CENTROSOL Solar Glass

Product Data and Technical Information

CENTROSOLAR GLAS offers different types of high efficient low-iron CENTROSOL glasses for a wide range of applications in solar, architectural, horticultural and technical fields.
All glass types in the solar glass line are also available with a Nano-Power Antireflective coating at highest transmittance level (CENTROSOL HiT) 1-side or 2-side coated.

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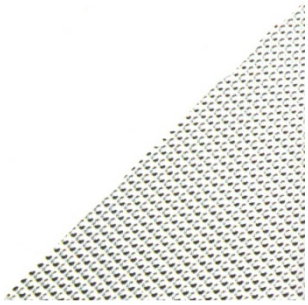
1 Technical Data

CENTROSOL solar glass is available in a variety of versions. Depending on requirements, there are the glass types Clear with plane surfaces and different transmittance classes, Patterned MM with micro-structured surfaces, and Patterned SM with micro-structured/patterned surfaces to choose from. All glass types can also be supplied optionally with Nano-Power Antireflective coating (CENTROSOL HiT) on one or both sides.

CENTROSOL CST, C, C+

CENTROSOL MM



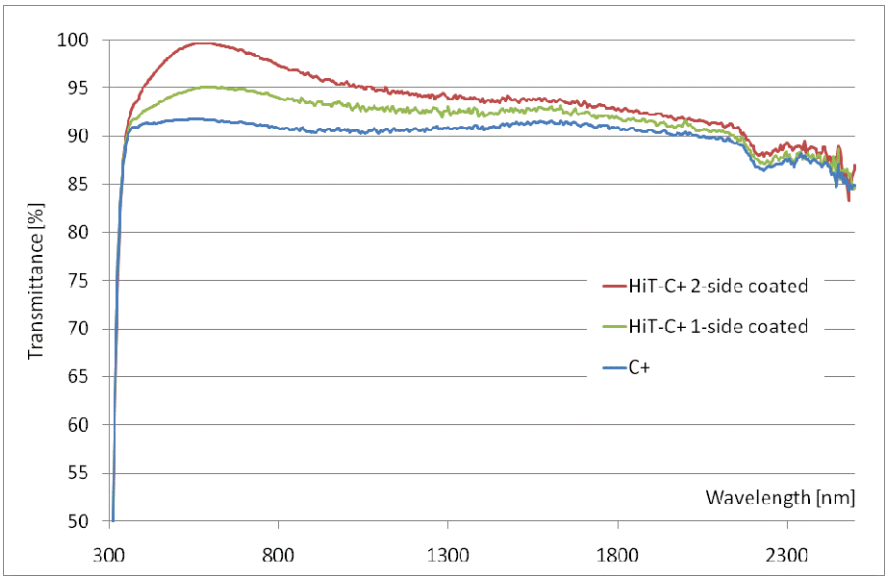
CENTROSOL SM

Please find below an overview of the characteristic product features of CENTROSOL and CENTROSOL HiT. More detailed information is given in the common specification.

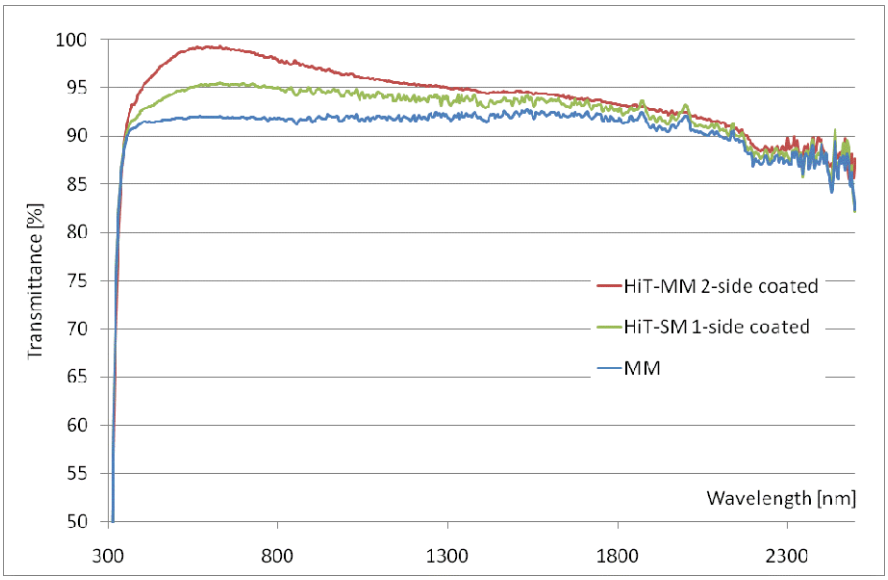
Basic glass	
Glass type	- Clear glass CST, C, C+ - Patterned glass MM, SM
Sizes (length x width)	600 mm x 400 mm to 2,500 mm x 1,620 mm
Glass thickness	3 - 6 mm
Edge processing	Seamed or ground
Version	- Annealed - Heat strengthened - Fully tempered - Laminated safety glass

Antireflective coating	
Coating system	Porous SiO_2 coating, 1-layer system 1-side or 2-side coated
Coating thickness	Approx. 120 nm
Solar energy transmittance T_E (AM1.5)	Depending on glass type up to 97%
Light transmittance T_L (D65)	Depending on glass type up to 99%
Durability	Long-term and weather-resistant, abrasion-proof

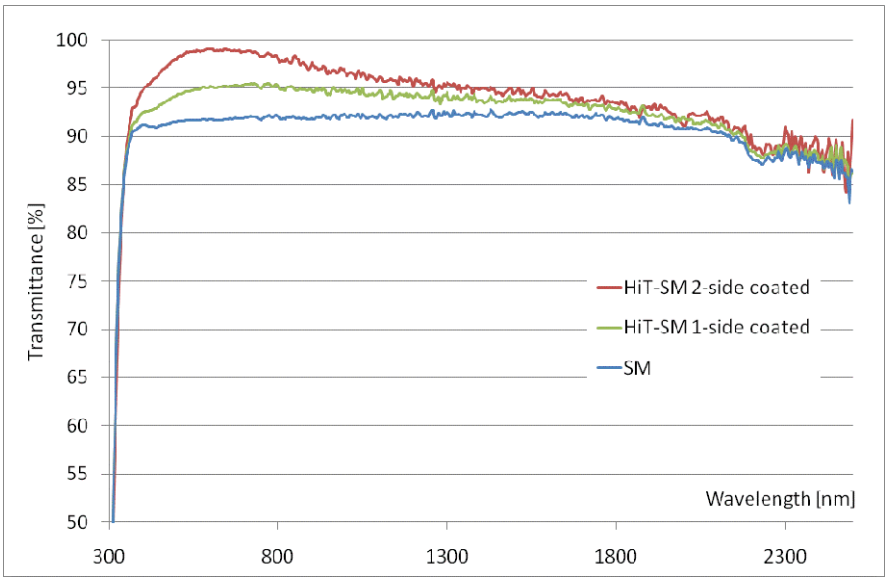
2 Transmittance Properties of CENTROSOL and CENTROSOL HiT 1S/2S



Transmittance of CENTROSOL C+ and HiT-C+



Transmittance of CENTROSOL MM and HiT-MM



Transmittance of CENTROSOL SM and HiT-SM

Solar Energy Transmittance Data (SET) [ISO 9050:2003; 300-2,500 nm]

Glass Types	C+	C+	SM	SM	MM	MM
Glass Thickness	3 mm	4 mm	3.2 mm	4 mm	3.2 mm	4 mm
Uncoated Glass	91,15%	90,97%	91,57%	91,55%	91,59%	91,57%
AR coated 1-side (HiT 1S-R)	93,70%	93,52%	94,12%	94,10%	94,14%	94,12%
AR coated 2-side (HiT 2S)	96,82%	96,67%	96,85%	96,83%	96,89%	96,85%

Solar Energy Transmittance Data (SET-PV) [acc. ISO 9050:2003; 300-1,200 nm]

Glass Types	C+	C+	SM	SM	MM	MM
Glass Thickness	3 mm	4 mm	3.2 mm	4 mm	3.2 mm	4 mm
Uncoated Glass	91,21%	91,05%	91,56%	91,53%	91,62%	91,60%
AR coated 1-side (HiT 1S-R)	93,98%	93,82%	94,33%	94,30%	94,39%	94,38%
AR coated 2-side (HiT 2S)	97,44%	97,44%	97,44%	97,34%	97,50%	97,42%

Light Transmittance Data (TL) [ISO 9050:2003; 380-780 nm]

Glass Types	C+	C+	SM	SM	MM	MM
Glass Thickness	3 mm	4 mm	3.2 mm	4 mm	3.2 mm	4 mm
Uncoated Glass	91,69%	91,69%	91,66%	91,65%	91,86%	91,89%
AR coated 1-side (HiT 1S-R)	94,82%	94,51%	94,79%	94,78%	94,98%	95,02%
AR coated 2-side (HiT 2S)	99,39%	99,39%	98,92%	98,72%	99,12%	98,96%

UV Transmittance Data (TUV) [ISO 9050:2003; 300-380 nm]

Glass Types	C+	C+	SM	SM	MM	MM
Glass Thickness	3 mm	4 mm	3.2 mm	4 mm	3.2 mm	4 mm
Uncoated Glass	88,07%	86,98%	86,32%	85,12%	87,79%	86,91%
AR coated 1-side (HiT 1S-R)	88,59%	87,50%	86,84%	85,64%	88,31%	87,43%
AR coated 2-side (HiT 2S)	89,12%	88,02%	88,41%	85,74%	89,88%	87,53%

3 Quality Assurance

CENTROSOLAR GLAS is certified according to DIN ISO 9001. We assure the quality of CENTROSOL glass by continuously monitoring and controlling the production process. Random samples are regularly taken from production and their properties are laboratory-tested. This includes measuring transmittance, testing of mechanical resistance and humidity resistance. We also perform a 100% visual inspection of all CENTROSOL glasses before delivery. CENTROSOL glasses are due to CE conformity acc. EN 12150-2.

4 Qualification Tests

Our antireflective glass CENTROSOL HiT has undergone a number of qualification tests to determine its utility and resistance to ageing under realistic conditions.

1 Damp heat steady state test of AR glasses in conformity with IEC 61215
Constant 85°C, 85% rh, 1,000 hours
2 Damp heat steady state test of AR PV modules acc. to IEC 61215
Constant 85°C, 85% rh, 1,000 hours
3 Condensation water climate test of AR glasses acc. to DIN 50017 / EN 1096-2
Constant 40°C, 100% rh, 480 hours
4 Condensation water climate test in a saturated Sulfur dioxide atmosphere of AR glasses acc. to DIN 50018 / EN 1096-2
Cycles: 40°C, 100 rh, 8 hours + 18-28°C, 75% rh, 16 hours, 5 ppm SO_2, 23 cycles
5 Thermal cycling testing of AR glasses in conformity with IEC 1215
Cycles: –18°C/-80°C, 56 cycles
6 Thermal cycling testing of AR PV modules acc. to IEC 1215
Cycles: -40°C/+85°C, 200 cycles
7 Salt spray test of AR glasses acc. DIN 50021
8 Outdoor exposure tests at ISE Freiburg as part of IEA Task 27 (testing of different materials)
8 Outdoor exposure tests, exposure racks in Fürth, Furth, Gernsheim, Freiburg
9 Hail impact testing of AR glasses acc. to IEC 1215
10 Frost test
-20°C, 8 weeks, with ice formation
11 Boiling test
10 min. boiling in demineralized water at 100°C
12 Abrasion test acc. to EN 1096-2 (Crockmeter Test)
Mechanical rubbing with felt fingers, weight 400 g, 1,000 cycles

5 General Technical Instructions

CENTROSOL and CENTROSOL HiT is used for glazing of solar collectors, photovoltaic modules and similar applications where less reflection and more light and energy transmittance are required, including lighting system covers and greenhouses.
The AR coating is by means of a silicon-dioxide-based 1-layer system applied to the glass plate.
CENTROSOL HiT for solar applications has a blue antireflective coating (maximum solar transmittance). The tint of the antireflective coating can be modified on request for visual applications.
CENTROSOL is a technical product for use in construction, architecture and industry. Certain permissible features may be evident that in no way compromise the product's functionality or properties. Slight variations in colour may appear under certain lighting conditions and at certain viewing angles. These are inherent in the production process and are not considered defects.
CENTROSOL and CENTROSOL HiT shall be stored under dry in-house conditions. The maximum storage time is 6 months. The glasses should be used in a first-in/first-out procedure.

Notes on handling

CENTROSOL HiT has a special finish. Like glass with a conventional antireflective coating, it should be handled carefully.
When working with this glass, make a general effort to maintain cleanliness. Use clean protective gloves to prevent fingerprints. In addition, be sure to use clean pads beneath and between glass panes as well as clean suction cups and tools. Store glass in a dry place and protect packaging from rain and moisture.
You can clean AR glasses with commercially available glass cleaner or alcohol. Abrasive or chemical cleaners could damage the antireflective coating. Clean with a soft (Micro fibre) cloth. Hard materials such as steel wool, sponges and scrapers may scratch the surface.
Protect CENTROSOL HiT against rain runoff from facades and leaching from concrete and mineral plasters as other conventional glazings. Before and during installation, take care to prevent any physical damage to the coated panes. When positioning and installing, avoid soiling the glass with any material, especially silicon, mineral substances such as cement and mortar, and grease, oil or other lubricants.
When using this glass in collectors the usage of insulating materials with reduced organic binder content is recommended.

May 2010