



ADDLUX
making light work

INDUSTRY LEADERS IN
**LED LIGHT SHEET
TECHNOLOGY**

TECHNICAL BROCHURE



Welcome,

Thank you for taking the time to read our Technical Brochure covering Addlux LED Light Sheet products. In it we describe our technology and give you an insight into technical advantages that they offer when you use them in your products and applications.

The benefits of using LED lighting are now well known within our industry – high brightness, energy-efficiency, long-life, low maintenance, no disposal problems, etcetera.

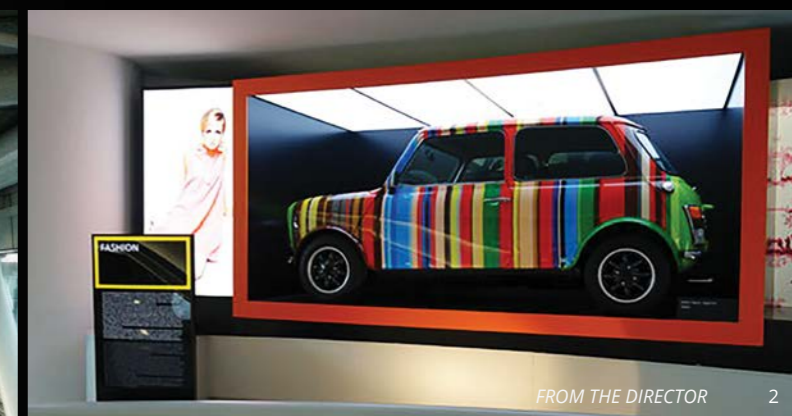
“We and our partners are industry leaders in LED light sheet technology – we develop and manufacture our own low energy LEDs, produce both the largest and the thinnest light sheet (now a mere 3 mm thick and flexible). We guarantee high and even brightness over the entire surface of the light sheet.”

In addition, we specialise in providing bespoke solutions and assistance with development projects. We pride ourselves in providing outstanding technical advice, prompt quotes, excellent delivery performance and a first-class after-sales service. Our technical service will assist you to find the optimum product for your end-use at the best price. However complex your enquiry may be, we are confident we can work with you to find a solution.

We look forward to receiving your enquiries and to working with you together as long-term business partners.

Kind regards,

Niels Fullerton-Batten



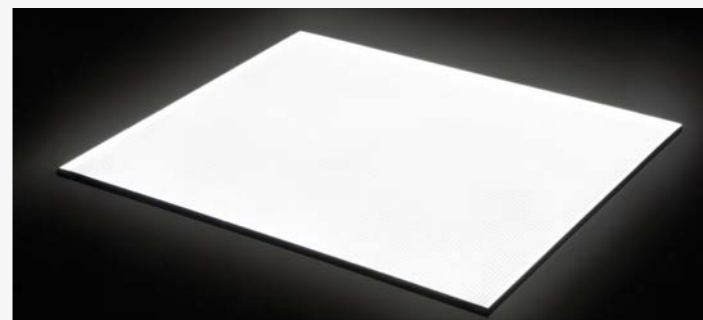
Addlux LED Light Sheet

Super large, Super thin, Super bright, Super flexible, Super service



Addlux LED Light Sheet are high quality, high energy efficient, state-of-the art lighting units for application in assemblies for many very varied applications.

High technology solutions for any requirement



Major differences in technology and design concepts distinguish our LED light sheet products from other similar products available in the market. We offer you greater flexibility in choosing various properties to match your specific requirements (see the Data Sheet). In addition, we assure you of sound technical advice, high quality, a speedy and reliable delivery, superb back-up service and a reasonable price.

Standard and ultra-slim light sheet thicknesses

Addlux light sheet are available with standard thicknesses and ultra-slim profiles. Standard thicknesses are 6mm, 8mm and 10mm. And if you need them, we also manufacture thicker light sheet.

Our minimum thicknesses of 3mm, 4mm and 5mm are unprecedented and offer unique advantages for limited space applications, curved configurations, and cost less.

Flexible light sheet products for curved displays



Addlux 3mm thick light sheet are not only thin, but also flexible and offer new design perspectives - curved displays, circular totems, and even wave-shaped displays. The micro-dot pattern applied to the surface of the Light Guide (see explanation below) ensures even brightness across the entire surface of the light sheet and stops the diffusing pattern being seen through the graphic. The possibilities are boundless. Excited? Ask our technical staff for more details and support.

Large size light sheet

At a maximum size of 4.8m x 2.7m our light sheet are the largest currently available in the market. Rectangular, square configurations and shapes of any size within those maximum dimensions are feasible.

Shapes to almost any design



We supply shapes and curved configurations to any specific design - small or large, simple or complicated. Our technical team will guide you and help you develop any concept ideas that you may have.

More Features Offering Great Flexibility for Your Design

- single- and double-sided LED light sheet
- very high brightness levels
- guaranteed even brightness across the entire light sheet surface
- LED lighting with a wide range of colour temperatures - bright cool, natural and warm whites to RGB multi-colour
- LED power cable exit points of your choice, from any edge or the back surface of the light sheet
- easy connectivity; male-female barrel connections between the light sheet and the PSU
- different voltage power supply units (PSU), 12V and 24V, or to your specification
- UK 3-pin, continental and other international power plugs hard-wired to the PSU
- IP67 rated light sheet for outside use or in wet environments

Our Comprehensive Service

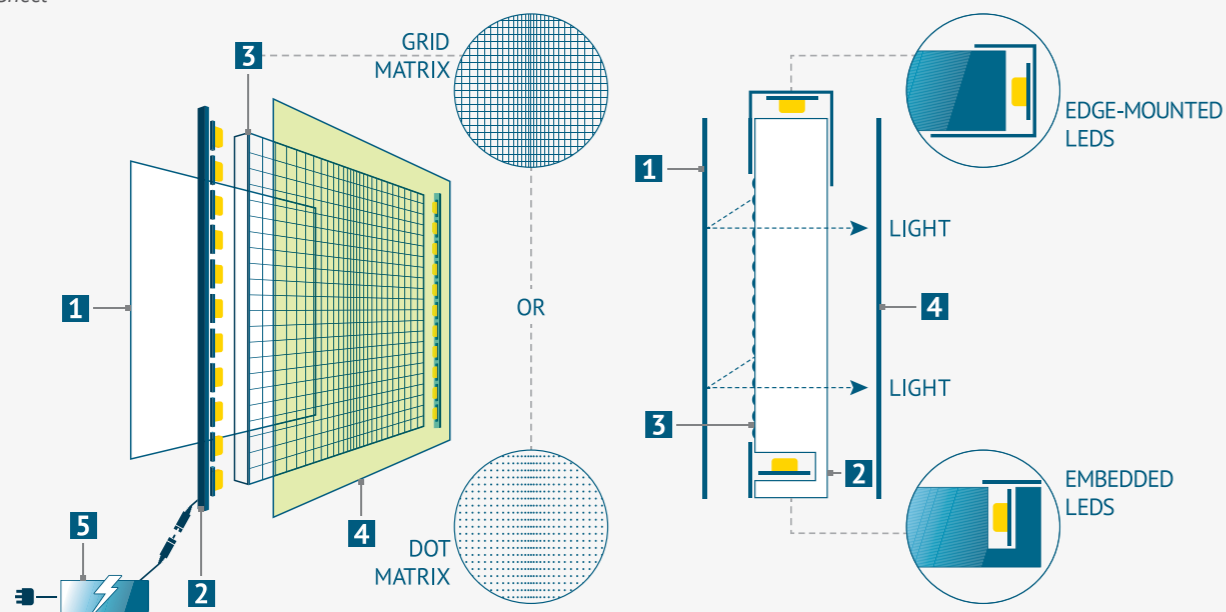
What you have always hoped for. We give a complete service - sound technical advice, prompt and comprehensive quotes (usually within 24 hours), attractive delivery schedules for standard and bespoke light sheet as well as for development samples (our delivery performance exceeds 99%), and exceptional post-sales support. We are flexible and innovative. We welcome your enquiries for the unusual and encourage you to try us for your development projects.

A Handy Data Sheet

Our attached Data Sheet gives you a full summary of dimensions, available property options and warranties for our range of light sheet. It is your to-hand guide for the many possibilities offered by Addlux LED Light Sheet.

TECHNICAL DESCRIPTION

Illustration 1
Exploded view of the composition of an Addlux LED Light Sheet



- 1 Reflector sheet
- 2 LEDs
- 3 Light Guide
- 4 Graphic
- 5 Transformer/PSU

Note:
Illustration 1 is a schematic of a single-sided sheet. It will look different for a double-sided sheet.

An Addlux light sheet comprises essentially the light source, a light guide (LG), a reflector sheet, and the power supply/driver/transformer (PSU), see **Illustration 1**.

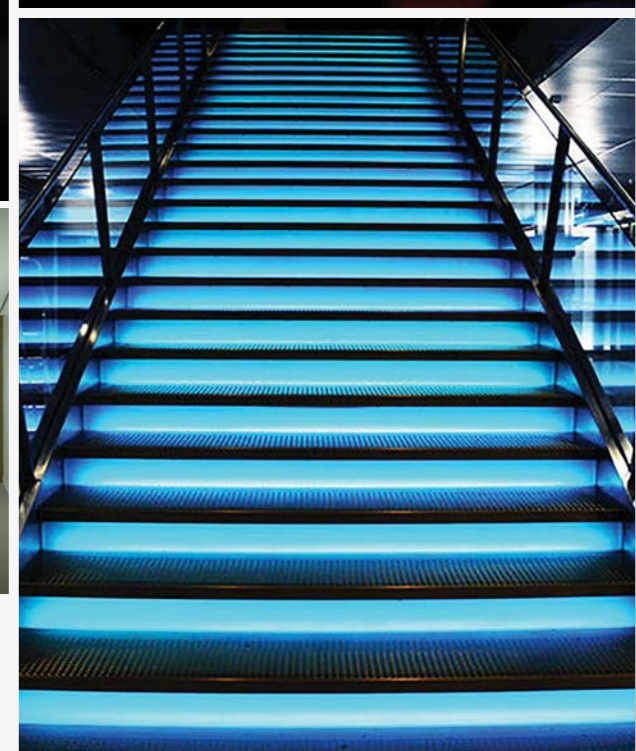
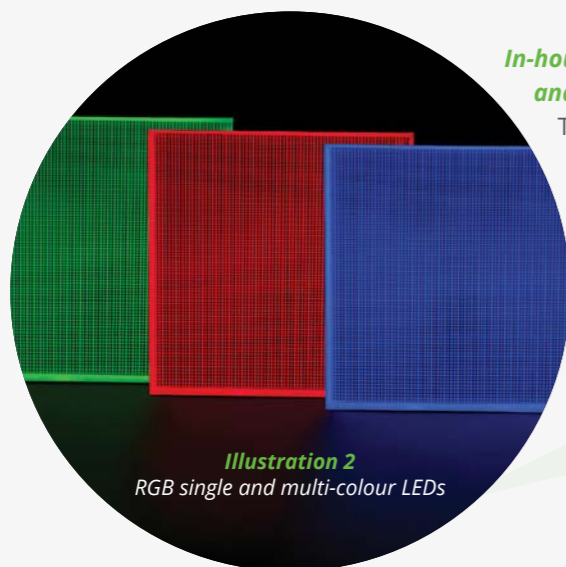
Function of the Reflector Sheet

The reflector sheet reflects light from the LEDs forward through the specially designed and manufactured, very efficient light guide (LG).

In-house LED Light Source Development and Manufacture

The light source for our LED light sheet are high light intensity, low energy LED strips. We develop and manufacture our own LED strip products in our factory from highest quality components.

We can supply light sheet with light from LEDs of widely different colour temperatures – 6000K or 5300K (cool white); 4000K (moonlight white); 3000K (warm white); single colour (red/green/blue) and RGB multi-colour, see **Illustration 2**.



Brightness? Whatever level you want!

Depending on the size and specification of the light sheet, LEDs are (a) mounted on the edge(s) of the LG or (b) embedded in the LG (see **Illustration 1**).

The brightness of the light sheet can be adjusted by attaching LEDs to one edge, two opposite edges or to all four edges. We can achieve higher level of brightness by using multiple rows of LEDs or more powerful LEDs.

The Light Guide (LG)

The function of the LG is to diffuse and distribute light from the LEDs evenly across its surface. The LG is made from acrylic sheet which is laser machined on one surface with a pattern unique to the size of the LED light sheet. After machining, the LG is assembled together with the LEDs and a reflector sheet.

TECHNICAL DESCRIPTION

Unique Technology Guarantees Even Brightness across the Entire Surface

The design and manufacturing processes used in the creation of the LG of our LED light sheet products represents a major development in LED light sheet technology. It enables us to guarantee even brightness across the entire surface of the light sheet regardless of its size and shape. Even brightness ultimately determines the quality of the end product, and, in many instances, the functionality and success of the product/application for which you will use it. A further benefit of this technology is that UV light emissions are prevented.

Depending on size, thickness, arrangement of the LED strips and the specification for your order, the LG is engraved or laser-machined on one surface with a unique pattern of grids or dots. The grids are made up of 3D grooves and the dots are 3D pits. The pattern is computer-generated and is unique to the size of the light sheet and varies in the spacing and the density of the grooves or dots, see *Illustrations 3 and 4*.

The unique pattern and the three dimensional nature of the grooves and dots distributes the light evenly across the entire surface of the light sheet. The evenness of brightness across an Addlux LED light sheet of any size or shape exceeds 90% even on very large sized light sheet. Actual brightness measurements on a 3.05m x 1.52m light sheet are shown in *Illustration 5*.

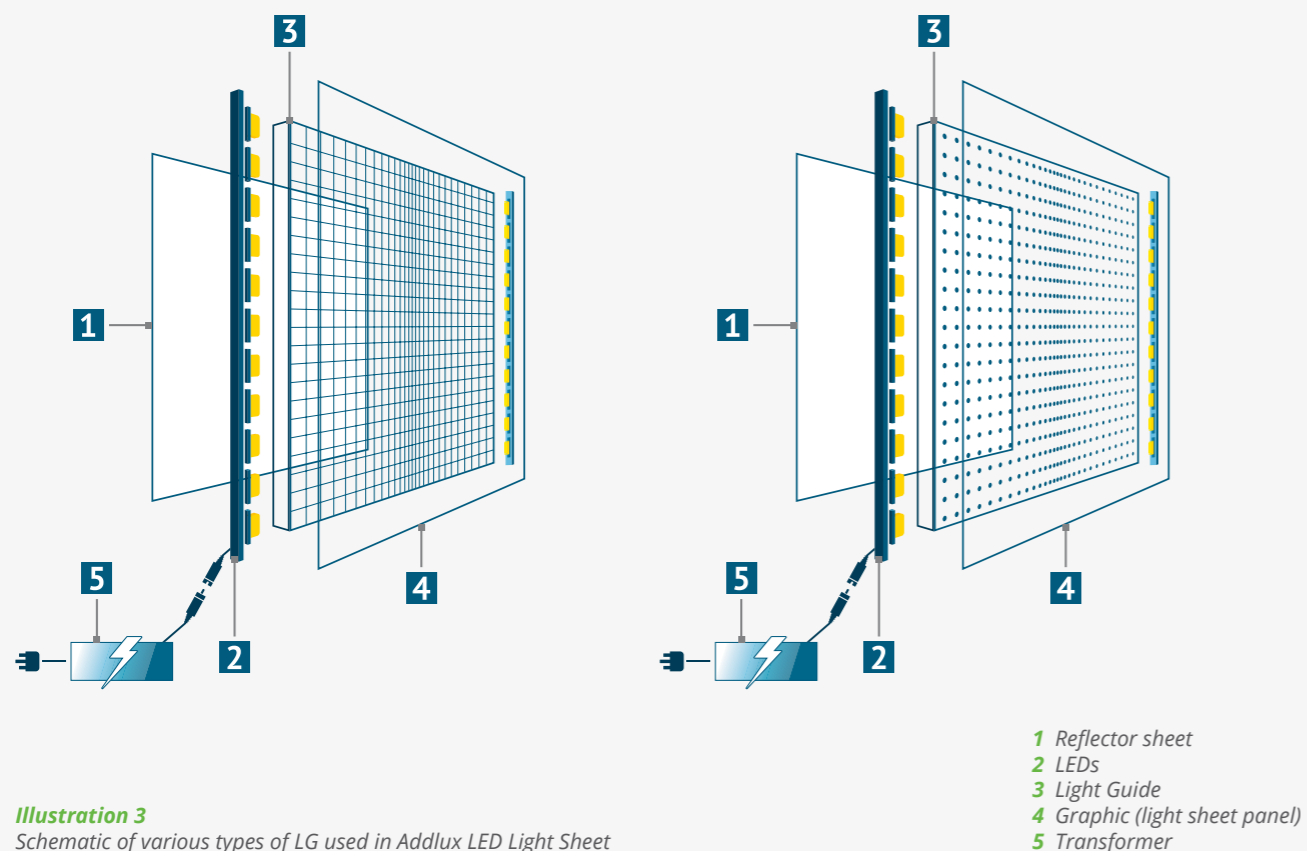


Illustration 3
Schematic of various types of LG used in Addlux LED Light Sheet

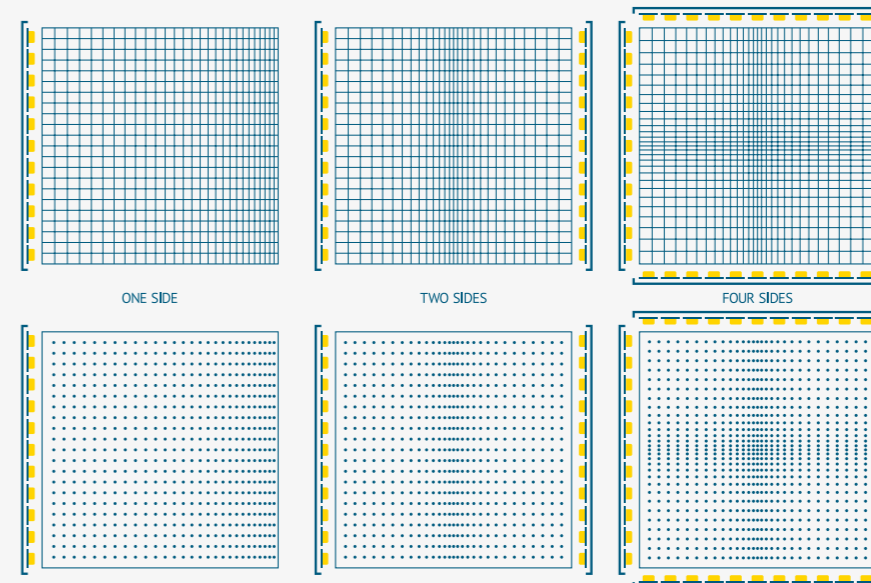


Illustration 4
The unique grid matrix and dot matrix patterns machined on the LG ensure even light distribution across its entire surface regardless of its dimensions

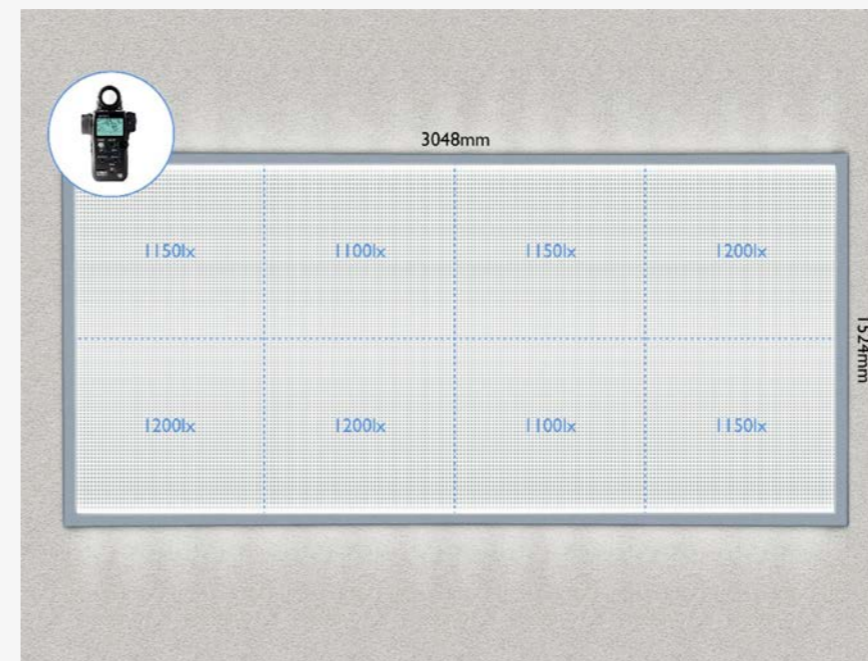


Illustration 5
Light meter measurements made on a very large sized light sheet

Addlux Light Distribution Sheet Properties

We use three different approaches to form the unique patterns on the LG - dot matrix, micro-dot matrix and grid matrix - each has specific properties and advantages, see *Table 1*.

Reflecting Matrix	Matrix Dimension	Max. size (mm)	Brightness	Use
Dot	3-D	1500 x 1500	Typically 2000 lux	Indoor and outdoor*
Grid	3-D	4000 x 1600 3000 x 2000	Similar to dot matrix	Indoor and outdoor*
Micro-dot	3-D	600 x 600	25% brighter	Indoor and outdoor*

Table 1 Summary of Addlux Light Guide Properties

*IP67-rated light sheet upon request; see definition below under User Guide

Dust, Impact and Waterproof LED Light Sheet

In many applications, light sheet need to be resistant to damage from impact, dust and water ingress. Addlux LED light sheet are produced to two different IP ratings (IP = Ingress Protection); standard LED light sheet are made to IP20 and are suitable for indoor use only. Waterproof light sheet, rated IP67, are suitable for outside use or in wet environments.

IP20 rated light sheet protect against

- impact by solid objects up to 1mm³
- water sprayed from all directions with limited ingress permitted

IP67 rated light sheet offer protection

- totally against dust
- against immersion in liquids up to 1m in depth for a maximum time of 30 minutes

Addlux standard light sheet are IP20 rated; if you wish for IP67 rated light sheet please specify this in your enquiry.

Non-Structural Use

Addlux light sheet should NOT be used as a load-bearing structural component in your design. They should be installed into a load-carrying structure

Attaching Graphics/Art-Work

Do NOT attach (glue) graphics or art work directly to the LG. A vinyl graphic or art work is usually applied to a separate clear or opal panel and then placed in front of the light sheet. Addlux supplies frames of many different sizes, styles and finishes for attaching graphic/art-work. Please ask our technical staff for details.

Matrix Pattern show-through

It is possible for the matrix pattern on the surface of an LG to show through the graphic/art-work. This is especially apparent with double-sided LED light sheet, but it is negligible with the micro-dot matrix machined LG.

To reduce this effect leave adequate space between the LG and the graphic/art-work in planning your design, or alternatively use a diffusing sheet. Please ask our technical staff for more details.

Handling Guidelines

Please observe the following guide lines for handling your LED light sheet.

Opening the delivery

Take care when opening the packaging. Wherever possible, avoid using very sharp-edged tools.

Handling

Always wear cotton gloves or equivalent to avoid scratching or fingerprints during handling of the light sheet. Avoid spillages or airborne contamination.

Protective Film

Remove the clear protective film covering the light sheet before installing it into the display.

Attaching graphics/art-work

Do not glue graphics/art-work directly to the front surface of the light sheet. Graphics/art-work is usually attached to a separate clear or opal panel, alternatively held in a frame and mounted in front of the light sheet.

Product inspection

Ensure that the light sheet works properly before assembling it by connecting it to the transformer provided and then to a power supply.

Cleaning

When you find fingerprints or other contamination on the light sheet, gently wipe the surface with a non-abrasive cloth soaked in a watered down vinegar based cleaning liquid e.g. Mr Muscle all-purpose cleaner. Do not use alcohol-based solutions.

Packing, transporting and storing your light sheet

Do not bend, flex or drop the LED light sheet, as it can damage the LEDs and/or soldered joints. Avoid bending the 3mm thick flexible light sheet too often. Protect the surface at all times with an anti-scratch protective film. Support, move and store the light sheet by laying it on a clean, flat substrate.

If the light sheet exceeds 1 meter in any dimension it should be packed separately for transport or storing - use plywood or equivalent of the same or larger dimensions to support the item and prevent bending. We advise that you pack larger quantities of light sheets in a wooden case.

Our standard product is NOT waterproof. Do not store these light sheets anywhere where they will be exposed to high humidity, or to dripping, splashing and sprayed liquids and rain. If this is likely, please order our IP67-rated waterproof light sheet version.

Caution

Please DO NOT under any circumstances

- disassemble the light sheet
- connect an AC power supply directly to the light sheet
- connect an incorrect DC power transformer
- pull on the power cable
- glue graphics directly to the surface of the acrylic LG
- use alcohol or any solvent for cleaning the light panel

Note: Alterations or modifications carried out on the light sheet without authorisation will invalidate the warranty, as will incorrect application of the light sheet.

Item	Description				
Product code	LS-XX4-XXXX-XXX	LS-XX6-XXXX-XXX	LS-XX8-XXXX-XXX	LS-XX10-XXXX-XXX	
Code definition (-XX)	MD = micro-dot; VC= V-cutting cutting; SD = standard dot				
Light Sheet Thickness, mm	3mm	5mm / 6mm	7mm / 8mm	10mm	
Maximum size, mm	2.4m x 0.6m	3m x 2m	3m x 2m 4m x 1.6m 4.8m x 2.7m	3m x 2m 4m x 1.6m 4.8m x 2.7m	
Weight calculation, kg	Length (m) x Width (m) x Thickness (mm) x 1.19kg				
Light source (LED type)	2835 SMD TOP VIEW LED (standard)				
Colour temperature (CCT)	3000K; 4000K; 5000K; 5300K; 6000K (others available on request); RGB & RGBW				
Brightness	Variable (mount LEDs on short, long, all sides) Max brightness – enquire				
Luminous Efficacy (LED)	22-24 lm/W (Standard)				
Colour Rendering Index	CRI >80 (>90 on request)				
Power consumption (LED)	0.16W				
IP rating	Standard IP20 (indoor use); IP67 (outdoor/wet area use)				
Operating temperature	-20°C to 60°C				
Power connections					
Input voltage	AC 100 ~ 240V 50/60Hz				
Power supply (PSU)	AC/DC 12V and 24V driver (or to customer specification)				
Power calculation (W)	Total length of sides mounted with LEDs in metre x 17 (Watts)				
Power cable exit	To customer specification: side- or rear edge				
Power cable length	2m (or to customer specification)				
Connections	Easy assembly, 5.5mm x 2.5mm barrel connector (other connectors available on request)				
Plugs	To customer specification; UK (standard), EU, USA, other international				
Power supply (PSU)					
Product code	PSU-M-20-12/24	PSU-M-35-12/24	PSU-M-60-12/24	PSU-M-100-12/24	PSU-M-150-12/24
DC voltage	12V / 24V	12V / 24V	12V / 24V	12V / 24V	12V / 24V
Rated power	20W	35W	60W	100W	150W
Rated current	1.67A / 0.84A	3A / 1.5A	5A / 2.5A	8.5A / 4.2A	10A / 6.3A
Dimensions L*W*H (mm)	118*35*26	148*40*30	162.5*42.5*32	190*52*37	191*63*37.5
MTBF, K hours, min.	>700	>700	>700	>700	>700
Est. lifetime (Light Sheet)	50,000 hours minimum				
Warranty					
LEDs	3 years				
PSU	3-5 years				



SIGNAGE | RETAIL | ARCHITECTURAL | SPECIAL PROJECTS

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