

ConstantColor™ Precise™ IR Energy efficient low voltage dichroic mirror halogen reflector lamps

DATA SHEET

Description

Precise™ MR16 lamps are low voltage tungsten halogen reflector-mounted lamps popular for downlighting and accent lighting applications because of their small size, precise beam control, high efficacy, excellent white light and cool beam characteristics.

New ConstantColor™ Precise™ IR lamp comprises a small halogen low voltage filament infra-red coated capsule permanently cemented into a one-piece, dichroic coated all glass reflector.

Beam patterns range from very narrow spots to wide floods. The lamp incorporates an integral clear lens to ensure that both bulb and reflector are protected from dust and dirt during installation and operation.

Cover glass effectively eliminates UV-C radiation and greatly reduces UV-B radiation.

Features & benefits

- **IR coated capsule**
 - Results in up to 43% energy saving
- **Premium ConstantColor™ coating**
 - Advanced GE Thin Film Technology
 - To maintain consistent colour over life
 - Reliable hard dichroic coating (double sided)
 - Close to 90% maintained light output over life
 - Eliminates backlight
 - Does not evaporate & maintains reflectance through life
- **Precise optical control.** Evenly lit surfaces
- **Crisp, white light**
- **Long 5000 hour life**
- **UV control**
- **Provide instant-on, full light output at start-up**
- **Environmentally friendly with no lead or mercury**

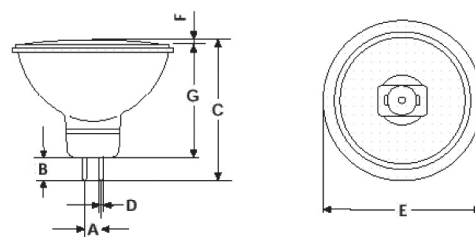


Technical Data

12Volts
Burning Position: any
Bulb: clear, closed, Cap:GU5.3

| Standard Watts | IR Watts | Peak intensity (Cd) | Beam spread (°) | Colour temp. (K) | Rated avrg. life (h) |
|----------------|----------|---------------------|-----------------|------------------|----------------------|
| 35 | 20 | 6000 | 10 | 2900 | 5000 |
| 35 | 20 | 2300 | 24 | 2900 | 5000 |
| 35 | 20 | 1000 | 36 | 2900 | 5000 |
| 50 | 30 | 10000 | 10 | 2950 | 5000 |
| 50 | 30 | 3350 | 24 | 2950 | 5000 |
| 50 | 30 | 1600 | 36 | 2950 | 5000 |
| 50 | 35 | 12000 | 10 | 2950 | 5000 |
| 50 | 35 | 4200 | 24 | 2950 | 5000 |
| 50 | 35 | 2000 | 36 | 2950 | 5000 |
| 65-71 | 45 | 14000 | 10 | 3000 | 5000 |
| 65-71 | 45 | 5200 | 24 | 3000 | 5000 |
| 65-71 | 45 | 2300 | 36 | 3000 | 5000 |

Dimensions (mm)



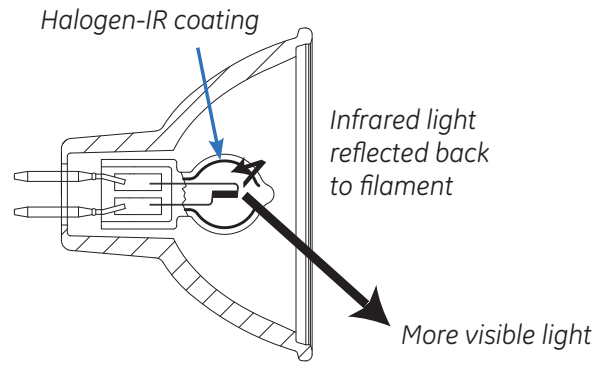
| | A | B | C | D | E | F | G |
|--------------------|------|------|------|------|------|-----|------|
| Closed bulb | | | | | | | |
| MIN. | - | 6.1 | - | 1.45 | 49.4 | - | 35.8 |
| AVE. | 5.33 | - | - | - | - | - | - |
| MAX. | - | 7.62 | 50.5 | 1.60 | 50.7 | 4.5 | 38.4 |



Halogen IR Technology

Standard incandescent and halogen lamps lose approximately 76% of the input energy by radiating heat, and convert only 8% into useful light. The Precise™ IR halogen capsule has multiple layers of very durable, thin, interference film which redirects heat, which would otherwise be wasted, back onto the lamp filament. This increases the filament temperature and allows it to give off more visible light for the same input power.

The increased burning efficiency provides the same light performance with a significantly reduced power input, alternatively allows a longer lamp operating life or a combination of both.

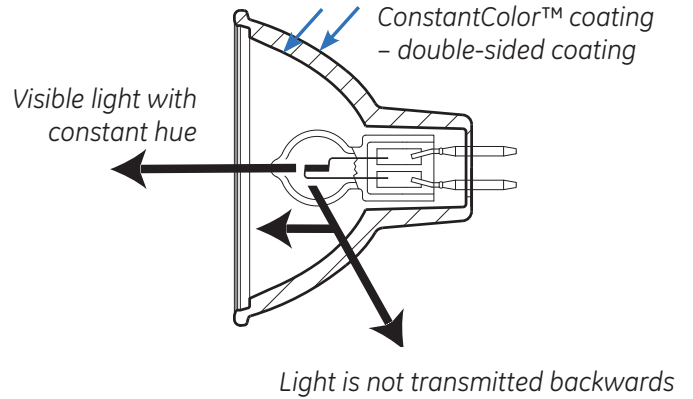


ConstantColor™ Coating

The application of GE Thin Film Technology is designed to maintain consistent colour throughout life. The durable Titania and Silica coating materials can withstand temperatures of 500°C without degradation over a rated life of 5000 hours.

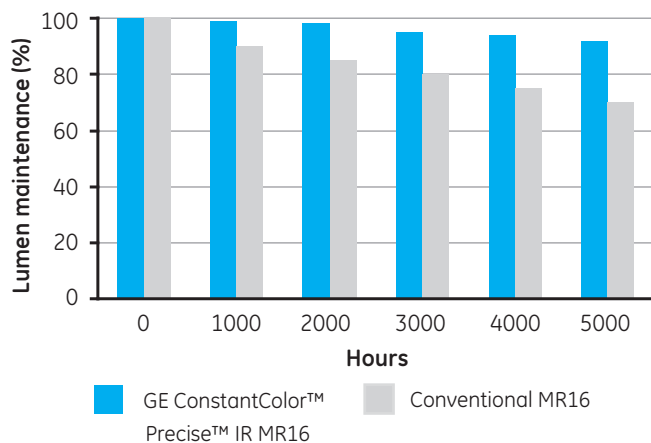
Backlight

With coating applied to both inside and outside of the reflector, a wasted backlight is virtually eliminated. The small amount of light that does escape through the reflector is a consistent hue which will not vary from lamp to lamp through life, ensuring replacements do not appear different from existing lamps.



Lumen maintenance

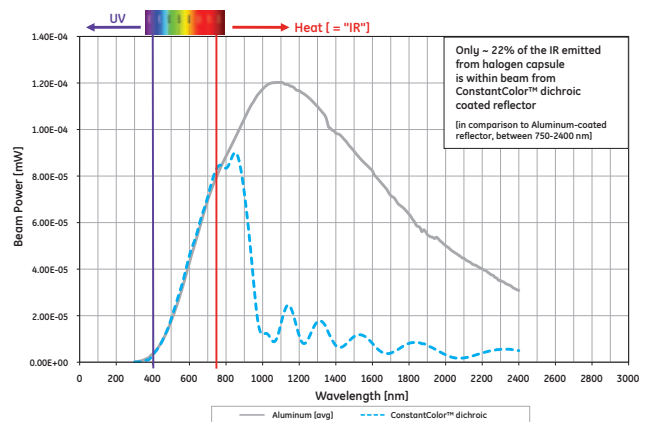
Advanced coating technology ensures, a high level of lumen maintenance is achieved throughout lamp life. Normal dichroic coatings can lose over 30% of lumen maintenance over life as the result of coating degradation.



Cool beam

The ConstantColor™ interference film still allows over 2/3 of the infra-red heat to pass through the back of the reflector to ensure a cool beam is achieved while reflecting forward almost 100% of the visible light.

Spectral Irradiance MLP CC vs Al



Precise optics

The computer designed multi-faceted reflector produces a “precise” beam pattern with excellent uniformity and sharp beam cut-off. The reflector is ellipsoidal in shape. The filament is precisely aligned along the optical axis of the reflector during the manufacturing process to achieve the required beam pattern.

Tungsten halogen principle

The tungsten filament is enclosed in a gas filled quartz bulb, together with a controlled quantity of halogen. At the operating temperature some tungsten vapourizes and migrates to the cooler areas of the bulb wall where before it can be deposited, it combines with the halogen to form a tungsten halide. This circulates until it comes near the filament where the halide dissociates and deposits the tungsten back on the filament. This cycle continues throughout the operating life of the lamp.

As the bulb wall remains clean the bulb size can be reduced considerably by the use of quartz which can withstand the high wall temperatures.

The small bulb and strong materials withstand much higher working pressures and the increased gas density. This reduces filament evaporation, thus offering increased performance either as more light or longer life.

Light, life & voltage

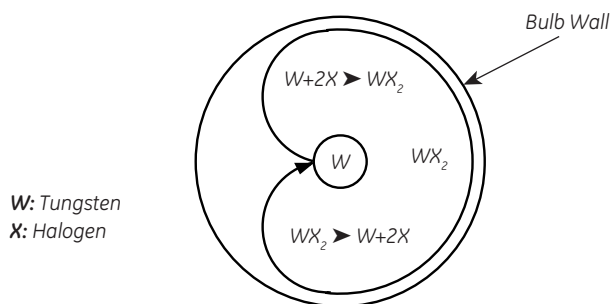
For any particular lamp, the light output and life depend upon the voltage at which a lamp is operated. For instance, as approximations, the light output varies as the 3.6th power of the voltage and the life varies inversely as the 12th power of the voltage. The Chart and Tables below illustrate the effects of overvoltage or undervoltage applied to lamp on its current, life and light output. The values given (except for long life lamps) are reasonably valid between 95% and 110% rated volts.

Beyond this range the indicated characteristics may not be realised because of the increasing influence of factors which cannot be incorporated into the chart. The chart applies only to sine-wave A.C. current. The data may differ particularly for lamp operation on half-wave rectified voltage, semiconductor dimming devices of constant operation or D.C. current.

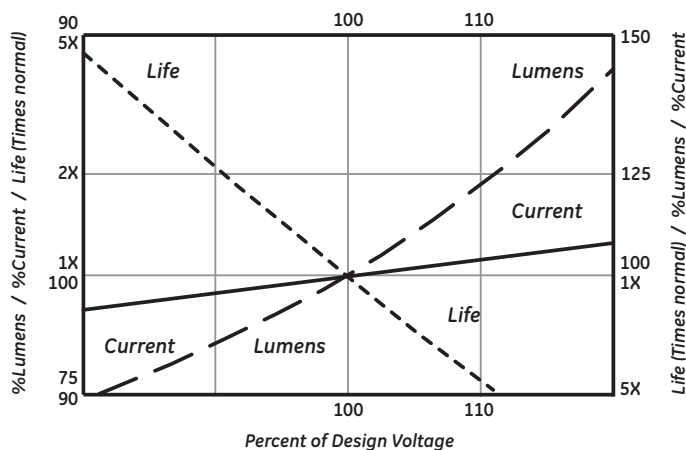
UV control

The use of IR coating and an optically neutral front cover glass allows the lamp to fully comply with the stringent requirements of IEC 60432-3.

Tungsten halogen principle



Voltage variations



Underrated Bulb Voltages (<100%)

| VOLTS % | AMPS % | LUMENS % | LIFE % |
|---------|--------|----------|--------|
| 99 | 99.5 | 96.5 | 111 |
| 98 | 99.0 | 93.2 | 122 |
| 97 | 98.4 | 89.9 | 136 |
| 96 | 97.9 | 86.7 | 150 |
| 95 | 97.4 | 83.5 | 167 |
| 90 | 94.8 | 69.1 | 287 |

Overrated Bulb Voltages (>100%)

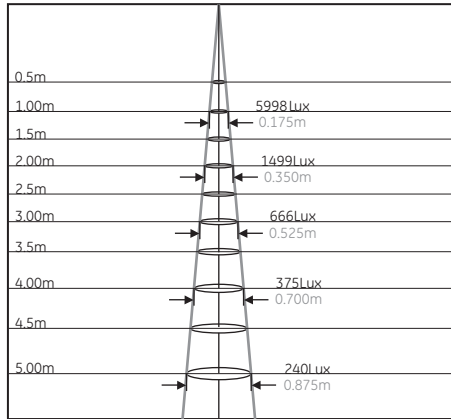
| VOLTS % | AMPS % | LUMENS % | LIFE % |
|---------|--------|----------|--------|
| 101 | 100.5 | 103.6 | 90 |
| 102 | 101.0 | 107.2 | 82 |
| 103 | 101.5 | 110.9 | 74 |
| 104 | 102.0 | 114.8 | 68 |
| 105 | 102.5 | 118.7 | 61 |
| 110 | 105.0 | 139.7 | 39 |

Performance Cones

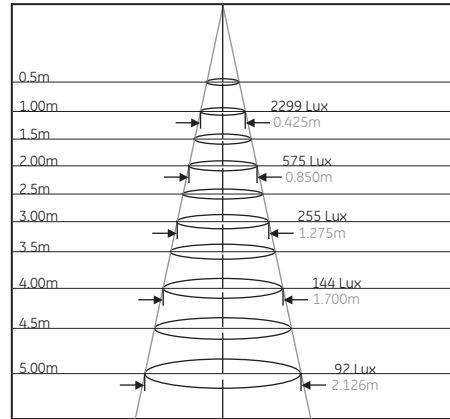
All GE reflector lamps have a performance cone. This is to help achieve the most effective spread and level of illumination by showing the lamp power, beam spread and mounting distance of each lamp.

A performance cone is a visual indicator of the angle at which the intensity of a beam produced by a reflector is at 50% of its peak. The cone shows the angle, the level of peak illuminance (lux) and the beam diameter for planes at right angles at various distances (m) from the lamps. The bold type at 2m serves as a benchmark for at a glance comparison of respective beam diameter and lux for different lamps.

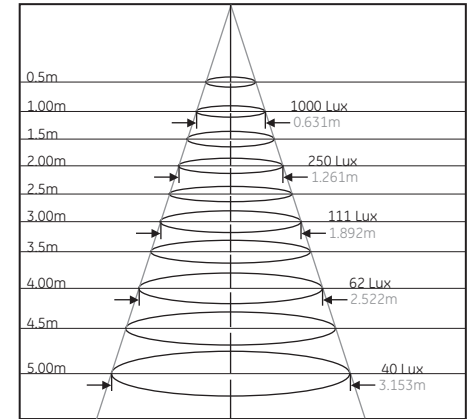
20W 10°



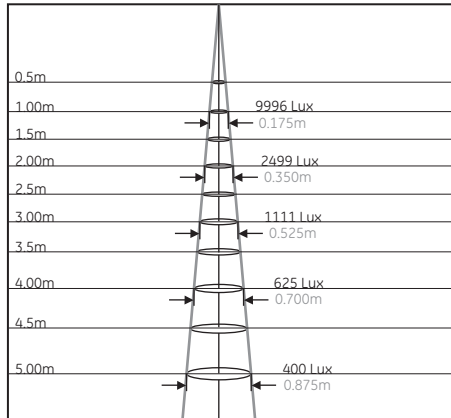
20W 24°



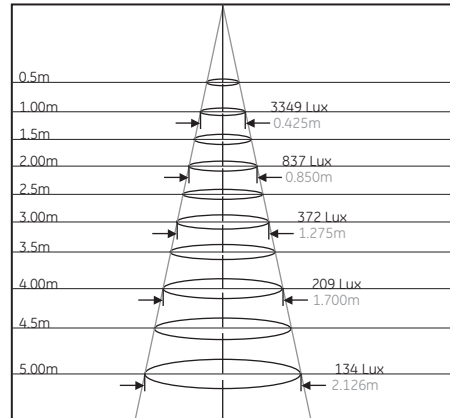
20W 36°



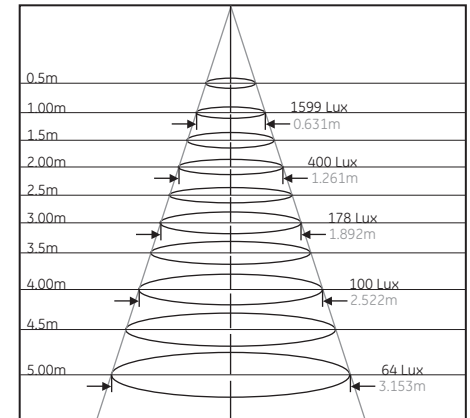
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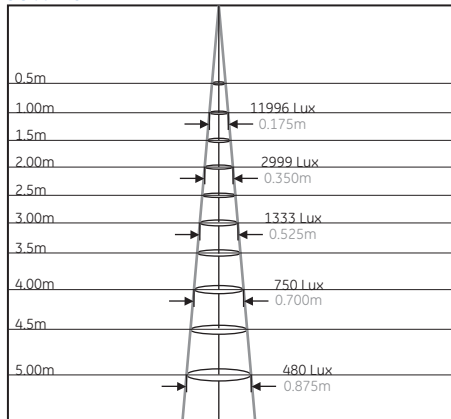
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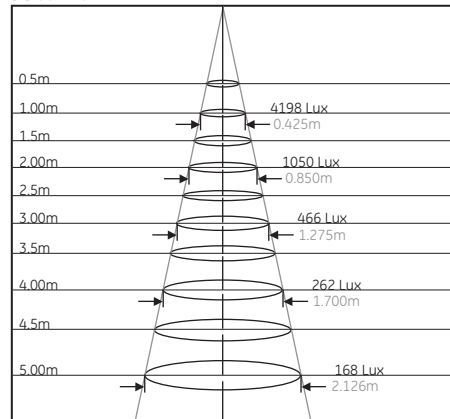
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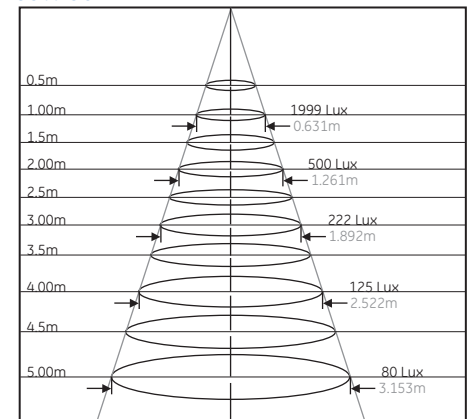
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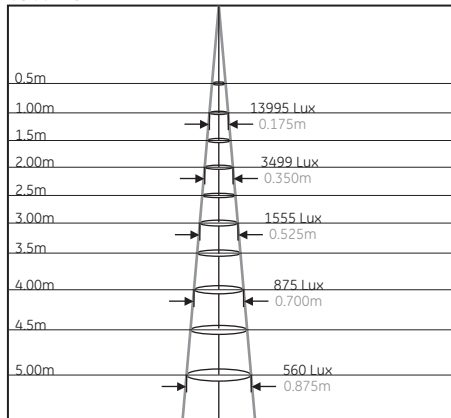
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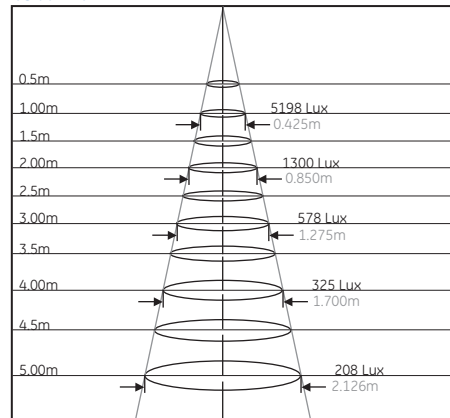
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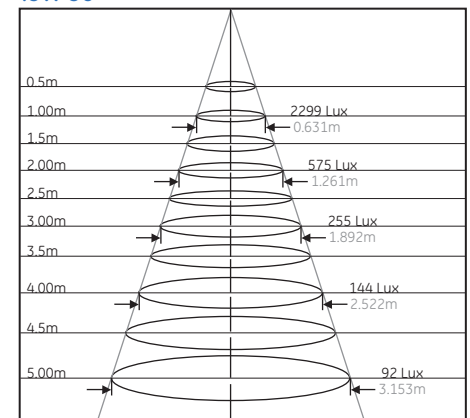
45W 10°



45W 24°

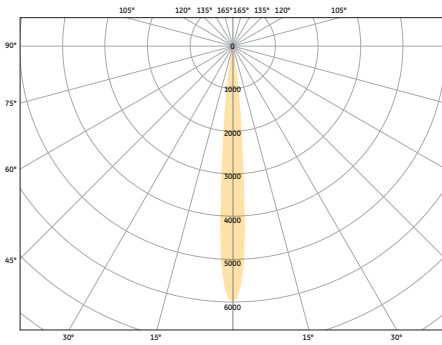


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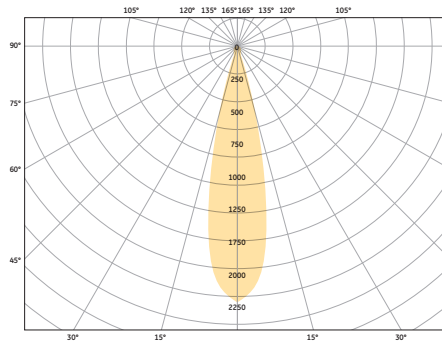


Photometric data

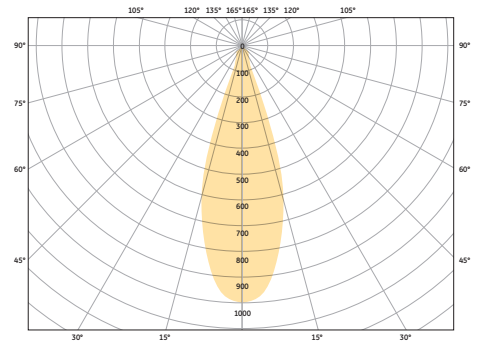
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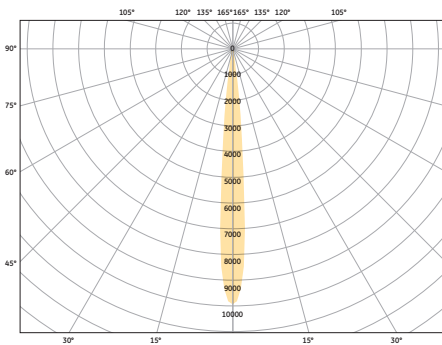
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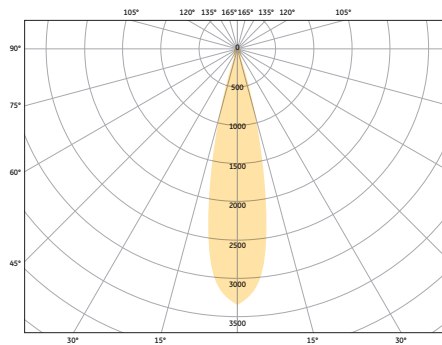
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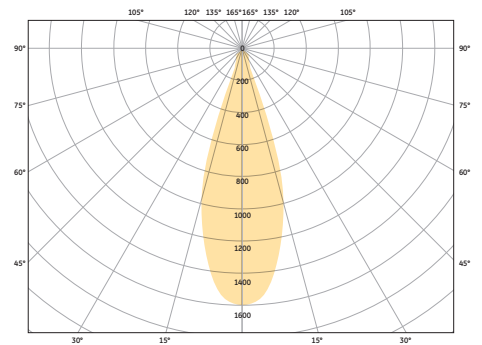
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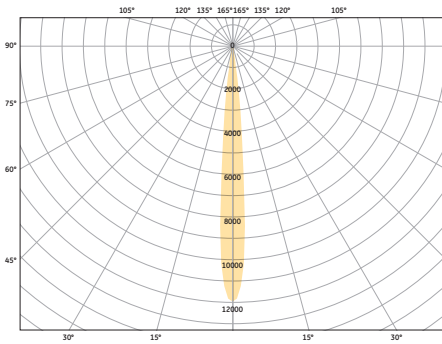
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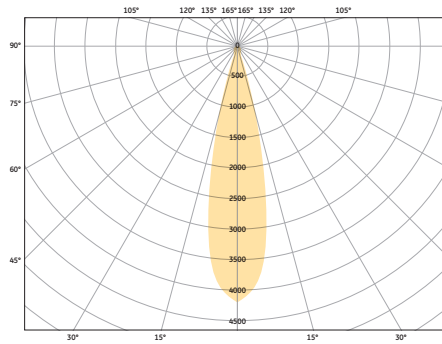
30W 36°



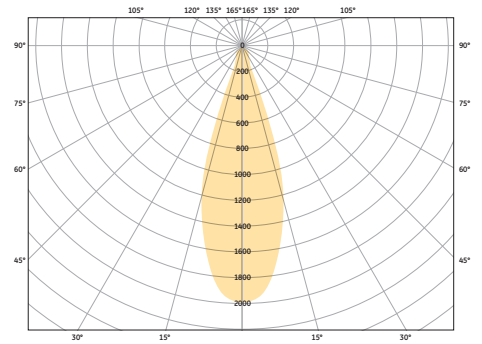
35W 10°



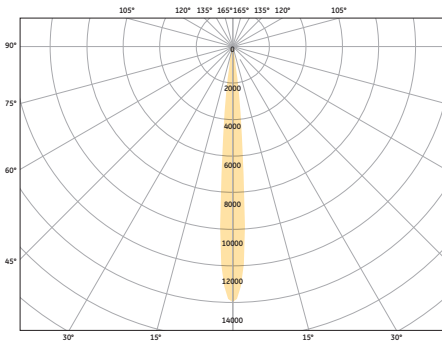
35W 24°



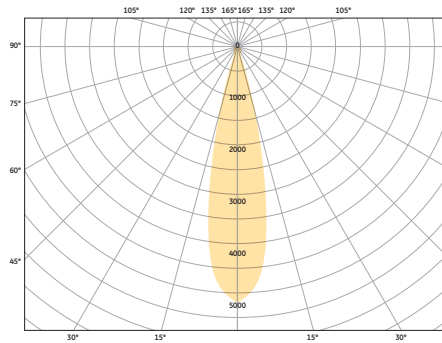
35W 36°



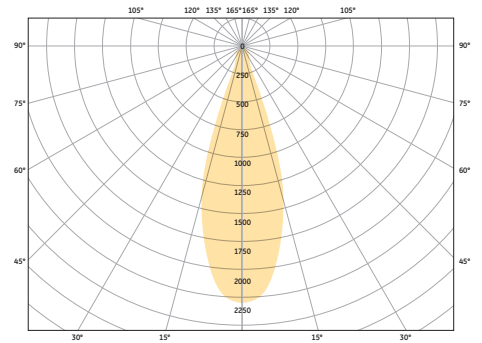
45W 10°



45W 24°



45W 36°



Operation and Maintenance

- Low voltage tungsten halogen lamps are sensitive to voltage variations. Even a small change in voltage can have a considerable impact on lamp life and light (see "Light, Life & Voltage"). Designers should match fitting transformer ratings to actual mains line voltages to ensure that the lamps operate at as close to 12V as possible.
- Rapid cycling can also shorten lamp life, and designers should take advice from their GE Lighting representative before using these lamps in flashing or blinking applications.
- The lamps may be dimmed by reducing voltage. However, this may cause the bulbs to blacken. If this occurs the lamp should be run at full voltage (12V) for fifteen minutes, thereby clearing the problem. Note that the nature of low voltage lighting systems requires the use of fluorescent-type dimmers.
- Switch off mains supply before installing/removing lamp.
- Fuse is essential in circuit.
- Observe temperature tolerances: pinch seal, max. 350°C, bulb wall min. 250°C.
- Lamps should be free from contamination, including finger marks, before lamp is operated. Lamps can be cleaned with a soft cloth moistened with alcohol.
- Good condition of the lampholder contacts is essential.
- Bulb wall temperatures are high and therefore lamps should not be operated in flammable atmospheres unless enclosed in suitably rated luminaires.
- Ensure lamp is cool before removing.
- Do not use if outer reflector is cracked/broken.

IEC Standards

GE tungsten halogen lamps comply with the following international standards where applicable:

- IEC 60432-3 Tungsten Halogen Lamps Safety Standard,
- IEC 60357 Tungsten Halogen Lamps Performance Standard,
- IEC 60061 Lamp Caps & Holders - Part1: Lamp Caps