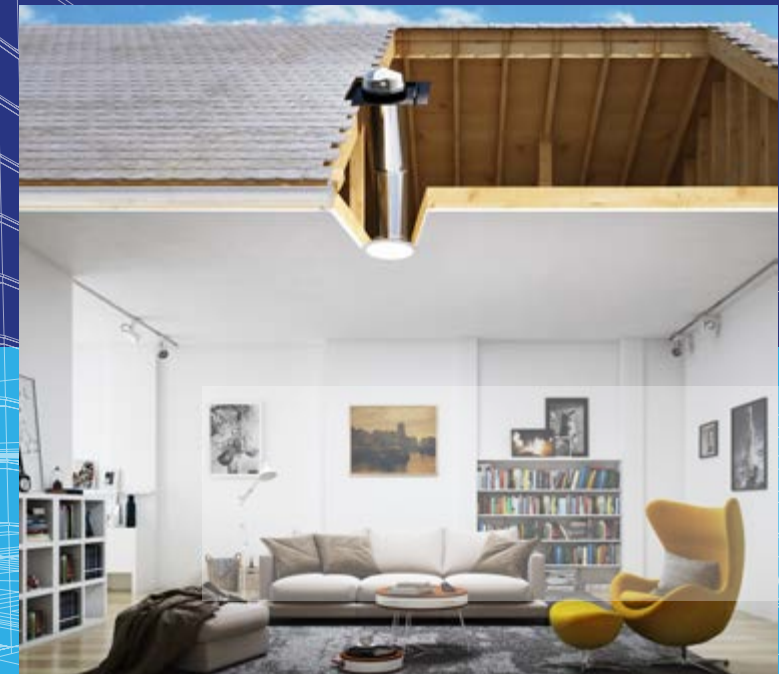


Established in

1974



Monodraught Natural Lighting

Delivering Healthy Natural Light Inside



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Engineering delivered naturally

We design, manufacture and install natural lighting, ventilation and cooling systems to create low energy, low carbon and sustainable buildings.



Monodraught has been at the forefront of designing and manufacturing low energy, low carbon, and sustainable solutions for over 40 years. Our company is focused around three product sets in which we are recognised as market leaders: natural and hybrid lighting, natural cooling and natural and hybrid ventilation.

Our products can be found anywhere from a residential build looking to increase its natural light through to a high impact architectural building such as the Copperbox Arena (formerly the Olympics Handball stadium). A key sector for Monodraught is in Education where our products can deliver real dividends in terms of lower energy and carbon footprint and improved environments for students and teachers.

We design, manufacture, install and maintain natural ventilation, natural lighting and natural cooling systems to create low energy, low carbon and sustainable buildings for healthier and more productive occupants

From R&D to Maintenance

Monodraught is proud of our history of developing products from R&D right through to installation and maintenance, all here in the UK and where possible using suppliers local to our head office base.

Our experience in installation means we can support your project wherever the location. With our own health & safety accredited installation personnel we are able to provide a complete package including commissioning and maintenance. We also have the experience to offer support and advice on installations to be carried out.



Manufacture

The large R&D team are continually challenging the boundaries developing new products to ensure customers continue to receive the market leading products for which Monodraught are renowned. These products are all manufactured within our High Wycombe factory and as R&D is in the same location as production then the highest levels of quality can be ensured.



Installation

We have a team of contract managers who will work with you and your clients from order creation through to delivery and beyond to maintenance if required. Our own team of installers work across England with partner agencies installing in Scotland, Ireland and worldwide. We will visit your site ahead of installation to ensure that all the details are covered and ensure that everything goes smoothly.



Building Simulation

To help architects and consultants deliver low maintenance, energy efficient designs within the built environment, Monodraught and building performance analysis specialist IES have developed Performance Components – a revolutionary way of modelling natural ventilation systems using the Virtual Environment Suite.



Maintenance

We can provide on-going service and maintenance of our installed products and this helps provide performance data for our customers and structured feedback that can assist product development, resulting in a system running at optimum performance and costs that are kept to a minimum.



Our Project Design Engineers are able to work with you to create the right design for your building.



Recognised as Industry Leaders

Monodraught are widely recognised as market leaders in sustainable low energy and low carbon solutions in natural ventilation, natural lighting and natural cooling. We are proud of our accreditations from prestigious independent organisations such as CIBSE and Ashden amongst others.



Awards & Accreditations

- CIBSE Building Performance Awards 2017 Shortlist- COOL-PHASE Hybrid
- Best Product/Service Range Category at the 2016 Best Business Awards
- Company of the Year 2016 Award – Buckinghamshire Business First
- Best Business in Wycombe District 2016 Award – Buckinghamshire Business First
- LUX, FX Design and Edie Awards 2015 shortlist - Sunpipe LuxLoop
- The Energy Awards 2015 finalist - Sunpipe LuxLoop
- Investors in People – The Standard for People Management
- Ashden – Award for Energy Innovation for COOL-PHASE
- ISO 9001 and ISO 14001: Established quality management and environmental management certificates.
- BSI (British Standards Institute) Members
- CIBSE Building Performance Award 2012 - COOL-PHASE



Corporate Citizenship

Monodraught are committed to working in an ethical and responsible manner. Our products and services are low-carbon and low-energy solutions, which help people be in a healthier natural built environment, and as such, we are also keen to extend these strong ethical credentials into ways to contribute to our local and wider community.

Monodraught: A place that benefits people

Our staff are one of our biggest assets and in 2015 we became a Living Wage Accredited Employer. This means that every member of our staff in our organisation earns not just the minimum wage but the Living Wage. We are always looking at ways to improve our impact on employee wellbeing and how we can help in our local community.

Community Relationships are vital and we are pleased to build on our relationship with Bucks Mind and support them in targeted strategic activities. We continue to source our materials within a 100 mile radius of High Wycombe, with 60% of our suppliers within a 50 mile radius, thereby investing in the local economy and supporting employment opportunities.



More skills, more opportunities

Our main focus in this area is in attracting, developing and retaining people through investment in skills. The Investors in People accreditation is a good example of this. Our Research and Development team also have close links with UK Universities, in particular [Brunel University](#) and [Coventry University](#) and we look forward to working with more placement students this summer.

Positive Environment

Our product set can help our customers create a more positive environment through reduced energy usage and carbon footprint. Across all our product sets we continue to look at ways to innovate and improve the built environment.

Natural Lighting

Why Choose Natural Lighting?

The most compelling reason for using SUNPIPE® systems is to introduce natural daylight to areas that don't have windows

Natural Daylight allows healthier, more productive, happier occupants and reduces carbon emissions

Improve Health

Exposure to Natural Lighting is believed to have the following benefits by boosting the production of vitamins and hormones:

- Maintains the Circadian Rhythm
- Reduces depression
- Alleviates pain
- Improves sleep pattern and mood



Health Care

Nurses commonly mention that fluorescent lighting on wards is tiring, so Natural Lighting can have a positive effect on both staff and patients.

- Typical payback period of 5-6 years
- Alleviates symptoms of Seasonal Affective Disorder (SAD)
- No maintenance - No Disruption



Offices

Productivity in offices served by Natural Lighting shows a **20% increase in output** from office employees along with reduced absences because of sickness.

It is considered that Natural Lighting systems have a marked effect on the reduction of the incidence of Sick Building Syndrome (SBS) and provide a stress-free, soothing, and far healthier office ambience by eliminating the glare and conflict of electric lighting and computer screens.



Education

In the Education sector, Natural Lighting is proven to:

- Increase achievement rates
- Reduce fatigue
- Improve health and attendance
- Enhance general development

Although most classrooms are now lit by natural means, the most common method for doing this is by using large vertical windows at the back of a classroom.

With the use of Monodraught's SUNPIPE, a classroom will provide 3 times more light, meet the daylight requirements, have a much lower internal temperature, and make a saving of 75% on daytime lighting costs.

Retail

Tests have been carried out in stores which are lit mainly by natural means.

The key finding of the study was that natural daylight was found to significantly correlate to higher sales.

An average non-daylit retail chain store monitored for this study had 40% higher sales with the addition of Natural Lighting.

During the study, customers commented:

- “This store feels cleaner”
- “It feels more spacious, more open”
- “I specifically travel to this store because I prefer the way it feels”



What is a SUNPIPE?

SUNPIPE is a Natural Lighting system that maximises the concept of renewable energy by channelling natural daylight from roofs to indoor environments.

SUNPIPES create healthier, cost-effective and more productive environments.

SUNPIPES are suited to almost any application and have been installed anywhere from residential buildings to the Olympic Handball Arena in London and Falcon Centre in Dubai. SUNPIPE are also designed for optimum efficiency and long working life, offering a **10 year guarantee**.



How does a SUNPIPE Work?

The SUNPIPE system collects daylight using a patented high impact acrylic Diamond Dome, passing it through a SUPER-SILVER[®] mirror finished aluminium tube which reflects and directs the Natural Daylight to the diffuser. The diffuser distributes the natural daylight evenly in the room.

SUNPIPE's Diamond Dome has been independently tested and proven to transmit over 20% more light than our leading competitor in overcast conditions, when light transmittance is most important.

Sunpipe[®] LuxLoop

Our latest product innovation is in hybrid lighting. The SUNPIPE LuxLoop has already been shortlisted for several lighting awards including the LUX Awards, Energy Awards and FX Design Awards

Low Energy Hybrid Lighting System

SUNPIPE LuxLoop combines the SUNPIPE natural daylight system with an incredibly efficient and intelligent LED solution.

Delivering the right light at the right time of the day: SUNPIPE directs healthy natural light from its patented Diamond Dome through the SUPER-SILVER[®] finish aluminium tube to the ceiling diffuser. In the evening or when the level of external light is insufficient to properly light the space, the system is complimented by its advanced LED by leading British manufacturer PhotonStar LED[™], and intelligently managed by the Halcyon[™] wireless control (optional).

The result is a complete and ultra-low energy lighting system, suitable for any location with guaranteed lighting performance.



Features:

- Smart controls that match LED colour temperature with natural daylight. Available in standard, smart and circadian configurations.
- Combines natural daylight with a biologically optimised LED to maintain the circadian rhythm, enabling healthier and more productive spaces.
- Reduces CO₂ emissions, lighting energy-usage and maintenance costs: The integration with SUNPIPE increases the life of the LEDs and leads to fewer replacements. Additionally, SUNPIPE is proven and tested to maintain its performance over long periods of time.
- Quadruple glazed system that minimises heat loss-gain achieving high thermal performance. Glazing Details: Clear high impact acrylic Diamond Dome complete with optional acrylic EcoShield double glazed component.
- Goretex: Breathable, waterproof vent to alleviate condensation risk.
- High performance polycarbonate diffuser for uniform distribution and low glare. Meets both LG7 - Office Lighting and UGR19.
- Conversant with microwave sensors and emergency options.
- Works on its own controls or with existing lighting systems/controls.
- Luminaire delivers up to 4000 lumens. SUNPIPE delivers 4460 lumens in full summer sun.
- Design life of 20 years and a 5 years warranty.

Technical Information

SUNPIPE Selection Criteria

The process to choose the correct system for your building application is described below:

Please note SUNPIPE LuxLoop is only available for the 300 mm SUNPIPE system.

1. Choose Diamond Dome or Square SUNPIPE:

Diamond Dome



Square SUNPIPE



2. Choose Roof Type:

Pitched



Pitched Gallery



Flat



3. Choose Roof Finish:

Plain Tile Roof



Slate Roof



Bold Roll Roof



Flat Felt/Asphalt Membrane Roof



Flat EPDM Rubber Roof













Contact us for more information on metal roofs.

4. Choose from our range of ceiling diffusers for SUNPIPE or SUNPIPE LuxLoop
5. Choose Additional/Optional Components (Please refer to page 12)
For SUNPIPE LuxLoop Only: Please choose control option on page 15

Product Components

Above Roof Components

<p>Diamond Dome SUNPIPE</p> <p>As standard we use high impact acrylic in our patented Diamond Domes which maximises the penetration of natural daylight.</p> 	<p>Sealing Gasket</p> <p>Brushed nylon condensation sealing gasket.</p> 	
<p>Gore® Vent Technology</p> <p>GORE vent technology uses a waterproof membrane whilst still allowing the pipe to breathe. This ensures the pipe is completely sealed against dust and water ingress and ensures that there will be no condensation on the inside of the dome.</p> 	<p>Code 4 Lead Flashing and ABS Collar</p> <p>Mouldable to suit any profiled/bold-roll tile, providing a completely watertight finish. Supplied with an ABS collar for diamond dome mounting.</p> 	<p>Composite EPDM Flashing Plate</p> <p>The Composite EPDM Flashing Plate is fully watertight and is designed to meet strict installation procedures for weathering into a flat rubber-cover roof.</p> 
<p>ABS Flashing Plate</p> <p>The ABS flashing plate is manufactured from 3.5 mm thick ABS, capped with PMA for a long lasting, durable finish.</p> <p>It is suitable for the majority of slate roofs.</p> 	<p>EcoShield</p> <p>When combined with the double glazed Micro Prism diffusers, the EcoShield effectively makes the SUNPIPE system a quadruple glazed system ensuring an extremely low U-value and sound transmission through the system.</p> 	<p>Galvanised Flashing Plate and ABS Collar</p> <p>Manufactured from 0.8 mm galvanised mild steel which is corrosion resistant and suitable for felt, membrane and asphalt roof finishes. Supplied with an ABS collar for dome to fit mounting.</p> 
<p>Squared Rooflight Frame</p> <p>690 mm x 780 mm rooflight with a double glazed cover measuring 475 mm x 570 mm which finishes virtually flush with the roof surface. Supplied with code 4 lead skirt to enable suitable weathering. A square to circular transition piece completes the arrangement.</p> 	<p>ABS Flashing Plate with Weathering Skirt and Foam</p> <p>Manufactured from 3.5 mm thick ABS capped with PMA for a long lasting, durable finish. It is suitable for the majority of plain tile roofs. Supplied with code 4 lead flashing for suitable weathering.</p> 	

Below Roof Components

<p>The Pipe SUPER-SILVER finish aluminium tube</p>		
 <p>610 mm Extension Pipe</p> <p>The 610 mm extension pipe is manufactured from a silverised PVD coated mirror finished aluminium with a total reflection of 98%.</p>	 <p>610 mm Plain End Pipe</p> <p>The 610 mm plain end pipe is manufactured from a silverised PVD coated mirror finished aluminium.</p>	 <p>Slip Length</p> <p>The 250 mm ceiling extension is manufactured from a silverised PVD coated mirror finished aluminium.</p>
<p>Elbows</p>		<p>Ceiling Diffusers</p>
 <p>45° Adjustable Elbow</p> <p>The 45° adjustable elbow is manufactured from a silverised PVD coated mirror finished aluminium.</p>	 <p>30° Adjustable Elbow</p> <p>The 30° adjustable elbow is manufactured from a silverised PVD coated mirror finished aluminium.</p>	 <p>Choose from our range of ceiling diffusers the style that best suits your project.</p>

Ceiling Diffuser Options

SUNPIPE



SUNPIPE LuxLoop



Panel:

Suitable for standard 595 mm x 595 mm suspended ceiling grids.

Efficacy up to 90 luminaire lumens per circuit watt.



Surface Mount:

Plasterboard and similar. Suitable for all surface mount applications including vertical and horizontal faces.

Efficacy up to 83 luminaire lumens per circuit watt.

Control Options:

- **Standard:** Switch operated on/off
- **Smart:** Fully automatic and reactive to illumination and motion.
- **Circadian:** Wireless, biologically optimised and fully customisable.

SUNPIPE DIMENSIONS						
	230	300	450	530	750	1000
SUNPIPE Diameter [mm]	230	305	457	535	750	1000
Roof and Ceiling Opening Ø [mm]	250	320	470	550	770	1020

Additional Components (Optional)

Security Bars

Provides extra security by means of integrating stainless steel security bars which do not impact the light output of the system.



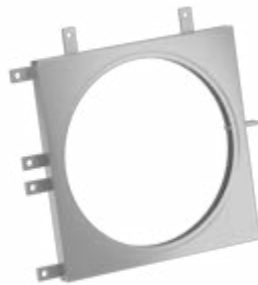
Sound-guard

Sound-guard ceiling diffusers can be used in place of the standard polycarbonate diffusers to provide sound attenuation of up to 37dBa.



Fire Collar

Intumescent 'Fire Choke' Fire collars can be integrated within the system to prevent the spread of smoke and fire through the roof to give up to 2 hours protection.



Motorised Shut Off

Features a butterfly light shut-off damper controlled by a 230V motorised actuator for use in areas such as Lecture Theatres, Conference Halls etc.



Fire-guard

Fireguard ceiling diffusers can be used in place of the standard polycarbonate diffusers to provide up to 1 hour fire resistance. (Larger ceiling opening required).



- 610 mm Extension Lengths and 30° - 45° Adjustable Elbows.
- Other bespoke arrangements are available. For sizing guidance or further details, please contact Monodraught Head Office

Performance

Diameter (mm)	Maximum Light Output			Area Lit (To a normal daylight level)
	Full Summer Sun 75 klux	Overcast Summer 50 klux	Overcast Winter 25 klux	
	Lux Value	Lux Value	Lux Value	
230	337	225	112	7.5 sq.m (approx 80 sq.ft)
300	607	404	202	14 sq.m (approx 150 sq.ft)
450	1452	968	484	22 sq.m (approx 230 sq.ft)
530	2052	1386	684	40 sq.m (approx 430 sq.ft)
750	4238	2825	1413	50 sq.m (approx 530 sq.ft)
1000	7675	5117	2558	60 sq.m (approx 650 sq.ft)

Technical Performance

U-Value

SUNPIPE's U-Value compares favourably alongside a double glazed roof-light.

As the actual area of a SUNPIPE is only a small percentage of that of a typical roof-light, the contribution to heat loss from the building or heat gain is greatly reduced.

The performance of SUNPIPE has also been assessed as part of a European Study of light-pipe performance, TC3-38. The introduction of the double glazed ceiling diffusers has further enhanced the U-value of SUNPIPE, lowering the figure to 1.66W/m²K for a typical application of 1.5 m length of SUNPIPE - This is further improved to a value of 1.38W/m²K when incorporating the EcoShield.

Acoustics

Multilayer Soundguard™ laminated glass can be incorporated into SUNPIPE ceramic ceiling diffusers, and provides a performance of RW 37 dB (Rtra 33 dB).

Lengths & Bends

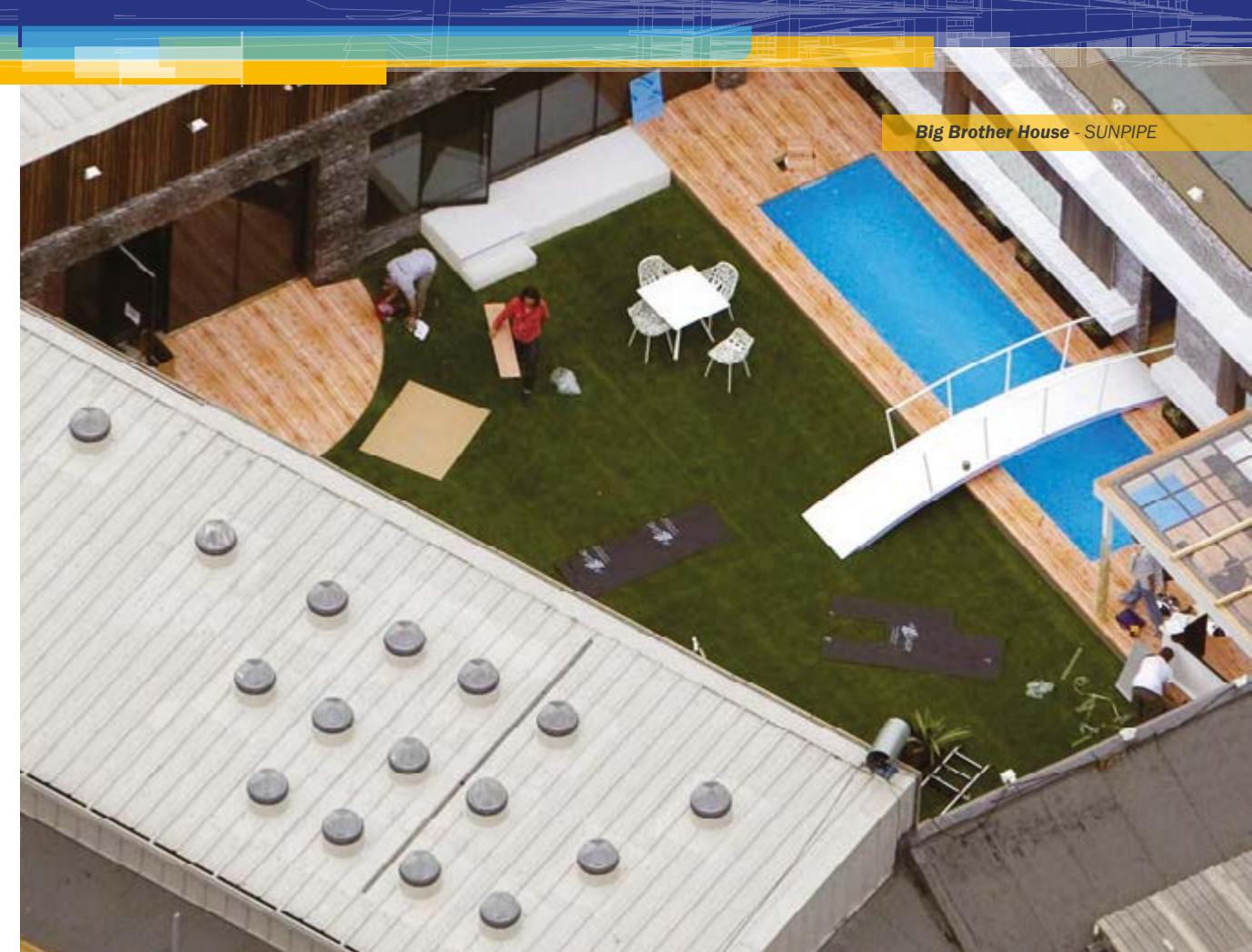
Smaller sizes have a recommended total maximum pipe length of 8 m. Larger sizes allow for longer lengths to be used.

There is a 12% reduction of light output for each 45° bend used and there is a 6% reduction in light transmission for every metre of SUNPIPE.

30° & 45° adjustable elbows can be used with all SUNPIPE applications to direct daylight to where it is required.

Standards

- BS EN ISO 14001 and BS EN ISO 9001
- The FireGuard ceiling diffuser has been tested to comply with BS 476-20: 1987
- The Fire Choke collar has been fully tested to current British and European standards (test report TE 39902)



CE Marking

SUNPIPE is classified within the following:

- EU Directive: Construction Products Directive **89/106/EEC**
- EU Harmonized Standard: **EN 1873:2995**



SUNPIPE Advantages

- Generally no structural alterations required, easily fits between joists and rafters
- No maintenance required
- Top domes are self-cleaning due to their shape

SUNPIPE LuxLoop Additional Information

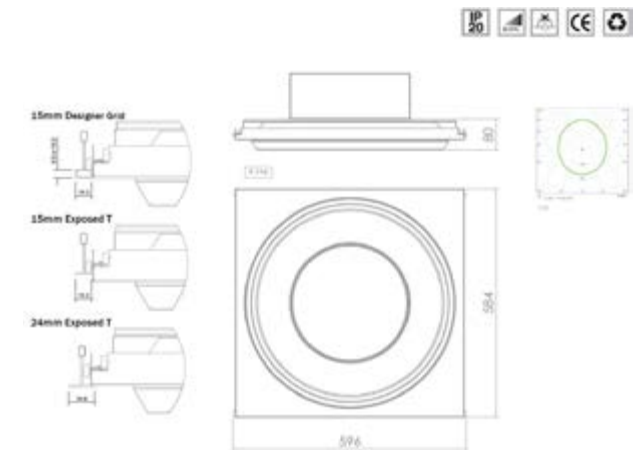
Performance:

- Natural daylight output: 4460 in full summer sun (105 k lux).
- LED output: up to 4000 lumens.
- Colour temperature of LEDs tunable from 1800 k to 7000 k.
- Efficacy of up to 83 lumens per circuit watt.
- 120° beam angle.
- Dimmable.
- Standards: BS EN ISO 14001 and BS EN ISO 9001. The Fire Choke Collar has been fully tested to current British and European Standards (test report TE39902).

PERFORMANCE DATA			
	SUNPIPE LuxLoop Standard	SUNPIPE LuxLoop Smart	SUNPIPE LuxLoop Circadian
Description	High Efficiency	High Efficiency	Tunable 1800 k - 7000 k & RGB
Illuminance comparable to	4 x 14 W T5/4 x 18 W T8	4 x 14 W T5/4 x 18 W T8	-
Light Engine Power	30 W	30 W	38 W
LED (Source) Lumens (L100)	3724 lm	3724 lm	3945 lm
Luminaire / System Power	30 W	30 W	38 W
For Drivers: I / Vmax	N/A	N/A	N/A
Optic	-	-	Diffuser
Beam Angle	120° / VW	120° / VW	120° / VW
Luminaire Efficacy >80R34000k	83 lm/cW	83 lm/cW	79 lm/cW @ 6500 k
Initial / Maintained SDCM	<3 / <3	<3 / <3	<3 / <3 @ 6500 K
Rated Life (hours)	50,000	50,000	50,000
Lumen Maintenance Category	Cat 1 / Code 9	Cat 1 / Code 9	Cat 1 / Code 9
Dimmable	No	Yes	Yes



Panel:

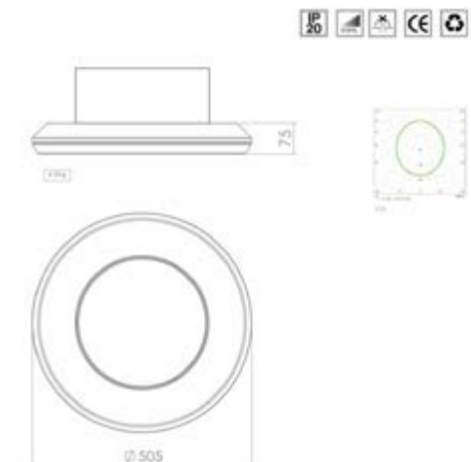


Dimensions:

- 305 mm Dia SUNPIPE.
- 320 mm Dia roof opening required.
- 595 mm x 595 mm LED suspended ceiling grid diffuser.



Surface Mount:



Dimensions:

- 305 mm Dia SUNPIPE.
- 320 mm Dia roof opening required.
- 505 mm LED surface mount diffuser.

*Diamond Dome SUNPIPE - Pitched Roof Exploded View
(Other Product Options are also available)*

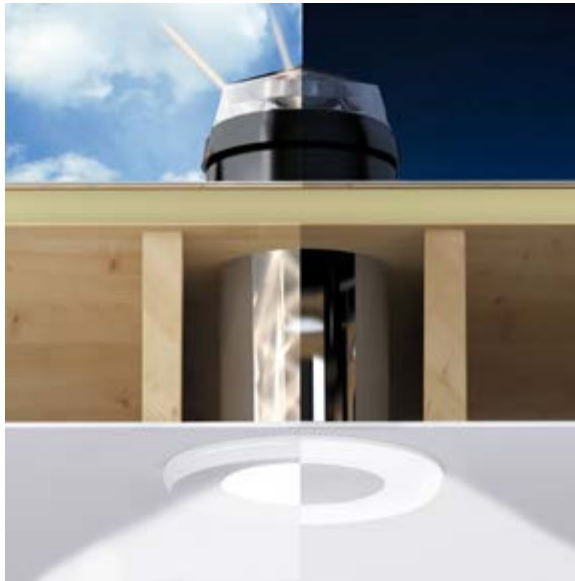
Deliver the Right Light at the Right Time

SUNPIPE LuxLoop Controls the Circadian Rhythm

Halcyon™ is the only intelligent wireless lighting system that has been optimised for your biology to deliver the right light at the right time of the day. Halcyon™ emulates changing daylight for health, wellbeing, productivity and improved sleep. The system also offers automated energy saving benefits through wireless lighting control.

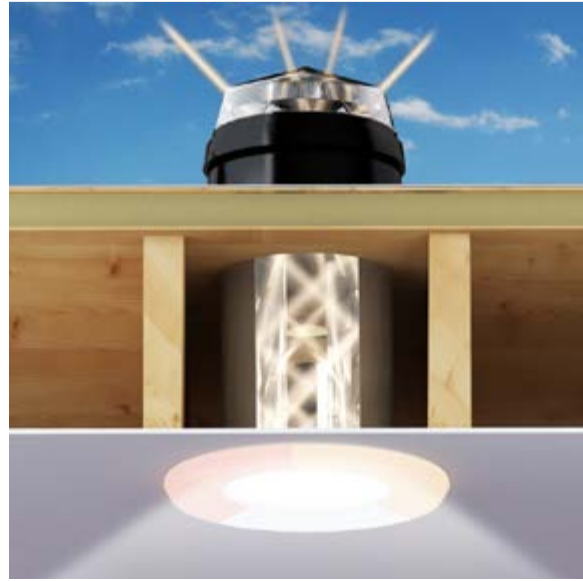


Modes of Operation



Standard:

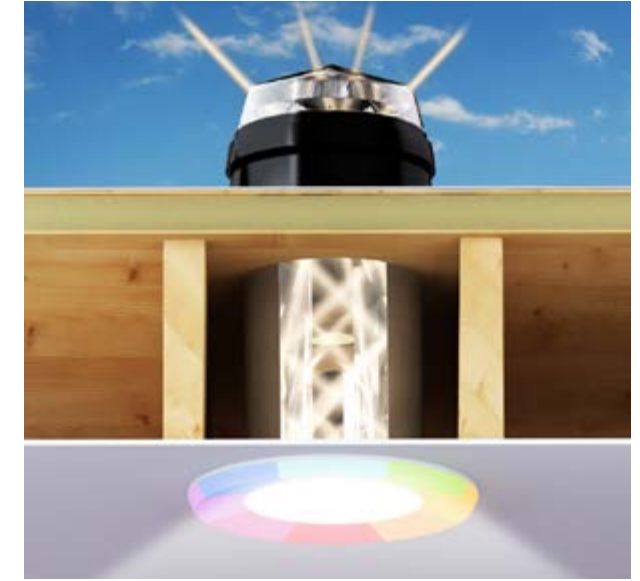
No controls. SUNPIPE LuxLoop operates on a standard ON/OFF switch (by others). Non-dimmable, fixed white 4000 k.



Smart:

SUNPIPE LuxLoop functions with a combination of 1-10V driver and Daylight Harvest sensor for fully automatic control. System operates as detailed below:

- When there is sufficient daylight, the LuxLoop will not turn on regardless of movement.
- When there is insufficient daylight, the lights will dim when it senses movement to maintain the specified lux level.
- It continuously monitors the level of daylight and dims the lights accordingly.
- The lights dim to a standby level if no movement is detected and daylight levels are insufficient.
- After a standby period has elapsed the lights will turn off automatically.
- The light is a fixed white 4000 k.
- 1 sensor per area to be served (normal sized office for 10 people), additional sensors may be required for large areas.



Circadian:

The SUNPIPE LuxLoop Circadian comes with the wireless control system which changes the colour of the LuxLoop as the colour of the natural daylight changes over the course of the day. It can also display a full RGB spectrum of colours and 1700 k - 7000 k white light. The systems can be controlled through a wireless network using any device which has an internet browser, enabling the users to set their own controls and scenes, have full control over individual luminaires or leave the system to run automatically.

- On Circadian Automatic setting (default) the colour of the luminaire matches the colour of natural daylight – helping the occupants to maintain a healthy Circadian Rhythm and promoting healthy bodily function.
- The system is fully customisable – preset scenes and schedules can be defined by the user.
- Areas and individual luminaires can be controlled together or independently.

For more details on Halcyon please visit [PhotonStar](http://PhotonStar.com) website.

**The healthiest
lighting available**

Note: Other lighting control drivers are available on request.

At Monodraught we pride ourselves on the quality of our engineering. Because of this, we design our systems very carefully in accordance with the message we want to convey:

- Performance
- Innovation
- Sustainability
- Reliability

In the tubular skylight industry clients are often presented with hypothetical theories asserting figures that claim superior performance.

The most prominent of these alleges that the **reflectance of the tube material is a direct representation of the lighting performance of the system, which is often displayed as the efficiency of the system.**

Further, light redirecting technology is often promoted without measurable data detailing how these technologies perform in a real world environment.

What Monodraught have attempted to quantify in our comparative testing is why **SUNPIPE should be your only logical choice of tubular skylight.**

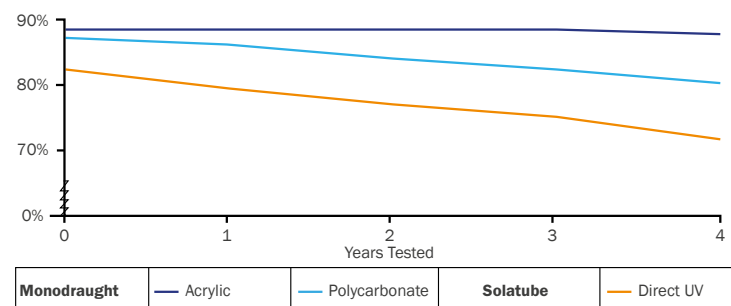
If a polymer laminate is used in a tubular skylight without being properly shielded from UV light it will suffer a large drop in performance. However, if it is protected by polycarbonate, the polycarbonate material will also lose performance and discolour

We subjected one of our SUNPIPE Natural Lighting systems to both a Light Transmittance Test and an Accelerated Ageing Test against Solatube to compare the systems.

SUNPIPE uses SUPER-SILVER mirror-finish aluminium for our tubing rather than a polymer laminate that can be found in other products. We avoid using polymer laminates because;

- Promised high performances quickly deteriorate over time
- They lead to further problems within the pipe, such as de-lamination
- They are susceptible to longer UV wavelengths that are particularly difficult to filter

Conclusions



Light Transmittance

Dome Material Samples were tested for Light Transmittance;

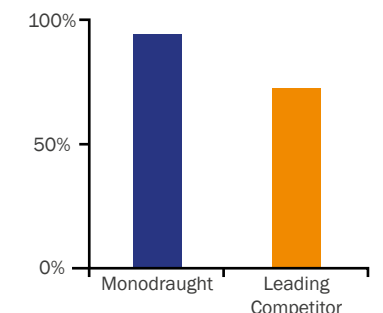
- Monodraught's Acrylic Dome Sample suffered almost no drop in light transmittance
- Solatube's Polycarbonate Dome Sample suffered a 10.1% drop in performance, and had the lowest initial transmittance measurement

Full Dome Light Transmittance

The three domes from which the samples were taken were also tested, unmodified, for their light transmittance. This is to clarify what effect the light redirecting technology in each dome had on the total light transmittance.

- Monodraught's Acrylic diamond dome had the highest light transmittance, 90.2%
- Solatube's dome had the lowest, only 74.2%

It is therefore feasible that the light redirecting technology in the Solatube's dome construction actually has an adverse effect on light transmittance under the testing conditions (CIBSE simulated overcast sky).



Specular Reflectance

The specular reflectance of each of the pipes were tested, determining which would perform better for the longest time; Solatube polymer laminated film's specular reflectance dropped dramatically when exposed to UV radiation

Monodraught's SUPER-SILVER mirror-finish aluminium only experienced a very minor change in reflectance when exposed to direct UV light and negligible performance drop when covered by both Acrylic and Polycarbonate domes

Put simply, your SUNPIPE system will still be performing in Year 5 just as it was at the date of purchase!

Inner light pipe sample	Reflectance before ageing (%)	Reflectance after 1000 hours artificial ageing (%)	Reflectance after 2000 hours artificial ageing (%)	Reflectance after 3000 hours artificial ageing (%)	Reflectance after 4000 hours artificial ageing (%)	Performance Change
Monodraught sample 1 (aged behind Monodraught acrylic dome sample)	93.5%	93.2%	93.2%	93.4%	92.8%	-0.7%
Monodraught sample 2	93.6%	92.5%	91.4%	91.5%	90.8%	-2.8%
Monodraught sample 3 (aged behind Monodraught polycarbonate dome sample)	93.3%	93.5%	92.8%	93.0%	93.3%	0%
Monodraught sample 4	92.9%	92.2%	91.5%	91.0%	91.1%	-1.8%
Solatube sample 1 (aged behind Solatube polycarbonate dome sample)	98.4%	98.3%	97.9%	97.5%	97.6%	-0.8%
Solatube sample 2	98.7%	94.6%	87.6%	66.0%	16.0%	-82.7%
Solatube sample 3	98.8%	94.7%	86.3%	57.0%	13.9%	-84.9%
Solatube sample 4	98.8%	94.6%	86.9%	67.6%	21.0%	-77.8%

SUNPIPE Projects



The Copper Box - Olympic Handball Arena

London

Having used the SUNPIPE Natural Lighting systems on previous projects, Make Architects entered into discussions with Monodraught to investigate the possibilities of using SUNPIPE technology to meet the strict environmental criteria of sustainable energy on the project. Make Architects specified a system that could deliver a 4% daylight factor.

Working with ARUP Consultants, Monodraught presented a scheme that included eighty-eight 1500 mm diameter SUNPIPES positioned strategically around the field of play. The systems also needed to be adaptable, so light shut off dampers were included along with special acoustic laminated glass.

Due to the nature of the project and the amount of congestion expected near the Olympic site, the systems were manufactured off site and delivered in sections ready to be installed on site.

CIC Zero Carbon Building

Hong Kong

ZCB is the first zero carbon building in Hong Kong and was selected as a finalist in the World Architecture News sustainable building of the year award for 2014. The concept of “Zero/Low-carbon” Building involved the integrated environmental design on one hand, such as heat island mitigation, reduction of solar heat gain through building envelope, natural ventilation and daylighting optimization strategies for low energy consumption, and on the other hand, the use of renewable energy and state-of-the-art clean technologies for on-site energy generation. Over the course of the year, a building is said to achieve “zero-carbon emissions” when it harvests sufficient non-fossil fuel energy to account for its carbon footprint fossil fuel use.

Being one of the landmark projects in the industry, all the products applied in this project were selected and approved for HK BEAM Plus Platinum green award for building. This certificate is granted by the Hong Kong Green Building Council.

Assistant Manager - Technical Services, ZCB - CIC Secretariat said “The Sunpipe brings daylight deeper into the office space/exhibition space. The Sunpipe has worked well and it can be quite bright, visitors are often surprised and impressed that it is natural light. The quality of the light is most impressive as it is warm in colour. The colour of the light is warm compared to cooler whiter daylight that illuminates the ECB eco-office on the northern side of the building (with a large glazing area). I think that staff generally prefer natural light and would be more productive”





Sainsbury's

Gloucester Quays

Sainsbury's 50,000 sq. ft. Gloucester Quays eco-store extends the lead taken by the supermarket chain's Dartmouth store by installing Monodraught SUNPIPE Natural Lighting systems throughout the building. As electricity reduction is a high priority at Gloucester Quays, Sainsbury's has ensured maximum use of natural daylight by installing a total of 146, 750 mm SUNPIPES in the roof.



Waitrose

Altrincham

Monodraught worked in partnership with supermarket Waitrose to develop a retail lighting unit, featuring a SUNPIPE integrated into an artificial light fitting. The system, is designed to maximise the use of natural daylight, while controlling and balancing it with artificial light.



The British School (Interior Design)

Abu Dhabi

Originally the Architect wanted a series of free form rooflights, but such is the intense heat of the sun in the Middle East the Architect opted for a series of SUNPIPES arranged not in a uniform pattern but formed part of the interior design by providing quite a spectacle of Natural Light. One 1000 mm diameter SUNPIPE was installed to the central Library and this in itself forms a focal point of a flood of Natural Light to this area, which draws comment and praise from many visitors to this rather unique institution in the middle of Abu Dhabi.

Poole Hospital

Dorset

The Sandbanks ward at Poole Hospital includes a greater number of single rooms to improve patient privacy. The refurbishment concentrated on bringing a brighter, more modern environment for people who have to undergo a hospital stay.



New Brentwood Resource Centre

Brentwood

The new centre is a modern, purpose built facility, which houses mental health outpatient, day care and therapy services for adult and older people in the Brentwood Locality. The completion of the resource centre has brought together a number of services which previously were operating in various buildings around the High Wood Hospital site.

Natural daylight was considered of prime importance on this new build development with the Natural Lighting systems utilised on the central corridors and to several of the treatment centres to increase the level of natural daylight over the level provided purely by the windows.



Basildon Hospital (Retrofit)

Basildon

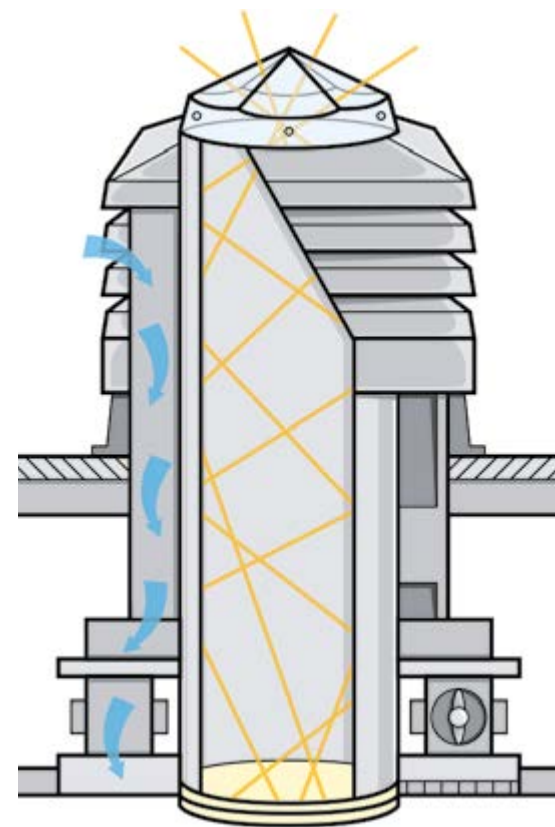
Our SUNPIPE Natural Lighting systems were chosen to replace ageing roof lights which originally provided daylight to internal corridors.

As part of a ward refurbishment project, Monodraught SUNPIPES were fitted directly over the existing skylights, ensuring a smooth and easy installation with minimal disruption to the hospital's patients and staff.

SUNCATCHER

What is SUNCATCHER?

The Monodraught **SUNCATCHER** systems are a method of effectively **conveying Natural Lighting and Natural Ventilation from roof level**, down into the building below by combining the principles of the Monodraught WINDCATCHER® system with the SUNPIPE system.



How Does SUNCATCHER Work?

The WINDCATCHER is divided internally into four quadrants so that one or more face into the wind. Any prevailing wind pressure carries a continuous fresh air supply through weather protected louvres on the windward side of the system at roof level.

The wind movement is encapsulated by internal quadrants which turns the wind through 90° forcing the air down through internal ducts into the room below.

Warm stale air is expelled from the room by the passive stack ventilation principle of differential temperatures and the natural buoyancy of air movement. Manual or motorised dampers at the base of the system control the rate of ventilation.

The SUNPIPE collects daylight using a patented Diamond Dome, passing it through a SUPER-SILVER mirror-finished aluminium tube, finally distributing it evenly through use of a ceiling diffuser.

To learn more about how the SUNCATCHER system could benefit your project please contact our head office.

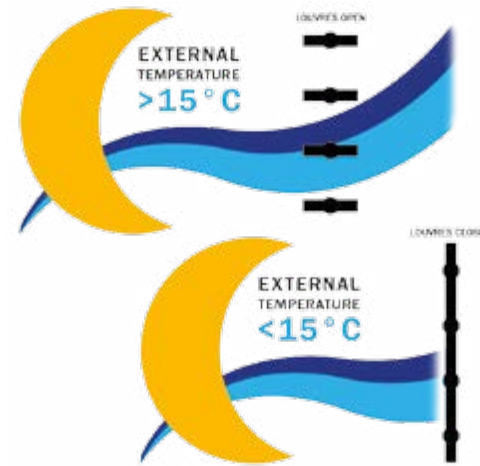
Night Time and Mid-Season Operation

During mid-seasons, in the evenings, or at weekends, when the building is perhaps unoccupied, the SUNCATCHER system is not dependent on openable windows or vents in the side of the building, which allows the building to be fully secured.

With all external windows closed, the Monodraught SUNCATCHER will still continue to operate providing all the benefits of this Natural Ventilation.

This is particularly important at night time where the system will cool the room ready for the next day, removing all heat from the fabric of the building.

Volume control dampers at the base of the system at ceiling level will precisely control the amount of airflow through the system. If the internal temperature falls below 15°C the dampers will automatically close to prevent over-cooling.



Summer Operation

In the summer months, perimeter windows can be utilised to aid cross flow ventilation. With fresh air coming in through the windows on the windward side of the building, stale air will be exhausted through the passive stack element of the SUNCATCHER system.

Warm air will naturally rise to ceiling level but at the same time any prevailing wind on the SUNCATCHER system carries a supply of fresh air down into the room below, thereby slightly pressurising the building and increasing the outward flow of stale air.

Winter Operation

To minimise ventilation heat loss, control is essential to ensure that the ventilation rate is continuously matched to meet occupant loading and to prevent excessive air change rates during unoccupied periods. Such control can most efficiently be achieved by ensuring that the building structure is airtight and by monitoring and maintaining carbon dioxide concentration in the 1000 ppm to 1500 ppm range.

At night time, demand for ventilation is greatly reduced and ventilation heat loss can largely be eliminated. Natural Ventilation may therefore be expected to provide reliable winter ventilation, at the full rate demanded by occupants, without resulting in excessive energy loss.

The SUNCATCHER system is controlled by manual or fully modulating dampers, linked to temperature or CO₂ sensors which in turn can be linked to a fully automatic control panel, our Monodraught iNVent 2 control system.

SUNCATCHER Projects

The Priory Neighbourhood Centre

Hastings

This was a major refurbishment project funded by English Partnership in 2004, whereby the existing building was transformed into a state of the art community centre.

The refurbishment was undertaken with a view to using sustainable energy principles wherever possible. This included a sedum roof and the use of photovoltaic panels.

The consultants, PJR, contacted Monodraught to design a system that was in keeping to the philosophy of the building.

Two GRP 1200 SUNCATCHER systems with integral 650 mm diameter SUNPIPES were installed to provide Natural Lighting and Ventilation to the café and IT areas. These systems were ideal as they met with the design philosophy in one neat package.



M&S

Galashiels

The 9,000 sq ft Galashiels store features 12 SUNPIPE systems and three GRP 800 Square SUNCATCHERS among other 'eco-features' that significantly reduce its carbon footprint and improve its energy efficiency.

M&S claims the store uses up to 25% less energy and emits up to 95% less carbon dioxide than an average Simply Food store.

The Galashiels store has been a test bed for developing new initiatives that have since been rolled out in other Simply Food stores across the UK.



Tesco Express

Hinkley

The first Tesco convenience store to be built in their new environmental format. The use of Monodraught SUNCATCHER, WINDCATCHER, and SUNPIPE systems helped to create a comfortable environment for customers and staff alike.

Blackberry Hill Hospital

Bristol

A Combination of WINDCATCHER, SUNPIPE and SUNCATCHER systems were specified to provide the ward corridors, central hub, and main building with a supply of Natural Light and Ventilation.





Primark


East Ham

17 SUNCATCHER systems were installed at the Primark store in East Ham, mainly providing Natural Lighting and Ventilation to offices. A further 3 WINDCATCHER systems and 42 SUNPIPES also help to create a comfortable shopping experience, at little cost.



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