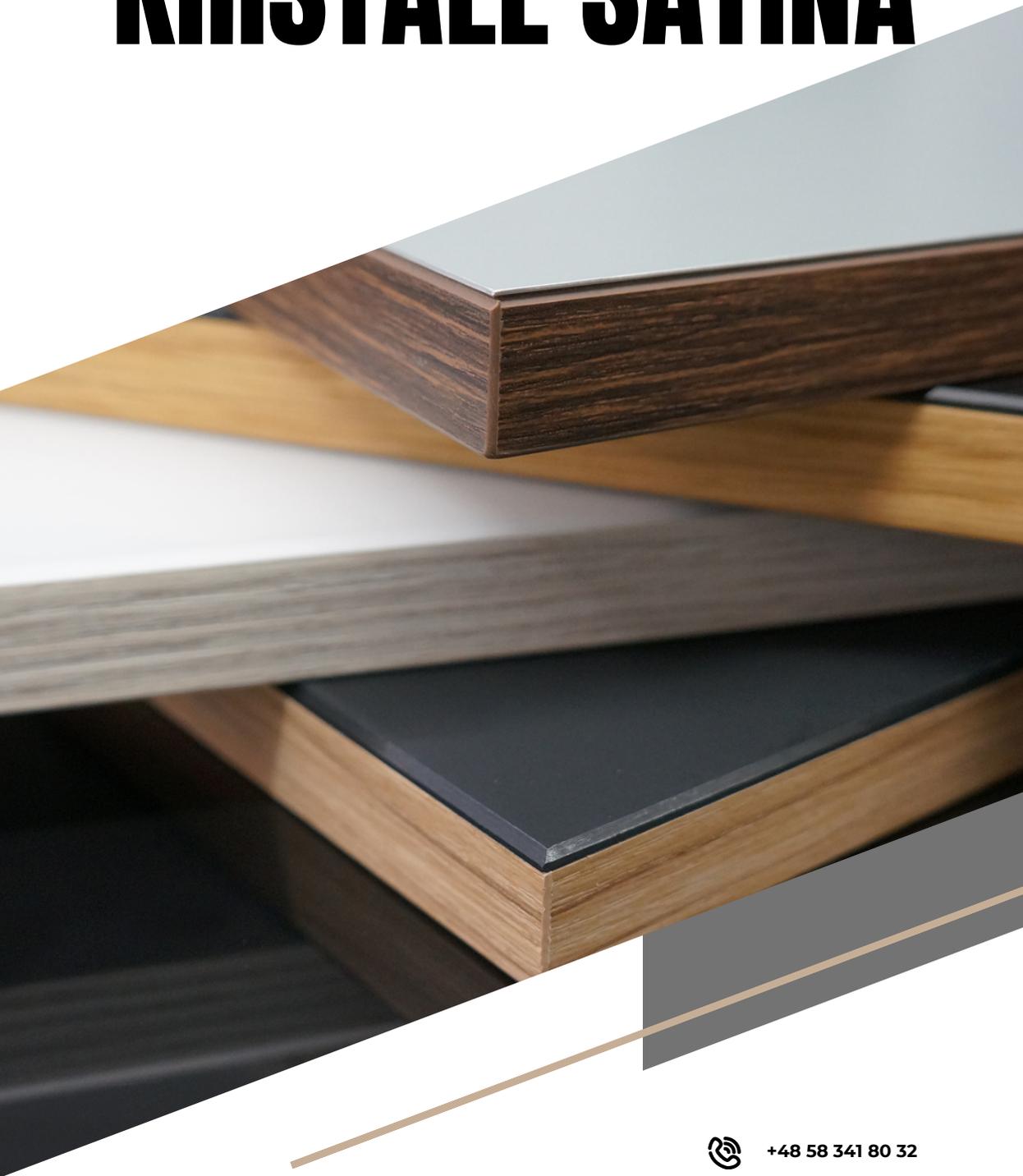


KRISTALL / KRISTALL SATINA



TECHNICAL SPECIFICATIONS



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Kristall/Kristall Satina furniture boards, with a high gloss- Kristall, or a super matte - Kristall Satina, surface finish.

On a raw board of MDF (Back-side laminated with colored-matched 2mm HIPS) glossy-Kristall or matte-Kristall Satina is applied sheet, consisting of co-extruded ABS/PMMA with a thickness of 2 mm. Due to its exceptional brilliance and depth of color, Kristall boards have become a new metric of quality for high-gloss surfaces.

The laminate appears to have the depth of real glass, can be conveniently processed, and is a very safe product (shatterproof).

The boards are additionally covered with a protective film, which significantly reduces the likelihood of damage during production and assembly of furniture components.

Standard Dimensions:

	Specification
Panel Variant	MDF + Hips
Dimensions	2800 x 1300 mm
Substrate Thickness	15 mm
Acrylic Sheet thickness	2 mm + Protection film thickness
HIPS Laminate Thickness	2 mm

Other dimensions available by request.

Kristall Laminate Properties:

Property	Test Standard	Unit	Class/ Value
Density	ISO 1183-1	g/cm ³	≥1.16<1.2
Scratch Resistance	IHD W-466		Method "A" - Class 1 loss of Gloss <20%
Gloss	DIN 67530 at an angle of 60°	GLE	>85
Light Resistance (Resistance to atmospheric conditions) Delta E of furniture panels - interior applications	EN ISO 4892-2 Complete color change after 200h Xenon Test		DE* <1,7
Steel Wool Abrasion Resistance	QPA-25-LT	Pressure: 1 kg Rotation Count: 20 Steel Wool Type : 00	1 Class No visible changes or scratches
Temperature Resistance (Dry Test)	DIN EN 68861 T7	Temperature [°C]	7D, 75 °C
Temperature Resistance (Wet Test)	DIN EN 68861 T8	Temperature [°C]	8B, 70 °C
Fire Rating	UL 94		n.d.
Water vapor/ Moisture Resistance	AMK		no visible changes
Chemical Resistance	DIN 68861/T1		Group 1B

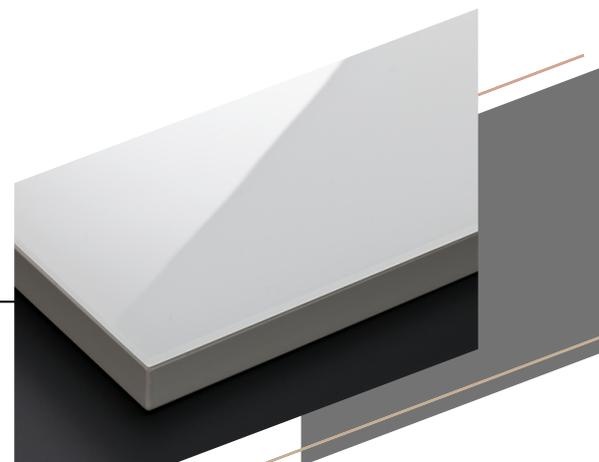


Kristall Satina Laminate Properties:

Property	Test Standard	Unit	Class/ Value
Density	ISO 1183-1	g/cm ³	≥1.16≤1.2
Scratch Resistance	IHD W-466		Method "A" - Class 1 loss of Gloss <20%
Gloss	DIN 67530 at an angle of 60°	GLE	>85
Light Resistance (Resistance to atmospheric conditions) Delta E of furniture panels - interior applications	EN ISO 4892-2 Complete color change after 200h Xenon Test		DE* <1,7
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Fire Rating	UL 94		n.d.
Water vapor/ Moisture Resistance	AMK		no visible changes
Chemical Resistance	DIN 68861/T1		Group 1B

HIPS Balancing Laminate Properties:

Characteristic	Value	Unit	Test Method
PHYSICAL PROPERTIES			
Density at 23°C	≥1.15≤1.18	g/cm ³	ISO 1183-1
MECHANICAL PROPERTIES			
Elastic Modulus during stretching at 23°C	2730	Mpa	ISO 527
Elastic Limit at 23°C	59	Mpa	ISO 527
Elongation at break at 23°C	36	%	ISO 527
THERMAL PROPERTIES			
Vicat B/50 , 50N/50K/h	101	°C.	ISO 306
OPTICAL PROPERTIES			
Top Surface Gloss	(Gloss Pattern at 60°)	7,00	Gloss Unit Din 67530
	(Gloss Pattern at 85°)	10,60	Gloss Unit Din 67530
FIRE RESISTANCE			
Fire Rating*	n.d.		UL94
OTHER PROPERTIES			
Forming Shrinkage	≥ 0.2 ≤ 0.8	%	Producer's Internal Testing Method
Thermo-forming Temperature Range	≥ 130 ≤ 180	°C.	Producer's Internal Testing Method
*Tested on the raw materials employed in this product, thickness > 1.6 mm.			

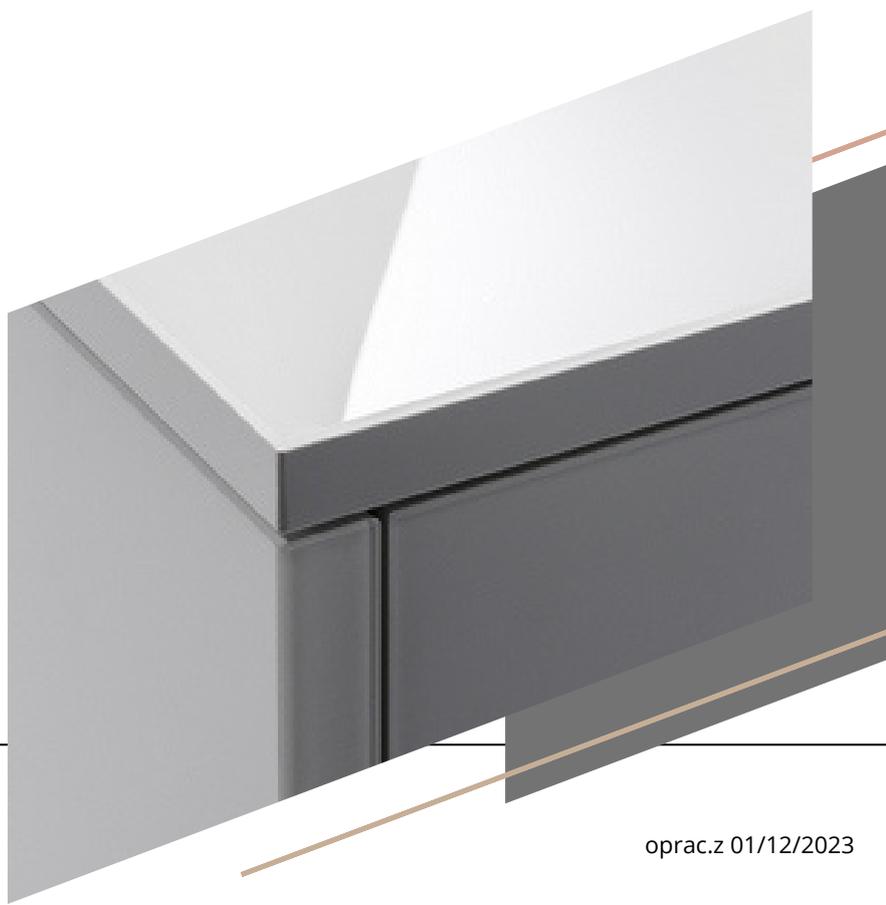


Board Tolerances:

	Panels		
Substrate Board Dimension	< 15 mm	15 - 20 mm	> 20 mm
Thickness Tolerance	± 0.5 mm		
Length and Width Tolerance	± 5.0 mm		
Length- and Width-wise Deformation	inward bending (concavity): 1.5mm/m, outward bending (bulging): 1.5mm/m, panels <16mm thick may have higher deformation values		
Edge Defects	≤ 10 mm from panel edge		
Final Thickness Tolerance	Nominal Dimension + 0.2mm (Foil + Adhesive) ± tolerance		

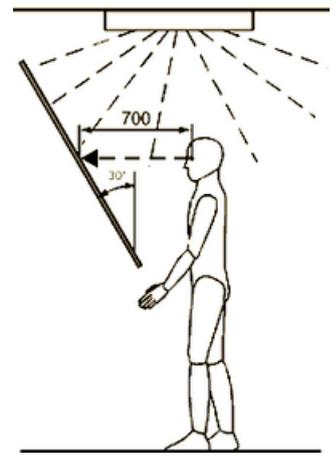
Surface Properties:

	Panels
Scratches	Listed surface properties are evaluated in accordance with PN EN 14322 and PN EN 438-1 norms
Contrasting Points	
Bulges, indentations, contaminating pa	
Pressure Marks	
Bubbles	
Observation distance and light characteristics for quality control in accordance with the current PN EN 14323 standard*	
Color Shade	Slight deviations (within the manufacturer's standard tolerance) may occur as a result of irregularities on the decor paper and the type of substrate used.
	Color Tolerance:
	White and Light Colors: Delta E ≤ 0.5
	Medium Intensity Colors: Delta E ≤ 0.8
	Dark Colors: Delta E ≤ 1.5
Larger Deviations are Permissible with Reflective and Metallic Decors	
Due to the different shape and size of the metallic pigment particles used in the production of the panels, the aperant color can vary from light to dark to iridescent depending on the angle of light and the angle of observation. This is an intentional element of metallic decors and is not grounds for complaint.	
When evaluating colors, the samples should first be subjected to 48h of daylight, due to the photochemical process taking place. This should always be done under the same conditions (same lighting, exposure time, etc.). The tested samples must not be exposed to direct sunlight.	



Procedure for Product Evaluation:

- Panel position: static, vertical
- Light: fluorescent lamp at 6.500°K (Diffuse light or D65)
- Observation at an angle of 30° at a distance of 0,7 m
- Observation time: max 20 s



Panel evaluation should take place under a diffuse and fixed light source that illuminates the surface uniformly. This can be sunlight or adequate artificial lighting (between 2000-5000 lux). The approximate distance between the assessed surface and light source should be 1,5m. Surface defects will only be acknowledged if they are larger than 0,8mm² and visible from a distance of 0,7m at a viewing angle of approximately 45°.

It is within tolerance for 3% of a given shipment to have defects exceeding the standards given above, and does not constitute grounds for a claim. This tolerance is in accordance with the European standards for chipboard and MDF manufacturers. For technical reasons, deliveries have a permitted quantity tolerance of +/- 10%

General Information: The product is intended for use as a decorative material in interior design and furniture making. It should only be used in dry places. The boards must be transported and stored with the proper precautions. If necessary, they can be stored on top of each other on a level and horizontal surface in a dry place. The boards should be stored indoors to protect them from swelling and deformation caused by moisture. The boards should not be stored at temperatures below 15°C for long periods of time, as this may cause irreparable damage. The relative humidity of storage should be between 45% and 65%. Before processing, boards should be acclimated by storage for a period of min. 48h and under suitable conditions (temperature of 18-22 C and humidity of 30%-65%). Processing should also take place at room temperature. It should be noted that, especially in the colder periods of the year, it is necessary to acclimatize all boards. If, due to the number of boards in a stack, there is a risk of insufficient acclimatization of boards in the middle of the stack, the acclimatization period should be extended accordingly.

Fronts made by Niemann Polska boards can be used in places with increased humidity if:

- * were produced using sharp saws and cutters and PUR glue was used for edge banding
- * if they were installed in accordance with documents and in the case of places particularly exposed to hot steam (fronts near the hood, oven, dishwasher) it was done in accordance with the recommendations of household appliances manufacturers
- * if used as intended and under the conditions described in the technical data sheet

If the above conditions are not met, the fronts may be irreversibly damaged.