



PALSUN®

POLYCARBONATE SHEET

Product Range*

- PALTUF™ - General Purpose
- PALSUN® - UV protected on one side
- PALSUN® UV2 - UV Protected on both sides
- PALSUN® CS - Coil Stock Sheet
- PALSUN® FR - Fire retardant
- PALSUN® Embossed
- PALSUN® Matte

Standard Colors*

Transparent: Clear, Solar Grey, Bronze
Translucent: Sign White

Standard Sizes*

Sheet size: 4'x8', 5'x8', 6'x8', 80"x120"
Thickness: 0.040 - 0.500 in.



Some products available as part of Supply-to-Size program.

POLYCARBONATE



PALGARD™

ABRASION RESISTANT POLYCARBONATE SHEET

Product Range*

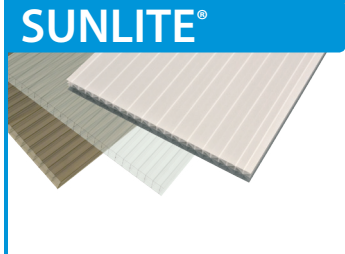
- PALGARD® - Coated two sides, One-side coated available
- **NEW** PALGARD® TG - Transportation Grade (FRA Approved)

Standard Colors*

Clear

Standard Sizes*

Sheet size: 4'x8', 5'x8', 6'x8'
Thickness: 0.040 - 0.5 in.



SUNLITE®

MULTI-WALL POLYCARBONATE SHEET

Product Range*

- SUNLITE® - UV protected on one side
- SUNLITE® UV2 - UV protected on both sides
- SUNLITE® Solar Control - Metallic reflective
- SUNLITE® SLT - Opal-diffused SolarSmart™

Standard Colors*

Clear, White Opal, Bronze

Standard Sizes*

Width: 48" and 72" (capable of 24"-82")
Length: Up to 40ft.
Thickness: 4mm-16mm (dependent on cell-wall structure)

Glazing Accessories

Profiles and sealing tape available via Green-Tek



PALIGHT®

FOAMED PVC SHEET

Product Range*

- PALIGHT® Premium - Optimized for digital or screen printing; available with masking on 1 side, 2 side, or unmasked
- PALIGHT® GPS - General Purpose Substrate
- **NEW** PALIGHT® Outdoor - Engineered to handle extended outdoor exposure. Available in Smooth or Wood Grain finish.

Standard Colors*

PALIGHT® PREMIUM: White, Yellow, Red, Blue, Black, Grey (other designer and Pantone® colors available with min. order requirements)
PALIGHT® GPS: White, Utility Grey
PALIGHT® Outdoor: White

Standard Sizes*

Sheet sizes: 48x96in. in stock; 60x96in., 60x120, 80x120in. available
Thickness: 1-13mm, 15, 19, 25mm



Some products available as part of Supply-to-Size program.

PVC



PALCLEAR®

TRANSPARENT PVC SHEET

Product Range*

- PALCLEAR™ Water Clear
- PALCLEAR™ HI (High-Impact)
- PALCLEAR™ Matte

Standard Colors*

Transparent: Water Clear

Standard Sizes*

Sheet sizes: 48x96in.
Thickness: 0.040-0.591in.



PALOPAQUE™

OPAQUE TYPE I PVC SHEET

Product Range*

- PALOPAQUE™ - General purpose
- PALOPAQUE™ Matte - Matte finish on one side

Standard Colors*

Dark Grey

Optional Colors

White, Light Grey, Metallic Grey

Standard Sizes*

Sheet sizes: 48 x 96 in.
Thickness: 0.040 - 1.0 in

* **IMPORTANT NOTE:** The products listed above are standard items that are stocked and/or produced on a regular basis in our USA plant. Each product may have additional types, colors, thicknesses, and sizes available with minimum order requirements. Visit PalramAmericas.com or contact Palram for more information.



PALSUN[®] CS

Coil Stock Polycarbonate Sheet



► Overview

PALSUN CS Coil Stock Polycarbonate Sheet provides customers flexibility and yield advantages because sheets can be cut at any desired length, right off the coil. Palsun CS is fabrication-friendly with significantly more impact strength than acrylic, hi-impact acrylic and copolymer substrates.

Palsun CS is available in clear and white. Thicknesses range from 2mm (.080") – 6mm (.236"), and available widths range from 30" to 80". Custom colors and dimensions are also available.

► Features and Benefits

- High impact resistance – Virtually unbreakable
- **Clear:** high clarity and high light transmission
- **Sign White:** excellent whiteness and superb light diffusion
- Widest service temperature range of any plastic substrate
- Versatile, formable, and machinable
- Superior vacuum definition in thermoforming applications
- Excellent chemical resistance
- 10-Year warranty against yellowing and breakage



► Typical Physical Properties

Property	(Method*)	Conditions	Units	Value
Density	(D-792)		lb/ft ³	75
Heat Deflection Temperature	(D-648)	Load: 264 psi	°F	265
Service Temperature - Short Term			°F	-60 to +250
Service Temperature - Long Term			°F	-50 to +210
Coefficient of Linear Thermal Expansion	(D-696)			3.6 x 10 ⁻⁵
Thermal Conductivity	(C-177)		Btu-in./hr-ft ² -F°	1.46
Tensile Strength at Yield	(D-638)	0.04 in./min	psi	9400
Tensile Strength at Break	(D-638)	0.04 in./min	psi	8800
Elongation at Yield	(D-638)	0.40 in./min	%	6
Elongation at Break	(D-638)	0.40 in./min	%	>90
Tensile Modulus of Elasticity	(D-638)	0.04 in./min	psi	290,000
Flexural Strength	(D-790)	0.051 in./min	psi	14,500
Flexural Modulus	(D-790)	0.051 in./min	psi	380,000
Impact Falling Weight	(ISO 6603/1 E ₅₀)	0.118 in. sheet	ft-lb	117
Rockwell Hardness	(D-785)		R Scale	125R
Light Transmission	(D-1003)	0.118 in. clear sheet	%	89
Haze	(D-1003)	0.118 in. clear sheet	%	<0.5
Yellowness Index	(D-1003)	0.118 in. clear sheet	WI	<1

*ASTM except where noted

► 10-Year Limited Warranty

Palsun is warranted for 10 years against yellowing and breakage. See Palsun Limited Warranty for details.

► Standard Dimensions*

Thickness Inches (mm)	Weight (lbs/sf)	Width	Length Lineal Feet
0.118 (3mm)	0.74	30 in. to 80 in.	500
0.150 (3.8mm)	0.94		400
0.117 (4.5mm)	1.11		350
0.236 (6mm)	1.47		250

*Custom thicknesses, widths and colors available with minimum order requirements.

► Flammability

PALSUN®	Standard	Classification*
	BS 476/7	Class 1
	NSP 92501, 4	M1, M2
	DIN 4102	B1, B2
	CSE RF 2/75/A, CSE RF 3/77	Class 1
	UL Classified	V2 (File e221255)
	ASTM D-635	CC1
	ASTM E-84	Class A

*Depends on thickness. For additional information please contact your PALSUN distributor.

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► UV Protection

Palsun CS coil stock features co-extruded UV protection on one side of the sheet. Double-side UV protection is available.

► PALSUN CS Colors

Palsun CS coil stock is available in Clear and Sign White. Custom colors are available upon request with minimum order requirements.

► Typical Applications

Signage

- Backlit and illuminated signage
- Channel letters
- LED sign faces
- Digital or screen printed signs

Other Applications

- Light Fixtures (white opal, diffused, or embossed sheets)
- Thermoformed, Vacuum Formed, Bent, and Fabricated Items

Display

- P-O-P displays
- Exhibits
- Merchandise racks and stands
- Literature holders

► Just some of Palram's other products:

Polycarbonate	Description
PALTUF™	General purpose flat solid polycarbonate sheet for interior use
PALSUN®	Flat solid polycarbonate sheet, UV protected on one side
PALSUN® UV2	UV protection on both sides
PALSUN® Embossed	Embossed surface (E102, prismatic, hair cell)
PALSUN® FR	Fire retardant, with higher fire resistant rating
PALSUN® Matte	Matte finish on one side
PALSUN® Solar Control	Efficient heat-blocking with metallic appearance
PALSUN® Smart	See-through sheet with advanced heat-blocking
PALSUN® Foam	Flat foamed polycarbonate sheet, UV protected on one side
PALGARD™	Abrasion resistant on one or both sides
SUNLITE®	Complete line of multi-wall polycarbonate sheet
PVC	Description
PALIGHT® Premium	Foam PVC sheet optimized for digital and screen printing
PALIGHT GPS	Competitively priced Foam PVC sheet for general purpose use
PALOPAQUE®	Type 1 solid PVC sheet
PALCLEAR®	Water-clear PVC sheet
Acrylic	Description
PALGLAS®	Acrylic Sheet



Authorized Dealer



Overview

PALGARD TG offers optically clear, impact-resistant glazing for rail car applications.

PALGARD TG is engineered to withstand the rigors of daily service in the rail industry, including vandalism.

Palgard TG is a polycarbonate substrate that offers tremendous impact resistance and breakage protection. It features an advanced surface coating that provides extraordinary chemical and abrasion resistance.

Budgets can be made or broken by unplanned maintenance and replacement. PALGARD TG helps to reduce costs and improve in-service availability of railcars.

www.palram.com

Main Benefits

- Manufacturer's limited warranty against breakage
- Abrasion-resistant surface resists weathering and scratching
- Complies with various FRA standards (*see table on reverse side*)
- Low weight: nearly half the weight of glass
- Clear - optical quality



Typical Applications

- Light rail
- Commuter rail
- High speed rail
- Bus glazing

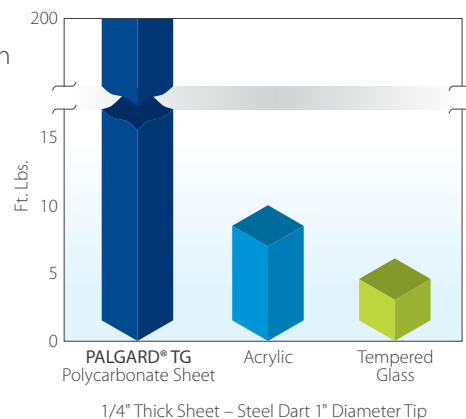




Impact Resistance

PALGARD TG weighs in at approximately half the weight of glass, yet offers more than 200 times its impact strength.

The result is better protection against vandalism, breakage, and unplanned maintenance.



Product Availability*

Width x Length in. (mm)	Thicknesses in. (mm)	Colors
48 x 96 (1200 x 2440)	.236 & .460	Clear*
60 x 96 (1525 x 2440)	Available upon request. Stock levels fluctuate according to market demand.	
72 x 96 (1830 x 2440)		

*Special dimensions and colors are available, subject to minimum order.

Care and Maintenance

Palgard TG offers excellent durability and easy care and maintenance, however, it is important to be aware of specific manufacturer recommendations to ensure compatibility.

For details, visit www.PalramAmericas.com/PalgardTG

Compatible Sealants and Chemicals

As with any plastic product, it is important to use compatible sealants and adhesives.

For a detailed list of compatibility-tested sealants, visit: www.PalramAmericas.com/sealants

For chemical resistance details, visit: <http://www.revbase.com/tt/sl.ashx?z=169034e2&dataid=140687>

Regulatory Code Compliance Certification

Organization	Standard	Classification*
FRA (Federal Railroad Administration)	49 CFR Part 238, App. B (ASTM E162)	Is <100
	49 CFR Part 238, App. B (ASTM E662)	Ds (4.0) <200
FRA	49 CFR Part 223 (Ballistic .22 LR)	Pass
	49 CFR Part 223 (Impact, Type I & II)	Pass
ANSI	Z26.1-96	AS-4
Boeing	BSS 7329	Approved
ASTM	D635 (Horizontal Burn, AEB)	< 1 in.

*Depends on thickness



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Authorized Distributor

F2202 - 08,11,15 SCS

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PALSHIELD™

Containment and Bullet Resistant Glazing



Overview

The PALSHIELD product line offers various levels of ballistics and forced entry protection.

Due to its layered structure, the laminate withstands both physical attack and multi-shot assault, absorbing the entire impact energy without shattering or spalling.

PALSHIELD features an abrasion resistant coating, which ensures long-term clarity for applications in accessible areas.

Main Benefits

- No spall design
- Abrasion resistant surface
- Complies with various ballistic and forced entry standards (*see table on reverse side*)
- Low weight: nearly half the weight of glass-equivalent
- Clear - good optical quality
- Colors: clear, bronze, grey

Typical Applications

- Security glazing in banks and government facilities
- Public institutions
- Gas stations and convenience stores
- Drive-up windows
- Ticket booths and kiosks
- Prisons and detention centers



www.palram.com



A Growing Line of Products

PALSHIELD is engineered to meet a variety of forced entry and ballistic test standards. Palram's Palshield line of products is destined to expand over time. The information listed below represents the Palram products that meet or exceed the various testing standards at the time of this printing. Please visit PalramAmericas.com/Palshield for the most up-to-date information and test approvals.

Regulatory Code Compliance Certification

Organization	Standard	Classification
ANSI	Z97.1-09	Approved Impact and Weathering
CPSC	16 CFR 1201	Category I or II

Manufacturer's Limited Warranty

PALSHIELD offers a 7-Year manufacturer's limited warranty against coating failure, structural delamination, yellowing, and loss of light transmittance. Visit www.PalramAmericas.com/Palshield for complete warranty and technical details.

Forced Entry Products	Protection Level	Thickness	Plies	Lbs./FT ²	Light Transmission
PALSHIELD FE 375	ASTM F1915-05 - Security Grade Level 2	.375"	2	2.4	86%
PALSHIELD FE 500	ASTM F1915-05 - Security Grade Level 2 HPW 0500.03 Level A ballistics (.38 special)	.500"	3	3.3	83%
PALSHIELD FE 750	ASTM F1915-05 - Security Grade Level 1 HTW 0500.03 Level B Ballistics (9mm)	.750"	3	4.9	77%

Ballistic Products	Protection Level	Thickness	Plies	Lbs./FT ²	Light Transmission
PALSHIELD UL1-750*	UL 752 Level 1 [†] – 9mm 3 shots	.750"	3	4.9	88%
PALSHIELD UL2-1000	UL 752 Level 2 [†] – .357 3 shots	1.0"	4	6.5	72%
PALSHIELD UL3-1250	UL 752 Level 3 [†] – .44 Mag 3 shots ASTM F1915-05 Security Grade 1 ASTM 1233-08 Class V (Body)	1.25"	4	8.1	67%
PALSHIELD UL6-1250*	UL 752 Level 6 [†] – High Velocity 9mm 5 shots, Supplemental shotgun 1 shot	1.25"	4	8.1	78%

* Contains Acrylic † Tested by an accredited independent lab according to UL specs.

Testing Std. Reference	Standard and Year	Title / Description
ASTM	F1233-08	Standard Test Method for Security Glazing Materials and Systems
ASTM	F1915-05	Standard Test Method for Glazing for Detention Facilities
HP White	TP-0500-.03	Transparent Material for Use in Forced Entry or Containment Barriers
UL	752	Bullet Resistant Equipment

Typical Layer Detail

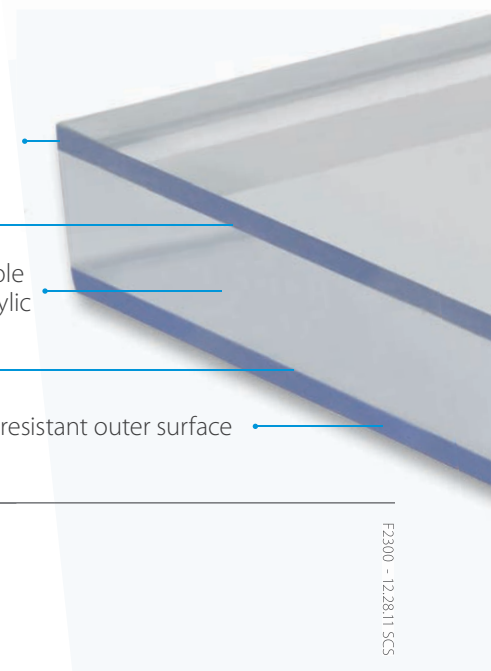
Polycarbonate with abrasion-resistant outer surface

Adhesive

Core made of single or multiple plies of polycarbonate, or acrylic

Adhesive

Polycarbonate with abrasion-resistant outer surface



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PALIGHT® EPS

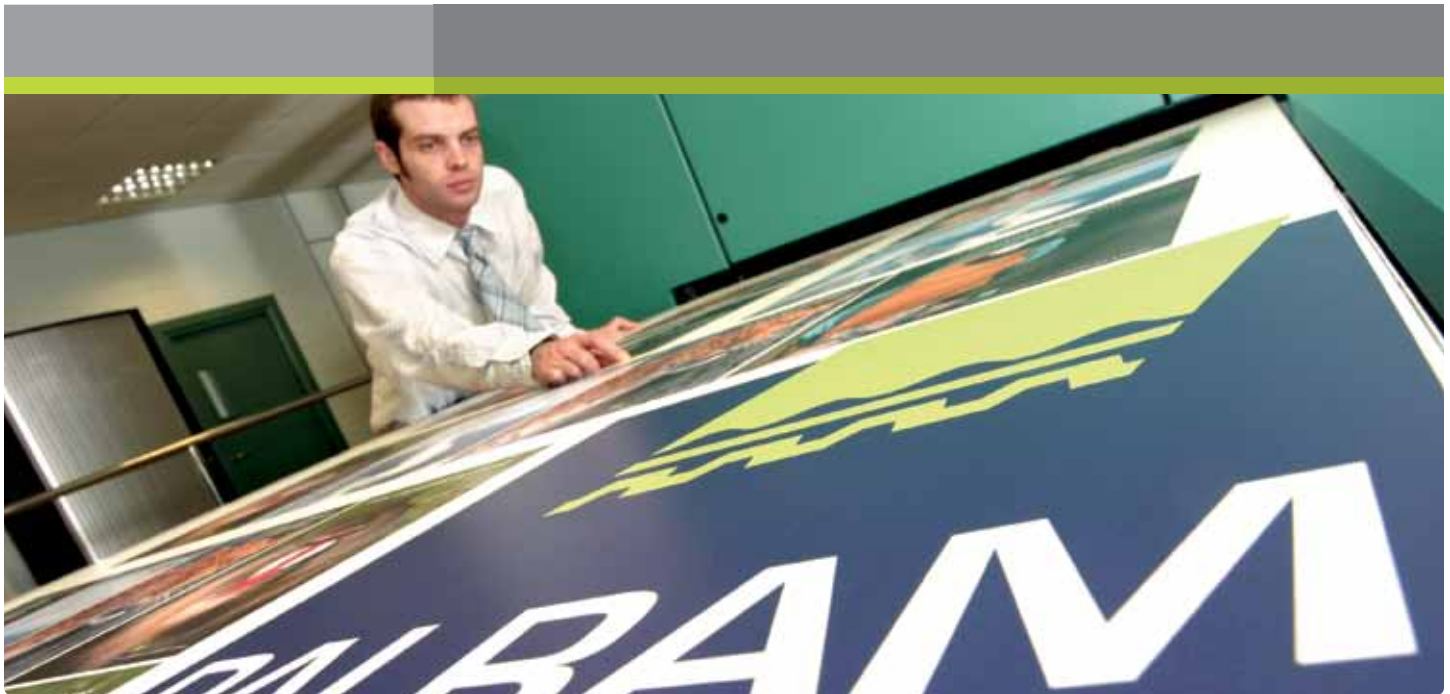
Foamed PVC Economical Print Substrate



FABRICATION



ADVERTISING



Overview

PALIGHT EPS is a value-oriented foam PVC for printers, display builders, and fabricators. It's slightly lighter-weight than Palight Premium and other Palight products, thereby decreasing weight and reducing production and freight costs.

PALIGHT EPS is formulated to give good performance for everyday, competitively priced digital or silk-screen print applications, and is also a good choice for cost-sensitive display and fabrication projects that do not require the added performance and rigidity of PALIGHT Premium or PALIGHT Outdoor.

See back side for more comparative details.

www.palramamericas.com

Main Benefits

- Value-oriented for cost-sensitive projects
- Bright white, smooth surface with uniform thickness
- Good adhesion of ink and paint
- Available in 3mm & 6mm thicknesses and 4' x 8' sheets
- Slightly lighter weight than our PALIGHT Premium Foam PVC
- Manufactured with nearly 50 years of PVC production experience



Typical Applications

- Displays
- Signage
- Promotional decoration
- Display cladding

A note about global branding: PALIGHT EPS is also marketed under the brand name PALFOAM™ in some regions of the world.



Standard Dimensions

Specification		Imperial	Metric
White	Thickness Range	.118 in. & .236 in	3mm & 6mm
	Panel Dimension Range	4 ft. x 8 ft.	1220mm x 2440mm

Fabrication, Care and Maintenance

Detailed fabrication, care and maintenance information is available at www.PalramAmericas.com/PalightEPS_Docs.

Which PALIGHT Product is Right for You?

Palram is one of the world's largest producers of Free-Foam PVC Sheet products. The table below is provided to help you understand which Palight products are available and how they differ, so you can be sure you're choosing the right product for your application.

Application & Product Feature	Print, Graphics, and Display			Marine	Construction
	PALIGHT Premium	PALIGHT EPS	PALIGHT Outdoor	PALIGHT Marine	PALIGHT Trimboard
Colors	Brightest White & Array of Colors	White	White	White	White, Sand, and Clay
Protective Film	Palight (1-Sided) Palight DF (2-Sided) Palight NF (No Film)	Not Available	Not Available	Not Available	1-Sided
Weight, Density, and Rigidity	Very Good	Good	Very Good	Very Good	Very Good
Available dimensions	Widest Variety	Limited	Variety	Limited	Variety
UV Protection	Acceptable <i>(applies to white only)</i>	Limited	Ideal	Limited	Ideal
Intended Use	High quality signs, graphics, displays and exhibits. Provides the best all-around performance for digital & screen print applications, and display fabrication.	An Economical Print Substrate (EPS). Great for lamination applications and cost-sensitive or short-term use digital and screen print applications.	Signs and displays destined for long-term outdoor exposure. Available in smooth or wood grain finish. Available in dimensions that are suitable for outdoor use.	Intended for marine or motor home applications. Seat backers, cabinet partitions, etc.	Used in home construction as a wood replacement for interior or exterior trim moulding. Sold in typical trim board/ lumber dimensions, as well as full-size sheets .



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