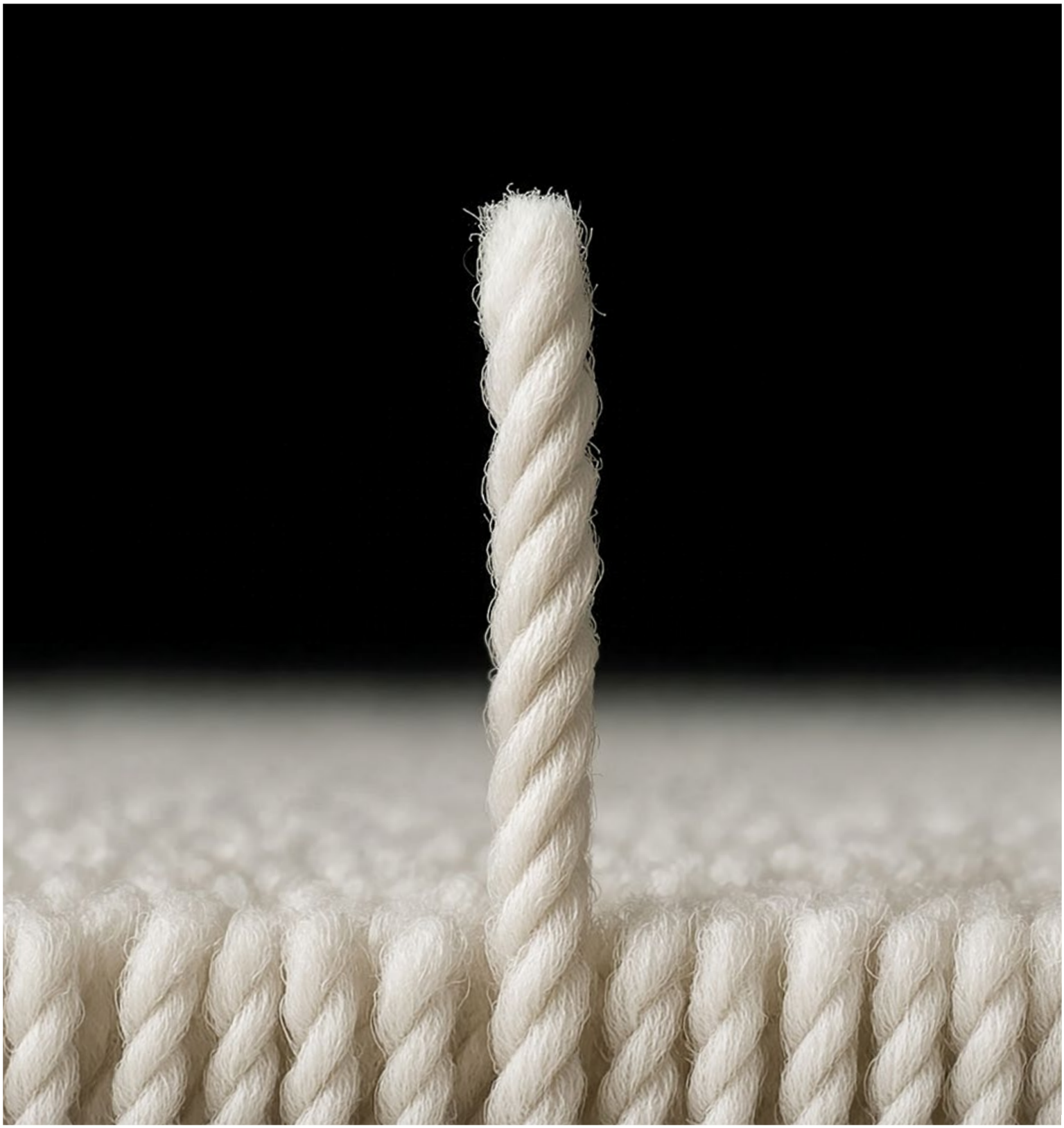
INFO GUIDE 04

HALBMOND

Tufting EXPLANATION

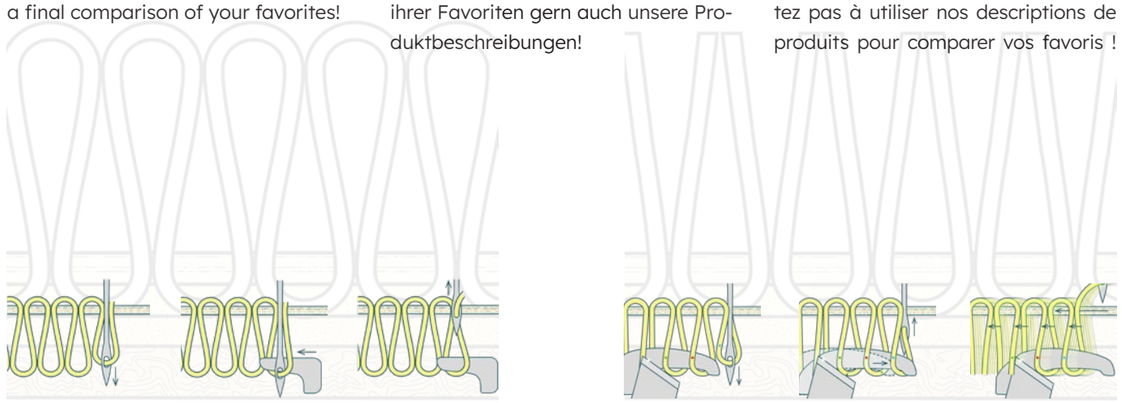


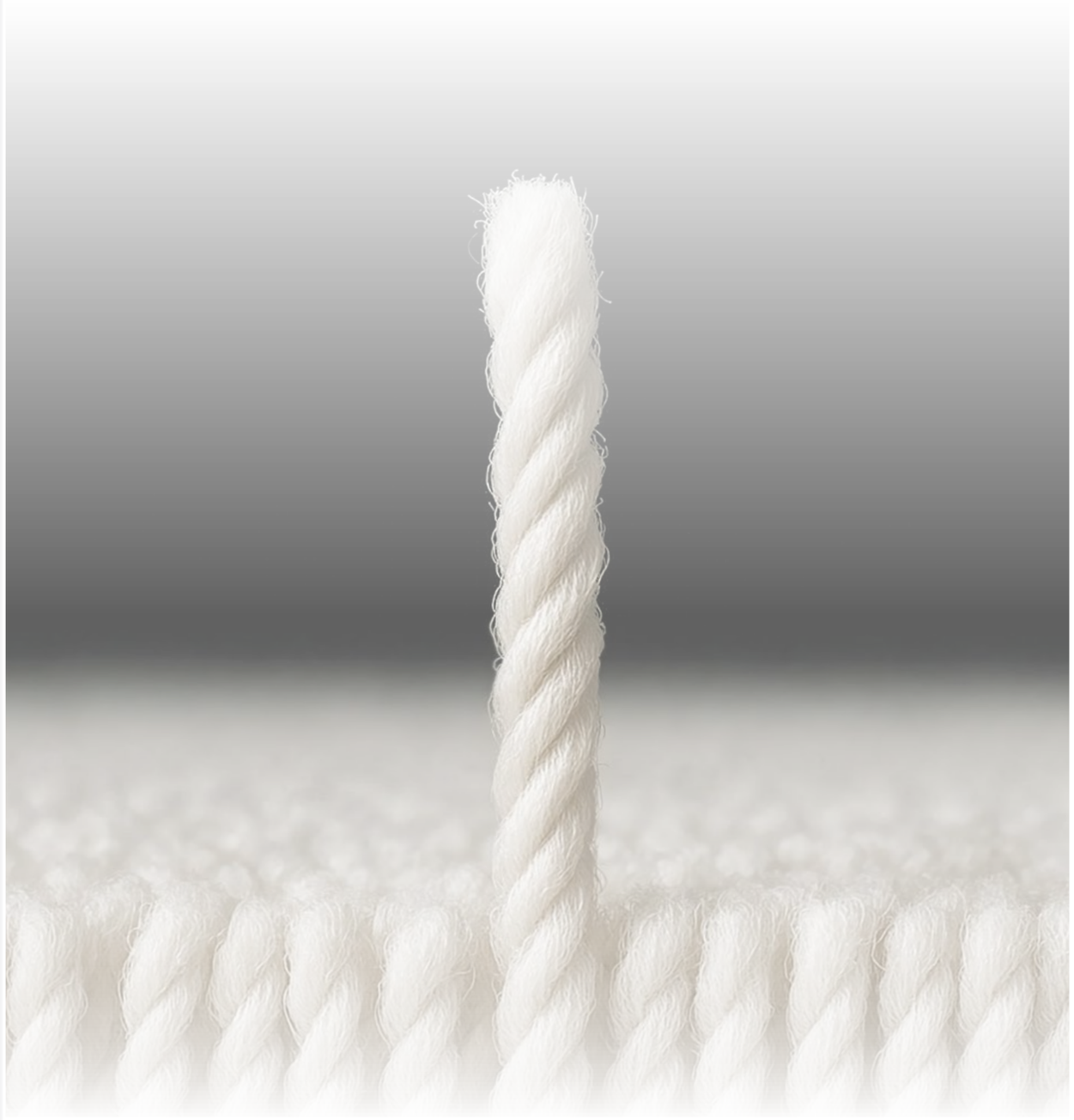
Tufting EXPLANATION

en Would you like to choose a carpet for your new project and find out about all the aspects involved beforehand? Then Halbmond is the right place for you!
The Infoguide 'Tufting EXPLANATION' takes you through the world of fibre materials, the technical process of tufting, and Halbmond's carpet pile qualities: Why polyamide and wool? What are the advantages of combining tufting and printing? What is a friseé? With the help of this and other Infoguides in the series ('Data Sheet EXPLANATION', 'Colour & Print EXPLANATION' and the following 'Backing EXPLANATION'), you can become an expert yourself and put together your own individual product. Feel free to use our product descriptions to make a final comparison of your favorites!

de Sie möchten einen Teppichboden für ihr neues Objekt auswählen und sich zuvor über alle Aspekte informieren? Dann sind Sie bei Halbmond genau richtig!
Der Infoguide „Tufting VERSTEHEN" führt Sie durch die Welt der Fasermaterialien über den technischen Prozess des Tuftens bishin zu Halbmonds Teppichpolqualitäten: Warum Polyamid und Wolle? Welche Vorteile hat die Kombination Tufting und Druck? Was ist ein Friseé? Mithilfe dieses und weiterer Infoguides der Reihe ("Datenblatt VERSTEHEN", "Farbe & Druck VERSTEHEN" sowie dem folgenden "Backing VERSTEHEN") werden Sie selbst zum Fachmann, um ihr ganz individuelles Produkt zusammenzustellen. Nutzen Sie zum finalen Vergleich ihrer Favoriten gern auch unsere Produktbeschreibungen!

fr Vous souhaitez choisir une moquette pour votre nouveau bien immobilier et vous informer au préalable sur tous les aspects ? Alors vous êtes à la bonne adresse chez Halbmond !
L'infoguide « COMPRENDRE tuftage » vous fait découvrir l'univers des matériaux fibreux, le processus technique du tuftage et les qualités des moquettes Halbmond : pourquoi le polyamide et la laine ? Quels sont les avantages de la combinaison du tuftage et de l'impression ? Qu'est-ce qu'un frisé ? Grâce à ce guide et aux autres guides de la série (« COMPRENDRE fiche technique », « COMPRENDRE couleur et l'impression » et « COMPRENDRE backing »), vous deviendrez vous-même un expert et pourrez composer votre produit personnalisé. N'hésitez pas à utiliser nos descriptions de produits pour comparer vos favoris !





CONTENTS

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Lives a happy life in the New Zealand countryside (and produces Halbmond wool as a bonus). :-)

INFO GUIDE 04

FIBRE AND YARN

Carpet fibres at Halbmond

1. Polyamide ----------> from page 10

Polyamide fibre scores highly in all the key categories for a good carpet fibre! It is therefore Halbmond's standard material for its various carpet yarns. As it is manufactured synthetically, many of its properties can be tailored: fibre length, thickness, cross-section, lustre, crimp (and thus elasticity and rebound behaviour) and raw material (also available as a recycled variant, 'ECO'). Even flame retardancy and antistatic properties can be improved through appropriate finishing and backing combinations to such an extent that the material is ideally suited for commercial applications.

> Polyamide is used in the 'Arc', 'Arcade', 'Arcade Spezial', 'Art', 'Art ECO' and 'Gallo' series, as well as in all 'AP' and 'ECO' products..

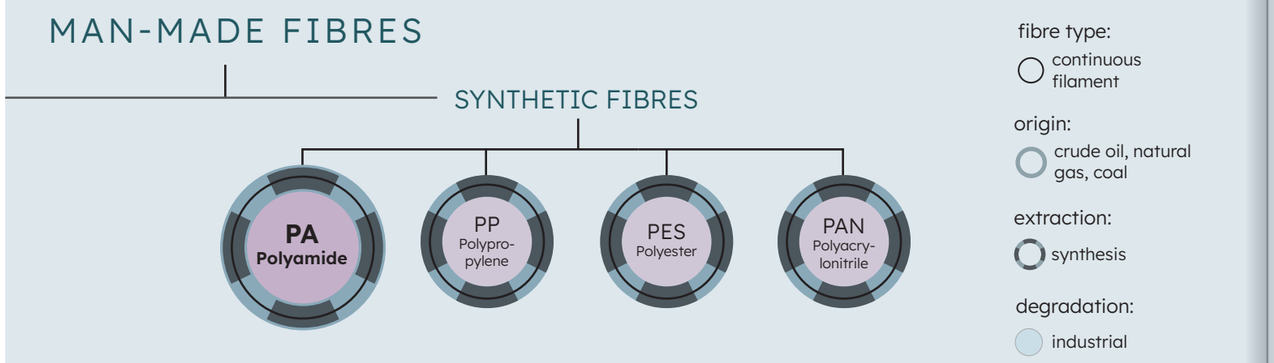
2. Wool/polyamide ----------> from page 18

The range is complemented by a high-performance natural fibre: wool. It has a long tradition in carpet-making, not least because of its widespread availability across all cultures – it is simply a true all-rounder! It can be pre-treated to prevent felting and shrinkage. If polyamide is added to the wool, the strengths of both materials are brought to the fore: the wool gives the floor covering volume and a high-quality appearance, whilst ensuring ideal moisture regulation and flame retardancy. A small proportion of polyamide is sufficient to further reduce the tendency to felt (-> greater dimensional stability), as well as to improve abrasion and tear resistance. That is why Halbmond uses a fibre blend of 80% sheep's wool and 20% polyamide.

> A wool-polyamide yarn is used in the 'Artemis' product from Halbmond.

1. Synthetic fibres: Polyamide!

Polyamide. A polyamide is a plastic consisting of many (‘**poly**’) identical molecular building blocks linked together by **amide** bonds. There are various types of polyamide; the best known are polyamide 6 and polyamide 6.6 (nylon). The diagram on page 13 illustrates one method by which polyamide 6 can be synthesised from crude oil.



Synthetic fibres. In addition to polyamide – the dominant player among carpet yarns – polyester (PES) and polypropylene (PP) are also used in the commercial sector, whilst polyacrylonitrile (PAN) – better known as polyacrylic – is also used in the domestic sector due to its softness. All these materials belong to the category of **man-made fibres**, or more precisely: to the subgroup of **synthetic fibres**. Synthetic fibres are produced **from petroleum, natural gas and coal**. The second major subgroup of man-made fibres is that of **regenerated fibres made from cellulose**, i.e. fibres artificially produced from plant-based raw materials. The most important examples are viscose (CV), modal (CMD) and lyocell (CLY), which, however, are rarely used in carpets as their performance characteristics do not meet the requirements of the commercial sector. They are not considered here.

A brief glossary of terms

Filament. A filament is a single, continuous strand.

Multifilament. A multifilament consists of several filaments; it is therefore a bundle of filaments.

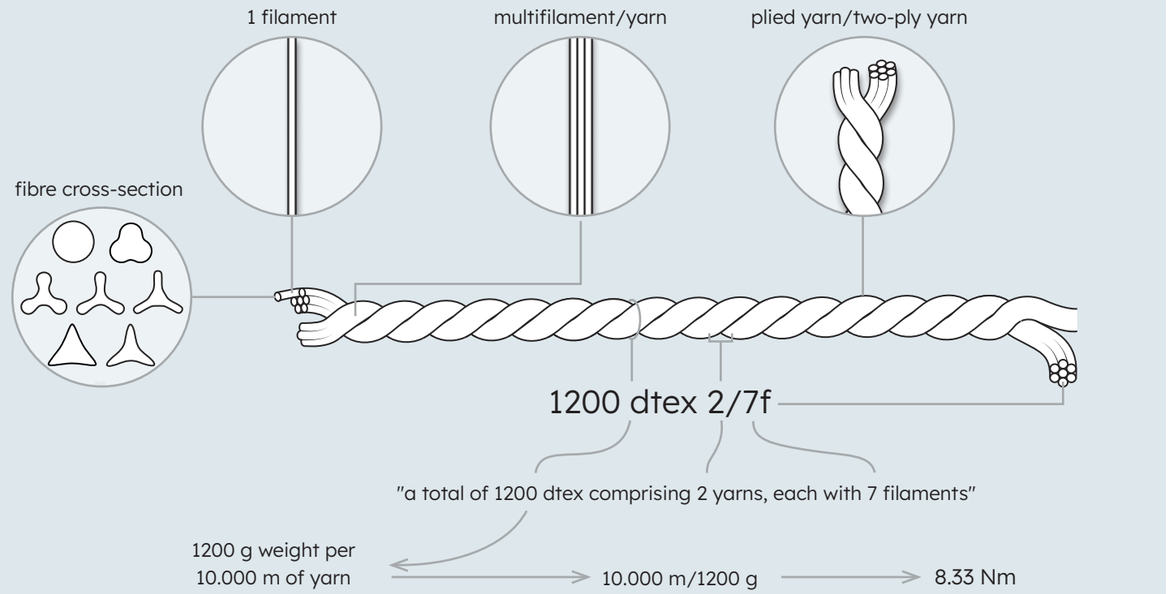
Yarn. A yarn is a continuous strand made up of finite or continuous fibres.

Plied yarn. Plied yarns are produced by twisting together at least two yarns.

Fibre cross-section. The cross-section of a filament can be shaped in various ways by the nozzle orifice geometry (see above). It influences the properties of the fibre.

Texturing. Texturing involves two- or three-dimensional deformations applied to the filament or yarn using various mechanical processes. These must then be set. Texturing affects elasticity, volume, spinnability, lustre and other properties.

Setting (Heat Set). Setting stabilises newly formed structures. Setting is achieved through controlled temperature changes: cooling hot-spun filaments is a form of setting, as is hot vapour treatment of a texture or twist created whilst the material is cold. This process of heat setting is known as ‘Heat Set’.



Pinpoint. A pinpoint is a single, clearly visible thread end that does not blend into the overall surface. A surface with a distinct pinpoint appears grainy. Why does the single thread stand out? Thermal setting stabilises its twist, keeping it tighter, so it does not visually disappear into the pile.

Yarn count. Whilst the diameter of natural fibres is measured in µm (microns), the fineness (the ‘titer’) of carpet yarns is expressed in dtex. In addition to the overall fineness of a yarn or twisted yarn, its designation also provides information about the number of yarns and filaments (see above).

standard unit for carpet yarns:

> dtex -> g/10.000 m (yarn weight in g per 10 km) -> used for filament yarns, standard in the carpet industry

standard unit for clothing and staple-fibre carpet yarns:

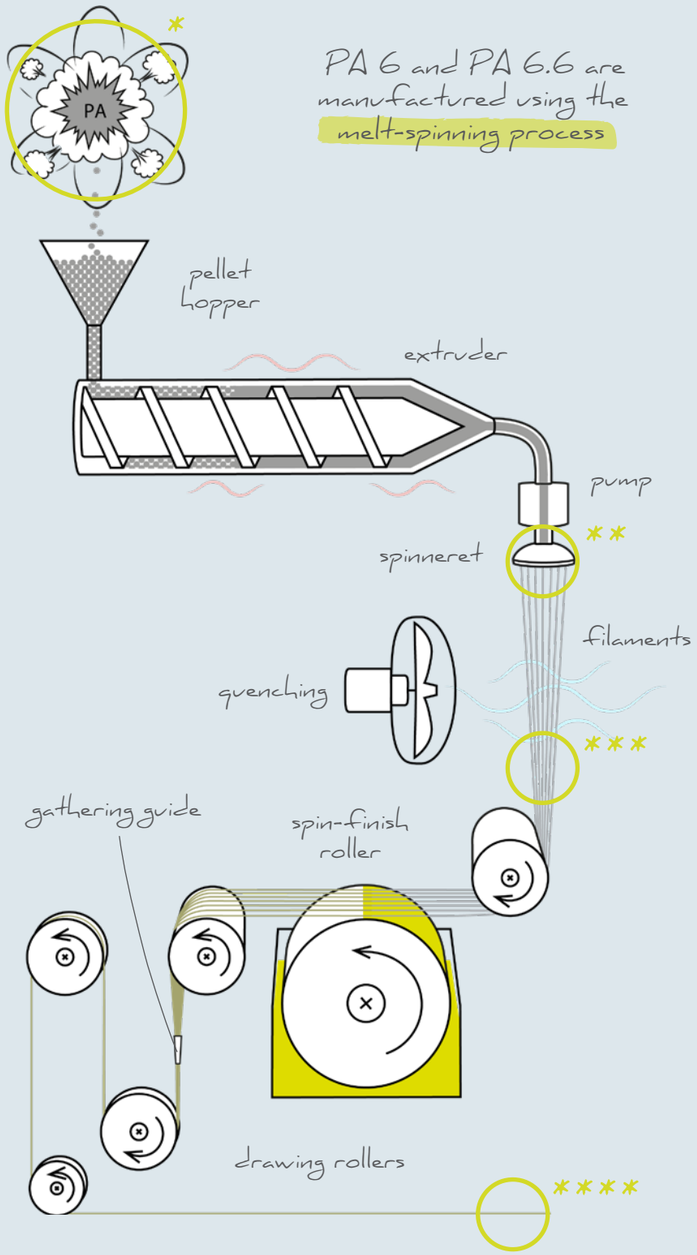
> Metric number or Nm -> m/g (Yarn length in metres per 1 g) -> used for staple fibre yarns

> Link zur Umrechnung zwischen dtex und Nm

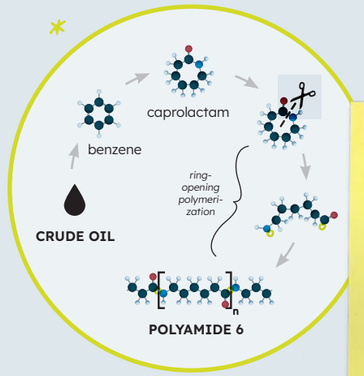
Filament production

1. **Polymer synthesis**
   -> PA synthesised from crude oil is used to produce granules
2. **Melting polymers**
   -> the granules melt in the extruder and become viscous
3. **Spinning filaments**
   -> spinning mass is pumped through the spinneret holes
4. **Quenching**
   -> the filaments are solidified by cooling air
5. **Spin finish**
   -> the roller applies a release agent that reduces adhesion
6. **Bundling**
   -> single filaments are twisted together to form a strand
7. **Drawing**
   -> heated and unheated rollers stretch the filaments

For further processing into BCF yarn, see page 14



PA 6 and PA 6.6 are manufactured using the **melt-spinning process**



By adding additives - antioxidants, antistatic agents, flame retardants, **matting agents**, among others - the properties of pure polyamide can be optimized with regard to both processing and subsequent end-use performance.

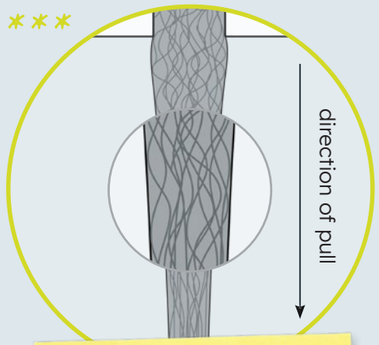
Matting/delustering:

Titanium dioxide (TiO_2) reduces gloss. Three gloss levels are distinguished (increasing TiO_2 content):

-> bright
-> semi-matte
-> matte

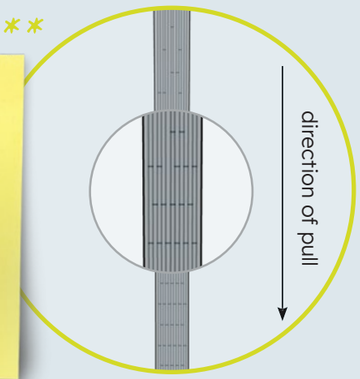
For the production of carpet fibres, essentially two spinneret hole geometries are commonly used: round and trilobal. The latter fulfills the requirements (air filtration while still maintaining a clean appearance) slightly better. Why?

see page 15

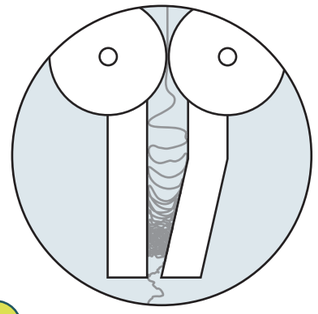


During the spinning process, the polymer chains are still in a disordered state within the filament. In this state, it is stretchable but has little elasticity, is prone to shrinkage, and has low tensile strength and abrasion resistance.

During drawing, the polymer chains are aligned parallel to one another and additional hydrogen bonds may form – the strength of the filament increases, whilst its diameter decreases!

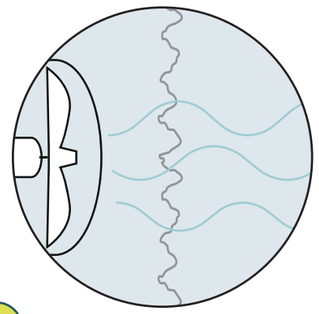


BCF yarn (Continued)



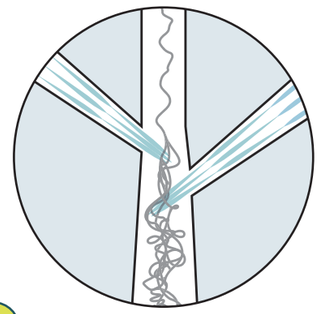
8 Gathering (stuffer box)

-> the heated filament bundle is accumulated and compressed in the channel/box



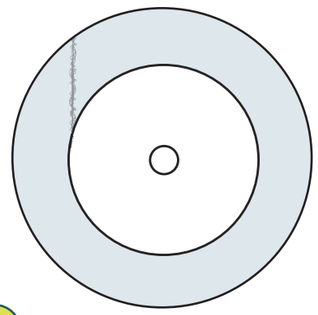
9 Setting

-> controlled cooling without pulling reduces fibre stresses and stabilises the new shape



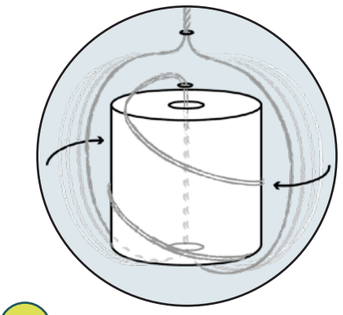
10 Interlacing

-> periodic bursts of air (3–7 bar) open up and whirl the cold bundle of filaments into yarn



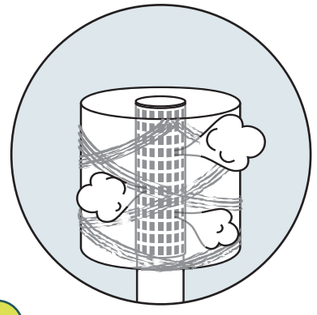
11 Winding

-> consistent yarn tension is achieved



12 Plying, winding

-> two or three strands of yarn are plied together to form a plied yarn and then rewound

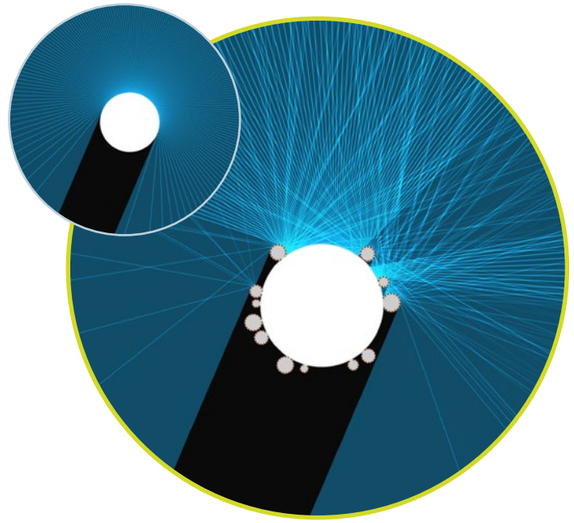


13 Heat setting

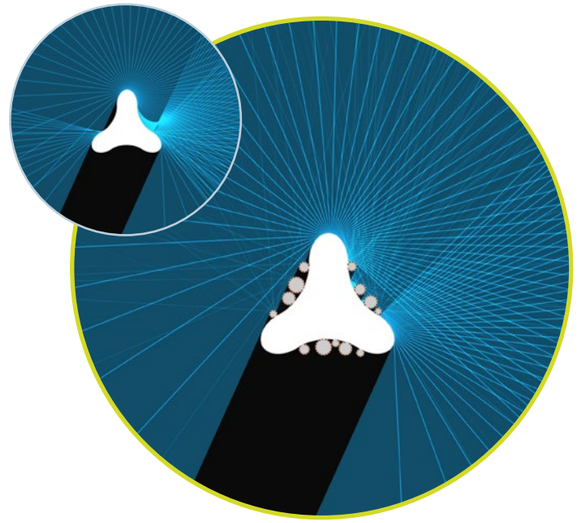
-> the twist in the yarn is set using steam, and the residual tension is released

BCF yarn. BCF yarn (**B**ulked **C**ontinuous **F**ilament) is a standard in the carpet industry. In the BCF process, all process steps follow one another immediately; this is referred to as a continuous process. The resulting yarn, made up of a multitude of extremely fine continuous filaments, is particularly durable and, thanks to its crimped texture, is nevertheless voluminous, light and elastic, so that it springs back to its original shape even after being walked on. In its basic form, it initially has no twist, but can be twisted into a two- or three-ply yarn, at which point it looks very similar to well-known knitting yarns. Various texturing, interlacing, fixing and finishing processes are possible; an example process is shown above.

Carpet fibre cross-sections



Round fibre cross-section without dust (small circle) and with dust (large circle)



Trilobal fibre cross-section without dust (small circle) and with dust (large circle)

Round and flat fibre cross-sections:

Appearance. The round fibre came first. Initially transparent and unmatted, its cross-section acted like a magnifying glass, making dust highly visible. However, even matted fibres with a smooth surface reflect light in a directional manner, like a mirror, creating glare effects. If these are disrupted by a foreign particle lying exposed, it is particularly noticeable in the light reflection pattern (see above). As every position on a round surface is exposed, **dust becomes clearly visible.**

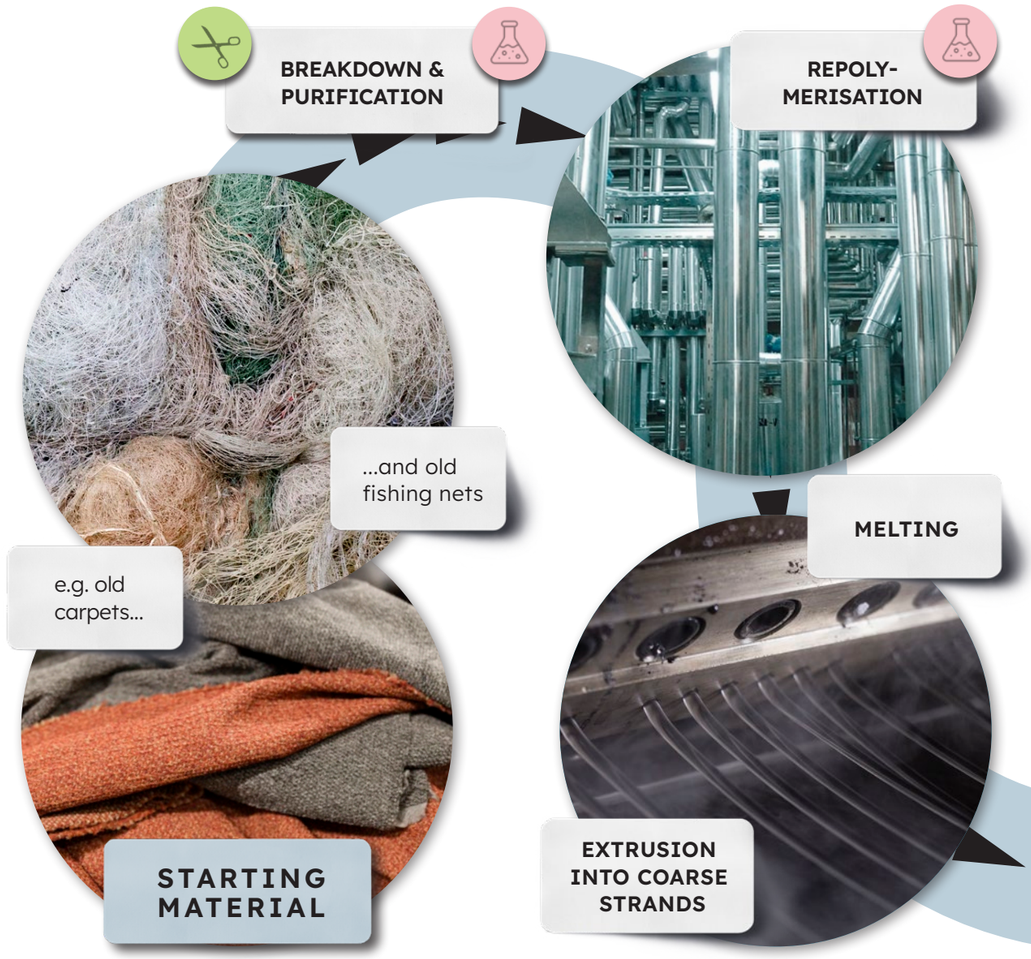
Trilobate fibre cross-sections:

Appearance. The trilobal fibre shape was developed to give carpets a more attractive appearance. A convex-concave cross-section results in a more diffuse light pattern. If this is disrupted by particles in some places, the change is barely noticeable. Furthermore, particles in the indentations are not as exposed, so the reflective behaviour is actually less affected – **dust does not spoil the appearance**. Similar Cross-sections (polylobal):

Filtering performance. The key factors for effective dust capture are primarily pile height and density, pile structure, fibre material and finish; environmental factors such as humidity also play a role. Consequently, the fact that the trilobal fibre can, in principle, capture more fine dust due to its larger surface and contact area, as well as the indentations that protect it from abrasion, is of less significance. A round cross-section, on the other hand, is more effective for coarse particles, as these can sink deeper into the pile.

> Visible or not: your carpet acts as an air filter – highly recommended for allergy sufferers! This makes regular vacuuming all the more important.

Side note: Recycled yarn



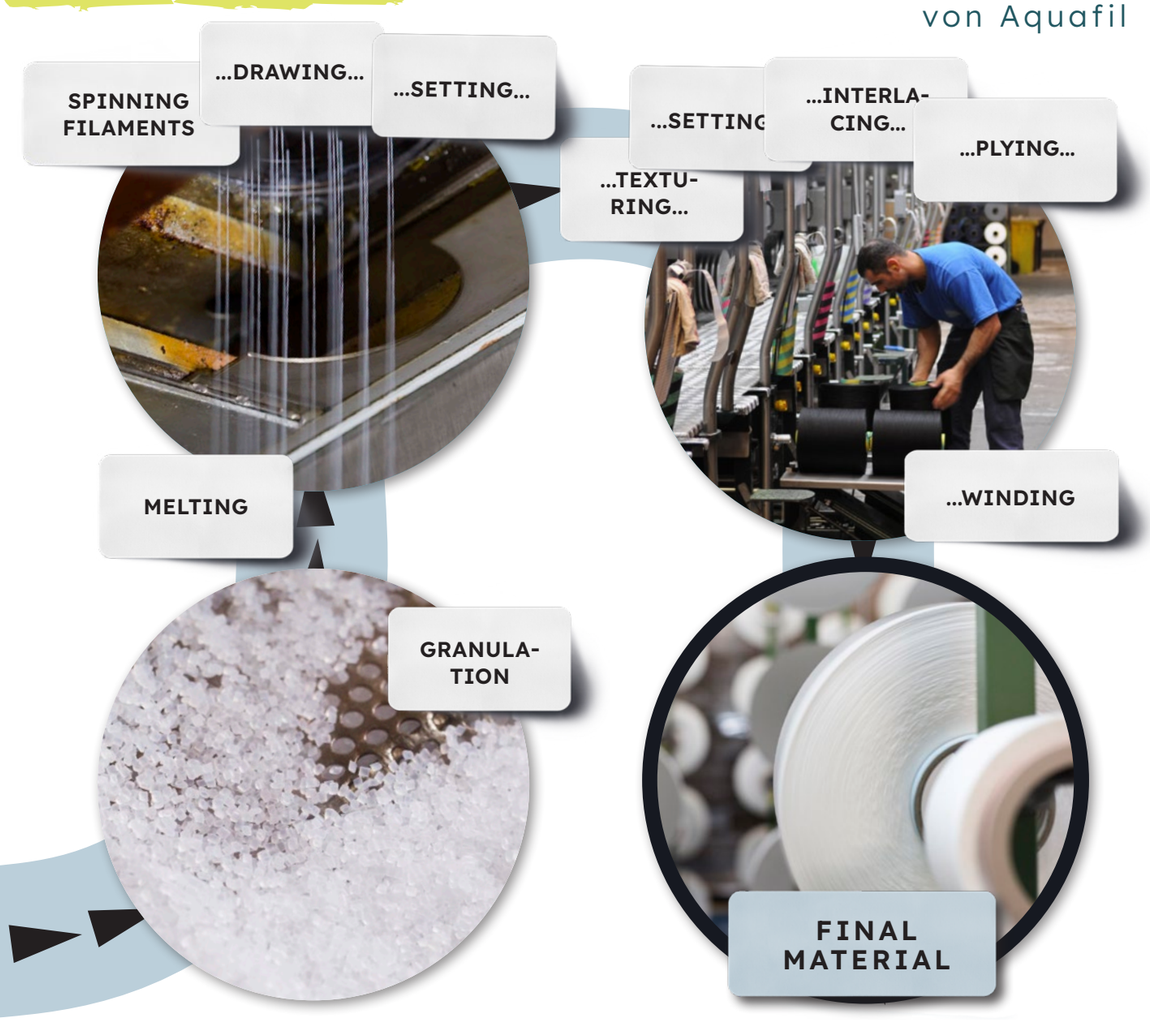
ECONYL. ECONYL is a recycled fibre produced by Aquafil that is chemically identical to PA 6 (the company refers to the material as ‘Nylon 6’, which is where the name comes from).

Both new and old nylon in any form can be used as **STARTING MATERIAL**. This means that pre-consumer waste – generated during production and before the product is used – or post-consumer waste, such as used textiles, salvaged fishing nets and other nylon waste, can be used. Following the **mechanical** process, the material undergoes a multi-stage **chemical BREAKDOWN AND PURIFICATION** to produce polyamide precursors (see page 13). From these building blocks, polyamide polymers are produced in the closed reactor through a process known as **POLYMERISATION**, which involves the formation of new chains. When melted into a liquid plastic mass, **EXTRUSION INTO COARSE STRANDS** can follow. Whilst still warm, the **GRANULATION** forms even, short segments, which solidify as they cool. This easy-to-handle plastic granulate can be stored or sent straight away to be **REMELTED** for the desired ECONYL yarn. **SPINNING** the fine **FILAMENTS** involves carrying out all the stages of melt spinning, including **DRAWING** and **SETTING** (see page 12). Depending on the type of yarn being produced, various texturing and setting methods may be used (see page 14). The process always concludes with **WINDING**.

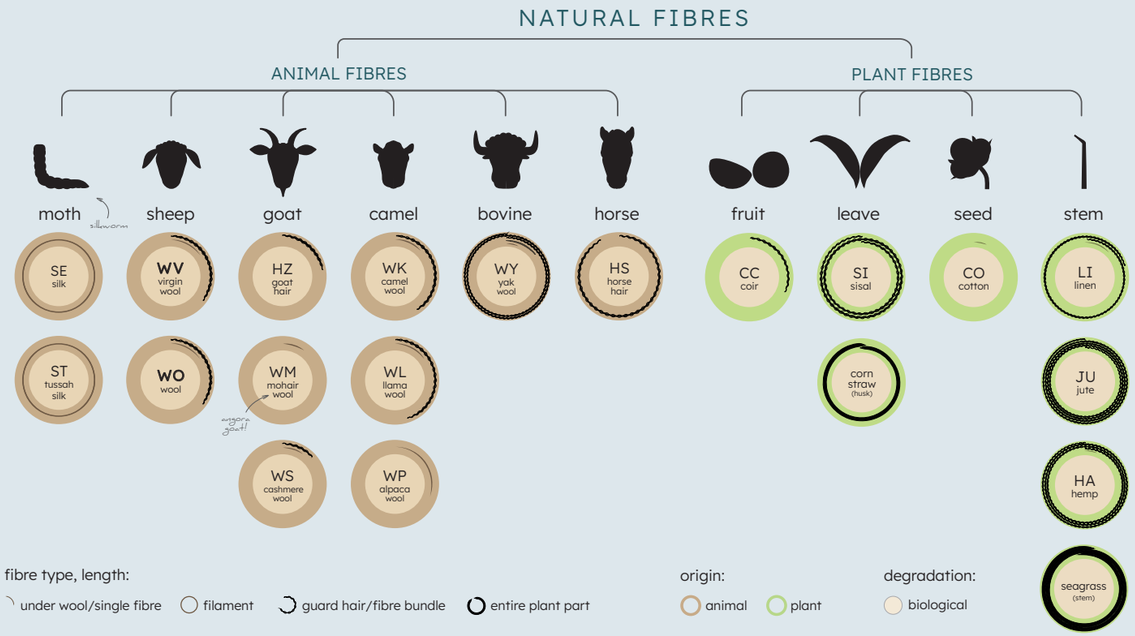
> The result is a polyamide yarn made from recycled plastic, which shows virtually no loss of visual quality or performance compared to yarns made from virgin plastic.

at Halbmond

ECONYL® von Aquafil



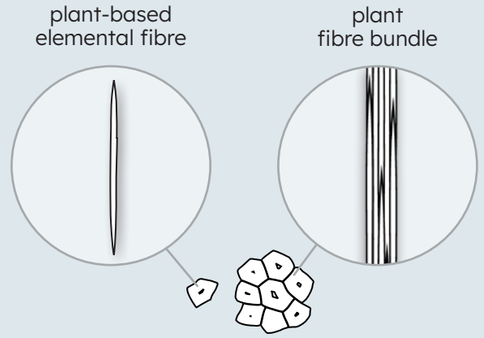
2. Natural fibres: Wool!

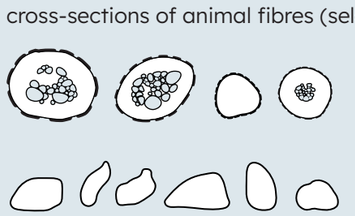


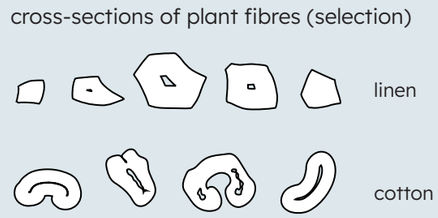
Animal fibres. Animal fibres consist mainly of keratin, a protein that gives hair its strength and flexibility. This makes them suitable for use in yarns, textiles, non-woven fabrics, brushes, instrument strings and other applications. Fine hairs from the warm **undercoat (underwool/fine wool)** and thicker hairs from the weather-resistant **outer coat (guard hairs)** of a wide variety of animals are used in the manufacture of carpets and rugs, including **mane** and **tail hair** from horses. Hair is a type of **staple fibre**, so it is limited in length.

Silk is an exception among animal fibres: it is the only **naturally occurring continuous filament**. During pupation, the silkworm spins a silk cocoon around itself using a thread approximately 900 metres long. This is reeled by humans, cleaned and processed into the finest yarns.

Wool. Depending on the animal species, breed, part of the body and even the section of the hair, wool has a characteristic cross-section; it can be hollow and is protected by a cuticle layer of varying thickness. This layer protects against mechanical and chemical influences and regulates water absorption and release, but it also causes the individual hairs to become entangled with one another. This makes it suitable for spinning, but is also the reason why wool felts and shrinks. An anti-felting or superwash finish counteracts both effects.







Plant fibres. Plant fibres consist mainly of cellulose and can come from a wide variety of sources: coconut fibres are obtained from the **fruit husk**, sisal fibres from the **leaves**, cotton fibres from the **burst seed pods**, and flax, jute and hemp from the plant's **stems**. A distinction is made between **elementary fibres**, which are often only a few millimetres long, and the **bundles of fibres** they form, which are considerably longer and thicker. Whilst the relatively long natural fibres of cotton can be spun into fine yarns, those of jute and sisal are only long enough in bundles to be used, for example, for coarse carpet yarns. In the case of floor mats made from maize and rice straw, the **entire leaf** is used; for those made from seaweed and water hyacinth, the **entire stem** is used.

A brief glossary of terms

Staple fibre. Staple fibres are of a limited length. There are natural and man-made staple fibres.
Elementary fibre. The elementary fibre is the smallest elongated unit of a plant structure.
Fibre bundle. A fibre bundle consists of several elementary fibres and is thicker and longer than them.
Underwool. Underwool, undercoat or fine wool comes from softest, innermost layers of an animal's fur.
Guard hair. Guard hairs are the coarse, protective outer layer of an animal's fur.

Marie: **65 µm**

Side note: Natural fibre

Precious, hand-knotted Persian rugs are renowned for their high-quality materials - silk and the finest wool. These are first dyed with plant-based dyes and then arranged into vibrant patterns. Their design serves as a model for the more affordable tufted rugs.

Woven natural-hair rugs are much more common. They can be made in virtually any quality, thickness, or fiber length. The range therefore extends from elegant, complex patterned rugs decorated with colorful, traditional motifs to functional, insulating floor mats made from undyed wool from available livestock. Blends of hair and wool from different animals are common.

mats and rugs

Most plant fibers do not match the softness, elasticity, and insulating properties of wool. In addition, stem and leaf fibers are more difficult to dye (naturally). However, undyed cotton, linen, and jute threads are used as warp material in knotted and woven rugs due to their tear resistance. Other plant parts or fibers are usually woven or braided into coarse floor coverings.

80-20 wool

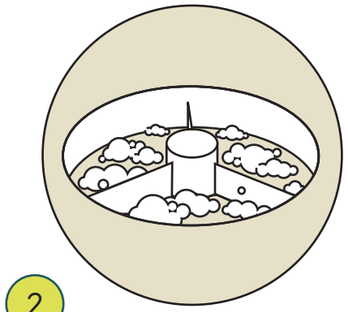
When blended yarns (blends) made from natural and synthetic fibers are required for carpeting, they are always produced in the form of staple fiber yarn. Since the natural fiber is already available in limited lengths, the synthetic fibers—which are initially produced as filaments—are subsequently cut to a similar length. This allows both raw materials to be blended in the desired ratio and spun into a yarn.

The process for manufacturing the specific “80-20-Wool” half-moon yarn is shown below in a highly simplified form.

> The ‘Artemis’ range from Halbmond uses the wool-polyamide blend yarn ‘80-20 wool’.

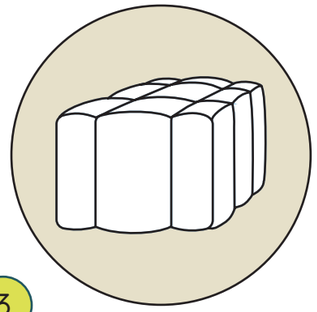
1 **Shearing, sorting**

-> wool harvesting



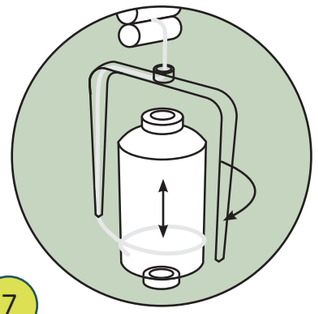
2 **Scouring, carbonizing**

-> removal of lanolin, dirt and vegetable matter



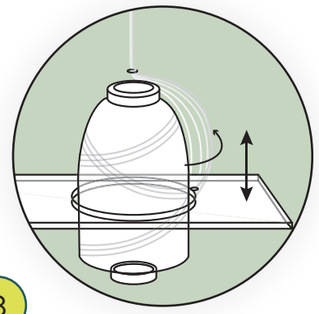
3 **Bale pressing**

-> storage/transport form



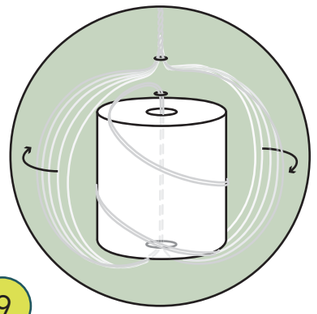
7 **Roving production**

-> sliver is highly drawn, slightly twisted for stability, and wound as roving



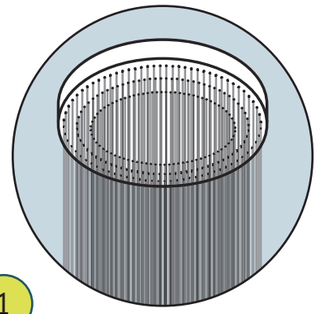
8 **Spinning**

-> roving is processed into finished yarn by ring spinning



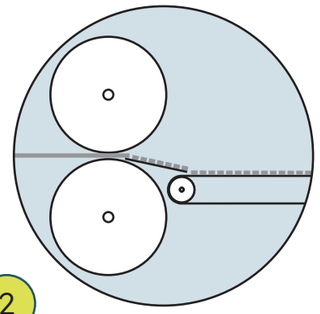
9 **Plying, winding**

-> two yarns are twisted into a ply yarn and rewound



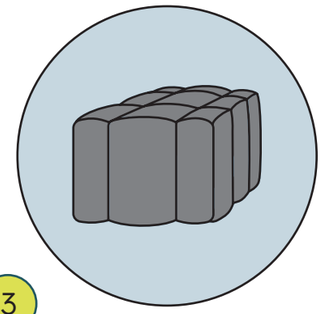
1 **Extrusion to texturing**

-> see pages 12, 14



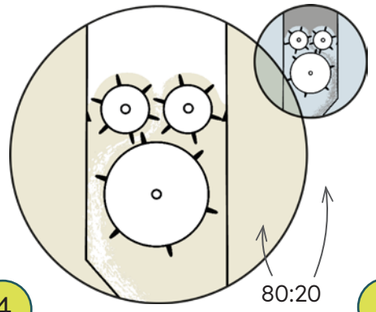
2 **Cutting, opening**

-> filament tows are combined into cables, cut, and separated into tufts



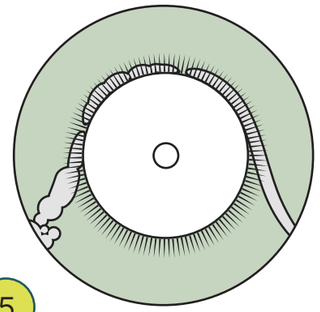
3 **Bale pressing**

-> storage/transport form



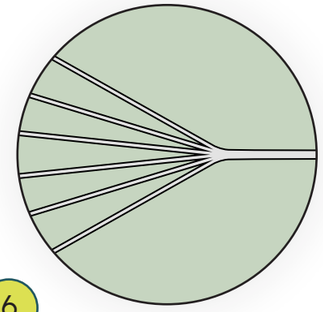
4 **Opening, metering**

-> bales are opened, fiber flocks separated into individual fibers, metered



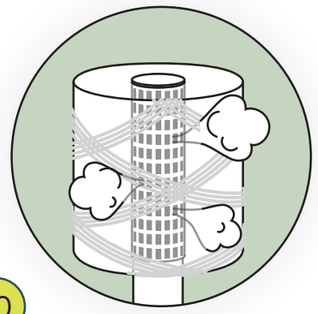
5 **Blending, carding**

-> fibers are blended, parallelized in multiple stages, short fibers removed = card sliver.



6 **Doubling, drawing**

-> 6–12 card slivers are combined and drawn into one draw sliver

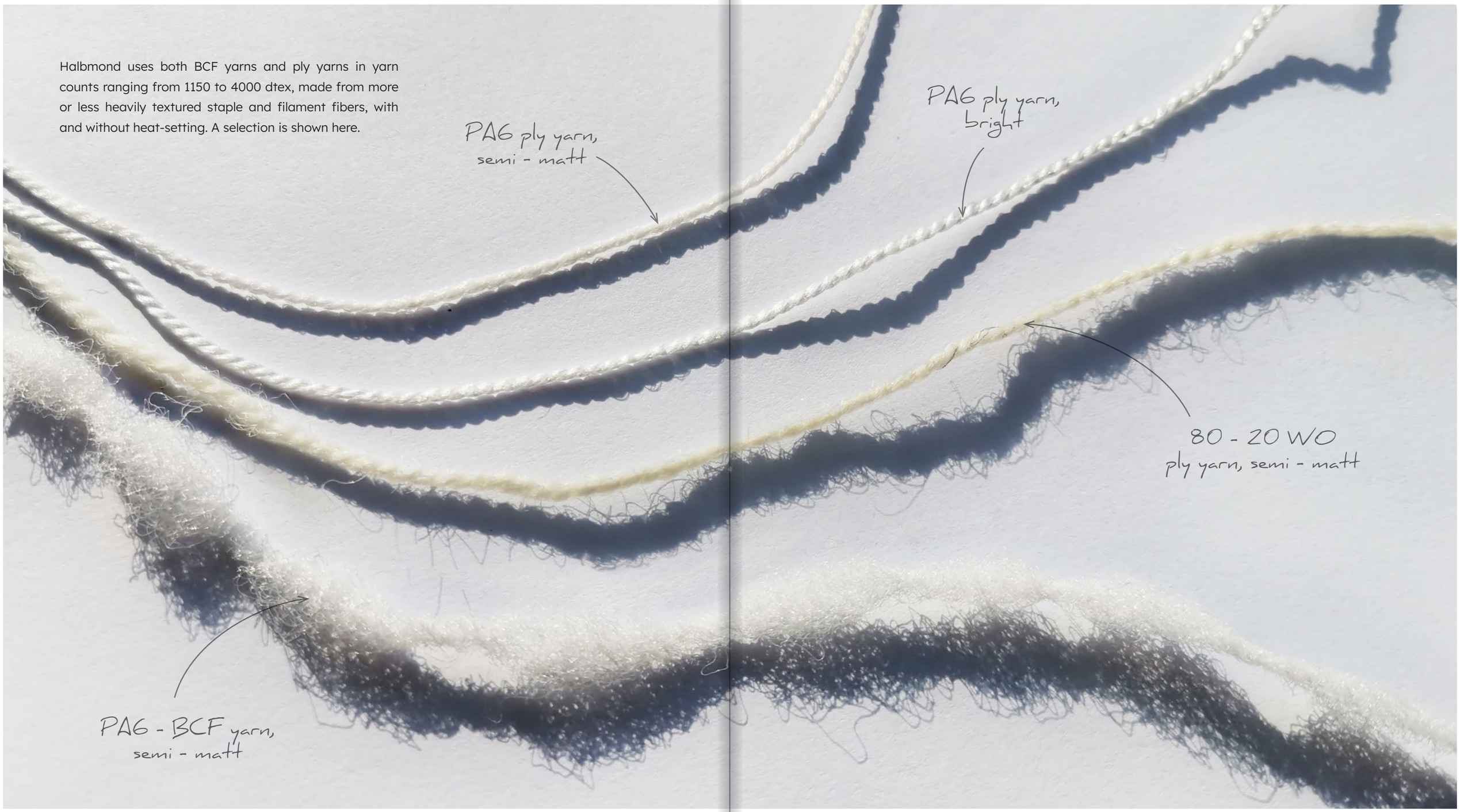


10 **Heat setting**

-> twist in the ply yarn is steam-set, residual stress is relieved

Carpet yarns at Halbmond

Halbmond uses both BCF yarns and ply yarns in yarn counts ranging from 1150 to 4000 dtex, made from more or less heavily textured staple and filament fibers, with and without heat-setting. A selection is shown here.



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TUFTING

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Side note: Types of tufting

TUFTING TYPE	Hand-knotting (reference technique)	Hand tufting gun	Table tufting machine	CNC tufting robot	Industrial tufting machine + printing
Product	Carpets	Carpets	Carpets, small series	Logos, carpets, series	**Broadloom (meter goods)**
Optimal batch size	1 piece	1 piece	1–10 pieces	1–100 pieces	**from 500 m²**
Time per 1 m²	150–800 + hours	2–4 hours	30–60 min	15–30 min	**approx. 1–2 min**
Printing time per 1 m²	N/A	N/A	N/A	N/A	**10–30 sec**
Colors simultaneously	1	1 (mixing of 2 possible)	1	8–24 (automatic)	**unlimited (digital printing)**
Color change	manual (yarn change)	manual (yarn change)	manual (yarn change)	automatic	**controlled via printing**
Max. color range	unlimited	unlimited	unlimited	8–24 (automatic system)	**unlimited (digital printing)**
Precision	very high (knot-dependent)	variable	high	very high (CNC)	**very high (print resolution)**
Operator fatigue	high	high	low	none	**none**
Reproducibility	low (unique pieces)	low (unique pieces)	medium	very high (digital)	**very high (industry standard)**
Market price/m²	€800–€5,000	€350–€800 +	€150–€400	€100–€300	**€10–€90**

Tufting characteristics

Tufting. Tufting is a technique for producing three-dimensional textile surfaces. In the industrial production of floor coverings, no other process is as high-resolution, flexible in sampling, fast, and cost-efficient as tufting a white base combined with subsequent printing. Tufted goods initially consist of two components (the secondary backing is added later): the primary backing and the pile yarns..

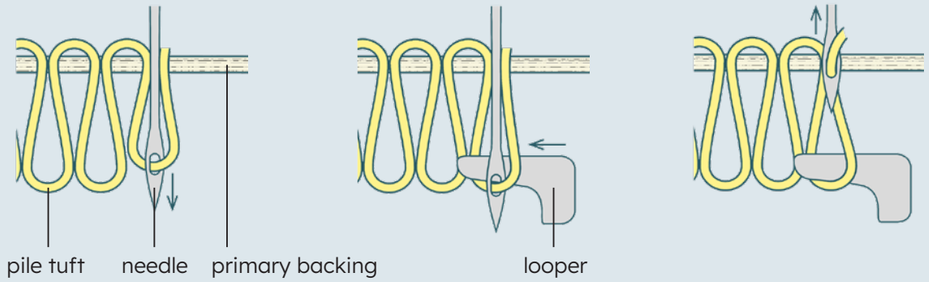
Primary backing. The primary backing is the textile base layer into which the pile yarns are inserted. It can be either a **non-woven** or a **woven fabric**, and may consist of a single material or a material blend.
A **non-woven** is a planar fibre structure in which the fibres are bonded either mechanically (e.g. needle-punched non-woven, hydroentangled nonwoven), thermally (e.g. thermal-bonded non-woven), or by binders.
A **woven fabric** is a planar structure composed of yarns that are typically arranged at right angles to each other and interlaced according to a defined weave pattern.

> At Halbmond, mechanically and thermally bonded nonwovens made of 75% polyester (PES) and 25% polyamide (PA) are used as tufting backings due to their dimensional stability..

Pile (yarn). The individual pile tufts (cut or uncut) consist of yarn that protrudes from the primary backing, forming the pile. This visible and tactile yarn portion is also referred to as the **wear layer.** The remaining part of the pile yarn penetrates the tufting backing and is visible on its reverse side as yarn loops or stitches - however, only before the secondary backing is applied. The total yarn mass per square metre - including the non-visible portion - is referred to as the **pile yarn weight** (pile weight). Its accurate determination requires a relatively complex extraction process, i.e. a complete deconstruction of the carpet. Halbmond regularly performs this analysis on both in-house and third-party qualities. Since the pile yarns are only inserted through the primary backing and not knotted, they are held in place by additional adhesion. A latex coating (pre-coat) and the subsequently applied secondary backing provide the necessary stability and fixation.

The process

loop pile process



Industrial tufting. During production, the primary backing is positioned with the reverse side facing upwards. The pile yarn is inserted into it from above using a needle and is held underneath the backing by a looper, so that the formed loop is retained when the needle is withdrawn (see above). These loops form the later pile tufts, while many dense rows form the so-called pile.

Loop pile. If the loops are retained, this is referred to as **loop pile**.

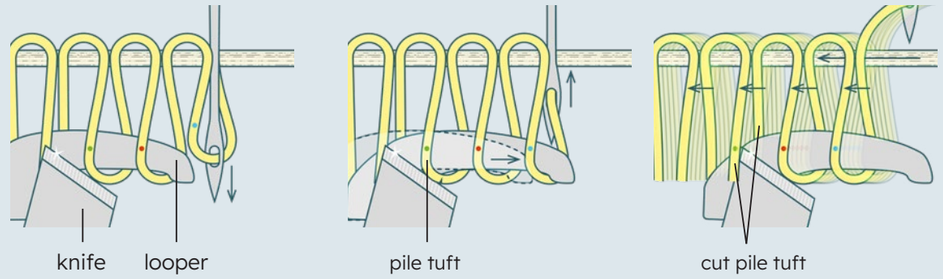
Cut pile. If the loops are cut by a knife during further transport of the fabric, a **cut pile**, or **velour**, is formed (see top right).

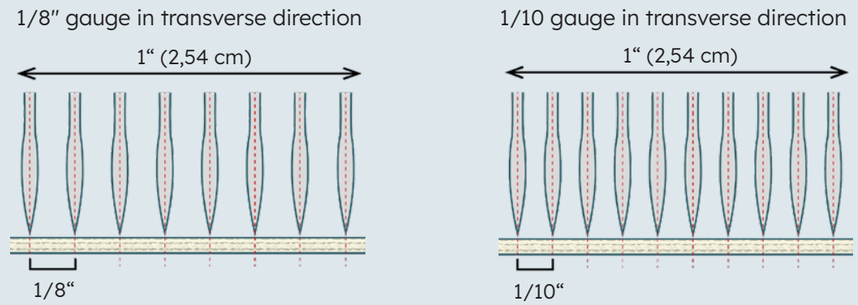
Gauge. In machine production, many needles work in parallel. The distance between them is referred to as the **gauge**. Since the needles carry the pile yarns, the gauge simultaneously determines the spacing of the pile yarns and thus the density of the resulting pile. The gauge can be adjusted to the yarn thickness. It is expressed as a fraction, where the denominator indicates the number of needles per inch.
> A loop pile fabric with a gauge of 1/8" has 8 stitches per inch (2.54 cm) across the width of the tufted fabric, while a fabric with a 1/10" gauge has 10 stitches over the same distance.

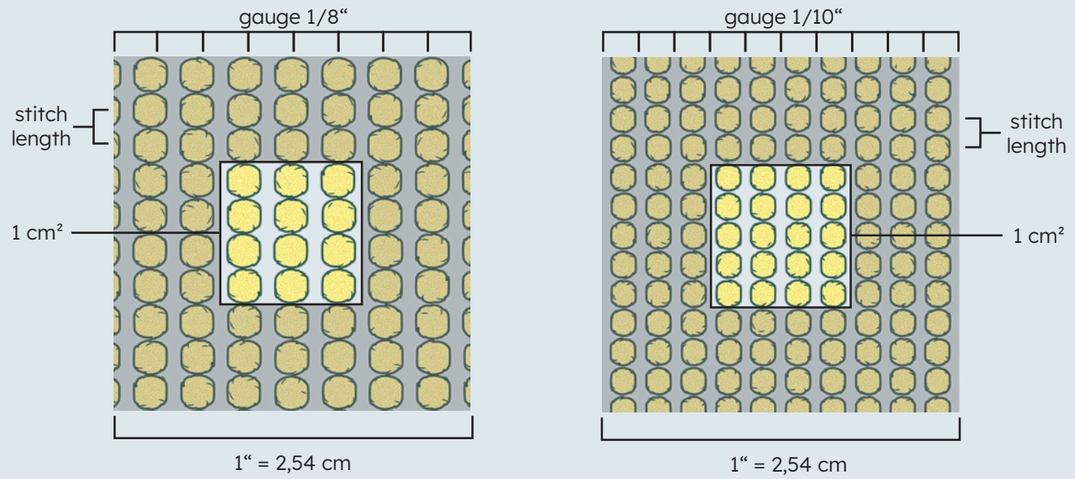
Tuft density. From the gauge (and stitch length in production direction), the number of tufts on a defined area is derived, also referred to as tuft density. It is typically expressed per square metre – a very large, hard-to-grasp number. It becomes more tangible when first considering the number of tufts per square centimetre (the number of tufts per square metre is then 10,000 times higher).
> In the adjacent example, the tuft densities per square centimetre are shown for the most common Halbmond gauges of 1/8" and 1/10".

> Further information on tufting can be found in the Infoguide "Understanding Data Sheet".

cut pile process







tuft density – example 1:
12 / cm² = 120.000 / m²

tuft density – example 2:
20 / cm² = 200.000 / m²

Tufting qualities at Halmbond

AP-ST 1150-28
Pile type: loop, PA 6
Models: AP-ST 1150-28
Appearance: relief-like, silk-matt, lively

Cut pile/velour. Cut pile qualities are classified according to their different constructions and appearances as follows:
(Plain) velour. The yarn ends bloom into small tufts, creating a homogeneous filament surface.
Saxony. The pile is slightly longer, the yarn more strongly twisted, and the surface has a soft fall.
Twist velour. The yarn twist is even higher; the pile stands more upright and is more robust.
Frisé. A very high yarn twist combined with heat-setting creates a granular pinpoint appearance; the yarn looks like fine curls.

Loop pile. Halmbond offers three types of loop pile: the standard version with uniform loop height (in the AP and ECO ranges), the AP-ST 1150-28 model with varying loop heights, and the AP 016 SM quality with a particularly low special loop. Due to their distinctly different appearances, they allow for a wide range of applications and aesthetic preferences.

ECO 850 S
Pile type: loop, PA 6
Models: 850 S
Appearance: nubby, closed surface, silk-matt

Arcade
Pile type: plain velour, PA 6
Models: Arc, Arcade, Arcade Special
Appearance: uniform closed surface, silk-matt

AP G (Glanz)
Pile type: gloss velour, PA 6
Models: 1000, 1500, 1800
Appearance: glossy, velvety, strong shading effect

AP 016 SM
Pile type: special loop, PA 6
Models: AP 016 SM
Appearance: braid-like, rib-bed, silk-matt, calm

AP
Pile type: velour (cut pile), PA 6
Models: 780–1400
Appearance: fine-grained, silk-matt, calm

Art
Pile type: velour (cut pile), PA 6
Models: 800–1400
Appearance: fine-grained, silk-matt, calm

Gloss yarns have an elegant appearance and attract attention.
A typical characteristic of gloss velour is the shading effect, i.e. the visible marks left by foot traffic.

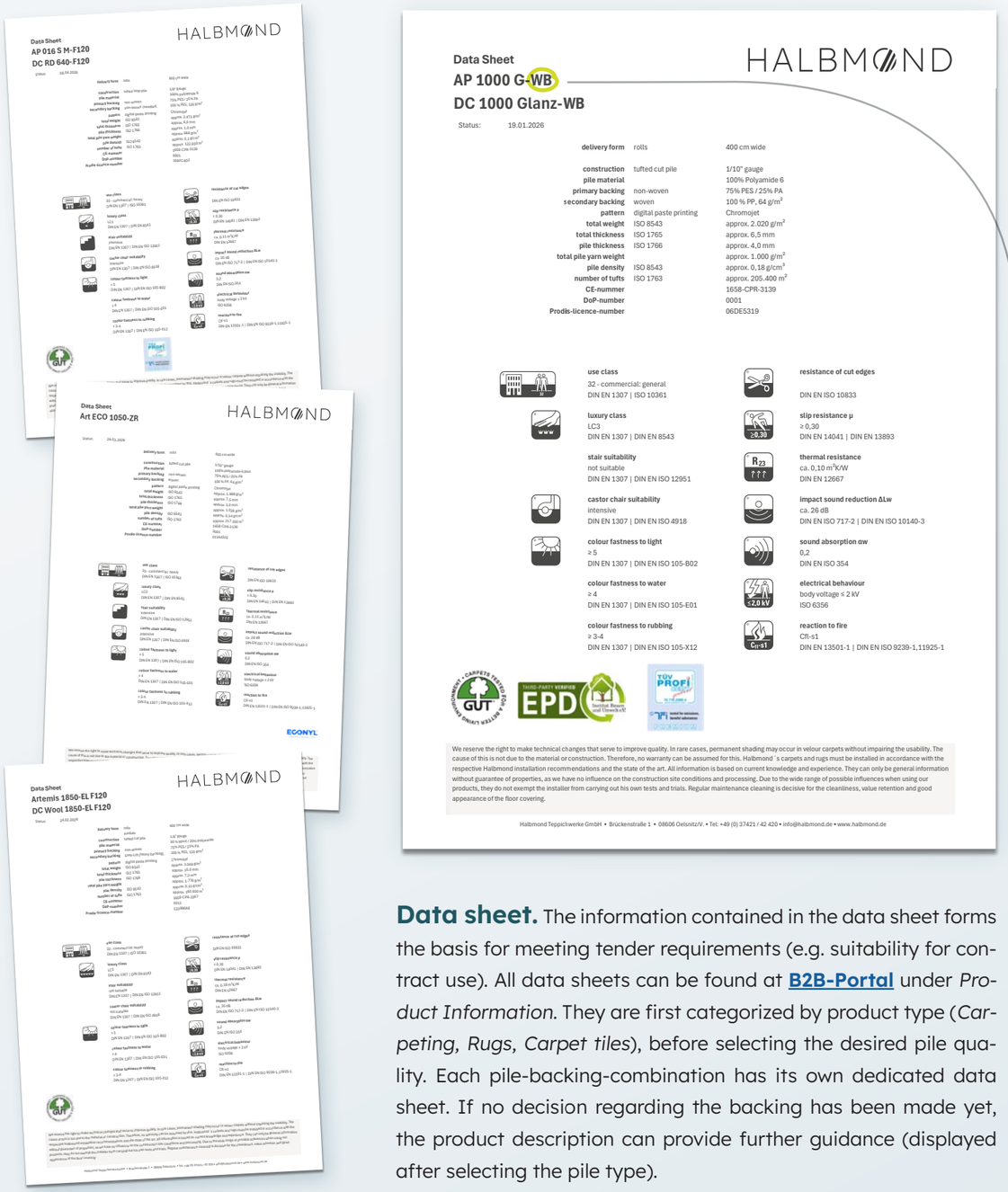
AP 1600 GF
Pile type: gloss velour frisé, PA 6
Models: 1600 GF
Appearance: granular pinpoint, glossy, fine shading effect

Gallo
Pile type: velour saxony frisé, PA 6
Models: Gallo
Appearance: glossy, curly, live

Artemis
Pile type: velour, 80% WO, 20% PA 6
Models: 1050–2000
Appearance: woolly, cream-white, silk-matt, calm

How does the customer obtain information?

Technical description: data sheet



Data sheet. The information contained in the data sheet forms the basis for meeting tender requirements (e.g. suitability for contract use). All data sheets can be found at **B2B-Portal** under *Product Information*. They are first categorized by product type (*Carpeting, Rugs, Carpet tiles*), before selecting the desired pile quality. Each pile-backing-combination has its own dedicated data sheet. If no decision regarding the backing has been made yet, the product description can provide further guidance (displayed after selecting the pile type).

Marketing information: product information

Product information. The product information initially helps with the interpretation of the key figures contained in the data sheet. It describes the character of a quality, recommends suitable application contexts, and provides an installation example. In the lower section, the most common backing variants are compared in terms of total thickness, acoustic performance, and thermal insulation properties. If the thermal resistance of a combination exceeds 0.17 m²K/W (dashed line), it is no longer recommended for installation over underfloor heating systems.

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CARPET INFO GUIDE

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