

## BEAMLINER COMPONENTS

# KB MIRROR AND BENDING SYSTEM

### Purpose

This system offers mirrors with variable elliptical shape with high optical performances.

Measurement on silicon mirrors gave a slope error lower than  $0.7 \mu\text{rad}$  on a 250 mm optical length for a 300 mm total length.

Thanks to the very low contribution of the bender, we can offer, on special request,  $0.4 \mu\text{rad}$ .

This concept is specially dedicated to short curvature radii, like those used for micro-focusing in KB configuration.

### Design features of the bending system

High optical performances with mirrors elliptically bent, need a high design level :

- High accurate bending moments actuated by two electrical jack systems, at each extremity of the mirror  
Each moment is controlled independently by means of a strain gauge
- Actuating system designed with a full isostatic configuration, which minimises the mirror torque (collapse)
- A mirror self-weight sag compensation by means of two calibrated counterweights
- Compatibility with high vacuum and gas pressure environment.

### Key features

Type of motor	Stepper
Electrical actuator	
Reducer	1/200
Stiffness for 2 steps/motor	$10^{-3}$ daN
Pick-up	
. gauge	0-50 daN
. error linearity + hysteresis	$\pm 0.5$ % full scale
Tightness	Welded connection and copper seal
Cable output	Flexible pipe onto CF35

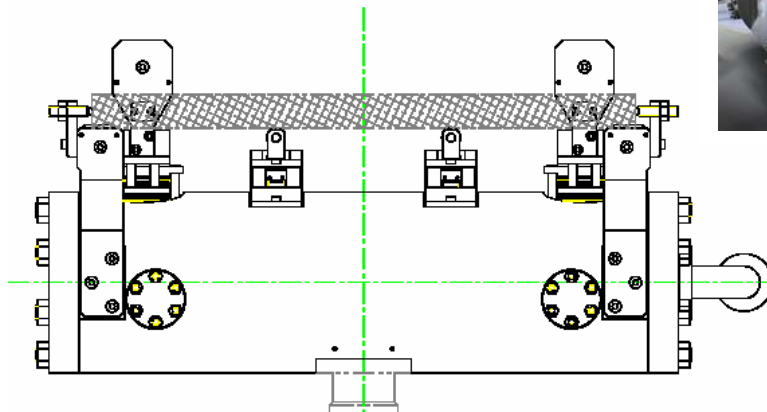
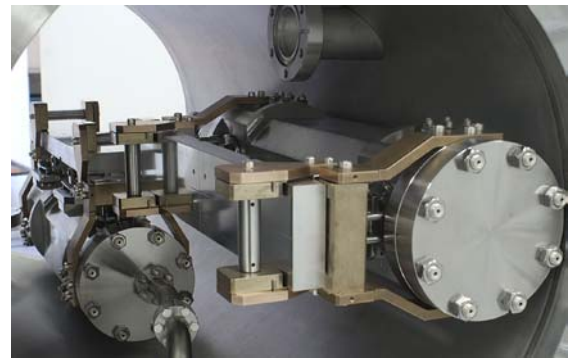
## Performances

Mirror type	Si, Zerodur®, SiC
Mirror length	from 300 to 600 mm
Mirror width	up to 70 mm
Mirror thickness	from 20 mm
Minimum curvature	ca. 150 m
Global longitudinal slope error (mirror + bender)	< 0.7 $\mu$ rad rms 0.4 $\mu$ rad rms on special request
Slope error due to the bender	< 0.2 $\mu$ rad rms
Resolution on sag	< 0.1 $\mu$ m
Repeatability on sag	< 0.1 $\mu$ m
Hysteresis around the working sag	< 0.1 $\mu$ m
Maximum moment applied to the mirror	1250 daN.mm
UHV compatible	< 10 <sup>-9</sup> mbar
Baking	up to 120°C

## Option

- Cooling system for mirrors

Overall dimensions                    380 × 200 × 120 mm  
 Weight (without mirror)            9 kg



IRELEC is specialised in the supply of :

- components for beamlines (mirror-holders, bending systems, mirrors, control systems, ...) and complete beamlines
- scientific equipment.

IRELEC reserves the right to change these specifications without prior advice in the scope of the improvement of the product

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