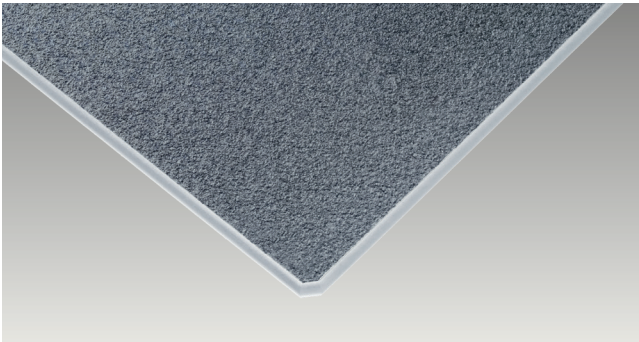


GMB SINA



Our high-performance glass for photovoltaic and solar thermal use.

Special forming rollers are used to apply a fine micropattern on both sides of the glass, in order to minimise direct reflection and the resulting dazzle. GMB SINA has a very high solar transmittance and is therefore one of the highest-performance types of glass for flat-plate collectors and photovoltaic modules on the market.

OPTICAL PROPERTIES (transmission τ)	2.0 mm	2.5 mm	3.2 mm	4.0 mm	5.0 mm
SINA (Poly-C)	92,0%	92,0%	91,9%	91,8%	91,7%
SINA (AM 1.5)	91,9%	91,8%	91,7%	91,7%	91,6%
SINA TT (Poly-C)	95,0%	94,9%	94,8%	94,7%	94,6%
SINA TT (AM 1.5)	94,6%	94,6%	94,5%	94,4%	94,3%
SINA TT plus (Poly-C)	95,0%	94,9%	94,9%	94,8%	94,7%
SINA TT plus (AM 1.5)	94,8%	94,7%	94,7%	94,6%	94,5%
SINA TT2 (Poly-C)	98,1%	98,1%	98,0%	97,9%	97,8%
SINA TT2 (AM 1.5)	97,1%	97,0%	97,0%	96,9%	96,8%
SINA Anti Soiling (Poly-C)	94,8%	94,8%	94,7%	94,6%	94,5%
SINA Anti Soiling (AM 1.5)	94,5%	94,5%	94,4%	94,3%	94,2%

MECHANICAL PROPERTIES (tempered glass)	
Moh's hardness:	~6
Poisson's ratio*	0.24
Density	2.50 g/cm ³
(Young's) modulus of elasticity*	73 Gpa
Bending tensile strength [2.0mm: >90Mpa]	> 120 Mpa
Compression strength	> 700 Mpa
Shear modulus*	30 Gpa
Bulk modulus*	48 Gpa

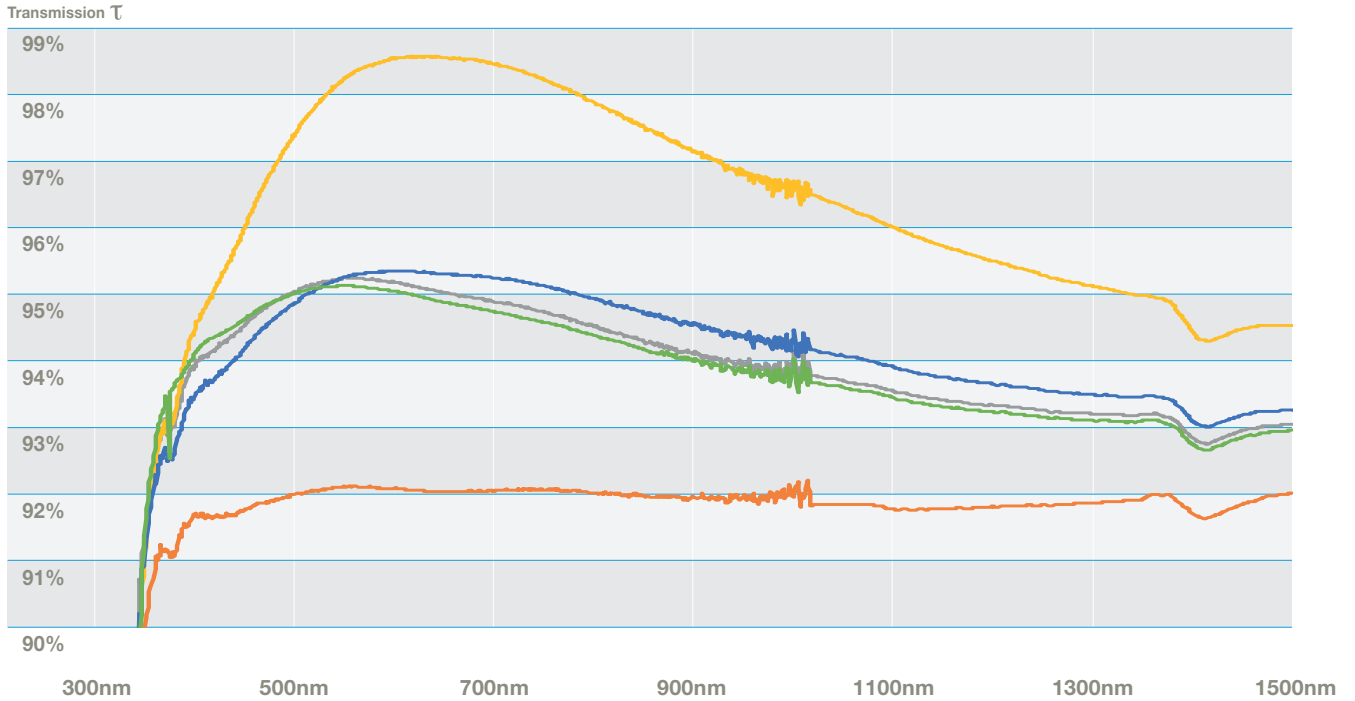
THERMAL PROPERTIES (tempered glass)	
Expansion coefficient $\alpha \cdot t$	9.20* 10 ⁻⁶ K ⁻¹ (Linear in the range of 100°C - 300°C)
Specific heat*	0.83kj/kgK (at 0° - 100°C)
Thermal conductivity* (at 20°C)	1.07 W/m ² K
Softening point (Littleton)	723°C
Annealing point	542°C
Strain point	504°C

CHEMICAL PROPERTIES	
Approximate chemical composition:	
silicon dioxide	73%
sodium oxide	13.9%
calcium oxide	8.2%
magnesium oxide	4.7%
trace elements	0.2%
thereof iron oxid	<0.014%
Hydrolytic class (DIN 52296)	HP 3
Acid resistance (DIN 12116)	S 2
Base resistance (DIN ISO 695)	A 2

WEIGHT					
Approximate weight per square meter					
	2.0 mm	2.5 mm	3.2 mm	4.0 mm	5.0 mm
	5 kg	6,3 kg	8 kg	10 kg	12.5 kg

* calculated data

Performance



Products (3.2 mm)	SINA	SINA TT	SINA TT2	SINA TTplus	SINA Anti Soiling
AM1,5	91,7%	94,5%	97,0%	94,7%	94,4%
PolyC	91,9%	94,8%	98,0%	94,9%	94,7%

The mentioned data is for information purpose only and do not constitute a contractual legal relationship or a basis for a claim.

