

## **I $\mu$ S** High-Brilliance

# The High-End Incoatec Microfocus X-ray Source - Unique Efficiency and Brightness



The Incoatec Microfocus Source I $\mu$ S<sup>High Brilliance</sup>

## Highest Brilliance Approved Quality & Convenience

- For Cu, Mo, Ag, Cr & Co
- Up to 60% more intensity than other microfocus sources
- Component recognition
- Improved safety features
- Fully compliant with Machinery Directive 2006/42/EC

Five years after the successful launch of the μS, in 2011 we introduced the next generation of Microfocus Sources: the Incoatec Microfocus Source μS<sup>High Brilliance</sup>! Its outstanding performance raised the standard of low-maintenance sealed tube solutions for crystallography, available for Cu, Mo and Ag radiation. Compared to the original μS, the μS<sup>High Brilliance</sup> shows an increase in intensity of about 30 % for Cu, 50 % for Ag and 60 % for Mo (Fig 1). The μS<sup>High Brilliance</sup> perfectly matches the new Bruker AXS D8 crystallography solutions (Fig 5). In 2014, the 500th μS was sold.

What's different? The improved heat-management makes it possible to produce more photons in the same small spot. Tried and trusted, our state-of-the-art Quazar multilayer optics are ideal for 2-dim focusing or collimating. Of course, the μS<sup>High Brilliance</sup> includes all familiar advantages of our previous μS systems: air-cooling, no moving parts, long lifetime without maintenance (3 years warranty). Furthermore, memory chips are built into tube, tube mount and optics, recording the real-time status of the components ("DAVINCI" design, Fig 4). These data allow for easier installation and change of components, and can be assessed online, making remote diagnostics faster, better and easier. The result is an absolutely reliable system. The μS fulfills highest safety standards: radiation safe, vacuum tested and fully compliant with Machinery Directive 2006/42/EC.

With a peak flux density of more than  $2 \cdot 10^9$  photons/(s mm<sup>2</sup>) the Mo-μS<sup>High Brilliance</sup> enables scientists in small molecule and high-resolution crystallography to collect better data sets in shorter time. Measurements in the Incoatec Applab with a Bruker D8 show an increase of more than 60 % in the diffracted intensity. The compact design makes the μS<sup>High Brilliance</sup> an attractive component for many academic and industrial research organizations to upgrade existing X-ray analytical instruments to cutting-edge performance.



Fig 1

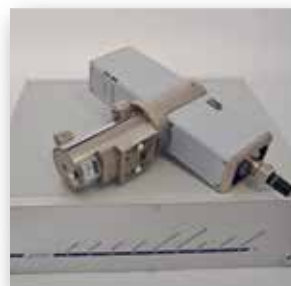


Fig 2



Fig 3

Fig 4



Fig 5

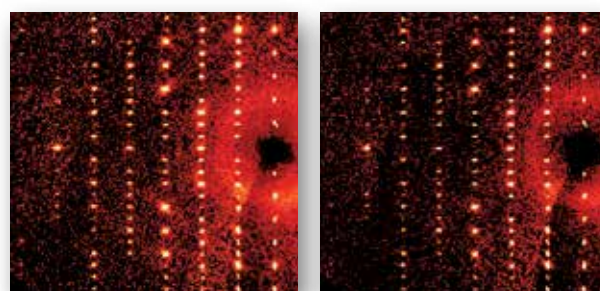


Fig 6: Section of the diffraction pattern of an Ylid crystal (C<sub>11</sub>H<sub>10</sub>O<sub>2</sub>S, 0.16 x 0.12 x 0.12 mm<sup>3</sup>, 2s/0.5° exposure time, h0l layer) recorded with an μS<sup>High Brilliance</sup> (left) and a classic μS (right).

Source	μS <sup>High Brilliance</sup>	μS classic
<I>	2927.2	1778.5
Resolution [Å]	0.83 (0.92-0.83)	0.83 (0.92-0.83)
<1/σ>	37.9 (8.7)	31.8 (6.5)
R (int); R(σ) [%]	3.39; 1.50	4.17; 1.81
R1; wR2 [%]	3.13; 8.80	3.58; 10.00
d (C2-C3) [Å]	1.368(3)	1.363(4)

Fig 7: Statistics of the two data sets from the Ylid crystal