



Orion: Target diagnostic

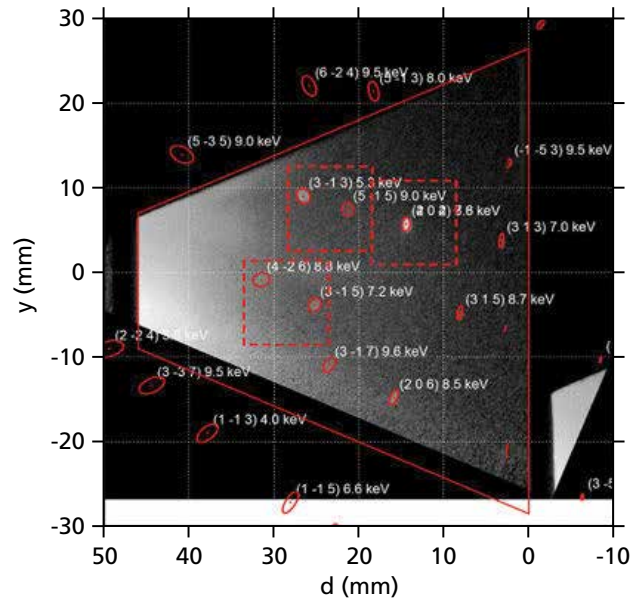
A photograph of the Orion laser facility building at AWE Aldermaston. The building is a large, modern structure with a prominent, curved, metallic facade that reflects the sky. It has a large, dark, arched entrance. The image is overlaid with a semi-transparent blue and teal gradient.

Broad-Band X-ray Diffraction Diagnostic (BBXRD)

The Orion laser facility at AWE Aldermaston, one of the largest scientific capital investments in the UK, houses a large neodymium glass laser system and a target chamber in which the high energy density physics experiments are performed. This is necessary to support certification of performance and safety of the UK deterrent.

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The Broad-Band X-ray Diffraction Diagnostic (BBXRD) is a small, passive, device that is deployed in an Orion Ten Inch Manipulator (TIM). It is a type of Laue camera used to record X-ray diffraction data from single-crystal samples of different materials (typically crystals of silicon, iron and tantalum). The diagnostic consists of a pyramid-shaped enclosure containing X-ray imaging plates mounted internally at its four sides and one or more single-crystal samples mounted from its square base. X-ray radiation from a laser-illuminated target enters the smaller end of the diagnostic enclosure through a collimating pinhole or slit, and propagates along the axis of the enclosure to the crystal sample. Diffracted radiation is recorded by the imaging plates.



Specification

TIM based

Positional alignment accuracy: < 500 μ m

Dimensions

Uni-mount to TCC: 273 mm

Front to TCC: 40 mm

Large end: 65 x 65 mm

Small end: 30 x 30 mm

Length: 50 mm