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A GUIDE TO BUYING
LED LENSES & REFLECTORS





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INTRODUCTION

Welcome to this guide to choosing LED secondary optics. It includes the basic factors to consider when choosing an LED lens or reflector for your application. There is also information behind these factors to help you to make your decision.
RS Components stock a wide variety of LED lenses and reflectors from the most popular brands. They also offer next-day deliver, competitive pricing and bulk discounts.

Before you start...
Have you chosen your LED(s)? We offer a wide variety of LED products to choose from including standard LEDs and LED arrays:



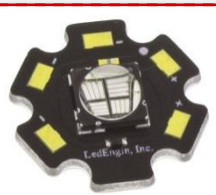
VISIBLE LEDS

These are your standard through-hole and surface mounted LEDs.



COB LEDS

High brightness SMD white LEDs. They consist of multiple chips /dies on one board.



LED ARRAYS

Single or multiple LEDs pre-mounted onto a PCB.



LED LIGHT ENGINES

Similar to LED arrays, these also have a driver IC on board.

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WHAT ARE LED OPTICS?

LED lighting fixtures utilise at least one type of secondary optic to alter the beam of light coming from the LED source. At RS Components we have three families for secondary LED optics: Lenses, Reflectors and Optic & Holder Kits. Here is what you can expect to find in each family:

LENSES

LED lenses come in various shapes and sizes, for example round, square and hexagonal. Common lens materials include plastic and silicone. Therefore some are rigid and some are flexible.
Lenses are designed for use with single or multiple LEDs. This includes LED modules or strips. They sit over the LEDs to create the desired lighting effect. Various properties of LED lenses enable precise control over the beams of light. LED lenses can also offer a nice aesthetic appearance by masking the LED components within.



Click here to see our range of LED Lenses

REFLECTORS

LED reflectors sit over the LED to alter the beam of light. They are an affordable and easy-to-use solution for your lighting fitment. However, they do not offer as much control as LED lenses.
Reflectors are made using plastic and can be metal coated.
LED reflectors are smooth or multifaceted inside and come in various different shapes. This enables them to create a range of lighting effects.
Some reflectors contain a sub-lens, for additional diffusion or control of the light.



Click here to see our range of LED Reflectors

OPTIC & HOLDER KITS

LED optic and holder kits contain both the LED reflector/lens plus a holder. These are called lens assemblies or reflector kits.
Lens holders provide a mechanical cut-off shield and can also be used to enhance performance. They are also much easier to install than a stand-alone lens.
Alternatively these kits may include an LED holder which holds the LED in place. The lens/reflector then simply twists on top.



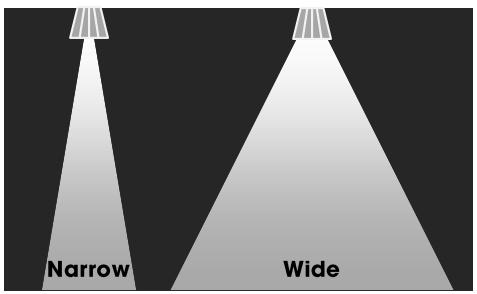
Click here to see our range of LED Optic & Holder Kits

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WHAT DOES IT ALL MEAN?

BEAM ANGLE

This describes the angle over which the light is distributed. Lenses and reflectors can be used to help create your desired beam angle.
Narrow beam angles, for example 40°, have a tight beam of light and are ideal for spotlights. **Wide** beam angles around 120° have a larger coverage for wide area lighting.



CLEAR / DIFFUSED

Clear lenses provide a crisp-edged beam of light. A diffused lens has a softer edge. Diffusion can also offer a more uniform light output when multiple LEDs are used.



Clear vs Diffused

NUMBER OF LEDS PER LENS

This refers to the number of LEDs that the lens is designed for. They can be for single LEDs or arrays of LEDs. Multiple LED lenses are ideal for wide area lighting, for example street lighting.
Lenses are often designed for use with specific LEDs. Check the manufacturer data for compatible LED options.
Some manufacturers pre-mount LEDs onto a board ready for the lens/reflector to sit over, saving you having to solder and line the LEDs up accurately.

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FIXING METHOD

How will you attach your lens/reflector? Some optics come supplied with an **adhesive tape** backing ready to be stuck down. Other optics will simply **twist** or **snap** onto an LED holder. Some may need attaching with **screws** or specific **clips** from the manufacturer. Alternatively a **glue** is used to attach the optic. Please note that certain glues are not compatible, check the manufacturer data for more information.



Adhesive Tape

GLUE:
Loctite 460
(RS: 496-108)

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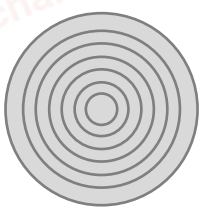
WHAT DOES IT ALL MEAN?

LENS/REFLECTOR MATERIAL

MATERIAL	DESCRIPTION
PMMA	Clear plastic, sometimes known as acrylic. PMMA is a cost-effective material which is common in lenses.
PC (Polycarbonate)	Temperature and impact resistant plastic. It also offers great optical characteristics.
Silicone	Lenses made of silicone are flexible. They are also resistant to effects of UV light.
HRPC	Hyper Reflective PC is used in reflectors and is often white. It has strong reflective qualities.
Aluminium Coated	Common in reflectors, aluminium gives a silver finish and helps with reflection of the light.

FRESNEL LENSES

Fresnel lenses feature a series of concentric circles to concentrate the light. These lenses are commonly used in light houses.
Fresnel lenses are designed to have a lower profile than standard lenses, as the amount of material required to create a Fresnel lens is much less.



Front View



Side View

ACCESSORIES

Some lenses work alongside a range of accessories. For example screws and clips which fasten the lens into the holder.
Some reflectors come with a sub-lens which clips on and provides additional control over the light. This includes beam angle and diffusion.
Plastic inserts can come with lenses to alter beams of light. They can be found in lenses which have a two-sided light emission, usually used in architecture.



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TIR (TOTAL INTERNAL REFLECTION)

TIR lenses and reflectors both use the same principle by reflecting the entire beam of light sending concentrated beams in the same direction. TIR lenses usually offer more control than TIR reflectors as some light can scatter in the reflector.
TIR lenses are also known as **Collimator** lenses.



PETUNIA lens by LEDiL

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BEAM PATTERNS

PATTERN	EXAMPLE	DESCRIPTION	APPLICATIONS
Asymmetric		These lenses direct the light forwards to avoid wasting light where it is not needed. For example in street lighting they will light up the road and not the grass behind it.	Street lighting Shelf lighting
Spot		A narrow angle provides a focused beam of light on a small area. It can have sharp edges or a diffused lens will give softer edges.	Accent lighting Task Lighting
Medium		Medium sits in the middle and is ideal for general purpose room illumination.	General Purpose Lighting
Wide		Wide angles are ideal for when the light needs to cover a large area, for example car parks. If the light covers a large area, fewer light sources are required.	Wide Area Lighting
Oval		Oval beams are ideal for areas where a round beam is not suitable.	Controlled and defined areas
Rectangular		Ideal for narrow areas of light. Rectangular beams reach the edges where rounded beams would not, for a seamless light coverage.	Corridors
Strip		Some lenses are designed to work with rigid or flexible LED strips. These are made up of multiple LEDs so the lens can be used to give a more uniform light appearance.	Cabinet lighting

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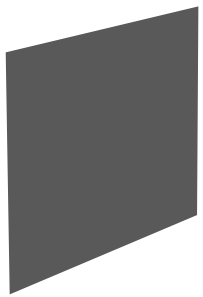
HOW TO ASSEMBLE

Here is a basic assembly layout for a LED array and an LED lens.

Heatsink

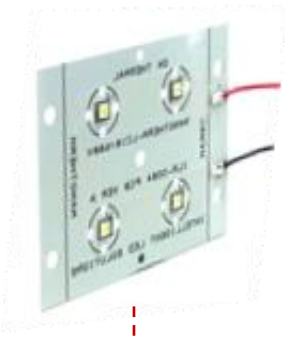


Thermal Interface Material



Thermal management is required when using your LED or array. Thermal interface material can also be self-adhesive.

LED Array



Some LED arrays are designed to work with specific lenses. Saving you time soldering your LEDs into the exact position.

Lens



Lenses may be adhesive backed with positioning pins. Alternatively there will be holes for fixing screws.

Screws

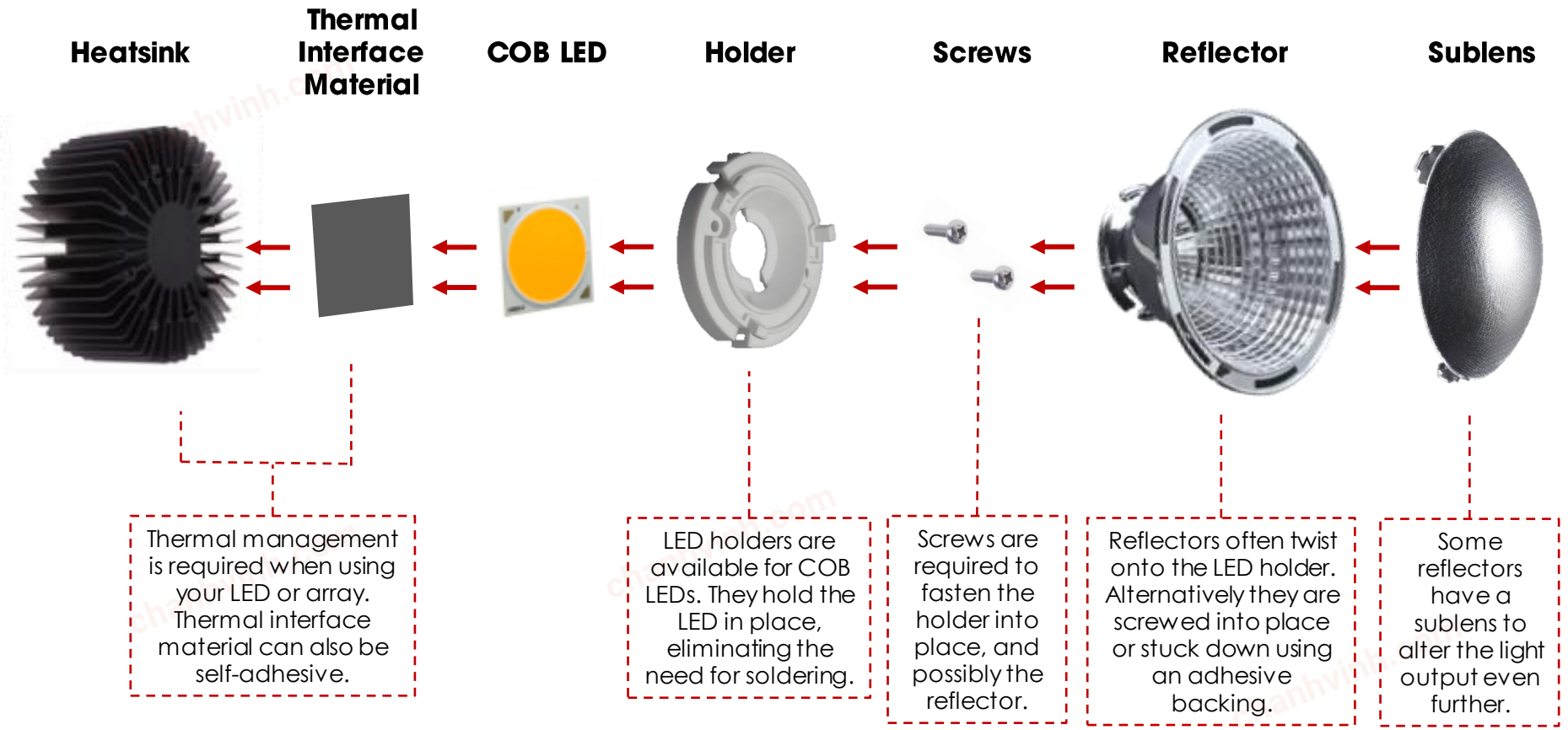


If a lens is not self-adhesive, screws may be required to fasten into place.

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HOW TO ASSEMBLE

Here is a basic assembly layout for a COB LED and an LED reflector.



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REMOTE PHOSPHOR

Have you considered remote phosphor?

REMOTE PHOSPHOR LENSES

RS Components offer a range of remote phosphor lenses. When used alongside a blue pump (LED) they create a white light output.
The remote phosphor lenses are available in various shapes and colour temperatures



Click here to see our range of Remote Phosphor Lenses

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