

Group Standard**PV 3975**

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Scrub Resistance of High-Gloss Surfaces in the Vehicle Interior

1 Scope

This Test Specification (PV) applies to the Volkswagen brand. It defines a method for testing the scrub resistance of high-gloss surfaces (uncoated plastics, painted surfaces and in-mold decorated (IMD) / in-mold labeled (IML) surfaces) in the vehicle interior using a Martindale tester. The gloss level of the surface under test must be at least 60 GU (measuring angle: 20°).

2 Terms

2.1 Scrub resistance

Scrub resistance is a specific form of scratch resistance. The term scrub resistance is used to denote the resistance of solid surfaces to mechanical stresses, which cause fine surface scratches with a maximum depth of 3 µm. Such scratches are frequently caused by cleaning surfaces, e.g., using a cloth. Whether the scratches are visible or not depends on the angle of light incidence.

3 Test

3.1 Test equipment

- Martindale tester (Figure 1)
- Polishing paper: 281Q WOD sandpaper, 9mic, 215,9 mm × 279 mm, by 3M
- Reflectometer, e.g., ZGM 1020 by Zehntner
- Foam as per DIN EN ISO 12947-1.
- Cleaning cloth (e.g., by Vileda, glass/window cleaning cloth, 100% microfiber: 70% polyester, 30% polyamide)

3.2 Specimen preparation

Size of the (plane parallel) plates under test: 110 mm × 110 mm.

Verify that you have the latest issue of the Standard before relying on it.

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The English translation is believed to be accurate. In case of discrepancies, the German version is alone authoritative and controlling.

Numerical notation acc. to ISO convention.

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The plates under test must be free of impurities and fingerprints.

Prior to the test, the plates under test must be conditioned for 7 days at room temperature, +18 °C to +28 °C, or for 48 h at +60 °C in a forced air oven.

3.3 Procedure

For this test method, a Martindale tester must be modified as per DIN EN ISO 12945-2. The deflection of the guide plate which describes the "Martindale" figure (see Figure 3) is reduced in both longitudinal and transverse direction. Offset of the drive units from their center axis: 12 mm.

Polishing paper (see Section 3.1) is used as fabric in the test. It is placed on a foam backing (see Section 3.1) and mounted in the fabric holder (see Figure 2). The scrub load applied is 12 kPa (800 g).

The fabric holder is mounted on the guide plate. The specimen is secured to the specimen holder by a ring. The test comprises 10 cycles. New polishing paper and a new foam backing must be used for each test.



Figure 1 – Layout of the Martindale tester

Legend

- | | |
|---|-----------------|
| 1 | Specimen holder |
| 2 | Fabric holder |
| 3 | Load |
| 4 | Guide plate |

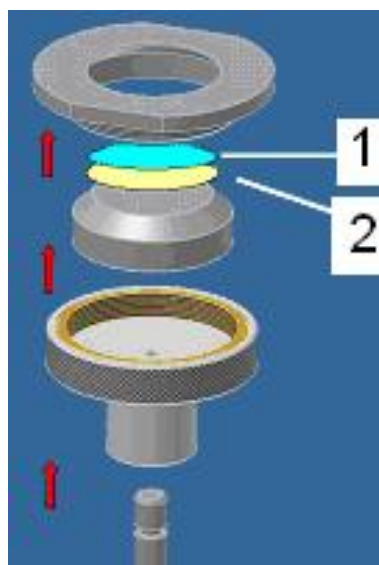


Figure 2 – Fabric holder

Legend

- 1 Polishing paper
- 2 Foam backing

4 Evaluation

4.1 Measuring the gloss level

The areas to be measured must be cleaned (e.g., from fingerprints) before the gloss level is measured. A glass/window cleaning cloth that does not damage the surface must be used for this purpose.

The gloss level (measuring angle 20°) is measured before and after the test.

Care must be taken to ensure that the opening of the reflectometer rests on the center of the surface applying the load (see Figure 3).

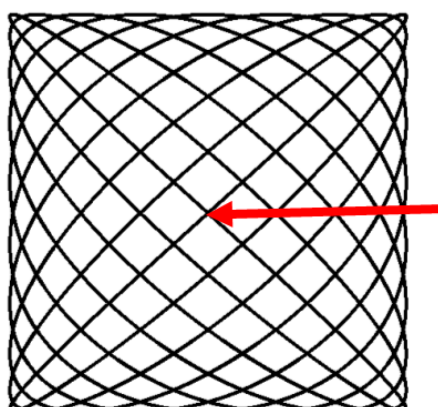


Figure 3 – Measuring the gloss level using the Martindale figure (Lissajours figure as per EN ISO 12947-1)

4.2 Scrub resistance

The scrub resistance must be specified in the test report as residual gloss in % acc. to (1):

$$\text{Residual gloss in \%} = \frac{\text{Gloss level after the test} \times 100}{\text{Gloss level before the test}} \quad (1)$$

5 Other applicable documents

The following documents cited in this Standard are necessary to its application.

Some of the cited documents are translations from the German original. The translations of German terms in such documents may differ from those used in this Standard, resulting in terminological inconsistency.

Standards whose titles are given in German may be available only in German. Editions in other languages may be available from the institution issuing the standard.

DIN EN ISO 12945-2 Textiles - Determination of fabric propensity to surface fuzzing and to pilling
- Part 2: Modified Martindale method

DIN EN ISO 12947-1 Textiles - Determination of the abrasion resistance of fabrics by the Mar-
tindale method - Part 1: Martindale abrasion testing apparatus