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| GM | WORLDWIDE ENGINEERING STANDARDS | Test Procedure | GMW4659 |

# Compatibility of Polyurethane Foam with Soft Trim Materials

## 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 is used to determine the effect of staining, or discoloration, on soft trim materials when in close, or intimate contact, with polyurethane foam.

**1.2 Applicability.** Soft trim materials, such as leather, vinyl, cloth, or other upholstery materials, with application dependent backing or support polyurethane materials, including: soft trim laminations for seating and headliners, seat cushions, backs, head restrains, armrest, back-foamed door and instrument panels; etc.

## 2 References

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

**2.1 External Standards/Specifications.**

ISO 105-A02

**2.2 GM Standards/Specifications.**

GMW3414

**2.3 Additional References.**

Testfabrics, Incorporated - 415 Delaware Avenue, PO Box No. 26, West Pittston, PA 18643, (570) 603-0432, email: info@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 Xenon-Arc Weathering Device.** Accelerated weathering equipment per GMW3414 for artificial accelerated weathering (laboratory test).

**3.2.2 Color Spectrophotometer.**

**3.3 Test Vehicle/Test Piece.** Test specimen size of components shall be as follows:

- **Vinyl**: 70 mm ± 5 mm × 150 mm ± 10 mm.
- **Leathe**r: 70 mm ± 5 mm × 150 mm ± 10 mm.
- **Foam:** (Unattached to trim): 67 mm ± 5 mm × 140 mm ± 10 mm × thickness: 27 mm ± 2 mm.

**3.3.1** Six (6) test specimens shall be prepared for each textile direction (warp/wales and weft/courses).

**3.3.2 Non-Woven Material.** GM White Unembossed and Unsupported Vinyl shall be used: Item No. 0705004, available from Testfabrics.

**3.3.3** White Automotive Leather shall be used: Item No. 0702013, available from Testfabrics.

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**3.3.4 Polyurethane Foam Material**. Production intent foam material shall be used. The foam material shall have a thickness of 27 mm ± 2 mm, and shall be less than four (4) weeks old since its date of manufacture.

**3.4 Test Time.** See 4.2.

**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

**4.1 Preparation.**

**4.1.1 Summary of Test Method**. A soft trim material, combined with production intent backing in a test pack, is carried out to artificial weathering conditions and inspected afterwards with regards to changes to the surfaces and the breaking force of the soft-trim (upholstery) material.

**4.1.2 Test Sample Preparation**.

**4.1.2.1** Prior to artificial weathering conditioning, measure the color of the Soft Trim samples using the spectrophotometer and record the original CIELAB L*a*b* data.

**4.1.2.2 Test Pack**. Figure 1. The foam piece is then placed onto the center of the back of the soft trim test specimen. Fold the ends of the test specimen over one another along the center Fold Line. Use stitches or staples to hold the material ends together and the foam in place during testing. Prepare test pack insuring intimate contact between the soft trim and the foam. If the foam is already laminated to the soft trim, fold in same manner – with foam in the center of the sandwich.

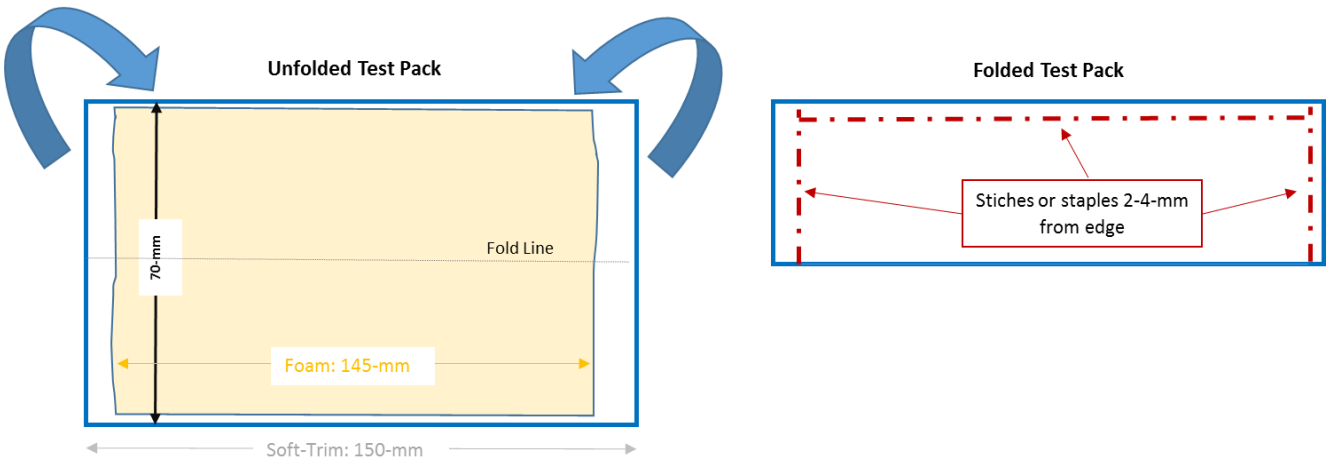


**Figure 1: Test Pack**

**4.1.2.3 Control Pack**. Prepare a Test Pack without loose foam piece. Fold the ends of the test specimen over one another along the center Fold Line. Use stitches or staples to hold the material ends together during testing.

**4.1.2.3.1** Materials should be assembled per production intent.

**4.1.2.4** The test specimens shall be tested in as received condition without any further conditioning.

**4.1.2.5** Place the Test Pack and Control Pack into the test specimen holder of the Xenon-Arc Weathering Device such that the face material is directed at the light source. Follow procedure per GMW3414.

**4.2 Conditions.**

**4.2.1 Environmental Conditions**. Test pack is subjected to the following test cycle conditions.

- Four (4) Light Cycles (Table 1) and three Dark Cycles (Table 2) starting with the Light Cycle.
- These cycles shall be performed continuously. Breaks between them are not acceptable.

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