

TECHNICAL SHEET SETA-LED[®] Cast acrylic sheets for backlighting with LEDS

Technical-commercial information

SetaLED[®] is the new range of cast acrylic sheets developed by Madreperla for the **LED backlighting** of panels, for the production of signs and other products.

For environmental reasons and in order to reduce energy consumption, the market imposes a choice of high efficiency light sources: from this point of view LEDS are certainly a very efficient solution. In order for the use of LEDS, instead of the classic neon tubes or traditional bulbs, to be efficient, however, it is necessary to use sheets which have two essential characteristics:

- a high **light transmission** (both towards white light and towards dedicated colours)
- a high **covering power** (by covering power here we mean the capacity of the sheet to hide the typical hot spot, a characteristic of the LED as a punctiform light source. This parameter is correlated to the diffusion factor, which is an index of the capacity of the sheet to diffuse light.

The formulation of the SetaLED[®] sheets in the five colours shown in the catalogue (white, orange, red , green, blue) has been developed to optimise these parameters simultaneously. The colours are formulated to respect the wave length typical of the LEDS currently on the market, in order to maintain the same shade both with or without lighting. In this way, signs can be produced with **fewer LEDS** (due to the high light transmission of the SetaLED[®] sheets) and with **small boxes** because the LEDS can be installed closer (due to the high diffusion of the light and the covering power of the SetaLED[®] sheets).

The figure at the side clearly shows how the **SetaLED 17000** sheet, backlit with white LEDs, has a higher luminosity than the typical opaline sheets normally used, guaranteeing simultaneously an even diffusion of the light and the possibility to hide the hot spot typical of the LED.



The current range of SetaLED® sheets consists of **7 colours** which can satisfy most requirements. Our laboratories are, however, able to development formulations for **Corporate**

Colours which the sign-making sector frequently require, For further information on this topic contact our commercial offices.

The specific formulation of SetaLED® also envisages the use of a polymer with a high molecular weight, able to make the post-machining operations typical of the sector (**laser cutting, thermoforming and gluing**) more efficient.

The sheets we supply are produced in observance of the requirements of standard UNI EN ISO 7823-1 (Polymethyl methacrylate sheets – types, dimensions and characteristics – cast sheets) where this is applicable. By request sheets with stricter requirements than the above-mentioned standard are produced. For details, contact our technical-commercial offices.

Standard colours and thicknesses are reported in our delivery program. Other thicknesses and colours can be produced on request and with a minimum quantity.

Standard protection

The film printed with the logo indicates the side to be used. The film is thermo-formable onto the products with a glossy surface, even if it is the responsibility of the user to check that the film is compatible with its usage. All the P.E. films used are suitable for laser cutting.

*Warning : for sheets with a matt surface (**Polarlite®** and **Satinglas®**) the protection film is **not thermo-formable**.*

Cuts to measure, square cuts and dimensional tolerances

On request shapes can be supplied cut to measure: minimum surface 400 cm².

The sheets are supplied with the following tolerances: standard sheet 0/+10 mm – formats cut to measure +/-1mm/ml. Square cuts can be supplied on request.

Untrimmed sheets can be supplied on request. The sheets are supplied with invoicing net of surplus allowance. Small surface defects can be found in the allowance. The size of the untrimmed sheet is, approximately, 4 cm more than the trimmed size.

Colour formulation

Our laboratories are available to develop new colours or personalised duplicating with a minimum quantity as indicated in the specific technical sheet ("Minimum quantity of productions on request")



Seta-LED standard range

Code	Colours	Format mm	Illumination engineering values with source of 2 LED 6V 700mA (LUX)	
			In contact	At 20 cm
17000	White	2030 x 3050 x 3	83000	1260
17001	White	2030 x 3050 x 3		
17200	Orange	2030 x 3050 x 3	14200	175
17300	Red	2030 x 3050 x 3	7700	123
17500	Green	2030 x 3050 x 3	29000	530
17600	Blue	2030 x 3050 x 3	8300	123
57000	White two sides mat	2030 x 3050 x 3		

TECHNICAL SHEET SETALED[®]

Physical-chemical properties.

The following table reports the characteristic properties of standard **SetaLED[®]** sheets; coloured opaline sheets have different physical-chemical properties (in addition to optic ones, obviously) depending on the type.

	Method	Unit of measurement	Values
Physical Properties			
Density	ISO 1183	g/cm ³	1.19
Water absorption after 24 h	ISO R 62/DIN53495	%	0.3
Optic Properties			
Transmittance (on colourless material)	ISO 4892-1 DIN 5036	%	92
Haze (on colourless material)	ASTM D 1003	%	< 0.5
Refraction index (on colourless material)	ISO 4892/DIN 53491	°C	1.49
Mechanical Properties			
Coefficient of elasticity due to pulling stress 23°C	ISO 527-2/1 B/1	MPa	3300
Ultimate elongation 23°C	ISO 527-2/1 B/5	%	5
Tensile strength 23°C	ISO 527-2/1 B/5	MPa	76
Flexing resistance	ISO 178	MPa	110
Compression resistance	ISO 604	MPa	110
IZOD impact resistance with notch	ISO 180/ 1 A	kJ/m ²	1.4
Charpy impact resistance without notch	ISO 179/ 1	kJ/m ²	13
Abrasion resistance	ISO 14782	%	0.5 to 1
Maximum allowed tension		MPa	5-7
Minimum cold curvature radius		mm	330 x thickness
Thermal Properties			
Softening time (Vicat)	ISO R 306 Method A	°C	>108
Deflection time (HDT)	50	°C	>102
Maximum running time	ISO 75/A	°C	80
Linear Expansion Coefficient	VDE 0304/1		7
Thermal conductivity	DIN 52612	W/m°C	0.17
Fire Behaviour			
Self-ignition temperature	DIN 51794	°C	430 c.a.
Fire Behaviour	NF P 9250		M4
Other Properties			
Poisson Coefficient	ISO 527 -1		0.39
Thermoforming Parameters			
Thermoforming Interval		°C	140-190
Heating furnace temperature		°C	130-180
Maximum heating temperature		°C	200
Shrinkage after heating		%	2.5 max

This information is given as a guide and does not represent the technical specifications of the materials and therefore does not imply any responsibility on the part of MADREPERLA SpA