

Trim and Molded Padded Parts for Vehicle Interiors (Composite Components)

Foreword

DBL 5471 describes the requirements for components in the vehicle interior.

This edition replaces the previous edition of this standard.

Changes

In comparison with edition 2007-05, the following changes have been made:

- Completely new editorial revision
- The product versions 08, 09, 11, 15, 20 have been added
- The product versions 92, 94 and 95 have been set to “Not for new designs”
- Full duration of test run reduced
- Update of applicable company and international standards
- Additional information on compliance with legal requirements and regional standards for emission behavior in the vehicle interior according to DBL 5430
- Tables formally revised

Contents

1	Scope of application.....	3
2	References.....	6
3	Terms and definitions.....	6
4	General requirements	7
5	Abbreviated material designation for documentation.....	7
6	Tests	8
6.1	Tests to be performed.....	8
6.2	Inspection characteristics.....	9
6.3	Component requirements	11
6.4	Aging tests (thermal and weathering tests).....	13
6.5	Aging test on laminated components.....	14
6.6	Peel test for decorative goods	15
6.7	Foam adhesion at interface between foam and substrate	17
Annex A	(normative) – Technical data	18
A.1	Evaluation before aging tests.....	18
A.2	Evaluations after aging tests.....	19
(informative)	Product versions not for new design	20

1 Scope of application

The specification describes accelerated aging tests for components.

In this case the following correlations are examined visually and in measurements after the tests are complete:

- Appearance
- Interactions
- Surface properties
- Adhesion properties
- Dimensional accuracy
- Bleeding
- Discoloration
- Migration due to demixing

The specification is used for the following areas of the passenger car:

- Vehicle interiors
- Cargo and luggage compartment

You can find an overview of the permissible product versions in Table 1.

Table 1: Overview of product versions

Product version	Zone (1)	Application example
08 (80 °C)	1	<ul style="list-style-type: none"> - floor coverings - luggage/cargo compartment trim - seat panels, seat-back lining, covers - B-pillar trim
09 (90 °C)	2	<ul style="list-style-type: none"> - Center armrests - Dashboard with glove compartment (2) - Center console (2) - Door trim, door pockets (2), door center panels (2), speaker grilles (2), mirror triangle - A-, C-, D-pillar and roof frame trim - Roof, sliding roof paneling - Handles and console - Sun visors - Single/combined luggage cover and retaining net (cargo compartment cover) - Roof roller blind, retractable rear windscreen blind, dividing net - Cargo space lining - Edge guards - Seats - Seat cushions, covers, driver's headrest - Laminated trim parts with web material (film, imitation leather, etc.)
<p>(1): Other temperatures can be specified/checked for the zones in the function specifications. (2): The component is tested at 90 °C. If a single part in the component fails, the operator shall check whether the test shall be repeated with a new component at 80 °C.</p>		

Product version	Zone (1)	Application example
11 (110 °C)	3	- Dashboard (≥ 25 cm away from the windshield) plastic parts, e.g. nozzles and trim ring, side window defrost trim ring - Parcel shelf (≥ 40 cm away from the rear window) plastic parts, e.g. unlocking rear seat backrest, top tether)
15 (115 °C)	4	Parcel shelf including the injection-molded part near the rear window (≤ 40 cm away from the rear window), e.g. trunk venting
20 (120 °C, 105 °C for leather surface)	5	- Dashboard upper part including the single components near the rear window (≤ 25 cm away from the rear window), e.g. defrosting channel below windshield

(1): Other temperatures can be specified/checked for the zones in the function specifications.

Division of the test zones:

The interior is divided into test zones with stronger and weaker heat and UV strain (environmental influences)(refer to Figure 1 to Figure 3).

The trim and molded padded parts shall be designed for the highest permissible temperatures in the respective test zones.

The following diagrams shall only be used as a guide, since the test zones depend on the vehicle design.

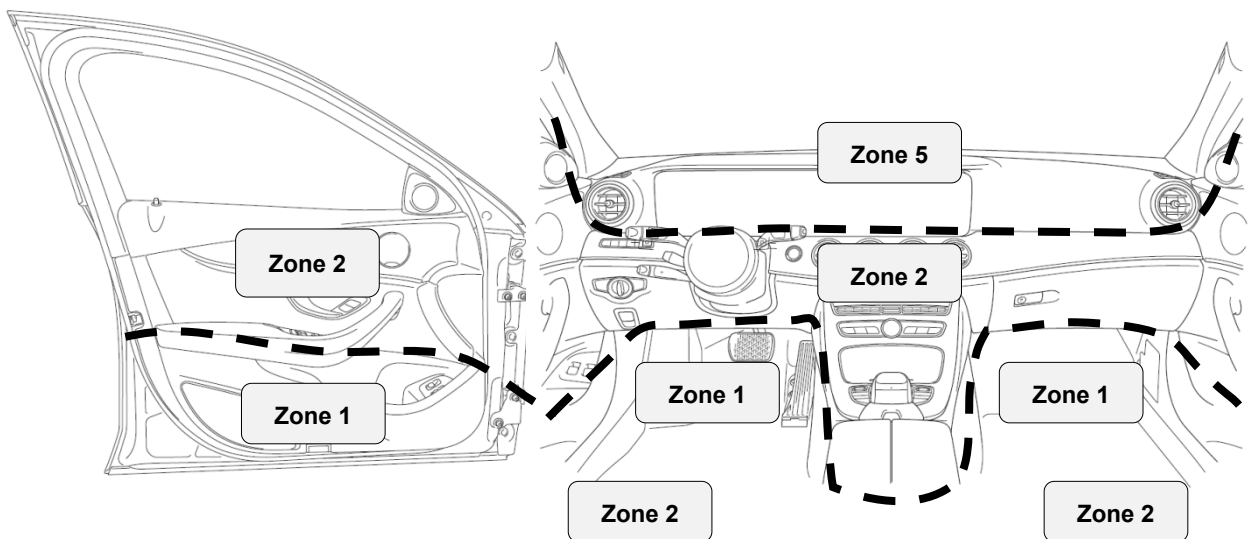


Figure 1: Zone 1 (side door, bottom and floor region), zone 2 (seating areas and side door, top) and zone 5 (dashboard)

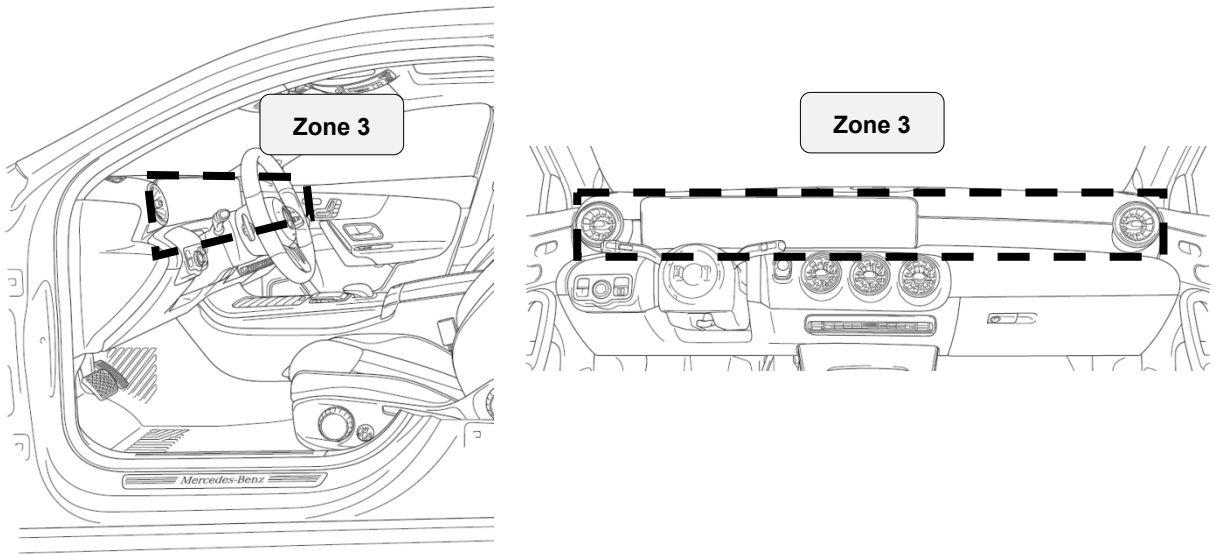


Figure 2: Zone 3 (e.g. nozzles, display console attachment, side window defrost trim ring)

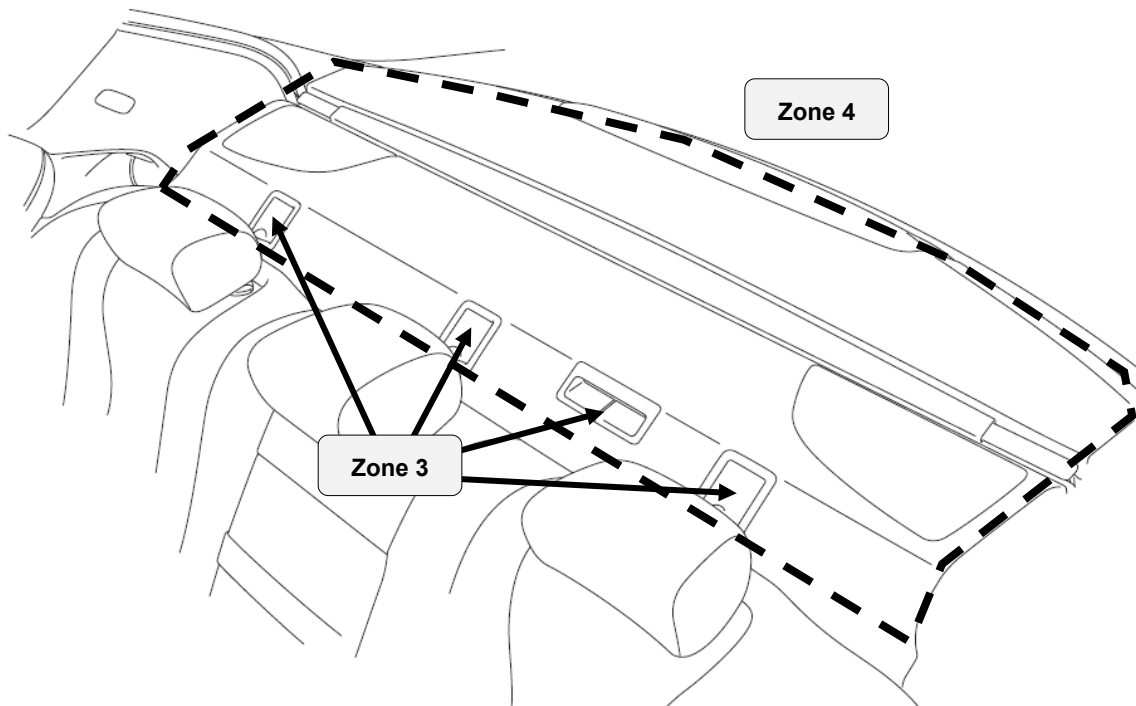


Figure 3: Zone 4 (parcel shelf), zone 3 (plastic parts, e.g. rear seat backrest unlocking)

2 References

The following referenced documents are required for the application of this document. For dated references, only the referenced edition applies. For undated references, the latest edition of the cited document (including any changes) applies.

DBL 5307	Flame Retardant Properties - Interior Trim Parts - Requirements and Test Specifications
DBL 5353	Supply Specification – Foam Foil
DBL 5430	Emissions and Odor in the Vehicle Interior
DBL 8585	General Requirements – Environmental Protection, Hazardous Substances, Dangerous Goods – Negative Substance List for the Selection of Materials
DBL 9202	Decorative Goods in Vehicle Interiors
DIN EN ISO 291	Plastics - Standard Atmospheres for Conditioning and Testing
ISO/IEC 17025	General Requirements for the Competence of Testing and Calibration Laboratories
MBN 10300	Standard Designation of Materials for Technical Documentation
MBN 55555 (Parts 3-7)	Non-metallic material systems, materials and semi-finished products, Parts 3 - 7
VDA 250	Material Laboratory Analysis

3 Terms and definitions

PV	Product version: Clearly specified variant of a material or profile of requirements described in a Daimler-Benz Supply Specification (DBL).
Requirements profile	clear description of the requirements to be met by a material for a certain use. Note: One profile of requirements can be satisfied by several materials.
DBL	Supply specification, designation of a specific company standard type within the Daimler group of companies
Decor	With regards to this standard: PU-sprayed skin, PVC slush skin, PVC sheeting, TPO foil, natural skin/leather surface, textiles, etc.
Person in charge	The person in charge is the Daimler AG employee responsible for the technical content of the standard and for the creation and revision of the company standard.
MBN	Mercedes-Benz standard, designation of a specific Daimler Group company standard type
Component	In accordance with this standard, a component shall be understood to include a single part, an assembly/composite part, modules or single parts (e.g. armrests or center panels of door trims).
Foam Films and Sheeting	Compound made from compact film layer, laminated with cut foam
Material systems	In accordance with this standard, material systems consist of multiple materials connected to each other and which cannot be separated without destroying them, e.g. laminated applications of all kinds.

4 General requirements

To guarantee product safety and product quality, and to meet certification requirements, all relevant statutory regulations and laws shall be complied with. In addition, the relevant requirements of the Daimler Group shall apply.

In terms of ingredients and recyclability, materials, procedure and process engineering, components and systems shall comply with all applicable legal requirements.

DBL 8585 shall be observed.

Legal requirements and regional standards for emission behavior in the vehicle interior shall be observed. The Daimler-specific specifications for emissions from materials and component parts in the vehicle interior shall also be met and shall be taken from DBL 5430.

Alterations as described in the referencing DBLs are permissible. Visually discernible inhomogeneous alterations are not permissible. Haptic alterations, such as tackiness or hardening, are not permissible.

Trim:

The bond between the surface material and the substrate shall extend across the whole surface and shall be uniform, sufficiently strong and resistant to aging. The surface material shall be turned over and glued at the outside edges with sufficient strength and without disturbing overlaps. The pull-off force of any glued-on, riveted, welded or integrated attachment or packaging parts (holders, clips or similar) shall correspond to the values indicated on the drawing.

Molded padded parts:

The molded padded parts shall be designed within the specified dimensions and correspond to the specified hardness. The foam expansion shall be even and without noticeable pockets. The foam shall have completed all reactions after a storage time of the molded padded part of 24 hours at room temperature, i.e. it shall not be tacky nor brittle. The bond between cover material and foam as well as between foam and substrates shall be firm enough to ensure that no separation can occur during assembly or use (e.g. as a result of release agent residues); this requires that the surface of the materials be suitably conditioned. The surfaces of the molded padded parts shall correspond to the specified design pattern.

5 Abbreviated material designation for documentation

The short material designation for the documentation is specified in the MBN 10300 at Mercedes-Benz and is composed of the material group, material standard and material number (product version) for the composite parts of this DBL (refer to Table 2).

Table 2: Structure of abbreviated material designation

Material data					Description of final condition	
a. Material group	b. Material standard	c. Material number	d. Material designation	e. DBL material	f. Processing condition	g. Binding Daimler-Benz Supply Specification
Material matrix composite	DBL 5471	.20				

Example of short description string for final material state:

In the drawing title block, e.g. material matrix composite DBL 5471.20 PVC slush skin / PU foam / PP LGF20 is stated in the material block.

6 Tests

6.1 Tests to be performed

The tests that are to be performed before and after the aging are listed in Table 3.

The requirements are classified as described below and the test results shall be determined accordingly:

- A) Method accredited according to [ISO/IEC 17025] and approved by Daimler AG (evaluation scale compared with Daimler AG; questions answered according to [VDA 250]).
 B) Method accredited according to [ISO/IEC 17025].

The following information shall be included in the results documentation: classification, name and location of the laboratory. Daimler AG reserves the right to a method-specific examination of the laboratory for classification B.

Table 3: Overview of the tests to be performed

No.	Inspection characteristic	Before aging	After aging A	After aging B	Classification
1.	Aging tests (thermal and weathering tests)	X (1)	X (2), (3)	X (4)	B
2.	Aging test on laminated components	X (1)	X (2)	–	B
3.	Peel test for decorative goods	X	X	X	B
4.	Foam adhesion at interface between foam and substrate	X	X	X	B
5.	Hardness test on component	X	X	X	B
6.	Measuring the decorative goods in the front passenger's airbag area	X	X	X	B
7.	Hot light fastness (HLF)/hot light aging (HLA)	X	–	–	B
8.	Scratching of surface using a chisel	X	–	–	B
9.	Low-temperature test (coolspotting)	X (5)	–	–	B
10.	Abrasion resistance to sun cream test substance	X	–	–	B
11.	Resistance to sun cream test substance through contact	X	–	–	B
12.	Resistance to care products via abrasion	X	X	X	B
13.	Abrasion resistance with the crockmeter (friction fabric)	X	–	–	B
14.	Cleanability following soiling	X	–	–	B
15.	Flame retardant properties	X	–	–	B
16.	Emissions and Odor in the Vehicle Interior	X	–	–	A

X = Perform test

– = Do not perform test

(1): Evaluation and documentation of the component before the aging tests acc. to Section 6.3. In addition: metrological determination of the color before the aging tests.

(2): Evaluation of the component after heat aging is complete acc. to Section 6.3. The change in color is determined metrologically and evaluated according to the gray scale.

After the Warm Climate Cycle Test, the peeling test for decorative goods is only performed for laminated and foamed components. If the peeling forces (refer to Section 6.6) are not reached, the process shall be optimized and Aging A shall be restarted with optimized components.

(3): Evaluation of the component after sun simulation is complete acc. to Section 6.3. The change in color is determined metrologically and evaluated according to the gray scale.

(4): Evaluation of the component after climate-conditioned storage is complete acc. to Section 6.3. The change in color is determined metrologically and evaluated according to the gray scale.

(5): Evaluation of the component after low-temperature test (coolspotting) is complete acc. to Section 6.3.

6.2 Inspection characteristics

The required inspection characteristics and test specifications of this DBL are summarized in Table 4.

Table 4: Overview of inspection characteristics and specifications

No.	Inspection characteristic	Test specification
1.	Aging tests (thermal and weathering tests)	<p>Relevant for initial material sampling, feasibility, concept suitability and series suitability</p> <p>For the procedure / description of the aging tests, refer to Section 6.4</p> <p>For the evaluation and documentation, refer to Section 6.3</p> <p>In addition the color change is determined metrologically and the results ΔE^*_{ab}, ΔL^*, Δa^* and Δb^* are specified in the test report.</p>
2.	Aging test on laminated components	<p>Relevant for components made of multiple nests or duplicated tools</p> <p>For the procedure/description of the aging test, refer to Section 6.5</p> <p>For the evaluation and documentation, refer to Section 6.3</p> <p>The laminated components such as the armrest, dashboard and door trim (made of multiple nests or duplicates) shall pass the tests listed below as a minimum (refer to Table 8 and Table 9) and satisfy the required quality.</p>
3.	Peel test for decorative goods	For a description of the peeling test, refer to Section 6.6
4.	Foam adhesion at interface between foam and substrate	MBN 5555-6, Foam adhesion at interface between foam and substrate refer to Section 6.7
5.	Hardness test on component	<p>MBN 5555-6, Hardness test on component</p> <p>The hardness test is performed on the top of the dashboard, upper body edge of the door trim at window level and the armrest.</p> <p>Purpose: Checking the haptic requirement</p>
6.	Measuring the decorative goods in the front passenger's airbag area	MBN 5555-3, Measuring the decorative goods in the front passenger's airbag area
7.	Hot light fastness (HLF)/hot light aging (HLA)	<p>MBN 5555-5, hot light fastness (HLE)/ hot light aging (HLA)</p> <p>The set points of the decor are specified by the PV of the referencing DBL. If no set points are present there, the following specifications shall apply (after four cycles):</p> <ul style="list-style-type: none"> - DBL 5471 PVs 08 and 09: Grade 3 - DBL 5471 PVs 11, 15 and 20: Grade 3-4
8.	Scratching of surface using a chisel	<p>MBN 5555-6, Scratching of surface using a chisel</p> <p>Application: Only for components that are laminated with a foam foil (dashboard, door trim, center console).</p> <p>Load: refer to DBL 5353 (technical data)</p> <p>Requirement: no damage to surface.</p>

No.	Inspection characteristic	Test specification
9.	Low-temperature test (coolspotting)	MBN 55555-4, low-temperature test The test shall only be performed on components with PVC imitation leather (darkest color e.g. black). For the evaluation and documentation, refer to Section 6.3
10.	Abrasion resistance to sun cream test substance	MBN 55555-7, Abrasion resistance to sun cream test substance Individual components do not have to be tested on the sun cream test substance as a matter of course. The ratio can be found in the document MBN 55555-3, supplementary page 1 (refer to DocMaster).
11.	Resistance to sun cream test substance through contact	MBN 55555-7, Resistance to sun cream test substance through contact Individual components do not have to be tested for the sun cream test substance as a matter of course. The ratio can be found in the document MBN 55555-3, supplementary page 1 (refer to DocMaster).
12.	Resistance to care products via abrasion	MBN 55555-7, Resistance to care products via abrasion Individual components do not have to be tested for the resistance to care products via abrasion as a matter of course. The ratio can be found in the document MBN 55555-3, supplementary page 1 (refer to DocMaster).
13.	Abrasion resistance with the crockmeter (friction fabric)	MBN 55555-6, Abrasion resistance with crockmeter (friction fabric) Individual components do not have to be tested for the abrasion resistance with crockmeter (friction fabric) as a matter of course. The ratio can be found in the document MBN 55555-3, supplementary page 1 (refer to DocMaster).
14.	Cleanability after soiling	MBN 55555-3, cleanability after soiling Individual components do not have to be tested on all test media as a matter of course. The ratios can be found in the document MBN 55555-3, supplementary page 1 (refer to DocMaster).
15.	Flame retardant properties	DBL 5307
16.	Emissions and Odor in the Vehicle Interior	DBL 5430, Odor: Method 1 (Variant 3)

6.3 Component requirements

The components are evaluated based on the following requirements (refer to Table 5). Example figures from the error catalog can be used for the evaluation (DBL 5471, supplementary page 2 "Error catalog WEB V214", refer to DocMaster).

The documentation is made with the template DBL 5471, supplementary page 1 "Evaluation matrix WEB V214" (refer to DocMaster).

Only the basic carrier bar' attachments or deformations are evaluated in built-in trim parts (wood, aluminum, etc.). The surfaces of the trim parts are checked and evaluated separately according to DBL 9202.

Table 5: Overview of component requirements

No haptic and visual changes to the surface on the visible side and the reverse side such as: <i>Keine haptischen und optischen Veränderungen der Oberfläche auf Sicht und Rückseite wie z. B.:</i>	
1.	Stains; <i>Flecken</i>
2.	Discolouration (Evaluation ISO 105-A02); <i>Verfärbungen (Bewertung ISO-105-A02)</i>
3.	Change in gloss (brightening / matting); <i>Glanzveränderung (Aufglänzen/Vermatten)</i>
4.	Yellowing; <i>Vergilbung</i>
5.	Cords / Blushing / Hazing; <i>Schlieren/ Schleier</i>
6.	Mildew; <i>Schimmel</i>
7.	Corrosion (red, white); <i>Korrosion (rot, weiß)</i>
No changes because of mechanical and thermal loads such as: <i>Keine Veränderungen durch mechanische und thermische Beanspruchungen wie z. B.:</i>	
8.	Scratches; <i>Kratzer</i>
9.	Crack/fracture; <i>Riss/Haar-Riss</i>
10.	Break/Breakage; <i>Bruch</i>
11.	Brittleness; <i>Versprödung</i>
No structural change of the surface or the component such as: <i>Keine strukturelle Veränderung der Oberfläche bzw. der Komponente wie z. B.:</i>	
12.	Pressure mark / Dent; <i>Druckstelle/ Delle</i>
13.	Wrinkle; <i>Falte</i>
14.	Blister / Bubbles; <i>Beule/ Blasen</i>
15.	Waviness; <i>Welligkeit</i>
16.	Dimple skin; <i>Orangenhaut</i>
17.	Edge wrapping inaccurate; <i>Umbug fehlerhaft</i>
18.	Fraying; <i>Ausfasern</i>
19.	Flattening (e. g. grain, application); <i>Verflachung (z. B. Narbung, Applikation)</i>
20.	Bending / Sagging; <i>Durchbiegen/-hängen</i>
21.	Distortion; <i>Verzug</i>
22.	Swelling; <i>Quellung</i>
23.	Shrinkage; <i>Schrumpf</i>

24.	Visible weld joints (1); <i>Abzeichnung von Verschweißungen an der Oberfläche (1)</i>
25.	Visible airbag seam (1); <i>Abzeichnungen der Airbagnaht (1)</i>
26.	Changing-hard-soft visible (1); <i>Hart-Weich-Übergang sichtbar (1)</i>
27.	Gap line irregular (1); <i>Spaltverlauf unregelmäßig (1)</i>
28.	Seam torn (1); <i>Naht aufgerissen (1)</i>
29.	Seam waviness (1); <i>Nahtverlauf wellig (1)</i>
30.	Seam bulge (1); <i>Nahtwulst (1)</i>
31.	Yarn peeled off (1); <i>Garn franst aus (1)</i>
32.	Seam compression (1); <i>Nahtstauchung (1)</i>
33.	Sink marks; Einfallstellen (1)
No migration of content and breaking/loosening of connecting points such as: <i>Keine Migration von Inhaltsstoffen und Aufbrechen/Lösen von Verbindungsstellen wie z. B.:</i>	
34.	Glue on the surface; <i>Kleber auf der Oberfläche</i>
35.	Tackiness; <i>Klebrigkeit</i>
36.	Indentation (e.g. disruptive discharge of the glue); <i>Ab- und Durchdrücke (z. B. Kleberdurchschlag)</i>
37.	Delamination / Release / Peeling of surface material; <i>Ablösen/Loslösen des Oberflächenmaterials</i>
38.	Layer and Fiber separation of the substrate; <i>Schicht- bzw. Fasertrennung der Trägermaterialien</i>
39.	Detachment of assembled parts, fastener, adhesive tape, etc.; <i>Loslösen der Anbauteile, Befestigungselemente, Klebebänder, etc.</i>
40.	Functional impairment on flexible parts (hard-steering); <i>Funktionsbeeinträchtigung von beweglichen Teilen (schwergängig)</i>
No other deviations from the component requirements such as: <i>Keine sonstigen Abweichungen zu den Komponentenanforderungen wie z. B.:</i>	
41.	Other noticeable problems (1); <i>Sonstige Auffälligkeiten (1)</i>
42.	Shrink hole / Blowhole (1); <i>Lunker (Einschluss) (1)</i>
43.	Hardening / Softening (e.g. foam block); <i>Verhärtung/Erweichen (z. B. Formschaum)</i>
44.	Odor (noticeable at delivery or during chamber removal) (1); <i>Geruch (bei Anlieferung oder Kammerentnahme auffällig) (1)</i>
45.	Elongation fabric/shimmering carrier (1); <i>Starker Dekorauszug/Durchscheinen Träger (1)</i>
46.	Cold temperature test (coolspotting); <i>Flecken nach Kälteprüfung (Coolspotting)</i>
(1): Before and after aging	

6.4 Aging tests (thermal and weathering tests)

This test is relevant for initial material sampling, feasibility, concept suitability and series suitability.

The components for the aging test shall be produced with series production tools in series production facilities. The number of components required for the aging tests depends on the tests that follow them.

The aging tests A and B are performed simultaneously, refer to Table 6 and

Table 7:

Aging tests A

The listed aging tests shall be performed on the same components one after another in the specified sequence.

Aging test B

The climate test shall be performed with a new component in parallel to aging test A.

Alterations may still occur after the aging tests in components made from material systems (e.g. lined dashboard with dark PVC imitation leather, dashboard with dark PVC slush skin or lined/one-shot component with light textile decor) as a result of demixing and/or interactions. One of these tested components shall be stored in a dark place after the aging tests. After six months only the haptic and optical changes in the surface are evaluated again. The subsequent evaluation shall be assessed and documented in accordance with Section 6.3 Point 1. – 7.

Table 6: Aging tests for components (except leather surface)

Product version	Zone (1)	Aging tests		MBN
08	1	A	1. WCC1 (Warm Climate Cycle Test) 2. TA1 (Thermal aging test)	MBN 55555-4
		B	CL1 (climate test) or CL2 (for component with natural fibers)	
09	2	A	1. WCC2 2. TA3	MBN 55555-4
		B	CL1 or CL2 (for component with natural fibers)	
11	3	A	1. WCC3 2. TA9	MBN 55555-4
15	4	A	1. WCC4 2. TA10 3. SoSi component 1 (Sun simulation)	MBN 55555-4 MBN 55555-5
		B	CL1 or CL2 (for component with natural fibers)	MBN 55555-4
20	5	A	1. WCC5 2. TA11 3. SoSi component 1	MBN 55555-4 MBN 55555-5
		B	CL1 or CL2 (for component with natural fibers)	MBN 55555-4

(1): Other temperatures can be specified/checked for the zones in the function specifications.

Table 7: Aging tests for components with leather surface

Product version	Zone (1)	Aging tests		MBN
08	1	A	1. WCC/natural skin leather test 1 2. TA1	MBN 55555-4
09	2	A	1. WCC/natural skin leather test 2 2. TA3	MBN 55555-4
20	5	A	1. WCC/natural skin leather test 3 2. TA8 3. SoSi component 1	MBN 55555-4 MBN 55555-5
(1): Other temperatures can be specified/checked for the zones in the function specifications.				

Assessment criteria

The time for the evaluation of the components is specified in Table 3.

The evaluation and documentation takes place in accordance with Section 6.3

6.5 Aging test on laminated components

This test is relevant for components made of multiple nests or duplicated tools.

The laminated components such as the armrest, dashboard and door trim shall pass the tests listed below as a minimum (refer to Table 8 and Table 9) and satisfy the required quality.

A uniform gap in the laminate or contact pressure shall be ensured for the high-quality surfaces.

The components are placed in the test cell. A visual and metrological evaluation then takes place.

Table 8: Aging tests for laminated components (except leather surface)

Product version	Zone (1)	Aging tests		MBN
08	1	A	1. WCC1 (Warm Climate Cycle Test) 2. TA1 (Thermal aging test)	MBN 55555-4
09	2	A	1. WCC2 2. TA3	MBN 55555-4
20	5	A	1. WCC5 2. TA11	MBN 55555-4
(1): Other temperatures can be specified/checked for the zones in the function specifications.				

Table 9: Aging tests for laminated components with leather surface

Product version	Zone (1)	Aging tests		MBN
08	1	A	1. WCC/natural skin leather test 1 2. TA1	MBN 55555-4
09	2	A	1. WCC/natural skin leather test 1 2. TA1	MBN 55555-4
20	5	A	1. WCC/natural skin leather test 3 2. TA8	MBN 55555-4

(1): Other temperatures can be specified/checked for the zones in the function specifications.

Assessment criteria

The time for the evaluation of the components is specified in Table 3.

The evaluation and documentation takes place in accordance with Section 6.3

6.6 Peel test for decorative goods

The test shall be performed according to MBN 55555-6, Peeling test for decorative goods.

The test parts are constructed differently depending on their application (e.g. pillar trim, roof trim or dashboard). The permissible coat structures are listed in Table 10 and provided with example applications.

Table 10: Schematic diagram of the coat structures

Structure	Layer structure	Application example
A1	Decor	Hard-lined component
	Adhesive layer	
	Backing	
A2	Decor	Foamed instrument panel
	Haptic layer	
	Backing	
A3	Decor	Component laminated with foam foil Front-foamed armrest
	Adhesive layer	
	Haptic layer	
	Backing	
A4	Decor	Component with low shear-resistant surface (spacer fabric)
	Adhesive layer	
	Haptic layer	
	Adhesive layer	
	Backing	
A5	Decor	Headliner Sun visor
	Adhesive layer	
	Backing/functional layer	

The average peeling force values to achieve in the test according to MBN 55555-6 "Peeling test for decorative goods" before and after aging are listed for the bodies A1 – A5 in Table 11.

One test part with a function is e.g. the dashboard, out of which the airbag folds through the decorative goods. One test part without a function is e.g. pillar trim.

Table 11: Average peeling force for structure A1 – A5 (1)

Structure	Range	Unit	Before aging	After aging
A1 – A4 (laminated)	with function	N/5 cm	70	60
A1 – A4 (foamed)			18	15
A1 – A4 (laminated)	without function		30	25
A1 – A4 (foamed)			18	15
A5			15	12

(1): All values are lower specifications limits, i.e. not a single value from the requirement
Fulfillment of the function shall be guaranteed.

For larger components, at least five specimens distributed across the component according to the sampling plan are tested (lengthwise, crosswise, etc.). For smaller components at least three specimens shall be tested. Should it not be possible to perform the test on a component, multiple components shall be used for the test.

The component shall be stored after foaming in a standard atmosphere 23/50-2 for at least 48 h as per DIN EN ISO 291 for the peeling tests before the aging tests.

The component shall be stored before the test in a standard atmosphere 23/50-2 for at least 24 h as per DIN EN ISO 291 for the peeling tests after the aging tests.

The adhesion in all areas shall be homogeneous and sufficient before and after the performed aging tests. Foam residue shall remain on the bottom of the decor after the peeling test on foamed components (for cohesion break in foam, refer to Figure 4 and Figure 5).

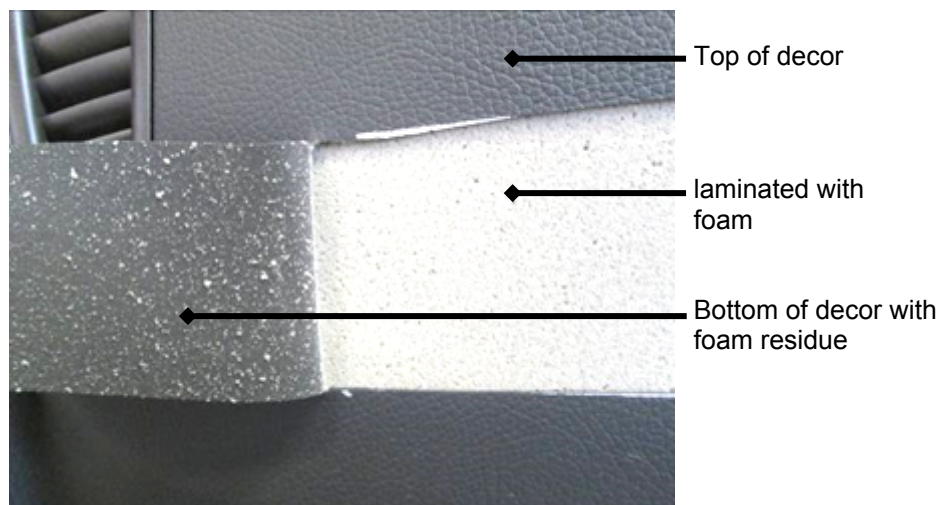


Figure 4: Adhesion between decor and foam OK

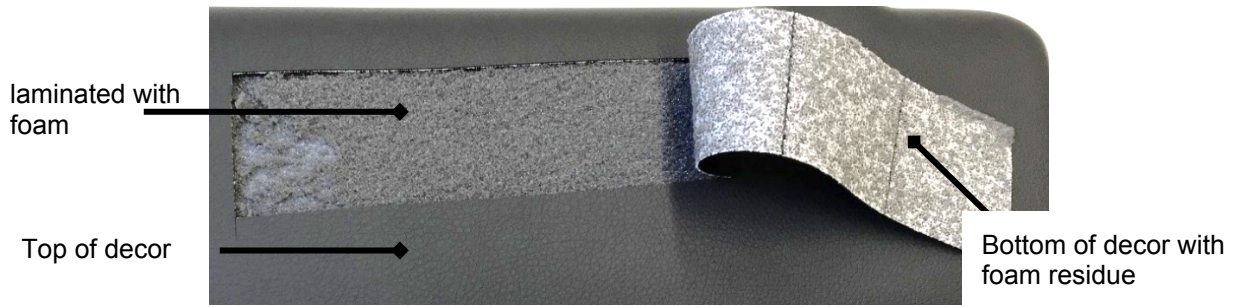


Figure 5: Adhesion between decor and foam OK

6.7 Foam adhesion at interface between foam and substrate

The following applies to the adhesion between the foam and substrate for the delivery condition and after the aging and weathering tests:

The adhesion shall be homogeneous and sufficient in all areas (refer to Figure 4).

Requirement for the adhesion between foam and substrate:

When pulling/smoothing the foam off the substrate, foam residue shall remain on the substrate surface (if cohesion break in foam is OK, refer to Figure 6, if adhesion between foam and substrate is NOK, refer to Figure 7).

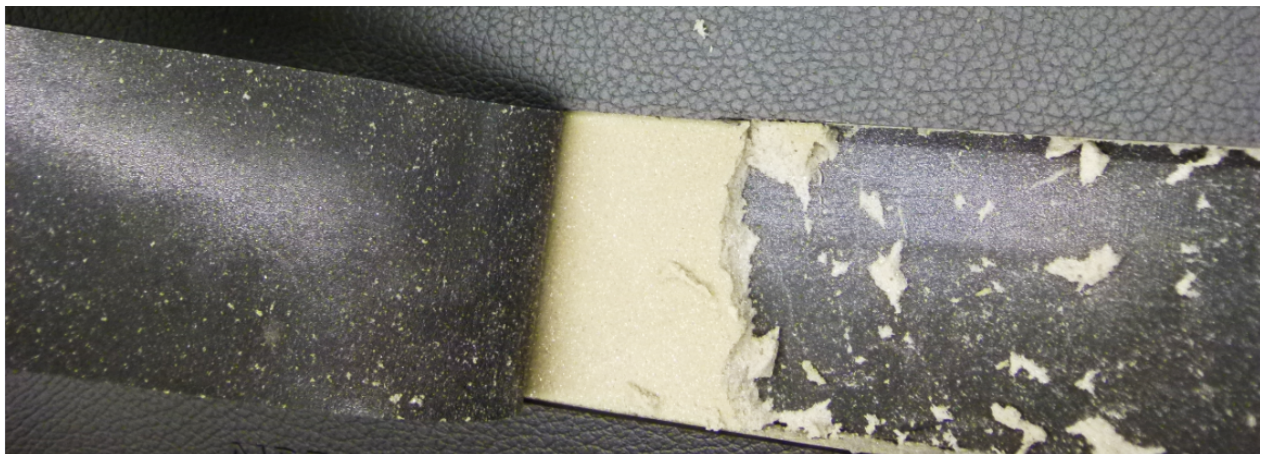


Figure 6: Adhesion between foam and substrate OK



Figure 7: Adhesion between foam and substrate NOK

Annex A (normative) – Technical data

A.1 Evaluation before aging tests

The general characteristics and requirements of the components can be found in Table 12 and are to be complied with for the material sampling.

Provided that no other statements are made in the test specifications or the referencing DBL, conditioning in a standard climate 23/50-2 for 24 h takes place before the test according to DIN EN ISO 291.

Table 12: Requirements before aging tests

No.	Inspection characteristic	Product version requirements
1.	Aging tests (thermal and weathering tests)	The evaluation and documentation of the component takes place before the aging tests acc. to Section 6.3. In addition: metrological determination of the color before the aging tests.
2.	Aging tests on laminated components	Relevant for components made of multiple nests or duplicated tools The evaluation and documentation of the component takes place before the aging tests acc. to Section 6.3. In addition: metrological determination of the color before the aging tests.
3.	Peel test for decorative goods	For set points, refer to Section 6.6 of this DBL
4.	Foam adhesion at interface between foam and substrate	When pulling/smoothing the foam off the substrate, foam residue shall remain on the substrate surface, refer to Section 6.7
5.	Hardness test on component	According to specification drawing and/or 3D Master or function specification
6.	Measuring the decorative goods in the front passenger's airbag area	Sink marks (horizontal/vertical seam direction): max. depth 30 µm Waviness (in all directions): max. depth -80 µm; max. height +80 µm
8.	Scratching of surface using a chisel	Only for components with foam foil laminate in area of dashboard, door trim and center console. The product versions of the decor goods in the referencing DBL determine the set points.
9.	Low-temperature test (coolspotting) (1)	Evaluation and documentation acc. to Section 6.3
10.	Abrasion resistance to sun cream test substance	Specimen surface ≤ Grade 1 Felt surface (gray scale) ≤ Grade 4
11.	Resistance to sun cream test substance through contact	Change of specimen surface parameter ≤ 2
12.	Resistance to care products via abrasion	Change of specimen surface and felt surface, parameter ≤ 2
13.	Abrasion resistance with the crockmeter (friction fabric)	See the referencing company standard for the number of set points and friction strokes
14.	Cleanability following soiling	See limits of the referencing company standard
15.	Flame retardant properties	The specifications of DBL 5307.10 shall be complied with.
16.	Emissions and Odor in the Vehicle Interior	The limits of DBL 5430 shall be complied with.
(1): Evaluation after low-temperature test (coolspotting)		

A.2 Evaluations after aging tests

The general characteristics and requirements of the components can be found in Table 13 and are to be complied with for the material sampling.

The component shall be stored after the aging tests in a standard atmosphere 23/50-2 for at least 24 h as per DIN EN ISO 291 before further tests.

Table 13: Requirements after aging tests

No.	Inspection characteristic	Product version requirements
1.	Aging tests (thermal and weathering tests)	After heat aging is complete: all decor \geq Grade 4 (1) After sun simulation is complete: all decor \geq Grade 4 (exception textile decor \geq Grade 3-4) (2) After climate-conditioned storage is complete: all decor \geq Grade 4 (3) Determination ΔE (L^* , a^* , b^* color values)
2.	Aging tests on laminated components	Relevant for components made of multiple nests or duplicated tools After heat aging is complete: all decor \geq Grade 4 (1) Determination ΔE (L^* , a^* , b^* color values)
3.	Peel test for decorative goods	For set points, refer to Section 6.6 of this DBL
4.	Foam adhesion at interface between foam and substrate	When pulling/smoothing the foam off the substrate, foam residue shall remain on the substrate surface, refer to Section 6.7
5.	Hardness test on component	According to specification of the drawing and/or 3D Master or function specification
6.	Measuring the decorative goods in the front passenger's airbag area	Sink marks (horizontal/vertical seam direction): max. depth 50 μm Waviness (in all directions): max. depth -80 μm ; max. height +80 μm
12.	Resistance to care products via abrasion	Change of specimen surface and felt surface Parameter ≤ 2

(1): Evaluation of the component after heat aging is complete acc. to Section 6.3. The change in color is determined metrologically and evaluated according to the gray scale.

After the Warm Climate Cycle Test, the peeling test for decorative goods is only performed for laminated and foamed components. If the peeling forces (refer to Section 6.6) are not reached, the process shall be optimized and Aging A shall be restarted with optimized components.

(2): Evaluation of the component after sun simulation is complete acc. to Section 6.3. The change in color is determined metrologically and evaluated according to the gray scale.

(3): Evaluation of the component after climate-conditioned storage is complete acc. to Section 6.3. The change in color is determined metrologically and evaluated according to the gray scale.

(informative)
Product versions not for new design

The following product versions shall not be used for new designs:

- PV 90
- PV 91
- PV 92
- PV 93
- PV 94
- PV 95

For technical data, if required, refer to DBL 5471:2007-05.