



FRC SERIES REFLECTORS for OSRAM OSTAR™ LEDs:

- **High efficiency**
- **Available in 2 different beams**

The FRC series offers two reflectors especially designed for the OSTAR™ LED from Osram Opto Semiconductors Inc (1).

A software-optimized aspheric profile combined with precision facets provides narrow and medium beam patterns with homogeneous central spots and useful peripheral spilled light.

The high collection efficiency reaches 88% of the total flux emitted from the LED.

Three locating legs assure proper relative placement between the reflector and the OSTAR™ LED.

Typical applications are:

- Portable lighting (flashlights, bicycle, etc.)
- Architectural Lighting
- Most application requiring a bright central spot with peripheral spilled light.



(1) OSTAR™ is a trademark of OSRAM Opto Semiconductors Inc. For technical specification on LEDs please refer to the OSTAR™ datasheet or visit <http://www.osram-os.com/>

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Material Characteristics

Reflector Material	ULTEM 1010 Polyetherimide, with aluminum reflective coating.
Operating Temperature range	- 40C / + 150C
Storage Temperature range	- 40C / + 150C

Please note that small defects in the reflective coating, and flow lines and weld lines on the surfaces of the reflectors are acceptable if the optical performance of the reflector is within the specification described in the section "OPTICAL CHARACTERISTICS"

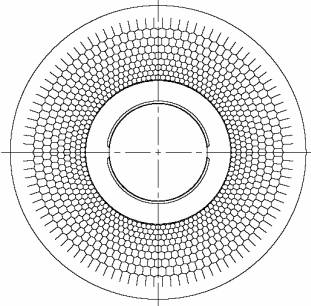
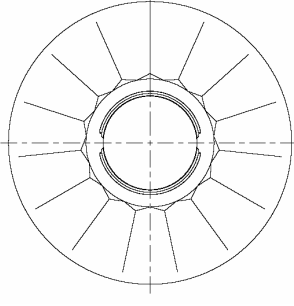
Assembly Information

IMPORTANT - Assembly information:

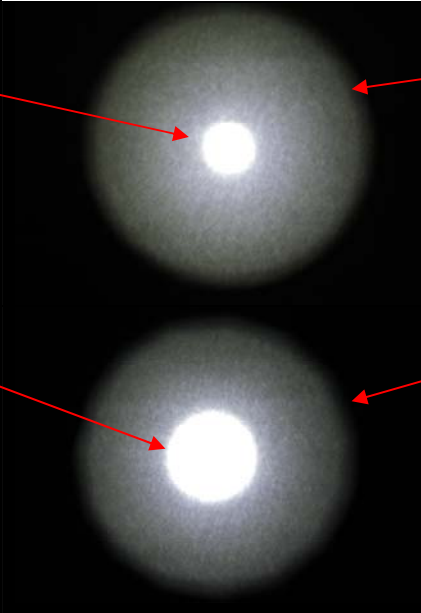
For best optical performance, correct mechanical position of the reflector on the OSTAR™ LED is critical.

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Identifying Reflectors by Their Appearance

Narrow beam reflector: FRC-N1-OE2B-0	Medium beam reflector: FRC-M1-OE2B-0
	

Optical Characteristics: Beam Divergence and On-axis Efficiency

Typical Beam Divergence, full beam width (degrees)		Central spot, at ½ peak intensity		Whole beam including spilled light, at cut-off
Reflector Part Number	Reflector Name	Beam angle: Full width ½ maximum	Beam style	Full width, at cutoff (degrees)
FRC-N1-OE2B-0	Narrow beam	See next data table below		100
FRC-M1-OE2B-0	Medium beam	See next data table below		100



Optical Characteristics: On-Axis Efficiency

Optical Performance On-axis efficiency (candela/lumen) and beam angle (degrees)			Central Spot		Spilled Light	
Fraen Reflector Part Number	Reflector Name	Osram OStar LED	On-axis intensity Cd/lm	Beam angle Degrees FWHM	~ spill intensity Cd/lm	Beam angle Degrees FWHM
FRC-N1-OE2B-0	Narrow beam	4-chip with dome lens	9.6	11	0.2	100
		4-chip no dome lens	21.7	7	0.3	100
		6-chip with dome lens	7.2	12	0.2	100
		6-chip no dome lens	14.4	8	0.3	100
FRC-M1-OE2B-0	Medium beam	4-chip with dome lens	2.4	25	0.2	100
		4-chip no dome lens	2.3	27	0.3	100
		6-chip with dome lens	2.3	27	0.2	100
		6-chip no dome lens	2.1	26	0.3	100

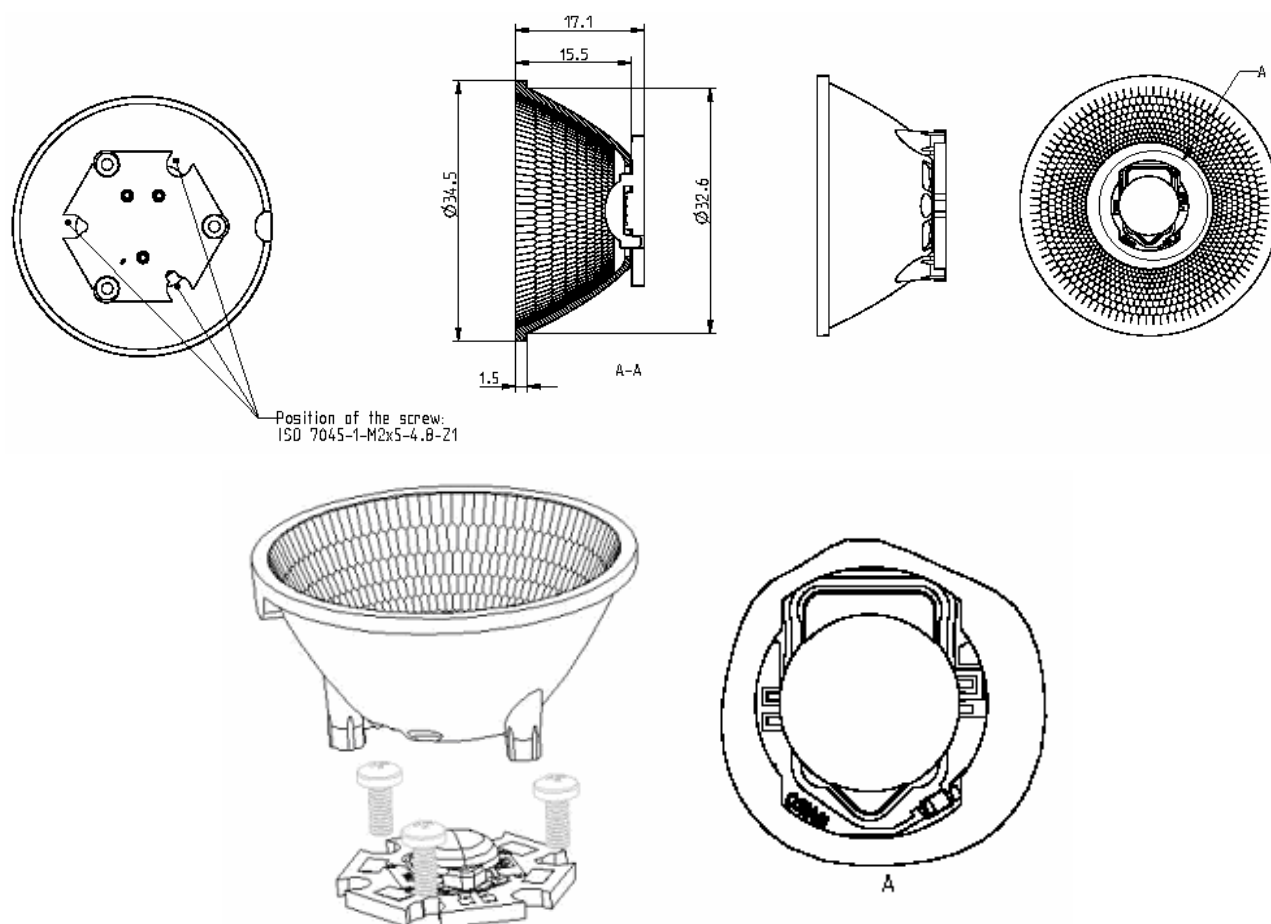
- (2) To estimate the on-axis intensity, multiply the on-axis efficiency of the reflector (cd/lm) by the total flux of the OSTARTM LED used. For more detail on flux binning please check the OSTARTM LED datasheet at [Osram OStar site](#)
- (3) Luminous intensity depends on the flux binning and tolerances of the LEDs. Please refer to the OSTARTM datasheet for more details on flux binning and mechanical tolerances.

Note: These values have been calculated using the efficiency values of the reflector listed above and the formula $E = I / d^2$, where E is the irradiance in lux, I the intensity in cd, and d the distance between the reflector output and the measured point.

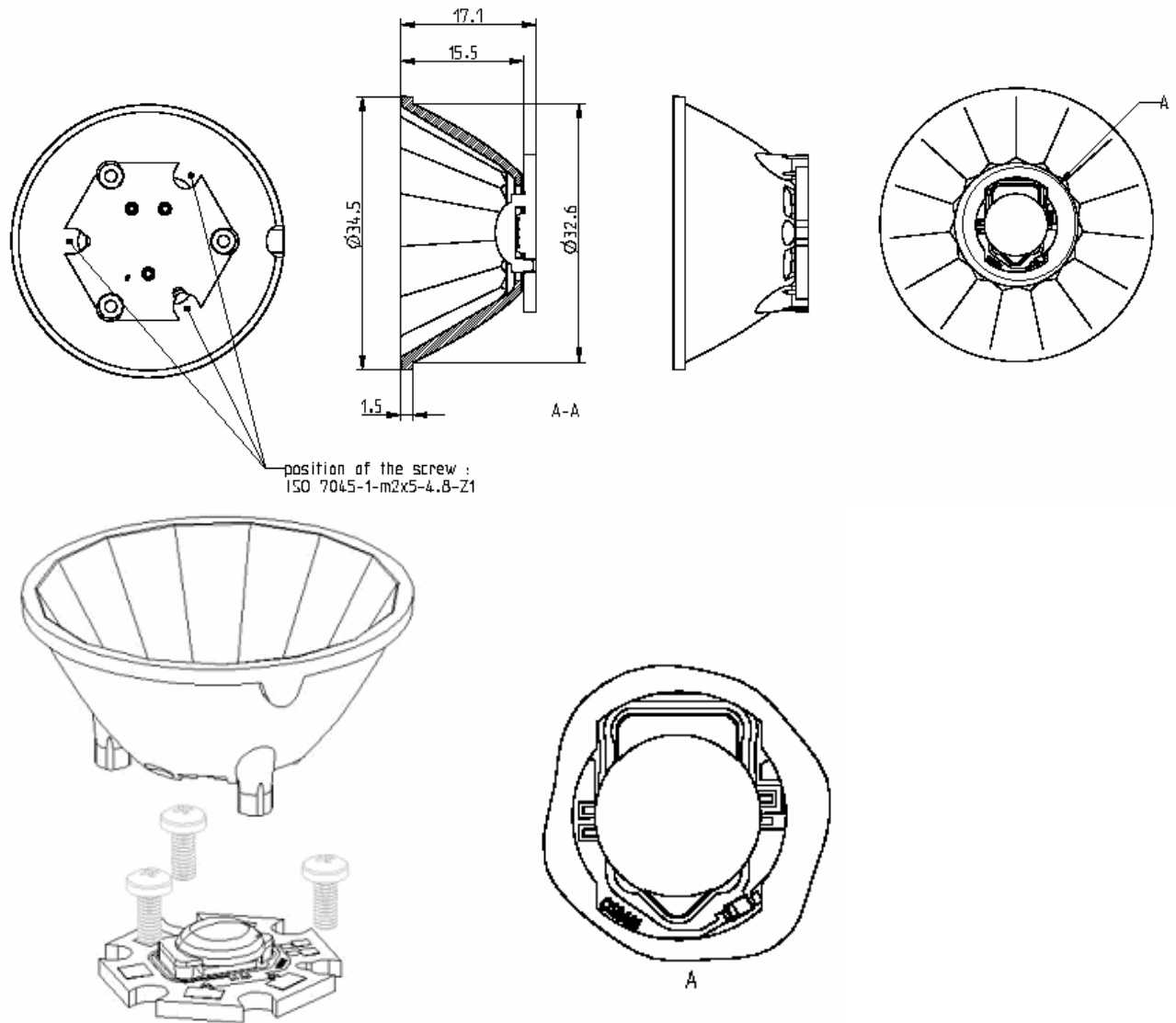
- (4) Typical illuminance measured in lux per lumen (E) with typical OSTARTM LEDs. Based on White LED. To estimate the illuminance in lux, multiply the typical illuminance E by the flux in lumens of the LED used.
- (5) Illuminance output depends on the flux (lumens) of the LEDs.

Mechanical dimensions

Narrow beam reflector:



Medium beam reflector:





Ordering Part Numbers

FRC-xx-OE2B-0

Beam Angle:

N1 = Narrow beam

M1 = Medium beam

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Document Revision Record

Rev	Date	Author	Description
00	06 June 2006	C. Jones	For review, pre-release.
01	28 June 2006	M.Thorailer	Update optical performances with measurements taken.
02	17 July 2006	M.Thorailer / C. Jones	Added data, mechanical dimensions, assembly views with LEDs.
03	21 March 2007	D. DeGaetano/C.Jones	Added 6-chip Ostar optical performance data.