

# PSS-1000 Optical Sheet



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 **ESP** <sup>TM</sup>  
Engineered  
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Products

# PSS-1000 Optical Sheet | Overview

## High Demand Applications

PSS-1000 optical sheet material is one of the toughest optical plastic materials available. Its exceptional impact resistance, superior optical properties, clarity and ultra-lightweight performance make PSS-1000 optical sheet the perfect choice for rugged applications including:

- Ballistic
- Marine
- Heavy Equipment
- Electronic Displays

In addition, PSS-1000 optical sheet material offers outstanding chemical resistance and thermal stability, providing all-around protection, durability and performance in a lightweight plastic sheet material.

## Impact Resistance

The strength and toughness of PSS-1000 sheet material make it an outstanding choice for any application that requires impact resistance for enhanced protection and performance.

- General impact resistance exceeds polycarbonate
- Resistance to ballistic threats is more than 40% better than competitive materials
- Ideal for armored vehicles, aircraft windshields, riot shields, banks, check cashing, convenience store locations and more

## Precision Optics

One of the most distinctive attributes of PSS-1000 sheet material is its optical performance and clarity, making it perfect for electronic display applications.

- High light transmission value
- Low haze value
- No optical defects resulting from black specs
- Compatible with touchscreen applications

## Lightweight Performance

PSS-1000 sheet is ultra-lightweight, providing added convenience and flexibility.

- Lower density than polycarbonate and acrylic
- Half the weight of glass



## Extreme Durability

Few other engineered plastics can match the chemical and thermal stability of PSS-1000 sheet material.

- Withstands extreme hot and cold temperatures
- Virtually unaffected by most organic and inorganic chemicals
- Extensive fabrication capabilities – drilled, screwed, notched, grommetted, formed



## Ballistic Performance

PSS-1000 optical sheet can be produced as a single monolithic sheet, with no lamination, for applications requiring superior clarity at lower threat levels and/or with lamination to add performance for the highest threat levels.

- Demonstrates >40% improvement vs. polycarbonate
- Ballistic performance remains stable across typical temperature ranges (-40°C to 60°C)



## PERFORMANCE COMPARISON

	PSS-1000	POLYCARBONATE	ACRYLIC	GLASS
Impact Resistance	● ● ●	● ●	⊘	⊘
Ballistic Performance	● ● ●	● ●	⊘	●
Optical Quality	● ●	⊘	● ●	● ● ●
Chemical Resistance	● ●	⊘	⊘	● ● ●
Lightweight / Low Density	● ● ●	● ●	● ●	⊘

● ● ● Superior   ● ● Excellent   ● Good   ⊘ Poor

## Standard Availability

### DIMENSIONS AND THICKNESS

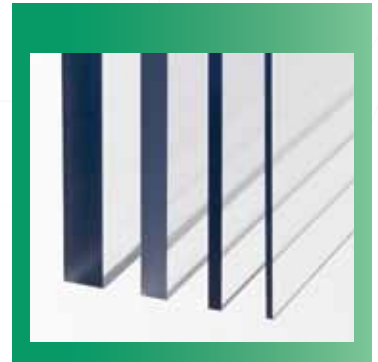
#### 2' x 3' (889 mm x 610 mm)

- 1/8" (3.175 mm)
- 1/4" (6.35 mm)
- 1/2" (12.7 mm)
- 3/4" (19.05 mm)
- 1" (25.4 mm)
- 1-1/4" (31.75 mm)

#### 15" x 18" (390 mm x 450 mm)

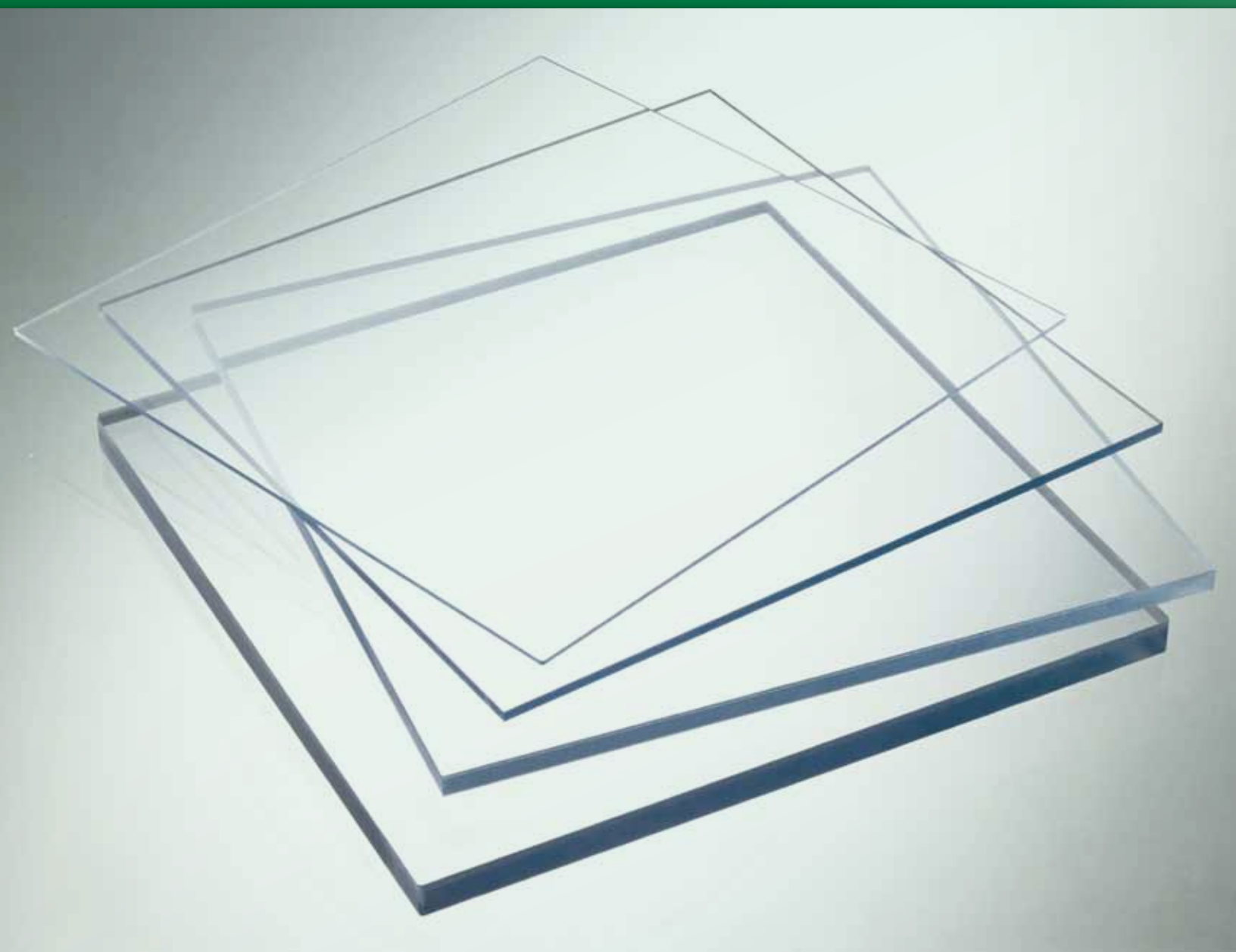
- 0.031" (0.8 mm)
- 0.040" (1.0 mm)
- 0.051" (1.3 mm)
- 0.071" (1.8 mm)

\*Custom thickness available on request



## PROPERTIES

	TEST CONDITIONS	UNITS	STANDARDS	PSS-1000
<b>OPTICAL</b>		Tests conducted on 3.0 mm thick sheet		
Luminous Transmittance		%	ASTM D1003	89
Haze		%	ASTM D1003	0.2
Yellowness Index			ASTM E313	1.22
Refractive Index, $n_e$	23°C, 546 nm			1.54
Abbe Value				45
<b>MECHANICAL</b>		Tests conducted on 1.0 mm thick sheet		
Tensile Modulus		MPa	ASTM D638-08	1655
Flexural Modulus		MPa	ASTM D790-07	2132
Impact Resistance		4.4 m/s		
Deflection at Peak Load		mm	ASTM D3763-10	24.0
Peak Load		N	ASTM D3763-10	6760
Total Energy		J	ASTM D3763-10	99.4
Taber Abrasion	500g, 100 cycles, 3.00 mm thick	% Haze	ASTM D1044-08	27%
<b>THERMAL</b>		Tests conducted on 1.0 mm thick sheet		
Thermal Expansion Coefficient		$\mu\text{m} / (\text{m } ^\circ\text{C})$	ASTM E831	120
Softening Temperature		$^\circ\text{C}$	ASTM E1545	173
Heat Distortion Temperature	264 psi	$^\circ\text{C}$	ASTM D648	70
UL 94 Flammability Class			ASTM D3801	V-2
<b>ELECTRICAL</b>		Tests conducted on 1.0 mm thick sheet		
Surface Resistivity		Ohms	ASTM 257-99	$10 \times 10^{15}$
Volume Resistivity		Ohms-cm	ASTM 257-99	$9 \times 10^{15}$
<b>BASIC</b>		Tests conducted on 1.0 mm thick sheet		
Specific Gravity		$\text{g} / \text{cm}^3$		1.11
Water Absorption	7 days, 25°C	%		0.8



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