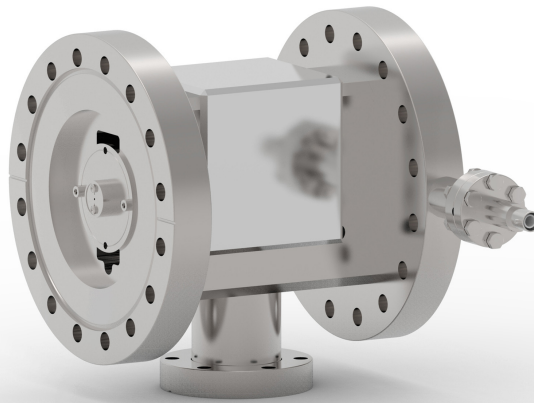


WIEN FILTER

- A COMPACT SETUP FOR PRECISE A/Q SEPARATION-



Wien Filter

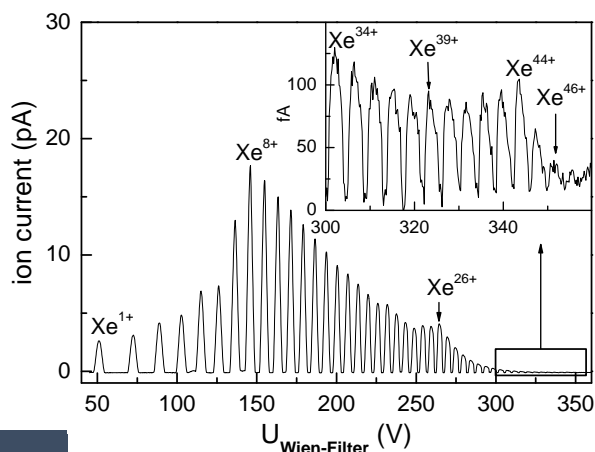
The Wien filter is a charged particle separator with a crossed electric and magnetic field configuration (ExB). It is characterized by a high dispersion at very small overall dimensions. The ion species of interest with a specific velocity due to its mass-to-charge ratio passes the Wien filter straightforward by properly adjusted electric and magnetic fields. All other species are deflected and absorbed between the Wien filter apertures.

The setup is delivered with weak and strong permanent magnetic yoke (150 mT / 500 mT) which can easily be mounted and unmounted outside of the beamline vacuum. If necessary, the integral particle beam can pass the filter without deflection by simply removing the magnetic yoke.

The weak permanent magnetic yoke allow for analyzing a larger measurement range towards fast ions of low mass-to-charge ratios. For heavy ion beams the strong magnetic yoke is used as these beams are more stiff regarding deflection in the magnetic field and higher dispersion is necessary to separate individual mass-to-charge ratios.

Furthermore, different sizes of apertures (0.5 mm, 1.0 mm, 1.5 mm) are available. A smaller aperture at the entrance and exit of the filter results in a higher resolution. However, depending on the size of the ion beam, smaller diameters may lead to a reduction of the ion transport efficiency through the setup.

To give an example of the Wien filter resolution, a monoisotopic xenon spectrum was measured at a test setup with a DREEBIT electron beam ion source at 13.6 keV·q (q - ion charge state) ion beam energy and a 1 mm filter aperture. Even the highest charge states Xe^{45+} and Xe^{46+} can still clearly be separated by the Wien filter, see figure "Xenon spectrum" below.



Xenon spectrum

SCOPE OF DELIVERY

- Wien filter recipient incl. installed electrodes and SHV feedthroughs
- two iron yokes with installed magnets (150 mT, 500 mT)
- three sets of apertures (0.5 mm, 1.0 mm, 1.5 mm), one readily installed

OPTIONAL EQUIPMENT

- power supply (2-channel, ± 1 kV) incl. 2 x 5 m HV cable with SHV plugs

TECHNICAL PARAMETERS

WIEN FILTER PARAMETERS

magnetic induction on-axis	150 mT or 500 mT
entrance / exit apertures	0.5 mm, 1.0 mm or 1.5 mm
max. Wien filter voltage	± 1 kV
beamline attachment flanges	DN 100 CF, other flange types available
dimensions (length x width x height)	153 mm x 300 mm x 170 mm
weight	10 kg (22 lbs)
vacuum conditions during operation	$1 \cdot 10^{-10}$ mbar up to atmospheric pressure

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

