PLEXIGLAS®

PLEXIGLAS®
Solid Sheet

# PLEXIGLAS® Optical hard coated (HC)

## Product

PLEXIGLAS® Optical hard coated (HC) is an extruded acrylic sheet material. The surface coating offers excellent resistance to wear and chemicals, and the material also has outstanding optical properties. The sheet, coated on one side, is particularly recommended for demanding applications where the material is subjected to heavy use and cleaning. PLEXIGLAS® Optical HC offers optimal protection even in heavily frequented public spaces: The coating helps ensure that the surface appearance of the material is preserved. The one-sided coating can be provided in various colors if required.

## Properties

In addition to the known and proven properties of PLEXIGLAS® such as

- outstanding light transmission and brilliance
- easy processability
- high surface hardness
- low weight, half that of glass
- high impact resistance, 11 times that of glass

PLEXIGLAS® Optical HC also has the following special characteristics:

- excellent surface appearance
- outstanding resistance to wear and chemicals
- almost complete opacity to UV radiation

## Applications

Thanks to these properties PLEXIGLAS® Optical HC is particularly suitable for

- furniture, shopfitting, and trade-show booth construction
- large-area wall paneling
- marker boards
- picture glazing
- museum and store display cases
- electronic displays
- the aviation industry
- industrial glazing
- signage

## Processing

PLEXIGLAS® Optical HC can be processed like standard PLEXIGLAS®.

The following guidelines are available for processing of PLEXIGLAS®:

- Processing of PLEXIGLAS® (no. 311-1)
- Joining of PLEXIGLAS® (no. 311-3)
- Surface treatment of PLEXIGLAS® (no. 311-4)
- Tips for processing of PLEXIGLAS® solid sheets (no. 311-5)

The following specific features must be noted for processing of PLEXIGLAS® Optical HC.

### Edge finishing

Scraping, wet grinding, and polishing are all highly suitable also for PLEXIGLAS® Optical HC. Flame polishing must be avoided: The flames may cause ruptures and cracks in the surface so that the characteristic wear resistance and chemical resistance may be lost in the affected area.

**Bonding**
The uncoated side of the sheet can be bonded in the same way as extruded PLEXIGLAS®. The surface of the coated surface must be prepared appropriately before bonding. For bonding of the coated side, the coating must first be wet ground or cut away. It must be ensured when removing the coating that the surface to be bonded is smooth, clean, and free from stress.

**Forming**
Line bending and thermoforming are not suitable for processing of PLEXIGLAS® Optical HC; these processes may lead to damage or detachment of the coating.

**Cleaning**
Liquid cleaning agents and water are very suitable for cleaning the chemical-resistant sheet. Mechanical cleaning methods using, for example, razor blades, knives, scrapers, or very hard scouring sponges must be avoided; these may cause scratches and damage the wear-resistant coating.

**Weathering**
PLEXIGLAS® Optical HC retains its very high light transmission even in outdoor applications. Detailed information on weathering behavior is available in the warranty for PLEXIGLAS® Optical HC (no. 111-105).

**Printing**
The uncoated side of the sheet can be printed as with extruded PLEXIGLAS®, for example by the screen printing process or digitally.

**Delivery Forms**

PLEXIGLAS® Optical HC is available in the following sizes and thicknesses:

3050 x 2050 mm with thickness from 2 to 8 mm.

Further details are available in the PLEXIGLAS® Sales Handbook.

**Typical values for properties - Chemical resistance[1]**

| | PLEXIGLAS® Optical hard coated (HC) | Uncoated acrylic sheet |
|---|---|---|
| Acetone | > 24 h | < 15 min |
| Petrol | > 24 h | < 24 h |
| Disinfectant | > 24 h | > 24 h |
| Ethanol (96 %) | > 24 h | < 24 h |
| Ethyl acetate and butyl acetate (1:1) | > 24 h | < 15 min |
| Isopropanol | > 24 h | > 24 h |
| Methanol | > 24 h | > 24 h |
| Sodium carbonate (10 %) | > 24 h | > 24 h |
| Sodium chloride (15 %) | > 24 h | > 24 h |
| Sodium hydroxide (30 %) | > 24 h | > 24 h |
| Hydrochloric acid (32 %) | > 24 h | > 24 h |
| Sulfuric acid (30 %) | > 24 h | > 24 h |
| Toluene | > 24 h | < 15 min |
| Citric acid (10 %) | > 24 h | > 24 h |

[1] Chemical resistance is tested as in DIN EN 12720.
The intervals between visual inspection of the sheet surfaces are 15 minutes, 1 hour, and 24 hours. The surface shows no change even after the specified time. The test surface is indistinguishable from the area around it.

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| Technical Data | | | | |
|---|---|---|---|---|
| **Physical properties (clear, thickness 3 mm )** | **PLEXIGLAS® Optical hard coated (HC)** | **Uncoated acrylic sheet** | **Unit** | **Test standard** |
| **Mechanical properties** | | | | |
| Tensile strength | 67.5 | 72 | MPa | DIN EN ISO 527 |
| Modulus of elasticity | 3450 | 3300 | MPa | DIN EN ISO 527 |
| Charpy impact strength | 10 | 15 | kj/m² | DIN EN ISO 527 |
| **Optical properties** | | | | |
| Light transmission | 92 | 92 | % | DIN 5036 |
| Yellowing | < 0.5 | < 0.5 | % | DIN 5036 |
| **Thermal properties** | | | | |
| Vicat softening point | 106 | 103 | °C | ISO 306, Methode B50 |
| Building material class | B2 | B2 | - | DIN 4102 |
| | E | E | - | DIN EN 13501 |
| Toxicity | Requirements satisfied | Requirements satisfied | - | AITM 3.0005 |
| Smoke density | Requirements satisfied | Requirements satisfied | - | AITM 2.0007 / FAR 25.853 |
| **Abrasion resistance of coating** | | | | |
| Abrasion resistance by the abrasive wheel method (100 cycles, 4.9 N, CS-10F) | < 3 | 20 - 30 | % Haze | ISO 9352 |
| Falling sand test | 2.3 | 22 | cd/(lx·m²) | DIN 52348 |
| Pencil hardness | 5H | 2H | - | DIN EN 13523-4 |
| Micro-scratch resistance | Class 1 | - | - | IHD-W-466 |
| Adhesion | GT 0 | - | - | DIN EN ISO 2409 |

Other typical values are available in the Technical Information for PLEXIGLAS® GS/XT (211-1).

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