

# TOP PC – PLAZIT- POLYGAL ULTRA-HIGH OPTICAL QUALITY THIN-GAUGE EXTRUDED PC Single Layer SHEETS



## PRODUCT DATASHEET

### DESCRIPTION

TOP EXTRUDED SHEETS (TOP) are the latest technology breakthrough of PLAZIT-POLYGAL GROUP. TOP sheets are produced using special ultra-clean materials, the most advanced extrusion lines in the world, rigorous clean room environment and computerized state-of-the-art video technology in order to detect the smallest imperfections, and designed specifically for electronic display application (screens and panels).

### TYPICAL PROPERTY VALUES

Properties	Method	Units	TOP PC
<b>General</b>			
Density	ISO 1183	g/cm <sup>3</sup>	1.2
Water Absorption	ISO 62 (1)	%	0.15
<b>Mechanical</b>			
Tensile Strength at Yield	ISO 527-2	MPa	>60
Elongation at Yield	ISO 527-2	%	6
Elongation at Break	ISO 527-2	%	> 60
Tensile Modulus	ISO 527-2	MPa	2400
Flexural Strength	ISO 178	MPa	90
Flexural Modulus	ISO 178	MPa	2300
Impact Resistance (Charpy unnotched)	ISO 179/1fu	kJ/m <sup>2</sup>	No Break
Impact Resistance (Izod notched)	ISO 180/1A	kJ/m <sup>2</sup>	> 65
<b>Optical</b>			
Refractive Index	ISO 489		1.585
Light Transmission (thickness dependent)	ASTM D1003	%	>90
Haze (thickness dependent)	ASTM D1003	%	< 0.5
Yellowness Index	ASTM E313, ASTM D1925		< 1
<b>Thermal</b>			
Vicat Softening Temp.(50N)	ISO 306	°C	144
Heat Deflection Temp. (1.82 MPa)	ISO 75-1	°C	130
Coeff. of Linear Thermal Expansion (0-500°C)		µm/m°C	6.5
Thermal Conductivity	ASTM C177	W/mK	0.2
Maximum Continuous Service Temp.		°C	85
Maximum Short Time Service Temp.		°C	120
Minimum Continuous Service Temp.		°C	-25
Minimum Short Time Service Temp.		°C	-40
<b>Electrical</b>			
Dielectric Constant (50Hz)	DIN 53483		3.0
Dissipation Factor tanδ (100Hz)	DIN 53483		0.0006
Dissipation Factor tanδ (1 MHz)	DIN 53483		0.009
Volume Resistivity	IEC 60093	Ohm.cm	>10 <sup>14</sup>
Surface Resistivity	IEC 60093	Ohm	>10 <sup>15</sup>

## DIMENSIONS

Thickness, mm	Width, mm	Length, mm
0.5, 0.65, 0.8, 1.0, 1.5, 2.0	Up to 1270 max	600 – 3000

Other thicknesses may be available upon request.

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

## TOLERANCES FOR DIMENSIONS

Sheet Thickness, mm	Thickness Tolerances, %	Width Tolerances, mm	Length Tolerances, mm	Diagonals Tolerances, mm	Flatness Tolerances
0.5-0.65	± 2	Sheets cut at production: -0.0 /+2.0	Sheets cut at production: -0.0 /+3.0	Sheets cut at production: ±2	Max allowed bowing - 0.5% from linear dimensions. Flatness is measured on one single sheet placed on a flat and rigid surface.
0.8-2.0	± 1	Sheets cut to size: ± 0.25	Sheets cut to size: ± 0.25		

## OPTICAL QUALITY

Sheets are examined according to several parameters that determine their optical quality.

Defect	Inspection method	Quality Standard
Scratch	Eye test from 350 mm at angle 25°-45°	Very weak scratches are allowed, scratches of more than 0.02 mm width are not allowed
Ripple		Inconspicuous even ripple is allowed. Obvious ripple is not allowed.
Foreign Particles	Particles ≥ 1.0mm <sup>2</sup>	Not Allowed
	0.5mm <sup>2</sup> ≥ Particles ≤ 1.0 mm <sup>2</sup>	5 particles or less for sqm
	Particles smaller than 0.5 mm <sup>2</sup>	Allowed
Grain (Dot)	Eye test from 350 mm under daylight lamp of 1000 Lux	- Dot allowed < 0.1 mm <sup>2</sup> - 50 dots per m <sup>2</sup> for 0.1-0.3 mm <sup>2</sup> - 8 dots per m <sup>2</sup> for 0.3-0.5 mm <sup>2</sup> - Dots not allowed > 0.5 mm <sup>2</sup>
Bubble		Bubbles not allowed > 0.1 mm <sup>2</sup>
Edges		Neat and clear edges, no cracks and big dust particles

\* All quantities refer to an area of 1.0 sqm

## COLORS

TOP sheets are naturally colorless and clear.

For optical data, please contact PLAZIT-POLYGAL Technical Support.

## DEFINITIONS

### UV-VIS TRANSMISSION

TOP PC sheets have excellent filtering of UV radiation. They completely block the harmful UV radiation while transmitting visible light and parts of the IR radiation. However, the PC itself is not resistant to UV radiation and must be stabilized or protected using UV absorbing additives.

A coextruded UV layer which is an integral part of the sheet, protects the sheets from degradation from solar ultraviolet radiation. The effectiveness of this protection has been confirmed by field and laboratory durability testing of Yellowness Index (YI), Light Transmission (LT) and Maintaining Mechanical properties.

Details are available at the Plazit-Polygal website ([www.plazit-polygal.com](http://www.plazit-polygal.com)).

### FIRE TEST PERFORMANCE

TOP PC sheets are a thermoplastic therefore it will eventually melt and burn under the intense heat of fire. However, PC is considered a self-extinguishing material meaning that it will stop burning when the fire source is removed. Unlike other polymers, does not produce toxic or corrosive gases when burning. When storing or working with TOP sheets, the necessary fire precautions must be considered.

### CHEMICAL RESISTANCE

PLAZIT-POLYGAL TOP PC sheets made from PC. Plazit-Polygal polycarbonate sheets can be safely used with most chemical materials and components, however, some common materials are not compatible with polycarbonate. The chemical stability depends on many factors such as concentration of the chemical agents, internal stresses and exposure temperature.

#### **Important Note:**

Any substance that meets TOP sheets should be checked for compatibility. 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 TOP sheets, laboratory testing is required.

For information regarding specific chemicals please refer to PLAZIT-POLYGAL Technical Support.

### ENVIRONMENTAL STRESS CRACKING

Environmental Stress Cracking (ESC) is a result of the combination of stress and exposure to chemicals. The level of stress needed for ESC is lower than the normal failure mechanical stress of PC in a chemical-free environment. Stresses can be created during forming and fabrication and can be controlled by an annealing process. Stresses can be created also by improper installation. Cold bended sheets under permanent induced stress or sheets under periodic stress (fatigue) are also susceptible to ESC.

## GENERAL GUIDELINES

### STORAGE

TOP sheets should 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. Never leave the sheets on uncovered pellets. Failing to store TOP sheets in adequate conditions can compromise the performance of the product. 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. TOP sheets are best stored horizontally on their delivery pallets. Pay attention to avoid pressure on the unsupported areas.

DO NOT store sheets under flexible PVC coverings, as flexible PVC can cause serious damage to the sheets.

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## PROTECTIVE FILM

Both surfaces of TOP sheets are protected by a fully recyclable polyethylene (PE) film. Keep this film in position as long as possible and remove only immediately after installation. Sharp objects, sharp particles or even small chips can penetrate the protective PE masking, and damage the surface, therefore always lay TOP sheets on a clean smooth surface.

The PE cover is examined according to several parameters that determine its quality.

Defect	Inspection method	Quality Standard
Uniformity	Eye test over light box	Area with ripples < 1%
Dust		Slight dust below the edge of the sheet, up to 2 mm from the edge, is allowed
Scratch		Not allowed if it cuts through until the sheet surface
Glue residue		Not allowed

## CLEANING & MAINTENANCE

TOP 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 like coating, vacuum metallization or printing or for maintenance during use. In the case that TOP sheets needs to be cleaned, wash the sheet surface with clean fresh water with a mild soap. Be sure that the soap you are using is compatible with the sheets. 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. Do not rub dry. The use of window cleaning fluids or solvents such as alcohols, turpentine, acetone, etc., can cause damage to the sheet.

## ENVIRONMENTAL ADVANTAGES

TOP sheets are environmentally friendly. The sheets and their polyethylene protective layers are fully recyclable. They do not contain any toxic materials or heavy metals, which may cause environmental damage or health risks. Ozone Depleting Substances are not used in the manufacture of TOP sheets. TOP sheets do not release pollutant substances to the environment during manufacture. They do not produce toxic or corrosive gases upon burning. Fires can be extinguished with water. TOP sheets can be used for energy recovery and chemical or mechanical recycling. TOP scrap is not classified as hazardous waste. Small amounts can be disposed as household refuse. Large quantities should be disposed for recycling.

## RE-WORKING

### - Handling:

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

Handling of TOP sheets must be done with care, always using protective gloves and shoes.

TOP sheets can be cut, sawn, drilled, milled and bent easily using standard workshop equipment for wood or metal. However, it is always recommended to use specific tools specially designed for plastics.

### - Machining and Forming with PE Film:

It is preferable to leave the protective film in position throughout machining to keep the sheet surface in perfect condition.

Machining, Assembling, Forming, Glazing and Signage Installation recommendations can be found to PLAZIT-POLYGAL Technical Support.

DISCLAIMER: The data in this advertisement are provided in good faith and constitute general information without commitment and no warranty is given or implied. Our plastics products are a combustible thermoplastic that complies with various international standards, as customary in each country. Avoid exposure to excessive heat or aromatic cleaning solvent. Normal fire precautions should be taken to protect against combustion.

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