FRAEN Srl
Maximizing Light

Fraen Fiber Light Injector (FFLI) For LUXEON™ LEDs

- **High efficiency**
- **Very compact size**
- **Patent Pending**

The FFLI is a fiber light injector designed specifically for all Lambertian LUXEON™ LEDs from Lumileds (1).

The FFLI has an output surface diameter of 7mm, to maximize the efficiency of total flux emitted from the Luxeon Lambertian LED into a 7mm to 9mm fiber optic bundle or light pipe.

A ring spacer assures the proper relative placement between the Fiber Light Injector and the LUXEON™ LED.

Typical applications are:

- Medical Equipment
- Industrial fiber optic backlighting
- Projection Systems
- Light-Path Coupler

(1) LUXEON™ is a trademark of Lumileds Lighting, LLC. For technical specification on LEDs please refer to the LUXEON™ datasheet or visit www.Luxeon.com or www.lumileds.com

(2) Typical beam divergence may change when used with different color LEDs.

FRAEN CORPORATION
80 Newcrossing Road
Reading MA 01867
Phone: 781.205.5300
Fax: 781.942.2426
Email: optics@fraen.com

FRAEN Srl
Via E.Fermi, 7
20090 Cusago (MI) – Italy
Phone: +39 02.90.39.40.49
Fax: +39 02.90.39.37.36
Email: info@fraen.it

Website: www.fraensrl.com

General Characteristics

Lens Material	Optical Grade PMMA
Ring Spacer	PC ABS
Operating Temperature range	-40deg C / + 80 deg C
Storage Temperature range	-40deg C / + 80 deg C

Average transmittance in visible Spectrum (400 – 700nm) >90% as measured using a 3mm thick PMMA sample.

Optical Characteristics:

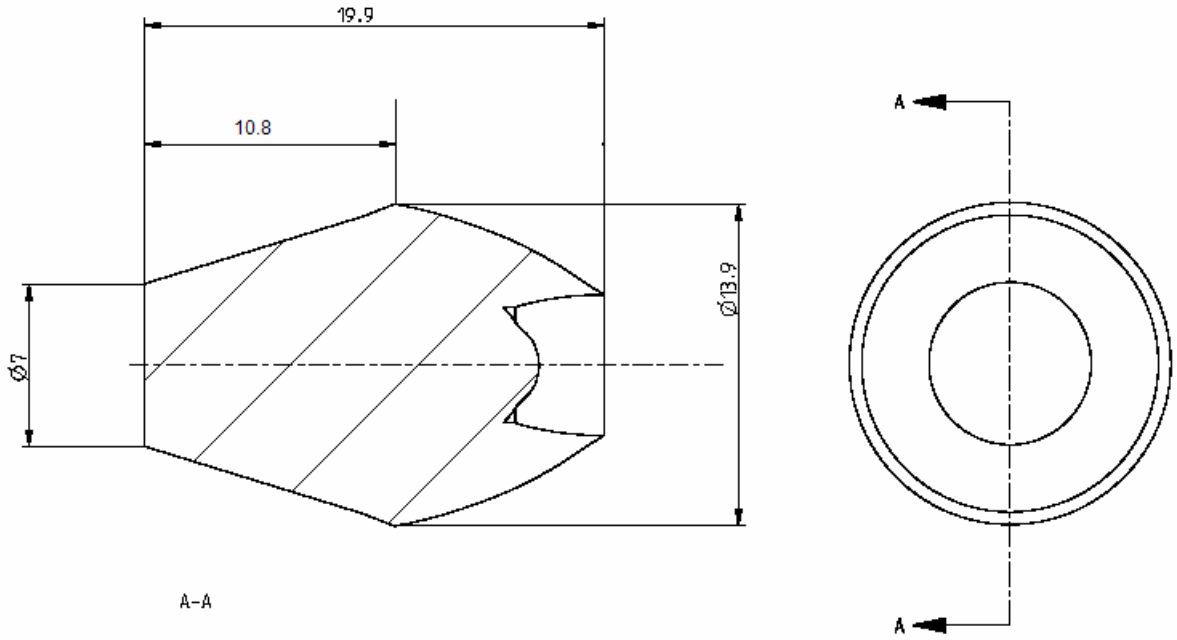
Typical Total divergence (deg) (3)	Red, Orange, Amber LEDs	Blue, Cyan, Green LEDs	White LEDs
With Luxeon I	30	37	35
With Luxeon III	TBD	36	36
With Luxeon V	N/A	45	50

Global efficiency (%): ratio of light flux exiting the FFLI to the flux of the LED.			
With Luxeon I	82	72	75
With Luxeon III	TBD	TBD	76

(3) The typical total divergence is the full angle measured on a section of the light spot where the luminous intensity is half of the peak value.
The typical divergence may change with different color LEDs due to different chip size and chip position tolerance.

Mechanical Characteristics

Fraen Fiber Light Injector drawing:

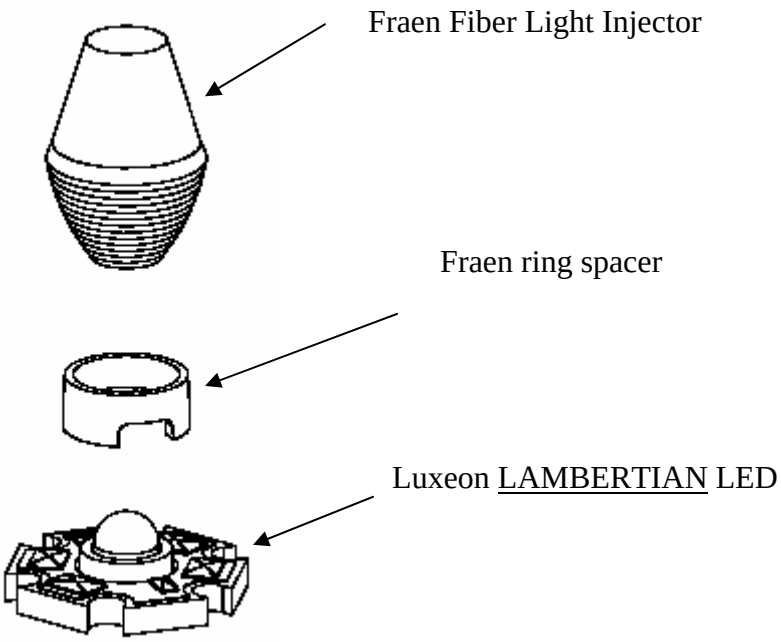


Please note that flow lines and weld lines on the external surfaces of the lenses are acceptable if the optical performance of the lens is within the specification described in the section "OPTICAL CHARACTERISTS".

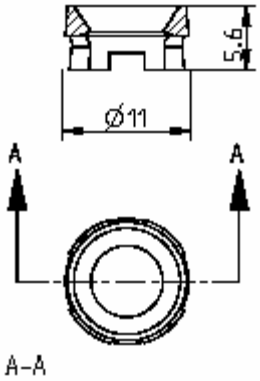
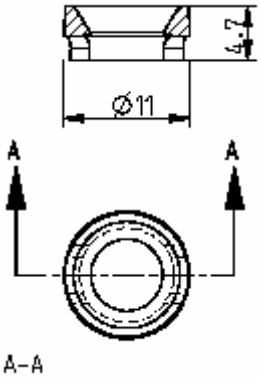
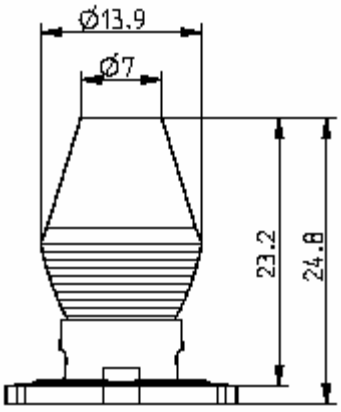
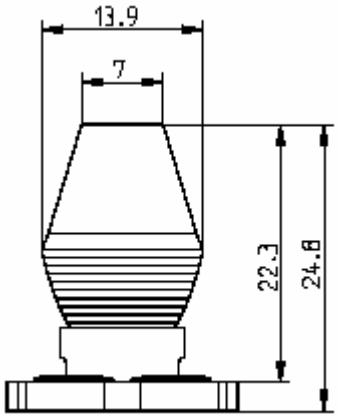
IMPORTANT : Assembly information :

To get the best optical performance (shown above), the Fraen Fiber Light Injector needs to be set at a specific mechanical position on the Luxeon LED.
In order to achieve this position, a Fraen ring spacer needs to be placed between the Lambertian Luxeon LED and the Fraen Fiber Light Injector. (Please see the following assembly view)

Lens + ring assembly view:



Two different ring spacers are available for the FFLI depending on which type of Luxeon LED is being used. Please see the table below for clarification.

Ring Spacer FTS-1WS	**Ring Spacer FTS-5WS**
- Luxeon I Lambertian star/emitter - Luxeon III Lambertian emitter - Luxeon V Lambertian emitter	- Luxeon III Lambertian star - Luxeon V Lambertian star
Ring Spacer Drawing:  	Ring Spacer Drawing: 
Assembly Drawing:  	Assembly Drawing: 

Ordering part numbers

1. Fraen Fiber Light Injector part number: **FFLI-07-LL-0**
2. Fraen Ring Spacer part number:

- **FTS-1WS**
  - Luxeon I Lambertian star/emitter
  - Luxeon III Lambertian emitter
  - Luxeon V Lambertian emitter

- **FTS-5WS**
  - Luxeon III Lambertian star
  - Luxeon V Lambertian star