

CREATING SOLUTIONS



PALIGHT®

Foamed Flat PVC Sheet



Fabrication



Construction



Advertising

► Introduction

PALIGHT is a lightweight, flexible and durable foamed PVC sheet that is ideal for advertising and construction. It brings quality, convenience and versatility to a whole new level for a wide range of applications. For high quality displays, PALIGHT exhibits the whitest color available, with a consistently smooth and bright surface that gives the best color interpretation in digital printing. Tested and approved by most digital flatbed printer manufacturers, PALIGHT is easy to handle, cut and fabricate using conventional tools and equipment, and can be also painted or laminated. The PALIGHT range offers standard matte or gloss finishes and is available in a wide range of standard and special designer colors.



► Main Benefits

- Consistent, smooth, flat surface for printing and lamination
- Excellent mechanical properties
- Easy handling, cutting, fabrication and bonding
- Lightweight (half the weight of solid PVC sheet)
- Low water absorption (closed cell structure)
- Flammability - self extinguishing
- Good insulation and low heat transmission
- High chemical resistance
- Non-toxic

PALIGHT® Product Range

Product	Description
PALIGHT®	Flat foamed PVC sheet with matt finish, available in a wide range of standard and special designer colors.
PALIGHT® 2001	Flat foamed PVC sheet with glossy hard surface on one side, available in white and standard colors.
PALIGHT® SF	Static-Free flat foamed PVC sheet for low interference digital printing, available upon special request.



► Typical Applications

Advertising - Lightweight and durable signs, displays, screen and digitally printed items, exhibition stands.

Construction - Industrial models, partitions, ducting, control cabinets, lightweight structures for corrosive environments, wet or wash down wall finish.

Industry - Insulation for control cabinets and panels, hygienic wall cladding, structures for corrosive environments, ducts, etc.

Screen Printing

- Flat, consistent surface is ideal for screen printing.
- Bright white color enables printers to reproduce true colors and achieve greater impact with white space.
- Suitable for use with aqueous and solvent inks.
- Low absorption of sheet surface provides excellent ink yield.

Digital Printing

- Specially designed for digital flatbed printers.
- Combines consistent, flat surface with market-leading quality and thickness control.
- Handling with lint-free gloves during production and optional packaging according to the printer's specific requirements reduce risk of surface contamination and to minimise static.
- Suitable for use with UV curing and solvent-based digital inks, and for heat drying when water-based inks are used.
- Bright white color retains superb whiteness after intense UV curing.

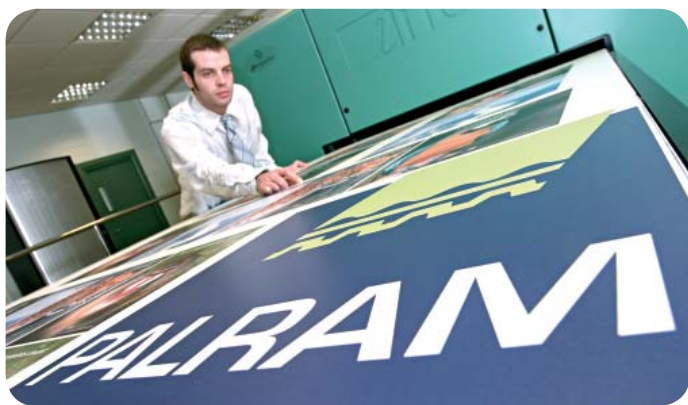


Photo Mounting - Highly suitable for photo mounting and digital printing lamination due to:

- Flat and even surface that allows complete lamination.
- Impact strength and ductility that allows cutting by guillotine or knife.
- High rigidity enables the use of large sheets without the need for support.

PALIGHT and PALIGHT 2001 sheets are ideal for numerous applications, with new uses being constantly found by users in various fields.













► Standard Dimensions and Colors















Specification	PALIGHT® (mm)	PALIGHT® 2001(mm)	
Thickness	1-13, 15, 19, 20, 25	3, 4	White
Dimensions*	1220x2440	1220x2440	
	1560x3050		
	2030x3050		
Colors	Standard & Designer Colors	Black, Gray, Red, Blue, Yellow, Green	Colors
Thickness	3, 6	3	
Dimintions*	1220x2440 2030x3050	1220x2440	

*Special dimensions are available upon request.

PALIGHT® Standard Colors*

	Color		PANTONE®	RAL
	White	ST-10		
	Cream	ST-20	-	9001
	Yellow	ST-30	108U	-
	Bright Yellow	ST-40	1235C	-
	Red	ST-50	1805C	-
	Light Blue	ST-60	2935C	-
	Blue	ST-70	288C	-
	Green	ST-80	3415C	-
	Black	ST-90	4C 2X	9011
	Grey	ST-100	430C	7037

PALIGHT® Designer Colors**

	Color		PANTONE®	RAL
	White DG	DE-11		
	Dark Cream	DE-21	Warm Grey 2C	1013
	Light Yellow	DE-31	102C	-
	Light Orange	DE-41	144U	-
	Orange	DE-51	165C	2004
	Red	DE-61	485C	-
	Dark Red	DE-71	187C	3001
	Pastel Blue	DE-81	277C	-
	Dark Blue	DE-91	2757C	5002
	Turquoise	DE-101	337C	-
	Green	DE-111	348C	6024
	Dark Green	DE-121	3308C	6005
	Dark Grey	DE-131	431C	7012
	Light Gray	DE-141	428C	7074

*The printed colors and the indicated PANTONE® and RAL designations are the closest match. The indices are presented only to give an approximate indication. To view the exact color, please request a sample chip from your Palram distributor.

** The designer colors are available in all thicknesses and dimensions stated above. They are subject to a minimum quantity.

► Flammability

PALIGHT sheets are self-extinguishing and comply with the most demanding international fire resistance standards defined in the field of plastics, as indicated by representative results in the attached table.

Standard	Classification*
DIN 4102	B-2
BS 476/7	Class 1
NSP 92501,5	M-1, M-2
UL 94	V-0

*Depends on product thickness, type and color.

► Product Masking

PALIGHT has a protective polyethylene film on one side. PALIGHT 2001 has a protective polyethylene film on both sides.

► Fabrication

PALIGHT and PALIGHT 2001 can be easily worked with standard tools used in metal and wood industries. All are especially easy to handle, transport and store, thanks to their exceptionally light weight.

Cutting - Easily cut using a cutting knife or a straight, finely serrated blade mounted on a hand-saw, band saw, disc (circular) saw or jig-saw. As a rule, low cutting feed rates and high cutting speeds are recommended. In extreme cases, it is recommended that the cutting blades be cooled with compressed air.

Drilling - Can be drilled using any conventional drill.

Fastening - Can be screwed and bolted in place. Use of a large washer is recommended, in order to distribute load on a wider area.

Printing - Suitable for use with all conventional and digital printing techniques. Sheets must be clean and dry before printing.

Adhesive Bonding - Supports standard formulations for PVC and most solvent based adhesives. For maximum structural bonding strength, two-part adhesive kits are recommended. Pressure-sensitive self-adhering tapes or pads may be used for temporary repairs.

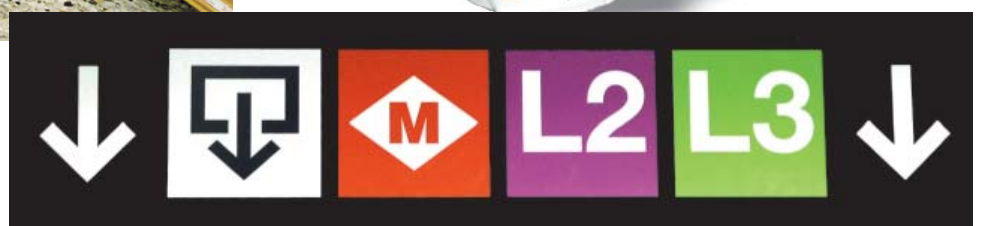
Welding - Can be welded to each other or to other rigid PVC sheets with standard hot-air welding equipment, or using the hot blade method.



► Typical Physical Properties

				3mm (0.12 in.) Sheet	10mm (0.39 in.) Sheet
Property	Conditions (US*)	ASTM Method	Units - SI (US*)	Value (US*)	Value (US*)
Physical					
Water absorption	24h @ 23°C (73°F)	D-570	%	0.5	0.8
Density			g/cm ³ (lb/ft ³)	0.65-0.7 (34-38)	0.55-0.6 (34-38)
Mechanical					
Tensile strength at yield	10mm/min (0.4in./min)	D-638	MPa (psi)	16 (1,600)	11 (1,600)
Elongation at break	10mm/min (0.4in./min)	D-638	%	30	20
Flexural strength at yield	10mm/min (0.4in./min)	D-790	MPa (psi)	28 (3,200)	22 (3,200)
Flexural modulus	10mm/min (0.4in./min)	D-790	MPa (psi)	900 (130,500)	900 (130,500)
Impact strength notch charpy	23°C (73°F)	D-256	J/m (ft•lb/in.)	29 (0.54)	17 (0.32)
Thermal					
Service temperature			°C (°F)	-10 to 55°C (14 to 131°F)	-10 to 55°C (14 to 131°F)
Heat deflection temperature			°C (°F)	63 (145)	63 (145)
VICAT softening temperature	Load: 1.85MPa (264psi)	D-648	°C (°F)	75 (167)	75 (167)
Coefficient of linear thermal expansion	Load: 11Kg (2.2lb)	D-1525	10 ⁻⁵ cm/cm°C	6.7 (3.7)	6.7 (3.7)
Thermal conductivity		D-696			
Electrical					
			W/mk (Btu.-in./hr.-ft. ² -°F)	0.07 (0.49)	0.07 (0.49)
Surface resistance		D-257	Ohm	5x10 ¹⁵	5x10 ¹⁵
Volume resistance		D-257	Ohm-cm	2x10 ¹⁶	2x10 ¹⁶

*Conditions, units and values in U.S. customary units are presented in the table within parentheses



► Thermoforming

PALIGHT and PALIGHT 2001 can be thermoformed using vacuum forming, pressure forming or a combination of the two.

- Standard tools used in thermoforming of sheet plastics may be used.
- Larger sheets require air support to avoid excessive sagging.
- For shallow forms, almost any type of equipment for conventional thermoforming will produce satisfactory results.
- More complex deep draw forms require double-sided (sandwich type) heaters. PALIGHT's and PALIGHT 2001's reaction to working is markedly different from solid plastics. The working cycle is usually shorter, and the radius and depth of draw are limited to the extent that the surface of the material will stretch.

► Forming Temperature

A. THERMO-ELASTIC RANGE 115°C - 130°C (239°F - 266°F).

Good extensibility of material; contour definitions is somewhat limited. The original smooth PALIGHT and PALIGHT 2001 surface is retained. Recommended maximum draw ratio h:d approximately 1:1.25

B. THERMO-ELASTIC RANGE 160 °C - 170 °C (320 °F - 338 °F).

Medium extensibility; excellent contour definition. The surface usually displays a typical grainy appearance. Larger sheets need air support to prevent sagging. At thermoforming temperatures of 160 °C - 170 °C (320 °F - 338 °F), slight colour changes may be observed.

► Heating Cycle

With radiation heat sources, the heating cycles are much shorter than for solid plastics, depending on the type of forming machine. Ceramic type infrared heaters are most suitable. Double sided (top & bottom) heating is strongly recommended, especially for thicker sheets.

Approximate Heating Cycle for Single-sided Heating with Ceramic Heaters:

- **Heater element temperature:** 450°C (842°F)
- **Power density:** 20 kW/m² (1.86 kW/ft²).

Sheet Thickness mm (in.)	Heating Cycle Seconds
3 (0.12)	60
4 (0.16)	80
5 (0.20)	110
6 (0.24)	140-150



Approximate Heating Cycle for Double-sided Heating with Ceramic Heaters:

- **Heater temperature:** top 380°C (716°F), bottom 150°C (202°F)
- **Power density:** 40 kW/m² (3.72 kW/ft²).

Sheet Thickness mm (in.)	Heating Cycle Seconds
3 (0.12)	25-35
4 (0.16)	45
5 (0.20)	60
6 (0.24)	80

► Other PALRAM Products for Signs and Advertising

PALSUN®	Flat solid polycarbonate sheet with the following options: standard, one or two sided co-extruded UV protection, solar control, FR, embossed (E102, prismatic, matte), abrasion and scratch resistant. PALSUN Foamed - flat foamed polycarbonate sheet.
SUNLITE®	Multi-wall (structured) sheets co-extruded with UV protection on one or two sides. Available with anti-condensation treatment, Controlled-Light (CL) heat filtering grade and other specialty sub-products.
PALGARD™	Flat UV and abrasion resistant polycarbonate sheet that excels in resisting vandalism, graffiti and physical attack. PALGARD is also more resistant to a wider variety of chemicals and to the wear and tear of high traffic areas.
PALCLEAR™	Flat transparent or translucent PVC sheets with the following options: standard, HI (High Impact), UV protection on one side, UV protection on one side for thermoforming, embossed (prismatic 12).
PALCLEAR™	Flat rigid opaque PVC sheets with the following options: glossy, matte, UV protection, UV protection for thermoforming.
PALGLAS®	Flat rigid extruded solid acrylic sheet.
PAL-G™	Flat rigid standard or UV protected (one side) co-polyester sheets

► Additional PALRAM Products

SUNTUF®	Corrugated polycarbonate sheets with UV protection on one or two sides. SUNTUF has a high light transmission, supplied in Optional characteristics: anti-condensation treatment, embossed surface, SolarSmart™ cool light colors.
SUNTOP®	Corrugated foam polycarbonate sheets in rounded profiles with co-extruded UV protection on one side.
PALRUF®	Corrugated rigid PVC sheets with the following options: clear, translucent or opaque, with or without additional UV protection, HI (High Impact), standard or tailor-made profiles.
COMPAX™	Flat matte opaque modified polycarbonate sheets for thermoforming without pre-drying.
PALDOOR™	Flat rigid matte PVC sheets for thermoforming door panels.

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