



**PHILIPS**

Museum lighting



Making visible what  
the artist intended  
**Museum lighting solutions**

# Turning museums into masterpieces

Our life is enriched by art. The value of museums to society has always been acknowledged, but their role has been changing. Instead of being purely collection-driven institutions, they are becoming more of a place to deliver visitor-centered experiences.

As your end-to-end partner, we're able to provide you with turnkey projects and help you respond to this more dynamic and interactive world. We work with a team of experts and lighting designers to provide consulting, design assistance and comprehensive services. Our ultimate mission is to bring your vision to life.



“

Good lighting is of paramount importance for art. If done properly, **visitors will enjoy the works on show, without even noticing what we have done to make them shine.**”

*Tim Zeedijk  
Head of Exhibitions Rijksmuseum*



Photo's: Rijksmuseum, the Netherlands

It's not about lux,  
it's **about people!**





**Portrait of a Family**  
1666, oil on canvas, 111 x 146 cm  
This is the only family portrait that was owned by Johannes Vermeer. The figures are dressed in fashionable 17th-century clothing, but the woman's red fur cloak is the most striking element of the scene. Vermeer's use of light and shadow is masterful, highlighting the figures against a dark background.

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**Beersnielsen lighting designers** is an independent lighting design firm founded by Sjoerd van Beers and Juliette Nielsen. Inspired and driven by a firm belief in the importance of designing light for people, Van Beers' and Nielsen's work is wide-ranging, from projects on an urban scale to individual buildings and interior spaces. We recently caught up with the two founding partners to hear their thoughts on the changing world of museum lighting.



Museums have been broadening their appeal to attract a wider audience. **More visitors are going to museums these days**, and with audio tours, interactivity, etc. a more people-centered experience is on offer.

Another major trend in museum lighting is the rise of LED. The reason is stability in color rendering, quality of light throughout its lifetime, and **high energy efficiency**.

## The evolving role of the museum

Juliette Nielsen: “Museums are becoming more accessible to a wider public. More people are going to museums, seeing it as a day out, with family or friends, including lunch, buying presents ... It’s no longer just ‘the art’, the traditional museum function. And with audio tours, interactivity museums are becoming more people-centered.

“Another interesting phenomenon is the rise of temporary exhibitions. Thanks to the unique combination of venue and collection, these travelling exhibitions offer people a once-in-a-lifetime experience.”

“Museums are also finding new ways to attract visitors and generate new revenue streams. For instance, running drawing and painting workshops, or granting visitors ‘behind-the-scenes’ access to departments like Art Restoration for a more in-depth view of how a museum works.”

## Trends in museum lighting

“Another major trend in museum lighting is of course the rise of LED. Sometimes museums want LED for the energy efficiency, but more often it’s for the reduced relamping. For lighting designers, a key advantage of LED is that, when dimmed, it doesn’t change in color temperature and doesn’t affect the stability of the color rendering. That was a problem with halogen. If you dim halogen it gets warmer; and you can have two of the same lamps side by side, and you’ll see a shift in the color temperature. For instance, one will be a stronger orange than the other.

“Flexibility is another big thing for us. If you have changing exhibitions, you want to be able to change the atmosphere. LED enables us to do that.”

“Last but not least, LED fixtures don’t get so hot, so they’re better to handle, say when you’re focusing the light beam. If you’re standing on a cherry picker 11 meters up, with paintings costing a few million below, you don’t want to be dropping anything. No heat also means that more precise beam-shaping lenses can be used, other than the glass lenses used for halogen fixtures. Also there’s no IR or UV in the beam, so from a conservation perspective too, it’s a step forward.”



## The heart of the matter

“For us at Beersnielsen, **it’s all about the emotion** that light can bring, not lux levels! **It’s about making light for people**, so people feel happy in it. And in museums, it’s not about light for the art, **it’s about light so the people can enjoy the art.**”

### Client dialogue – seeing is believing

Juliette Nielsen: “When we’re creating the lighting design plan for a museum, our first priority is to really listen to the client – ask lots of questions and analyze the situation. ‘What kind of atmosphere do you want?’ ‘Do you want to integrate the lighting in the architecture?’

Then, once we have a full understanding of the desired ambiance, we work out the lighting principles, the layers of light, the specific light qualities we need to achieve that ambiance: color rendering, color temperature, dimming protocols, etc.

“For us as lighting designers, the quality of the light, beam quality, flexibility and usability are the key factors. Clearly, when you’re dealing with a multidisciplinary client team including the curator, museum director, technical manager, etc., other factors such as energy efficiency and price come into play as well. It can be a question of balancing sometimes conflicting requirements. But our advice is always to focus on the factors that will shape the end-user’s experience: beam quality, stability of color rendering, flexibility.

“Another important step is to tune the lighting from the perspective of the visitor. It’s not about it looking beautiful from up on the ladder.”

### Lux levels – a meaningful discussion?

Sjoerd van Beers: “Measuring the actual light on a painting in relation to the maximum lux levels allowed is an interesting discussion. For example, there may be a stipulation that a drawing should have max. 50 lux. People often then think 49 lux is good, and 51 lux bad. In my opinion this whole discussion is a red herring. The angle at which you hold the lux meter can already make a substantial difference! Different meters give different readings! But the biggest shortcoming is that exposure time is not taken into account. The discussion should not be about the 50 lux: it should be about lux hours!

“Another common misconception is that if you have a picture that can take 150 lux, then you should put 150 lux on it, and it will look good. 150 lux on a dark painting is a very different proposition to 150 lux on a light painting. We shouldn’t become obsessed with absolute lux values. We’ve done exhibitions where we could use only 50 lux on the works of art, but the space was lit in such a way that it seemed like it was lit by daylight with much higher lux levels.”

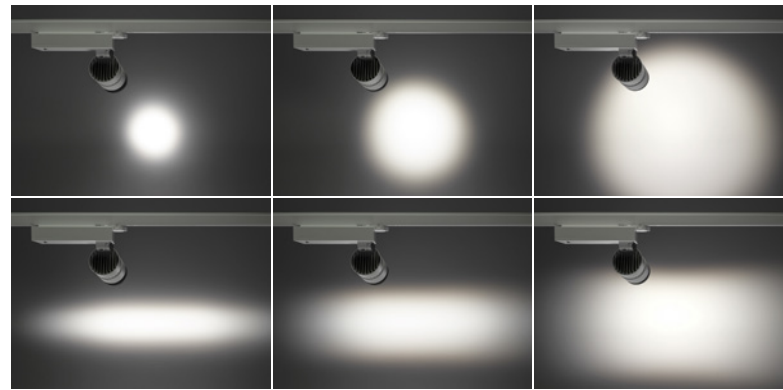
With the rise in temporary exhibitions and special activities like workshops and conferences, **museums are becoming multifunctional**. They no longer only house art.

Museums are seeking the right balance today **between preserving art and presenting it!**



## Variable Spot

# PerfectBeam Endless possibilities to shape light



StyliD PerfectBeam has been developed specifically for museum applications. It strikes the perfect balance between presenting and preserving art, between ever-changing exhibitions and the need for low maintenance and energy efficiency. The often conflicting demands for good visibility and conservation are now being met with LED lighting that emits no harmful UV or IR radiation.

Inspired by precision optics like camera lenses, this luminaire range comes with a zoom mechanism and a number of beam shaping lenses that are easy to adapt.

## Superior Light Quality

### making visible what the artist intended

**Perfect lighting is invisible: It gets out of the way, and makes visible what the artist intended.**

Key to showcasing masterpieces is to present with authentic colors, subtly attracting and guiding the viewer's eye. Perfect lighting makes it easy to see, interpret, understand and appreciate, down to the smallest detail, using light to evoke personal emotions and to create an unforgettable museum experience.

Learn more about PerfectBeam at  
[www.philips.com/perfectbeam](http://www.philips.com/perfectbeam)

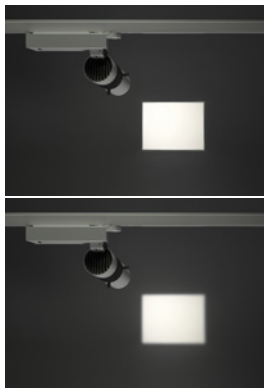
#### Key Features:

- CRI of 90+
- Patented technology for light uniformity
- No halo or spill light
- Crisp light, single shadow
- High color consistency
- Minimal glare





**Framing Projector**



## Optimal Art Preservation

### protecting precious exhibits

**Perfect lighting is gentle: It provides good visibility, while adequately protecting precious exhibits.**

The often contrary demands for good visibility, conservation and compliance with permissible limits for exhibits are now being met using LED lighting. Containing no harmful UV and IR rays, your sensitive exhibits do not need the use of additional filters and protection.

## Maximum Beam Flexibility

### adapting to changing exhibition needs

**Perfect lighting is versatile: It adapts to constant change in exhibition and lighting needs.**

PerfectBeam is creating the perfect light for any exhibit. Its modular design, the variable beam, the beam shaping accessories and onboard dimming ensure maximum flexibility, all from a single spot. Its extreme flexibility makes it easy to adapt to the unique demands of temporary exhibitions and last minute lighting design adjustments.

#### Key Features:

- No harming UV/IR radiation to precious exhibits
- Individual dimming and full control of light exposure
- Research has shown that PerfectBeam LEDs have the lowest damage potential at a given CCT compared to unfiltered incandescent and halogen sources.

#### Key Features:

- Modular design, easy to adapt
- Variable beam angle (7°-43°)
- Beam shaping accessories (clear, soft, linear, etc)
- Onboard dimming, DALI

“

They did not just develop the light, **but everything connected with it.** So that we could concentrate on the art.”

*Taco Dibbits*

*Director of Collections Rijksmuseum*

Rijksmuseum,  
the Netherlands  
(2013)

# New light

## on old masterpieces

As one of the lead partners in the renovation, Philips has been working closely with the Rijksmuseum on the lighting design with a strong focus on the visitor experience and the conservation of the artworks. The LED lighting solution implemented in the museum creates effects and visual contrasts that closely mimic the color rendition of natural daylight, presenting the artwork in the best way and enhancing the visitor experience. With more than 9,500 square meters and 7,500 artworks illuminated. In addition, Philips' LEDs light the museum's public spaces including the shop, the atriums, the restaurant as well as the outdoor area and building façade.

Tim Zeedijk, Head of Exhibitions at the Rijksmuseum outlined the reasons behind the choice of going for

LED lighting: “At the heart of all the decisions we take are two aspects, the visitor's experience of the museum and the preservation of our art. We chose LED lighting for firstly, the high quality of the light emitted, and secondly the color rendering of LED lighting, which is very close to that of daylight. In 2013, the Rijksmuseum in Amsterdam reopened after a massive renovation, being one of the first to illuminate a premiere art collection exclusively using LED technology.

Philips Lighting provided a complete, turn-key solution. The high quality LED lighting has been chosen to reveal the full beauty of the Dutch Masters and ensure preservation for decades to come.

# Illuminating the work of an old Master of light

More than 300 years ago Dutch Baroque painter Godefridus Schalcken (1643-1706) was famous for his skill in reproducing the effect of candlelight and the play of light and shadow in his paintings. Philips' highly flexible PerfectBeam luminaires enabled a sparing and selective use of light in this exhibition to create an atmosphere that reflected the artist's particular style creating a memorable experience for visitors discovering the beauty of his work.

The first implementation of PerfectBeam in the Wallraf-Richartz museum in Cologne is a testament to the flexibility of the luminaire.

Furthermore, Philips' state-of-the-art LED lighting technology enables 80% energy savings for the Wallraf-Richartz Museum compared with the previous lighting solution.

“

I love the accuracy  
that was possible  
with the lighting.”

Dr. Anja K. Sevcik



Wallraf Richartz Museum,  
Germany (2015)

# More project references



## Utrecht Centraal museum Utrecht (NL)

As part of the three year renovation program, Philips installed the PerfectBeam Variable Spot, which resulted in a more pleasant atmosphere and improved experience for the visitors. Philips has customized the LED module (Xicato), the light output and the finish of the products.



## Noordbrabants Museum 's-Hertogenbosch (NL)

Fully customized lighting solution for the complete museum.



## Reggia di Venaria Turin, (IT)

Temporary Exposition Raffaello. Il Sole delle Arti, Reggia di Venaria 2015 Painting: Estasi di Santa Cecilia, Raffaello, 1513  
*"Precise lighting of Raphael's masterpieces was an important challenge. Customer needed to obtain a faithful colour rendering, optic beam flexibility and a precise control of lumen output and projection"*

- Arch. Giovanni Tironi,  
Exhibition project leader



## National Military Museum Soesterberg (NL)

Complete turn-key lighting solution. Including exhibition and exterior lighting, a control system and connected lighting to create an immersive visitor experience.



## Boerhaave Museum Leiden (NL)

Lighting of the 100 years Philips Research exhibition. Including pilot of the Philips Indoor positioning system, which allows visitors to receive multimedia content relevant to the objects via a tablet.



## Museo Poldi Pezzoli Milan (IT)

A fully customized solution, centrally fixed to the ceiling. Designed as a large chandelier, each fixture is composed of 12 pivot arms with 12 LEDs each, adjustable in color temperature.

# We are here to bring your vision to life



Lighting is in our DNA. We've been designing and delivering lighting installations for more than 120 years.

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We understand the changing role of museums and your challenge to attract a new generation.

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As your end-to-end partner, we're able to provide you with turnkey projects and continuous support.

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We have a wide range of standard and customized products, systems and services, offering high quality, flexible, and easily-adaptable future proof solutions.

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We work with a team of experts and lighting designers to provide consulting, design assistance and comprehensive services.

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To find out more about our museum lighting solutions and learn about customization and co-creation, please go to [philips.com/museumlighting](https://philips.com/museumlighting) and get in touch with us!

# PerfectBeam

## Variable Spot

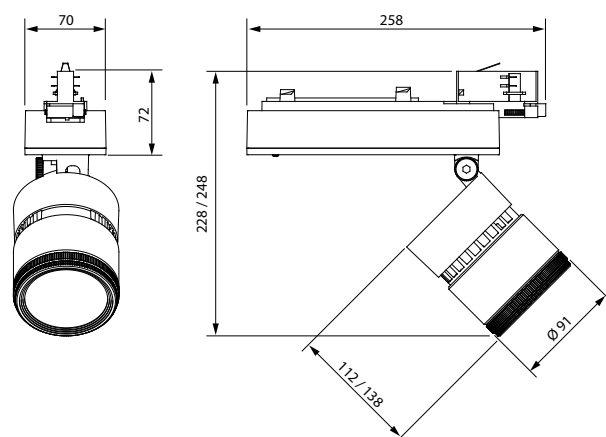
### Specifications

Light source	LED module
Power	21 W
Beam angle	NB (7°) - WB (43°) (with clear frontal lens)
Luminous flux	450 lx (7°) - 660 lm (43°) (3000K)
Correlated Color Temperature	2700K / 3000K / 4000K
Color Rendering Index	<ul style="list-style-type: none"> <li>• 2700K, CRI 90+</li> <li>• 3000K, CRI 90+</li> <li>• 4000K, CRI 90+</li> </ul>
Standard deviation color matching	<3 (with a tolerance $\pm 0.005$ on x, y color point measurements)
Median useful life L80B50	50,000 hours
Median useful life L90B50	25,000 hours
Average ambient temperature	+25 °C
Driver failure rate	1% per 5000 hours
Operating temperature range	0 to +35 °C
Driver	Built-in
Mains voltage	220 or 240 V / 50-60 Hz
Dimming	Onboard Dimming (10% to 100%) DALI dimming ON/OFF
Material	Gearbox: plastic Head and heatsink: aluminum Frontal lens: polycarbonate
Color	Black White
Connection	Push-in connector or with pull relief. Track connector (3C)
Installation	On 3-circuit track (3C)
Accessories	Clear frontal lens (included) Soft frontal lens [SV-5] (included) Linear frontal lens [L-0140] (not included) Other lenses available on request
Warranty	5 years

### Variable spot (7° - 43°)



### Technical drawings



# PerfectBeam

## Variable Spot

Interchangeable lenses for beam shaping

Inspired by precision optics like camera lenses, this luminaire range comes with a zoom mechanism and a number of beam shaping lenses that are easy to adapt.



Small beam



Medium beam



Wide beam

7 degrees



Soft frontal lens  
[SV-5]

11 degrees



43 degrees



Linear frontal lens  
[L-0140]



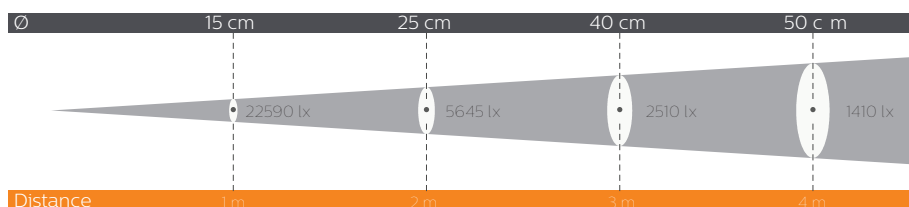
# PerfectBeam

## Variable Spot

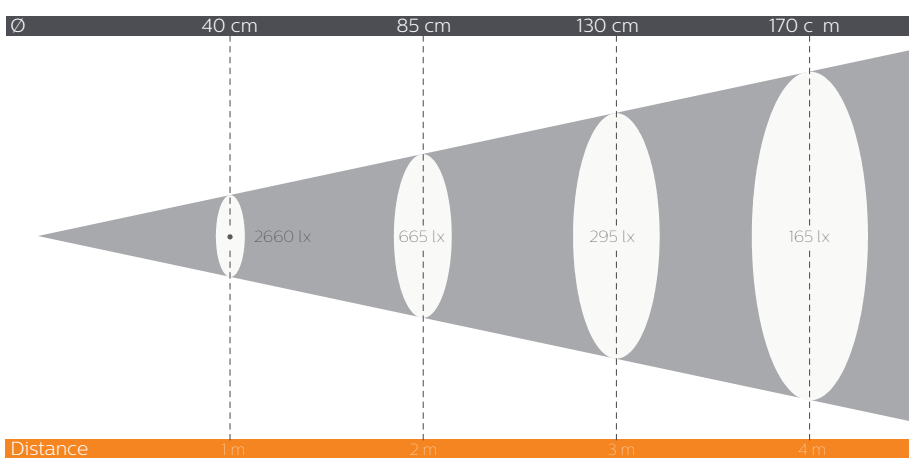
### Output details



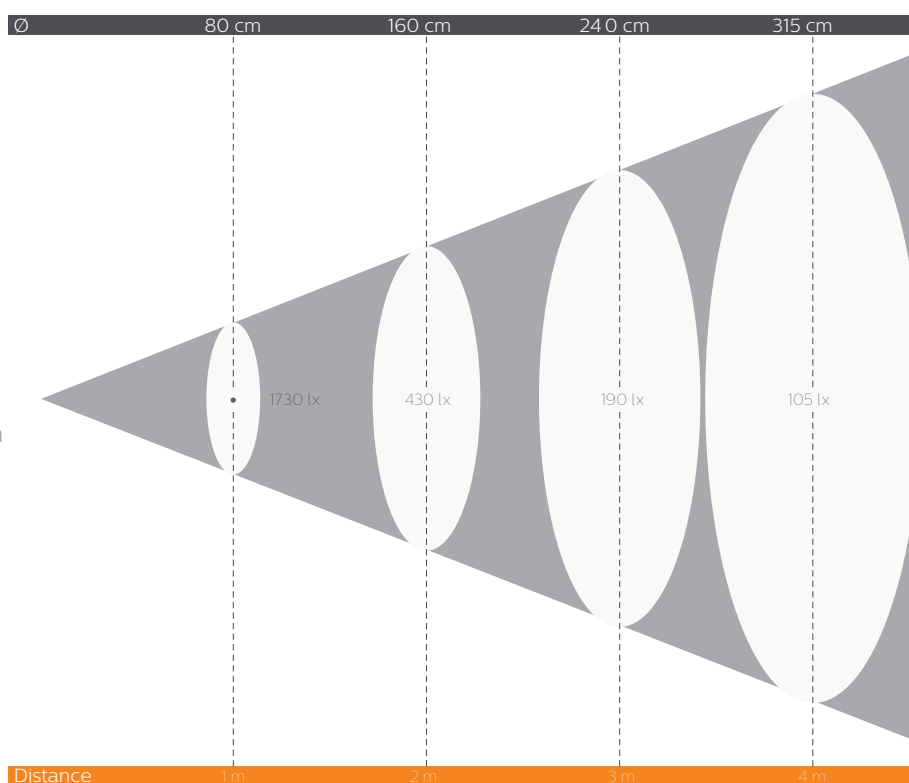
7°  
450 lm



24°  
600 lm



43°  
660 lm



\*Photometric files available please contact...  
See information on: webpage...



# PerfectBeam

## Framing Projector

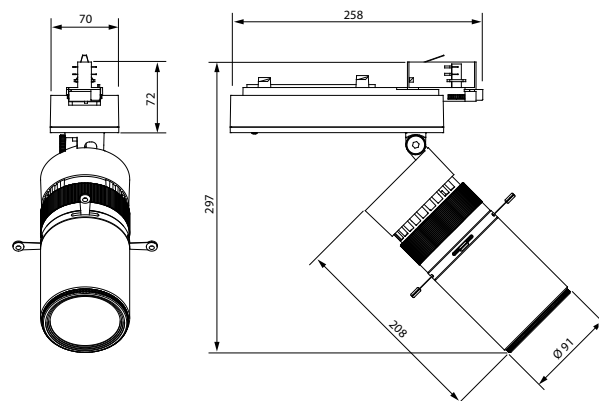
### Specifications

Light source	LED module
Power	21 W
Beam angle	max 30°
Luminous flux	240 lm (3000K)
Correlated Color Temperature	2700K / 3000K / 4000K
Color Rendering Index	<ul style="list-style-type: none"> <li>• 2700K, CRI 90+</li> <li>• 3000K, CRI 90+</li> <li>• 4000K, CRI 90+</li> </ul>
Standard deviation color matching	<3 (with a tolerance $\pm 0.005$ on x, y color point measurements)
Median useful life L80B50	50,000 hours
Median useful life L90B50	25,000 hours
Average ambient temperature	+25 °C
Driver failure rate	1% per 5000 hours
Operating temperature range	0 to +35 °C
Driver	Built-in
Mains voltage	220 or 240 V / 50-60 Hz
Dimming	Onboard Dimming (10% to 100%) DALI dimming ON/OFF
Material	Gearbox: plastic Head and heatsink: aluminum Frontal lens: polycarbonate
Color	Black White
Connection	Push-in connector or with pull relief. Track connector (3C)
Installation	On 3-circuit track (3C)
Accessories	Clear frontal lens (included) Soft frontal lens [SF-0.5] (not included) Other lenses available on request
Warranty	5 years

### Framing projector (30°)



### Technical drawings



# PerfectBeam Framing Projector

Interchangeable lenses for beam shaping & Output details



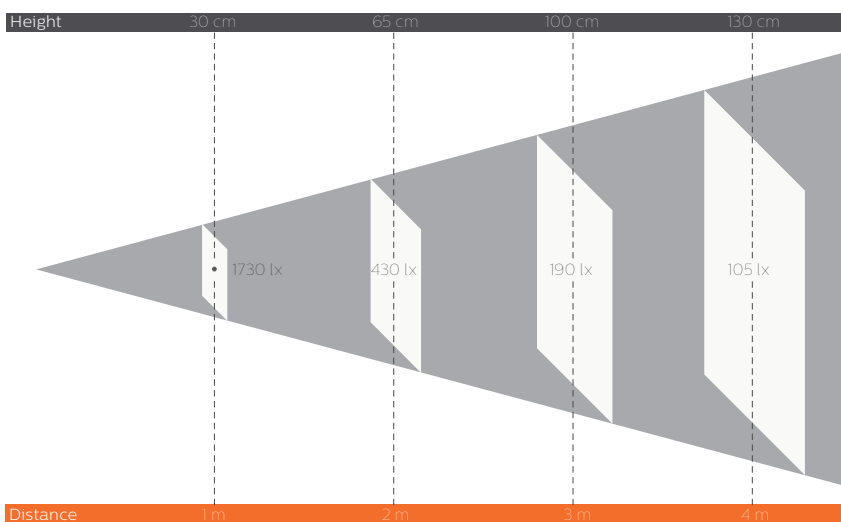
Clear frontal lens



Soft frontal lens  
[SF-0.5]






30°  
240 lm





## Standard products

### Code overview - Variable Spot

product	12NC code	CT	type	n° LED	power	frontal lens	finish	dimming	protection class IEC	IP
	910504801181	2700K	Variable Spot	1	21W	clear & soft	white	onboard dim	CL II	20
	910504801182	3000K	Variable Spot	1	21W	clear & soft	white	onboard dim	CL II	20
	910504801183	2700K	Variable Spot	1	21W	clear & soft	black	onboard dim	CL II	20
	910504801184	3000K	Variable Spot	1	21W	clear & soft	black	onboard dim	CL II	20
	910504801189	Linear frontal lens for Variable Spot (SV-5)								

All products also available in DALI.

### Code overview - Framing Projector

product	12NC code	CT	type	n° LED	power	frontal lens	finish	dimming	protection class IEC	IP
	910504801185	2700K	Framing Projector	1	21W	clear	white	onboard dim	CL II	20
	910504801186	3000K	Framing Projector	1	21W	clear	white	onboard dim	CL II	20
	910504801187	2700K	Framing Projector	1	21W	clear	black	onboard dim	CL II	20
	910504801188	3000K	Framing Projector	1	21W	clear	black	onboard dim	CL II	20

All products also available in DALI.

### Soft frontal lens for Framing Projector

12NC code	
910504801375	Soft lens for Framing Projector (SF-0.5)

## Customized products

Every Museum is unique. At Philips Lighting we fully understand this, offering a wide range of customized products on request. See below some examples of customization options. Our ultimate mission is to bring your vision to life.

#### Finish

- White/Silver version (instead of White/Black)
- Other special finishing on request

#### Color Temperature

- Other customized color temperatures on request

#### CRI / Spectrum

- Xicato Artist Series LED, CRI 98
- Other customized CRI and spectrum on request

#### Luminous Flux

- Lower light output
- Higher light output

#### Dimming

- DALI control

#### Accessories

- Other customized frontal lenses on request

#### Framing Projector

- Focus mechanism for sharp or soft edges
- Other customizations on request

#### Mounting Options

- Surface mounted or semi-recessed
- Other mounting systems on request

#### Certifications

- ETL listed version for US market
- Other certifications on request

