

LED-FILM



PRODUCT DATA SHEET - INTRODUCTION

Transparent LED-Films consist of semi-fabricated Polyester sheets. They have to be inserted between customer substrates to produce final products. The thin transparent electro conductive metallic layer has to be secured against water, electrostatic charges and physical stress like bending or scratches. -> **THE SUBSTRATE**

Customer substrates act as protection for LEDs and for the thin, transparent metallic layer.

LED film may be laminated between glass with EVA, PVB or TPU, if all conditions and limitations are fulfilled correctly. -> **LAMINATION**

SUN-TEC may place -> **STANDARD LEADS**, but also stronger -> **POWERLEADS**. The customer should secure the films against -> **ELECTROSTATICS**

SUN-TEC delivers requested transformers. The working voltage will depend on customers LED Design, LED Quantity and LED-Film size.

DESIGN AND BUSBARS

The customer should send the design as 2D DXF/PDF/JPG of high resolution containing the correct size, film-geometry and LED placement. SUN-TEC will add the bus-bars, which are metallic pressure sensitive tapes on opposite borders on the film.

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THE LED-FILM SUBSTRATE

SUN-TEC LED-films consist of standard SMD LEDs bonded on a Polyester (PET) film. On one side of the transparent PET there is a thin transparent metallic layer of 1 micrometre thickness.

Attention: The metallic layer is not resistant against water, scratches or bending of the film. That is why the use of the film has to be done with highest caution.

Thickness of the Polyester:

125 Micrometres (0.125 mm)

Thickness of the LEDs:

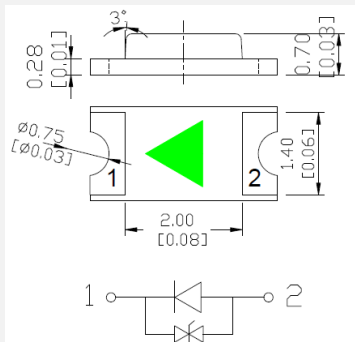
700 Micrometres (0.7 mm)

Thickness of metallic bus-bars:

500 Micrometres (0.5 mm)

The picture above shows a round shaped LED Films with bus-bars, which are metallic pressure sensitive tapes which have to spread the electricity on the LED Film.

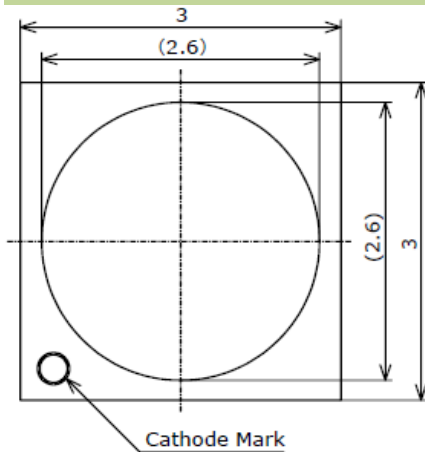
LED sizes



FILM WITH STANDARD LEDs

LEDs are bonded on top of the conductive Polyester Film by means of a cold curing adhesive. After curing, LED FILMs will withstand laminating temperatures of 125 °C. It is important that customer lamination process never exceeds this temperature of 125 °C.

Standard LEDs size:	3.2 x 1.4 x 0.7 mm
Maximum LED-Film sizes:	3200 mm x 1250 mm
Minimum LED-Film sizes:	10 mm x 10 mm
Transparency of Polyester:	L > 90.5 %
Colour of the Polyester:	a* between -2.5 and +1 b* between -2.5 and +1
LED Quantities on A4 size Film:	Up to 400
LED Quantities on 1 m2:	Up to 1000
Minimum LED distance:	5 mm
Maximum current per standard LED:	10 – 15 mA
LED Intensities of cold white LEDs:	600 mCd/LED
LED Intensities of warm white LEDs:	500 mCd/LED
Power and current of LED Film:	Depend on LED Design
Maximum Power of LED Film:	48 VDC



POWERLEDS

Laminated between glass, or inserted in a polymeric matrix, Powerleds may be powered with 15 – 20 mA each instead of 10-15 mA of standard LEDs.

Attention: If higher currents are needed, the transparent Polyester must be substituted by silver printed Polyester. This material is described on another material data sheet.

Size of the PowerLED

3.0 x 3.0 x 0.55 mm

Maximum current on transparent LED-film: 15-20 mA/Power LED

Colours: Warm- and cold-white

STANDARD LEDs and POWERLEDS may also be available in red, blue, green and amber as well.

RGB

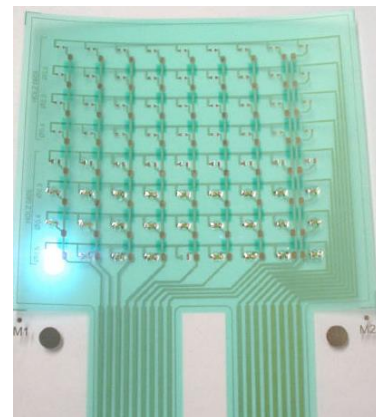


RGB-LEDS

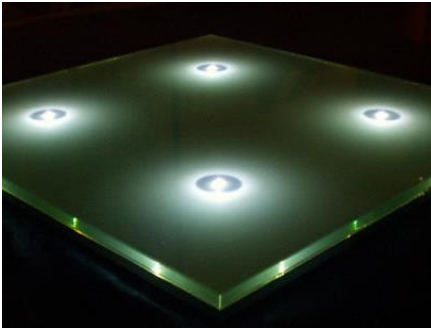
Transparent LED Films (left picture) are usually not delivered with RGB-LEDs.

This is due to the difficulty to design multi-channels on transparent LED-Films.

RGB LEDs are preferably placed on printed LED Films which are not part of this datasheet. (Right picture)



LAMINATION



If laminated with TPU, PVB or EVA, staying below 125 °C is mandatory.

To avoid electrostatic destruction of LEDs, static charges should be destroyed by de-ioniser below the level of 50 V.

The ideal temperature history has to be found by the customer on his lamination process.

Thickness of EVA, TPU, PVB:

1.3 mm on top of LEDs

0.7 mm below the LEDs

Typical Temperature History:

90 min at 60 °- 80 ° C

120 min at 125 °C

Full vacuum until cold

Laminating ovens and autoclaves never show homogeneous temperatures. And big substrates need more time to heat and to cool down. Process optimisation is mandatory for good results.

De-Ionizer



ELECTROSTATICS

To minimise electrostatics it may be necessary to neutralise electric charges on PVB, EVA or TPU. This is achieved with De-Ionisers.

They blow positive and negative charges to PVB, EVA or TPU. It is mandatory to avoid a blow of these charges on the LED-Film.



DISCLAIMER

All information on this material datasheet is no guaranty for the quality of the final product.

It is mandatory to test transparent LED-Films with respect to all parts of the customer process.

Type of LEDs and Polyester may change with time and the customer has to use the most actual product datasheet

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