

ZUMTOBEL STAFF
THE LIGHT ®

MIROS
“Satelighting”

www.zumtobelstaff.com/miros



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MIROS
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The fascination of reflected light



Projector – wall-mounted version

Contemporary architecture calls out for modern lighting systems that can meet both aesthetic and functional requirements. Open, lofty interiors place particularly high demands on form and function. [Projector-mirror technology](#) offers the optimum solution to this lighting challenge.

We can send light into places that are difficult for us to access, in order to distribute this light evenly back into the room. Fascination, functionality and efficiency were the themes of our Miros development. Equally important to us were clear lines, universal adjustability and high system quality.

The reflector unit has a very flat design and can be supplied in various sizes depending on the task. The circular or square design of the mirror means it is easy to fit in any ceiling construction. Unwanted glare is prevented by the multi-spherical surface structure of the mirror.

The multifunctional housing enables straightforward mounting even in awkward positions.

MIROS DESIGN CHARLES KELLER



“The spatial separation of light source and reflecting surface opens up new lighting dimensions for architectures. High-ceilinged rooms and large spaces can have focussed lighting – simply fascinating.”

[Charles Keller](#),
Designer of the MIROS
projector-mirror “satelighting”
system.



The projector

Technology and perfection



Concentration of the light

The high technical quality of the projector makes it an impressive light source, as does the attractive, minimalist design with its functional outlines. The light from the projector is highly concentrated, minimising scattering losses when reflected from the mirror.

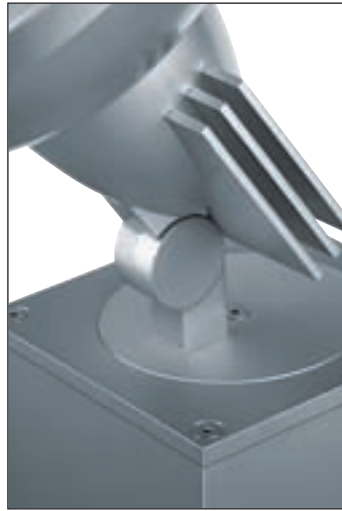
Perfect focussing and low beam divergence are guaranteed by an exact computer-designed reflector structure. The circular louvres and integrated lamp shielding element prevent glare from the extremely bright light source.

The ballast housing and reflector unit are designed to IP 54 protection, and can therefore also be used outdoors as well.

Mobile and cool

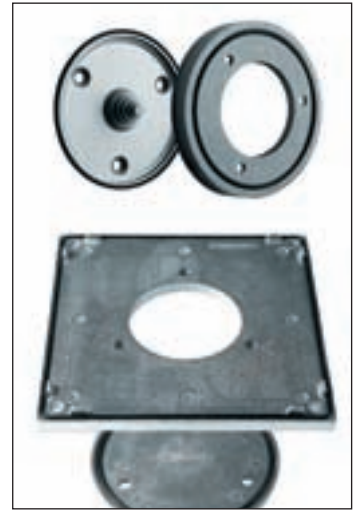
A long-lasting reliable mechanism for aligning and fixing the reflector head is essential for a good projector-reflector system. The reflector head can rotate through $2 \times 60^\circ$, and can tilt through 1° to 100° . The position on each axis can be secured by simply and reliably using a locking screw.

Ribbing around the reflector head provides optimised heat dissipation for an ideal lamp operating temperature.



IP 54 protection

IP 54 protection means that projectors can also be used outdoors. Possible wind loads must be borne in mind in the case of the reflector.



Laser pointer

The laser pointer helps align the projector with the reflector. Important: Do not remove the protective film before alignment or you will not be able to see the laser dot on the reflector.



Anti-glare protection

The standard projector uses circular louvres with an integrated lamp shielding element to provide the necessary glare protection, to afford protection against looking straight into the lamp, and to prevent unwanted multiple irradiation of reflectors and annoying excessive irradiation.



Lighting task

Different tasks need different lighting. Different light sources are therefore available to suit different requirements and applications.



The mirror

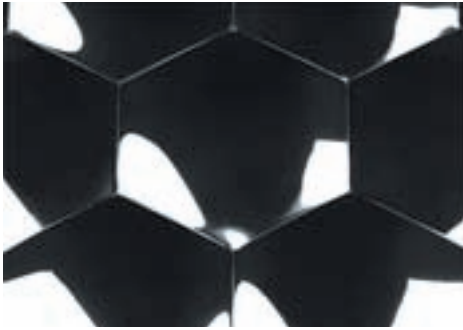
Aesthetics and perfection



The reflection spectrum

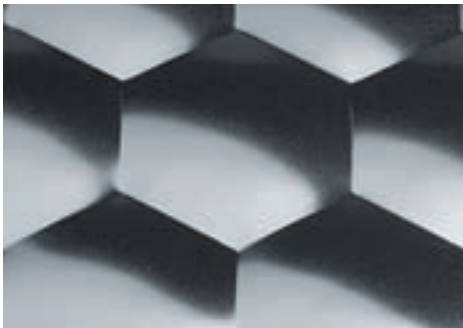
A multi-faceted reflector. Shimmering brilliance in an attractive, simple design implemented in top-quality material makes this mirror a “highlight” in high rooms.

Various shapes and surface structures as well as different beam divergence angles are available, providing a platform for individual and innovative lighting designs. Whether a circular or square optic, in highly-polished, satin matt or perforated finish, the abundance of choice provides plenty of options to meet the widest range of architectural and technical lighting requirements. Multiple spherical surfaces reflect the incident light, resolving the reflection of the light into numerous separate images. This ensures uniform light distribution and low glare. Standard versions are available ex-stock, with other designs available on request.



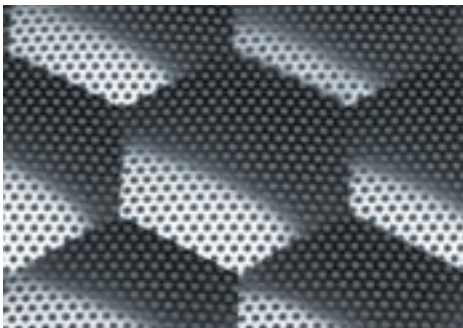
Highly specular surface

Exclusively directional reflection of light. Outside the light cone, the reflector appears "dark".



Semi-matt surface

Slightly diffuse component of reflected light for soft transitions. Luminance levels are perceptible on the reflector even with oblique light incidence.



Perforated sheet steel optic

Same properties as for semi-matt version but with 20 % transmission component. Light for brightening up the ceiling and throwing soft shadows behind the reflector.

Mounting method

The reflectors are practically maintenance-free, and can be fixed onto any standard supporting surface because of their low intrinsic weight.

The mounting plate is made of die-cast aluminium in RAL 9006, with two fixing points, and three-point support. Comes with a screw-in suspension tube of various lengths to suit the reflector diameter.



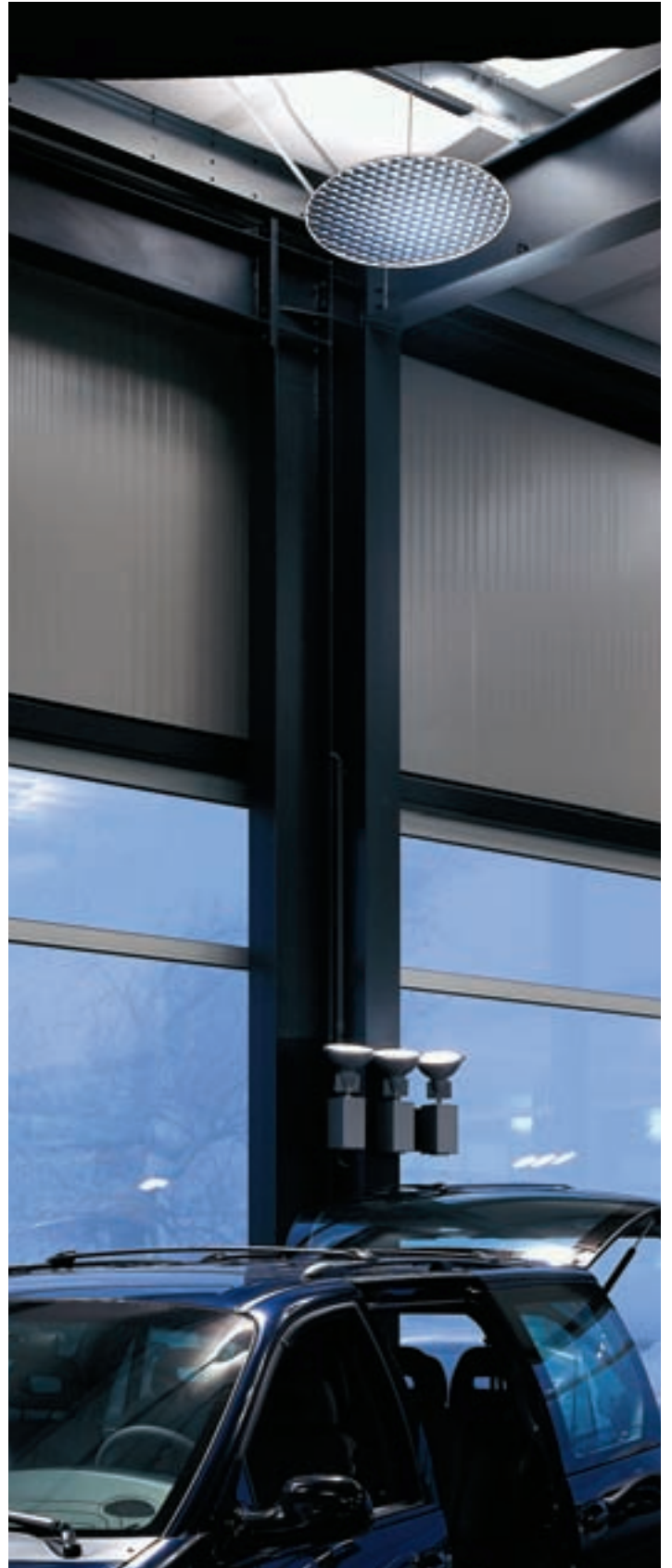
Adjustment

The reflectors are easy to align and secure. The reflector angle is adjusted via a ball-and-socket joint integrated into the suspension tube, and can be fixed with a screw. The risk of the reflector shifting out of alignment is minimal, even during cleaning.



Projector-mirror “satelighting” system

Applications

















Installation

The projector is designed for a range of fixing options. A three-piece fixing set consisting of

- mounting ring
- projector fixing ring
- cover plate

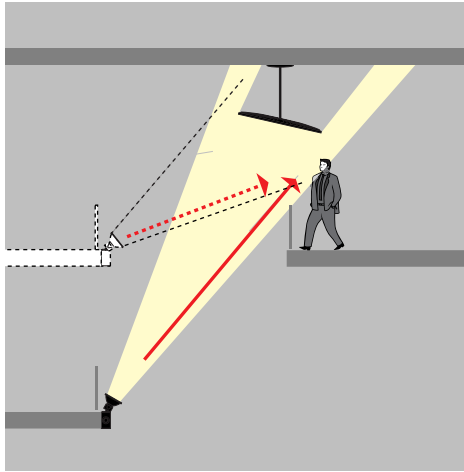
enables flexible installation with in-situ electrical wiring.

Fit the wall plugs into the wall or floor before letting them support the entire weight of the projector. Once the mounting ring has been installed, simply place the projector on it and secure it by means of two Allen screws. The fact that the electrician has both hands free to make electrical connections makes this a straightforward job because the projector is already fully physically installed.

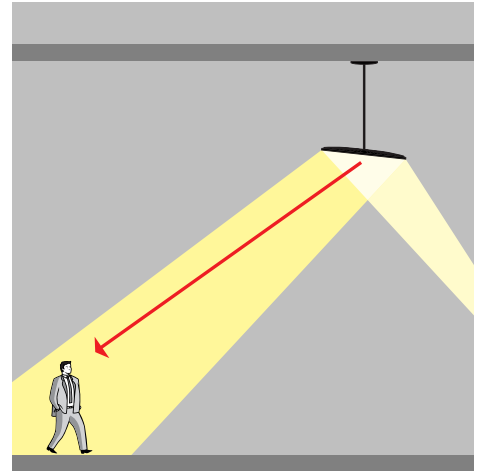
| VERTICAL MOUNTING | WALL | FLOOR | HORIZONTAL MOUNTING |
|---|--|---|---|
|  | <p><i>Use three wall plugs to fit mounting ring, allowing length of wire to protrude (approx. 400–500 mm).</i></p> |  |  |
|  | <p><i>Feed power lead through the housing, and place the projector on the mounting ring.</i></p> |  |  |
|  | <p><i>Secure and align on mounting ring by means of two Allen screws.</i></p> |  |  |
|  | <p><i>Connect power supply to lamp in separate wiring compartment.</i></p> |  |  |
|  | <p><i>Secure cover plate by means of three Allen screws.</i></p> |  |  |

MIROS design

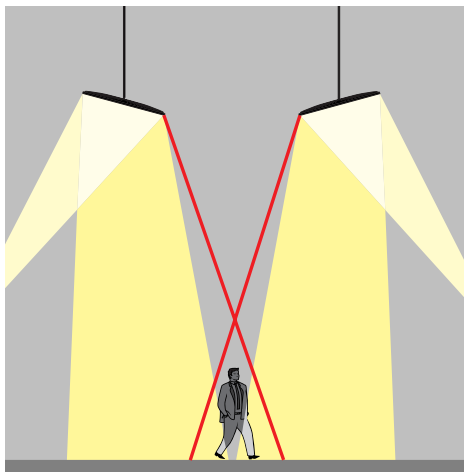
At a glance – the most common design mistakes



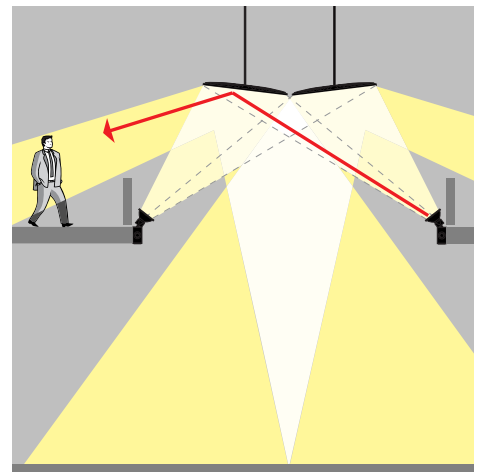
Glare caused by projector with direct scattered light or spill. When the projector is used properly, a special glare-protection louvre reduces this critical effect.



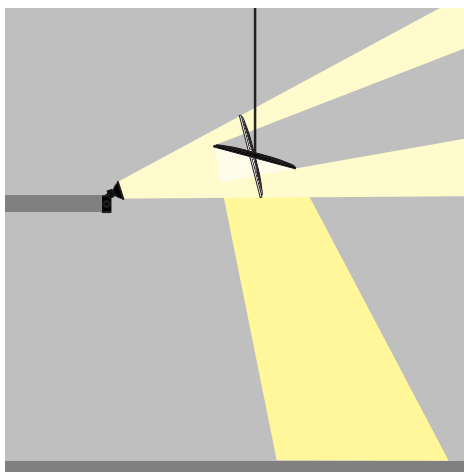
Glare caused by mirror which is set at too shallow an angle (50° max.). This allows direct viewing of critically high luminance.



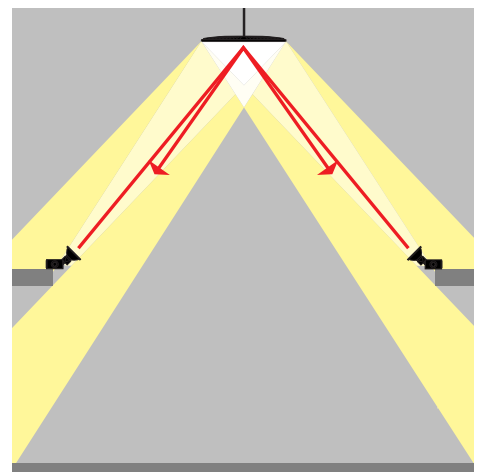
Light cones do not overlap sufficiently. The floor is well lit but the cones of light do not overlap sufficiently; light cones must start to overlap at a height of at least 2 metres.



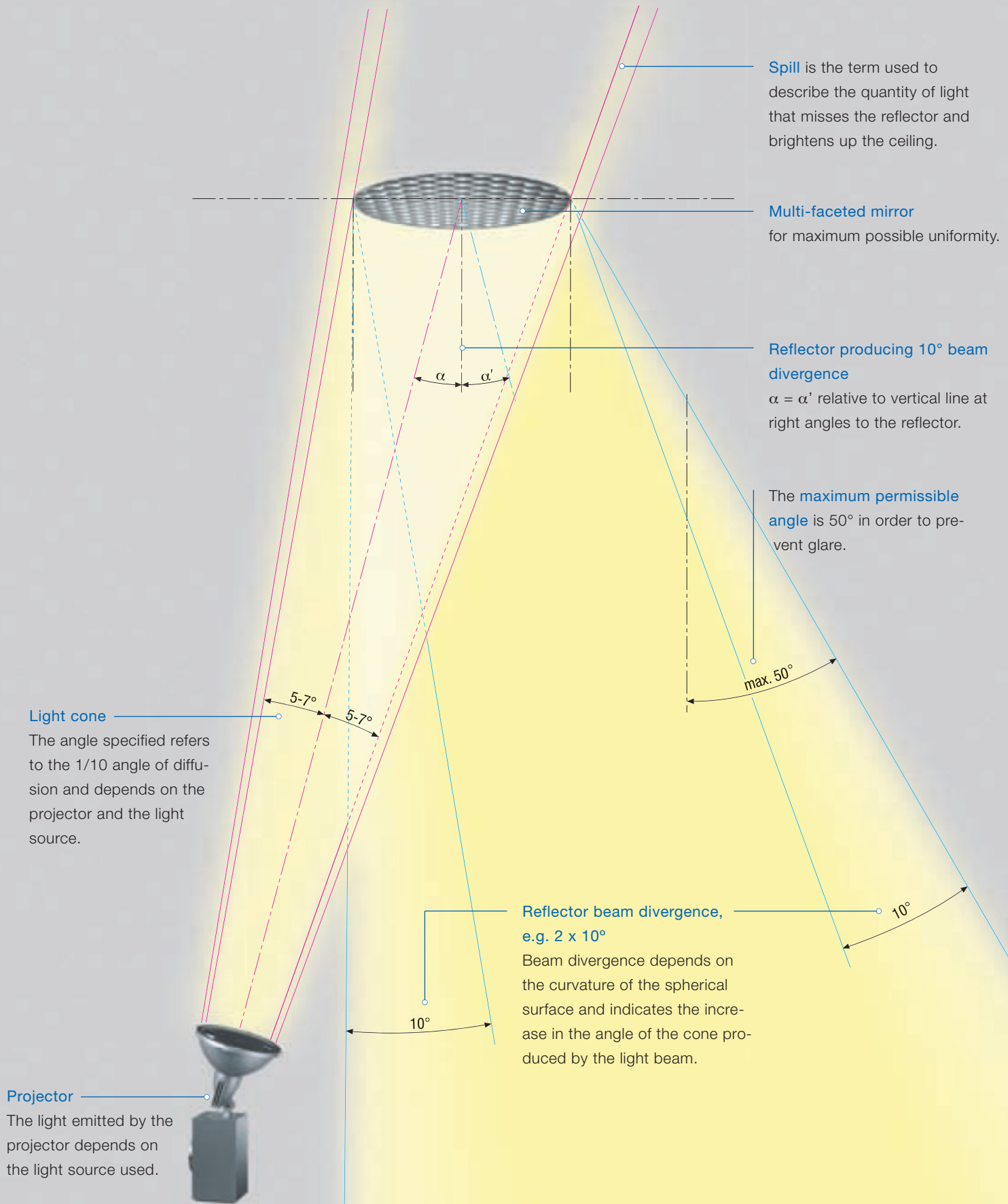
Glare due to scattered light. Light that is reflected by other mirrors, areas of glass or shiny surfaces may result in glare.



Excessive irradiation will occur if mirrors that are too small are used or if insufficient allowance is made for the fact that the target area of the mirror is reduced by tilting it relative to the projector.



Multiple irradiation aimed at illuminating a common surface area. The configuration shown in the picture does not allow direct illumination in the area underneath the reflector.



MIROS design

Distance between projector and mirror

Sizing an installation

“Spill”, is the term used to describe the proportion of the luminous flux produced by the projector that fails to hit the reflector. This quantity must be optimised depending on the emphasis of the lighting concept. Efforts must be made to achieve a minimum level for maximum system efficiency in terms of illuminating the working plane, whereas a useful spill component must be defined for formal, creative aspects (ceiling appearance or indirect light in the room).

Note: The diagrams below can be used to look up the percentage of excessive irradiation of the reflector produced by the light cone from the projector. This is shown below for three different reflector sizes (Ø 500/600/800 mm) for mirrors that are inclined at two angles relative to the projector (0° and 40°). Starting from a selected distance between the projector and the reflector and the corresponding reflector characteristic in the diagram, users can read off the relevant excessive irradiation component on the vertical axis in the following diagrams.

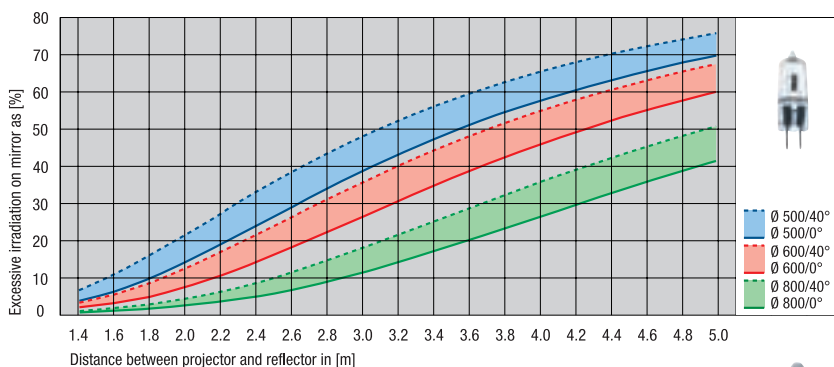
OSRAM HALOSTAR QT 24 V 150 W (halogen lamp)

Projector efficiency: 51 %, 3,200 lm

Advantages: best possible colour rendition properties, straightforward dimming, narrow-beam projector characteristic due to compact axial filament.

Restrictions: lower luminous efficiency, (21 lm/W compared with 85–93 lm/W using HIT lamps), shorter service life (2,000 h)

1/10 angle of diffusion of projector 2 x 7°

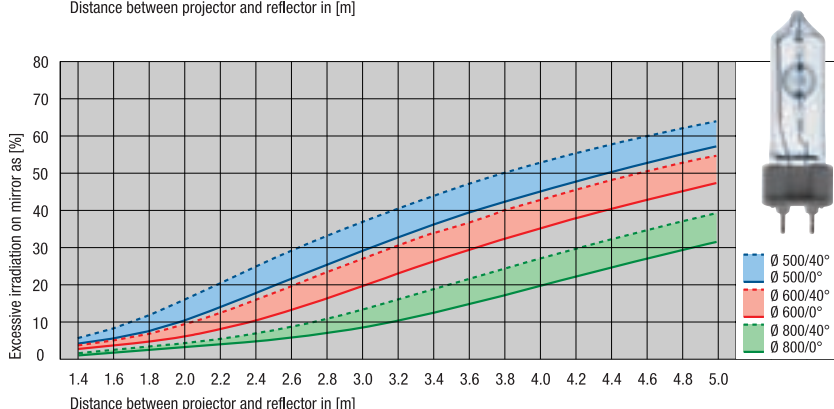


BLV HIT 150 W G12 axial (lamp with quartz discharge tube)

Projector efficiency: 47 %, 13,000 lm

Advantages: long service life, high luminous efficiency, narrower beam characteristic compared with lamps with ceramic discharge tube, highly constant luminous flux after start-up phase, good colour rendition.

Restrictions: only available from BLV, possible colour scattering and colour drift, significant earlis drop in luminous flux due to NaSc technology, 1/10 angle of diffusion of projector 2 x 5.5°

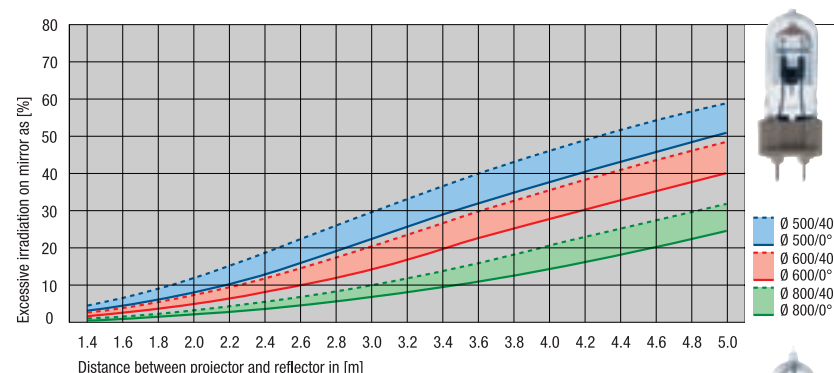


OSRAM HQT-T 150/PRO W (lamp with quartz discharge tube)

Projector efficiency: 48 %, 12,500 lm

Advantages: long service life (9,000 h)

Restrictions: possible colour scattering and colour drift, 1/10 angle of diffusion of projector 2 x 5°

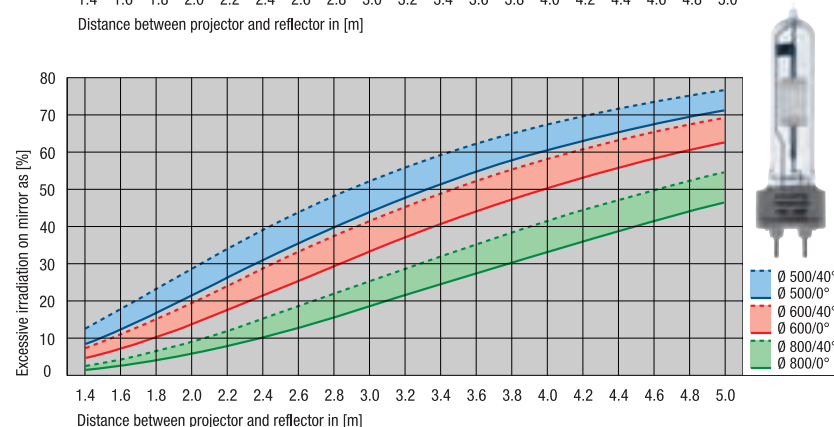


GE CMH 150/T W (lamp with ceramic discharge tube)

Projector efficiency: 48 %, 14,000 lm

Advantages: extremely long service life (10-15,000 h), extremely low colour scattering, excellent colour stability, extremely high luminous efficiency

Restrictions: more wide-angle projector characteristic compared with lamps with quartz discharge tube, 1/10 angle of diffusion of projector 2 x 7°



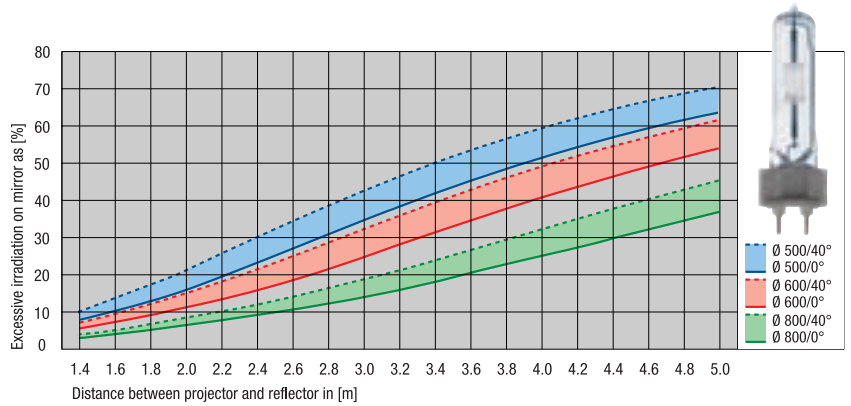
PHILIPS CDM-SA/T 150 W (lamp with ceramic discharge tube)

Projector efficiency: 49 %, 12,900 lm (lamp with short discharge tube)

Advantages: high colour stability, good colour rendition

Restrictions: service life is shorter than conventional CDM-T (6,000 h),

1/10 angle of diffusion of projector 2 x 6°



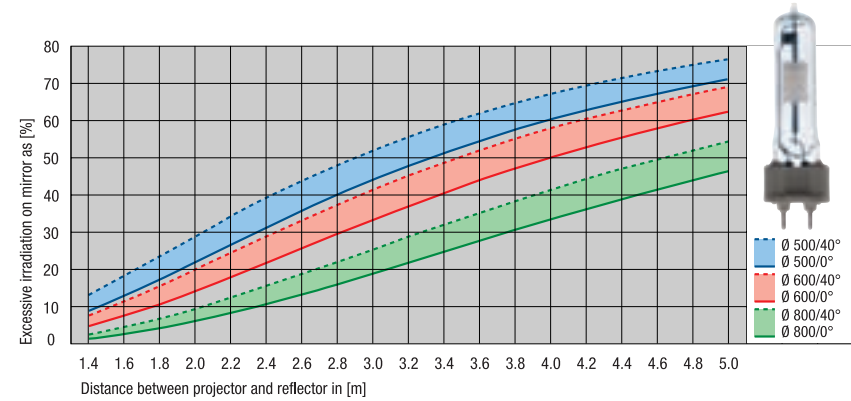
PHILIPS CDM-T 150 W similar to OSRAM HCI-T 150 W (ceramic burner)

Projector efficiency: 44 %, 14,000 lm

Advantages: extremely long service life (10,000 h), reduced colour scattering, high colour stability, extremely high luminous efficiency

Restrictions: more wide-angle projector characteristic compared with lamps with ceramic discharge tube,

1/10 angle of diffusion of projector 2 x 7°



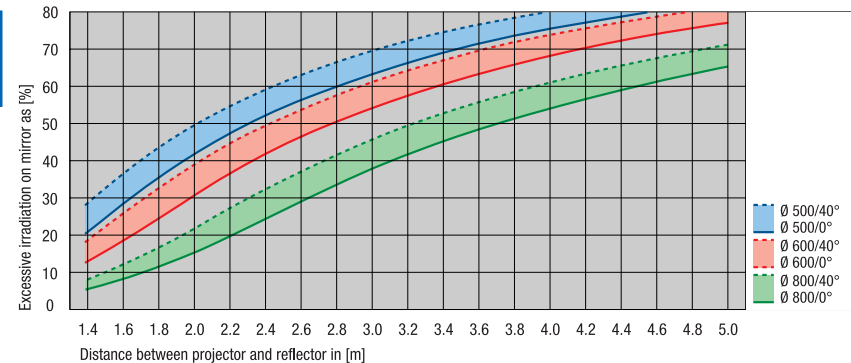
Special lighting design is required for the following wattages: (implementation does not use standard MIROS projectors)

OSRAM HQI-BT 400/D W

Projector efficiency: 50 %, 32,000 lm (at NAV device)

Advantages: extremely long service life (15,000 h before 50 % failure rate is reached),

1/10 angle of diffusion of projector 2 x 10°



OSRAM HQI-TS 1000/S W

Projector efficiency: 59 %, 90,000 lm

Advantages: extremely small drop in luminous flux over the course of entire service life

1/10 angle of diffusion of projector 2 x 8°

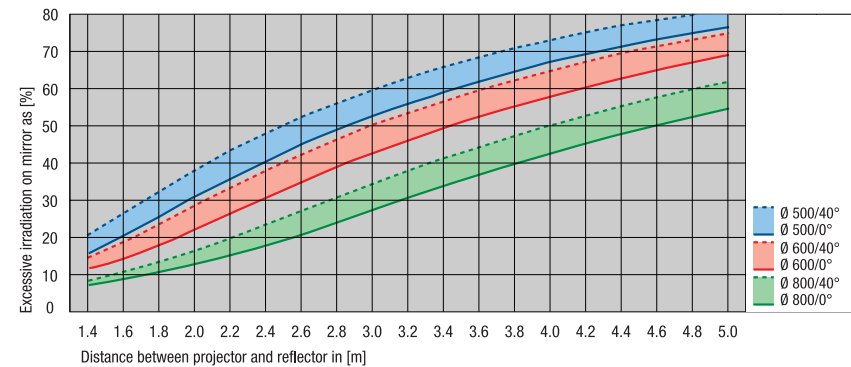
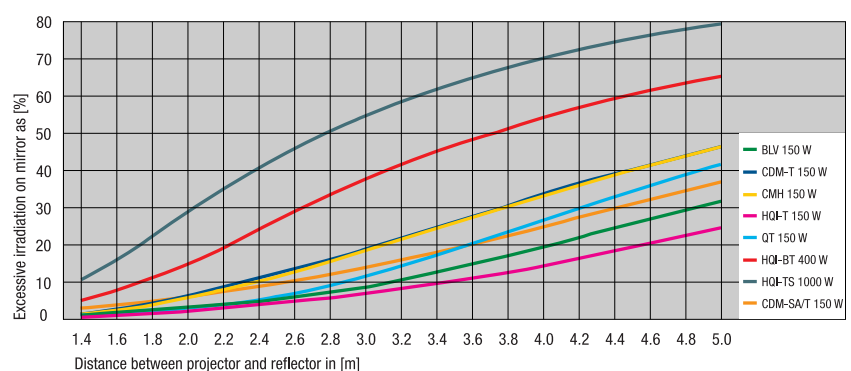


Table for comparison of different light sources (reflector diameter 800 mm/40° inclination)



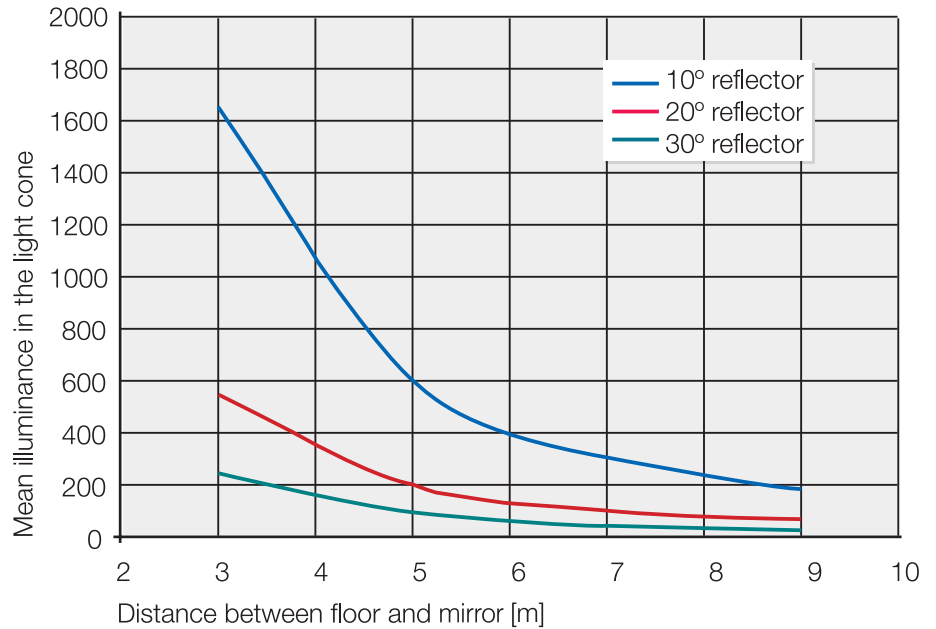
MIROS lighting design

Distance between projector and surface to be illuminated

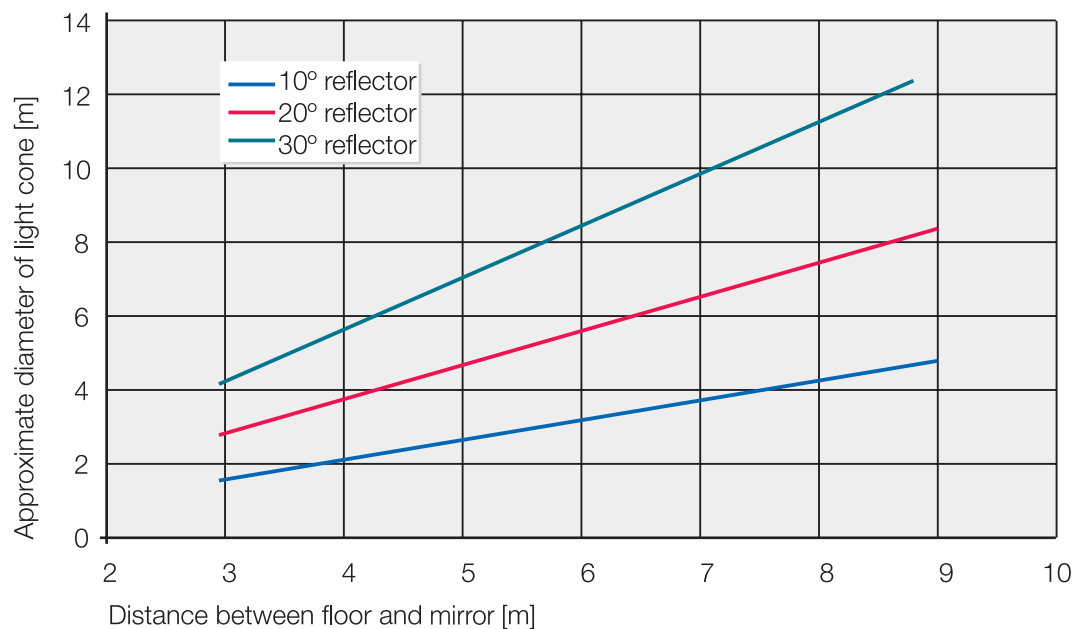
Sizing an installation

This diagram can be used to roughly estimate the mean illuminance levels in the light cone of the reflector depending on the distance to the mirror surface. These levels can be determined for three different types of multi-faceted mirror (beam divergence of cone: $2 \times 10^\circ$, $2 \times 20^\circ$, $2 \times 30^\circ$). The following assumptions are made for the sake of simplification:

- Light loss factor 0.8 (ageing, dirt)
- No allowance made for light cone distortion
- Assumed spill by projector 30 %
- Projector model 150 W CDM - SA/T
- Highly specular mirror

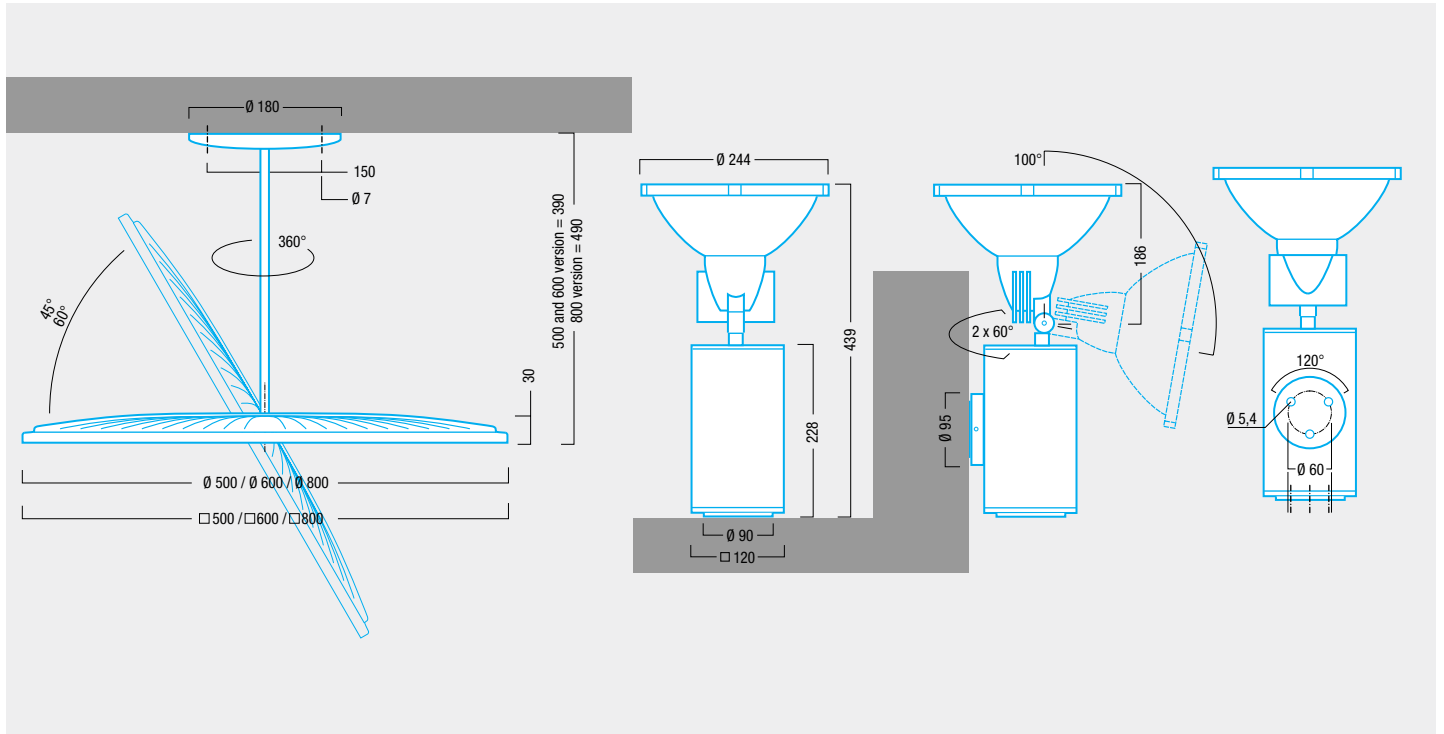


The diagram on the right shows the approximate diameter of the light cone as a function of the beam divergence of the mirror and the distance between the mirror and the floor. This is based on a projector with a 1/10 angle of diffusion of 5–7°.









MIROS IP 54 projector



Cat. no.

L/W/H

kg

Order no.



Projector

- Pin spot with symmetrical highly specular reflector
- Housing made of extruded aluminium section, painted in RAL 9006
- Circular vane louvre with built-in lamp shielding element
- Electrical connection in separate ballast housing
- Easy installation method

for metal halide lamp* on electronic ballast

| | | | |
|-------------|-------------|-----|------------|
| 1/70 W HIT | 244/244/450 | 4.1 | 42 122 854 |
| 1/150 W HIT | 244/244/450 | 4.2 | 42 122 867 |

for metal halide lamp* on low-loss ballast

| | | | |
|-----------------|-------------|-----|------------|
| 1/70 W HIT I | 244/244/450 | 4.9 | 32 122 814 |
| 1/70 W HIT KSP | 244/244/450 | 5.3 | 32 122 820 |
| 1/150 W HIT I | 244/244/450 | 6.2 | 32 122 836 |
| 1/150 W HIT KSP | 244/244/450 | 6.6 | 32 122 842 |

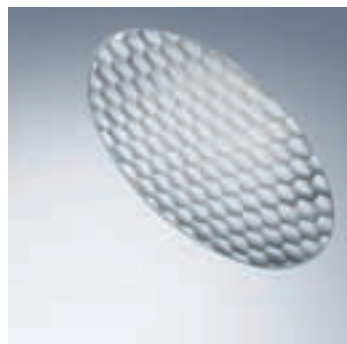
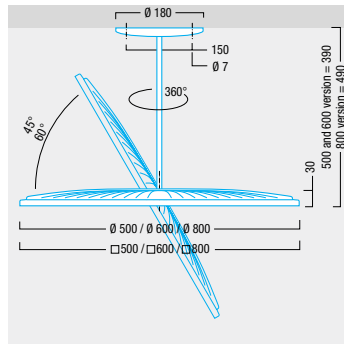
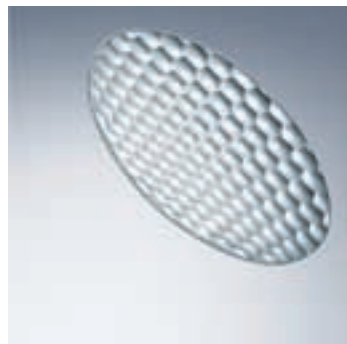
for LV*

| | | | |
|--------------|-------------|-----|------------|
| 1/150 W QT16 | 244/244/450 | 5.5 | 22 122 780 |
|--------------|-------------|-----|------------|

*KSP = hpf, with blocking inductor for HIT and HIT-CRI lamps.
* For suitable lamps, please consult the section on design.*

To specify e.g.: **MIROS IP 54 projector 1/70 W HIT 42 122 854**

MIROS round mirror with multi-faceted surface



| Cat. no. | ∅ | kg | Order no. |
|-------------------------------|-----|-----|------------|
| highly specular finish | | | |
| SRD 500 2x10° | 506 | 1.9 | 22 119 448 |
| SRD 500 2x20° | 506 | 1.9 | 22 119 454 |
| SRD 500 2x30° | 506 | 1.9 | 22 119 467 |
| SRD 600 2x10° | 606 | 2.5 | 22 119 473 |
| SRD 600 2x20° | 606 | 2.5 | 22 119 489 |
| SRD 600 2x30° | 606 | 2.5 | 22 119 495 |
| SRD 800 2x10° | 806 | 3.5 | 22 119 502 |
| SRD 800 2x20° | 806 | 3.5 | 22 119 511 |
| SRD 800 2x30° | 806 | 3.5 | 22 119 527 |

| | | | |
|-------------------------|-----|-----|------------|
| semi-matt finish | | | |
| SRC 500 2x10° | 506 | 1.9 | 22 119 533 |
| SRC 500 2x20° | 506 | 1.9 | 22 119 549 |
| SRC 500 2x30° | 506 | 1.9 | 22 119 555 |
| SRC 600 2x10° | 606 | 2.5 | 22 119 568 |
| SRC 600 2x20° | 606 | 2.5 | 22 119 574 |
| SRC 600 2x30° | 606 | 2.5 | 22 119 580 |
| SRC 800 2x10° | 806 | 4.2 | 22 119 596 |
| SRC 800 2x20° | 506 | 4.2 | 22 122 405 |
| SRC 800 2x30° | 506 | 4.2 | 22 122 414 |

| | | | |
|-------------------------------------|-----|-----|------------|
| perforated sheet steel optic | | | |
| SRG 500 2x10° | 506 | 1.4 | 22 122 420 |
| SRG 500 2x20° | 506 | 1.4 | 22 122 436 |
| SRG 500 2x30° | 506 | 1.4 | 22 122 442 |
| SRG 600 2x10° | 606 | 1.8 | 22 122 458 |
| SRG 600 2x20° | 606 | 1.8 | 22 122 461 |
| SRG 600 2x30° | 606 | 1.8 | 22 122 477 |
| SRG 800 2x10° | 806 | 3.0 | 22 122 483 |
| SRG 800 2x20° | 806 | 3.0 | 22 122 499 |
| SRG 800 2x30° | 806 | 3.0 | 22 122 506 |

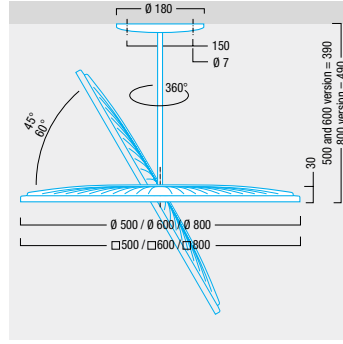
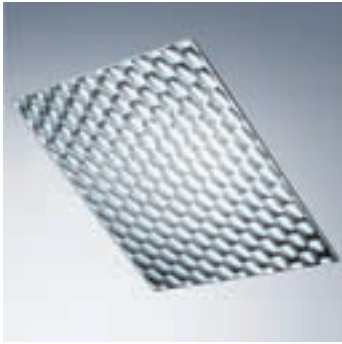
- Multi-faceted mirror
- High level of uniformity at working plane thanks to multi-faceted surface
 - One-piece reflector element
 - Simple adjustment using ball-and-socket-joint and single-point fixing
 - Rotates through 360° and tilts through 45°/60°
 - Variable expansion, surface and dimensions for different lighting tasks

To specify e.g.: MIROS round mirror SRD 500 2x10° 22 119 448



MIROS square mirror with multi-faceted surface

Cat. no. L kg Order no.



highly specular finish

| | | | |
|---------------|-----|-----|------------|
| SQD 500 2x10° | 506 | 2.0 | 22 122 515 |
| SQD 500 2x20° | 506 | 2.0 | 22 122 521 |
| SQD 500 2x30° | 506 | 2.0 | 22 122 537 |
| SQD 600 2x10° | 606 | 2.8 | 22 122 543 |
| SQD 600 2x20° | 606 | 2.8 | 22 122 559 |
| SQD 600 2x30° | 606 | 2.8 | 22 122 562 |
| SQD 800 2x10° | 806 | 4.2 | 22 122 578 |
| SQD 800 2x20° | 806 | 4.2 | 22 122 584 |
| SQD 800 2x30° | 806 | 4.2 | 22 122 590 |

semi-matt finish

| | | | |
|---------------|-----|-----|------------|
| SQC 500 2x10° | 506 | 2.0 | 22 122 601 |
| SQC 500 2x20° | 506 | 2.0 | 22 122 610 |
| SQC 500 2x30° | 506 | 2.0 | 22 122 626 |
| SQC 600 2x10° | 606 | 2.8 | 22 122 632 |
| SQC 600 2x20° | 606 | 2.9 | 22 122 648 |
| SQC 600 2x30° | 606 | 2.9 | 22 122 654 |
| SQC 800 2x10° | 806 | 4.4 | 22 122 667 |
| SQC 800 2x20° | 806 | 4.4 | 22 122 673 |
| SQC 800 2x30° | 806 | 4.4 | 22 122 689 |

perforated sheet steel optic

| | | | |
|---------------|-----|-----|------------|
| SQG 500 2x10° | 506 | 1.5 | 22 122 695 |
| SQG 500 2x20° | 506 | 1.5 | 22 122 702 |
| SQG 500 2x30° | 506 | 1.5 | 22 122 711 |
| SQG 600 2x10° | 606 | 2.0 | 22 122 727 |
| SQG 600 2x20° | 606 | 2.0 | 22 122 733 |
| SQG 600 2x30° | 606 | 2.0 | 22 122 749 |
| SQG 800 2x10° | 806 | 3.3 | 22 122 755 |
| SQG 800 2x20° | 606 | 3.3 | 22 122 768 |
| SQG 800 2x30° | 606 | 3.3 | 22 122 774 |

Multi-faceted reflector

- High level of uniformity at working plane thanks to multi-faceted surface
- One-piece reflector element
- Simple adjustment using ball-and-socket-joint and single-point fixing
- Rotates through 360° and tilts through 45°/60°
- Variable expansion, surface and dimensions for different lighting tasks

MIROS adjustment unit

Cat. no. W/H kg Order no.



accessories

| | | | |
|------------------|--------|-----|------------|
| Adjusting device | 190/42 | 0.3 | 22 126 482 |
|------------------|--------|-----|------------|

Adjusting device

- Adjustment kit with laser pointer in order to align projector with mirror
- Enables adjustment without switching on projectors
- Can be snapped on and removed from projector head without the use of tools, via three fixing clips

To specify e.g.: *MIROS square mirror SQD 500 2x10° 22 122 515*

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AND CAR PARKS**



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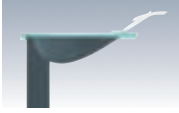


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[Transit areas and Car parks](#)

With production plants in Austria, Germany, Australia and the USA, and sales organisations in all major European markets as well as commercial agencies in most regions of the world, Zumtobel Staff is one of the biggest international enterprises in the lighting sector.

As a leader in innovation, we guarantee our customers global competence in lighting consulting and design assistance, superior product quality and future-proof technologies – from individual luminaires to electronic lighting management systems.

Corporate goal: We want to use light to create worlds of experience, make work easier and improve communications and safety while remaining fully aware of our responsibility to the environment.

| | |
|---|---|
| Lighting management |  |
| Track and spots |  |
| Lighting systems |  |
| Downlights/uplights |  |
| Recessed luminaires |  |
| Surface-mounted and pendant luminaires |  |
| Wallwashers |  |
| Uplights, wall lights and task lights |  |
| Batten luminaires and continuous row luminaires |  |
| High-bay reflector luminaires |  |
| Luminaires of higher protection |  |
| Emergency lighting |  |
| Hospital trunking |  |

United Kingdom

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