

PMMA COLATO

DESCRIPTION

PLASKOLITE ACRYLIC (Poly Methyl Methacrylate / PMMA) CAST SHEETS are produced according to the ISO 7823-1:2003 standard and can be used both indoor and outdoor for a visual communication, architectural, interior design and other purposes.

PLAZCAST is available in wide range of thicknesses, translucent and opaque colors, special effects and Metal Reinforced grades (PLAZCAST SMR).

The complete range offers excellent transparency, bright clarity, long-life UV resistance and can be easily machined or thermoformed by standard techniques.

TYPICAL PROPERTY VALUE

Properties	Method	Units	PLAZCAST
General			
Density	ISO 1183	g/cm ³	1.2
Water Absorption	ISO 62 (1)	%	0.3
Mechanical			
Tensile Strength	ISO 527-2	MPa	70
Elongation at break	ISO 527-2	%	4
Tensile Modulus	ISO 527-2	MPa	3300
Flexural Strength	ISO 178	MPa	104
Flexural Modulus	ISO 178	MPa	3000
Rockwell Hardness	M scale		100
Impact Resistance (Charpy unnotched)	ISO 179/1fu	kJ/m ²	15
Impact Resistance (Izod notched)	ISO 180/1A	kJ/m ²	1.5
Optical			
Refractive Index	ISO 489		1.49
Light Transmission (3mm transparent sheet)	ASTM D1003	%	92
Haze (3mm transparent sheet)	ASTM D1003	%	< 1
Thermal			
Vicat Softening Temp.(50N)	ISO 306	°C	105-112
Heat Deflection Temp. (1.82 MPa)	ISO 75-1	°C	105
Coeff. of Linear Thermal Expansion (0-500C)	ISO 11359-2	°K ⁻¹	7x10 ⁻⁵
Thermal Conductivity	ASTM C177	W/mK	0.19
Maximum Continuous Service Temp.		°C	82
Electrical			
Dielectric Strength	DIN 53481	kV/mm	20-25
Dielectric Constant (50Hz)	DIN 5 3483		3.6
Dissipation Factor tan δ (1 MHz)	DIN 5 3483		0.06
Surface Resistivity	IEC 60093	Ohm	>10 ¹⁵
Volume Resistivity	IEC 60093	Ohm.cm	>10 ¹⁵

DIMENSIONS

Thickness, mm	Width, mm	Length, mm
3-6	2050	3050
8-35	2030	3050
40-60	2000	3000

Sheets are also available cut to size, according to customer requirements.

TOLERANCE FOR DIMENSIONS

Sheet Thickness, mm	Thickness, mm	Width Tolerances, mm	Length Tolerances, mm	Diagonals Tolerances, mm	Flatness Tolerances
3-25	$\pm (0.4 + 0.1 \times \text{sheet nominal thickness})$	Sheets cut in production: -0.0 / +3.0 Sheets cut to size: ± 1.0	Sheets cut in production: -0.0 / +3.0 Sheets cut to size: ± 1.0	Sheets cut in production: Length ≤ 4000 mm - ≤ 3 Length ≥ 4000 mm - ≤ 4 Sheets cut to size: ≤ 1	Max. allowed bowing - 0.5% from linear dimensions. Max. allowed bowing across the width of the sheet - ≤ 5 mm per meter of width. Max. allowed bowing along the length of the sheet - ≤ 5 mm per meter of length.
28-30	± 2.0				
35-60	- 2.0 + 3.0				

Flatness is measured on one single sheet placed on a flat and rigid surface.

OPTICAL QUALITY

Maximum number of faults	<ul style="list-style-type: none"> - Black specks, scratches, marks or other surface defects of 3 mm^2, with a minimum distance between them of 0.5 meter. - Air bubbles, inclusions, cracks or other inclusion defects of 3 mm^2, with a minimum distance between them of 0.5 meter. - "Fish eyes" of 3 mm^2 in size, when there are no more than five (5) on an area of 0.4 m^2.
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COLORS

PLAZCAST sheets are naturally colorless and exceptionally clear, however they can be pigmented to obtain a wide range of tints and colors. They are available transparent and in a wide range of translucent colors, opaque colors, opals and diffusers. PLAZCAST colored sheets maintain the same light transmission percentages regardless of the original sheet thickness (except for special types of opals, diffusers and LEDs). Please note that machining the sheet to a reduced thickness will increase the light transmission and may change the color shade of the reduced area.

For a list of updated colors, please contact PLASKOLITE Technical Support or your regional supplier.

DEFINITIONS

SHRINKAGE

As opposed to the extrusion process, cast PMMA sheets shrink isotropically (same in all directions).

PLAZCAST sheets may shrink up to 2% in each direction.

FIRE TEST PERFORMANCE

PMMA is a combustible material and will burn if ignited. However, unlike other polymers, does not drop or produce toxic or corrosive gases and produces very little smoke, an important safety benefit.

PLAZCAST extruded acrylic sheets are classified:

- HB according to UL94.
- E according to UNE-EN ISO 13501.



NOISE REDUCTION

PLAZCAST sheets are used widely as noise-reduction barriers along roads and highways.

CE Marking for PLAZCAST SMR sheets are available according to EN-14388 "Road Traffic Noise Reducing Device".

CHEMICAL RESISTANCE

PLAZCAST sheets have good resistance to water, alkalis, aqueous inorganic salt solutions and most common dilute acids. Some substances do not have any effect on PLAZCAST however some can cause staining, swelling, crazing, weakening or dissolve it completely.

Important Note: Any substance that comes with contact with PMMA should be checked for compatibility. Even if the supplier confirms that the material is suitable for PMMA, please apply it first to a hidden area to see if there are any effects. However this will cover you for short-time effects only. To assess long-term effects of substances on PMMA, laboratory testing is required.

ENVIRONMENTAL STRESS CRACKING

ESC (Environmental Stress Cracking) is a well-known phenomenon in plastics including PMMA, and a common reason of product failure. ESC is a result of the combination of stress and chemical exposure. Under harsh chemical environment, stressed sheets will fail by cracking and crazing. The level of stress needed for ESC is lower than the normal failure mechanical stress of PMMA in a chemical-free environment. Stresses can be induced during forming and fabrication. These can be eliminated by an annealing process (see PLAZCAST Guidebook for machining and forming instructions). Stresses can be induced also by improper installation (see PLAZCAST Guidebook for installation instructions). Cold bended sheets under permanent induced stress or sheets under periodic stress (fatigue) are also susceptible to ESC.

GENERAL GUIDELINES

STORAGE

PLAZCAST sheets must be stored with their original protective masking in a cool, dry and well-ventilated room, at a reasonable constant temperature, away from direct sunlight, excessive humidity, rain or solvent's vapors. Failing to store PLAZCAST in adequate conditions can produce distortions in the sheets and other effects, which will make later fabricating, a more difficult task.

Long term exposure to the sun or other heat sources can cause fusing of the protective polyethylene film to the sheet surface, impeding its removal.

PLAZCAST sheets are best stored horizontally on their delivery pallets. Pay attention to avoid pressure on the unsupported areas.

Never leave uncovered sheets or pallets. It is advisable to replace the original packaging over the stack after a sheet is removed from stock to avoid moisture absorption. If stored for long time, the use of dry-packaging is highly recommendable.

PROTECTIVE FILM

Both surfaces of PLAZCAST sheet are protected by a fully recyclable polyethylene (PE) film. Keep this film in position as long as possible and remove only and immediately after installation.

Sharp objects, sharp particles or even small chips can penetrate the protective PE masking, and damage the surface, therefore always lay PLAZCAST on a clean smooth surface.

PLAZCAST protective film is suitable for thermoforming and laser cutting (except for satin sheets).

It is preferable to leave the protective film in position throughout machining to keep the sheet surface in perfect condition. Normal thermoforming temperatures do not affect the adhesive used for the film on PLAZCAST sheets and can therefore be left in place during most heating and forming operations. However, care should be taken to ensure there are no defects in the film (holes, scratches, bubbles), which could mark the part during the forming process. High-heat deep-draw thermoforming applications can cause the PE film to adhere more strongly. Printed film must be removed before thermoforming, to avoid transfer of the printing ink to the sheet's surface.

CLEANING AND MAINTENANCE

PLAZCAST sheets are produced in clean-room environment and do not need to be cleaned before use. However, cleaning may be needed after fabrication, before sensitive processes such as vacuum metallization or printing or for maintenance during use.

If PLAZCAST sheets need to be cleaned, wash the sheet surface with clean fresh water with a mild soap. In order to verify that the soap you are using is compatible with PMMA test a hidden area before cleaning. Use a clean soft cloth or sponge and rinse well. Do not scrub or use brushes. Dry with a soft cloth. The use of window cleaning fluids or solvents such as alcohols, turpentine, acetone, etc., can cause damage to the sheet.

ENVIRONMENTAL ADVANTAGES

PLAZCAST sheets are environmentally friendly. The outstanding chemical stability and long-time resistance to aging and weathering of PLAZCAST sheets often ensures a long service time. The sheets and their polyethylene protective layers are fully recyclable. They do not contain any toxic materials, halogens or heavy metals, which may cause environmental damage or health risks. PLAZCAST sheets do not contain Bisphenol-A. Ozone Depleting Substances (ODP) are not used in the manufacture of PLAZCAST sheets and they do not release pollutant substances into the environment during manufacture. They do not produce toxic or corrosive gases when burning, fires can be extinguished with water.

PLAZCAST sheets can be used for energy recovery and chemical recycling. PLAZCAST scrap is not classified as hazardous waste small amounts can be disposed as household refuse. Large quantities should be disposed for recycling.

REWORKING

- HANDLING:

PLAZCAST is a rigid sheet, which with wrong handling can break, leaving sharp edges.

Handling PLAZCAST must be done with care, always using protective gloves and shoes.

- Burning Behavior:

PLAZCAST sheets are combustible, and if not extinguished, will burn to completion once ignited. When burning, in the presence of sufficient air, PLAZCAST releases CO₂ and water however if there is a lack of sufficient air, CO can be formed.

When storing or working with PLAZCAST, the necessary fire precautions must be considered, taking into account the burning behavior of PLAZCAST.

- COLD BENDING:

Unlike thermoforming, cold-bended PLAZCAST will not keep its form unless installed into a frame. The sheet must be with perfect edges to avoid breakage during bending. The radius of the bend should not be below the minimum value in order to avoid high permanent stress, which can eventually cause small cracks or even break the sheet.

Minimum recommended bend radius is 300 times the thickness of the sheet.

