

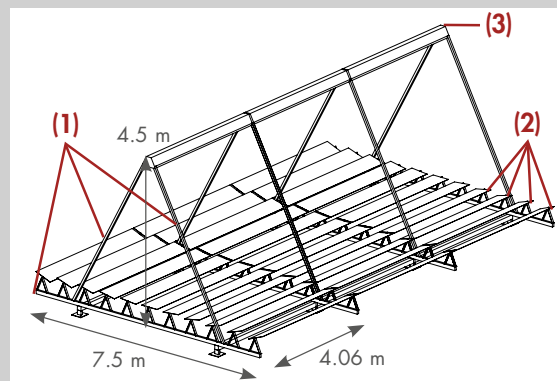


## ○ Fresnel Collector LF-11 Datasheet

The LF-11 Fresnel collector uses high-quality components from the concentrating solar power (CSP) industry, such as safety glass mirrors and thermally efficient vacuum absorber tubes. The collector operates safely and with minimum human intervention, guaranteeing the highest yields from the solar resource.

### ○ General data of a single module

Module width: <b>7.5 m</b>
Module length: <b>4.06 m</b>
Aperture surface of primary reflectors: <b>23 m<sup>2</sup></b>
Ground surface of a single module: <b>30.45 m<sup>2</sup></b>
Receiver height above primary reflector: <b>4.0 m</b>
Height of primary reflector above ground level: <b>0.5 m</b>
Minimum clearance between parallel rows: <b>0.2 m</b>
Specific weight: <b>26.2 kg/m<sup>2</sup> (per installation area)</b>
Maximum operational wind speed: <b>100 km/h</b>
Maximum wind speed in stow position: <b>180 km/h</b>
Life expectancy: <b>+25 years</b>



- 1. Support structure
- 2. Primary reflectors
- 3. Receiver, consisting of secondary reflector and vacuum absorber tube

### ○ Optical performance characteristics

Angle-independent optical efficiency (with 100% clean primary and secondary reflectors and receiver glass tube)

- $\eta_0 = 0.686$  (for sun in zenith)
- $\eta_{\max} = 0.709$  (for sun at 5° transversal zenith angle)

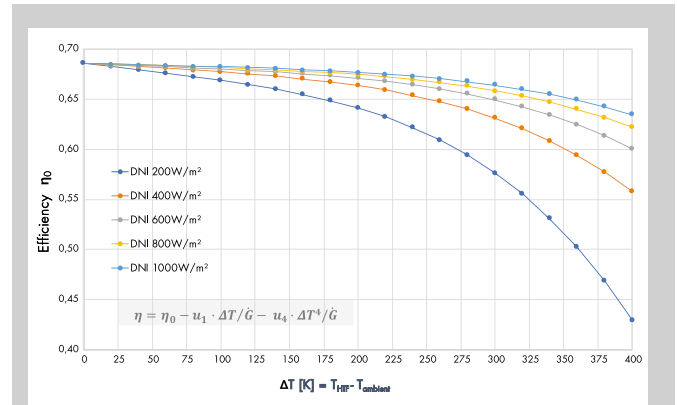
## Thermal performance characteristics

Due to the vacuum absorber tube, thermal performance is independent of wind speed.

- ✓ **Maximum operating temperature: 400°C**
- ✓ **Thermal loss per m<sup>2</sup> of primary reflector** (according to DLR):
  - $u_1 = 0.032913 \text{ W}/(\text{m}^2\text{K})$
  - $u_4 = 1.4838 \times 10^{-9} \text{ W}/(\text{m}^2\text{K}^4)$
- ✓ **Thermal output (under reference conditions\*)**
  - 13.82 kW per standard module
  - 601 W/m<sup>2</sup> in terms of aperture surface area of primary reflectors
  - 454 W/m<sup>2</sup> in terms of total installation surface area

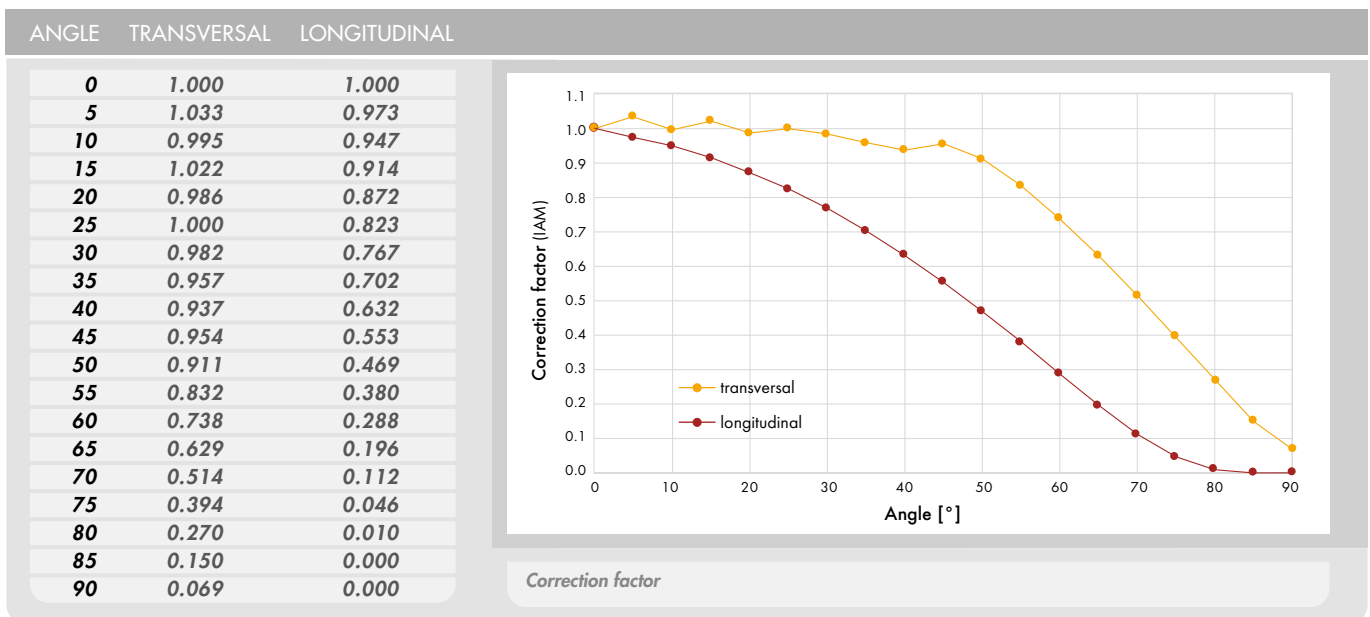
**\*reference conditions:**

30°C ambient temperature	900 W/m <sup>2</sup> direct normal radiation
160°C inflow temperature	Azimuth angle 90°
180°C outflow temperature	Zenith angle 30°



Characteristic curve of the LF-11 Fresnel collector

## Correction factor (IAM – Incident Angle Modifier)



Correction factor

## Additional features

- ✓ Lightweight structure
- ✓ Stow position for self-cleaning
- ✓ Good accessibility for maintenance
- ✓ Automatic mirror calibration system
- ✓ High ground usage efficiency
- ✓ Touchscreen HMI
- ✓ Electrical system according to steam boiler standards
- ✓ Optional automatic cleaning