Technical Information

PLEXIGLAS® Optical hard coated (HC)

Product Description

PLEXIGLAS® Optical hard coated (HC) is an extruded acrylic sheet material. The surface coating offers excellent resistance to abrasion and chemicals and the material also shows outstanding optical properties. The sheet is coated on one side and is particularly recommended for demanding applications exposed to heavy wear and frequent cleaning. PLEXIGLAS® Optical hard coated also provides optimal protection in high-traffic areas. The coating preserves the material's surface appearance.

Surface textures are available on request and the coating can also be applied to one side of different substrate materials.

Applications for PLEXIGLAS® Optical hard coated

- aviation
- conservation glazing and show cases
- electronic displays
- furniture and shop fitting
- machine guards
- picture framing
- signage

Its outstanding properties include

- 11 times as impact-resistant as float glass
- 92 % light transmission
- excellent resistance to abrasion and chemicals
- excellent surface appearance
- good fabrication and machining options
- half the weight of float glas
- UV resistance and almost complete UV absorption

Fabrication

PLEXIGLAS® Optical hard coated sheets can be machined using the same tools and processes as PLEXIGLAS® XT sheets, for example. These include drilling, sawing, routing and laser treatment. It is better if the tool enters the sheet through the coated surface. Restrictions apply to the following processes:

Edge preparation
Scraping, wet sanding and polishing are excellent processes for treating PLEXIGLAS® Optical hard coated. Flame polishing should not be used because of the risk of flashover. In this case, the flame may cause breaks and cracks in the surface and the resistance to abrasion and chemicals may be lost in this section of the sheet.

Bonding
The uncoated side of the sheet can be bonded just like extruded PLEXIGLAS®. The surface on the coated side must be prepared for bonding. First of all, the coating must be wet-sanded or routed off on the side to be bonded. After removing the coating, it should be ensured that the area to be bonded is flat, clean and free from stress.

Thermoforming
Line bending and thermoforming are not suitable for machining PLEXIGLAS® Optical hard coated. These processes may damage the coating or cause delamination.

Cleaning
Liquid cleaning agents and water are very suitable for cleaning the chemical-resistant sheet. Mechanical cleaning agents such as razor blades, knives or scrapers should not be used. These may cause scratches and damage the abrasion resistant coating.

Flammability
PLEXIGLAS® Optical hard coated is classed as B2 to DIN EN 4102 and as Class E, "with no burning droplets", to DIN EN 130501.

Weathering
PLEXIGLAS® Optical hard coated retains its extremely high light transmission also in outdoor applications and is suitable for permanent use.

Technical data (typical values)

Physical properties (Clear, 3 mm thickness)	Test Standard	Unit	PLEXIGLAS® Optical hard coated (HC)	Uncoated acrylic sheet
Mechanical Properties				
Tensile strength	DIN EN ISO 527	MPa	67.5	72
Modulus of elasticity	DIN EN ISO 527	MPa	3450	3300
Impact strength	DIN EN ISO 179	kj/m²	10	15
Optical properties				
Light Transmission	DIN 5036	%	92	92
Yellowness Index	DIN 5036	%	< 0.5	< 0.5
Thermal properties				
Vicat softening point	ISO 306, method B50	°C	106	103
Flame resistance	DIN 4102		B2	B2
	DIN EN 130501		E	E
Toxicity	AITM 3.0005		meets requirements	meets requirements
Smoke density	AITM 2.0007/FAR 25.853		meets requirements	meets requirements
Abrasion resistance of coating				
Taber abrasion (100 cycles, 5.4 N, CS-10F)	ISO 9352	% Haze	< 2%	20–30%
Falling sand test	DIN 52348	% Haze	< 3%	–
Pencil hardness	DIN EN 13523-4		5H	2H
Adhesion	DIN EN ISO 2409		GT0	–

Chemical resistance[1]

	PLEXIGLAS® Optical hard coated (HC)	Uncoated acrylic sheet		PLEXIGLAS® Optical hard coated (HC)	Uncoated acrylic sheet
Acetone	> 24 hrs	< 15 Min	Isopropyl alcohol	> 24 hrs	> 24 hrs
Citric acid	> 24 hrs	> 24 hrs	Methyl alcohol	> 24 hrs	< 24 hrs
Disinfectant	> 24 hrs	> 24 hrs	Sodium carbonate	> 24 hrs	> 24 hrs
Ethyl alcohol	> 24 hrs	< 24 hrs	Sodium chloride	> 24 hrs	> 24 hrs
Ethyl acetate and butyl acetate	> 24 hrs	< 15 min	Sodium hydroxide	> 24 hrs	> 24 hrs
Gasoline	> 24 hrs	< 24 hrs	Sulfuric acid	> 24 hrs	> 24 hrs
Hydrochloric acid	> 24 hrs	> 24 hrs	Toluene	> 24 hrs	< 15 min

[1] The chemical resistance test is performed in accordance with DIN EN 12720. The sheet surfaces are visually examined at the following intervals: 15 min, 1 hour and 24 hours. The surface shows no change after the stated time. The test surface cannot be distinguished from the surrounding area.

Evonik Röhm GmbH is certified to DIN EN ISO 9001 (Quality) and DIN EN ISO 14001 (Environment).

Evonik Industries is a worldwide manufacturer of PMMA products sold under the PLEXIGLAS® trademark on the European, Asian, African and Australian continents and under the ACRYLITE® trademark in the Americas.

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