

What is PMMA Optical HC (PLEXIGLAS® Optical HC)

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Extruded PMMA sheet with one-sided scratch- and chemical-resistant hard coating

PMMA Optical HC is an extruded acrylic sheet with a one-sided scratch- and chemical-resistant hard coating applied to its surface. It combines the high optical quality and impact resistance of PMMA with significantly improved surface durability – for applications where transparency and resistance to mechanical and chemical stress are both required.

Material Character

PMMA Optical HC is based on transparent, extruded acrylic (PMMA) with a light transmission of 92% and very low yellowing (< 0.5%). At roughly half the weight of glass and up to eleven times the impact resistance, the material is particularly suited to applications where glass would be too heavy, too fragile, or too unwieldy.

The one-sided hard coating significantly improves abrasion resistance compared with uncoated PMMA (abrasive wheel test per ISO 9352: < 3% haze increase versus 20–30% for uncoated material) and improves resistance to many solvents that uncoated PMMA can only withstand to a limited extent – such as acetone, toluene, or ethyl acetate/butyl acetate mixtures, against which the coated surface remains resistant for more than 24 hours, while uncoated PMMA can be attacked within minutes. Uncoated PMMA is already largely resistant to dilute acids, alkalis, and alcohols.

Scratch resistance also improves markedly: pencil hardness increases from 2H (uncoated) to 5H, and micro-scratch resistance reaches Class 1.

Advantages and Limitations

Advantages

- High scratch and chemical resistance due to the hard coating
- High light transmission (92%) with low yellowing
- Significantly more impact-resistant and lighter than glass
- Good building material classification (B2 / Class E)

Disadvantages

- Coating is one-sided only – the reverse side remains uncoated PMMA
- Not suitable for flame polishing (risk of cracking the coating)
- Not suitable for line bending or thermoforming (coating may crack or detach)
- Higher cost than uncoated PMMA

Processing Notes

Flame polishing of edges should be avoided, as it can cause cracks in the hard coating. Line bending and thermoforming are also unsuitable for PMMA Optical HC, as the coating may be damaged or detach during these processes.

Sawing, milling, and drilling are possible with the tools commonly used for PMMA. The coated side should be protected from mechanical damage during processing (e.g. with the factory-applied protective film).

Typical Properties

- High scratch and chemical resistance
- High light transmission (92%) with low yellowing
- Significantly more impact-resistant and lighter than glass
- Good building material classification (B2 / Class E)

Product Examples

- Display case and showcase glazing
- Machine guard panels with high optical quality
- Outdoor signage
- Glazing for aviation applications

Typical Industries

- Furniture, shopfitting and trade-show construction
- Museum and store display cases
- Aviation industry
- Industrial glazing

	Test Method	Unit	Value
General Properties			
Light transmission	DIN 5036	%	92
Yellowing	DIN 5036	%	< 0.5
Mechanical Properties			
Tensile strength	DIN EN ISO 527	MPa	67.5 (uncoated: 72)
Modulus of elasticity	DIN EN ISO 527	MPa	3450 (uncoated: 3300)
Abrasion and Coating Properties			
Abrasion resistance (100 cycles, 4.9 N, CS-10F)	ISO 9352	% Haze	< 3 (uncoated: 20 – 30)
Pencil hardness	DIN EN 13523-4		5H (uncoated: 2H)

The values stated are typical average values for PMMA sheets with a one-sided hard coating. The comparison values given in brackets refer to the uncoated variant of the same base material. They serve only as information about our products and as an aid to material selection.