

# ION IRRADIATION FACILITY-S

- A COMPACT VERSION OF DREEBIT'S STANDARD ION IRRADIATION FACILITY-



IIF-S

The IIF-S is the most compact one of DREEBIT's standard ion irradiation facilities. It can be equipped with Dresden EBIS/T ion sources providing various ion types from lowly charged ions or molecule fragments up to highly charged ions. Continuous ion beams or ion pulses are transported through the beamline using Einzel lenses, deflectors, and ion beam diagnostics (Faraday cups). Ion species separation is realized by a Wien filter. The complete ion beamline is designed for ultra high vacuum operation and includes hardware and software for remote controlling the facility as well as analysis of the produced spectrum of ions.

## EXTRACTED ION CURRENTS

The IIF-S can be equipped with different ion sources. Thus, the available ion intensities depend on the chosen ion source as well as the applied source parameters. Furthermore, depending on the desired resolution of the Wien filter, large or small aperture diaphragms may be necessary which can limit the ion transportation efficiency of the beamline. In the following table extracted ion beam intensities for the IIF-S including a Dresden EBIS-A combined with a Wien filter with 1 mm apertures are given.

ION SPECIES	IONS / s (DC)	IONS / s (PULSED)
H <sup>+</sup>	$2 \cdot 10^{10}$	$1 \cdot 10^{10}$
He <sup>2+</sup>	$6 \cdot 10^8$	
C <sup>4+</sup>		$1 \cdot 10^9$
C <sup>6+</sup>		$1 \cdot 10^8$
Ar <sup>8+</sup>	$2 \cdot 10^8$	$1 \cdot 10^8$
Ar <sup>16+</sup>		$7 \cdot 10^6$
Ar <sup>18+</sup>		$1 \cdot 10^5$
Fe <sup>24+</sup>		$2 \cdot 10^5$
Fe <sup>26+</sup>		$3 \cdot 10^4$
Kr <sup>26+</sup>	$2 \cdot 10^6$	
Xe <sup>44+</sup>		$6 \cdot 10^4$
Au <sup>60+</sup>		$4 \cdot 10^3$

## SCOPE OF DELIVERY

- ion source of the EBIS/T type
- beamline with ion optical elements and Faraday cups for beam transportation
- Wien filter for ion species separation
- target chamber
- beamline support rack
- control racks equipped with all power supplies required for the operation of the IIF-S
- remote control system including computer and control software

## OPTIONAL EQUIPMENT

- x-ray spectroscopical equipment at the ions source (Be window, x-ray detector, TERX system)
- spare electron gun for EBIS/T ion sources
- additional beam diagnostics such as Pepperpot emittance meter or retarding field analyzer
- Metal Ion injection from Volatile Compounds (MIVoC) kit
- target chamber equipment such as sample holders, linear feedthroughs, load lock, etc.
- heating equipment including temperature control for the entire beamline

## TECHNICAL PARAMETERS

### FACILITY PARAMETERS

source potential	1 kV up to 20 kV (depending on source type)
ion energy at target chamber	equals source potential x ion charge
ion pulse width	50 ns up to 100 $\mu$ s (depending on source type)

### GENERAL PARAMETERS

dimensions (length x width x height)	1.5 m x 1 m x 2 m
weight	~ 300 kg

### INFRASTRUCTURAL REQUIREMENTS

cooling water	one cooling water circuit, $p \geq 3$ bar
electrical power consumption	up to 15 kW (depending on source type)

The specifications and parameters of the IIF-S can be adjusted according to customer's demands.

## CONTACT

**Headquarters Großröhrsdorf**  
Dreebit GmbH  
Dr. Daniel Kost  
Southwallstr. 5  
01900 Großröhrsdorf, Germany

Phone: +49-35952-420-236  
Cell: +49-174-2610-366  
E-Mail: [ibt.sales@dreebit.com](mailto:ibt.sales@dreebit.com)

