

STANDARD RANGE

16 mm PMMA collimator -
LLC22

December, 2023

LLC22: presentation

Given the current increasing demand on small optics,
GAGGIONE launched a $\varnothing 16$ mm collimators range.

8 references

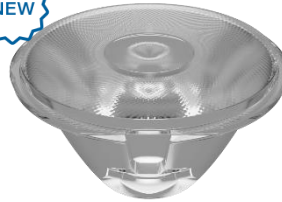
NEW



LLC22R

Ultra narrow beam

NEW



LLC22F

Focused beam



LLC22N

Narrow beam

NEW



LLC22T

Tight beam



LLC22M

Medium beam



LLC22W

Wide beam



LLC22V

Very large
beam



LLC22E

Elliptical beam



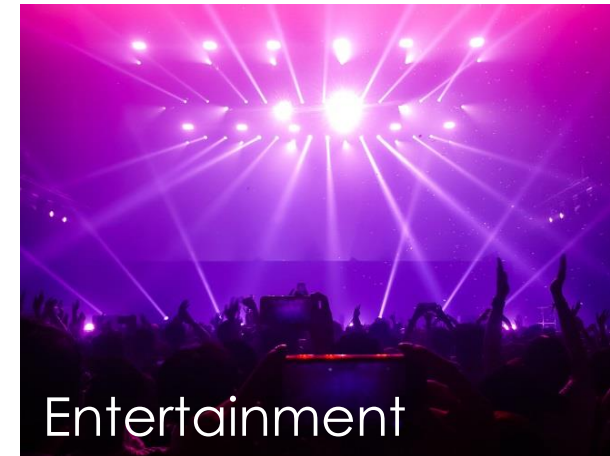
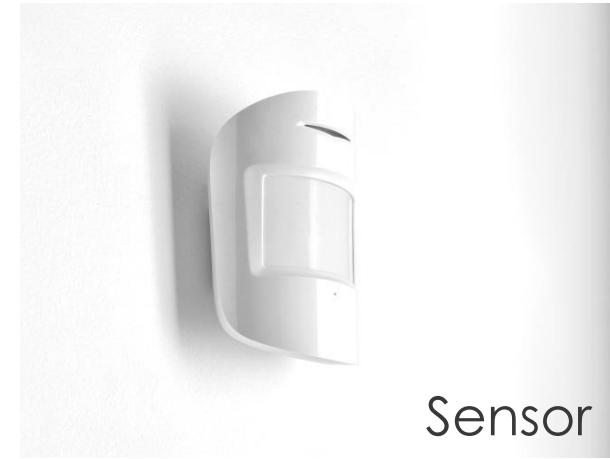
LLC22: LED specifications

LES size: 3mm x 3mm maximum.

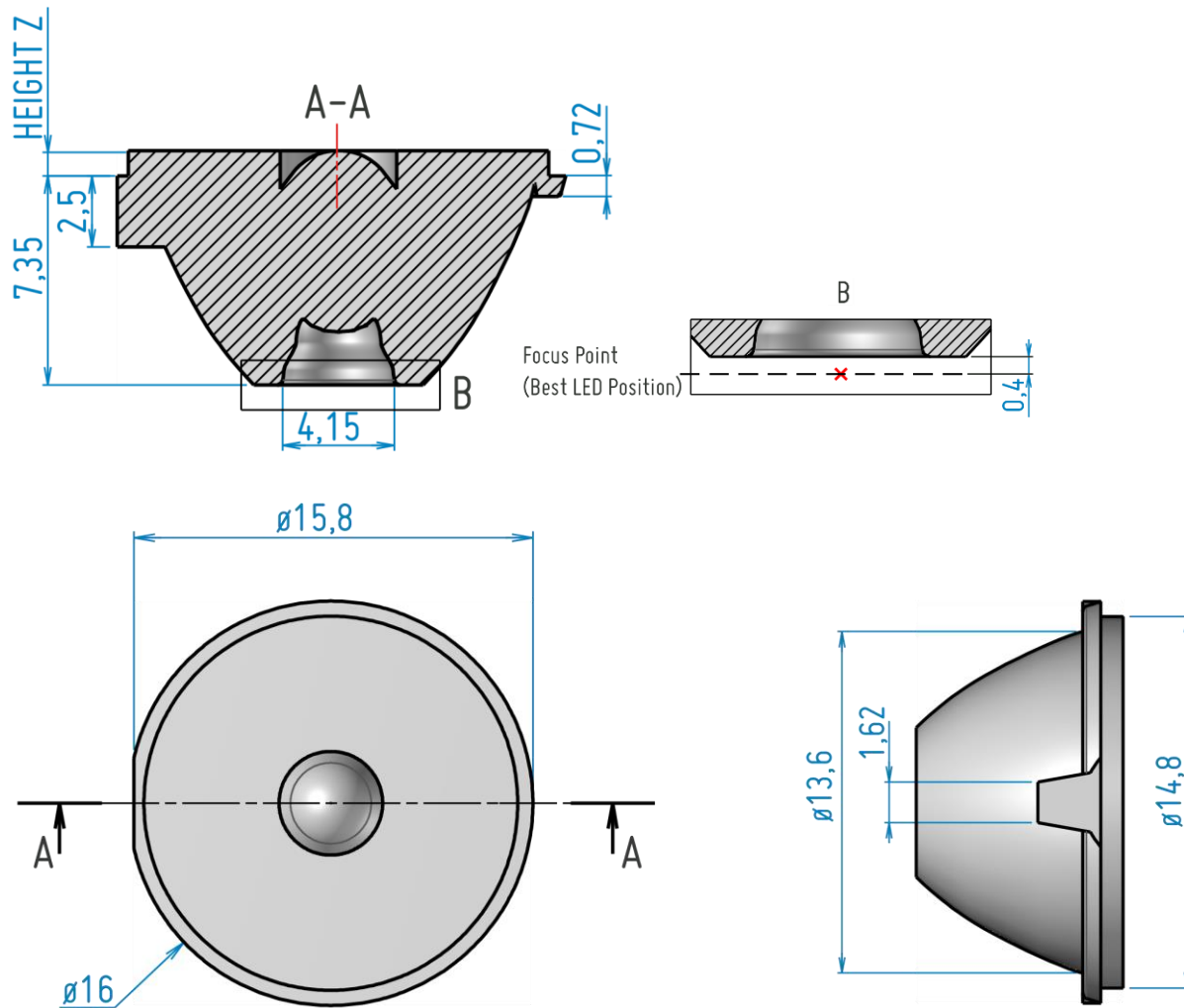
Type of LED: High Power, Chip Scale Package.

Type of Led	LLC22R	LLC22F	LLC22N	LLC22T	LLC22M	LLC22W	LLC22V	LLC22E
RGBW	✗	✗	✗	✗	✓	✓	✓	✓
Tunable White	✗	✗	✗	✗	✓	✓	✓	✓
Single chip	✓	✓	✓	✓	✓	✓	✓	✓
Multi chip	✗	✗	✗	✗	✓	✓	✓	✓

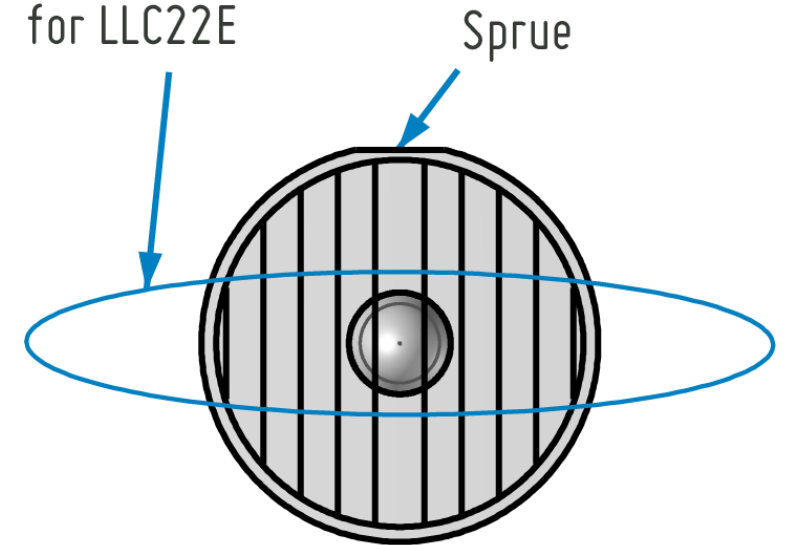
LLC22: applications



LLC22: 2D drawing



Beam orientation
for LLC22E



Without holder, all dimensions are in millimeters.

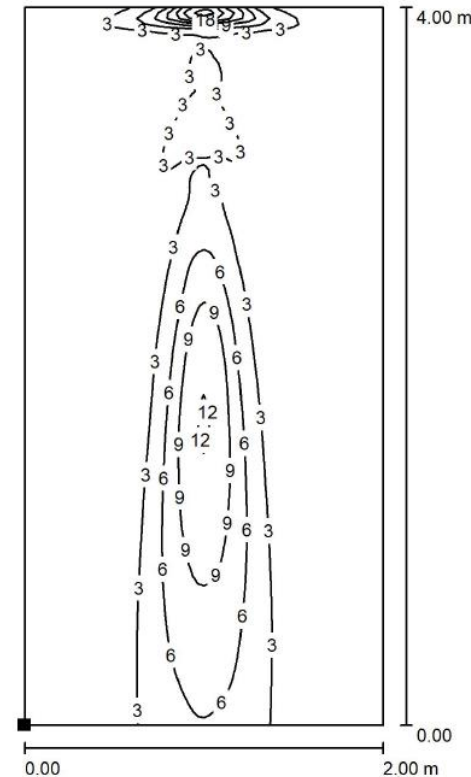
General tolerance ± 0.1 mm (standard NF T 58-000 cat. 4, reduced class).

LLC22R: Ultra narrow beam



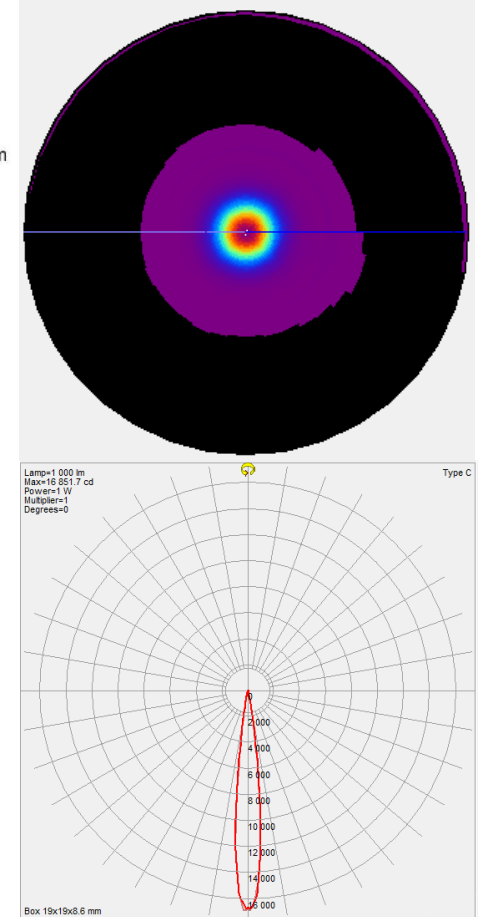
Compatibility matrix

	CREE	OSRAM	NICHIA	LUMILEDS
LLC22R	XQ-E HI	Oslon Compact CL	NFSWE11A	LUXEON Z
FWHM (°)	7.1	8.6	7.6	8.0
FTM (°)	13.3	13.6	13.0	13.1
Efficacy (cd/lm)	40.7	37.2	41.1	40.4



Dialux simulation

Values in lux, scale 1 : 32
Distance from wall: 0,3 m



Intensity pattern

[Visit the product page](#) on our website

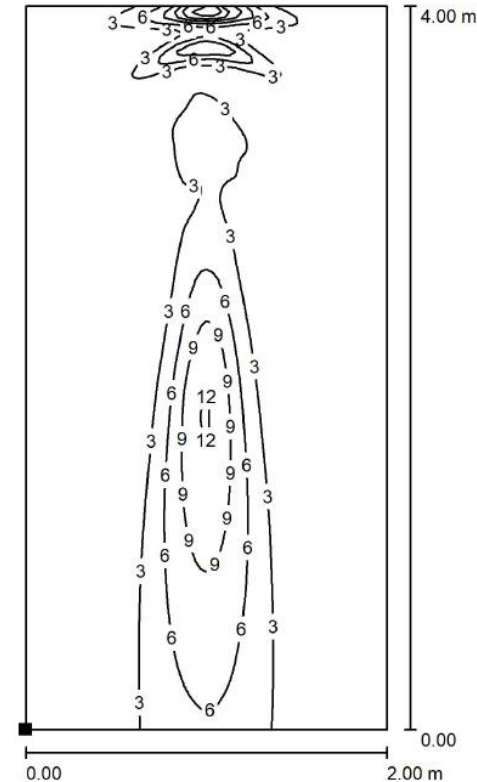
LED: CREE XD16

LLC22F: Focused beam



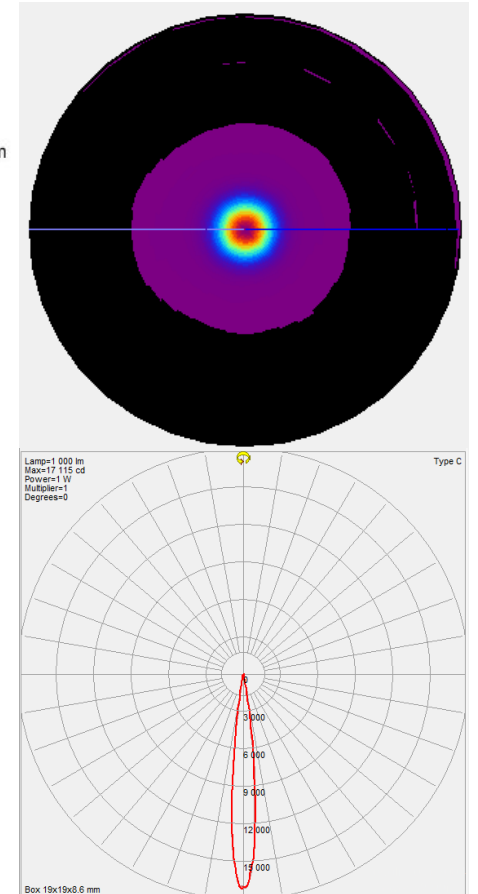
Compatibility matrix

	CREE	OSRAM	NICHIA	CREE
LLC22F	XQ-E HI	Oslon Compact CL	NCSWEE17AT	XD16
FWHM (°)	7.6	8.3	10.0	11.8
FWTM (°)	14.1	14.2	18.2	19.8
Efficacy (cd/lm)	36.9	36.7	21.5	17.1



Dialux simulation

Values in lux, scale 1 : 32
Distance from wall: 0,3 m



Intensity pattern

[Visit the product page](#) on our website

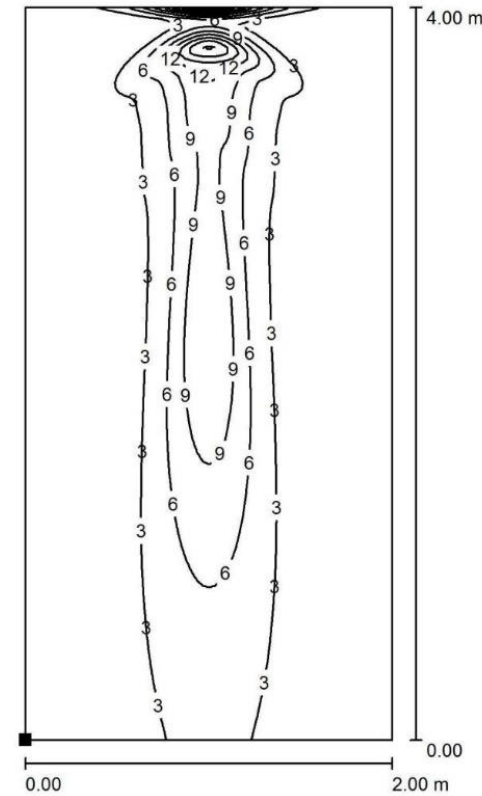
LED: CREE XD16

LLC22N: Narrow beam



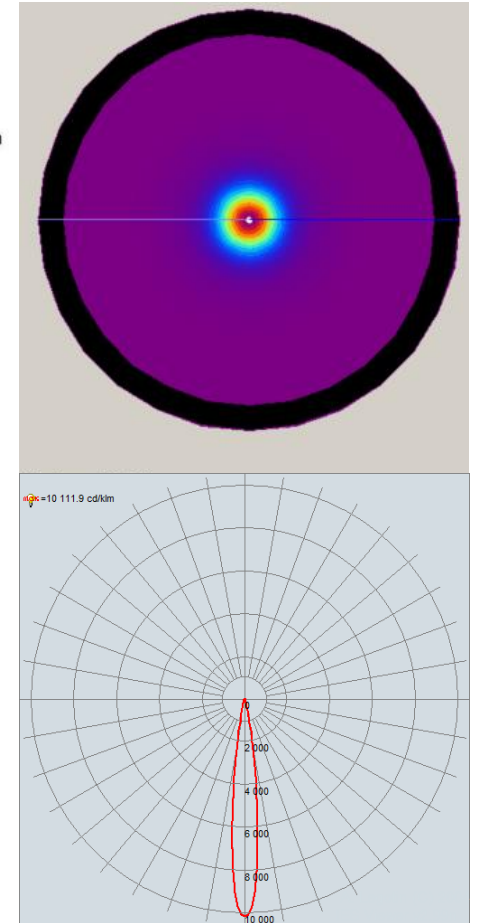
Compatibility matrix

	CREE	OSRAM	NICHIA	CREE
LLC22N	XQ-E HI	Oslon Compact CL	NCSWEE17AT	XD16
FWHM (°)	9.6	9.8	11.2	13.2
FWTM (°)	18.9	19.2	21.7	24.5
Efficacy (cd/lm)	18.7	19.1	14.9	10.1



Dialux simulation

Values in lux, scale 1 : 32
Distance from wall: 0,3 m



Intensity pattern

[Visit the product page](#) on our website

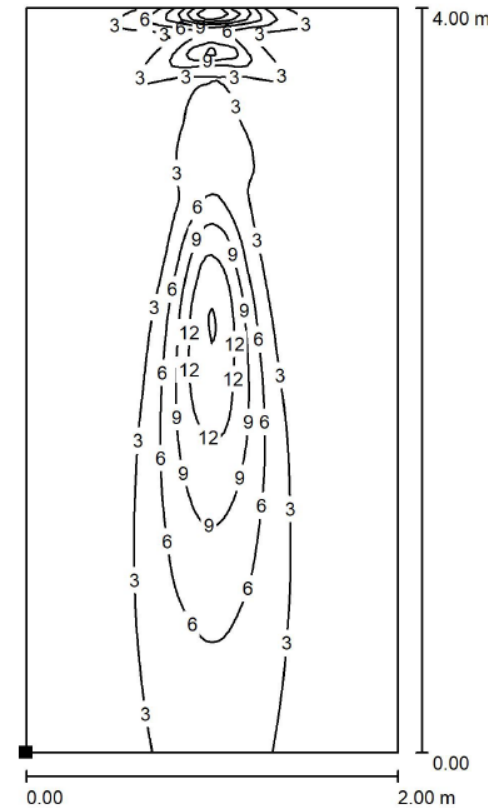
LED: CREE XD16

LLC22T: Tight beam



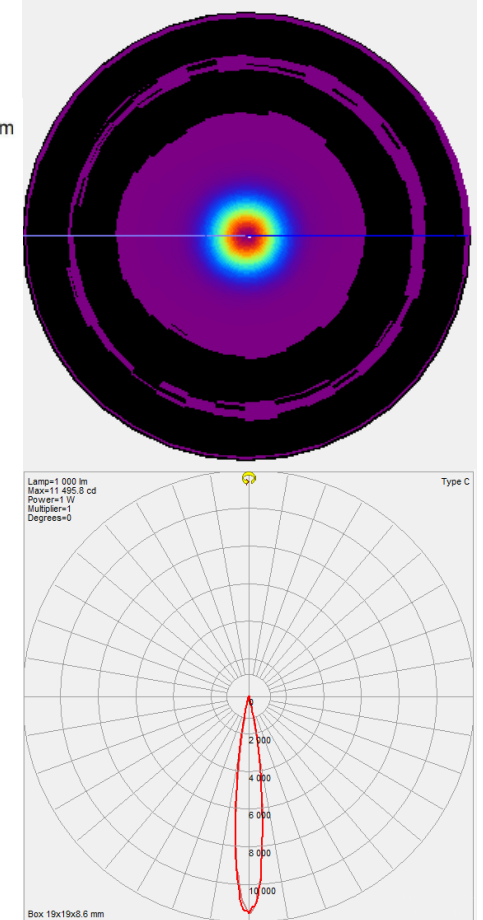
Compatibility matrix

	CREE	OSRAM	NICHIA	CREE
LLC22T	XQ-E HI	Oslon Compact CL	NCSWEE17AT	XD16
FWHM (°)	11.9	11.8	12.8	13.8
FWTM (°)	21.5	21.3	24.3	25.1
Efficacy (cd/lm)	15.8	17.2	12.7	11.4



Dialux simulation

Values in lux, scale 1 : 32
Distance from wall: 0,3 m



Intensity pattern

[Visit the product page](#) on our website

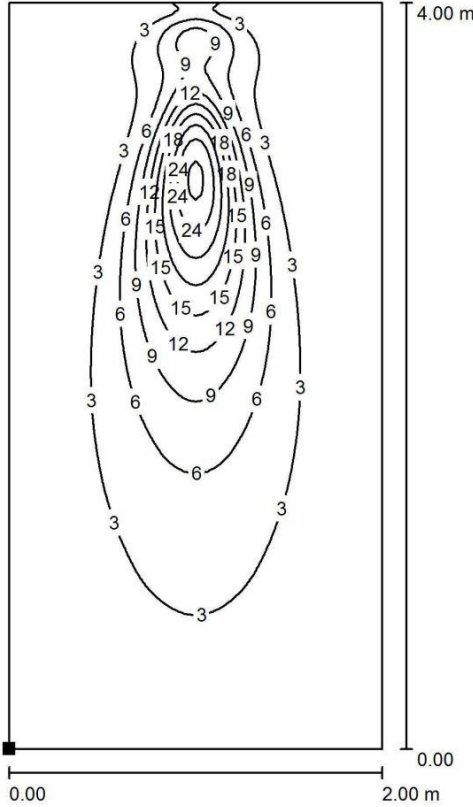
LED: CREE XD16

LLC22M: Medium beam



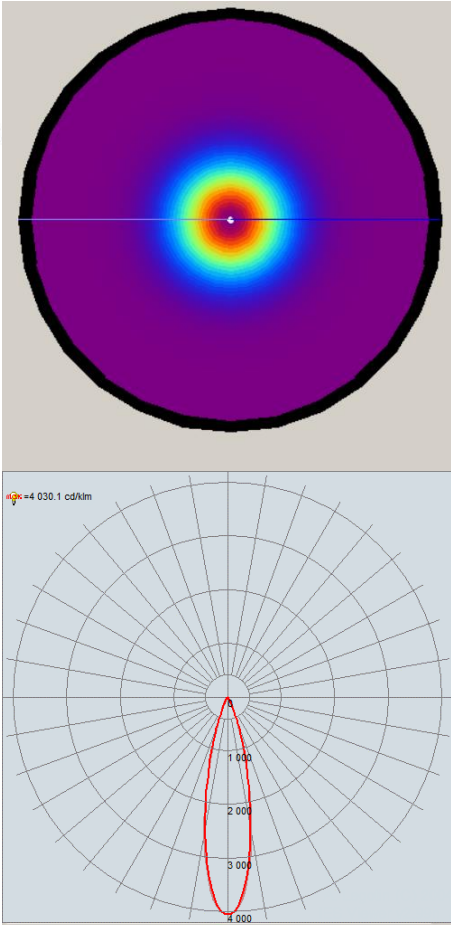
Compatibility matrix

LLC22M	OSRAM	LUMILEDS	CREE	NICHIA
	Ostar Stage RGBW	Luxeon Z TW cluster	XP-E2	NF2W757_MT
FWHM (°)	23.8	28.8	24.5	25.0
FWTM (°)	44.6	56.1	44.1	48.0
Efficacy (cd/lm)	4.0	2.3	3.9	3.3



Dialux simulation

Values in lux, scale 1 : 32
Distance from wall: 0,3 m



Intensity pattern

[Visit the product page](#) on our website

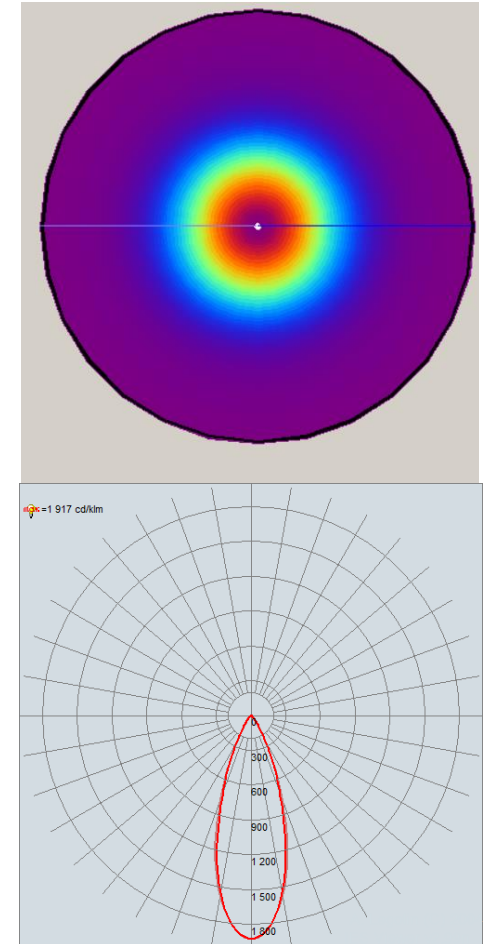
LED: Osram Ostar Stage LE RTDUW S2WN

LLC22W: Wide beam



Compatibility matrix

LLC22W	OSRAM	LUMILEDS	CREE	NICHIA
	Ostar Stage RGBW	Luxeon Z TW cluster	XP-E2	NF2W757_MT
FWHM (°)	35.1	34.2	34.4	34.1
FTM (°)	62.1	66.0	60.4	62.8
Efficacy (cd/lm)	1.9	1.6	2.1	1.9



Intensity pattern

[Visit the product page](#) on our website

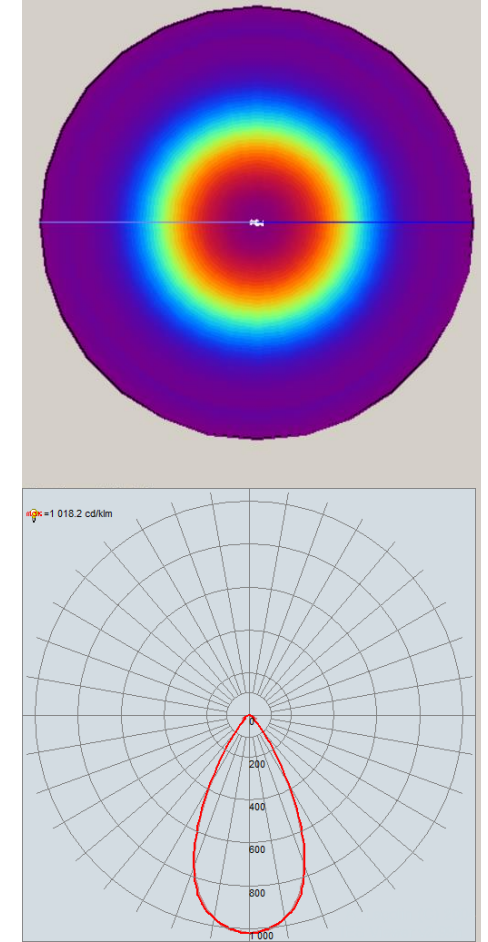
LED: Osram Ostar Stage LE RTDUW S2WN

LLC22V: Very large beam



Compatibility matrix

	OSRAM	LUMILEDS	CREE	NICHIA
LLC22V	Ostar Stage RGBW	Luxeon Z TW cluster	XP-E2	NF2W757_MT
FWHM (°)	52.3	54.4	56.1	53.6
FWTM (°)	79.4	83.8	82.0	82.5
Efficacy (cd/lm)	1.0	0.8	0.9	0.9



Intensity pattern

Visit the [product page](#) on our website

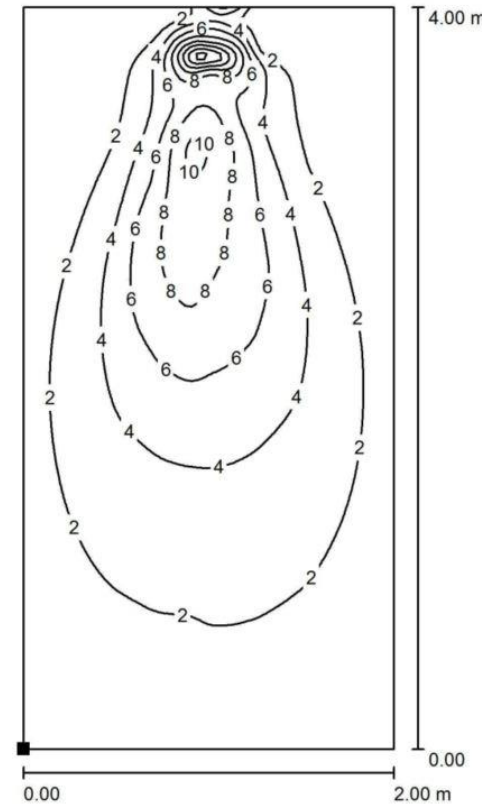
LED: Osram Ostar Stage LE RTDUW S2WN

LLC22E: Elliptical beam



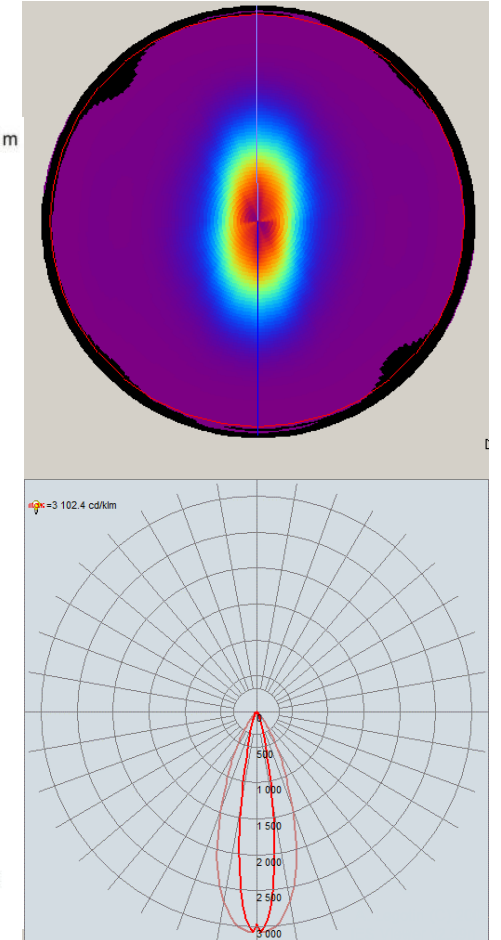
Compatibility matrix

	OSRAM	LUMILEDS	CREE	NICHIA
LLC22E	Ostar Stage RGBW	Luxeon Z TW cluster	XP-E2	NF2W757_MT
FWHM (°)	16.6 – 38.8	22.7 – 36.6	11.9 – 43.8	17.8 – 38.9
FWTM (°)	32.1 – 67.8	38.5 – 70.4	28.1 – 65.2	35.4 – 67.3
Efficacy (cd/lm)	3.3	2.6	4.0	3.2



Dialux simulation

Values in lux, scale 1 : 32
Distance from wall: 0,3 m



Intensity pattern

Visit the [product page](#) on our website

LED: Osram Ostar Stage LE RTDUW S2WN

LLC22: compatible holders

Holder reference	PCB to LES distance (mm) with adhesive	PCB to LES distance (mm) without adhesive	Pins spacing (mm)	Diameter (mm)
LLH01CCD0*	0.20	0.10	8.6	17.0
LLH01BBD0*	0.20	0.10	16.6	17.0
LLH01AAD0*	0.30	0.25	18.6	19.0
LLH01CCC0*	0.50	0.40	8.6	17.0
LLH01BBC0*	0.50	0.40	18.6	17.0
LLH01AAC0*	0.60	0.55	16.6	19.0
LLH01CCA0*	0.75	0.65	8.6	17.0
LLH01BBA0*	0.75	0.65	16.6	17.0
LLH01AAA0*	0.85	0.80	18.6	19.0
LLH01AAB0*	1.40	1.35	15.0	19.0

* : colors : 0 is clear, 1 is white, 2 is black

Other colors might be available, please [contact us](#) if needed.

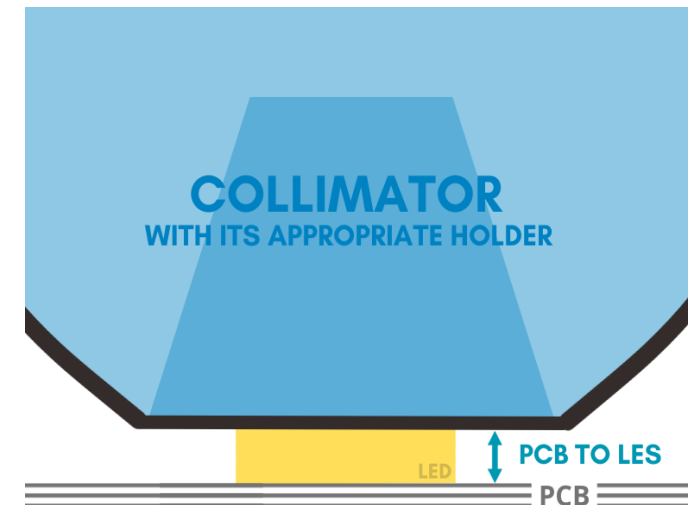


Achieving an optimal focus position of the lens is the key factor for a successful LED/Collimator integration.

Different holder references are available to position collimators to considered LED.

The correct position is achieved when the PCB to LES distance from the LED datasheet is equal or close to the PCB to LES distance of the holder.

If you need assistance to choose the right holder, please [contact us](#).



LLC22: Assembled set

Holder	Adhesive	Ultra narrow LLC22R	Focused LLC22F	Narrow LLC22N	Tight LLC22T	Medium LLC22M	Wide LLC22W	Very large LLC22V	Elliptical LLC22E
LLH01CCD0*	No	LLS22R01CCD0*	LLS22F01CCD0*	LLS22N01CCD0*	LLS22T01CCD0*	LLS22M01CCD0*	LLS22W01CCD0*	LLS22V01CCD0*	LLS22E01CCD0*
LLH01CCD*01	Yes	LLS22R01CCD0*1	LLS22F01CCD0*1	LLS22N01CCD0*1	LLS22T01CCD0*1	LLS22M01CCD0*1	LLS22W01CCD0*1	LLS22V01CCD0*1	LLS22E01CCD0*1
LLH01BBD0*	No	LLS22R01BBD0*	LLS22F01BBD0*	LLS22N01BBD0*	LLS22T01BBD0*	LLS22M01BBD0*	LLS22W01BBD0*	LLS22V01BBD0*	LLS22E01BBD0*
LLH01BBD0*1	Yes	LLS22R01BBD0*1	LLS22F01BBD0*1	LLS22N01BBD0*1	LLS22T01BBD0*1	LLS22M01BBD0*1	LLS22W01BBD0*1	LLS22V01BBD0*1	LLS22E01BBD0*1
LLH01AAD0*	No	LLS22R01AAD0*	LLS22F01AAD0*	LLS22N01AAD0*	LLS22T01AAD0*	LLS22M01AAD0*	LLS22W01AAD0*	LLS22V01AAD0*	LLS22E01AAD0*
LLH01AAD0*1	Yes	LLS22R01AAD0*1	LLS22F01AAD0*1	LLS22N01AAD0*1	LLS22T01AAD0*1	LLS22M01AAD0*1	LLS22W01AAD0*1	LLS22V01AAD0*1	LLS22E01AAD0*1
LLH01CCC0*	No	LLS22R01CCC0*	LLS22F01CCC0*	LLS22N01CCC0*	LLS22T01CCC0*	LLS22M01CCC0*	LLS22W01CCC0*	LLS22V01CCC0*	LLS22E01CCC0*
LLH01CCC0*1	Yes	LLS22R01CCC0*1	LLS22F01CCC0*1	LLS22N01CCC0*1	LLS22T01CCC0*1	LLS22M01CCC0*1	LLS22W01CCC0*1	LLS22V01CCC0*1	LLS22E01CCC0*1
LLH01BBC0*	No	LLS22R01BBC0*	LLS22F01BBC0*	LLS22N01BBC0*	LLS22T01BBC0*	LLS22M01BBC0*	LLS22W01BBC0*	LLS22V01BBC0*	LLS22E01BBC0*
LLH01BBC0*1	Yes	LLS22R01BBC0*1	LLS22F01BBC0*1	LLS22N01BBC0*1	LLS22T01BBC0*1	LLS22M01BBC0*1	LLS22W01BBC0*1	LLS22V01BBC0*1	LLS22E01BBC0*1

* : colors : 0 is clear, 1 is white, 2 is black

Other colors might be available, please [contact us](#) if needed.

LLC22: Assembled set

Holder	Adhesive	Ultra narrow LLC22R	Focused LLC22F	Narrow LLC22N	Tight LLC22T	Medium LLC22M	Wide LLC22W	Very large LLC22V	Elliptical LLC22E
LLH01AAC0*	No	LLS22R01AAC0*	LLS22F01AAC0*	LLS22N01AAC0*	LLS22T01AAC0*	LLS22M01AAC0*	LLS22W01AAC0*	LLS22V01AAC0*	LLS22E01AAC0*
LLH01AAC*01	Yes	LLS22R01AAC0*1	LLS22F01AAC0*1	LLS22N01AAC0*1	LLS22T01AAC0*1	LLS22M01AAC0*1	LLS22W01AAC0*1	LLS22V01AAC0*1	LLS22E01AAC0*1
LLH01CCA0*	No	LLS22R01CCA0*	LLS22F01CCA0*	LLS22N01CCA0*	LLS22T01CCA0*	LLS22M01CCA0*	LLS22W01CCA0*	LLS22V01CCA0*	LLS22E01CCA0*
LLH01CCA0*1	Yes	LLS22R01CCA0*1	LLS22F01CCA0*1	LLS22N01CCA0*1	LLS22T01CCA0*1	LLS22M01CCA0*1	LLS22W01CCA0*1	LLS22V01CCA0*1	LLS22E01CCA0*1
LLH01BBA0*	No	LLS22R01BBA0*	LLS22F01BBA0*	LLS22N01BBA0*	LLS22T01BBA0*	LLS22M01BBA0*	LLS22W01BBA0*	LLS22V01BBA0*	LLS22E01BBA0*
LLH01BBA0*1	Yes	LLS22R01BBA0*1	LLS22F01BBA0*1	LLS22N01BBA0*1	LLS22T01BBA0*1	LLS22M01BBA0*1	LLS22W01BBA0*1	LLS22V01BBA0*1	LLS22E01BBA0*1
LLH01AAA0*	No	LLS22R01AAA0*	LLS22F01AAA0*	LLS22N01AAA0*	LLS22T01AAA0*	LLS22M01AAA0*	LLS22W01AAA0*	LLS22V01AAA0*	LLS22E01AAA0*
LLH01AAA0*1	Yes	LLS22R01AAA0*1	LLS22F01AAA0*1	LLS22N01AAA0*1	LLS22T01AAA0*1	LLS22M01AAA0*1	LLS22W01AAA0*1	LLS22V01AAA0*1	LLS22E01AAA0*1
LLH01AAB0*	No	LLS22R01AAB0*	LLS22F01AAB0*	LLS22N01AAB0*	LLS22T01AAB0*	LLS22M01AAB0*	LLS22W01AAB0*	LLS22V01AAB0*	LLS22E01AAB0*
LLH01AAB0*1	Yes	LLS22R01AAB0*1	LLS22F01AAB0*1	LLS22N01AAB0*1	LLS22T01AAB0*1	LLS22M01AAB0*1	LLS22W01AAB0*1	LLS22V01AAB0*1	LLS22E01AAB0*1

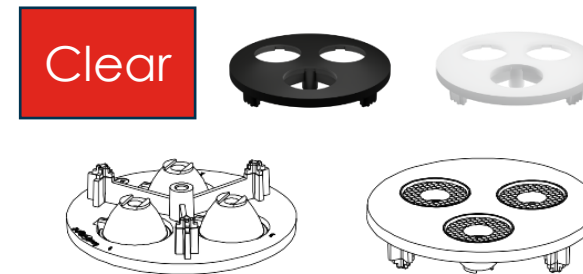
* : colors : 0 is clear, 1 is white, 2 is black

Other colors might be available, please [contact us](#) if needed.

LLC22: compatible holders

LLH03XRR

Holder reference	PCB to LES distance (mm) without adhesive	Pins spacing (mm)	Diameter (mm)
LLH03XRR0*	0.75	38.0	49.8



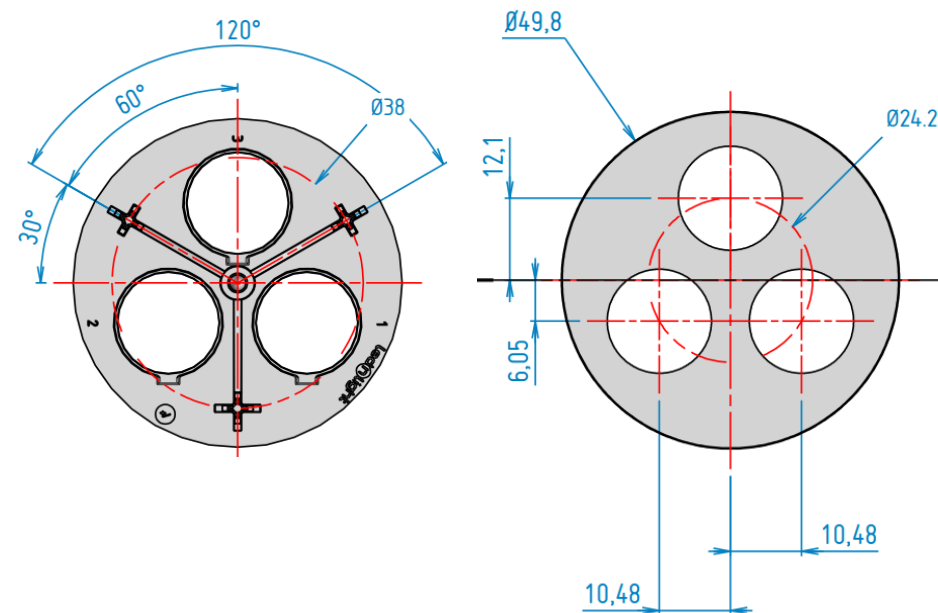
Assembled set

Holder	Ultra narrow LLC22R	Focused LLC22F	Narrow LLC22N	Tight LLC22T
LLH03XRR0*	LLS22R03XRR0*	LLS22F03XRR0*	LLS22N03XRR0*	LLS22T03XRR0*

Holder	Medium LLC22M	Wide LLC22W	Very large LLC22V	Elliptical LLC22E
LLH03XRR0*	LLS22M03XRR0*	LLS22W03XRR0*	LLS22V03XRR0*	LLS22E03XRR0*

* : colors : 0 is clear, 1 is white, 2 is black

Other colors might be available, please [contact us](#) if needed.



All dimensions are in millimeters.

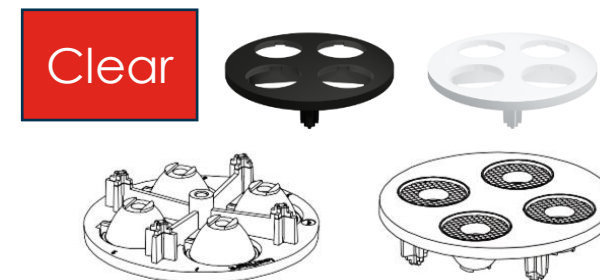
General tolerance +/- 0.1mm (standard NF T 58-000 cat. 4, reduced class).

Positioning holes need to be created into the PCB.

LLC22: compatible holders

LLH04XRR

Holder reference	PCB to LES distance (mm) without adhesive	Pins spacing (mm)	Diameter (mm)
LLH04XRR0*	0.75	38.0	49.8



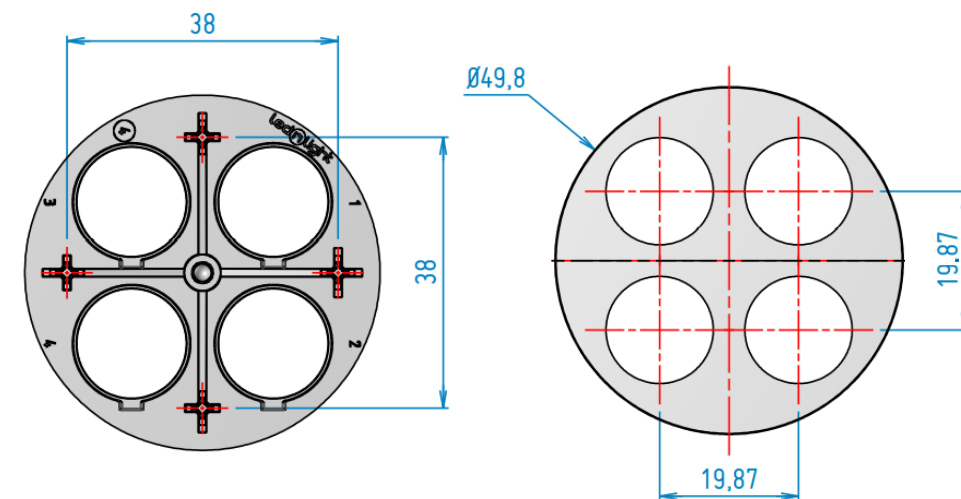
Assembled set

Holder	Ultra narrow LLC22R	Focused LLC22F	Narrow LLC22N	Tight LLC22T
LLH04XRR0*	LLS22R04XRR0*	LLS22F04XRR0*	LLS22N04XRR0*	LLS22T04XRR0*

Holder	Medium LLC22M	Wide LLC22W	Very large LLC22V	Elliptical LLC22E
LLH04XRR0*	LLS22M04XRR0*	LLS22W04XRR0*	LLS22V04XRR0*	LLS22E04XRR0*

* : colors : 0 is clear, 1 is white, 2 is black

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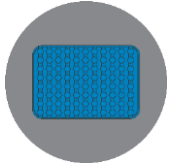
All dimensions are in millimeters.

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

Positioning holes need to be created into the PCB.

LLC22: Packaging

LLC22x

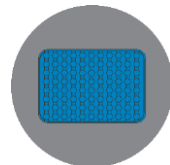


5 thermoformed trays with 100 parts each



500 parts
Box: B10 – 285x195x50 mm
Weight: 0.7 kg

LLS22x



10 layers with 50 parts each



500 parts
Box: C10 – 285x195x150 mm
Weight: 2.0 kg

LLH01x



1 plastic bag with 1 500 parts
Box: C10 – 285x195x150 mm
Weight: 1.2 kg

LLH03XRR*



1 plastic bag with 2 000 parts
Box: GALIA A9 – 589x385x287 mm
Weight: 10 kg

LLH04XRR*



1 plastic bag with 2 000 parts
Box: GALIA A9 – 589x385x287 mm
Weight: 9.6 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

Contact us

GAGGIONE SAS Headquarter

3, Rue de la Rolland
01460 Montréal la Cluse
France

☎ +33 4 74 76 12 66

@ contact@gaggione.com

💻 www.optic-gaggione.com

Sales Team in GAGGIONE

Sandrine Mancuso
France, UK, Italy, Spain

@ s.mancuso@gaggione.com

☎ +33 787 87 84 72

Nicolas Golfier
France, Scandinavia,
Eastern and Northern Europe

@ n.golfier@gaggione.com

☎ +33 677 35 50 37

Laurent Barel
Sales & Marketing Director

@ l.barel@gaggione.com

☎ +33 612 04 41 30

International Sales Offices

GAGGIONE Americas
Michael Pietro
12833 Surrey Ct.
Palos Park, IL
60464

@ m.pietro@gaggione.com

☎ +1 224 392 0087

GAGGIONE Asia
Zhen Xu
Unit 1808, No. 8, Kuaiji Road,
Jintiandi International building,
Huangpu District,
Shanghai, 200021, China

@ z.xu@gaggione.com

☎ +86 136 5189 6981

GAGGIONE Canada
Stephane Saindon
744 36th Avenue
Montreal, Quebec
H8T3L2

@ s.saindon@gaggione.com

☎ +1 514 928 2179

GAGGIONE DACH
Angelika Aigner
Kreuzstrasse 7
83355 Grabenstätt
Germany

@ a.aigner@gaggione.com

☎ +49 8661 983 44 77

Product Management & Business development

Joni MÄKI
Artunkuja 7,
24260 Salo
FINLAND

@ j.maki@gaggione.com

☎ +33 6 38 24 17 51