



TiNOX outdoor Al

HIGLY SELECTIVE ABSORBER MATERIAL

OPTICAL PROPERTIES

	Typical	Standards
SOLAR ABSORPTION α_{sol}	93 % \pm 2 %	ASTM E 891-87 and ISO 9845-1
THERMAL EMISSIVITY $\epsilon_{100^{\circ}\text{C}}$	4 % \pm 2 %	DIN ISO 22975-3
Blue version: COLOUR VALUES – a*	2 < a < 14	CIE Lab (D65 / 10°)
Blue version: COLOUR VALUES – b*	-10 < b < -30	CIE Lab (D65 / 10°)
Black version: COLOUR VALUES – a*	0 < a < 10	CIE Lab (D65 / 10°)
Black version: COLOUR VALUES – b*	-6 < b < +6	CIE Lab (D65 / 10°)

TECHNICAL DATA

COATING METHOD	PVD	AIR TO AIR COIL COATING
ABSORBER COATING	SELECTIVE ABSORBER COATING	ALUMINIUM SUBSTRATE / ADHESION LAYER / CERMET ABSORBER MULTILAYER/ CERAMIC ANTI REFLECTION AND PROTECTION LAYER

ENVIRONMENTAL STABILITY

Conditions	Time	PC = $-\Delta\alpha + 0.5\Delta\epsilon$ *	Cross hatch test	Standards
Temperature 291°C	600 h	< 2%	OK	DIN ISO 22975-3
Humidity at 40°C condensing	600 h	< 1%	OK	DIN ISO 22975-3
CLIMATE CHAMBER 85°C – 85% r.H.	1000 h	< 1%	OK	
UV 0,53W/mm ² @ 340nm	100 h	< 1%	OK	
Neutral salt spray test (NSS)	24h	< 2%		ISO 9227 ASTM B 117

*) Performance criterion "PC" as defined in DIN ISO 22975-3.

MECHANICAL STABILITY

	Value	Standards
CROSS HATCH TEST	No more than 2 of 100 test fields delaminating	ISO 2409 / ASTM D 3359
ADMISSIBLE BENDING RADIUS	\geq 5 mm	
SCRATCH RESISTANCE	good	(due to ceramic protection layer)
Finger prints	Nearly not visible	(due to ceramic protection layer)



SUBSTRATE: MECHANICAL PROPERTIES

	Value	Standards
ALUMINIUM ALLOY	1080A	EN 573-3
TEMPER	H 18 (hard)	EN 515
TENSILE STRENGTH	≥ 140 N/mm ²	EN 485-2
YIELD STRENGTH 0.2%	≥ 120 N/mm ²	EN 485-2
ELONGATION A ₅₀	> 1 %	EN 485-2
ROUGHNESS:	Ra < 0.5 μm	

SUBSTRATE: PHYSICAL PROPERTIES

	Value	Standards
THERMAL CONDUCTIVITY	> 220 W/mK	
Density	2.71 g/cm ³	

AVAILABLE SIZES

THICKNESS	0.5mm - 0.7mm
WIDTH	≤ 1250mm

TiNOX outdoor is available also on other metallic substrates as stainless steel on request.

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All information provided is based on up-to-date values where possible. Optical values are average results from 0.4mm substrate and are published for guidance only; they may vary according to raw material thickness. For more detailed information please contact our technical sales department. Physical characteristics of the materials are in accordance with EN (European Committee for Standardization).

General tolerance

Gauge tolerance: ± 0.03 mm
 Width tolerance: ± 0.15 mm
 Length-cut sheets: ± 1 mm/m

Note

All materials listed above can be delivered in various sizes and shapes according to customer requirements. Products with protective tape are guaranteed for six months after delivery if they are stored in a conditioned room (temperature 20-30°C and relative humidity 50-60%) and kept away from sunlight and any heating source. Protective tape is not UV resistant.

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