.

4.3.9 The hook fastening material may become clogged with fibers and should be replaced after each test.

4.3.10 Ensure there is no contact between the sample holder, spindle guide, or weights. Examples of possible equipment modifications are shown in Appendix A, Figure A1 thru Figure A6.

5 Data

5.1 Calculations.

5.1.1 The rating scale in Table 1 is a general rating scale for any material that may be tested for hook fastener material resistance. See applicable material specification to determine if there is a more specific rating scale. Unless otherwise specified, the rating scale in the material specification shall be used to evaluate wear.

5.2 Interpretation of Results. Not applicable.

5.3 Test Documentation. Compare the tested specimen to the rating scale (see Table 1) with the aid of the photographic standards (Appendix B, Figure B1). Report the appropriate rating.

5.3.1 Intermediate ratings are allowed. For example, if the test specimen results are between a rating of "10" and "8", a rating of "9" may be specified.

Table 1: Rating Scale

Rating	Change
10	No change.
8	Slight change. Slight filament damage (slightly fuzzy), only detectable upon close visual examination.
6	Moderate change. Noticeable change from original. Filament damage and pulled out fibers.
4	Significant change. Objectionable change (very fuzzy).
2	Highly objectionable change. Bearding, change of design intent, etc.
1	Severe change. Destructive abrasion that wears through the surface.

6 Safety

This Engineering Standard may involve safety requirements for hazardous materials, the method of operations and equipment. This standard does not propose to address all the safety issues associated with its use. It is the responsibility of the user of this standard to ensure compliance with all appropriate safety and health practices. This would include any specific training that may be required. The safety and health standards include site specific rules and procedures, company rules and procedures, and Government Standards. Contact shall be made with the appropriate site Safety and Health personnel for further direction and guidance in these matters.

7 Notes

7.1 Glossary. Not applicable.

7.2 Acronyms, Abbreviations, and Symbols.

GSSLT Global Subsystem Leadership Team

8 Coding System

This standard shall be referenced in other documents, drawings, etc., as follows:

Test to GMW15651

9 Release and Revisions

This standard was originated in July 2007. It was first approved by Textiles Global Subsystem Leadership Team (GSSLT) in February 2009. It was first published in February 2009.

Issue	Publication Date	Description (Organization)
1	FEB 2009	Initial publication.
2	AUG 2014	Revised to current template. (Materials-Textile GSSLT)
3	SEP 2019	Five year refresh. (Materials Textiles/Trim Global Subsystem Leadership Team (GSSLT))