

Museum & Gallery Lighting

Contemporary Display Lighting Systems



World Class Lighting

For leading museums and galleries, worldwide

02

Universal Fibre Optics have worked with many world class lighting designers and specifiers on high profile projects for clients around the world.

Our range of innovative, functional and discrete fittings are market leaders in the display lighting field, and as shown in the images below, they have been used to illuminate a wide range of exhibits and artefacts in museums and galleries worldwide.

Contents

2	About Universal Fibre Optics
4	Fibre optic technology
5	Benefits of fibre optics
6	Robert Burns Birthplace Museum
7	The Novium, Chichester
8	Light tubes
9	Light bars
10	Light wands
11	Lighting gantries
12	MetroLED
14	Lighting extrusions
15	Extrusion fittings
16	The Harley-Davidson Museum
17	The Thompson Collection
18	Downlight fittings
21	Hermetic fittings
22	Crooks / rod and clamps
23	Specialised fittings
24	National Football Museum
25	Stirling Castle
26	Fibre harnesses
27	Halogen light sources
28	LED light sources
30	Museum of Liverpool
31	Ulster Folk & Transport Museum



Palace Green Library

Credits

- ▶ National Museum of Scotland - *courtesy of Click Netherfield Ltd.*
- ▶ Cambridge Press Museum - *courtesy of Click Netherfield Ltd.*
- ▶ Palace Green Library - *courtesy of Click Netherfield Ltd.*
- ▶ Maidstone Museum - *photography by Hufton+Crow*
- ▶ Leeds City Museum - *courtesy of Click Netherfield Ltd.*
- ▶ The National Football Museum - *photography by Daniel James of Porter James Media*
- ▶ The Novium, Chichester - *courtesy of Maevert*
- ▶ Museum of Liverpool - *courtesy of Click Netherfield Ltd.*
- ▶ Stirling Castle - *courtesy of Click Netherfield Ltd.*
- ▶ Ulster Folk & Transport Museum - *photography by Rory Moore*
- ▶ Robert Burns Birthplace Museum - *courtesy of Conservation by Design*
- ▶ Images of The Thomson Collection - *copyright The Art Gallery of Ontario*
- ▶ Cover images of Preston Park Museum - *courtesy of RS Displays*

All material is ©2013 Universal Fibre Optics Ltd. and may not be reproduced in whole or in part without the written consent of the copyright holder. R2-13

World Class Manufacturer

With over twenty-two years experience in the industry

03



Bilder Treasury

Universal Fibre Optics is one of only a few manufacturers of glass fibre for lighting in the world.

We have the widest range of specialist fibre optic lighting solutions for lighting in museums, galleries and retail displays.

We can supply complete systems using glass or PMMA fibre and we manufacture our own class leading light sources and end fittings.

Being a complete manufacturer we can also make bespoke fabrications such as light tubes, rod and clamps and gantry systems all finished to blend seamlessly into their surroundings.

We understand how important it is to meet deadlines and keep a project within budget. We are quality focussed, using only the highest quality raw materials.



Cambridge Press Museum

The Technology Behind Our Systems

How fibre optic lighting systems work

04

Fibre optic lighting systems are generally made up of the three main components described below.

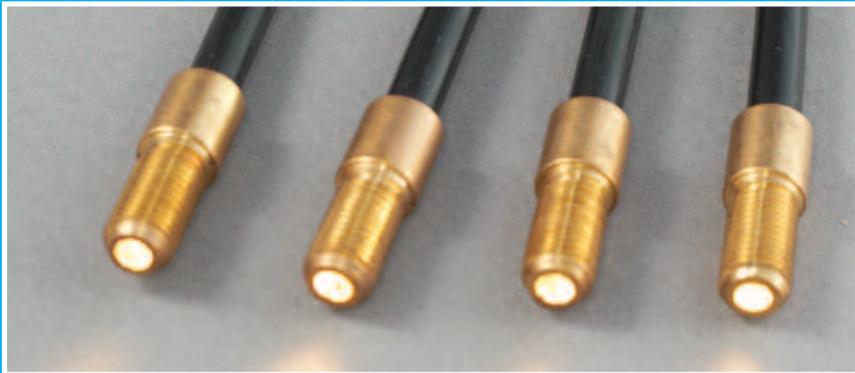
Unlike most fibre optic lighting suppliers, we manufacture each of these components ourselves, so you can be sure of high quality western manufactured equipment. This also gives us the ability to make short-run and bespoke items to suit your specification exactly.

The Light Source



- ▶ The light source is the box which contains the lamp, filtration, and all the electrical components in the system.
- ▶ Light from the light source is fed into the fibre optic harness and transmitted to the end fitting. This allows the light source to be located remotely by using a longer harness.

The Harness



- ▶ The harness is the 'fibre' part of a fibre optic system. It is made up of many strands of optical fibre which are usually wrapped in a flexible black sheathing for protection.
- ▶ The harness is used to transport the light from the light source to the end fitting. One end of the harness has a common end where all the fibres are gathered and plugged into the light source. The other end is normally terminated with a number of metal ferrules onto which the end fittings are connected.
- ▶ The harness contains no heat or electricity, making it safe to route through wet and humid areas, as well as safe to touch.

The End Fittings

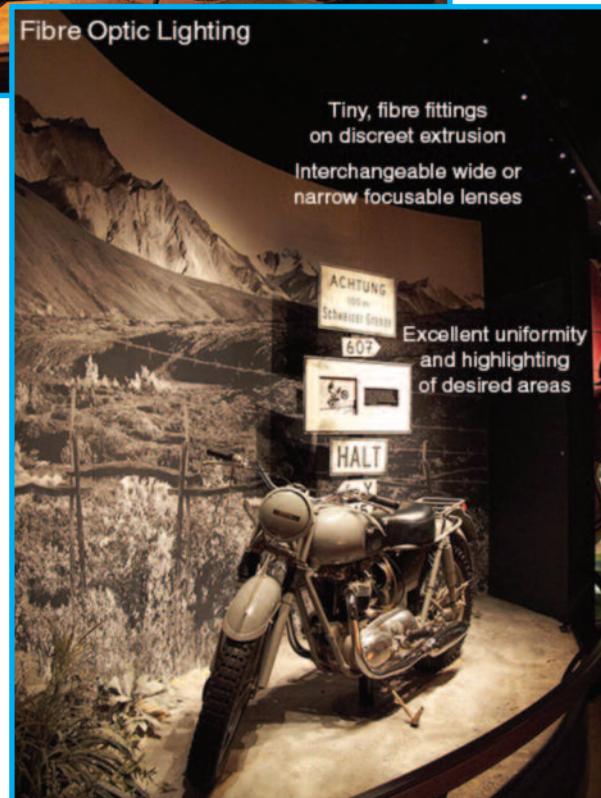
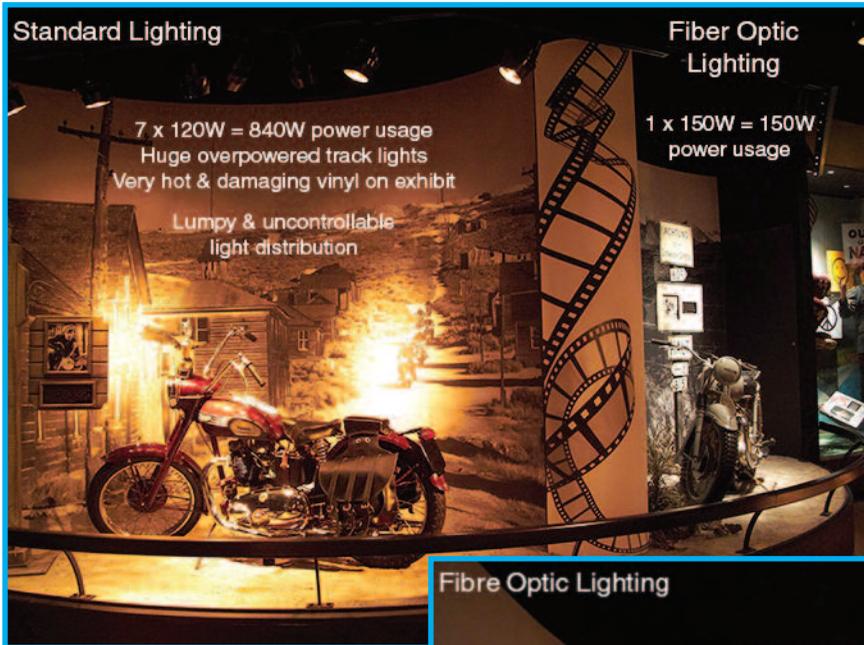


- ▶ The end fitting is where the light generated in the light source is output after travelling along the fibre optic harness.
- ▶ End fittings are available for many applications, however for display use, generally downlight fittings, or custom systems, such as light tubes, bars and wands are used. More information on fittings for display applications is available throughout this brochure.
- ▶ As with the harness, end fittings contain no heat or electricity making them safe to handle even when illuminated.

Benefits of Fibre Optic Lighting

Why you should consider fibre optics for your display lighting project

05



Fibre optic lighting has many benefits over older lighting technologies, especially in the field of cabinet and display lighting where precious artefacts need to be securely displayed and protected from heat and high UV light output.

► Security

Since the light source can be located remotely from the end fittings, the risk of theft from open display cases and cabinets is greatly reduced. Once the end fittings have been positioned they require no maintenance, so there is no need to open the cabinet again for lamp changes or other maintenance.

► Low Maintenance

In a fibre optic lighting system, one lamp can supply light to many end fittings, thus reducing costly and time consuming lamp changes.

► Low UV and No Heat Emission

Sensitive items such as paper and textiles can be easily damaged by heat and UV light from conventional lighting systems. Fibre optics feature very low UV and no heat emission from the fittings at the end of the fibre optic cables. This makes them ideal for use in areas where precious items could be easily damaged.

Universal Fibre Optics were recently contracted to provide fibre optic lighting to illuminate the motorcycle used by Steve McQueen in the movie *The Great Escape*, which is now on display in a Hollywood Casino in Pennsylvania. The images on this page show how much difference our lighting can make to your exhibits.

Robert Burns Birthplace

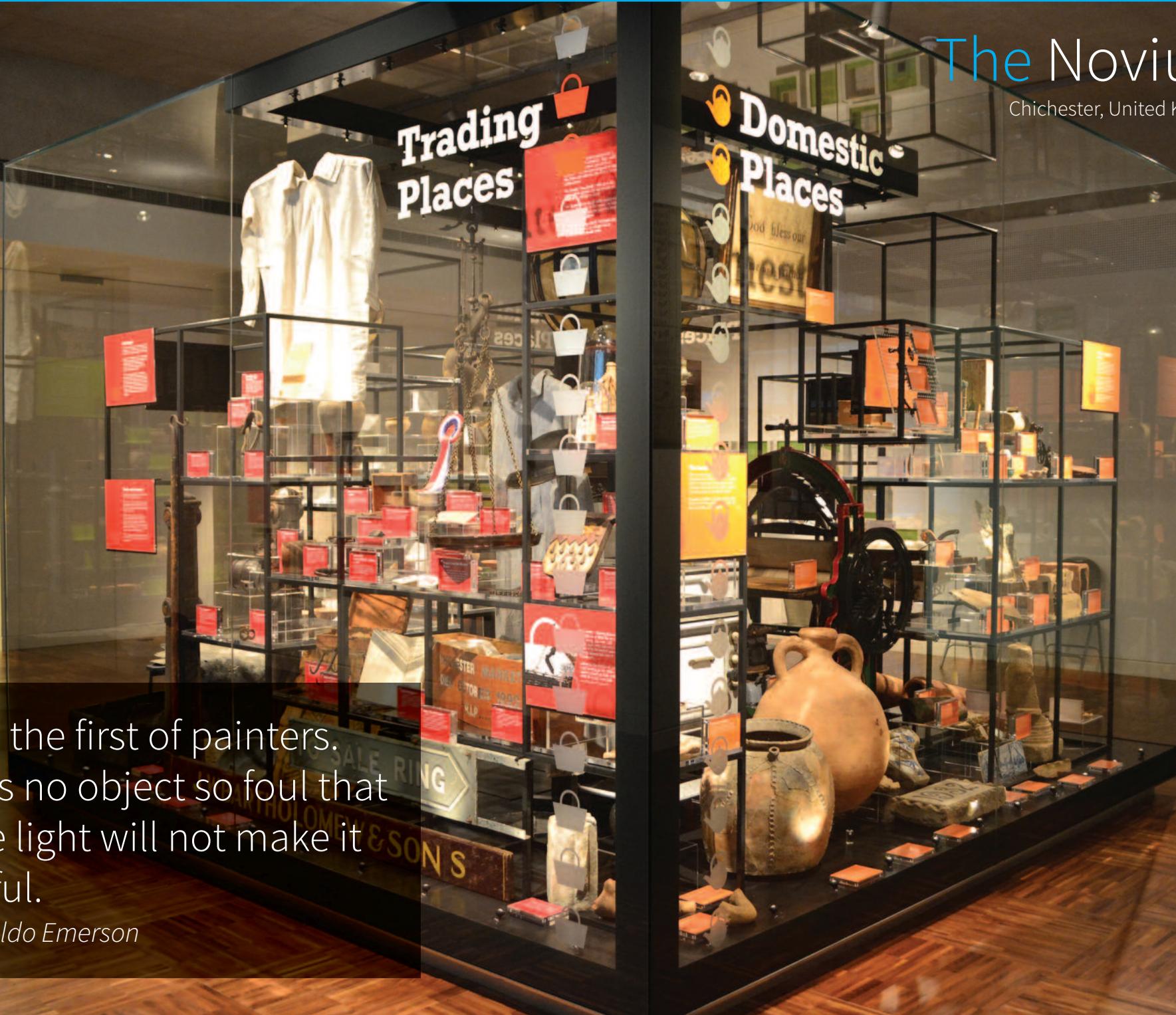
Alloway, United Kingdom

06



Misled by Fancy's meteor-ray, By
passion driven; But yet the light
that led astray, Was light from
Heaven.

- Robert Burns



Light is the first of painters.
There is no object so foul that
intense light will not make it
beautiful.

- Ralph Waldo Emerson

Linear Lighting Systems

Fibre optic light tubes

08

Light Tubes provide a versatile method to give a general wash of light and can be either easily hidden from view or finished to become an integral part of the display case design.

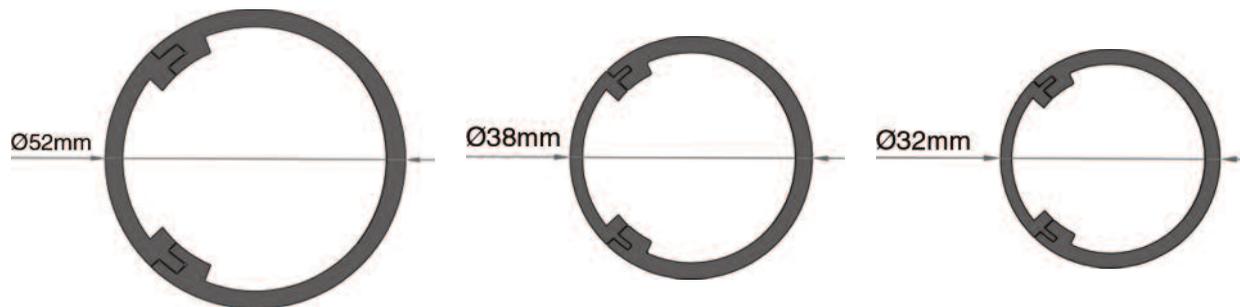
Available in three diameters, 32mm, 38mm and 52mm, they consist of an aluminium tube which holds end emitting fibres at close spacings to give an even light.

The points of light can be staggered if required to give light coverage to a wider area.

Light Tubes can be supplied as a straight tube with the fibre optic tails emerging from one end or as a u-shaped gantry which can be surface mounted (see page 10).

A range of mounting brackets are also available which allow for the horizontal or vertical mounting of tubes. When these are used, the tube is secured with a grub screw which allows for easy rotation and positioning.

Light Tubes can be custom painted in-house and are manufactured to order at the sizes specified.



Rangers House



The Royal Institute

Manufactured To Your Specifications

Fibre optic light bars

09



The UFO Light Bar systems use similar profiles to that of the Light Tubes, but have a flat front to allow the mounting of the UFO 34D mini trumpet fitting.

Light Bars are available in 27mm, 32mm, 38mm, 44mm and 52mm diameters, and as each system is made to order, the fittings, and optionally interspersed points of light, can be placed at regular or irregular intervals to suit what is being illuminated.

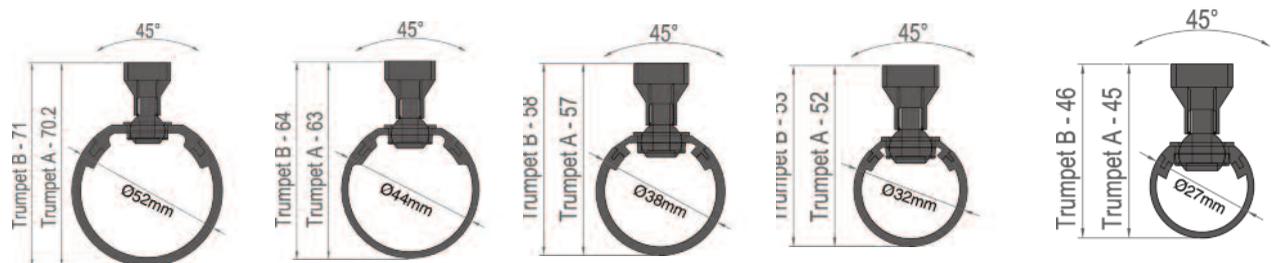
The UFO 34D fittings can act as spotlights while the small points can give fill-in light. The 34D fitting is detailed on page 15.

The UFO 34D fitting comes with a choice of two trumpet styles - type 'A' which has a 20° - 45° focus range and type 'B' which has a focus range of 55° - 60°.

Custom painted and anodised finishes are available for the Light Bars and black is the standard finish for the 34D fitting.



Leeds City Museum



Discrete Linear Lighting

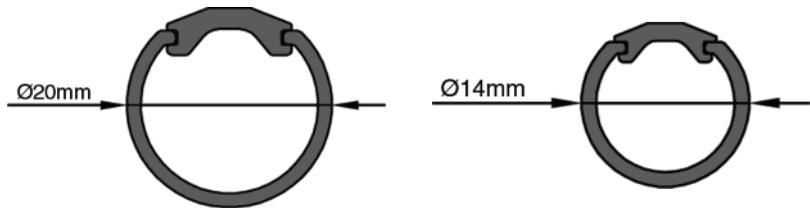
Fibre optic light wands

10

Light Wands are a compact version of the Light Tubes. Available in standard 20mm and mini 14mm diameter sizes, they come as standard in a black or silver anodised finish but can be painted to any custom colour.

The light wands use polymer fibres at close spacings to give a very even wash of light which is ideally suited to use in small display cases or to light pictures on information boards.

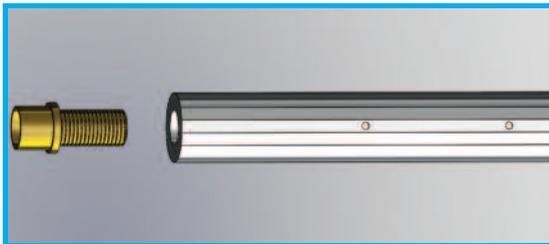
Available in lengths of up to 3 metres, depending on the size of fibre and the hole spacings used. This will be determined by the amount of light needed and how close to the wand the scallops of light are required to merge into an even wash.



Light wands are also available in a plug-in version.

These allow for the rigid mounting of an M8 ferrule in almost any position, normally through a mounting surface, such as a cabinet base.

The light wand is then screwed onto the ferrule and can be easily removed if required.

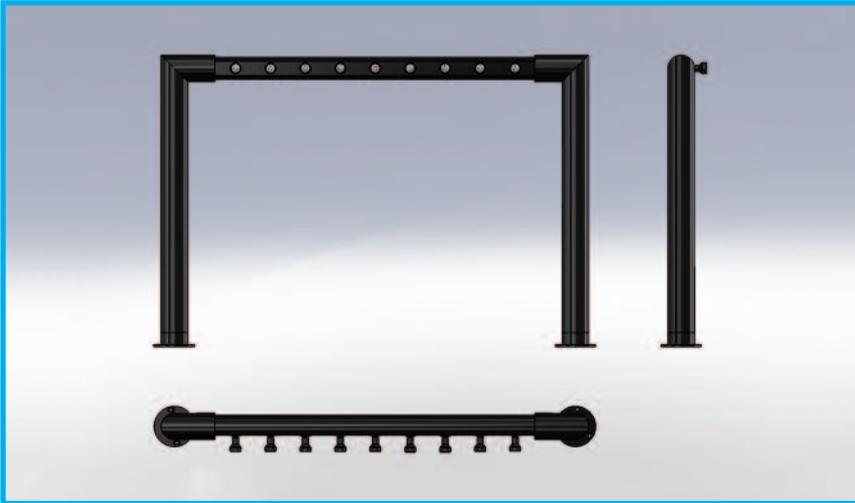


The Royal Observatory

Surface Mounted Linear Lighting

Lighting gantries based on light tubes, bars or wands

11



In addition to standard Light Tubes, Bars and Wands, where the fibre exits straight from one end of the tube, all three products can also be supplied as part of a u-shaped gantry system.

This allows for surface mounting, with the fibre exiting from one of the gantry legs and through a hole in the mounting surface.

Gantries are made to order so the lengths of both the tube and the legs are very customisable. They can also be based on any of the available Tube, Bar or Wand profiles.

Our standard gantry systems allow the tubes to have a degree of rotation within the legs. This makes it easy to adjust the beam angle of the illumination.

We can also supply systems where the legs are fixed rigidly to the tube.

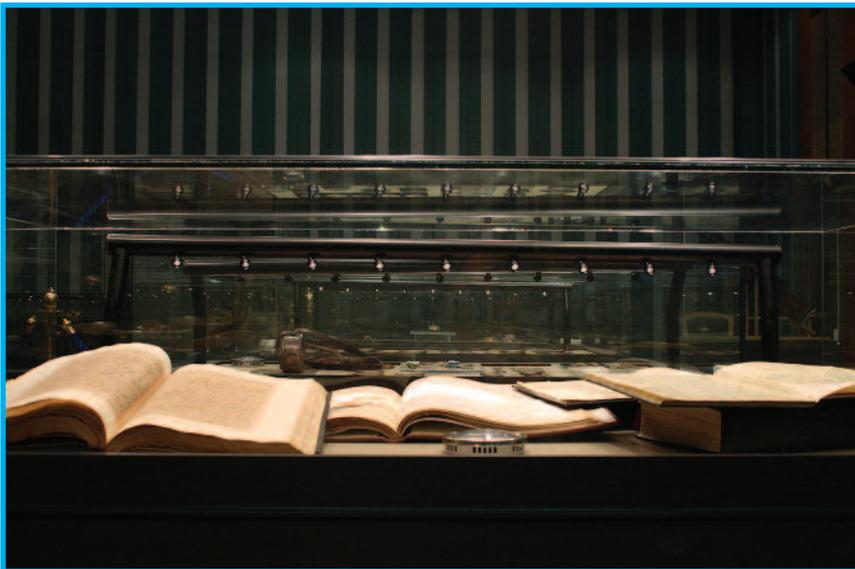
Our standard gantry system is available for the most popular sizes of light tubes, bars and wands.

A range of mounting feet are also available. Please contact us for details.

- ▶ Available for 27mm), 32mm & 38mm tubes or bars and 20mm wands.

- ▶ Leg lengths - max. 650mm but optional joining brackets are available if a longer length is required.

- ▶ Finish - can be painted to any custom RAL colour.



Museum of Cairo



Leeds City Museum

MetroLED Systems

Fully configurable led lighting fixtures

12

With a choice of fully positionable spotlights, two vertical light bar options, or a linear array of LED modules at close spacings providing a wash of light, this product offers all the flexibility you need for illuminating display cases.

Spotlights are fully tiltable and can be independently moved along the fixture and pointed exactly where you need them. There is also a choice of trumpets which offer either wide or narrow beam angles. Gantry systems also feature rotating corners so that the complete light bar can be rotated by 350°.

The system runs on dual circuit power, allowing for 2 independent dimming levels and has the option of using either 3000K or 4000K LED's.

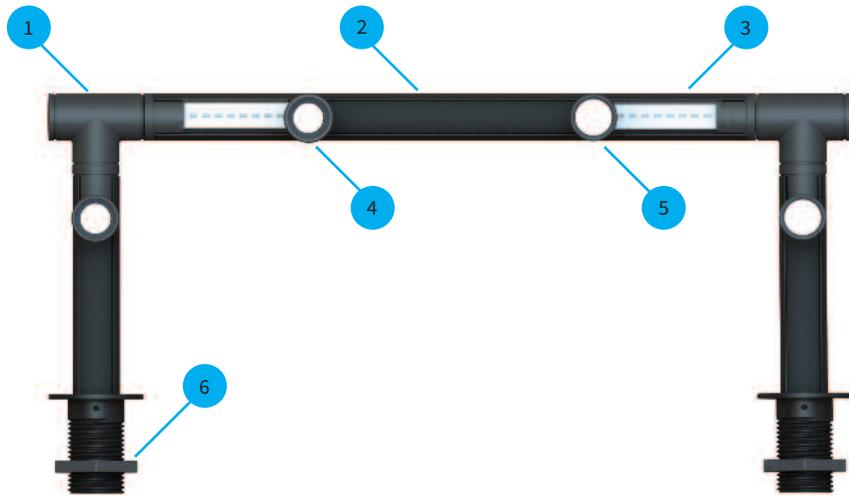
The MetroLED systems offer versatility combined with the efficiency and power of LED modules, ease of installation and very low maintenance requirements.



It's child's play.

Configure As You Want

Vertical. Horizontal. Spots. Linear. MetroLED allows any combination you want



General Technical Specifications

Description	Details
Main supply voltage	100-240VAC, 50-60Hz
PSU output	5VDC
Min. ambient temp.	-10°C
Max. ambient temp.	45°C
Power connection	2.1 x 5.5 x 12mm
LED type/model	White light
LED linear CRI	85 (typical)
LED linear colour temp	300K and 4000K
LED linear efficiency	112 Lumen / W
LED linear current	10mA
LED spot CRI	95 (typical)
LED spot colour temp.	3000K and 4000K
LED spot efficiency	66 Lumen / W
LED spot current	100mA
LED life	50000 hours in ambient 25°C

LED Specifications

Component	Variant	Nominal Power	Working Current	Notes
Spotlight	3000K	0.5W	100mA	Available in spot and flood fitting
Spotlight	4000K	0.5W	100mA	Available in spot and flood fitting
Linear array 45mm	3000K	0.4W	80mA	
Linear array 45mm	4000K	0.4W	80mA	
Linear array 95mm	3000K	0.8W	160mA	
Linear array 95mm	4000K	0.8W	160mA	
Linear array 245mm	3000K	2.3W	460mA	
Linear array 245mm	4000K	2.3W	460mA	
MetroLED driver	Version 2	N/A	Variable	Overload indication and shutdown

Component	Description
1	350° rotating corners
2	Infill strip
3	Linear LED module (45mm, 95mm and 245mm lengths) and 3000K or 4000K colour temperatures
4	Narrow angle spot, 3000K or 4000K
5	Wide angle spot, 3000K or 4000K
6	Mounting foot and retaining nut
7	Corner mounting foot
8	Round mounting foot
9	MetroLED Gooseneck
10	MetroLED Elbow

Surface Mount In Corners & Recesses

Angled extrusion for mounting fibre optics

14

Cabinet mounting extrusions allow the use of conventional recessed downlight type fittings where it is only possible to surface mount.

The extrusion forms a conduit which conceals the fibre tails until they can be exited from the end. We normally supply the harness pre-fitted to the extrusion or we can supply the extrusion on its own.

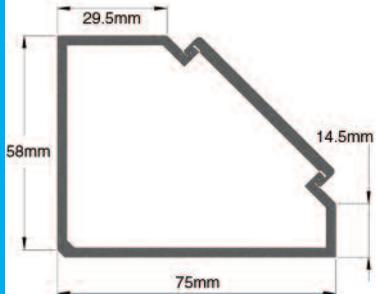
As detailed, there are five sizes of extrusion available, from the largest CX1, to the smallest CX5.

The CX5 extrusion is unique in that it does not allow for downlights to be fitted to it - instead it allows for the mounting of fibre optic tails which shine out through small holes in the surface.

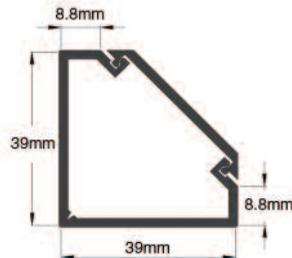
We are also able to supply gantry systems manufactured from our extrusions.

This can provide a different aesthetic to our standard light bar gantries, depending on the subject to be illuminated. The Harley-Davidson Museum in Milwaukee, featured overleaf, shows a CX4 gantry system used to great effect.

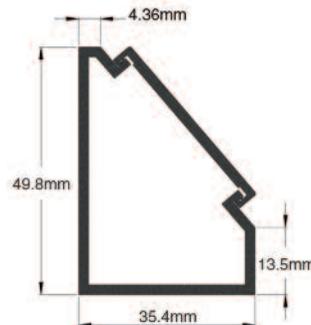
CX1 extrusion



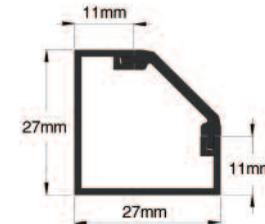
CX2 extrusion



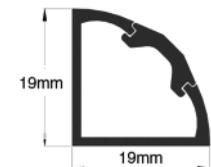
CX3 extrusion



CX4 extrusion



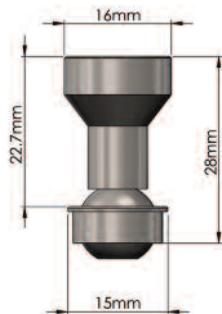
CX5 extrusion



Fittings For Light Bars & Extrusion

Discrete and focusable

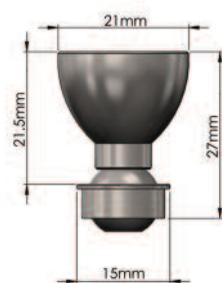
UFO 34da fitting



Tiny focusable downlight fitting, for use with light bars and extrusions.

- Lens:** Clear focusing lens
- Flange diameter:** 16mm
- Focus angle:** 20° - 45°
- Tilt:** 60°
- Rotate:** 360°
- Material:** Acrylic
- Standard colour:** black
- Ferrule size:** Custom ferrule
- Min. fibre size:** 1mm
- Max. fibre size:** 4mm

UFO 34db fitting



Tiny focusable downlight fitting, for use with light bars and extrusions.

- Lens:** Clear focusing lens
- Flange diameter:** 16mm
- Focus angle:** 55° - 60°
- Tilt:** 60°
- Rotate:** 360°
- Material:** Acrylic
- Standard colour:** black
- Ferrule size:** Custom ferrule
- Min. fibre size:** 1mm
- Max. fibre size:** 4mm

UFO 14db fitting



Downlight fitting, for use with CX1, CX2 and CX3 extrusions.

- Lens:** Clear focusing lens
- Flange diameter:** 30mm
- Focus angle:** 25° - 45°
- Tilt:** 60°
- Rotate:** 360°
- Material:** Aluminium
- Standard colours:** Black, white, chrome, polished aluminium
- Ferrule size:** M10
- Min. fibre size:** 2mm
- Max. fibre size:** 8mm

A range of discreet, focusable downlight fittings which are specially designed for use with either our light bar or cabinet extrusion systems.

The tiny 34DA and 34DB fittings are primarily for use in all sizes of light bar system, but can also be successfully employed in our CX4 extrusion.

The larger 14DB fitting, which is secured through the extrusion surface with a threaded ring, is suitable for use in the CX1, CX2 and CX3 extrusions.

All fittings can be powdercoated to any RAL colour to suit your specific application.



Leeds City Museum

Harley-Davidson Museum

Milwaukee, Wisconsin, USA

16



In the end, people will not be judged by the darkness they lived in, but by the light they rejected.

- Anthony Liccione

The Thompson Collection

Art Gallery of Ontario, Canada

17



Design is defined by light and shade, and appropriate lighting is enormously important.

- Albert Hadley

Directional & Focusable Fittings

Adjustable downlight fittings

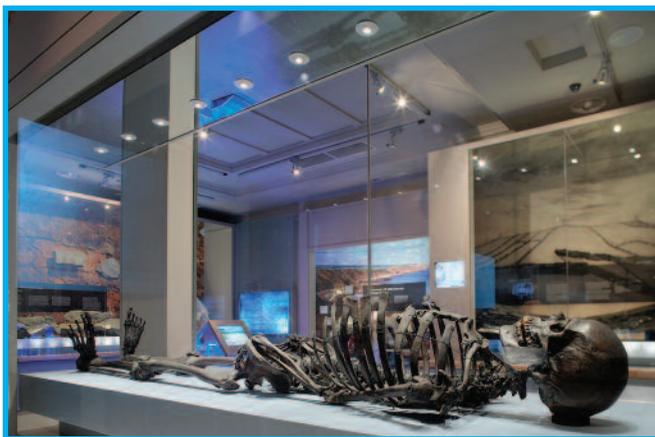
18

Although this range of products are called downlight fittings, they can also be used to illuminate upwards or from the side with great effect.

These fittings can be used individually to give a spot light or in multiples to wash an area or item with light. Ideal for use within showcases, they are focusable and some types are also directional.

All standard downlight fittings are secured using a spring clip to hold the fitting in place within the mounting surface.

The range of hermetic fittings UFO27H, 28H, 29H and 30H are threaded hermetic fittings which are mounted through a cutout and are secured by a retaining nut on the back.

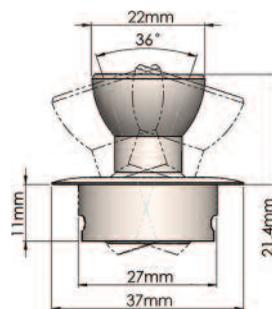


Rotunda Museum



Rotunda Museum

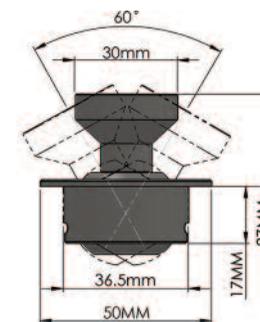
UFO 9d downlight



Small articulated downlight fitting for M8x1mm ferrules. Available with either wide or narrow angle trumpets.

Cutout size: 31mm
Focus angle: 20° - 30° or 30° - 40°
Material: Aluminium
Standard colours: polished aluminium, black, white, silver
Ferrule size: M8
Min. fibre size: 2mm
Max. fibre size: 6mm

UFO 10d downlight



Articulated downlight fitting for M10x1mm or 8mm smooth ferrules.

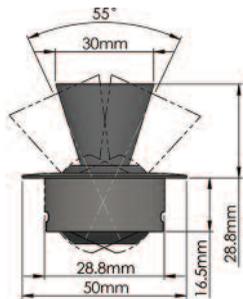
Cutout size: 40mm
Focus angle: 25° - 45°
Material: Aluminium, stainless steel or polycarbonate
Standard colours: polished aluminium, black, white, silver, polished stainless steel
Ferrule size: M10 or 8mm smooth
Min. fibre size: 2mm
Max. fibre size: 8mm

Classic Lighting Effects

Suitable for installation in ceilings, cabinets - in fact almost anywhere

19

UFO 10da downlight



Articulated downlight fitting for M10x1mm or 8mm smooth ferrules.

Cutout size: 40mm

Focus angle: 40° - 75°

Material: Aluminium (stainless steel to special order)

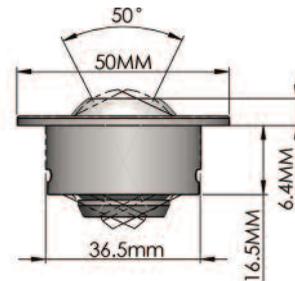
Standard colours: polished aluminium, black, white, silver

Ferrule size: M10 or 8mm smooth

Min. fibre size: 2mm

Max. fibre size: 8mm

UFO 11d downlight



Recessed articulated downlight fitting for M10x1mm or 8mm smooth ferrules.

Cutout size: 40mm

Focus angle: 30° - 50°

Material: Aluminium, stainless steel or polycarbonate

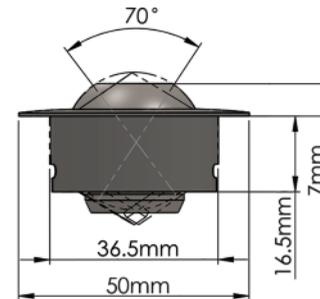
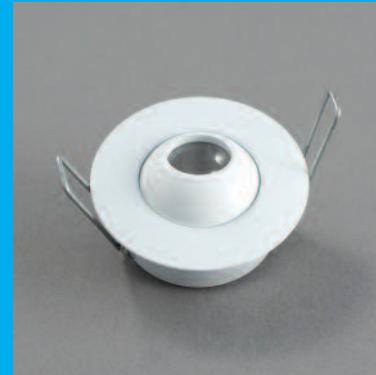
Standard colours: polished aluminium, black, white, silver, ivory

Ferrule size: M10 or 8mm smooth

Min. fibre size: 2mm

Max. fibre size: 8mm

UFO 11da downlight



Recessed articulated downlight fitting with smoother flange for M10x1mm or 8mm smooth ferrules.

Cutout size: 40mm

Focus angle: 30° - 50°

Material: Aluminium, stainless steel

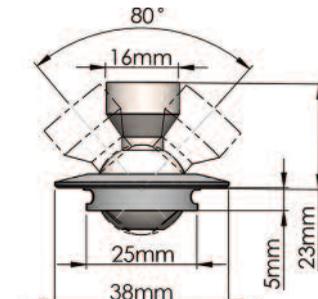
Standard colours: polished aluminium, black, white, silver, polished stainless steel

Ferrule size: M10 or 8mm smooth

Min. fibre size: 2mm

Max. fibre size: 8mm

UFO 20d downlight



Very small articulated downlight fitting with front mounted trumpet for M7x1mm ferrules.

Cutout size: 30mm

Focus angle: 15° - 30°

Material: Aluminium

Standard colours: polished aluminium, black, white, silver

Ferrule size: M7

Min. fibre size: 2mm

Max. fibre size: 4.5mm

Directional & Focusable Fittings

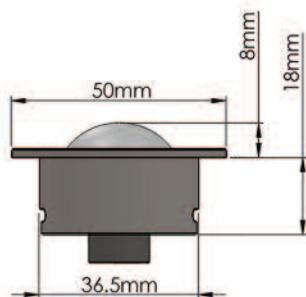
Fixed position downlights

20



Maidstone Museum

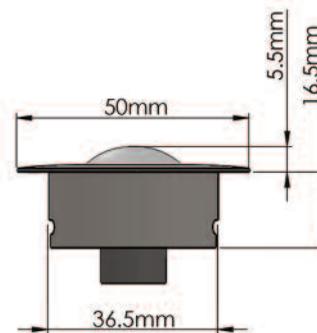
UFO 13d downlight



Recessed, fixed lens downlight fitting for M10x1mm or 8mm smooth ferrules.

Cutout size: 40mm
Focus angle: 20° - 45°
Material: Aluminium, stainless steel or polycarbonate
Standard colours: polished aluminium, black, white, silver, ivory
Ferrule size: M10 or 8mm smooth
Min. fibre size: 2mm
Max. fibre size: 8mm

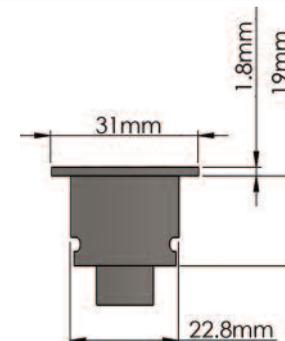
UFO 13da downlight



Recessed, fixed lens downlight fitting for M10x1mm or 8mm smooth ferrules.

Cutout size: 40mm
Focus angle: 20° - 45°
Material: Aluminium, stainless steel
Standard colours: polished aluminium, black, white, silver, polished stainless steel
Ferrule size: M10 or 8mm smooth
Min. fibre size: 2mm
Max. fibre size: 8mm

UFO 21d downlight



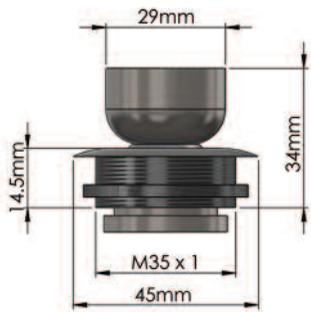
Recessed, fixed lens downlight fitting for M10x1mm or 8mm smooth ferrules.

Cutout size: 26mm
Focus angle: 30° - 60°
Material: Aluminium
Standard colours: polished aluminium, black, white, silver
Ferrule size: M10 or 8mm smooth
Min. fibre size: 2mm
Max. fibre size: 8mm

Hermetic Airtight Fittings

Airtight fittings for priceless objects

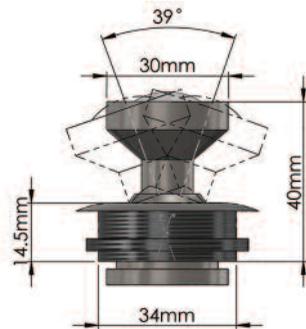
UFO 27h hermetic fitting



Adjustable trumpet fitting which allows an airtight seal to be maintained within a display case when using fibre optics.

- Cutout size:** 38mm
- Focus angle:** 20° - 50°
- Material:** Aluminium
- Standard colours:** polished aluminium, black, white, chrome
- Ferrule size:** M10 or 8mm smooth
- Min. fibre size:** 2mm
- Max. fibre size:** 8mm

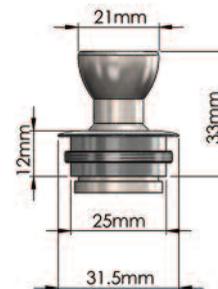
UFO 28h hermetic fitting



Adjustable trumpet fitting which allows an airtight seal to be maintained within a display case when using fibre optics.

- Cutout size:** 38mm
- Focus angle:** 40° - 65°
- Material:** Aluminium
- Standard colours:** polished aluminium, black, white, chrome
- Ferrule size:** M10 or 8mm smooth
- Min. fibre size:** 2mm
- Max. fibre size:** 8mm

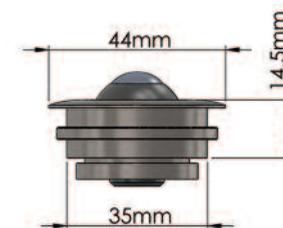
UFO 29h hermetic fitting



Allows an airtight seal to be maintained within a display case when using fibre optics. Available with wide or narrow beam lenses.

- Cutout size:** 27mm
- Focus angle:** 25° - 65° or 70° - 120°
- Material:** Aluminium
- Standard colours:** polished aluminium, black, white, chrome
- Ferrule size:** M8
- Min. fibre size:** 2mm
- Max. fibre size:** 6mm

UFO 30h hermetic fitting



Smooth recessed fitting which allows an airtight seal to be maintained within a display case when using fibre optics.

- Cutout size:** 38mm
- Focus angle:** 30° - 50°
- Material:** Aluminium
- Standard colours:** polished aluminium, black, white, chrome
- Ferrule size:** M10 or 8mm smooth
- Min. fibre size:** 2mm
- Max. fibre size:** 8mm

Crooks and Rod & Clamp Systems

Surface mounted lighting

22

Lighting Crooks are an optional termination to a fibre tail which holds the fibre at an angle from vertical and is very useful for lighting static arrangements of items.

Available in two sizes, the crooks are fitted through a slot or hole cut into the mounting surface.

The Crook comes fitted to fibre tails as part of a harness and is not an interchangeable fitting.

A fitted lens is optionally available on the larger crook.

Mini crooks have four configuration options - see the image and table, right, for details.

Mounting feet (part no. ABR06R) are also available.

The Rod and Clamp assembly allows fibres and lenses to be mounted to a shelf or to the sides or bottom of a cabinet.

Rods are made to a customer's specified length and come as standard in black, although they and the clamps can be painted to a specified RAL colour if required.

The rods are typically mounted using a foot on the top or underside of the mounting surface.

A number of lenses can be supported on one rod - depending on the length of rod used.
The fibre tails run separately to each lens.



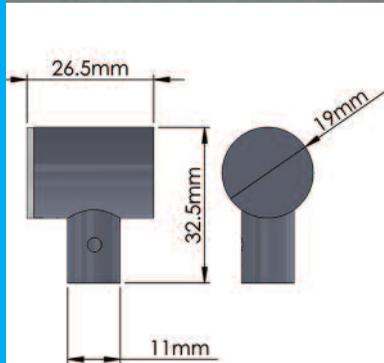
Norwich Castle Museum

Specialised Fittings

Mirror and picture framing fittings

23

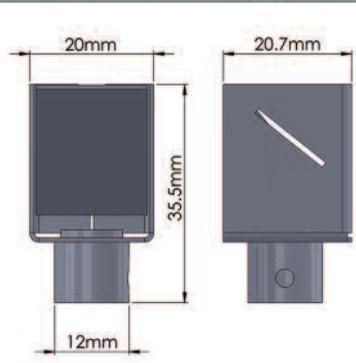
UFO 19m mirror fitting



The UFO 19M is a round mirror fitting with a glazed front for use where an overall depth of 27mm can be accommodated. The fitting delivers light at a 90° angle to the run of the fibre tail.

The UFO 19M is suitable for use in situations where there is enough room and where a glazed front is needed for aesthetic purposes and to prevent dust ingress.

UFO 26m mirror fitting

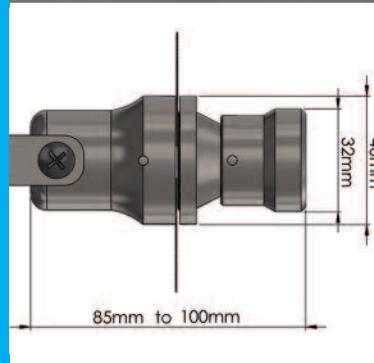


The UFO 26M is a rectangular mirror fitting with an open front for use where an overall depth of 20mm can be accommodated. The fitting delivers light at a 90° angle to the run of the fibre tail.

The UFO 26M is suitable for use in situations where there is a very limited depth to mount the fitting.

At close range the 26M gives a slightly rectangular light pattern.

UFO 2f framing fitting



The UFO 2F framing projector is used to frame an object or picture with a beam of light.

The in-built shutters create a square or rectangular beam shape. By adjusting these the size of the beam can be altered to perfectly frame the sides of an object or picture.

The fitting is also focusable. Adjustment is made by moving the lens tube backwards and forwards.

Fibre optic lighting is the leader in the field for providing spotlighting within display cases, and is highly focusable.

The fittings featured on this page, also allow the light to be angled and shaped so that it shines exactly as a project requires.



National Museum of Scotland

National Football Museum

Manchester, United Kingdom

24

You're telling the story, creating the sets, doing the lighting, the designing, and establishing the pace.

- Bill Sienkiewicz





Darkness has the ability to cover up;
light has the ability to uncover!
Darkness is the enemy of truth;
light is the friend of truth!

- Mehmet Murat Ildan

Fibre Harnesses

Moving light from source to destination

26

The harness is the core of a fibre optic lighting system and is responsible for transmitting the light from the light source to the end fitting.

Universal Fibre Optics make these harnesses in-house and to the highest quality, terminating and polishing the ends for maximum light transmission and longevity.

Two basic types of fibre are available - glass and PMMA.

For use in display cases and for conservation applications glass fibre is the preferred choice due to an increased evenness of light output between discrete points. This is achieved by mixing the fibres together in a more random way.



Glass harness specifications

Glass fibre harnesses are made from tails which contain many fine glass fibres sheathed in a low smoke material.

The ends are finished with crimp terminations for small diameters and with brass or stainless steel ferrules for larger diameters. Glass end emitting fibre is the preferred option for lengths of up to about 10 metres.

Size code	Active diameter	Outer diameter	Max. tails per light source	Minimum bend radius	Standard end termination
1	1mm	2.3mm	400	7mm	crimp
1.5	1.5mm	2.7mm	270	10mm	crimp/tube
2	2mm	2.8mm	135	15mm	crimp/3mm/tube
8	3mm	4.9mm	68	18mm	M8/M10 ferrule
14	4mm	6.4mm	38	20mm	M8/M10 ferrule
18	5mm	7.4mm	25	40mm	M8/M10 ferrule
24	6mm	8.7mm	17	50mm	M8/M10 ferrule
36	7mm	10.1mm	12	70mm	M10 ferrule
48	8mm	10.7mm	10	90mm	M10 ferrule

PMMA harness specifications

Multi-stranded PMMA end emitting fibre is usually specified where long tail lengths of above 10 metres are required.

There is less colour shift over long distances than with glass. PMMA fibre is made up of much thicker fibres and is less flexible than glass, meaning it cannot be randomised to the same extent.

No. of 0.75 mm strands	Active diameter	Outer diameter	Max. tails per light source	Minimum bend radius	Standard end termination
8	2.4mm	4.5mm	115	20mm	M8/M10 ferrule
12	3.1mm	4.5mm	65	25mm	M8/M10 ferrule
25	4.3mm	6.3mm	38	30mm	M8/M10 ferrule
33	5mm	7.1mm	25	50mm	M8/M10 ferrule
50	6mm	8.7mm	17	60mm	M8/M10 ferrule
67	7mm	10.5mm	12	80mm	M10 ferrule
75	7.5mm	10.5mm	11	90mm	M10 ferrule
88	8mm	10.5mm	10	100mm	M10 ferrule

Halogen Light Sources

The classic range of light sources

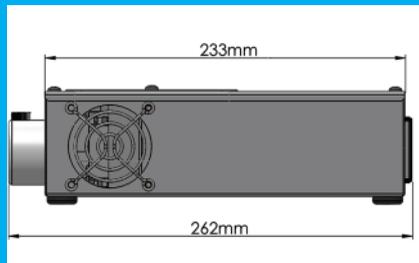
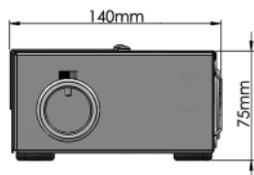
These light sources use lamps based on the tungsten halogen cycle which gives a uniform light output until close to the time of lamp expiry. They are low voltage, low in UV output and typically last from 1500 to 4000 hours, depending on the lamp wattage.

Because the lamps are relatively cool running there is the option with lower Wattage versions of these light sources to be fanless, although this will impact on lamp life.

Optionally, halogen light sources can be mains dimmed, with 75W and 100W models requiring a separate power feed to the fan to avoid it stopping. Alternatively, a popular option is to supply an integral manual dimmer with a dimming control on the light source body.

The UFO range of tungsten halogen light sources are available with lamp wattages of 35W, 50W, 42W, 50W, 75W and 100W, so are highly suitable for a large variety of project types.

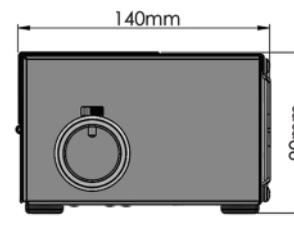
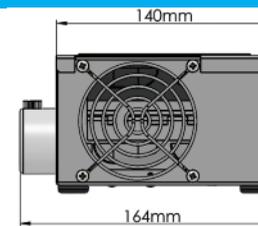
Slimline light source



Specifications

- ▶ Dimensions: 262mm x 140mm x 75mm
- ▶ Lamp type: MR16 tungsten halogen
- ▶ Lamp power: 35W / 42W / 50W / 75W / 100W
- ▶ Lamp life: 1500-4000 hours (wattage dep.)
- ▶ Colour temp: 2900 - 3000K (wattage dep.)
- ▶ Supply voltage: 110VAC 60Hz / 230VAC 50Hz
- ▶ Max start up current: 0.73A (100W lamp)
- ▶ Max running current: 0.53A (100W lamp)
- ▶ Dimming: *Optional inbuilt*
- ▶ Acoustic rating: 17dB(A) - 26dB(A)
- ▶ Min. ambient temperature: -20°C
- ▶ Max. ambient temperature: 40°C
- ▶ Enclosure: Black, sheet steel

Ixion light source



Specifications

- ▶ Dimensions: 164mm x 140mm x 90mm
- ▶ Lamp type: MR16 tungsten halogen
- ▶ Lamp power: 35W / 42W / 50W / 75W / 100W
- ▶ Lamp life: 1500-4000 hours (wattage dep.)
- ▶ Colour temp: 2900 - 3000K (wattage dep.)
- ▶ Supply voltage: 110VAC 60Hz / 230VAC 50Hz
- ▶ Power supply: 12VDC
- ▶ Max start up current: 0.73A (100W lamp)
- ▶ Max running current: 0.53A (100W lamp)
- ▶ Dimming: *Optional inbuilt*
- ▶ Acoustic rating: 31dB(A)
- ▶ Ambient temperature: -20°C to 40°C
- ▶ Enclosure: Black, sheet steel

LED Light Sources

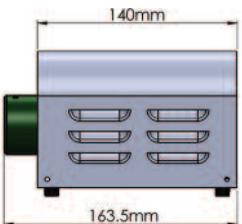
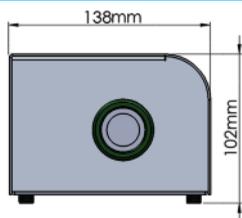
White Light Output Only - Cool, quiet and with DMX control

28

Our range of LED light sources use the latest technology to provide high output light combined with small unit size and very cool and quiet running.

LED modules typically have a lifespan of around 40,000 hours which reduces maintenance requirements to almost nil. Power consumption is also vastly reduced in comparison to older lamp technologies making them the most environmentally friendly and sustainable option for fibre illumination.

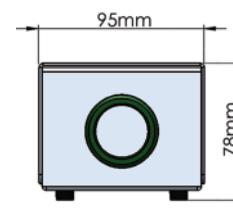
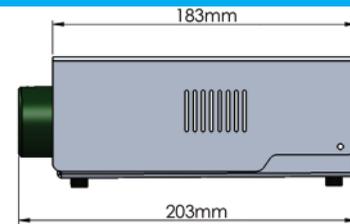
Mercury led light source



Specifications

- ▶ Dimensions: 138mm x 140mm x 102mm
- ▶ Lamp type: LED
- ▶ Supply voltage: 110VAC 60Hz / 230VAC 50Hz
- ▶ Power supply: External 36V DC adaptor
- ▶ Power consumption: <48W
- ▶ Colour temperature: 3050K
- ▶ Approx. LED life: 50,000 hours
- ▶ DMX: Optional
- ▶ Dimming: Inbuilt 0-10V
- ▶ Acoustic rating: 20dB(A)
- ▶ Min. ambient temperature: -10°C
- ▶ Max. ambient temperature: 45°C
- ▶ Enclosure: Silver, aluminium

Luna led light source



Specifications

- ▶ Dimensions: 183mm x 95mm x 78mm
- ▶ Lamp type: LED
- ▶ Supply voltage: 110VAC - 240VAC 47 - 63Hz
- ▶ Power supply: External 36V DC adaptor
- ▶ Power consumption: <48W
- ▶ Colour temperature: 3000K or 4000K
- ▶ LED power: 11.5W
- ▶ Approx. LED life: 50,000 hours
- ▶ DMX: Factory addressable 1 channel dimming (0-255)
- ▶ Min. ambient temperature: -10°C
- ▶ Max. ambient temperature: 45°C
- ▶ Enclosure: Silver, aluminium

Offering a choice of colour temperatures especially chosen for use in display applications, our range of LED light sources also offers full DMX control as well as in-built dimming effects via a control on the light source body.

All our LED products utilise industry standard 30mm fibre ports so can be retro-fitted to replace existing older technology units.

LED Light Sources

Coloured effect lighting with optional remote control

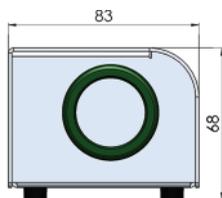
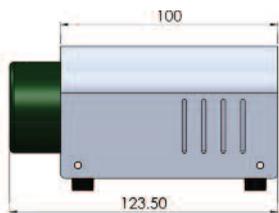
We can supply a range of RGBW light sources which can be used to provide a static coloured wash of light, colour cycling or twinkling effects.

The tiny RGBW MicroLED 1000 offers a choice of seven colours, including white and can be set to output static light, or offers two colour cycle modes each in a choice of three speeds. The MicroLED 4000 is similar to the 1000 however offers full remote control and the ability to link several sources together in a master/slave arrangement.

The MicroLED 5000T offers addressable DMX controlled colour output and twinkling effects.

This light source can be used standalone where light output can be controlled either by a DMX controller or by dipswitches on the rear of the unit. Alternatively multiple units can be connected in series and controlled by a standard DMX controller.

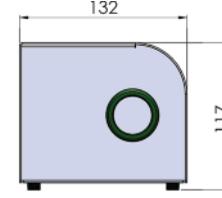
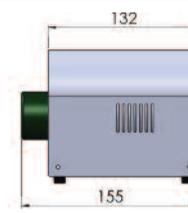
MicroLED 1000 light source



Specifications

- ▶ Dimensions: 100mm x 83mm x 68mm
- ▶ Lamp type: LED
- ▶ Supply voltage: 110 - 230VAC 47 - 63Hz
- ▶ Power supply: External 12V DC adaptor
- ▶ LED power: 2 - 5W in colour cycle mode
- ▶ LED type: RGBW
- ▶ Colours: Seven
- ▶ Cycles: Two, each at three speeds
- ▶ Approx. LED life: 50,000 hours
- ▶ Min. ambient temperature: -10°C
- ▶ Max. ambient temperature: 45°C
- ▶ Enclosure: Silver, aluminium

MicroLED 5000T light source



Specifications

- ▶ Dimensions: 132mm x 132mm x 117mm
- ▶ Lamp type: LED
- ▶ Supply voltage: 110VAC - 240VAC 47 - 63Hz
- ▶ Power supply: External 12V DC adaptor
- ▶ LED power: 2 - 5W in colour cycle mode
- ▶ LED type: RGBW
- ▶ DMX: Standalone or master / slave
- ▶ Twinkle: DMX controlled
- ▶ Approx. LED life: 50,000 hours
- ▶ Min. ambient temperature: -10°C
- ▶ Max. ambient temperature: 45°C
- ▶ Enclosure: Silver, aluminium

Museum of Liverpool

Liverpool, United Kingdom

30

- 8 Biscuit ware fragments**
Products from some of the large local pottery industries were also found. These biscuit ware fragments are from unfinished vessels which had not been decorated or glazed.
- 9 Rubbish from the market**
Rubbish, including food waste, was dumped around the market. These bone fragments are from domesticated animals which were eaten as food.
- 10 Dog skull**
Bones, such as this dog skull, were recovered from scavenging animals feeding on market refuse. There were also cat, rat, pigeon and crow bones.
- 11 Shells**
Archaeologists found large numbers of shells. Shellfish were once widespread convenience foods which were sold in the fish market.
- 12 PRECINCT**
The University of Liverpool's newsletter, PRECINCT, printed a story about the 1970s excavations.

Lighting is vital. Without that they've got nothing.

- Joe Grant



Ulster Folk & Transport Museum

Holywood, United Kingdom

31



There is one fundamental fact about lighting. Where there is no light, there is no beauty.

- Billy Baldwin



Home Place - Coldstream - TD12 4DT | United Kingdom | tel: +44 (0)1890 883416

Universal Fibre Optics

www.fibreopticlighting.com