

CREATING SOLUTIONS



# PALIGHT®

*Foamed Flat PVC Sheet*



Construction Advertising Fabrication

## ► Overview

PALIGHT is a versatile, flexible, lightweight 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.

PALIGHT exhibits the whitest colour available, with a consistently smooth and bright surface that is ideal for high quality displays. Tested and approved by most digital flatbed printer manufacturers, the material is easy to handle, cut and fabricate using conventional tools and equipment, and can be printed, painted or laminated. The PALIGHT range offers standard matte or gloss finishes and is available in white and a wide range of standard and special designer colors.



## ► Key Benefits

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

## The PALIGHT® Product Line

**PALIGHT®** - Matte finish on both sides; available in white and other colours

**PALIGHT® 2001** - Glossy hard surface on one side, available in white and other colours



## ► Typical Applications

**Advertising** - Lightweight 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** - 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 colour enables printers to reproduce true colours 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 flat bed printers.
- Combines consistent, flat surface with market-leading 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 virtually any application. In addition to these typical applications, other uses are constantly being found. **Imagination is the only limit.**



## ► Typical Physical Properties

Property	Conditions (US) <sup>a</sup>	ASTM Method <sup>b</sup>	Units - SI (US Customary) <sup>a</sup>	Value (US Customary) <sup>a</sup>	Value (US Customary) <sup>a</sup>
Sheet thickness			10mm (0.39 in.)	3mm (0.39 in.)	10mm (0.39 in.)
<b>Physical</b>					
Water absorption	24h @ 23°C (73°F)	D-570	%	0.5	0.8
Density			g/cm <sup>3</sup> (lb/ft <sup>3</sup> )	0.65-0.7 (34-38)	0.55-0.6 (34-38)
<b>Mechanical</b>					
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)
<b>Thermal</b>					
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 <sup>-5</sup> cm/cm°C (3.7)	6.7 (3.7)	6.7 (3.7)
Thermal conductivity		D-696			
<b>Electrical</b>					
Surface resistance		D-257	Ohm	5x10 <sup>15</sup>	5x10 <sup>15</sup>
Volume resistance		D-257	Ohm-cm	2x10 <sup>16</sup>	2x10 <sup>16</sup>

<sup>a</sup> Conditions, units and values in U.S. customary units are presented in the table within parentheses.

<sup>b</sup> All the results depicted in this table were obtained by following the indicated ASTM method except where another method is indicated by the appearance of this symbol (b).



## ► Standard Dimensions and Colours

Specifications	PALIGHT®	PALIGHT® 2001	
Units	mm	mm	
Thickness	1-13, 15, 19	3, 5, 6, 10	White
Width*	1220, 1560, 2030	1220	
Length*	2440, 3050	2440, 3050	
Colours	Standard and Designer Colours**	Black, Grey, Red, Blue, Yellow, Green	Colored
Thickness	3, 5, 6	3, 5	
Width*	1220, 2030	1220	
Length*	2440, 3050	2440, 3050	

\* Special dimensions available upon request.

\*\* 13mm and above available in 1220mm width only

PALIGHT has a protective polyethylene film on one side.

PALIGHT 2001 has a protective polyethylene film on both sides.

### PALIGHT® Standard Colors

Color		PANTONE®	RAL
WHITE*	ST-10		
CREAM	ST-20	none	9001
YELLOW	ST-30	108U	none
B. YELLOW	ST-40	1235C	none
RED	ST-50	1805C	none
L. BLUE	ST-60	2935C	none
BLUE	ST-70	288C	none
GREEN	ST-80	3415C	none
BLACK	ST-90	4C 2X	9011
GREY	ST-100	430C	7037

\* White ST-10: 1-10 mm.

12-25 mm White are Classic White

### PALIGHT® Designer Colors\*

Color		PANTONE®	RAL
WHITE DG	DE-11		
D. CREAM	DE-21	Warm Grey 2C	1013
L. YELLOW	DE-31	102C	none
L. ORANGE	DE-41	144U	none
ORANGE	DE-51	165C	2004
RED	DE-61	485C	none
D. RED	DE-71	187C	3001
P. BLUE	DE-81	277C	none
D. BLUE	DE-91	2757C	5002
TURQUOISE	DE-101	337C	none
GREEN	DE-111	348C	6024
D. GREEN	DE-121	3308C	6005
D. GREY	DE-131	431C	7012
L. GREY	DE-141	428C	7074

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

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.

## ► 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 table below.

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

\* Depends on thickness.

## ► 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.



## ► 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/m<sup>2</sup> (1.86 kW/ft<sup>2</sup>).

Sheet Thickness mm (in.)	Heating Cycle (Sec)
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/m<sup>2</sup> (3.72 kW/ft<sup>2</sup>).

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

## ► More Products for Signs and Advertising

### **PALSUN®**

Flat solid polycarbonate sheets 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.

### **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 high wear and tear of high traffic areas.

### **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.

### **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).

### **PALOPAQUE™**

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 Products

### **SUNTUF®**

Corrugated rigid polycarbonate sheets with the following options: co-extruded UV protection on one or two sides, anti-condensation treatment, embossed, solar control, standard or tailor-made profiles.

### **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 rigid matte opaque modified polycarbonate sheets for thermoforming without pre-drying.

### **PALDOOR™**

Flat rigid matte PVC sheets for thermoforming door panels.

Inasmuch as PALRAM Industries has no control over the use to which others may put the material, it does not guarantee that the same results as those described herein will be obtained. Each user of the material should make his own tests to determine the material's suitability for his own particular use. Statements concerning possible or suggested uses of the materials described herein are not to be construed as constituting a license under any PALRAM Industries patent covering such use or as recommendations for use of such materials in the infringement of any patent. PALRAM Industries or its distributors cannot be held responsible for any losses incurred through incorrect installation of the material. In accordance with our company policy of continual product development you are advised to check with your local PALRAM Industries supplier to ensure that you have obtained the most up to date information.



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