

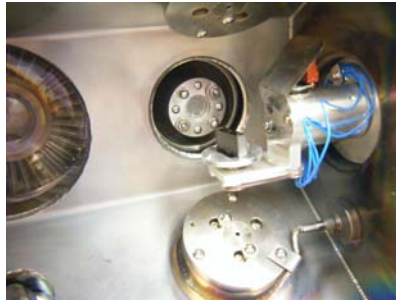
# KDC-10 1 cm Broad Beam Ion Source



Sample Preparation



Shown is the IBS/e Ion Beam Sputter and Etch system with the KDC-10 power supply and optional MKS Mass Flow Controller. The power supply is safety interlocked with the vacuum system and the beam on/off is controlled remotely by the IBS/e system. The parameters of the power supply are easily changed. The automatic mode will ignite the plasma and start the beam automatically. Beam voltage and beam current are independently adjustable. The IBS/e is available in five configurations with the KDC-10 ion source for multiple applications. With auxiliary gas lines, reactive etching and reactive deposition can be accomplished.



Shown is the KDC-10 ion source in the etch port of the IBS/e. The KDC-10 can be configured with either collimating or focusing optics. A neutralizer filament (not shown) can be used to neutralize the beam for non-conducting samples. The ion source is easily serviced by loosening two bolts and pulling the ion source from its socket. Change of filaments or the type of optics takes less than fifteen minutes.

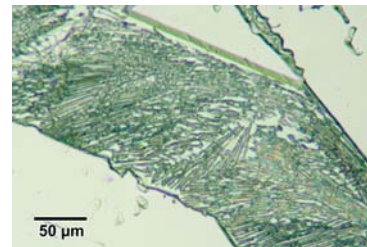
## The Model KDC-10

### Large Area Ion Polishing and Ion Etching Accessory for the IBS/e

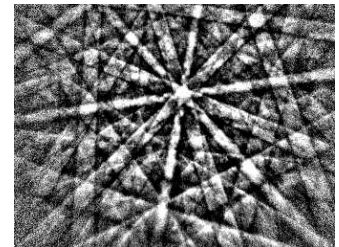
The KDC-10 is a Kaufman-type ion source accessory for the SBT Model IBS/e that can be used for ion polishing and ion etching with a low energy beam over a large area when installed in the etch port of the IBS/e. When it is installed in the upper Depo port, it can be used to rapidly ion beam sputter deposit films. The beam energy and beam current are easily changed. The energy range of the KDC-10 is 100 to 1000 eV. Three ion optic assemblies are available, focusing, collimating, and defocusing, for versatility in area coverage. With charge neutralization, non-conducting samples and targets can be processed without charging effects.

## Special Features

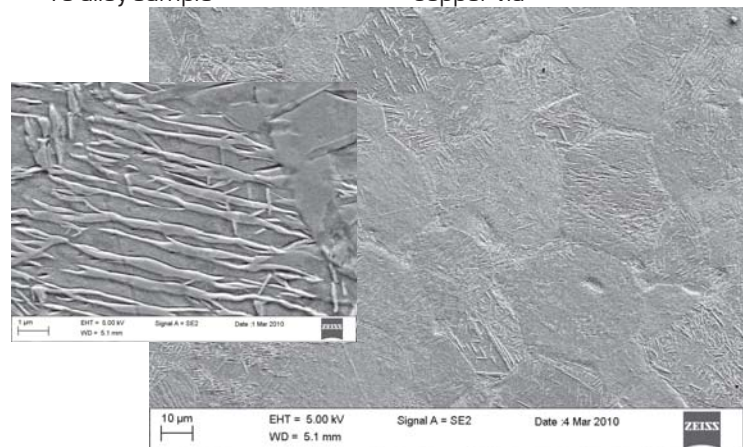
- Proven design from the pioneers of ion sources
- Low energy, 100 - 1000 eV, provides gentle ion polishing for hard to polish samples for EBSD
- Large area, greater than 1 inch diameter samples can be polished and etched
- High Current, gives high sputter rates even at low energies
- Interchangeable optics for focusing, collimation, and defocusing provides variable areas of treatment
- Automatic mode of operation for power supply makes using the system very easy
- Design allows for easy removal of ion source for maintenance of filaments, insulators, and ion optics
- Neutralizer filament provides a neutral beam for non-conducting samples
- Optional auxiliary gas lines to the IBS/e allows for reactive gas etching and deposition



Optical image of an ion etched Te alloy sample



EBSD pattern of an ion polished copper via



SEM images of a KDC-10 ion etched CP Heat Treated Ti Sample



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# Model KDC-10 Configurations with IBS/e



IBS/e-KDC

This configuration is the IBS/e with two high voltage ion guns in the two depo ports and the KDC-10 ion source in the etch/polish port. The system is integrated with the KRI power supply which is external to the IBS/e system. The system comes with the focusing optics unless otherwise specified. It is used for low rate deposition for high resolution SEM coatings and for ion etching, slope cutting, and ion polishing a sample in a large area with low energy ions or neutrals.



IBS/e-KDCAUX

This configuration is the IBS/e with one high voltage ion gun in one of the depo ports and the KDC-10 ion source in the etch/polish port. The system is integrated with the KRI power supply which is external to the IBS/e system. The system comes with the focusing optics unless otherwise specified. It is used for low rate deposition for high resolution SEM coatings and for ion etching, slope cutting, and ion polishing a sample in a large area with low energy ions or neutrals. An auxiliary gas line is supplied for reactive ion sputtering.



IBS/e-KDCETCH

This configuration is the IBS/e with the KDC-10 ion source in the etch/polish port. The high voltage guns and deposition capability are removed from this system. The ion source is used for ion polishing and ion etching of the sample. It is used for ion etching, slope cutting, and ion polishing a sample in a large area with low energy ions or neutrals. An optional auxiliary gas line is available for reactive ion etching applications.



IBS/e-KDCDEPO

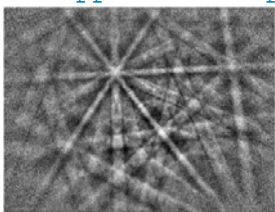
This configuration is the IBS/e with the KDC-10 ion source in the upper depo port. The high voltage guns and power supply are removed from this system. The system is integrated with the KRI power supply which is external to the IBS/e system. This system is capable of depositing films at very low to very high rates. An auxiliary gas line is included for reactive sputter deposition capability.



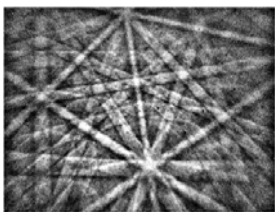
IBS/e-KDCDUAL

This configuration is the IBS/e with one KDC-10 ion source in the upper depo port and another KDC-10 ion source in the etch/polish port. The high voltage guns and power supply are removed from this system. The system is integrated with the KRI power supply which is external to the IBS/e system. A switchbox is included in the system to switch power between the depo ion source and the etch ion source based on the IBS/e mode. An auxiliary gas line is added for reactive sputter deposition capability or reactive ion etching capability. The system is used for low to very high rate deposition metal or oxide coatings and for ion etching, slope cutting, and ion polishing a sample in a large area with low energy ions or neutrals.

OFHC Copper Rod Sample



Colloidal Silica Polish: 34-50% Hit Rate



250 eV, 10 mA, 5°, 40 min:  
consistent 80% Hit Rate



4" Glass disk deposited with ITO coating using the IBS/e-KDCDEPO

