



## FIRST Newsletter

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### IµS DIAMOND II – A Powerful Microfocus Source for D8 QUEST and D8 VENTURE Solutions

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The new [IµS DIAMOND II](#) once more pushes the limits in microfocus source technology for crystallography. The IµS DIAMOND II represents the fifth generation of the INCOATEC's microfocus source, with the first generation introduced at ECM in Leuven in 2006. Since the first generation, all IµS excel with air cooled source technology. Users report tube lifetimes of typically 5 years or more when using the source 24/7. The new generation of IµS DIAMOND maintains the legendary reliability of previous generations but features a two times higher intensity. The new source is available with Cu-, Mo- and Ag-radiation.

The IµS DIAMOND II clearly surpasses the average intensity of current rotating anodes. The increase in intensity enables faster data collection even on crystals smaller than have been accessible before. While rotating anodes exhibit an intensity loss between 30% and 50% per year, all IµS show a decay in intensity only in the low single digit percent range. No annual maintenance, no filament exchange, no pump maintenance, no cooling water: the list of goodies in favor of the IµS is almost endless.

In sum, all these features guarantee high up-time and low maintenance costs. The IµS DIAMOND II just adds a factor two in intensity.

The two-fold intensity increase of the IµS DIAMOND II is based on a number of significant improvements:

- During the development of the IµS DIAMOND, we removed the limitation in power load from the anode and took advantage of the eight-fold higher heat conductivity of diamond compared to copper. However, it turned out that the cathode now was limiting the maximum intensity. This bottleneck has been addressed in the IµS DIAMOND II. The conventional tungsten filaments have been replaced by a more efficient, flat high-brightness cathode.
- We added active electron lenses, replacing the conventional Wehnelt cylinder, to the IµS DIAMOND II for improved source brilliance.
- Isotopically pure diamond has about 50% higher heat conductivity than natural diamond. To provide you with the best possible solution, the IµS DIAMOND II uses isotopically pure diamond.
- Finally, the newly designed HELIOS EF optics for the IµS DIAMOND source delivers a focused beam with a divergence ideally matching the typical mosaicity of small and weakly diffracting samples in crystallography.

With more than 1700 units in the field, the  $\mu$ S source is the most successful source in single crystal X-ray diffraction. In dual wavelength systems, the  $\mu$ S technology allows a fast power ramp-up and ramp-down, which makes software-selected wavelength switching possible in much less than a minute. With the new  $\mu$ S DIAMOND, virtually instantaneous automated

wavelength switching is possible in dual wavelength configurations without any intensity loss or the need for tweaking the alignment.

Like previous generations, the  $\mu$ S DIAMOND II is designed and manufactured in Germany and backed by a three-year warranty.