

# PLEXIGLAS® Optical

## hard coated (HC)

### Product

PLEXIGLAS® Optical hard coated (HC) is an extruded acrylic sheet material. The surface coating offers excellent resistance to abrasion and chemicals. 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 material.

### Properties

Besides the general properties of PLEXIGLAS® like

- Excellent light transmission and brilliance
- Easy to fabricate
- High surface hardness
- Light weight – half the weight of glass
- 11 times more break resistant than glass

PLEXIGLAS® Optical hard coated possesses the following properties:

- Excellent surface appearance
- Excellent resistance to abrasion and chemicals
- Almost UV resistant (99,7 %)

### Applications

Due to these properties PLEXIGLAS® Optical hard coated is suitable for the following applications

- Aviation (dust covers for windows)
- Conservation glazing and show cases
- Electronic displays
- Furniture and shop fitting
- Industrial glazing
- Picture framing
- Signage

### Processing

PLEXIGLAS® Optical hard coated can be machined with the same parameters and equipment as standard PLEXIGLAS®.

The following fabricating guidelines are available:

- Machining of PLEXIGLAS® (No. 311-1)
- Forming of PLEXIGLAS® (No. 311-2)
- Joining of PLEXIGLAS® (No. 311-3)
- Surface treatment of PLEXIGLAS® (No. 311-4)
- Fabricating tips of PLEXIGLAS® solid sheets (No. 311-5)

The polyethylene film must be left on the sheet until machining is completed. The upper side (hard coated side) of PLEXIGLAS® Optical HC is protected by a red transparent film, the lower side (uncoated side) is protected by a blue transparent film.

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.

### Weathering

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

### Printing

The uncoated side of the sheet can be treated like standard extruded sheet, e.g. for screen printing or digital printing.

## Product range

PLEXIGLAS® Optical hard coated is available in the following grades and sizes:

Size 3050 x 2050 mm from 2 up to 12 mm.

For details please refer to the PLEXIGLAS® sales handbook.

## Technical data

### Chemical resistance <sup>1</sup>

	PLEXIGLAS® Optical hard coated (HC)	Uncoated acrylic sheet
Acetone	> 24 hrs	< 15 min
Citric acid (10 %)	> 24 hrs	> 24 hrs
Disinfectant	> 24 hrs	> 24 hrs
Ethyl alcohol (96%)	> 24 hrs	< 24 hrs
Ethyl acetate and butyl acetate (1:1)	> 24 hrs	< 15 min
Gasoline	> 24 hrs	< 24 hrs
Hydrochloric acid (32 %)	> 24 hrs	> 24 hrs
Isopropyl alcohol	> 24 hrs	> 24 hrs
Methyl alcohol	> 24 hrs	< 24 hrs
Sodium carbonate (10%)	> 24 hrs	> 24 hrs
Sodium chloride (15%)	> 24 hrs	> 24 hrs
Sodium hydroxide (30%)	> 24 hrs	> 24 hrs
Sulfuric acid (30%)	> 24 hrs	> 24 hrs
Toluene	> 24 hrs	< 15 min

<sup>1</sup> 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.

## Technical Data

Physical properties (clear, 3 mm thickness)	Test Standard	Unit	PLEXIGLAS® Optical hard coated (HC)	Uncoated acrylic sheet
<b>Mechanical properties</b>				
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 527	kJ / m <sup>2</sup>	10	15
<b>Optical properties</b>				
Light transmission	DIN 5036	%	92	92
Yellowness index	DIN 5036	%	< 0,5	< 0,5
<b>Thermal properties</b>				
Vicat softening point	ISO 306, method B50	°C	106	103
Flame resistance	DIN 4102		B2	B2
	DIN EN 13501		E	E
Toxicity	AITM 3.0005		meets requirements	meets requirements
Smoke density	AITM 2.0007 / FAR 25.853		meets requirements	meets requirements
<b>Abrasion resistance of coating</b>				
Taber abrasion (100 cycles, 5,4 N, CS-10F)	ISO 9352	% Haze	< 3	20 – 30
Falling sand test	DIN 52348	cd/(lx · m <sup>2</sup> )	2,3	22
Pencil hardness	DIN EN 13523-4		5H	2H
Adhesion	DIN EN ISO 2409		GT 0	-

For further typical data of PLEXIGLAS® Optical hard coated please see the Technical Information of PLEXIGLAS® GS/XT (211-1).

® = registered trademark PLEXIGLAS is a registered trademark of Evonik Röhm GmbH, Darmstadt, Germany. 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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