

# STANDARD RANGE

45 mm PMMA collimator — LLC59

Last update : September, 2023

# LLC59: presentation

Given the current increasing demand on applications of color mixing or tunable white, GAGGIONE is launching its  $\varnothing$  45 mm collimator range without sprue as well as **new versions**.

11 references



LLC59R

Ultra narrow beam



LLC59U

Ultra narrow beam



LLC59RF



LLC59N

Narrow beam



LLC59NF



LLC59C

Color beam



LLC59CM

Medium Color beam



LLC59M

Medium beam



LLC59W

Wide beam



LLC59V

Very large beam



LLC59E

Elliptical beam

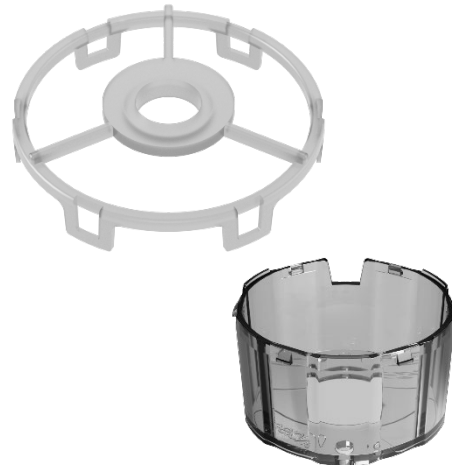
# LLC59: presentation

We have developed a series of accessories dedicated to the LLC59 to **avoid backlight**.

3 accessories



**LLH59GWB\***  
Grained Window



**LLH59FMB\***  
Flat Mask



**LLH59HMB\***  
High Mask



# LLC59: LED specifications

LES size: 8mm<sup>2</sup> max without dome / 4mm<sup>2</sup> max with dome

Type of LED: High Power, Cluster High Power, Mid Power, Cluster Chip Scale Package, Chip Scale Package.

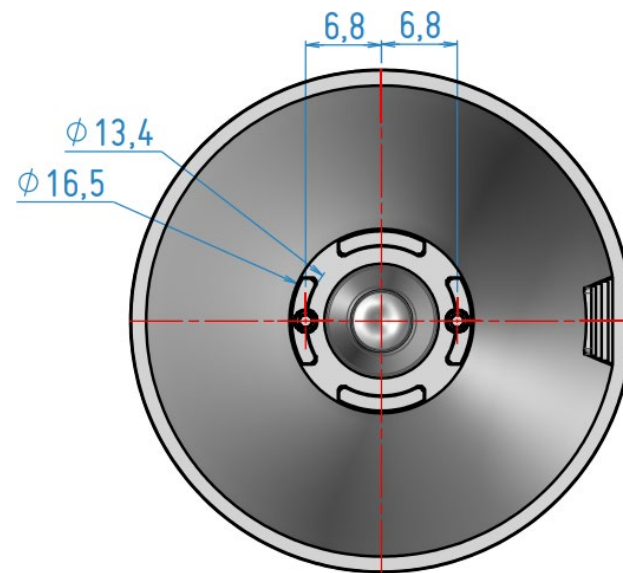
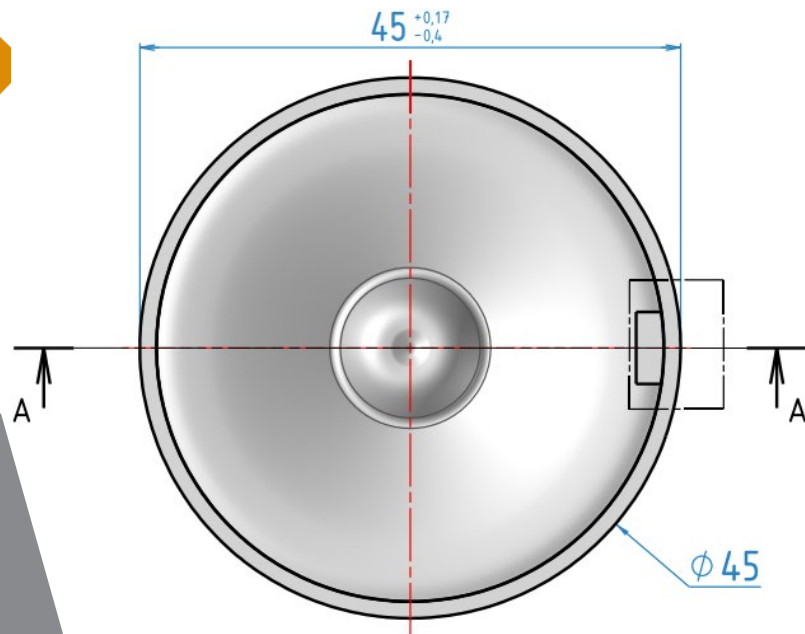
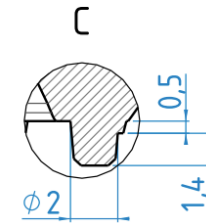
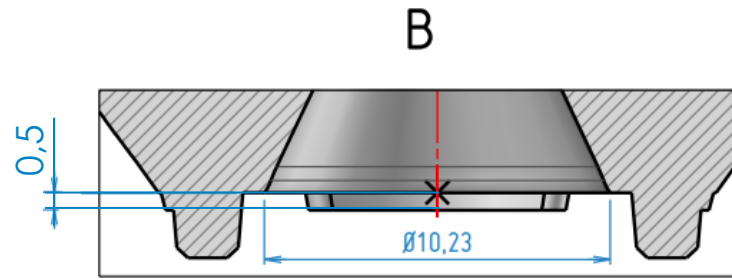
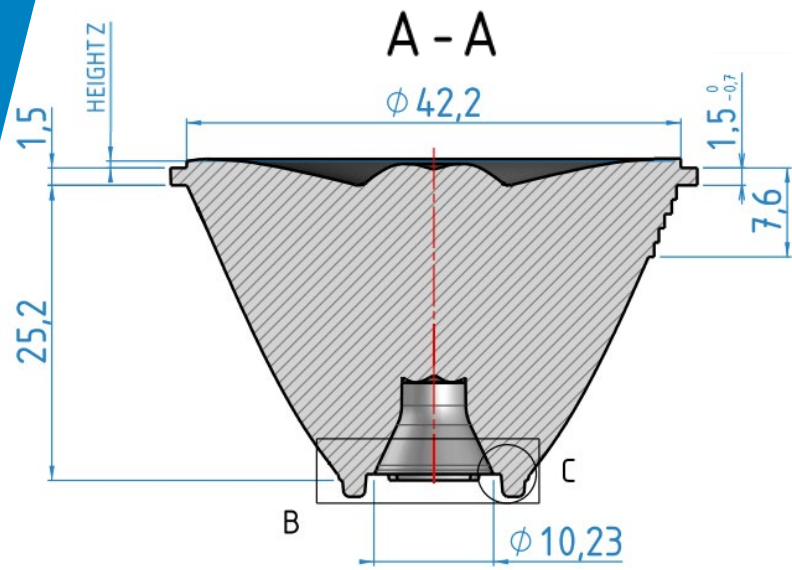
Type of Led	LLC59R	LLC59U	LLC59RF	LLC59N	LLC59NF	LLC59C	LLC59CM	LLC59M	LLC59W	LLC59E
RGBW	✗	✗	✗	✓	✓	✓	✓	✓	✓	✓
Tunable White	✗	✗	✗	✓	✓	✓	✓	✓	✓	✓
Single chip	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Multi chip	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓

# LLC59: applications



# LLC59: 2D drawing

except LLC59E

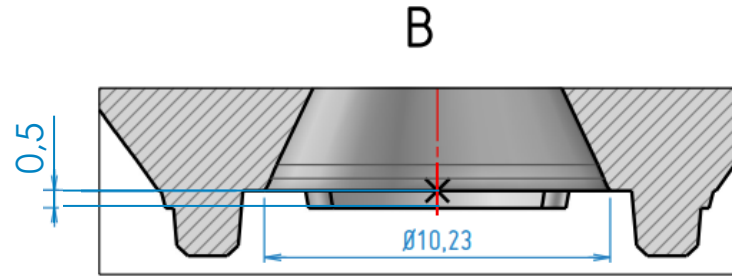
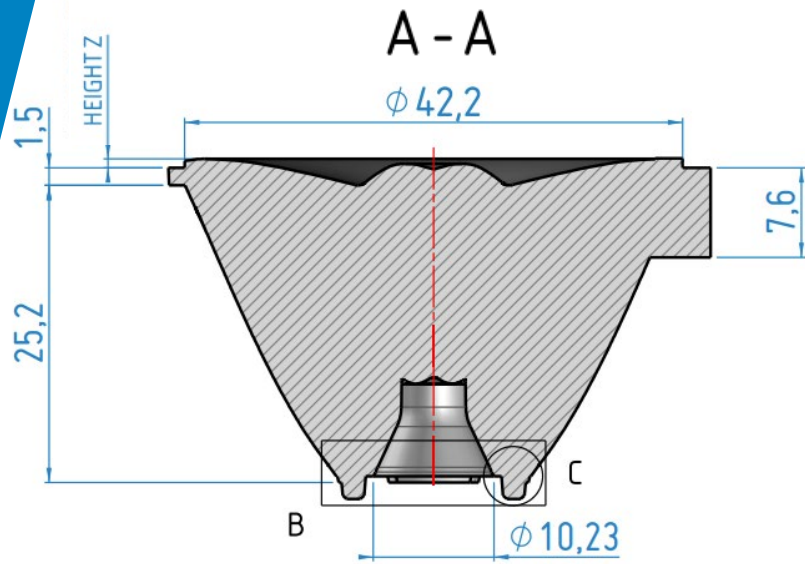


For missing elements, please refer to the 2D plan.

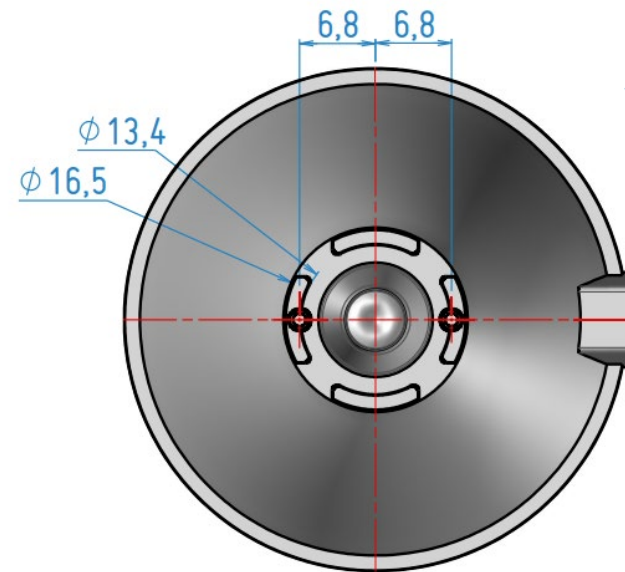
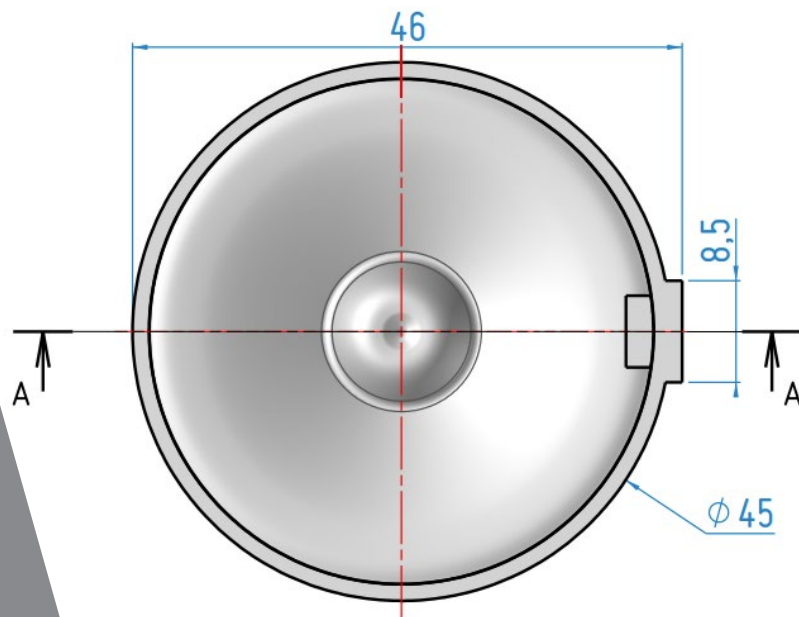
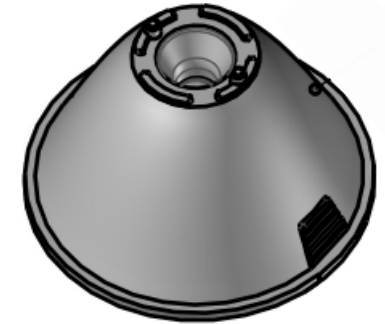
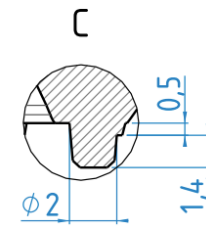
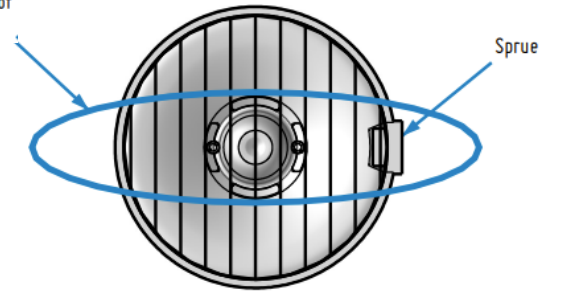
Without holder, all dimensions are in millimeters.

General tolerance  $\pm 0,1$  mm (standard NF T 58-000 cat. 4, reduced class).

# LLC59E: 2D drawing



Beam orientation of the LLC59E



For missing elements, please refer to the 2D plan.

Without holder, all dimensions are in millimeters.

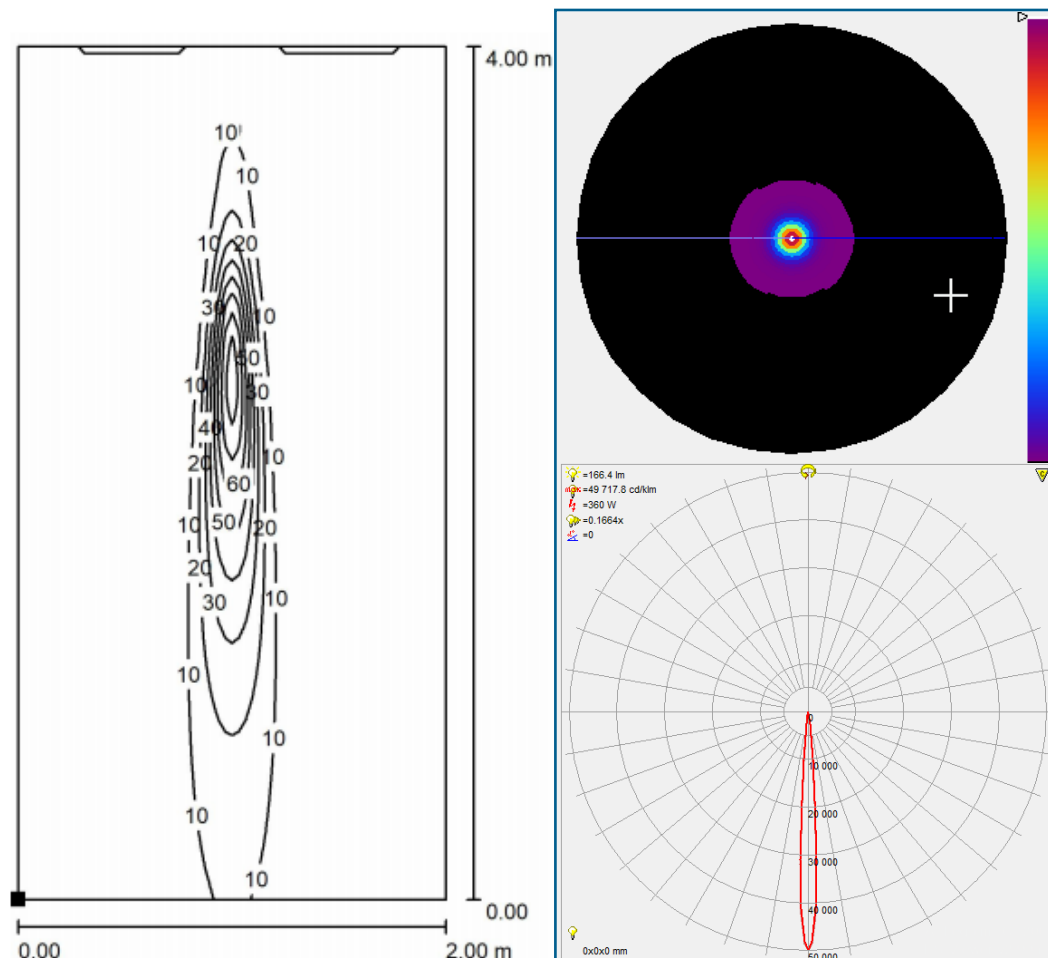
General tolerance  $\pm 0.1\text{mm}$  (standard NF T 58-000 cat. 4, reduced class).

# LLC59R: Ultra intensive narrow beam



## Compatibility matrix

	OSRAM	LUMILEDS	CREE	NICHIA
<b>LLC59R</b>	<b>OSLON COMPACT CL LUW CEUP</b>	<b>LUXEON Z ES</b>	<b>XHP35.2 HI</b>	<b>NV4WB35AM</b>
FWHM (°)	1,8	3,4	7	7,6
FWTM (°)	3,8	7,6	12,2	14,8
Efficacy (cd/lm)	572,9	160,4	48,6	34,8
CCI*	3,1	1,8	4,0	1,4



Dialux simulation

Values in lux, scale 1 : 32  
Distance from wall: 0,15 m  
100 lumens per LED

Intensity pattern

[Visit the product page](#)

LED: XHP35.2HI

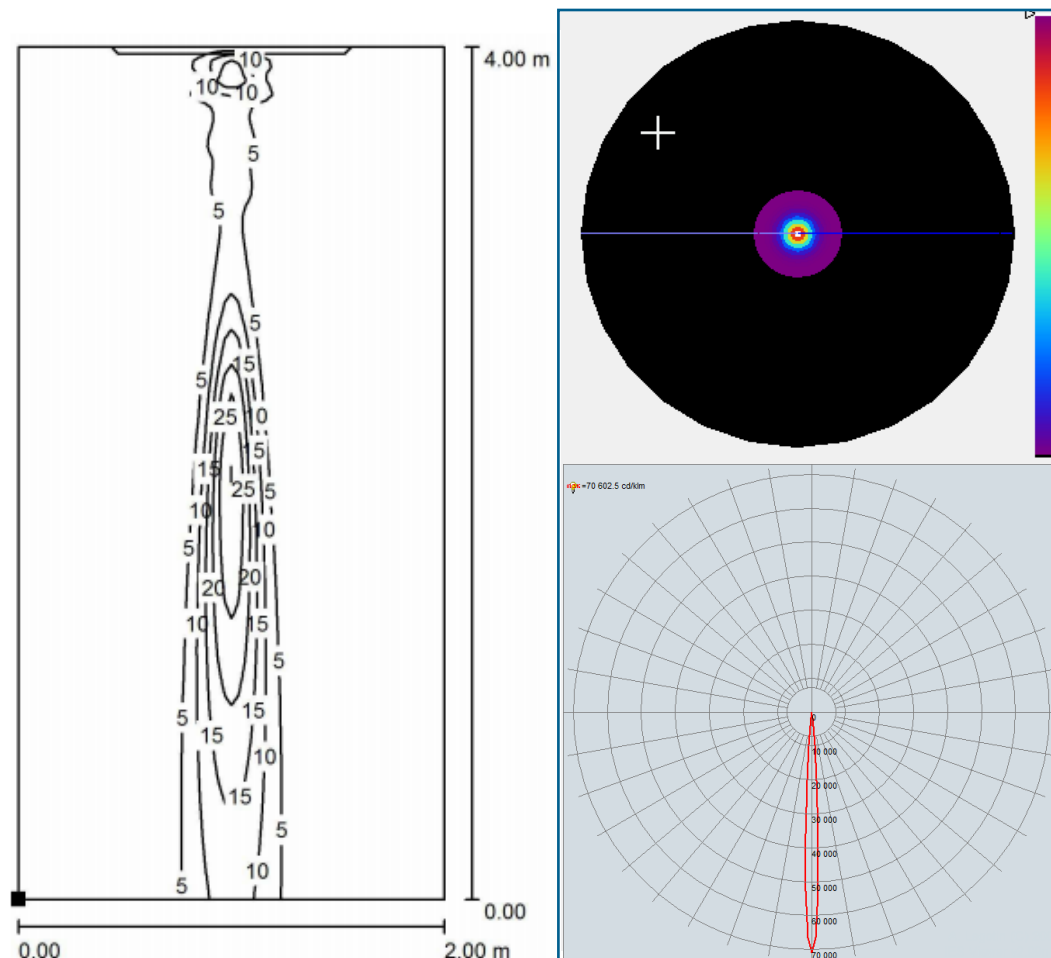


# LLC59U: Ultra narrow beam



## Compatibility matrix

	OSRAM	LUMILEDS	CREE	NICHIA
LLC59U	OSLON COMPACT CL LUW CEUP	LUXEON Z ES	XHP35.2 HI	NV4WB35AM
FWHM (°)	3,7	4,4	7,3	7,6
FWTM (°)	6,3	8,2	13,1	14,0
Efficacy (cd/lm)	181,6	112,2	43,7	37,1
CCI*	1,0	1,5	-	1,1



Dialux simulation

Values in lux, scale 1 : 32  
Distance from wall: 0,3 M  
100 lumens per LED

Intensity pattern

[Visit the product page](#)

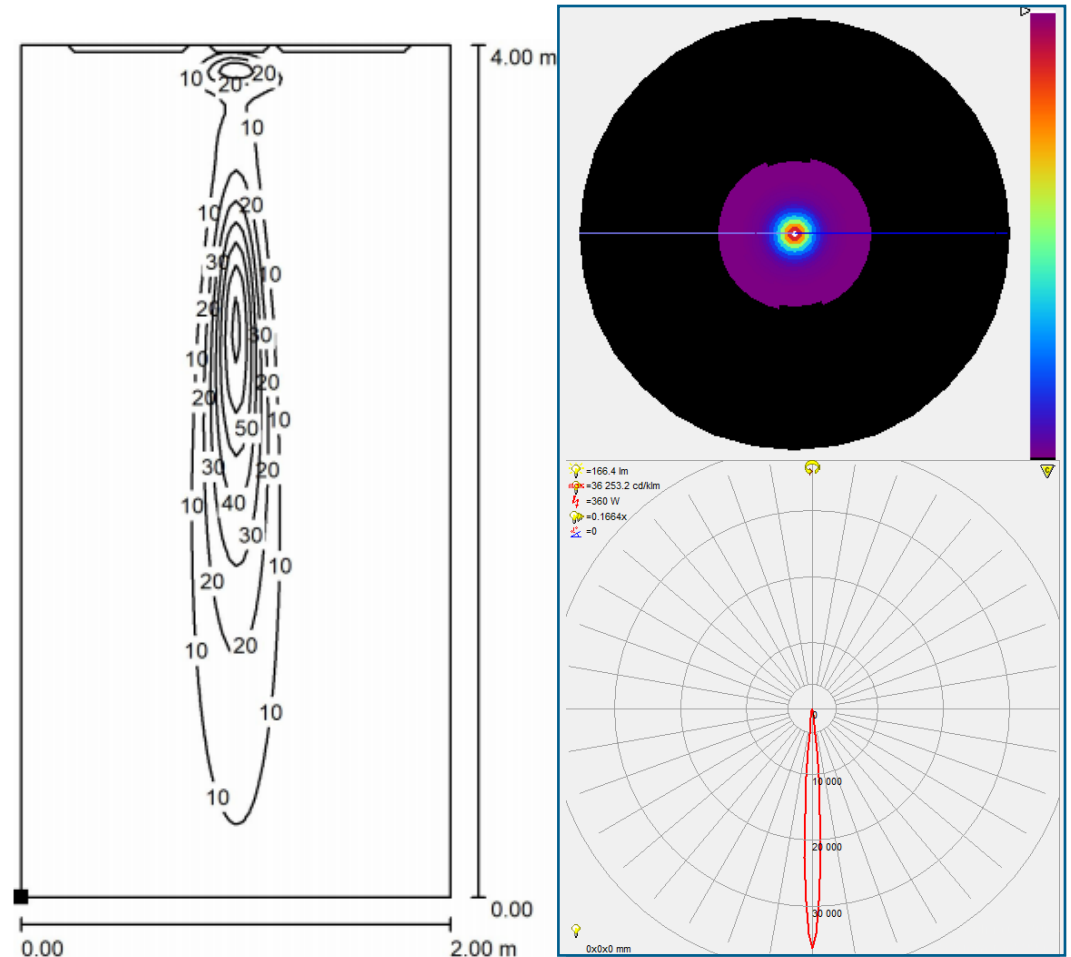
LED: XHP35.2HI

# LLC59RF: Narrow beam



## Compatibility matrix

	OSRAM	LUMILEDS	CREE	NICHIA
LLC59RF	OSLON COMPACT CL LUW CEUP	LUXEON Z ES	XHP35.2 HI	NV4WB35AM
FWHM (°)	3,6	4,6	7,3	8,4
FWTM (°)	7,9	9,8	14,2	15,9
Efficacy (cd/lm)	120,1	79,2	35,5	28,1
CCI*	1,9	0,7	2,8	1,0



Dialux simulation

Values in lux, scale 1 : 32  
Distance from wall: 0,3 m  
100 lumens per LED

Intensity pattern

[Visit the product page](#)

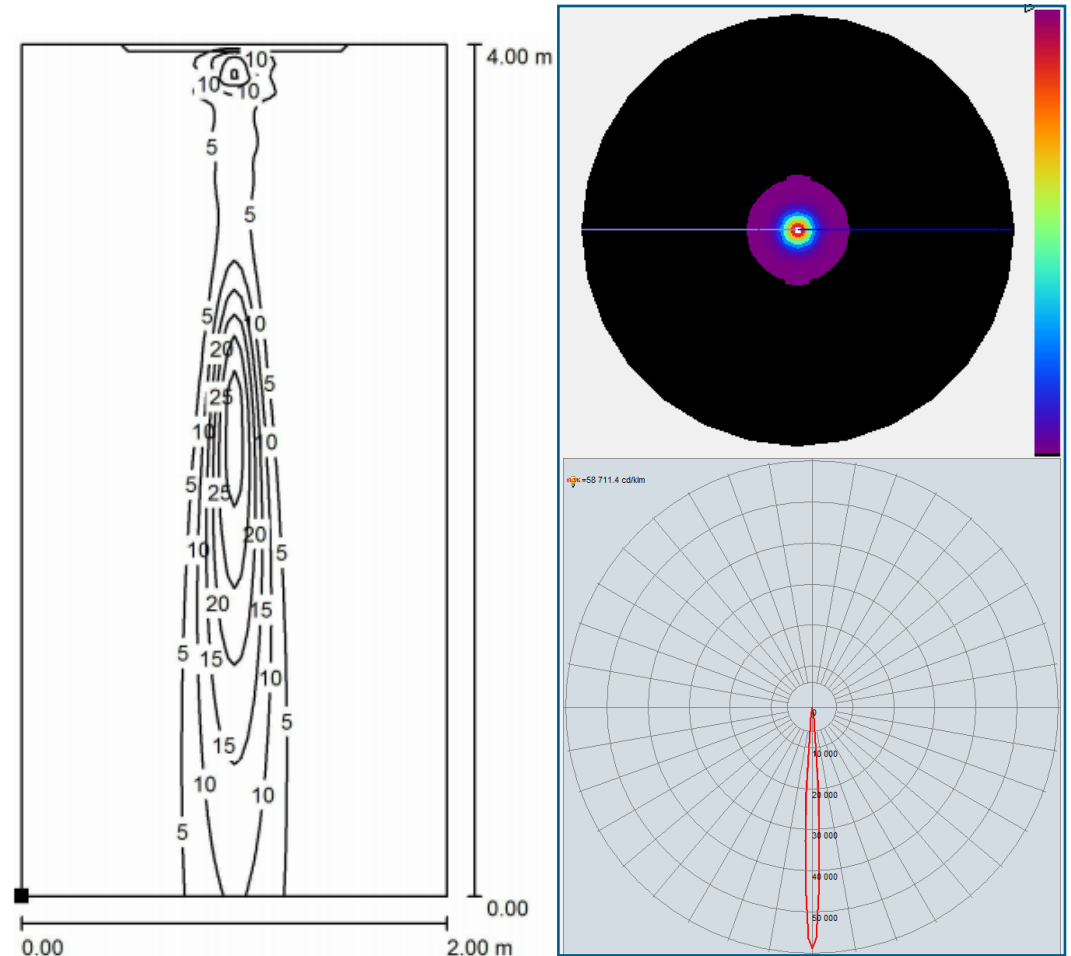
LED: XHP35.2HI

# LLC59N: Narrow beam



## Compatibility matrix

	OSRAM	LUMILEDS	CREE	NICHIA
LLC59N	OSLON COMPACT CL LUW CEUP	LUXEON Z ES	XHP35.2 HI	NV4L144AR
FWHM (°)	4,4	5,4	7,6	7,6
FWTM (°)	8,3	10,1	14,1	15,1
Efficacy (cd/lm)	118,7	77,8	40,2	32,7
CCI*	-	1,5	-	1,3



Dialux simulation

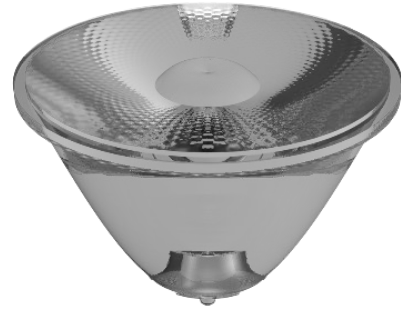
Values in lux, scale 1 : 32  
Distance from wall: 0,3 M  
100 lumens per LED

Intensity pattern

[Visit the product page](#)

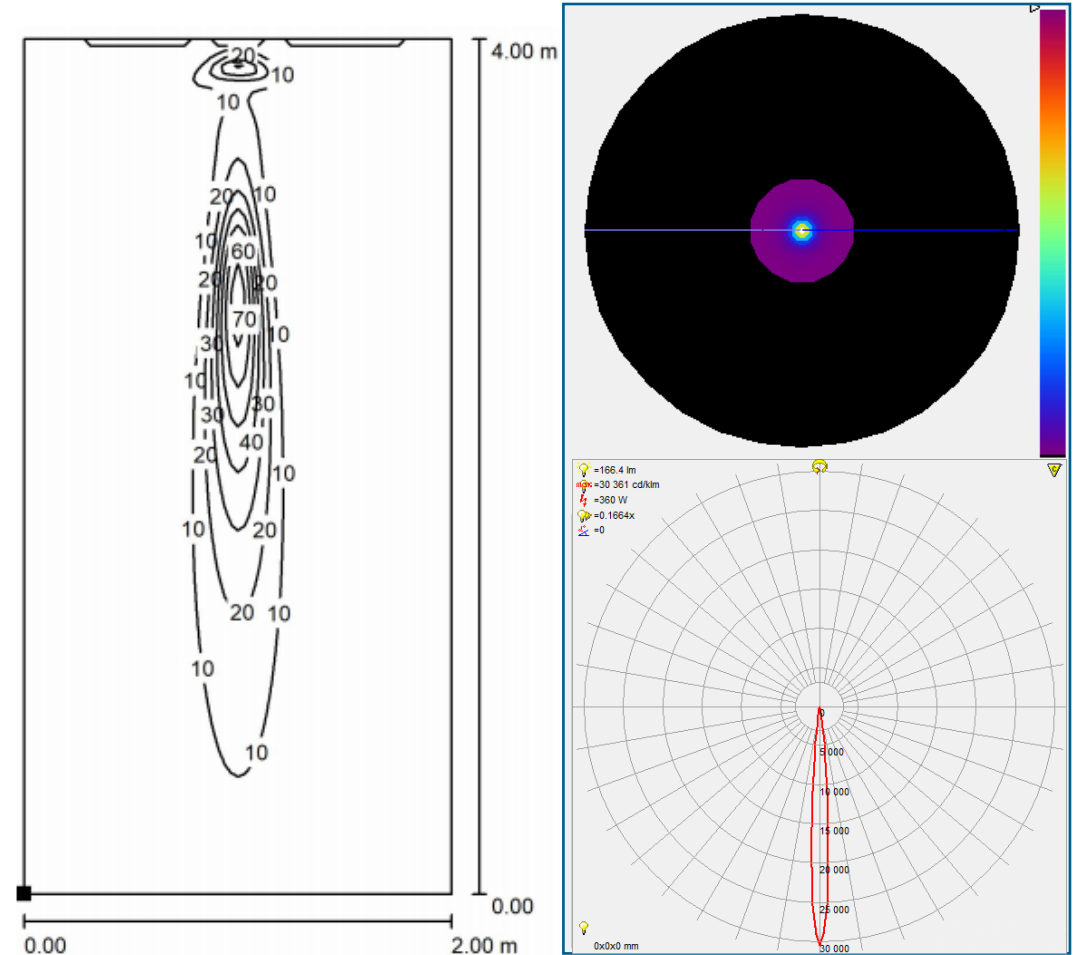
LED: XHP35.2HI

# LLC59NF: Narrow beam



## Compatibility matrix

	OSRAM	LUMILEDS	CREE	NICHIA
LLC59NF	OSLON COMPACT CL LUW CEUP	LUXEON Z ES	XHP35.2 HI	NV4WB35AM
FWHM (°)	5,5	6,1	8,1	9,4
FWTM (°)	10,8	12,1	15,7	18,0
Efficacy (cd/lm)	61,7	50,7	29,5	22,3
CCI*	0,4	0,9	1,9	0,9



Dialux simulation

Values in lux, scale 1 : 32  
Distance from wall: 0,3 m  
100 lumens per LED

Intensity pattern

[Visit the product page](#)

LED: XHP35.2HI

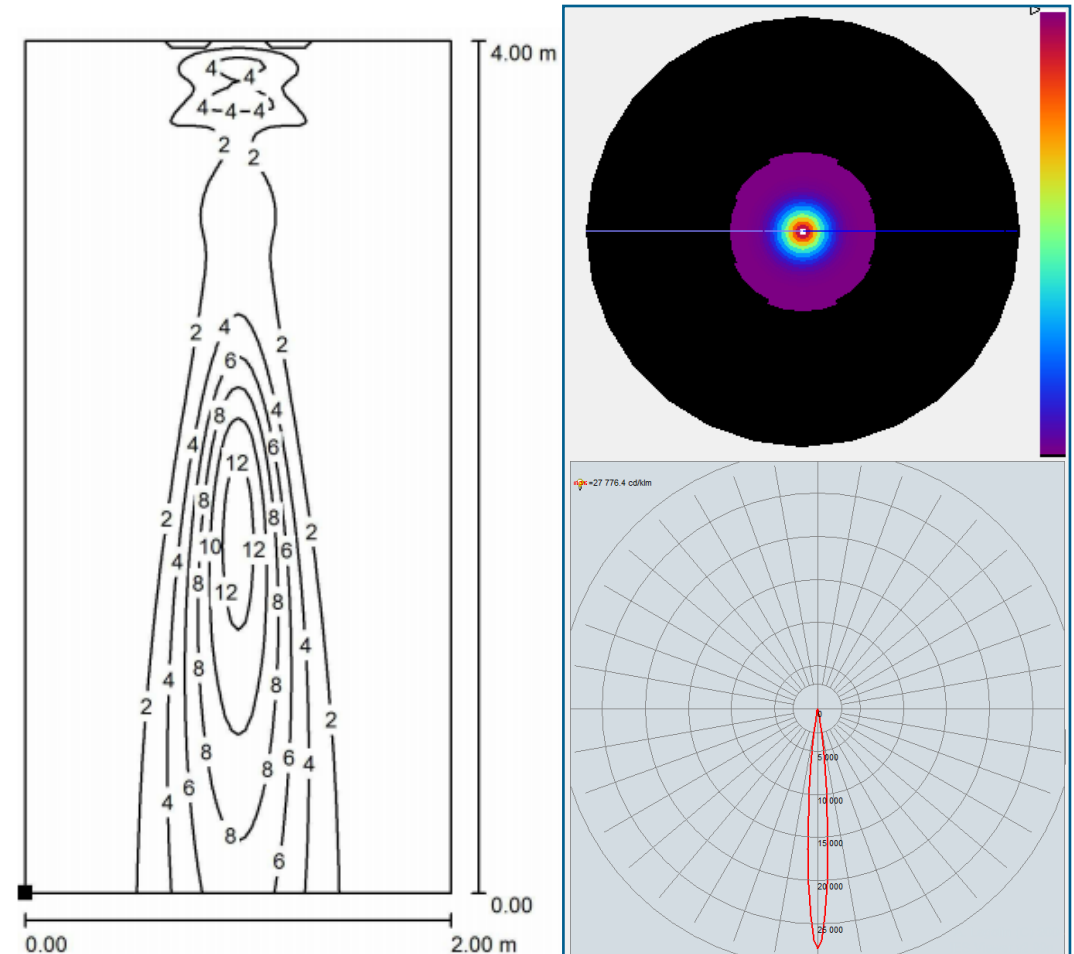
# LLC59C: Color beam



## Compatibility matrix

### LLC59C

	OSRAM	LUMILEDS	CREE	NICHIA
	OSTAR STAGE LE RTDUW S2WN	LUXEON Z ES	XHP35.2 HI	NV4WB35AM
FWHM (°)	9,4	9,2	10,3	10,9
FWTM (°)	18,2	18,1	19,9	21,1
Efficacy (cd/lm)	27,0	25,6	21,1	17,0
CCI*	4,8	1,4	-	1,1



## Dialux simulation

Values in lux, scale 1 : 32  
Distance from wall: 0,3 m  
100 lumens per LED

## Intensity pattern

LED: LERTDUW\_S2WN

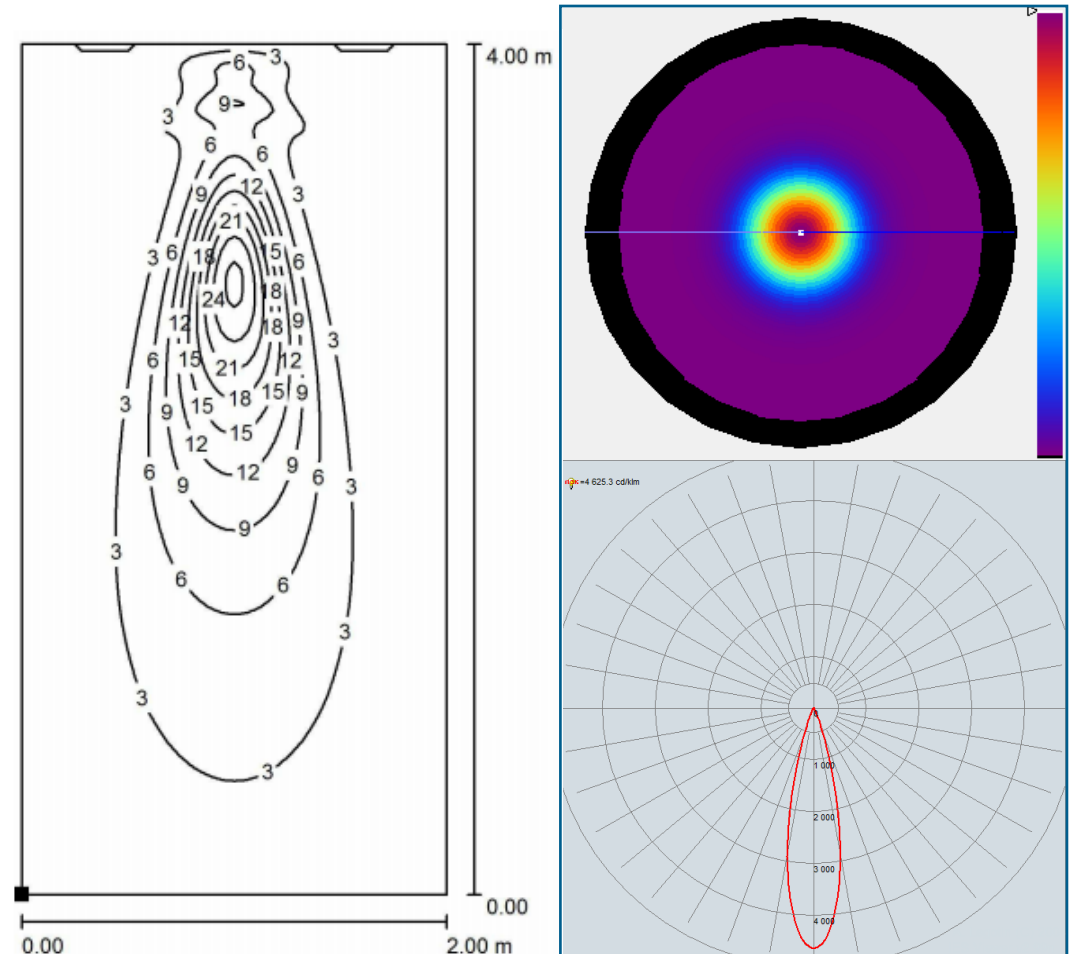
[Visit the product page](#)

# LLC59M: Medium beam



## Compatibility matrix

	OSRAM	LUMILEDS	CREE	NICHIA
LLC59M	OSTAR STAGE LE RTDUW S2WN	LUXEON M	XHP35.2 HI	NF2W757G MT
FWHM (°)	24,0	24,2	25,2	23,8
FWTM (°)	40,2	44,1	42,7	40,8
Efficacy (cd/lm)	4,7	3,9	4,1	4,6
CCI*	2,3	1	-	0,9



Dialux simulation

Values in lux, scale 1 : 32  
Distance from wall: 0,3 m  
100 lumens per LED

Intensity pattern

LED: LERTDUW\_S2WN

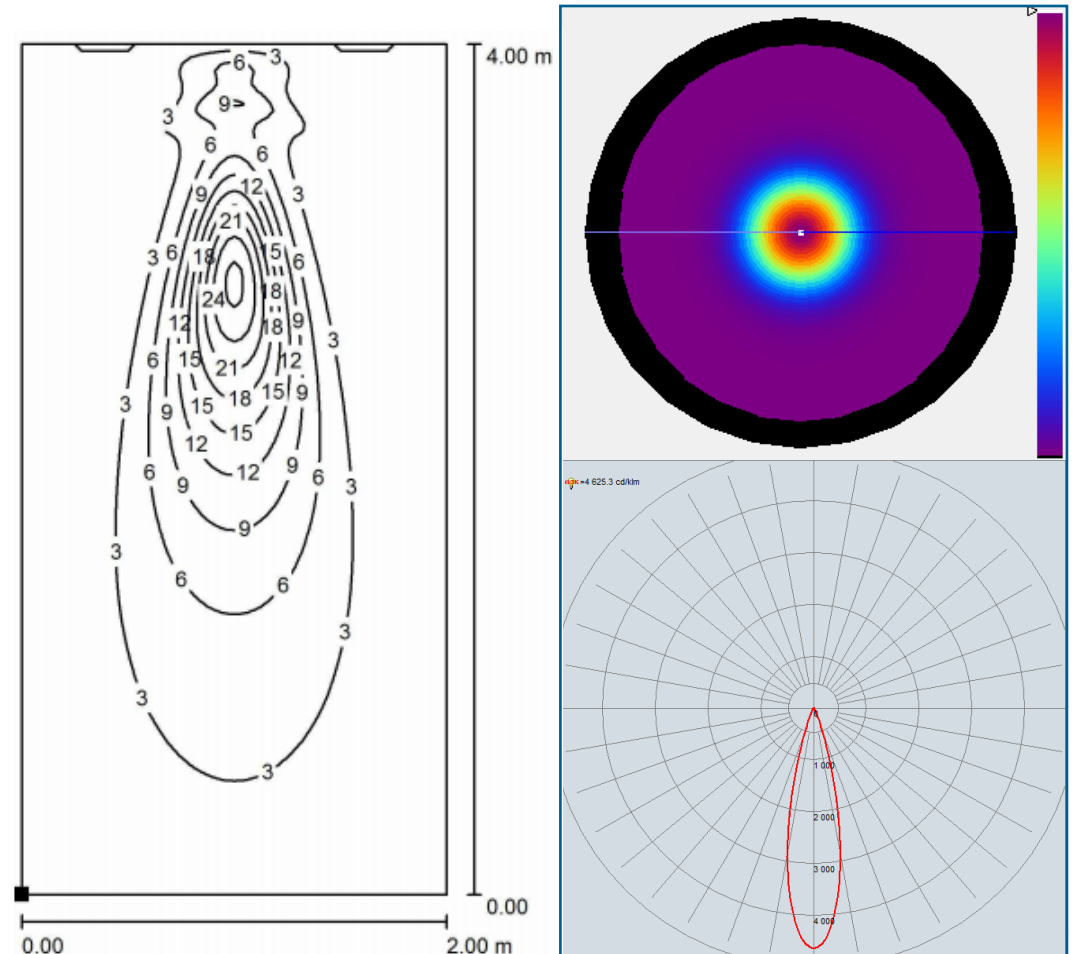
[Visit the product page](#)

# LLC59CM: Medium Color beam



## Compatibility matrix

	OSRAM	LUMILEDS	CREE	CREE
LLC59CM	OSTAR STAGE LE RTDUW S2WN	LUXEON Z RGBW	XM-L COLOR GEN 2 HI	XHP50.3
FWHM (°)	11.9	13.7	13.3	15.4
FWTM (°)	23.6	27.3	27.1	30.3
Efficacy (cd/lm)	14	10.7	11	8.4
CCI*	2.9	9.6	6.1	0.4



Dialux simulation

Values in lux, scale 1 : 32  
Distance from wall: 0,3 m  
100 lumens per LED

Intensity pattern

LED: LERTDUW\_S2WN

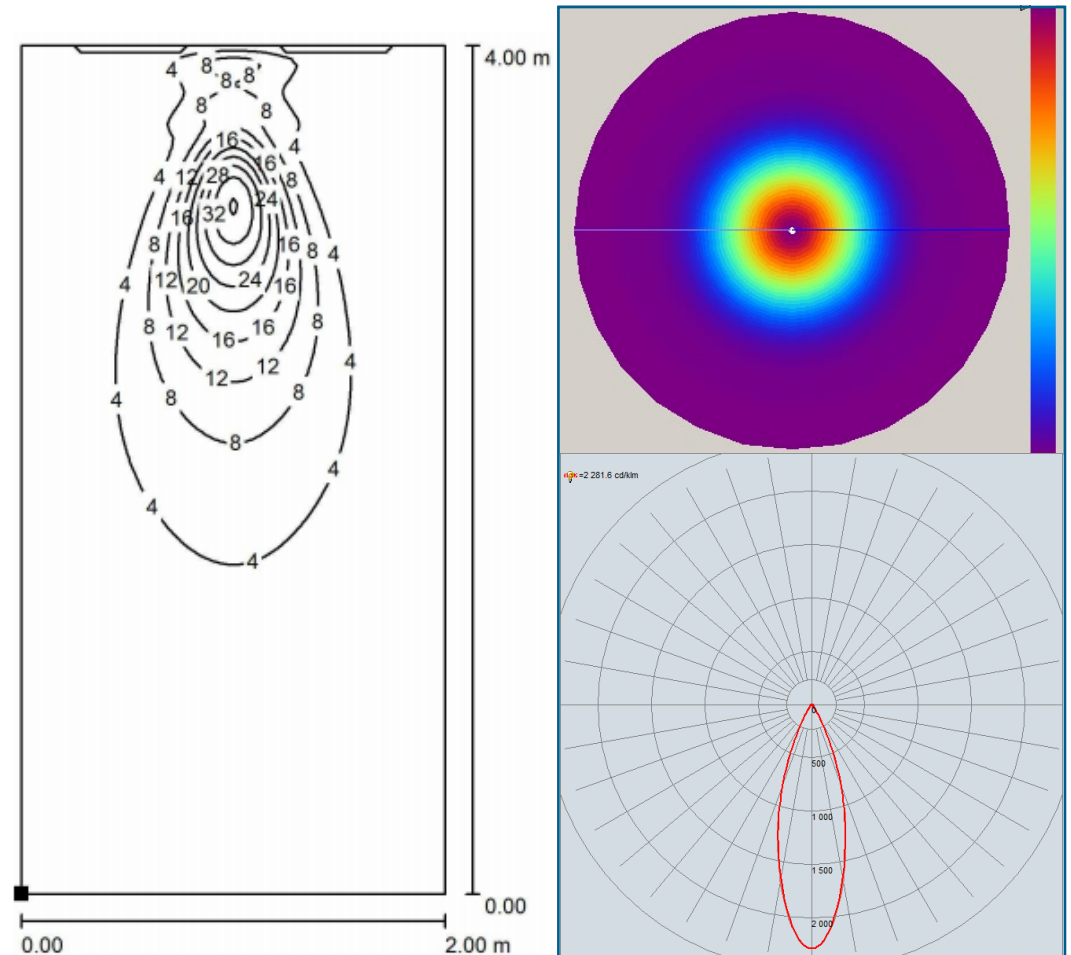
[Visit the product page](#)

# LLC59W: Wide beam



## Compatibility matrix

	OSRAM	LUMILEDS	CREE	NICHIA
LLC59W	OSTAR STAGE LE RTDUW S2WN	LUXEON M	XHP35.2HI	NV4WB35AM
FWHM (°)	31,8	32,1	33,0	32,2
FWTM (°)	57,7	59,9	60,1	58,4
Efficacy (cd/lm)	2,3	2,0	2,1	2,2
CCI*	3,1	0,6	-	1,5



Dialux simulation

Values in lux, scale 1 : 32  
Distance from wall: 0,3 m  
100 lumens per LED

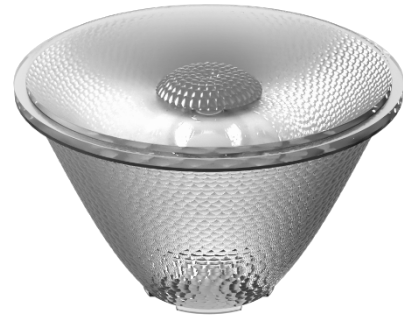
Intensity pattern

LED: LERTDUW\_S2WN

[Visit the product page](#)

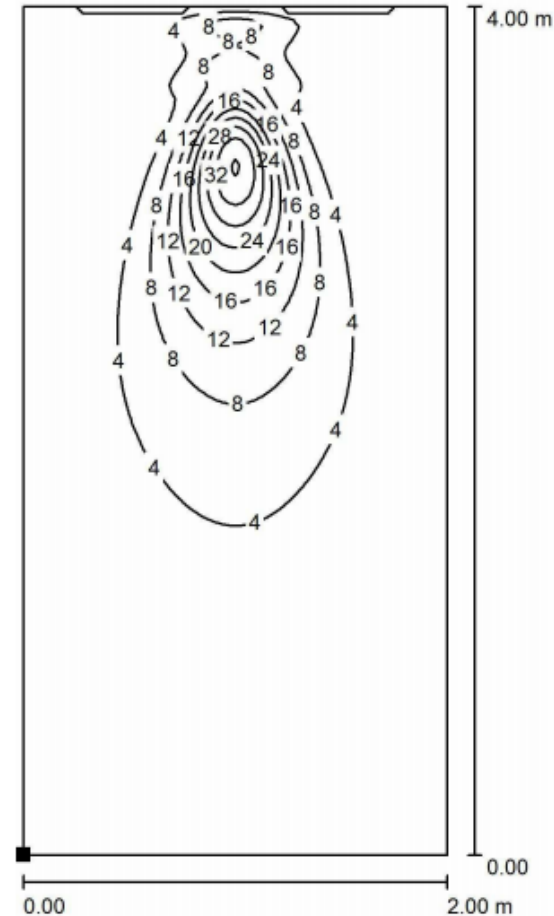


# LLC59V: Very large beam



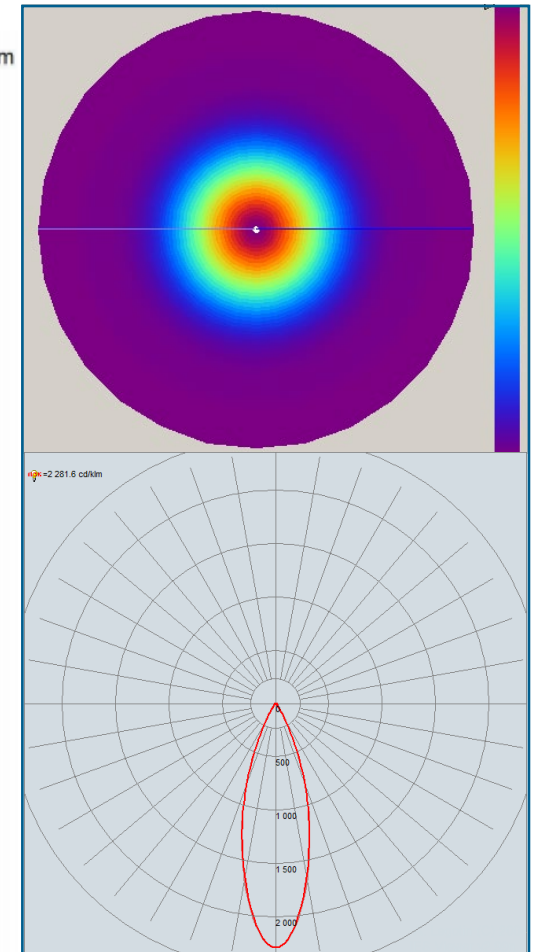
## Compatibility matrix

	OSRAM	LUMILEDS	CREE	CREE
LLC59W	OSTAR STAGE LE RTDUW S2WN	LUXEON Z CLUSTER TW	XHP50.3 HD	XM-L COLOR GEN 2 HI
FWHM (°)	48,6	48	48,2	48,8
FWTM (°)	75,5	76,2	77,9	77,4
Efficacy (cd/lm)	1,3	1,3	1,2	1,2
CCI*	4,5	1,4	1,3	5



Dialux simulation

Values in lux, scale 1 : 32  
Distance from wall: 0,3 m  
100 lumens per LED



Intensity pattern

LED: LERTDUW\_S2WN

[Visit the product page](#)

# LLC59E: Elliptical beam

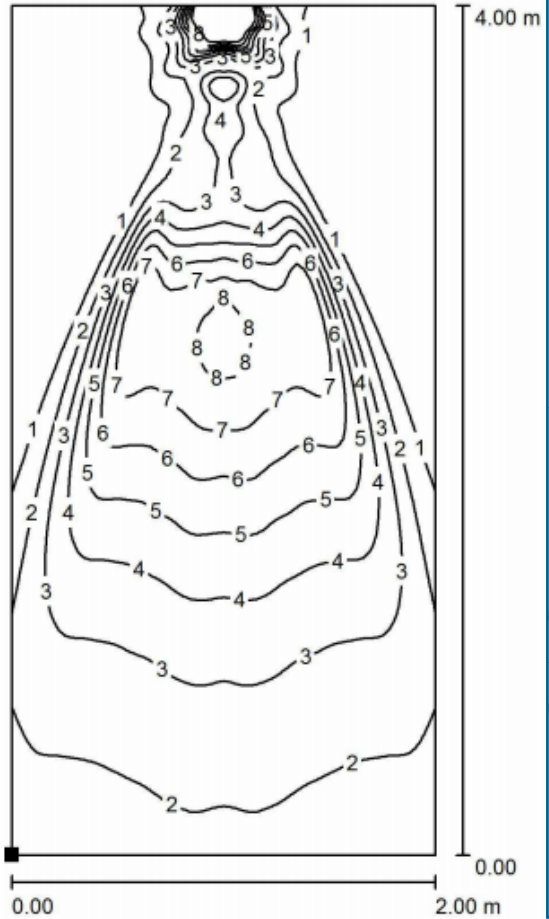


## Compatibility matrix

	OSRAM	LUMILEDS	CREE	NICHIA
LLC59E	OSTAR STAGE LE RTDUW S2WN	LUXEON Z ES	XHP35.2HI	NV4WB35AM
FWHM (°)	6,4 – 32,8	5,9 – 32,0	7,6 – 33,4	8,2 – 31,5
FWTM (°)	11,7 – 41,3	11,5 – 39,9	41 – 43,9	15,3 – 43,1
Efficacy (cd/lm)	13,4	13,2	10,6	9,1
CCI*	6,8	1,4	-	1,7

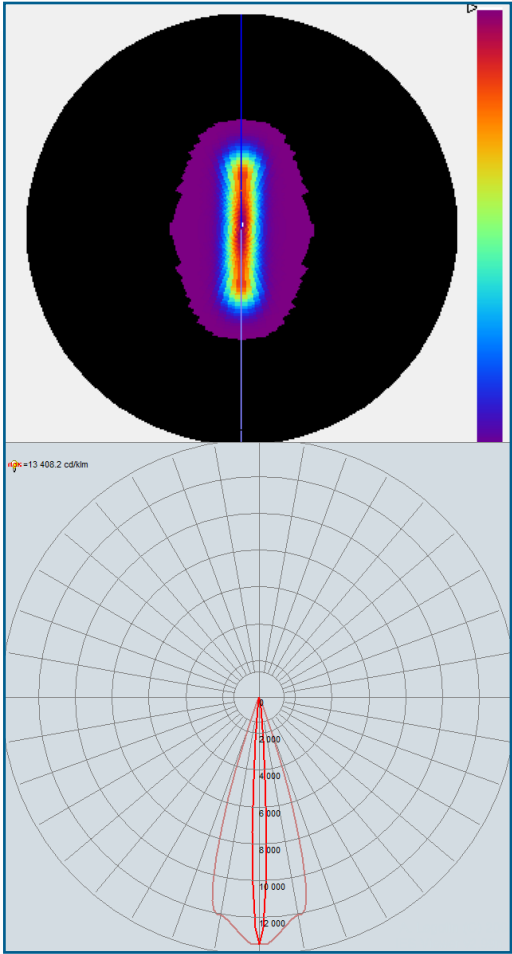
This collimator still has a sprue.

[Visit the product page](#)



Dialux simulation

Values in lux, scale 1 : 32  
Distance from wall: 0,3 m  
100 lumens per LED



Intensity pattern

LED: LERTDUW\_S2WN

# LLC59: compatible holders

## LLH59SPB0x



Clear holder



Black holder

Without adhesive: LLH59SPB00

LLH59SPB02

With adhesive: LLH59SPB001

LLH59SPB021

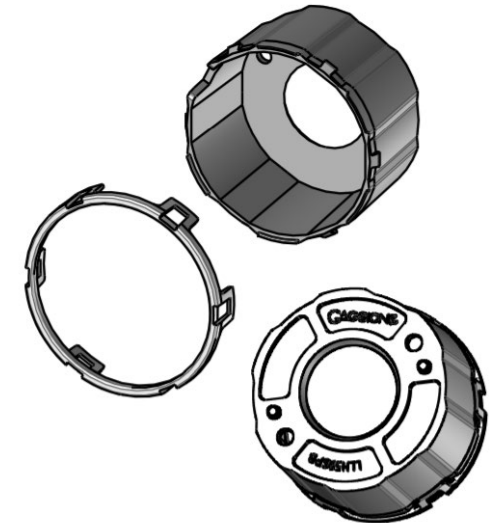
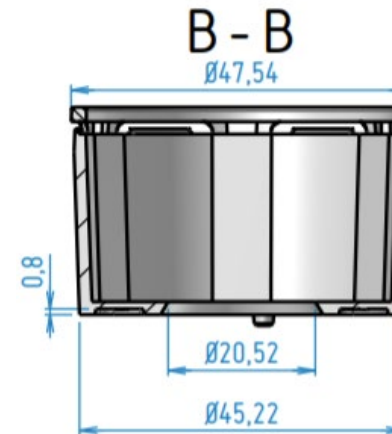
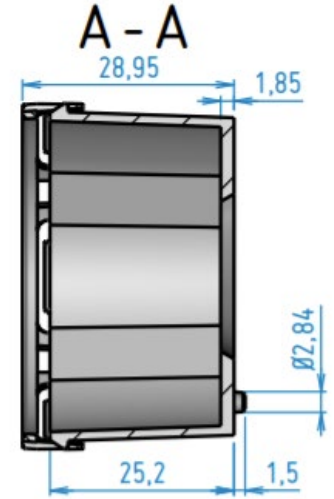
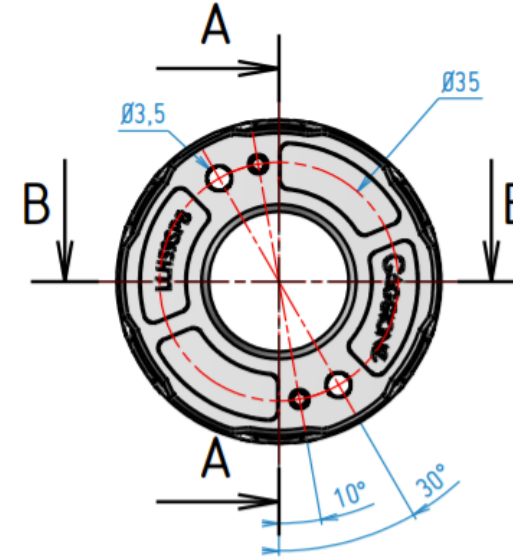
Holder reference	Diameter (mm)	PCB to LES (mm)	Height (H)	Note
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LLH59SPB0**	47.54	0.5	28.95	With pins
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Adhesive : 1 (Yes), Nothing (No)

Colors : 0 (clear), 2 (black)

If you need another color of holder, please [contact us](#)



All dimensions are in millimeters.

General tolerance +/- 0.1mm (standard NFT 58-000 cat. 4, reduced class).

⚠ Positioning holes need to be created into the PCB.

# LLC59: Assembled set

LLH59SPB\* + LLC59x

Type of Led	Color	Adhesive	LLC59R	LLC59U	LLC59RF	LLC59N	LLC59NF
LLH59SPB001	Clear	✓	LLS59R59SPB001	LLS59U59SPB001	LLS59RF59SPB001	LLS59N59SPB001	LLS59NF59SPB001
LLH59SPB021	Black	✓	LLS59R59SPB021	LLS59U59SPB021	LLS59RF59SPB021	LLS59N59SPB021	LLS59NF59SPB021

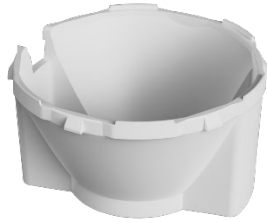
Type of Led	Color	Adhesive	LLC59C	LLC59M	LLC59CM	LLC59W	LLC59E
LLH59SPB001	Clear	✓	LLS59C59SPB001	LLS59M59SPB001	LLS59CM59SPB001	LLS59W59SPB001	LLS59E59SPB001
LLH59SPB021	Black	✓	LLS59C59SPB021	LLS59M59SPB021	LLS59CM59SPB021	LLS59W59SPB021	LLS59E59SPB021

# LLC59: compatible holders

## LLH59AAA0x



Clear holder



White holder



Black holder

Without adhesive: LLH59AAA00

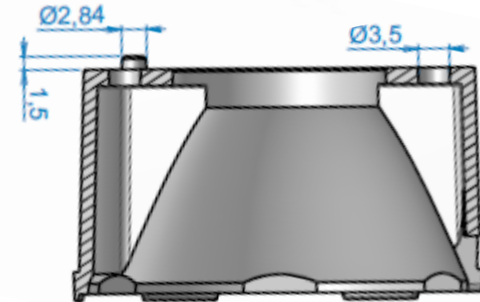
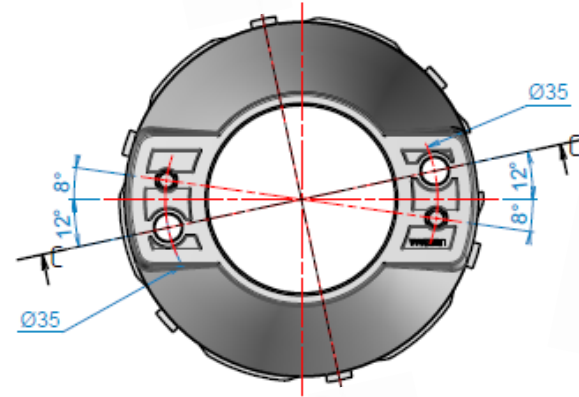
LLH59AAA01

LLH59AAA02

With adhesive: LLH59AAA001

LLH59AAA011

LLH59AAA021

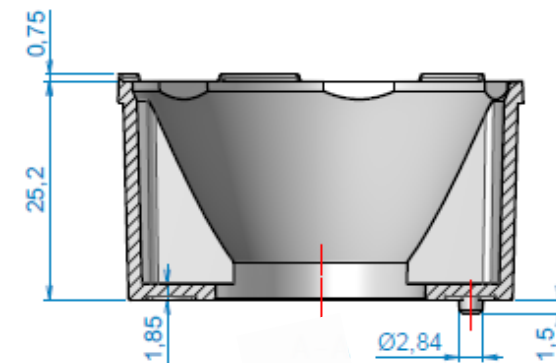
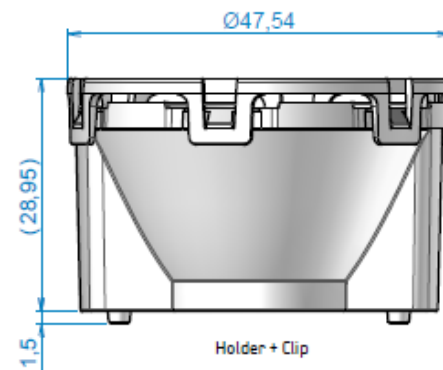


Holder reference	Diameter (mm)	PCB to LES (mm)	Height (H)	Note
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LLH59AAA0**	47.54	-	28.95	With pins
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- Adhesive : 1 (Yes), Nothing (No)
- Colors : 0 (clear), 2 (black)

If you need another color of holder, please [contact us](#)



All dimensions are in millimeters.

General tolerance +/- 0.1mm (standard NFT 58-000 cat. 4, reduced class).

⚠ Positioning holes need to be created into the PCB.

# LLH59AAA\* + LLC59x

# LLC59: Assembled set

Type of Led	Color	Adhesive	LLC59R	LLC59U	LLC59RF	LLC59N	LLC59NF
LLH59AAA00	Clear	✗	LLS59R59AAA00	LLS59U59AAA00	LLS59RF59AAA00	LLS59N59AAA00	LLS59NF59AAA00
LLH59AAA01	White	✗	LLS59R59AAA01	LLS59U59AAA01	LLS59RF59AAA01	LLS59N59AAA01	LLS59NF59AAA01
LLH59AAA02	Black	✗	LLS59R59AAA02	LLS59U59AAA02	LLS59RF59AAA02	LLS59N59AAA02	LLS59NF59AAA02

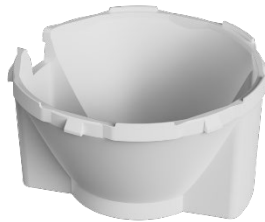
Type of Led	Color	Adhesive	LLC59C	LLC59M	LLC59CM	LLC59W	LLC59E
LLH59AAA00	Clear	✗	LLS59C59AAA00	LLS59M59AAA00	LLS59CM59AAA00	LLS59W59AAA00	LLS59E59AAA00
LLH59AAA01	White	✗	LLS59C59AAA01	LLS59M59AAA01	LLS59CM59AAA01	LLS59W59AAA01	LLS59E59AAA01
LLH59AAA02	Black	✗	LLS59C59AAA02	LLS59M59AAA02	LLS59CM59AAA02	LLS59W59AAA02	LLS59E59AAA02

# LLC59: compatible holders

## LLH59ABA0x



Clear holder



White holder



Black holder

Without adhesive: LLH59ABA00

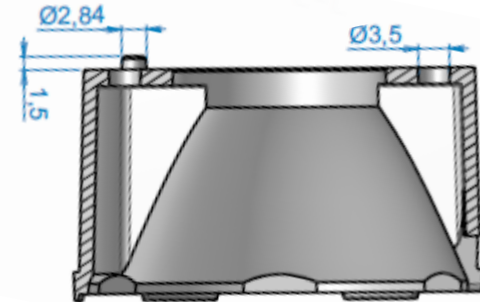
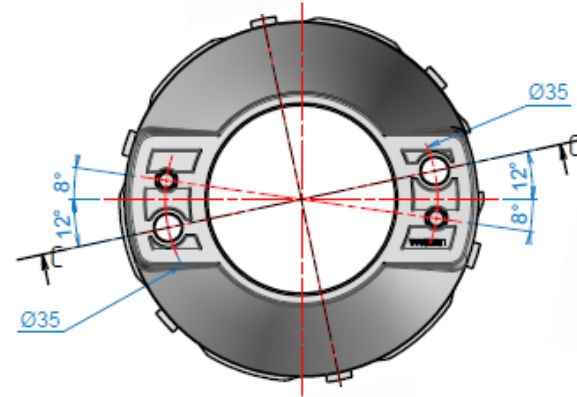
LLH59ABA01

LLH59ABA02

With adhesive: LLH59ABA001

LLH59ABA011

LLH59ABA021



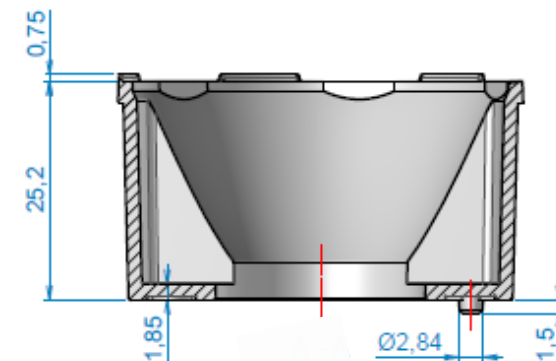
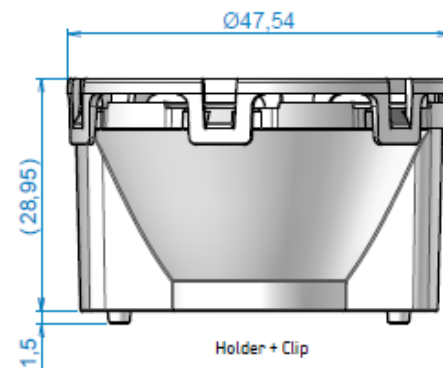
Holder reference	Diameter (mm)	Nominal distance from PCB (mm)	Height (H)	Note
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LLH59ABA0\*\*      -      28.95      With pins

→ Adhesive : 1 (Yes), Nothing (No)

→ Colors : 0 (clear), 2 (black)

If you need another color of holder, please [contact us](#)



All dimensions are in millimeters.

General tolerance +/- 0.1mm (standard NFT 58-000 cat. 4, reduced class).

⚠ Positioning holes need to be created into the PCB.

LLH59ABA\* + LLC59x

# LLC59: Assembled set

Type of Led	Color	Adhesive	LLC59R	LLC59U	LLC59RF	LLC59N	LLC59NF
LLH59ABA00	Clear	×	LLS59R59ABA00	LLS59U59ABA00	LLS59RF59ABA00	LLS59N59ABA00	LLS59NF59ABA00
LLH59ABA01	White	×	LLS59R59ABA01	LLS59U59ABA01	LLS59RF59ABA01	LLS59N59ABA01	LLS59NF59ABA01
LLH59ABA02	Black	×	LLS59R59ABA02	LLS59U59ABA02	LLS59RF59ABA02	LLS59N59ABA02	LLS59NF59ABA02

Type of Led	Color	Adhesive	LLC59C	LLC59M	LLC59CM	LLC59W	LLC59E
LLH59ABA00	Clear	×	LLS59C59ABA00	LLS59M59ABA00	LLS59CM59ABA00	LLS59W59ABA00	LLS59E59ABA00
LLH59ABA01	White	×	LLS59C59ABA01	LLS59M59ABA01	LLS59CM59ABA01	LLS59W59ABA01	LLS59E59ABA01
LLH59ABA02	Black	×	LLS59C59ABA02	LLS59M59ABA02	LLS59CM59ABA02	LLS59W59ABA02	LLS59E59ABA02



# LLC59: Nominal distance

## Nominal distance from PCB surface to best focus point of optic

Achieving an optimal focus position of the lens is the key factor for a successful LED/Collimator integration.

The best focus position will be achieved when matching the collimator's focus position with LED's Light Emission Surface position.

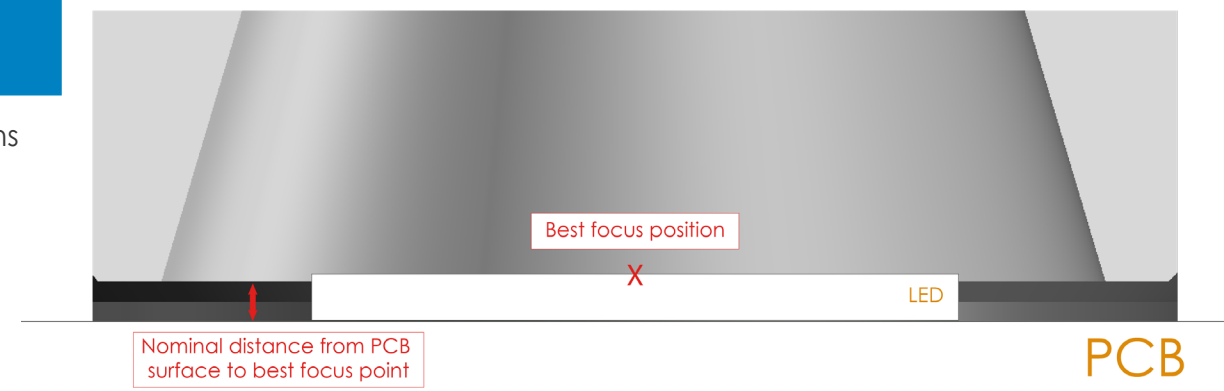
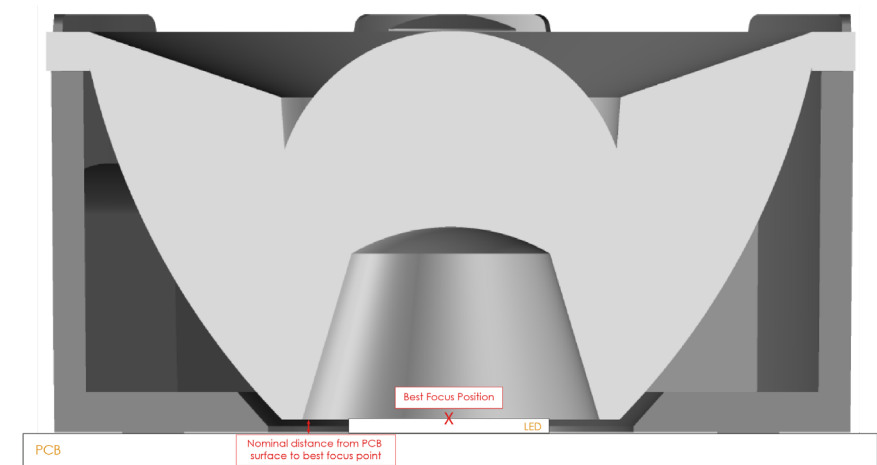
Different holder references will achieve specific PCB to Collimator's focus point distance in order to adapt to the considered LED.

Holder reference	Diameter (mm)	Nominal distance from PCB (mm)	Height (H)	Note
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LLH59SPB0**	47,54	0,5	28,95	With pins
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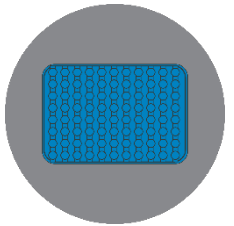
- Adhesive : 1 (Yes), Nothing (No)
- Colors : 0 (clear), 1 (white), 2 (black)

If you need another color of holder, please [contact us](#)



# LLC59: Packaging

## LLC59x

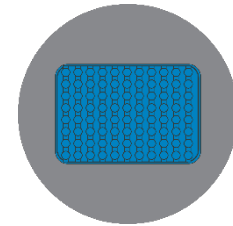


5 thermoformed trays  
with 30 parts each



150 parts  
Box: A13 - 387x283x170 mm  
Weight: 4,36 kg

## LLS59x



5 thermoformed trays  
with 30 parts each



150 parts  
Box: A13 - 387x283x170 mm  
Weight: 6 kg

# Code form standard range

## LENS

### OPTICAL

- 01: 16 mm
- 02: 16 mm
- 12: 16 mm
- 22: 16 mm RGBW
- 05: 32 mm
- 15: 32 mm
- 25: 32 mm RGBW
- 07: 35 mm
- 45: 45 mm UFO
- 49: 45 mm RGBW
- 59: 45 mm RGBW gen 2
- 56: 67mm in PMMA
- 66: 67 mm in silicone
- 76: 67mm in silicone
- 67: 67 mm UFO

### PRODUCT

- LLC: Collimator
- LLH: Holder
- LLL: Linear collimator
- LLR: Reflector
- LLS: Set
- UFO: Ultra Flat Optic

### BEAM ANGLE

- U/R: Ultra Narrow
- N: Narrow
- M: Medium
- W: Wide
- X: Extra large
- S: Super large
- L: Large
- V: Very large
- E: Elliptical
- Z: Zoom

### MATERIAL

- 0 or nothing : PMMA
- 1: PC
- 2: PC anti-UV
- 7: Silicone

LLS01W01ABC001

**ABC:** Holder type according to LED package

### COLORS & DECORS

- 0: Translucent
- 1: White
- 2: Black

### ADHESIVE OPTION

- 1: Yes
- Nothing: No

### VERSION

### TYPE

- 1: 16mm
- 2: 32mm
- 3: 3x16mm
- 4: 4x16mm
- 9: 45mm

## HOLDER