

# SHUTTERS

In MBE systems, different types of shutters are used

- Linear shutters for effusion cells
- Rotational shutters for effusion cells
- Shutters for substrates
- Shutters to protect windows
- Shutters to protect RHEED screens and sensor heads of analysis instruments

The shutters can be mounted directly into the MBE system or can be integrated into the effusion cell flanges. The shutters are driven by mechanical or magnetical feedthroughs, which are activated manually or by electric or pneumatic motors. All shutterblades are made from molybdenum, tantalum, PBN or PGR.

## MANUAL SHUTTER *SH-M*



Typical shutters for effusion cells, built from two shutter blades, one looks to the orifice of the cell and the other one to the substrate.

- The substrate-side blade is always relatively cool.
  - In case of reaction with the evaporated material only the orifice-side near blade will be damaged.
  - The blades are easy changeable.
  - Blade materials: molybdenum, tantalum, PBN or PGR.
- Options:**
- Linear motion shutters
  - Rotational shutters with a fixing tube for a stand alone version
  - Soft-action linear and rotating shutters.

## WINDOW SHUTTER *WSH*



To protect vacuum chamber windows (RHEED, transfer, etc.) against condensation of evaporating materials, it is necessary to use a shutter in front of the window.

- The shutter blade is typically made from stainless steel or molybdenum. Its shape is designed to optimise the protection area.
- The shutter is mounted in a double flange which is located between the window and the MBE system.
- The shutter is manually, pneumatically or electrically activated.

### Technical Data

#### Standard :

Type . . . . .	SH-M
Shutter material . . . . .	Molybdenum, tantalum, PBN or PGR
Shutterrod . . . . .	Molybdenum or tantalum
Length . . . . .	As specified
Diameter of the blade . . . . .	As specified
Mounting flange . . . . .	NW 16 CF/ NW 40 CF/ NW 63 CF
Actuator . . . . .	Manual, pneumatical or electrical motor
Bakeout temperature . . . . .	250 °C

### Technical Data

#### Fixed :

Type . . . . .	SH-M
Shutter material . . . . .	Molybdenum, tantalum, PBN or PGR
Shutterrod . . . . .	Molybdenum or tantalum
Length . . . . .	As specified
Diameter of the blade . . . . .	As specified
Mounting flange . . . . .	NW 16 CF/ NW 40 CF/ NW 63 CF
Actuator . . . . .	Manual, pneumatical or electrical motor
Bakeout temperature . . . . .	250 °C