Technical specifications for ESCO engineered and solid wood flooring

Important notice:

Please carefully review these technical specifications and contact us if anything is unclear or you have questions before signing and placing a binding order. This is to avoid any misunderstandings and so that you know the exact type of flooring you will receive. The technical specifications along with the General Terms and Conditions and the valid price list serve as the basis for resolving any complaints, claims, or disputes. All customers are informed in writing as to where they can find these technical specifications in every confirmed order. The technical specifications are also available at www.escogroup.eu and www.escopodlahy.cz. The customer automatically accepts these technical specifications when ordering products from ESCO.

Content

1. Product specifications

These technical specifications define the properties of engineered parquet and solid wood tongue-and-groove flooring for use as **indoor flooring**. The specifications cover engineered parquet and solid wood flooring with and without surface finishes.

The technical specifications also describe the individual categories of joinery products.

1.1. Wood

European oak, Quercus robur – summer oak, and Quercus petraea – winter oak, are used to produce these wood flooring products. The wood is certified with a PEFC certificate. Oak is a natural material, a gift from Mother Nature, and its origin thus influences **the diverse anatomical structure and colour differences of the finished product**, which cannot be avoided. After installation, wood products respond to changes in environmental conditions. The dimensions of wood elements in flooring and in other products change depending on ambient humidity, and their colour also changes depending on the intensity of the surrounding, especially natural light.

1.2. Flooring made from a single piece of wood

This is referred to as **solid wood flooring**. The individual parquet pieces are completely made from a single piece of wood, including the joints.

1.3. Engineered flooring

Engineered flooring is available in **2-layer or 3-layer** designs.

In the case of 2-layer parquets, the structure is a top layer, so called lamella, made from natural wood that is bonded to a core layer made of plywood.

In the case of 3-layer parquets, the flooring is made of a sandwich construction, consisting of a natural wood lamella glued to a 2-layer, slatted center. The middle layer of the floor consists of a slatted center and a thicker softwood veneer on the underside.

Engineered flooring is dimensionally **more stable** than solid wood flooring.

2. Shipping and storage conditions for flooring and joinery products

Flooring is shipped on pallets. A pallet consists of a varying number of flooring packages, depending on the order. Every package of flooring is secured with straps and is shrink wrapped to protect the flooring from dust and moisture. The packages of flooring are secured to the pallet with straps. The entire pallet is then covered on the top and shorter sides with PE film and wrapped with stretch film on all sides. This system ensures that the flooring has the prescribed moisture content when it is shipped, as specified in the standards specified below.

Never store flooring in an environment with a relative humidity **outside the recommended range**:

Short-term (only during transport): ≤ 30% and ≥70%

Long-term (before installation): 40% to 60%

Notice:
Shape and visual abnormalities may appear in flooring exposed to ambient humidity outside the recommended range for a longer period of time. Relative ambient humidity below 30% and above 70% is considered extreme. At a moisture content of 5% for instance, the response in the product will be extreme, with desiccation cracks appearing and dimensional changes leading to gaps forming between the elements. There may be permanent deformation of the parquets due to longitudinal and transverse deflection, torsion, etc. In case of extremely high ambient humidity, the floor will bulge due to localised swelling; the floor may be infested with mould, etc. The customer and the carrier must also protect the flooring to ensure that it cannot come into contact with water, e.g. rain when it is being unloaded, etc.

If Esco does not receive any information or claim from the customer regarding moisture content in the product upon delivery, Esco automatically considers that this factor has been confirmed as acceptable and further claims related to moisture content will not be honoured. The customer must use a certified and calibrated instrument to measure moisture content, as well as a method that conforms to the valid standards.

3. Wood quality classes for engineered and solid wood flooring

The wood is sorted into individual quality classes by hand when it is processed. Since the classification of some features into individual classes is always subjective and also depends on the overall appearance of the flooring, a certain proportion of another class may be represented in one quality class. This representation is determined by the relevant product standard and the associated free wood classification class.

3.1 Elegance class:

- **Permissible:** small knots - might be also filled, natural colour differences and the natural grain of the wood structure. Not filled fine hairline cracks up to a width of approx. 0.4 mm, which are left in this way to preserve the natural appearance of the wood
- **Not permissible:** insects, sapwood, ingrown bark, rot
- This select quality is intended to give a very **calm and uniform** pure wood impression
- For certain types of products, the Elegance / Superb quality classes are used together (see the product technical sheets)

3.2 Superb class:

- **Permissible:** medium-sized filled and closed knots, natural colours and vivid structural differences and minor cracks. Not filled fine hairline cracks up to a width of approx. 0.4 mm, which are left in this way to preserve the natural appearance of the wood
- **Not permissible:** insects, sapwood, ingrown bark, rot
- This quality class is intended to provide a more natural character, but **with no large, distracting** growth **anomalies**
- The Superb class is also used to produce products in the Pelgrim collection

3.3 Calm class:

- **Permissible:** medium-sized filled and closed knots, natural colours, vivid structural differences and minor cracks. Sapwood content is not restricted. Not filled fine hairline cracks up to a width of approx. 0.4 mm, which are left in this way to preserve the natural appearance of the wood
- **Not permissible:** insects, ingrown bark, rot
- **The very calm appearance** of almost pure wood here is in direct contrast with the unlimited proportion of new-growth wood (sapwood). This creates a pleasant harmony, where even selected wood with very limited signs of natural growth looks natural

3.4 Hamony class:

- **Permissible:** medium-sized and larger filled and healthy knots, filled cracks and natural components of the wood structure such as heartwood, sapwood along one long side, natural colours and vivid structural differences. Not filled fine hairline cracks up to a width of approx. 0.4 mm, which are left in this way to preserve the natural appearance of the wood
- **Not permissible:** insects
- **A reflection of pure nature**. A quality that leaves the wood as it grew. Here, almost pure wood is in harmony with the natural texture to highlight the color and vibrancy of the structure. The effect will be supported by a reduction in the representation of sapwood

3.5 Original class:

- **Permissible:** medium-sized and larger filled and healthy knots, filled cracks and natural components of the wood structure such as heartwood, sapwood along one long side, natural colours and vivid structural differences. Not filled fine hairline cracks up to a width of approx. 0.4 mm, which are left in this way to preserve the natural appearance of the wood
- **Not permissible:** insects
- This quality class portrays the natural **character** of oak wood by **representing all growth signs** and defects with the limitation of heavily rustic wood

3.6 Special Rustic class:

- **Permissible:** open filled knots, cracks and cross-shaped knots of any size, any natural colour variance, sapwood, all growth anomalies and markings. Not filled fine hairline cracks up to a width of approx. 0.4 mm, which are left in this way to preserve the natural appearance of the wood
- **Not permissible:** insects
- This quality class displays the **strongly rustic character** of the wood

3.7 Karel IV class:

- **Permissible:** very vivid, open filled and unfilled knots, cracks and cross-shaped knots with no size limit, extreme natural colour variance, sapwood. Not filled fine hairline cracks up to a width of approx. 0.4 mm, which are left in this way to preserve the natural appearance of the wood
- **Not permissible:** insects and larger filled unhealthy knots
- A special class of **old-style** oak material

4. Flooring surface finishes

Flooring surface finishes are primarily **influenced by the anatomy of the wood**. This causes surface unevenness in relation to roughness/smoothness. Veins, pores, knots and the uneven density of wood in different parts of the tree then affect the amount of surface finish absorbed. This will cause **differences in surface colour** and differences in colour between the individual parquets. Likewise, the quantity, sequence and method used for parts of the production workflow influence the surface finish. The overall colour of the floor will therefore be different even when the same oil is used if the surface of the flooring is brushed or simply sanded smoothly. The following production operations, or a combination thereof, can be used in flooring surface finishes.

4.1. Bevels on parquets

Bevelling involves milling an acute angle around the perimeter of the tread surface of the floor parquets (planks) at an angle of 45°. The surface area size of the bevel can be influenced by subsequent manufacturing operations. The product can be delivered at the customer's request without bevelling, with longitudinal bevelling (standard) or with bevelling around the entire perimeter of the parquets. For practical reasons, Esco **does not recommend** a sanded **product without bevelling**. Changes in ambient humidity may cause height differences between the elements, and maintaining the sharp edge of the element without bevelling may not be comfortable for some users.

4.2. Planing

When planed, the surface of the floor is very smooth to vitreous. The structure of the wood on the surface is much more closed than with sanding and brushing. The floor surface is left as it is after being treated by planing knives. The surface may show small gouges, typical of the marks left by rotary planing knives. This is desirable in this case and not a defect.

4.3. Filling

Before the filling process, all **parquets** are **freed** of anatomically **soft parts** such as hearth, the soft parts of knots, ingrown bark, etc. In addition, parts of wood that could come loose from the floor during use are removed. After this, **surface irregularities and openings** are **filled** with thermoplastic filler in a choice of colours. **Filled areas**, such as knots and cracks, may be **depressed** relative to the wood surface, which is not a defect and is caused by slight shrinkage of the sealant during cooling or e.g. brushing. The thermoplastic filler absorbs significantly **less pigment** from the oil finish. Filled areas can therefore be significantly **less coloured** than the surrounding wood. This depends on the chosen colour of the filler and how it contrasts with the chosen oil colour. This is not a defect.

In the Pelgrim collection, the knots are filled with a special ecological filler, which is tinted the same shade as the floor. After oxidative drying, which takes about 3 weeks, this filler sinks into the knot, giving the floor an inimitable plasticity. It is not recommended to touch the sealant when laying the floor, unless it is completely hardened.

In the Karel IV. collection, the knots are filled with water born filler which is oxidative dried.

4.4. Sanding

We adjust the sanding fineness so that the floor subsequently absorbs the oil surface finish well. The surface of the sanded floor is therefore slightly rough. The surface may have areas with rougher and smoother areas, which can be transferred to the finished product, especially if it is also treated with ammonia. This is not a defect.

4.5. Ageing/distressing

Ageing is a process where the surface of the floor is intentionally, manually or mechanically modified so that the surface of the new floor looks like it has been used for a long time. Ageing is therefore either the production of mechanical defects in the surface (scratches, dents) or the imitation of imperfections left behind by previous production process (waviness or marks left by a tool, saw, etc.). The ageing effect is influenced by the hardness, structure, knots on the surface of the wood and also the size of the parquet. This makes it irregular in different places, which is desirable. Mechanical intervention in the natural structure of wood disrupts the anatomical structures of wood. This significantly affects the ability of the surface to absorb different amounts of pigment during subsequent surface treatment. The defects produced therefore usually have a darker tint than the surrounding surface. This is not a defect.

4.6. Brushing

Brushing, also sometimes referred to as scraping, is a process where the surface of wood is changed from a smooth (two-dimensional) surface to a plastic (three-dimensional) surface using brushes. The natural properties of wood are used here, when the individual anatomical elements of the wood do not have the same density and hardness. The action of the brushes on the surface of the future floor will result in greater abrasion of soft and sensitive parts (new-growth wood, pith, sapwood, knotted areas, faces, etc.) and less abrasion of hard parts (summer wood, knots, reaction wood, etc.). The brushing effect on the surface of the individual parquets is variable and may cause greater thickness differences between the elements.

4.7. Ammonia treatment/smoking

Ammonia treatment is a process where the surface of the wood is exposed to ammonia gas for a specific length of time.

This facilitates a chemical reaction with the natural substances in the wood. This results in an overall change in the colour of the wood (yellow shades in particular turn grey to brown and darker shades) and further highlights some of the anatomical structures of the wood. This chemical process is very difficult to influence, because it is impossible to estimate in advance the content of substances in the wood that will react with the gas. This can produce very different colouration in the individual elements, which can be further accentuated by subsequent oiling (e.g. with white shades). This is not a defect.

Fig. 1: Colouration differences after ammonia treatment

4.8. Staining

Staining wood is the process of **impregnating it with a stain solution**. This is done with a cylindrical roller, which applies the stain precisely over the entire surface of the parquet. After applying the stain, the **wood** usually **changes** its **colour** (darkens), but at the same time its **grain** and structure stand out. The stain soaks into the wood, highlights its texture and **unifies the natural colour differences** of the wood, without hiding the natural structure of the wood. Stains therefore lightly tone and prepare the wood floor for further coating. Water-based stains are used.

Special stains are also used, which **prevent the wood from changing its colour** as it ages in daylight. This reduces the natural "yellowing" of the wood.

4.9. Oiling

Oiling wood is a process where **oil** is applied to the surface of the floor by hand or by machine, which **creates the final surface finish** on the floor. This process is carried out either **mechanically** or **by hand**. Each of these processes uses a different composition of oils and a different final curing process. Oiling creates an anti-static surface that is warm to the touch. If damaged, an oiled surface can be locally repaired very easily and inexpensively. The floor can breathe under the oil because the pores of the wood remain open. Oils also do not form layers that can separate.

4.9.1. Hand oiling

Hard, oxidative **oil** (hard wax Polyx oil) is used. This oil penetrates deep into the pores of the wood, **enhances** the natural **appearance** and protects the wood from moisture. It is applied manually, in 2-3 coats using a roller. After each layer is applied, the oil is evenly spread over the surface of the parquet with a felt fleece. Oxidizing oil thus **penetrates deep into the pores of the wood** and protects the wood from moisture. The oil then dries and hardens at ambient temperature for at least 1 day so that the floor can be packed and shipped. Oxidizing oil completely hardens in a few days.

4.9.2. Machine oiling

Machine Polyx hard wax oil & top-coating is used, which cures with UV light. The entire oiling process is performed by a machine roller in 2 coats, which in this case are ideally bonded using brushes. There is always a transparent top layer on the surface of the floor. The surface feels soft with a natural matte shade, as with hand oiling.

5. Parameters, properties and normative references of ESCO floors

TECHNICAL SPECIFICATIONS OF ESCO PRODUCTS								
			ENGINEERED FLOORS			SOLID FLOORS		
Product / parameter	**Standard**	**Standard number / test method**	Multi-layer parquet elements	Multi-layer parquet elements	Multi-layer parquet elements	Solid individual and pre-assembled hardwood boards	Solid parquet elements with T&G	Mosaic parquet elements
Floor type			3-layer oak floor	3-layer oak floor	2-layer oak floor	Solid oak floor	Solid oak floor	Solid oak floor
Floor thickness			14 mm	15 mm	15mm	20 mm	20 mm	20 mm
PRODUCT STANDARD								
Wood flooring and parquet	Multi-layer parquet elements	EN 13489	Implemented *	Implemented *	Implemented *	N/A	N/A	N/A
Wood flooring and parquet	Mosaic parquet elements	EN 13488	N/A	N/A	N/A	N/A	N/A	Implemented *
Wood flooring and parquet	Solid individual and pre-assembled hardwood boards	EN 13629	N/A	N/A	N/A	Implemented *	N/A	N/A
Wood flooring and parquet	Solid parquet elements with T&G	EN 13226	N/A	N/A	N/A	N/A	Implemented *	N/A
PROPERTY STANDARDS								
Wooden flooring and wooden wall and ceiling coverings	Determination of resistance to chemicals	EN 13442		≥ 3**			≥ 3**	
Wood-based panels	Wood veneer floor coverings	EN 14354						
	Classes for household and commercial use	Esco recommendation		Household use, commercial use feasible ***			Household use, commercial use feasible ***	
Wood flooring and parquet	Characteristics, evaluation of conformity and marking	EN 14342						
	CE marking	EN 14342	Certified	Certified	Certified	Certified	Certified	Certified
	Formaldehyde emissions	EN 717-1	E1	E1	E1	E1	E1	E1
	PCP content	CEN/TR 14823	PCP ≤ ppm	PCP ≤ ppm	PCP ≤ ppm	PCP ≤ ppm	PCP ≤ ppm	PCP ≤ ppm
	The maximum recommended support distance for a solid floor on a grid	By calculation according to EC 5	N/A	N/A	N/A	≤ 400 mm	≤ 400 mm	≤ 400 mm
	Slip resistance	CEN/TS 15676		****			****	
		Dry surface sanded		≥ 65 mm			≥ 65 mm	
		Wet surface sanded		≥ 26 mm			≥ 26 mm	
		Dry surface brushed		≥ 69 mm			≥ 69 mm	
		Wet surface brushed		≥ 29 mm			≥ 29 mm	
Building materials and products	Hygrothermal properties — Tabulated design values	EN 10456						
		Thermal resistance	0.11 m2*K/W	0.12 m2*K/W	0.09 m2*K/W		0.15 m2*K/W	
		Thermal conductivity	0.13 W/(mK)	0.13 W/(mK)	0.17 W/(mK)	0.13 W/(mK)	0.13 W/(mK)	0.13 W/(mK)
Durability of wood and wood-based products	Use classes: definitions, application to solid wood and wood-based products	EN 335 Biological durability	Class 1	Class 1	Class 1	Class 1	Class 1	Class 1
Fire classification of construction products and building elements	Part 1: Classification using test data from reaction to fire tests	EN 13501-1	Dfl-S1	Cfl-S1	Dfl-S1	Cfl-S1	Cfl-S1	Cfl-S1
Sound impact			The acoustics of the structure must be addresses regardless of the floor used			The acoustics of the structure must be addresses regardless of the floor used		
Underfloor heating		Esco recommendation	YES	YES	YES	NO	NO	NO
Floor weight	kg/m2		≥7.8	≥8.5	≥10.5	≥14.8	≥14.8	≥14.8
Floor density	kg/m3	EN 323	≥560	≥570	≥700	≥750	≥750	≥750
Determination of indentation resistance	N/mm2	EN 1534	25-40	25-40	25-40	25-40	25-40	25-40

NOTES

* Given manufacturing conditions, Esco guarantees the following geometric tolerances for parquets less than 120 mm wide and shorter than 800 mm:

permitted thickness deviation	± 0.2	mm
permitted thickness deviation with SF	± 0.5	mm
permitted length deviation (does not apply to random lengths)	± 0.5	mm
permitted length deviation (for chevron and straight weave patterns)	± 0.2	mm
permitted width deviation	± 0.5	mm

Given the manufacturing conditions, Esco guarantees the following thickness range for lamellae:

lamella thickness tolerance 3 mm	≥ 2.5 mm	≤ 3.2 mm
lamella thickness tolerance 4 mm	≥ 3.5 mm	≤ 4.2 mm

Given the manufacturing conditions, Esco guarantees the following thickness range for product PELGRIM:

permitted thickness deviation	+ 0,0 / - 0,4	mm

Given the manufacturing conditions, Esco guarantees the following thickness range for product HARFA VINTAGE:

permitted thickness deviation	+ 0,2 / - 0,4	mm

** Declared resistance to distilled water, coffee and red wine vinegar

*** Commercial use feasible if regular floor maintenance is performed per the maintenance instructions for hardwood flooring treated with OSMO Polyx® - Oil issued by OSMO.

**** The values are not declared, but determined by measurement

N/A Cannot be used

5.1. Parquet length, width and thickness

Floor dimensions and length rules are specified for each product line in the Technical Data Sheets.

6. Joinery products

These products include **solid wood stairs (can also be used as window sills), solid wood stair nosings, engineered (multi-layered) stair nosings, solid wood thresholds, solid wood skirting boards, solid wood handrails, veneered trim boards and tables.** All of these products are intended **for interior use** and are subject to the same moisture conditions as flooring. They can be supplied with or without oil surface finishes.

Joinery products are mainly made by hand and subsequently also hand oiled. Esco makes every effort to ensure that the supplied accessory products are as identical as possible to the supplied floor, but manual processing (surface finish, oiling, ammonia treatment) and the specific lumber used to produce these accessories mean there may be some colour differences compared to the supplied floor. These facts must be considered by the customer before ordering. The difference in colour with the floor is not a product defect. As an alternative, Esco can deliver these products with no surface finish, including a pack of hand oil, which is used to treat the product after installation and therefore the shade can be influenced directly on site. The work procedure will influence the colouring in these two alternatives.

6.1. Solid wood stairs

The available sizes and shapes are always listed in the valid price list or are available on request.

Solid wood stairs are made from joined solid wood materials. The individual possible designs differ in the design and construction of the joint - see Figure 2

Figure 2 – design of solid wood stairs

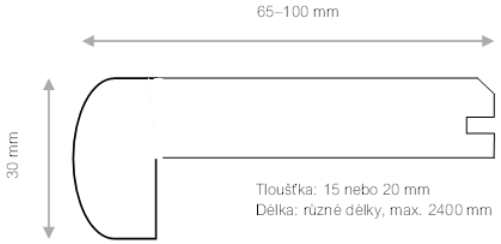
Model 2 and 5 - the corner joint is a 45° glued butt joint
Model 4 - the vertical element is inserted from below into the groove of the horizontal element, is delivered disassembled and the installation is carried out by a floor specialist directly on site
Surface finish: Sanded or brushed surface. Without and/or with oil.
Stair thickness: 20, 30, 40 and 50 mm
Dimensions: made to order, including when dimensions of elements with other than right angles are required

6.2. Solid wood stair edges

The available sizes and shapes are always listed in the valid price list or are available on request.

Solid wood stair edges are made from joined solid wood materials - see Figure 3

Figure 3 – solid wood stair edge



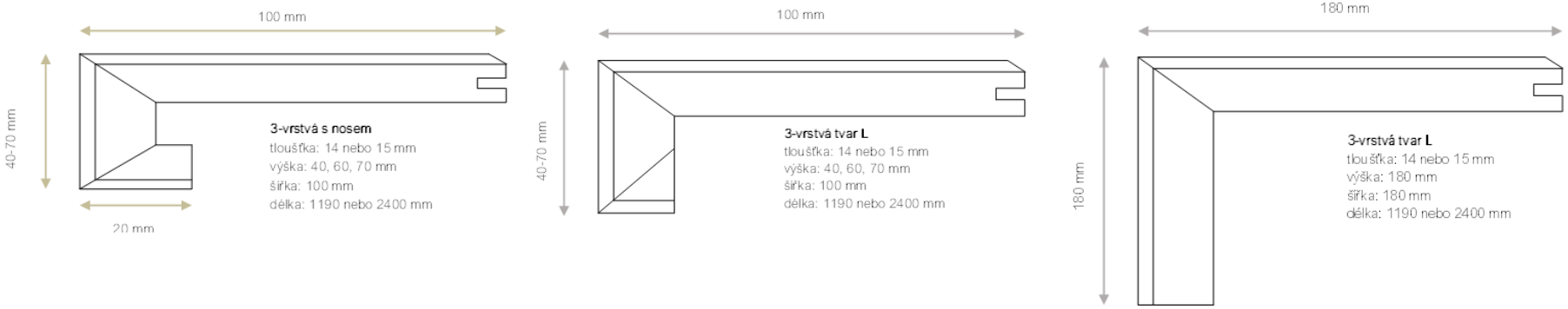
The rounded face is glued at a butt joint to the horizontal plank.
Surface finish: Sanded or brushed surface. Without and/or with oil.
Always finished with a groove and bevel.

6.3. Engineered (multi-layered) stair edges

The available sizes and shapes are always listed in the valid price list or are available on request.

Engineered (multi-layered) stair edges are made from an identical sandwich structure as a flooring plank (see Paragraph 1.3 Engineering flooring). The individual versions are shown in Figure 4

Figure 4 – engineered (multi-layered) stair edges



The elements are butt-glued.
Surface finish: Sanded or brushed surface. Without and/or with oil.
Always finished with a groove and bevel.

6.4. Solid wood thresholds

The available sizes and shapes are always listed in the valid price list.

Solid wood thresholds are made from a single piece of wood. Available designs are shown in Figure 5

Figure 5 – solid wood thresholds

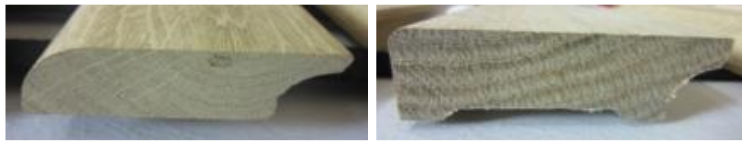
Surface finish: Sanded or brushed surface. Without oil and/or oiled.

6.5. Solid wood skirting boards

The available sizes and shapes are always listed in the valid price list or are available on request.

Solid wood skirting boards are made from a single piece of wood. The available designs are shown in Figure 6

Figure 6 – solid wood skirting boards



Surface finish: Sanded or brushed surface. Without oil and/or oiled.

6.6. Solid wood handrails

The available sizes and shapes are always listed in the valid price list.

Solid wood handrails are made from a single piece of wood. The available designs are shown in Figure 7

Figure 7 – solid wood handrails

Surface finish: Sanded surface. Without oil and/or oiled.

6.7. Veneer trim boards

The available sizes and shapes are always listed in the valid price list.

Veneer trim boards are made from a profiled MDF board core on which an oak veneer is applied to the visible side. The available designs are shown in Figure 8

Figure 8 – veneer trim boards

Surface finish: Sanded surface. Without oil and/or oiled.

6.8. Solid wood tables

The available sizes and shapes are always listed in the valid price list.

Selected oak wood is used to produce solid wood tables. The individual elements (table tops, ribs, legs, etc.) consist of joinery blocks that are butt-glued together in compliance with joinery rules to prevent the wood from twisting.

Surface finish: Sanded surface. Ammonia treatment is available. With no surface finish or oiled.