



Application example

# dekorial starline

High Pressure Metal Laminate HPML

## Product description

The product name dekorial starline refers to real metal laminates (HPML) with an aluminium surface. This metal layer is applied to a phenolic resin core with high pressure. The resistant aluminium surface is produced by anodising (for mirror quality) or by painting. Since anodising is an integral part of the top layer, this provides permanent protection against external influences.

A special stove enamelling on an epoxy resin basis or a PU coating are also measures to protect the metal surface, which is implemented in many designs. Depending on the requirements, the aluminium layer can be smooth, brushed or embossed. The typical metallic character is created by pressing in the natural colour tone. A transparent colour in combination with surface structures is another additional possibility for decorative design.

A „slight surface unevenness“ and (in the case of structures) slight differences in the degree of gloss in some aluminium laminate grades characterizes this product, among others. Small dents are also unavoidable and normal with the current state of the art. The same applies to the colour tone of the products listed here. This can vary minimally due to the production process, but the overall impression is generally not disturbed.

### Suitable for:

- implementation of high-quality concepts (e.g. shopfitting, hotels, etc.)
- vertical use, as wall covering, etc.
- horizontal use, in some cases even up to the demands of highly frequented areas (A 480 and A 486)

### Not recommended for:

- Outdoor use, area exposed to spray water, very humid environment (Wet and damp rooms / areas)



dekorial starline

### Characteristics:



Non-fade



Resistant to chemicals



Food safe



Resistant to cleaning



Flame retardant



Scratchproof



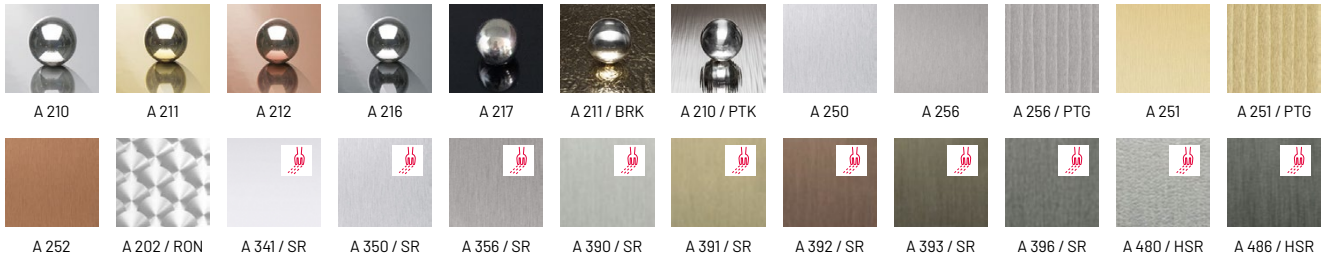
European  
Standard  
**EN 438**

low formaldehyd



Lloyd's  
Register

**Selection from the dekorial starline collection:**



You can find further decors from the dekorial starline collection at [www.dekodur.de/de/metall/aluminium-hpl.html](http://www.dekodur.de/de/metall/aluminium-hpl.html)

Real aluminium surfaces are very often pressed in smooth surface. However, surface structures such as PTG, PTK, NTZ, AQA, DIA, RON or grooves lengthwise or crosswise with different characteristics (603 - 610) also emphasise the metallic character of the application. Due to the different characteristics of the grooves, a combination is not recommended.

**Of course, the optimum mirror effect is only achieved with a smooth metal surface. Structures such as groove structures (see dekovario) offer additional possibilities with these mirror qualities..**

A 210	Real aluminium	smooth & anodized	Silver color	Mirror quality
A 211	Real aluminium	smooth & anodized	Gold color	Mirror quality
A 212	Real aluminium	smooth & anodized	Copper color	Mirror quality
A 216	Real aluminium	smooth & anodized	Gunmetal color	Mirror quality
A 217	Real aluminium	smooth, matt, anodized	Night blue color	Mirror quality

 **Scratch resistance**

**Abrasive resistant: A 341, A350, A356, A390, A391, A392, A393 and A396**

These products are coated with a special lacquer. The surface protection lacquer has a scratch hardness according to **DIN EN 438 of  $\geq 1.2$  N**. A comparative test with a household steel sponge, loaded with weights, gives the following result when tested in transverse direction of brushing: **no scratch marks with a 1 kg load**. Standard versions from 2 kg light and from 5 kg clear scratch marks.

**i-RESIST / high abrasive resistant: A480 and A486**

The surface protection lacquer has a scratch hardness according to **DIN EN 438 of  $\geq 3$  N = horizontally applicable**

Standard version	Scratch-resistant	High scratch-resistant
Scratch hardness 0.5 N	Scratch hardness $\geq 1,2$ N	Scratch hardness $\geq 3$ N



**Balancing Plate for dekorial starline: Smooth and varnished real aluminium (natural colour)**  
A 209 / aluminum HPL without any decorative colour and quality requirements

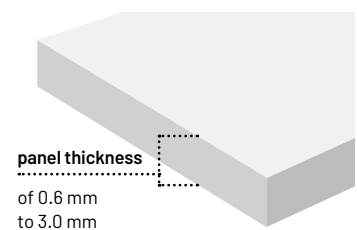
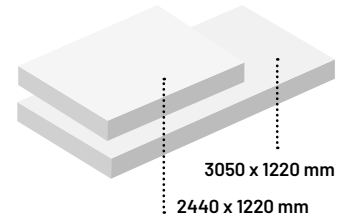
## Delivery form and quality

All dekorial starline panels in smooth design are supplied in the dimensions **2440 x 1220 mm** and **3050 x 1220 mm**.

Only the waffle structure (WAF) has an effective width of only 1200 mm with a longitudinal dimension of 2440 mm.

According to **DIN EN 438**, the tolerance for the nominal length and width must correspond to the limit dimensions of **- 0 mm and + 10 mm**.

The thickness of dekorial starline plates can be produced from **0.6 mm to 3.0 mm**. The standard thickness for painted versions is 0.8 mm (weight: 1.3 kg/m<sup>2</sup>), and with mirror quality 0.9 mm. (weight: 1.4 kg/m<sup>2</sup>).



Nominal thickness	Limit deviations
0.6 - 1.0 mm	± 0.15 mm
> 1.0 - 2.0 mm	± 0.15 mm
> 2.0 - 2.5 mm	± 0.18 mm
> 2.5 - 3.0 mm	± 0.20 mm

The purchase of stronger dekorial starline panels can be arranged via an in-house inquiry.

**The fire behaviour of the dekorial starline standard quality product range corresponds to classification B2 according to DIN 4102 part 1.** In addition, the boards of the starline product range are tested according to the requirements of the International Maritime Organisation (IMO) as per EC type examination and according to the Marine Equipment Directive (MED) FTPC Annex 1, Part 5 and Annex 2 and are classified as „**flame retardant**“ and certified in Lloyd’s Register as USCG- EU MRA.

Laminating with a protective film is mandatory for dekorial starline. The film must be removed after 6 months at the latest, otherwise the aluminium surface may be damaged when the film is removed later.



**All painted aluminium versions can be produced in postforming quality „postformable“ in addition to the standard quality. The postforming quality can be recognised by the abbreviation in the article description: NF**

The lamination of these plates is done on request with a heat-resistant foil.

The processing of dekorial starline postforming quality is influenced and determined by a multitude of material and processing parameters. (Thickness of the material, decor, structure, temperature, feed, rounding profile, rounding radius etc.) The specific production parameters must be adapted to the equipment and adhesive selection in addition to the material properties.

A general specification for the forming temperature of the laminate is a value range of 140 - 160° C, the feed rate of 10 - 20 m/min is another guideline for the forming process. The laminate generally allows a maximum bending radius in mm of approx. 10 x the sheet thickness (e.g. 0.8 mm = 8 mm radius). Storage under normal climatic conditions (approx. 18 - 23° C and 50 - 65 % relative humidity) must be observed. Under these storage conditions the postforming properties will not change significantly for up to one year.

## Applications and processing method

The use of **dekorial starline** is intended for decorative vertical surfaces in interior design. Even lightly stressed, horizontal surfaces can be covered with starline.

### Typical application examples are:

- Wall panelling
- Ceiling panelling
- Living room furniture
- Hotel and restaurant furniture
- Drawer fronts
- Company signs
- Shelf cladding
- Counters and displays in shopfittings
- Door and frame coverings
- Shipbuilding
- Vehicle construction/Caravan construction
- and much more



A glass plate or similar is recommended for a heavily used work surface with dekorial starline for protection. The dekorial starline laminates can be sawed, milled and drilled with carbide tipped tools.

### When gluing in surface presses the following must be observed with dekorial starline:

- maximum temperature **60° C** (Recommendation: cold pressing)
- surface pressure **0.15 – 0.20 N/mm<sup>2</sup> ( 1.5 – 2.0 bar )**
- **soft padding** between laminate surface and pressing agent

All commercially available adhesives and glues that are also used to bond classic high-pressure laminates are suitable for gluing.

#### Adhesive types:

- Dispersion adhesives (PVAc)
- Condensation resin adhesives (urea resin)
- Contact adhesives
- Reaction adhesives
- Hot melt adhesives

PU adhesive residues must be removed immediately from the surface absolutely residue-free before curing.

In the case of composite elements, attention must be paid to a symmetrical structure, i.e. the back must be glued to a corresponding backing plate. A good flatness is achieved by using the same panel quality and thickness on the rear side of the element with a 2nd choice panel or with the A 209 backing plate.

When used as a front, A quality is recommended on both sides!

### Gluing of HPL boards with genuine metal foil

#### The gluing of the genuine metal HPML with

- Contact adhesives (solvent-based)
- Condensation adhesives (phenol-resorcinol resin base)

requires special care and compliance with the adhesive manufacturer's instructions. Particular attention must be paid to even, not too thick adhesive application, sufficient ventilation (insufficient ventilation can lead to delayed formation of bubbles between the metal foil and the laminate core and/or separation of the metal foil from the laminate core! - Consultation with manufacturers necessary before use!)

If possible, the parts should be pressed together over a small area. At least one edge length should be less than 800 mm.

## Guide value table for the bonding of HPL with real metal surfaces on wood materials

(chipboard V 20, chipboard V 100, plywood, hard fibre, solid wood)

Adhesives	Condensation adhesives		
	Urea resin approx. 10 % filled	Urea melamine resin	Phenol resorcinol resin
Strength n. EN 204	D 3	D 3	D 3 / D 4
Temperature resistance	- 20 °C to + 150 °C		- 20 °C to + 150 °C
	- <b>Adhesive application:</b> 90-150 g/m <sup>2</sup> on HPL or carrier material - <b>open waiting time:</b> 2-20 min - <b>Pressure:</b> 3-5 bar - <b>Compression temperature/Compression time:</b> 20 °C / 15-180 min 40 °C / 5-30 min 60 °C / 1-12 min waiting time and pressing time depending on the addition of hardener		100-180 g/m <sup>2</sup> 2-15 min 3-5 bar  20°C / approx. 9 h 80°C / approx. 10 min 110°C / approx. 5 min

Adhesives	Contact adhesives		
	without hardener	with hardener	with built-in resin hardener
Strength n. EN 204	no classification according to EN 204		
Temperature resistance	- 20 °C to + 70 °C	- 20 °C to + 100 °C	Consult the manufacturer
	- <b>Adhesive application:</b> 150-200 g/m <sup>2</sup> respectively on HPL and backing material - <b>waiting period:</b> depending on ambient temperature and adhesive type (finger test) - <b>Pressure:</b> min. 5 bar - <b>Compression temperature:</b> 20 / 40 / 60 °C - <b>Compression time:</b> briefly (preferably roller press)		These are special adhesive settings for which no guide values can be given.  Consultation with the adhesive manufacturer is necessary.

## Cleaning and maintenance

The dekorial starline surfaces are cleaned with a clean cloth, a soft sponge using soap and plenty of water or a glass cleaner. Abrasive cleaning agents, acids and alkalins, especially chlorine-containing products should not be used.

## Storage

The dekorial starline laminates must be stored in a closed room at 18 - 25°C and 50 - 60% relative humidity, full-surface and horizontally with at least 200 mm distance to the floor. The board stacks are

- to be protected from moisture ■ must not be exposed to direct sunlight ■ must not be placed in a warm / cold air stream



If horizontal storage is not possible, an **inclination of approx. 80°** with full-surface support and lower counter bearing is recommended.

## Disposal

- dekorial starline waste can be incinerated in officially approved industrial combustion plants.
- dekorial starline waste can be deposited in landfills in accordance with local waste regulations.
- According to TA-Abfall, version dated 28.3.91, Category I, No. 571, HPL residues are classified as „other cured plastic waste“. Category I means that a material is similar to household waste.

# Technical data overview

	Quality		
	Decoration / Surface		All
	Strength		0,8 - 0,9 mm
	Standardized type		MTF
Entspricht EN 438-8	Standard	Unit	
Characteristics			

## Physical properties and dimensions of metal laminate panels \*

Density	EN ISO 1183-1	g / cm <sup>3</sup>	≤ 1,35
Strength tolerance	EN 438-2-5	mm	± 0,15
Length and width tolerance	EN 438-2-6	mm	- 0 / +10
Edge straightness tolerance	EN 438-2-7	mm / m	≤ 1,5
Perpendicularity tolerance	EN 438-2-8	mm / m	≤ 1,5
Flatness tolerance	EN 438-2-9	mm / m	100
Dimensional stability at high temperature:	EN 438-2-17	%	
■ Longitudinal direction			≤ 0,75
■ Cross direction			≤ 1,25

## Mechanical properties

Boiling water resistance	EN 438-2-12		No delamination of core
Tear resistance	EN 438-2-23	Class <sup>(a)</sup>	4
Minimum bending radius (convex and concave direction)		cm	15

## Surface properties

Resistance to steam	EN 438-2-14	Class <sup>(a)</sup>	3
Scratch resistance	EN 438-2-25	Degree <sup>(b)</sup>	1
Stain resistance	EN 438-2-26	Class <sup>(a)</sup>	
■ Group 1 & 2			4
■ Group 3			4
Colour stability under artificial light	EN 438-2-27	Grey scales	4 to 5

## Fire behaviour

Burning behaviour (on request)	EN 13501-1	Class	D-s2-d0 / B-s1-d0 / A2-s1-d0
Gross calorific value	EN ISO 1716	MJ / Kg	18 - 20

## Health and environmental qualities

Formaldehyde release	EN 717-2	Class	E1 (< 0,1ppm)
Volatile substance emissions	ISO 16000-9	Class	A

\* Metal may show a slight natural variation in colour and structure and a pearlescent shine on some decors. These deviations are no reason for complaint.

MTF : Fire resistant metal laminate surface / Type P2 : Boards used in dry environment for interior decoration.

(a) Level: 1 = surface damage. 2 = substantial change in appearance. 3 = moderate change. 4 = minor change visible from certain angles. 5 = no change.

(b) Level: 2 = continuous scratches at 2N. 3 = continuous scratches at 4N.

## Do you have questions?

Then please contact our service department. If you require viewing samples, you can request them from Dekodur<sup>®</sup> in the form of sample chains or hand samples in DIN A5 or DIN A4.

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