

System Details - HMX/HMX ST



HMXST high performance Real-Time X-ray inspection system For general non-destructive testing.

The HMX and HMXST are advanced microfocus x-ray system, capable of resolving details down to 5 microns, and with magnifications up to 160X. The sample can be manipulated with 5 axes of freedom, whilst continuously viewing the image on a monitor. Defects can be rapidly located, zooming in for detailed analysis. The HMXST system is the big brother of the HMX. Both are supplied as a complete, large dimension radiation enclosure, with x-ray, manipulator and imaging controls housed in a separate control console. HMX & HMXST the flexible system range:

The HMX family of systems has a wider choice of options than any other x-ray system, enabling the user to select the optimum design.

Customer options include:

- kV ranges
- Target types
- Manipulator capacity
- X-ray intensifier type and size
- Cabinet Sizes

X-ray sets

Voltage ranges are up to a maximum of 160 or 225 kV. 160kV is for general-purpose use, ideal for plastics, PCB's, light alloys, small assemblies and organic or biological samples. At maximum kV it can penetrate 15mm steel. 225kV will do all the above plus heavier castings, welds and high-density alloys.

Target types

The Ultrafocus 5-micron spot gives very high resolution and is the recommended standard target. 60W and 225W versions are available. Rod anodes are ideal for single wall inspection of hollow samples, such as pipe welds. They can be supplied in a range of diameters, from 3 to 19mm, and varying lengths, to suit the application. Targets can be interchanged with any x-ray set.

Manipulators

All provide 3 linear axes and 2 rotational axes, to view the sample at any angle. There are 5kg, 15kg, 30kg and 50kg rated manipulators dependent on sample weight and required precision. The manipulator is normally controlled by variable speed joysticks. It can also be program controlled via the rack-mounted industrial PC.

X-ray image intensifiers

The wide choice of intensifiers allows a good match to be made for subject size and x-ray energy. The standard is a single field 150mm aluminium intensifier. With high performance and low cost, it is a good general-purpose unit. Larger, smaller, or multi-field intensifiers are available to provide optimum for sample size, field of view, and magnification requirements. Beryllium intensifiers are best for low-density materials such as organic material, thin ceramics and small semiconductors. All intensifiers are mounted on sliding rails to adjust x-ray source to intensifier separation, optimising field of view and x-ray dose.

High magnification

As the sample is moved towards the x-ray source, the geometric magnification continuously increases from approximately 1X (close to the intensifier window) to 160X (touching the x-ray source).

How it works

The x-ray source generates a continuous beam of x-rays from a 5-micron spot. The beam passes through the sample placed on the manipulator turntable, and casts an x-ray shadow onto the intensifier window. The intensifier converts the x-ray shadow into a visible image, which is recorded by a video camera and displayed on a monitor. The magnification of the sample depends on its position between the x-ray source and intensifier. Moving the sample towards the x-ray source enlarges the x-ray shadow, showing greater detail. Even when operating at maximum magnification, the ultra fine x-ray spot ensures the monitor image is always sharp.

Image processing

General NDT applications usually need the standard functions, such as contrast enhancement, image integration and background subtraction. Special functions, such as automatic die attach void and wire sweep calculations, graphic displays and colour enhancement are available for more critical analysis. Images can be stored on floppy disk, CD, ZIP or DVD disk.

Reliability

The continuously pumped all metal x-ray tube eliminates the problems of costly failures and long replacement times of sealed glass tubes. Customer maintenance is minimal, typically requiring filament changes at 3-month intervals (15-minute replacement time). Preventative maintenance is recommended at 6 or 12 month intervals.