INFO GUIDE 02

Data sheet EXPLANATION

Data sheet

EXPLANATION

en The info guide ‘Data sheet EXPLANATION ’ focuses on the data sheet as such.
The data sheet contains a great deal of information about the respective product and its suitability. However, in order to be able to interpret and compare this information correctly and to use it for the upcoming purchase decision, a basic understanding of all terms and contexts is required. On the one hand, this infoguide functions as an encyclopedia and, on the other hand, is intended to provide insights into the procedures and processes of the testing laboratories.
Follow us and learn everything you always wanted to know about the data sheet!

de Der Infoguide „Data sheet EXPLANATION “ rückt das Datenblatt als solches in den Mittelpunkt.
Im Datenblatt steckt eine Vielzahl an Informationen zum jeweiligen Produkt und seiner Eignung. Um diese richtig interpretieren, vergleichen und für die bevorstehende Kaufentscheidung nutzen zu können, bedarf es jedoch eines grundlegenden Verständnisses aller Begrifflichkeiten und Zusammenhänge. Dieser Infoguide fungiert zum einen als Nachschlagewerk und soll zum anderen Einblicke in die Verfahren und Abläufe der Prüflabore gewähren. Folgen Sie uns und erfahren Sie alles, was Sie schon immer über das Datenblatt wissen wollten!

fr L’infoguide «Data sheet EXPLANATION » met l’accent sur la fiche technique en tant que telle.
La fiche technique contient une multitude d’informations sur le produit concerné et son adéquation. Pour pouvoir les interpréter correctement, les comparer et les utiliser pour la décision d’achat à venir, il est toutefois nécessaire de bien comprendre toutes les notions et les relations. Cet infoguide sert d’ouvrage de référence et donne un aperçu des procédures et des processus des laboratoires d’essai.
Suivez-nous et découvrez tout ce que vous avez toujours voulu savoir sur la fiche technique!

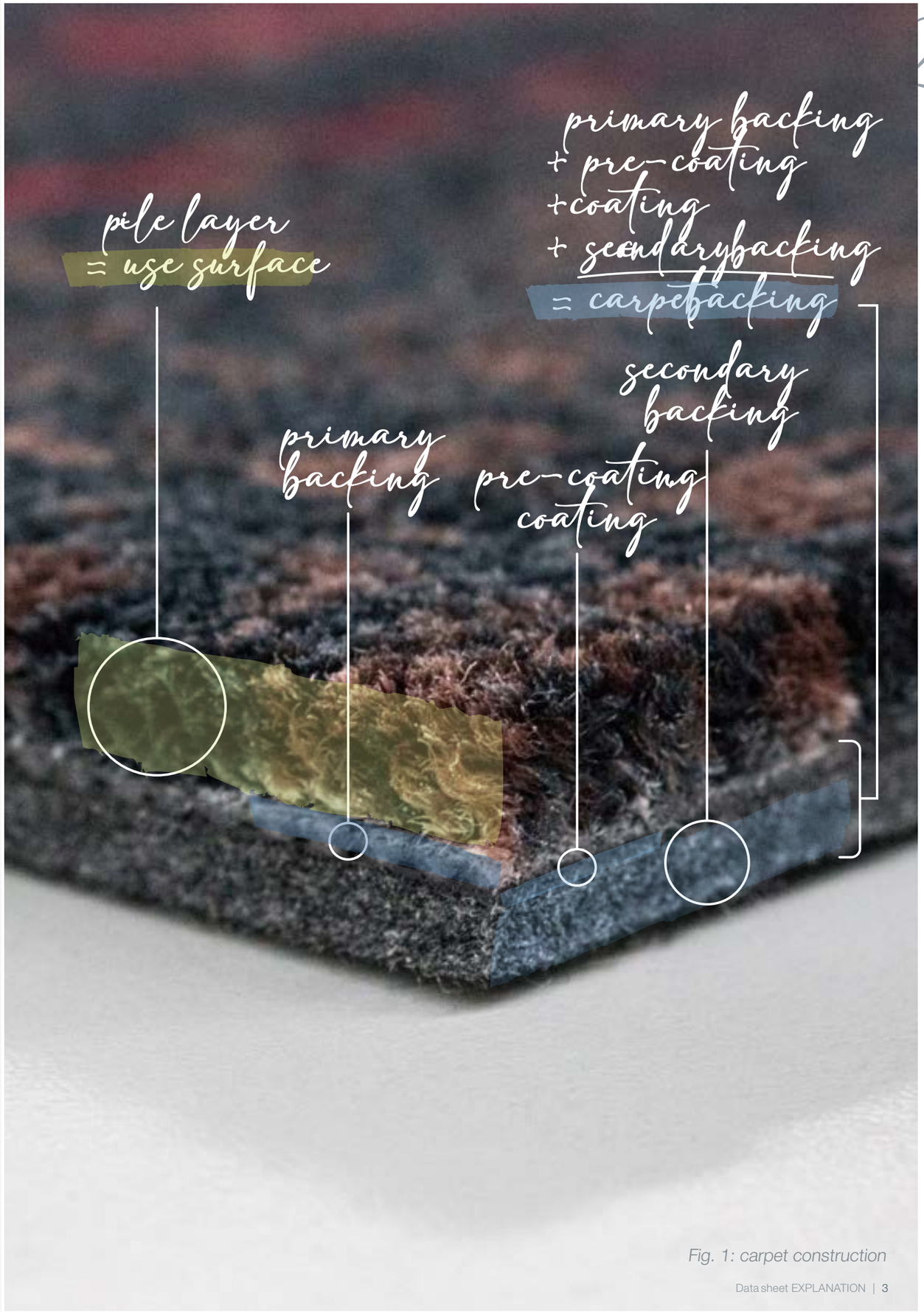


Fig. 1: carpet construction

CONTENTS

0 Bfl
Bfl

orm	rolls tiles	400 cm wide
construction	tufted cut pile	1/10" gauge
pile material	ECONYL® yarn	100 % Polyamide 6, recycled
primary backing	non-woven	75 % PES / 25 % PA
secondary backing	Easy Lift (heavy backing), non-woven (needled, thermal fixed)	100 % PES, 120 g/m²
pattern	digital paste printing	Chromojet
total weight	ISO 8543	ca. 2120 g/m²
total thickness	ISO 1765	ca. 7,5 mm
pile thickness	ISO 1766	ca. 4,6 mm
total pile yarn weight		ca. 1100 g/m²
pile density	ISO 8543	ca. 0,15 g/cm³
number of tufts	ISO 1763	ca. 181700 /m²
CE-number		1658-CPR-3139
DoP-number		0001
Prodis-licence-number		75CA6F1A
Environmental Product Declaration	ISO 14025+EN 15804+A2	EPD-HBM-20170151-CBC1-DE + annex LC 3

use class
33 - commercial: heavy
DIN EN 1307 | ISO 10361

luxury class
LC 3
DIN EN 1307 | ISO 8543

stair suitability
intensive
DIN EN 1307 | DIN EN ISO 12951

castor chair suitability
intensive
DIN EN 1307 | DIN EN ISO 4918

colour fastness to light
≥ 5
DIN EN 1307 | DIN EN ISO 105-B02

colour fastness to water
≥ 4
DIN EN 1307 | DIN EN ISO 105-E01

colour fastness to rubbing
≥ 3-4
DIN EN 1307 | DIN EN ISO 105-X12

resistance of cut edges
DIN EN ISO 10833

slip resistance μ
≥ 0,30
DIN EN 14041 | DIN EN 13893

thermal resistance
ca. 0,15 m²K/W
DIN EN 12667

impact sound reduction ΔL_w
ca. 28 dB
DIN EN ISO 717-2 | DIN EN ISO 10140-3

sound absorption α_w
ca. 0,2
DIN EN ISO 354

electrical behaviour
body voltage ≤ 2 kV
ISO 6356

reaction to fire
Bfl-s1
DIN EN 13501-1 | DIN EN ISO 9239-1, 11925-1

0098/2023

We reserve the right to make technical changes that serve to improve quality. In rare cases, permanent shading may occur in velour carpets without impairing the usability. The cause of this is not due to the material or construction. Therefore, no warranty can be assumed for this. Halbmond's carpets and rugs must be installed in accordance with the respective Halbmond installation recommendations and the state of the art. All information is based on current knowledge and experience. They can only be general information without guarantee of properties, as we have no influence on the construction site conditions and processing. Due to the wide range of possible influences when using our products, they do not exempt the installer from carrying out his own tests and trials. Regular maintenance cleaning is decisive for the cleanliness, value retention and good appearance of the floor covering.

The terms in the Halbmond data sheet are based on the norm DIN EN 1307, but there are also various synonyms for some terms, depending on the source. The most common are summa - rised here.

Fig. 2: synonymous terms

delivery form

The delivery form indicates in which configuration the carpet is delivered to the customer.

roll

The roll has a defined maximum width, but can be produced in almost endless lengths. For practical reasons, it is often cut directly to the room dimensions. Rolls are usually glued to the floor.
If it is used in the commercial sector, the provisions of the Construction Products Regulation apply.

module

Modules are pieces of carpet cut from rolls of different shapes and sizes. A square module is usually referred to as a tile, while a plank is a rectangular, long module. Carpet modules can be freely combined, are easy to transport due to their small size and can be replaced individually if damaged or soiled. The modules do not necessarily have to be glued to the floor.
If they are used in commercial areas, the provisions of the Construction Products Regulation apply.

rug & mat

The rug can come in different sizes and shapes, but is usually rectangular. It has a corresponding edge finish so that it can be laid directly on the floor of the room, but is not usually glued to it. For this reason, overlay rugs also have to fulfil less stringent requirements than glued rolls, for example. This also applies to entrance mats and bath mats.
> Nevertheless, Halbmond finishes rugs like rolls to meet the highest standards.

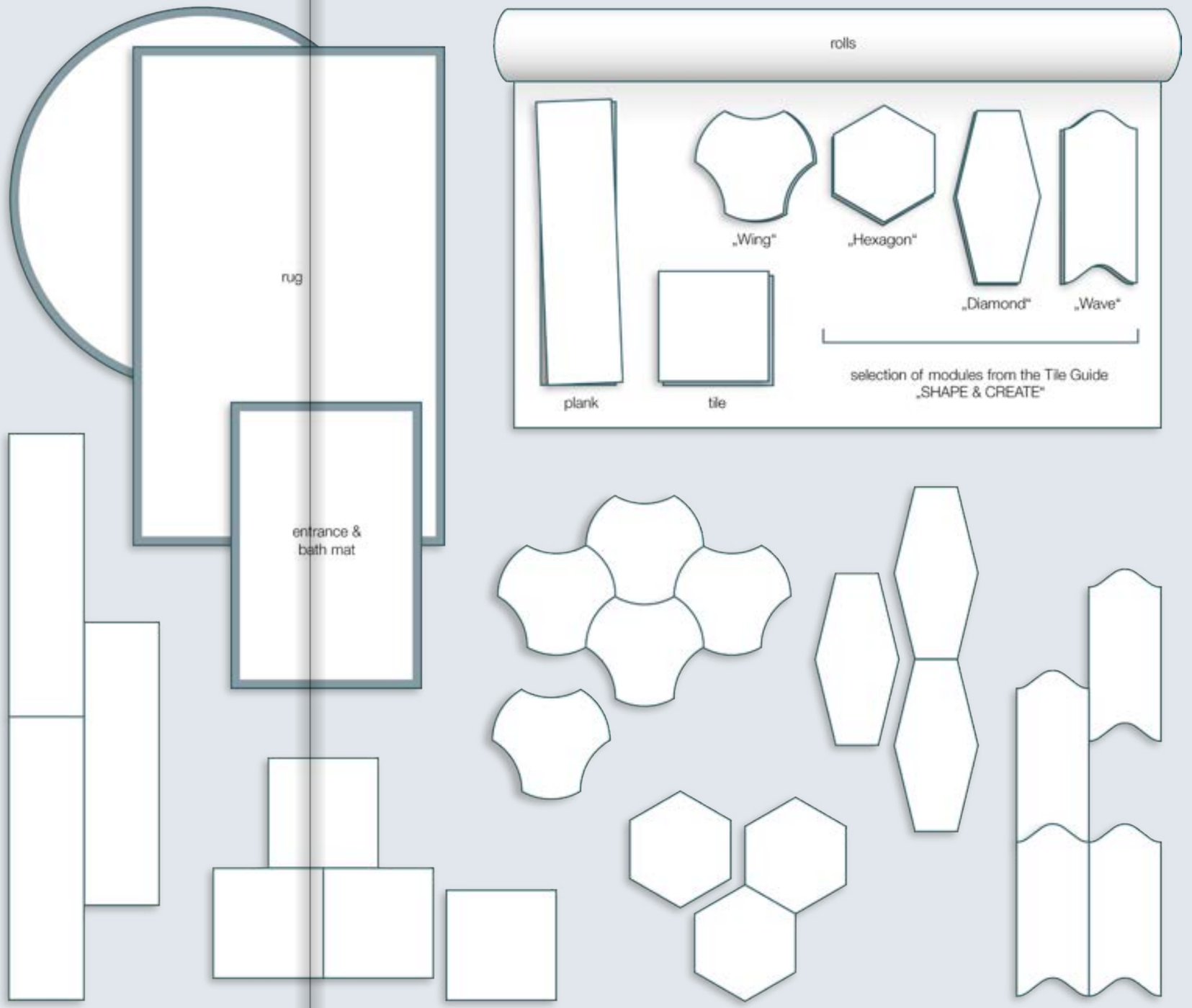


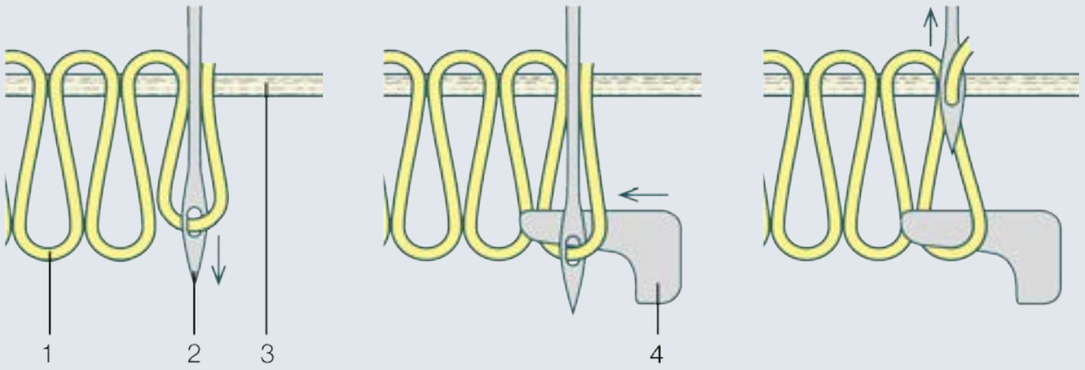
Fig. 3: delivery forms

construction

The construction describes the technical manufacturing process of the rug or carpet. Rugs are usually tufted, woven or knotted.
> Halbmond generally uses a tufted carpet base.

tufting

Tufting is a technique for creating three-dimensional textile surfaces in which a thread (Fig. 4, No. 1) is inserted into the primary backing (Fig. 4, No. 3) from the back with a needle (Fig. 4, No. 2) and held by a hook (Fig. 4, No. 4) when the needle is withdrawn, so that it comes out at the front as a loop (Fig. 5, No. 1). Many dense rows of these pile nubs form the pile or pile layer (Fig. 5, No. 3). If the loop heads are cut off, a cut pile is formed (Fig. 5, No. 3a).
> If a Halbmond carpet or rug is to be created from the tufted material, the pre-coating (Fig. 5, No. 4) must be applied to the back of the primary backing for nap binding. The coating (Fig. 5, No. 5) and secondary backing (Fig. 5, No. 6) complete the carpet backing (Fig. 5, No. 8).



1 thread
2 needle
3 primary backing
4 hook

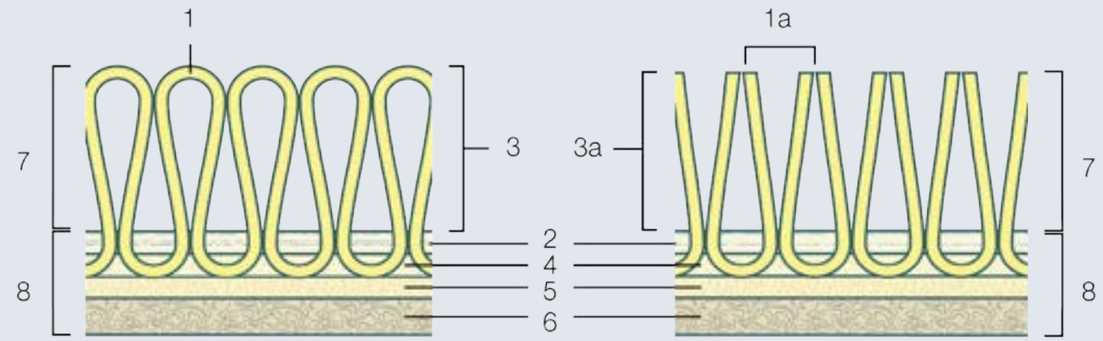
Fig. 4: tufting

tufted loop pile

A tufted quality whose pile loops are not cut is called tufted loop pile (Fig. 5, No. 1). The appearance is reminiscent of standard terry towels - these usually have uncut, small loops - although the manufacturing process is different.

tufted cut pile

Tufted cut pile is a tufted material with open yarn ends on the front, which is produced from looped fabric by cutting off the loop heads (Fig. 5, No. 1a). The appearance of tufted cut pile without a heat setting is comparable to that of velvet, whereas thermofixed or chemofixed yarns form a grainy surface. For the layman, the machine-tufted cut pile can hardly be distinguished from a hand-knotted carpet.



1 loop (1a cut)
2 primary backing
3 pile (3a cut pile)
4 pre-coating
5 coating
6 secondary backing
7 use surface (3/3a)
8 carpet backing (2, 4, 5, 6)

Fig. 5: layers of tufted carpet

gauge

The gauge provides information about the distances between the needles or pile loops and therefore also their number per inch. For example, a product with a gauge of 1/8“ has 8 columns of stitches over a distance of 1 inch (2.54 cm) in the transverse direction of the tufted material, while a product with a gauge of 1/10“ has 10 stitch columns over the same distance. The density of the stitches in the longitudinal direction cannot be determined from this value (but can be calculated from the number of tufts and the gauge if required).

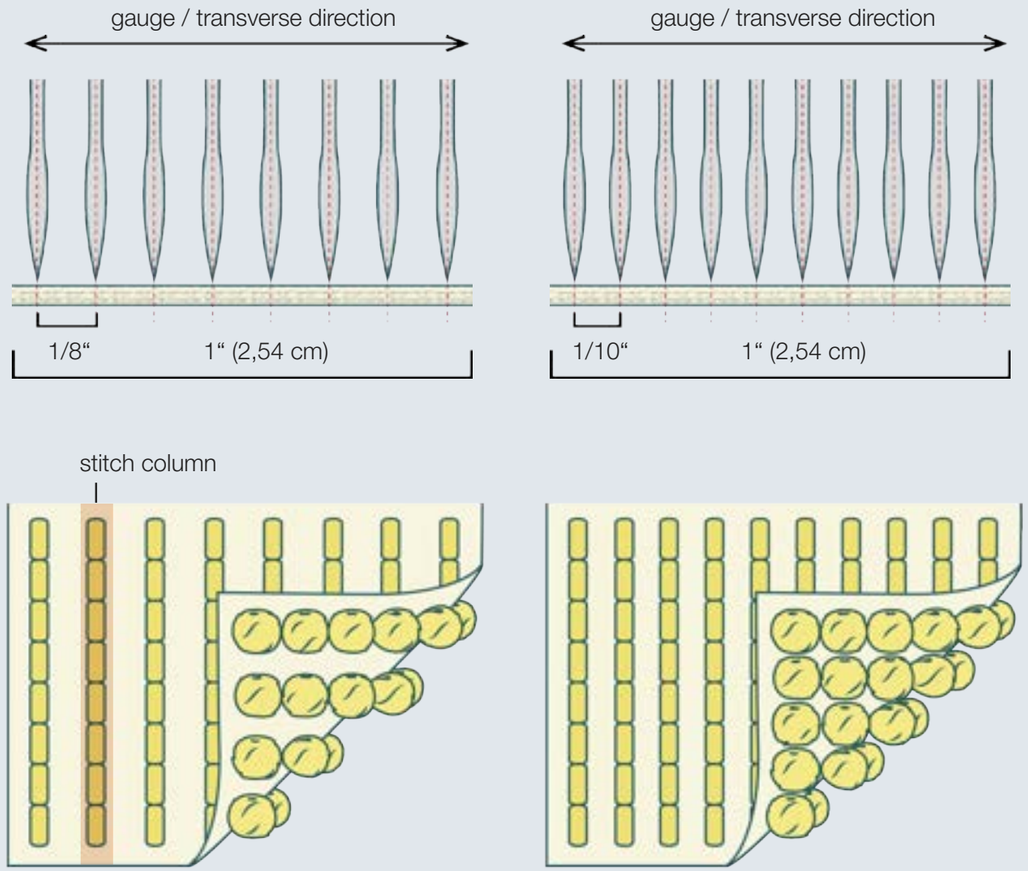


Fig. 6: gauge 1/8“ and 1/10“

Fig. 7: tufted cut pile without coating and secondary backing

Fig. 8: pile layer of tufted cut pile

pile material

The material from which the yarn for the pile threads is made is called pile material. This must be clearly labelled with prescribed formulations in accordance with the Textile Labelling Act. The most common pile materials for carpets and rugs are polypropylene (PP), polyester (PES), polyamide (PA) and wool (WO).

> Halbmond mainly uses polyamide (Fig. 9, No. 1a) because it is the most hard-wearing fibre. However, natural fibres such as wool blended with polyamide (Fig. 9, No. 2) and pure linen (LI) (Fig. 9, No. 3) are also processed. If recycled polyamide (Fig. 9, No. 1b) is used, this cannot initially be recognised by the material designation „PA“ itself, as it is chemically identical to first qualities. However, it is then always labelled as recycled yarn by both the yarn manufacturer and the carpet producer.

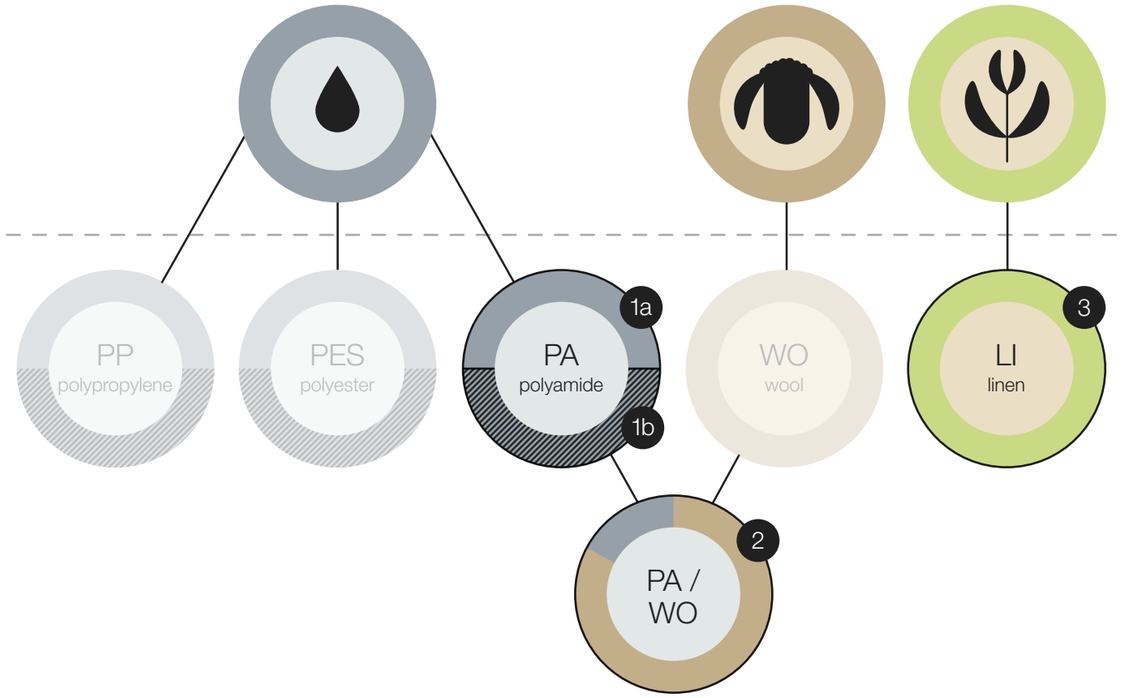


Fig. 9: pile material overview

primary backing

The primary backing is the textile base layer into which the pile threads are stitched (Fig. 10 and 11). This can be a woven or non-woven fabric and can consist of either a pure material or a mixture of materials.

secondary backing

The secondary backing (Figs. 11, 12 and 13) is part of the carpet backing just like the pre-coating and coating (Fig. 11). The secondary backing has direct contact with the floor. It can be a woven fabric or non-woven like fleece or felt, for example, and fulfils various technical functions, in particular it has an acoustic and heat-insulating effect.

> Due to the wide range of requirements and applications, Halbmond uses both woven and non-woven fabrics of different thicknesses, densities and compositions as secondary backing. The customer therefore not only receives a surface as desired, but also the fulfilment of his functional suitability profile on the back of the carpet or rug.

Fig. 10: non-woven primary backing from below, no backing

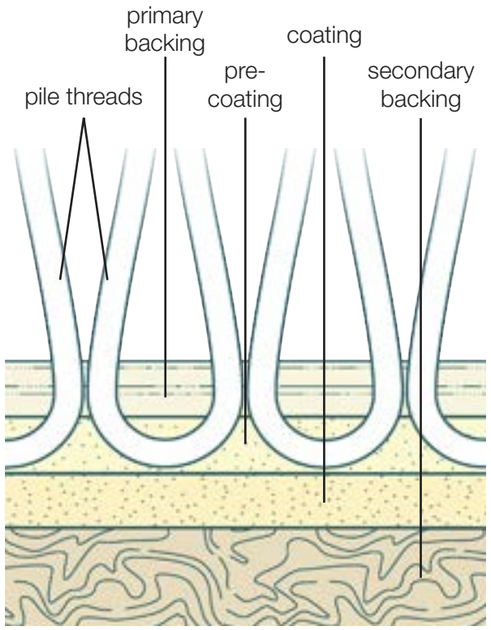


Fig. 11: layers of tufted carpet

non-woven

A non-woven is a flat material consisting of single, disordered fibres. There are non-wovens whose fibre bonding is achieved entirely mechanically (e.g. needled non-wovens, hydroentangled non-wovens), those that are fused under the influence of heat (e.g. thermal bond non-wovens) and - more rarely - non-wovens that are bonded using a binding agent.

> Halbmond uses non-wovens as primary backings because they are more dimensionally stable than woven fabrics. They usually consist of a mixture of 75% polyester (PES) and 25% polyamide (PA).

> Non-wovens in the grammages 120g/m², 280g/m², 550g/m², 600g/m² and 1000g/m² are used for the secondary backing. All non-wovens are needled and - apart from the 280g and 550g qualities - additionally heat-set, which results in a denser, firmer structure. The 120g non-woven secondary backing is used in combination with the heavy coating „Easy-Lift“ (EL) , particularly for modules. For large tiles (e.g. 1.92m x 1.92m), the 1000g quality is generally used in conjunction with „Easy-Lift“. Halbmonds non-woven secondary backings are made of 100% polyester (PES), which comes from recycled PET bottles. In addition, a viscose (VI) variant is also available.

woven

A woven fabric is a two-dimensional structure of threads that are usually arranged at right angles to each other and interwoven according to a specific weave binding.

> Halbmond only uses a woven primary backing for the linen carpets and linen rugs from the LIN series. This woven fabric is also made of linen and is even compostable as part of the product LIN Komp.

> For a long time, the entire carpet industry only used a polyester fabric as the secondary backing to give the tufted base carpet additional strength and dimensional stability. At Halbmond, this polyester fabric is still chosen as the secondary backing in just over half of all cases. For LIN and LIN Komp linen carpets biodegradable jute fabric is used as secondary backing.

Fig. 12: non-woven secondary backing from below

Fig. 13: woven secondary backing from below

pattern

Pattern design can be achieved in textile production using different processes.
*> At Halbmond, the pattern design is usually created by printing on the tufted, white base material, with a choice of two processes: On the **Colaris printing machine**, a few basic colour inks are used, from which all other colours can be mixed in the process (process colours). On the **Chromojet printing machine**, a selection of pre-mixed colour pastes (solid colours) are used.*

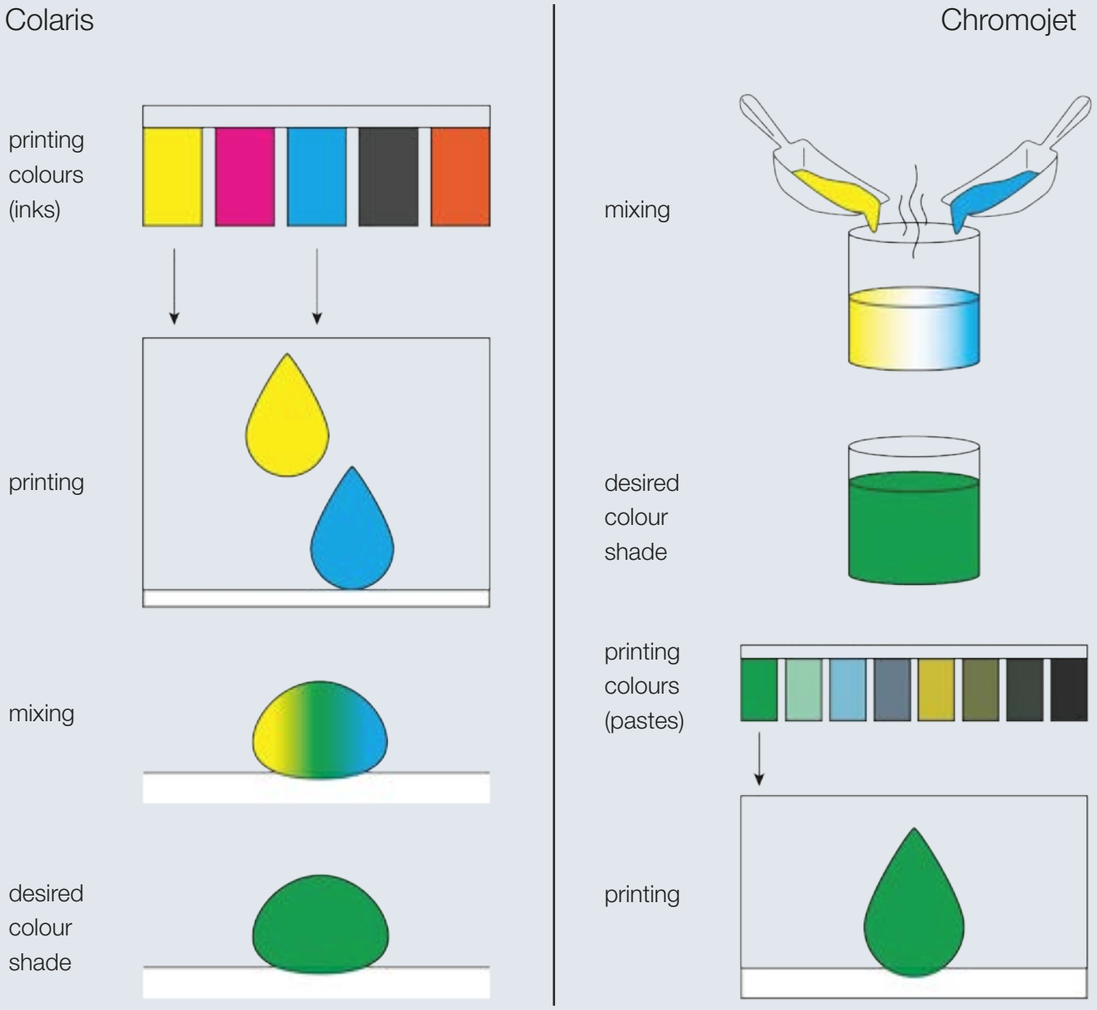


Fig. 14: printing with Colaris and Chromojet

total weight

The total weight indicates how much a square metre of the carpet or rug weighs including all layers (Fig. 15, No. 1).

total thickness

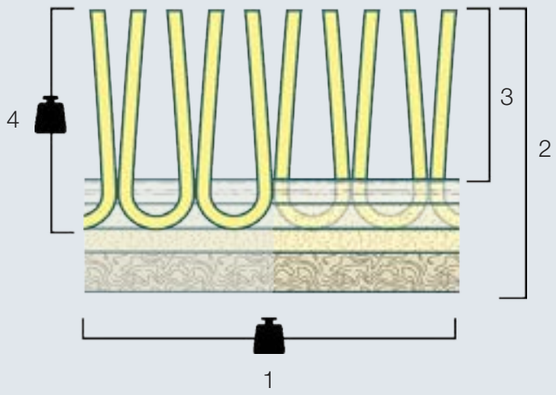
The total thickness indicates how thick the carpet or rug is including all layers (Fig. 15, No. 2).

pile thickness

The pile thickness indicates the height of the visible threads protruding from the primary backing above the ground. The part embedded in the carpet or rug is not measured (Fig. 15, No. 3).

total pile yarn weight

The pile weight indicates how much thread material has been used to produce the pile per square metre, i.e. how much is above, inside and below the primary backing (Fig. 15, No. 4). This value can no longer be measured after completion of the carpet or rug, but can only be determined approximately by calculation.



1 total weight
2 total thickness
3 pile thickness
4 total pile yarn weigth

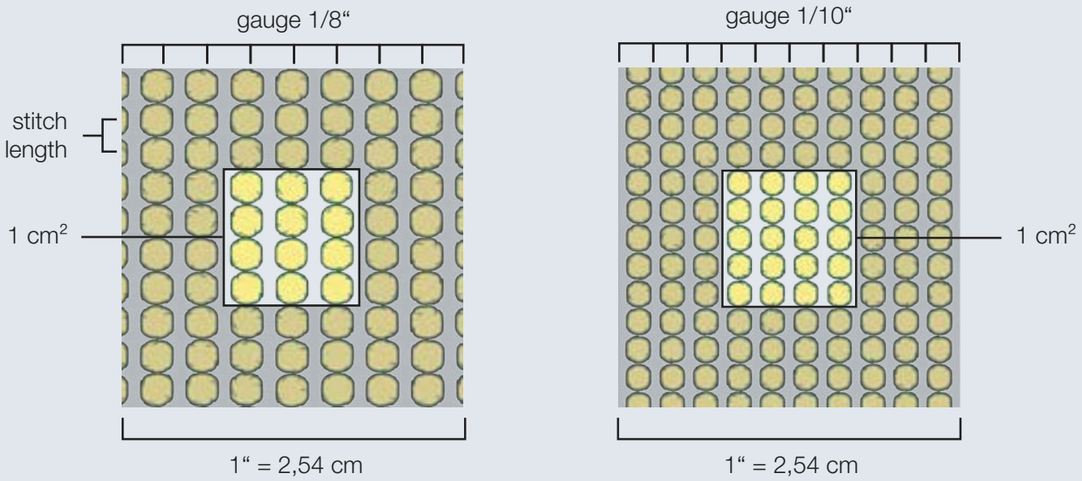
Fig. 15: thickness and weight

pile density

Pile thickness doesn‘t tell the whole story, nor does the total pile yarn weight. A carpet can be high, but does not necessarily have to weigh a lot if it is only loosely tufted. In industry jargon, this is referred to as a „blender“, as the carpet looks voluminous, but its durability does not allow it to be used in commercial properties. Only the combination of pile thickness and total pile yarn weight provides a reliable indication of the quality of a carpet or rug. In this context, the term „pile density“ is used. It provides information on how much pile material is located in a certain area of the carpet above the primary backing. A higher pile density leads to the conclusion that the overall performance characteristics are improved and, in particular, that the acoustic effectiveness is better.

number of tufts

The number of tufts indicates how many loops are present on one square metre of the floor covering. Either a pile loop (Fig. 5, No. 1) or two pile thread ends (Fig. 5, No. 1a) are counted as a tuft on the front side, while each stitch (piece of thread between two stitching points) is counted on the back side. The number of tufts is not only determined by the gauge, but also by the stitch length and thus the distance between the tufts in the longitudinal direction. The high value in the data sheet is easier to understand if you first look at the number of tufts per square centimetre (Fig. 16) and then calculate it per square metre.



Ex. 1: number of tufts 12/cm² = 120.000/m²

Ex. 2: number of tufts 20/cm² = 200.000/m²

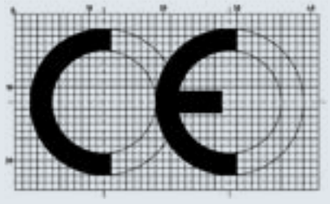
Fig. 16: number of tufts

CE-number

The CE-marking indicates that a product has „conformité européenne“ (European conformity), i.e. that all the requirements placed on this product by the EU have been met. The CE-marking can be presented in more or less detail, but always contains the standardised CE-mark.

> At Halbmond, the CE-marking is shown as below and can be read as follows:

The first 4 digits of the CE-number indicate the „notified body“ (test centre) that has awarded the CE-mark. The assignment can be looked up in a suitable register. The letters „CPR“ indicate that the product has been tested in accordance with the „Construction Products Regulation“. The last digits refer to a specific test certificate.



1658 - CPR - 3139

registered code number of the „notified body“ (test centre)

tested in accordance with the „Construction Products Regulation“

Code number of a specific test certificate

Fig. 17: CE-number

DoP-number

The term DoP stands for „Declaration of Performance“. It confirms the consistent quality (through constant monitoring) of the approved articles and is required in addition to the CE-number in order to be able to call up the corresponding Declaration of Performance.

Prodis-licence-number

The association „Gemeinschaft umweltfreundlicher Teppichboden e.V.„ (GUT) has been campaigning for environmental standards in the textile flooring industry since 1990. The eight-digit Prodis-licence-number consisting of letters and numbers must be entered on the GUT-Prodis website in order to access the Product Passport for the respective article. Alternatively, the QR code of the GUT-Prodis label can also be scanned. The Product Passport contains all the information on the data sheet, as well as more detailed information on the materials used and their environmental compatibility. However, it is only available online, not as a PDF.

> Below is shown an excerpt from the GUT-Prodis Product Passport for the Halbmond product „LIN Komp“ with the Prodis-licence-number 40A01761.

https://gut-prodis.eu/en/product-testing-gut/product-passport

GUT-Prodis Product Passport

Home | Product testing | Sustainability | Environment & Health | Info

The Licence Number

Each licence number is unique to each carpet and identifies the product and manufacturer. When used with the QR code, all the information on the Product Passport can be accessed directly from the GUT - PRODIS database.

40A01761

→ OK

Basic product information

Product Name

LIN Komp

Digital CE-Label

EN 14041

CE

The manufacturer does not yet provide the requested information online

GUT-PRODIS-Label

40A01761

Details of the selected product

PRODUCT DESCRIPTION

MORE INFORMATION

- Name of product: LIN Komp
- carpet type: Bahnenware
- carpet type: Pile carpet
- Use layer (structure): loop/cut pile
- Use layer (color and pattern): C2 - patterned
- Composition of surface: 100,00% sisal/jute/linen/bamboo (Recycled proportion: 0,00%)
- Primary backing: woven - natural fibre
- Backing: textile backing woven-textile fabric based - natural fibre
- total thickness: 5,6 [mm]
- total mass: 3005,0 [g/m²]
- surface pile thickness: 1,0 [mm]
- weight of use surface: 210,0 [g/m²]
- number of tufts: 1039,5 [1/dm²]
- surface pile density: 0,2 [g/cm³]

PROPERTIES OF USE

MORE INFORMATION

- Use class: 32
- Luxury Class: LC1
- castor chair suitability: Castor chair continuously
- stair suitability: No informations available
- Resistance to fraying: No informations available
- Impact noise: No informations available
- Accoustical absorption: No informations available
- Dimensional stability: No informations available
- Light fastness: No informations available

INFORMATION ON EMISSIONS, CHEMICALS AND POLLUTANTS

MORE INFORMATION

- VOC-Emissions: TVOC 28 < 100 [µg/m³]. Details...
- Formaldehydemission: < 10 [µg/m³]. The product meets the requirements of GUT. additional info...
- Flame retardants:
  For compliance with the fire class B_2S_1 was ATH (Aluminiumtrihydroxid) added as flame retardant.
  What is ATH?...
- Biocides:
  The limits for possible residual contents of in-can preservatives, which may originate from the stabilisation of raw materials, are complied with. see Biocides...
- Active biocidal finishing: According to the GUT criteria none biocidal treatment was applied.
- Dyestuff classes used: reactive
- Azo dyes: Have not been used according to the GUT list of banned substances. additional info...
- Allergenic and carcinogenic dyes:
  Have not been used according to the GUT list of banned substances. additional info...
- Organic dyeing accelerators (e.g. chlorophenols):
  Have not been used according to the GUT list of banned substances. additional info...
- Plasticisers and phthalates:
  Have not been used according to the GUT list of banned substances. additional info...
- Polycyclic aromatic hydrocarbons: The limit values according to GUT criteria were met. additional info...
- Heavy metals: The GUT limits for contents and eluates (releasable amounts) were met. additional info...

SVHC - SUBSTANCES

MORE INFORMATION

In this module you will find information on the content of so-called SVHC substances (Substances of Very High Concern)
Within the framework of the GUT criteria, active use of SVHC substances in the manufacture of textile floor coverings is not permitted.
According to REACH Art 33 there is an obligation to inform as soon as SVHC substances are contained in a product in concentrations of > 0.1 weight percent.
Based on the weight of an average carpet, a content of 0.1% corresponds to a quantity of SVHC of 1.7 g/m².

In the product passport the information is provided in 3 steps even if the legally required limit of 0,1 weight percent is not reached.

A)
The product contains SVHC substances based on the current candidate list in concentrations below 0.1 % (1 g/kg).
Name and CAS number of the substance(s)

B)
The product contains SVHC substances based on the current candidate list in concentrations below 0.05 % (0.5 g/kg).
Name and CAS number of the substance(s)

C)
The product contains no SVHC substances based on the current candidate list

This information will be available from spring 2021.

Fig. 18: Excerpt from GUT-Prodis Product Passport for the HALBMOND product „LIN Komp“

Environmental Product Declaration (EPD)

The Environmental Product Declaration of the Institut Bauen und Umwelt e.V. provides the information that is relevant for assessing a building product with regard to its suitability for sustainable construction in a standardised, clearly summarised and comparable format. The entire life cycle of a product is considered, including its disposal. Unlike the GUT-Prodis Product Passport, which is specifically designed for carpets, the Environmental Product Declaration is designed for all construction products. It can be viewed in the online database of published EDPs and can also be downloaded as a PDF or XML file.

> The Environmental Product Declaration EPD-HBM-20230143-CBC1-EN, valid for a Halmbond product group with similar properties, is shown below.

https://ibu-epd.com/veroeffentlichte-epds/

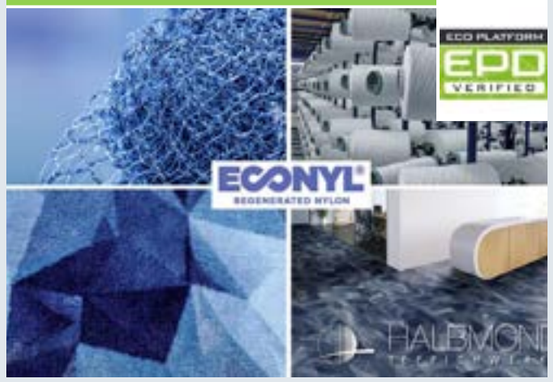
ENVIRONMENTAL PRODUCT DECLARATION
as per *ISO 14025* and *EN 15804+A2*

Owner of the Declaration	Halbmond Teppichwerke GmbH
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-HBM-20230143-CBC1-EN
Issue date	05.05.2023
Valid to	04.05.2028

Tufted wall-to-wall carpet with a pile material of PA 6 Econyl® with 100% recycled content and a felt backing of 600 g/m2 PET

Halbmond Teppichwerke GmbH

www.ibu-epd.com | https://epd-online.com



General Information

Halbmond Teppichwerke GmbH

Programme holder
IBU – Institut Bauen und Umwelt e.V.
Hegelplatz 1
10117 Berlin
Germany

Declaration number
EPD-HBM-20230143-CBC1-EN

This declaration is based on the product category rules:
Floor coverings, 01.08.2021
(PCR checked and approved by the SVR)

Issue date
05.05.2023

Valid to
04.05.2028

Dipl.-Ing. Hans Peters
(Chairman of Institut Bauen und Umwelt e.V.)

Florian Pronold
(Managing Director Institut Bauen und Umwelt e.V.)

Tufted wall-to-wall carpet with a pile material of PA 6 Econyl® with 100% recycled content and a felt backing of 600 g/m2 PET

Owner of the declaration
Halbmond Teppichwerke GmbH
Brückenstraße 1
08606 Oelsnitz
Germany

Declared product / declared unit
Tufted wall-to-wall carpet with a pile material of PA 6 with 100% recycled content and a felt backing of 600 g/m² PET with 99.6% recycled content

Scope:
The manufacturer declaration applies to tufted wall-to-wall carpet with a PET felt backing, a pile material of PA 6 with 100% recycled content and a maximum total pile weight of 745 g/m². The products are produced in Oelsnitz/Vogtl., Germany.
The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

The EPD was created according to the specifications of EN 15804+A2. In the following, the standard will be simplified as *EN 15804*.

Verification

The standard EN 15804 serves as the core PCR
Independent verification of the declaration and data according to ISO 14025:2011
☐ internally [X] externally

Angela Schindler,
(Independent verifier)

Fig. 19: Example of Environmental Product Declaration for HALBMOND product „Art 1400“ and similar

Product

Product description/Product definition
The declaration applies to tufted wall-to-wall carpets having a surface pile of 100% recycled solution dyed polyamide 6 with a maximum total pile weight of 745 g/m². The backing of the carpet consists of a felt backing of 600 g/m² PET with 99.6% recycled content. The total recycled content of the carpet is 57%. The chromojet printing system allows the creation of various designs. For the placing on the market of the specific product in the European Union/European Free Trade Association (EU/EFTA) (with the exception of Switzerland) *Regulation (EU) No. 305/2011* Construction Product Regulation (CPR) applies. The product needs a Declaration of Performance (DoP) taking into consideration *EN 14041*:2018-05, Resilient, textile and laminate floor coverings - Essential characteristics, and the CE-marking. The DoP of the product can be found on the manufacturer's technical information section. For the application and use of the product the respective national provisions apply.

Application
The use class of the specific product as defined in *EN 1307* can be found in the Product Information System (*PRODIS*) using the *PRODIS* registration number of the product.

Technical Data

Constructional data according to EN 1307

Name	Value	Unit
Product Form	Wall-to-wall carpet on rolls	-
Type of manufacture	Tufted carpet	-
Yarn type	PA 6 with 100% recycled content	-
Total carpet weight	2365	g/m²
Secondary backing	PET felt backing	-
Total pile weight	745	g/m²

Performance data of the product in accordance with the declaration of performance with respect to its essential characteristics according to *EN 14041*: 2018-05, Resilient, textile and laminate floor coverings - Essential characteristics. Additional product properties in accordance with *EN 1307* can be found on the Product Information System *PRODIS* using the *PRODIS* registration number of the product (www.pro-dis.info) or on the manufacturer's technical information section.

Base materials/Ancillary materials

Name	Value	Unit
Polyamide 6	32.7	%
Polyester	29.2	%
SBR Latex	13.9	%
Limestone	13.0	%
Aluminium Hydroxide	10.3	%
Additives	0.9	%

The specific product covered by the EPD contains substances listed in the *ECHA candidate list* (17.01.2023) or other carcinogenic, mutagenic or reprotoxic (CMR) substances in categories 1A or 1B which are not on the candidate list exceeding 0.1 percentage by mass: no
The products are registered in the GUT-*PRODIS* Information System. The *PRODIS* system ensures the compliance with limitations of various chemicals and Volatile Organic Compound (VOC)-emissions and a ban on the use of all substances that are listed as 'Substances of Very High Concern' (SVHC) under *REACH*.

Reference service life
The service life of textile floor coverings strongly depends on the correct installation taking into account the declared use classification and the adherence to cleaning and maintenance instructions.
A calculation of the reference service life according to *ISO 15686* is not possible. Alternatively, a reference service life of 10 years can be assumed, during which the functional and visual quality is guaranteed *(BNB, Nutzungsdauer von Bauteilen)*. The technical service life can be significantly longer.

LCA: Calculation rules

Declared Unit

Name	Value	Unit
Declared unit	1	m²
Grammage	2.365	kg/m²

The declared unit refers to 1 m² produced textile floor covering. The Output of module A5 'Assembly' is 1 m² installed textile floor covering.
The layer thickness of the specific product covered by the EPD can be found on the Product Information System *PRODIS* using the *PRODIS* registration number of the product (www.pro-dis.info) or on the manufacturer's technical information section.

System boundary
Type of EPD:
Cradle-to-gate with options, module C1-C4, module D, and additional modules *A4*, A5, B1, B2.
System boundaries of modules A, B, C, D:
Modules C3, C4 and D are indicated separately for three end-of-life scenarios:
1 - landfill disposal
2 - municipal waste incineration
3 - recovery in a cement plant

A1-A3 Production:
Energy supply and production of the basic material, processing of secondary material, auxiliary material, transport of the material to the manufacturing site, emissions, waste water treatment, packaging material and waste processing up to the landfill disposal of residual waste (except radioactive waste). Benefits for generated electricity and steam due to the incineration of production waste are aggregated. Biogenic carbon that is stored in renewable material (packaging paper) is taken into account as well as the associated carbon dioxide uptake from the air from which this biogenic carbon comes.

A4 Transport:
Transport of the packed textile floor covering from factory gate to the place of installation.

A5 Installation:
Installation of the textile floor covering, processing of installation waste and packaging waste up to the landfill disposal of residual waste (except radioactive waste), the production of the amount of carpet that occurs as installation waste including its transport to the place of installation. Generated electricity and steam due to the incineration of waste are listed in the result table as exported energy. Biogenic carbon that is stored in renewable materials in packaging paper is released as carbon dioxide emissions into the air at the end of life in module A5. Preparation of the floor and auxiliary materials (adhesives, fixing agents, PET connectors) are beyond the system boundaries and not taken into account.

B1 Use:
Indoor emissions during the use stage. After the first year, no product-related Volatile Organic Compound (VOC) emissions are relevant due to known VOC decay curves of the product.

B2 Maintenance:
Cleaning of the textile floor covering for a period of 1 year:
Vacuum cleaning – electricity supply
Wet cleaning – electricity, water consumption, production of the cleaning agent, waste water treatment.
The declared values in this module have to be multiplied by the assumed service life of the floor covering in the building in question.

B3 - B5:
The modules are not relevant within the assumed reference service life of 10 years.

B6 - B7:
No energy and water input are required for the operation of the carpet in the use stage. The modules do not cause any environmental impact.

C1 De-construction:
The floor covering is de-constructed manually and no additional environmental impact is caused.

C2 Transport:
Transport of the carpet waste to a landfill, to the municipal waste incineration plant (MWI) or to the waste collection facility for recycling.

C3 Waste processing:
C3-1: Landfill disposal needs no waste processing.
C3-2: Impact from waste incineration (plant with R1>0.6), generated electricity and steam are listed in the result table as exported energy.
C3-3: Collection of the carpet waste for recovery in the cement industry,
waste processing (granulating), transport to the cement plant, emissions
from the incineration.

C4 Disposal
C4-1: Impact from landfill disposal,
C4-2: The carpet waste leaves the system in module C3-2,
C4-3: The pre-processed carpet waste leaves the system in module C3-3.

D Recycling potential:
Calculated benefits result from materials exclusive secondary materials (net materials).
D-A5: Benefits for generated energy due to incineration of packaging and installation waste (incineration plant with R1 > 0.6),
D-1: Benefits for generated energy due to landfill disposal of carpet waste at the end-of-life,
D-2: Benefits for generated energy due to incineration of carpet waste at the end-of-life (incineration plant with R1 > 0.6),
D-3: Benefits for saved fossil energy and saved inorganic material due to recovery of the carpet in a cement plant.

Geographic Representativeness
Land or region, in which the declared product system is manufactured, used or handled at the end of the product´s lifespan: Europe

Comparability
Basically, a comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to *EN 15804* and the building context, respectively the product-specific characteristics of performance, are taken into account. Background data are taken from the GaBi database, 2022-2. Remaining data gaps are covered by the ecoinvent 3.7 database, 2020

LCA: Scenarios and additional technical information

Characteristic product properties of biogenic carbon

Name	Value	Unit
Biogenic carbon content in accompanying packaging at factory gate	0.013	kg C

1 kg biogenic Carbon is equivalent to 44/12 kg of CO_2

Name	Value	Unit
Material loss	0.213	kg

Polyethylene packaging waste and installation waste are considered to be incinerated in a municipal waste incineration plant. Cardboard packaging waste is going to be recycled. Preparation of the floor and auxiliaries (adhesives, fixing agents, PET connectors etc.) are not taken into account.

Transport to the construction site (A4)

Name	Value	Unit
Litres of fuel (truck, EURO 0-6 mix)	0.0055	l/100km
Transport distance	700	km
Capacity utilisation (including empty runs)	55	%

Maintenance (B2)
The values for cleaning refer to 1 m² floor covering per year. Depending on the application based on *ISO 10874*, the technical service life recommended by the manufacturer and the anticipated strain on the floor by customers, the case-specific useful life can be established. Based on this useful life the effects of module B2 need to be calculated in order to obtain the overall environmental impacts.

Installation in the building (A5)

Name	Value	Unit
Maintenance cycle (vacuum cleaning)	208	Number /year
Maintenance cycle (wet cleaning)	1.5	Number /year
Water consumption (wet cleaning)	0.004	m³
Cleaning agent (wet cleaning)	0.09	kg
Electricity consumption	0.314	kWh

For further information on cleaning and maintenance see www.halbmond.de

Service life

Name	Value	Unit
Life Span (according to BBSR)	10	a
Declared product properties (at the gate) and finishes	Corresponds to the specifications of EN 1307	-
An assumed quality of work, when installed in accordance with the manufacturer's instructions	Conforms to the manufacturer's instructions	-
Usage conditions, e.g. frequency of use, mechanical exposure	Use in areas defined by the use class according to EN 1307	-
Maintenance e.g. required frequency, type and quality and replacement of components	According to the manufacturers instructions	-

End of Life (C1-C4)
Three different end-of-life scenarios are declared and the results are indicated separately in module C.

Name	Value	Unit
Collected as mixed construction waste (scenario 1 and 2)	2.365	kg
Collected separately waste type (scenario 3)	2.365	kg
Landfilling (scenario 1)	2.365	kg
Energy recovery (scenario 2)	2.365	kg
Energy recovery (scenario 3)	1.816	kg
Recycling (scenario 3)	0.549	kg

Reuse, recovery and/or recycling potentials (D), relevant scenario information
Recovery or recycling potentials due to the three end-of-life scenarios (module C) are indicated separately.

Recycling in the cement industry (scenario 3)
The organic material of the carpet is used as an alternative fuel in a cement kiln. It mainly substitutes for lignite (68.8 %), hard coal (23.6 %) and petrol coke (7.6 %). The inorganic material is substantially integrated into the cement clinker and substitutes for original material input. *VDZ e.V.*

Each scenario is calculated as a 100% scenario.
Scenario 1: 100 % landfill disposal
Scenario 2: 100 % municipal waste incineration (MWI) with R1>0.6
Scenario 3: 100 % recovery in the cement industry

If combinations of these scenarios have to be calculated this should be done according to the following scheme:
EOL-impact = x % impact (Scenario 1)
+ y % impact (Scenario 2)
+ z % impact (Scenario 3)
with x % + y % + z % = 100 %

LCA: Results

The LCA results refer to all declared products with a maximum total pile weight of 745 g/m². The declared result figures in module B2 have to be multiplied by the assumed service life (in years) of the floor covering in the building under consideration. Information on non-relevant modules: Modules B3 - B7 are not relevant during the service life of the carpet. Modules C1, C3/1, C4/2 and C4/3 cause no additional impact (see chapter "LCA: Calculation rules" in this document). All these modules are declared and marked as 'modules not relevant/declared'. Module C2 represents the transport for scenarios 1, 2 and 3. Column D represents module D/A5.

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; MND = MODULE OR INDICATOR NOT DECLARED; MNR = MODULE NOT RELEVANT)

Product stage				Construction process stage		Use stage							End of life stage				Benefits and loads beyond the system boundaries
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	X	X	MNR	MNR	MNR	MND	MND	X	X	X	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: 1 m² floor covering

Parameter	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3/2	C3/3	C4/1	D	D/1	D/2	D/3
GWP-total	kg CO_2 eq.	6.12E+00	1.43E-01	9.9E-01	0	4.16E-01	0	8.02E-03	3.95E+00	3.99E+00	1.68E-01	-2.65E-02	0	-1.79E-01	-1.31E-01
GWP-fossil	kg CO_2 eq.	6.05E+00	1.4E-01	9.36E-01	0	2.15E-01	0	7.88E-03	3.95E+00	3.99E+00	1.68E-01	-2.63E-02	0	-1.78E-01	-1.31E-01
GWP-biogenic	kg CO_2 eq.	6.14E-02	1.81E-03	5.37E-02	0	4.16E-03	0	1.02E-04	3.98E-04	7.62E-04	-2.72E-08	-1.32E-04	0	-8.79E-04	-2.4E-04
GWP-luluc	kg CO_2 eq.	6.86E-03	7.93E-04	6.98E-04	0	1.96E-01	0	4.47E-05	6.51E-05	1.79E-04	8.16E-05	-2.83E-06	0	-1.87E-05	-7.29E-05
ODP	kg CFC11 eq.	2.21E-07	8.53E-15	1.99E-08	0	3.42E-08	0	4.8E-16	3.47E-13	5.25E-13	2.25E-13	-1.73E-13	0	-1.14E-12	-1.11E-13
AP	mol H⁺ eq.	1.89E-02	8.48E-04	2.11E-03	0	8.32E-04	0	4.75E-05	3.62E-03	3.77E-03	4.97E-04	-3.4E-05	0	-2.27E-04	-6.07E-04
EP-freshwater	kg P eq.	4.82E-04	4.25E-07	4.35E-05	0	5.19E-06	0	2.39E-08	2.84E-07	3.79E-07	3.12E-05	-3.52E-08	0	-2.33E-07	-1.6E-07
EP-marine	kg N eq	6.11E-03	4.16E-04	7.5E-04	0	1.97E-04	0	2.34E-03	1.79E-03	1.85E-03	1.1E-04	-9.32E-06	0	-6.25E-05	-1.71E-04
EP-terrestrial	mol N eq.	6.7E-02	4.61E-03	7.38E-03	0	2.63E-03	0	2.6E-04	2.01E-02	2.26E-02	1.21E-03	-9.98E-05	0	-6.69E-04	-1.87E-03
POCP	kg NMVOC eq.	1.52E-02	7.86E-04	1.85E-03	4.18E-04	9.83E-04	0	4.42E-05	4.57E-03	4.7E-03	3.52E-04	-2.61E-05	0	-1.75E-04	-4.96E-04
ADPE	kg Sb eq.	3.46E-05	1.19E-08	3.11E-06	0	2.3E-07	0	6.69E-10	1.33E-08	1.83E-08	1.16E-08	-3.9E-09	0	-2.59E-08	-1.36E-08
ADPF	MJ	1E+02	1.9E+00	9.35E+00	0	5.9E+00	0	1.07E-01	1.65E+00	2.14E+00	2.39E+00	-4.48E-01	0	-3.02E+00	-9.68E+00
WDP	m³ world eq. deprived	5.27E+00	1.27E-03	5.17E-01	0	9.99E-02	0	7.17E-05	4.46E-01	4.49E-01	-1.78E-03	-2.7E-03	0	-1.78E-02	-1.68E-02

GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources; WDP = Water (user) deprivation potential)

RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2: 1 m² floor covering

Parameter	Unit	A1-A3	A4	A5	B1	B2	C1	C2	C3/2	C3/3	C4/1	D	D/1	D/2	D/3
PERE	MJ	4.89E+01	1.08E-01	4.5E+00	0	3.68E+00	0	6.08E-03	2.71E-01	4.08E-01	1.96E-01	-1.2E-01	0	-7.87E-01	-2.27E-01
PERM	MJ	5.9E-02	0	-5.9E-02	0	0	0	0	0	0	0	0	0	0	0
PERT	MJ	4.89E+01	1.08E-01	4.44E+00	0	3.68E+00	0	6.08E-03	2.71E-01	4.08E-01	1.96E-01	-1.2E-01	0	-7.87E-01	-2.27E-01
PENRE	MJ	9.05E+01	1.91E+00	9.67E+00	0	5.9E+00	0	1.07E-01	1.15E+01	1.2E+01	2.39E+00	-4.48E-01	0	-3.02E+00	-9.69E+00
PENRM	MJ	1.01E+01	0	-3.01E-01	0	0	0	0	-9.82E+00	-9.82E+00	0	0	0	0	0
PENRT	MJ	1E+02	1.91E+00	9.36E+00	0	5.9E+00	0	1.07E-01	1.66E+00	2.15E+00	2.39E+00	-4.48E-01	0	-3.02E+00	-9.69E+00
SM	kg	1.47E+00	0	1.33E-01	0	0	0	0	0	0	0	0	0	0	3.33E-01
RSF	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FW	m³	1.3E-01	1.22E-04	1.27E-02	0	3.34E-03	0	6.88E-06	1.05E-02	1.07E-02	2.79E-05	-1.14E-04	0	-7.52E-04	-1.04E-03

PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water

RESULTS OF THE LCA – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2: 1 m² floor covering

...more pages follow...

use class

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The use class provides information about the area of application (private or commercial) and the intensity of use (moderate to very heavy) for which a textile floor covering is suitable.

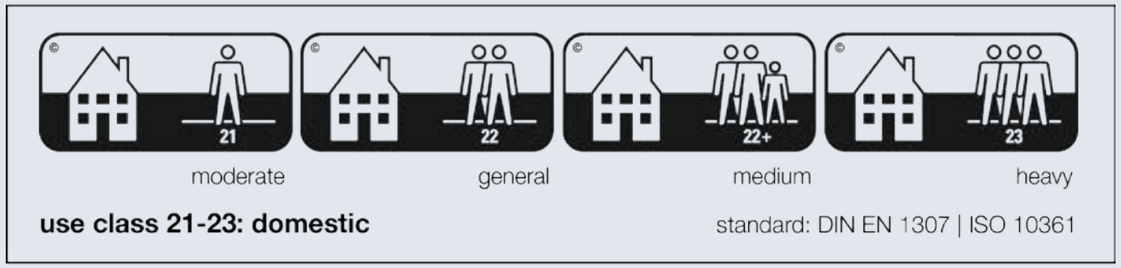

Fig. 20: use class 21-23

Use classes 21-23 characterise the suitability of textile floor coverings for **domestic use**. Class 21 stands for moderate, 22 for general, 22+ for medium (if existing) and 23 for heavy use.
Domestic areas can be, for example: **bedrooms, guest rooms, hobby rooms, home offices, living rooms and children's rooms, kitchens, bathrooms, corridors, entrance areas, etc.**

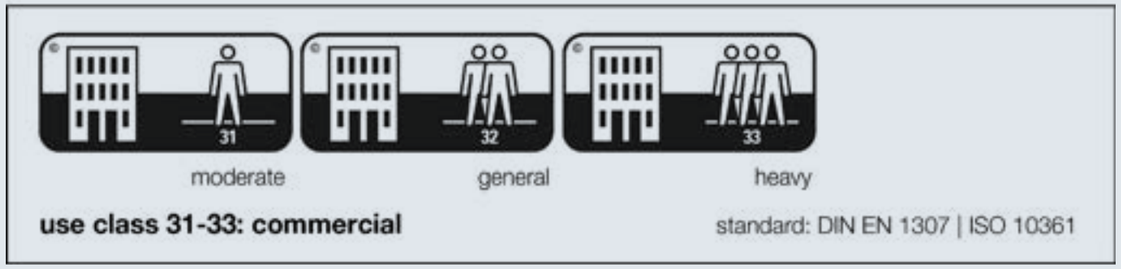

Fig. 21: use class 31-33

Use classes 31-33 characterise the suitability of textile floor coverings for **commercial use**. Class 31 stands for moderate wear, 32 for general wear and 33 for heavy wear.
Commercial areas can be, for example: **hotel lobbies, corridors and rooms, open plan offices, waiting rooms, classrooms, shops and department stores, airports, etc..**

luxury class

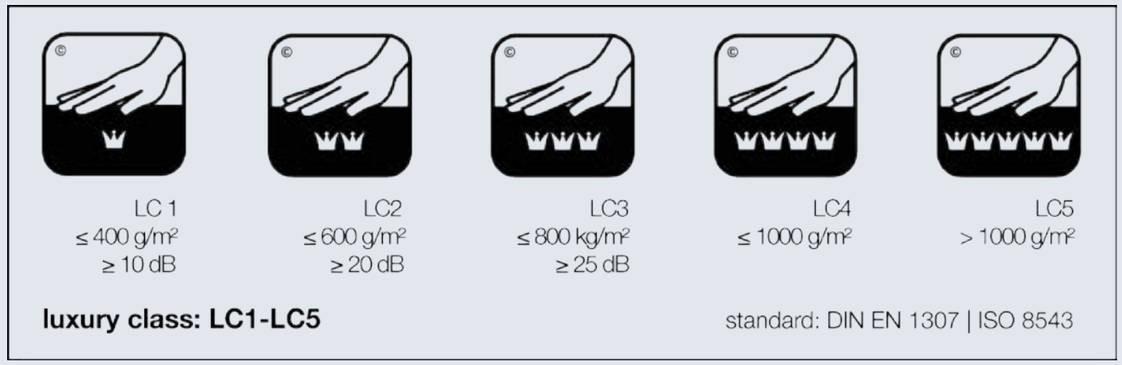

Fig. 22: luxury class

The luxury class of a textile floor covering is based on the **weight per unit area of its use surface**. One crown corresponds to the lowest luxury class (LC1), five stand for the highest comfort (LC5). The luxury class also allows an **assignment of the impact sound insulation** to the respective total weight without measurement. Accordingly, a carpet in class LC1 absorbs more than 10 dB, one in class LC2 more than 20 dB and carpets from class LC3 more than 25 dB of the impact sound generated.

stair suitability

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Fig. 23: stair suitability

If the floor covering is **suitable for occasional use on stairs**, the carpet is sufficiently abrasion-resistant at the edge of the stairs for **moderate use**. It is only recommended for **domestic areas**. If the floor covering has an **intensive stair suitability rating**, it is also sufficiently abrasion-resistant at the edge of the stairs for **heavy and permanent use** and is suitable for installation in **commercial areas**.

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castor chair suitability

Fig. 24: castor chair suitability

If the floor covering has a **chair castor suitability rating of „occasional“**, it remains visually appealing with **moderate use by office chair castors**. It is only recommended for **domestic use**. If the floor covering has an **„intensive“ chair castor suitability rating**, it remains visually appealing even with **heavy and constant use by chair castors** and is also suitable for installation in **commercial areas**.

COLOUR FASTNESS

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colour fastness to light

Fig. 25: colour fastness to light

A floor covering is lightfast if it is **colourfast when exposed to natural light**. The colour result is rated with a value between 1 (= very low) and 8 (= excellent). From a test score of 5, the floor covering is suitable for commercial use.

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colour fastness to water

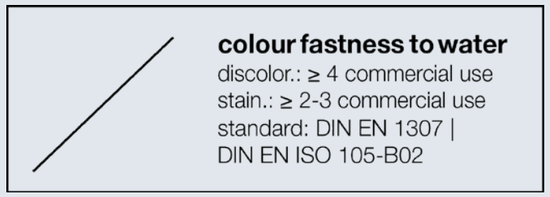

Fig. 26: colour fastness to water

The floor covering has colour fastness to water if it **does not lose any colour and also does not stain anything else**. Water resistance is assessed with a value between 1 (= very low) and 5 (= excellent). From a test score of ≥ 4 for discolouring and ≥ 2-3 for staining, the floor covering is suitable for commercial use.

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colour fastness to rubbing

Fig. 27: colour fastness to rubbing

A textile floor covering has colour fastness to rubbing if it **does not lose colour or stain other fabrics when subjected to mechanical stress in dry or wet condition**. Both the dry and wet rubbing fastness is assessed with a value between 1 (= very low) and 5 (= excellent). From test scores of ≥ 3-4 for dry rubbing fastness and ≥ 3 for wet rubbing fastness, the floor covering can be used in commercial areas.

All colour fastnesses (to light, to water, to rubbing) are assessed using a **standardised contrast scale**, the **grey or blue scale**. These are explained at the beginning of the „test procedures“ section.

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resistance of cut edges

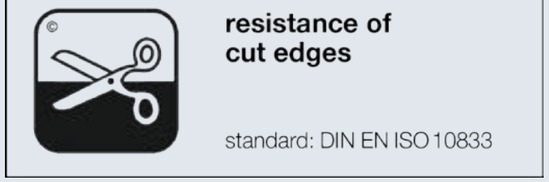

Fig. 28: resistance of cut edges

If the floor covering has a high resistance of cut edges, it remains attractive at the cut edges during installation and in use, i.e. the **backing does not delaminate**, it **does not lose loops** and **does not fray**. This property is particularly important when the carpet is used for modules.

slip resistance

Fig. 29: slip resistance

Slip resistance is guaranteed if the floor covering has a **dynamic coefficient of friction of ≥ 0,3 in dry and wet condition**, i.e. there is **sufficient grip on the floor covering for the user to prevent slipping**. The new symbol now additionally contains the coefficient of friction as a numerical value.
Carpet always fulfils this requirement.

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thermal resistance

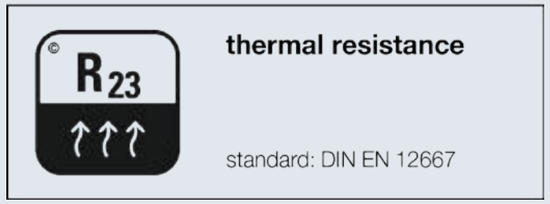

Fig. 30: thermal resistance

The symbol indicates that the adjacent measured value for the thermal resistance of the carpet was determined at a room temperature of 23 °C. The thermal resistance indicates **how well a material can be penetrated by heat** (low thermal resistance = fast/good penetration, high thermal resistance = slow/poor heat conduction). If the thermal resistance is ≤ 0,17 m^2K/W, it can be assumed that the floor covering does not significantly slow down the spread of heat by the underfloor heating. In this case, the old symbol with underfloor heating can often still be found.

ACOUSTICS

No other floor covering can have such a positive influence on room acoustics as carpet! While hard floors largely reflect sound waves (echoing in the same room) or transmit them through the adjacent and surrounding building architecture (your neighbour hears you walking), even a conventional carpet absorbs more sound than, for example, a laminate floor with impact sound insulation laid underneath. This has a positive effect on both attenuation (reduction of sound volume and echo in the same room) and insulation (reduction of sound transmission to neighbouring rooms). By consciously designing the carpet pile and backing, it is possible to influence not only the degree of sound reduction (dB) but also the affected frequency range (Hz).
> We will be happy to provide you with further information on this topic in a personal consultation or in our „Acoustics“ Infoguide.

What is needed in my situation?

To keep it simple: the neighbour or hotel guest **below** you will be grateful for the **impact sound reduction**, and good **sound absorption** will benefit you and your colleagues **in the same** open plan office.

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impact sound reduction ΔL_w

Fig. 31: impact sound reduction

The floor covering **reduces the volume of all sounds transmitted through the architecture** into neighbouring rooms by the specified dB value. The impact sound level in the room below is measured.

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sound absorption α_w

Fig. 32: sound absorption

Conversations or music generate airborne sound in the room. The sound absorption coefficient α_w is a maximum of 1 (= 100%) and indicates **how much of the airborne sound is absorbed** by the floor covering. The α_w value summarises 18 measured individual values for different frequency ranges, the α_s values, and forms an average. It is **not possible to deduce** from the α_w value alone **which frequencies** are attenuated to what extent.

ELECTRICAL BEHAVIOUR

By walking on a floor with shoe soles or by friction of clothing when sitting, materials become statically charged. The spontaneous discharge in the form of a low electric shock (such as when touching a car door or a door handle) can be unpleasant but also harmful to people and/or sensitive electronics or trigger dangerous chemical reactions. To ensure that this charge does not exceed a dangerous level, for special room utilisation concepts **antistatic**, **dissipative** or **conductive** flooring (sometimes also carpeting) is used. For example:

- **in intensive care rooms such as operating rooms**
- **in laboratories**
- **in server rooms**
- **in the industrial production of highly sensitive components**
- **in the processing of fuels and solvents**
- **in the generation of flammable or explosive dusts, gases and compounds**

A distinction is made between **conductive** and **dissipative** floor coverings according to their vertical resistance. Whether a floor covering should be earthed can be found in the installation recommendation, but depends primarily on the context in which it is installed. If a carpet is to be earthed, this must always be carried out by specialised professionals. For this purpose, it is usually bonded to a copper tape net using conductive glue and this is connected to a potential equalisation system by an electrician. Other earthing installation systems are also possible; the decisive factor is the functionality of the overall structure and compliance with applicable standards.

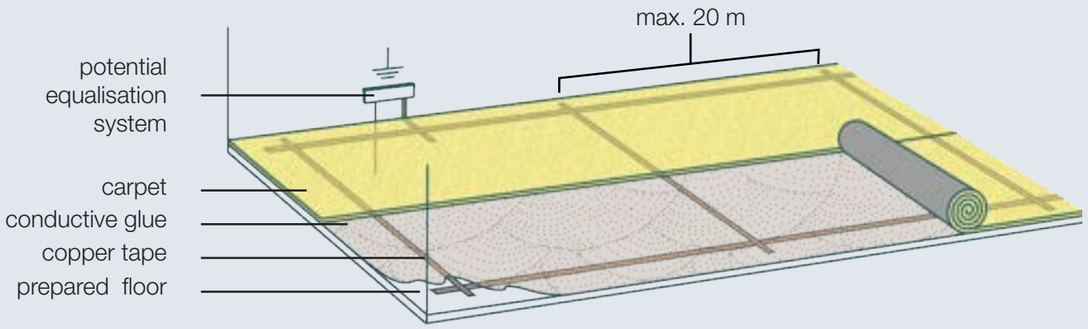

Fig. 33: installation example conductive carpeting

antistatic

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Fig. 34: antistatic

The floor covering is considered antistatic if the measured **body voltage of a person** walking on it is **below 2 kV**.

electrostatic discharge (ESD)

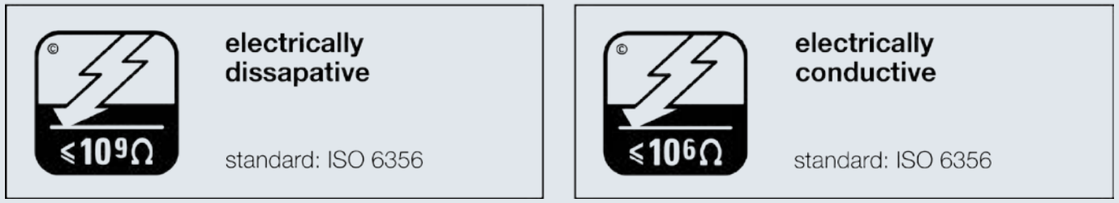

Fig. 35: electrostatic discharge

If the measured **vertical resistance** of the floor covering to current flow is **≤ 10^9 Ω** (1.000.000.000 Ω), it is considered **electrically dissipative**. Connection to potential equalisation is recommended.
Conductive floor coverings are sufficient for rooms with electronic devices such as data centres.

If the measured **vertical resistance** of the floor covering to current flow is **≤ 10^6 Ω** (1.000.000 Ω), it is considered **electrically conductive** and leads off the voltage even faster as electricity. This requires connection to a potential equalisation system.
Conductive floor coverings are used, for example, in areas with unprotected electronic components, explosive substances, laboratories and medical facilities.

reaction to fire

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Floor coverings used in commercial buildings are classed as construction products and are therefore subject to the Construction Products Regulation, which defines the fire protection classes. Fire protection classes A1fl and A2fl-s1 (non-flammable) only apply to mineral hard floors, while **the highest possible fire protection classes for textile floor coverings are Bfl-s1 and Cfl-s1** (flame-retardant), which permit installation in **commercial areas.**
> All Halbmond carpets achieve classes Bfl-s1 or Cfl-s1.

A 2 fl - s1

- from class A (non-combustible) to F (easily flammable)
- additional number only in class A
  A1 = without combust. building materials
  A2 = with combustible building materials
- fl = „flooring“, for textile floor coverings
- s = „smoke“, for smoke development
  s1 = low (classes A - C for commercial areas)
  s2 = medium (for domestic areas)

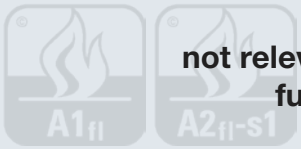
Building authority requirement		Fire protection class according to standard DIN EN 13501-1	
COMMERCIAL (31-33)	non-combustible	 **not relevant for textile floor coverings (only fulfilled by mineral hard floors)**	A1fl A2fl -s1
	flame-retardant		Bfl -s1 Cfl -s1
DOMESTIC (21-23)	normally flammable		A2fl -s2 Bfl -s2 Cfl -s2 Dfl -s1, -s2 Efl
	easily flammable		Ffl

Fig. 36: fire protection classes