X-ray scanning system for cast iron

Cast iron production is vulnerable to a number of critical defects, in particular voids and micro-porosity, These defects cause a reduction of the sample strength, and their detection is therefore essential as part of the quality control. X-ray inspection is the most obvious, fastest, and most reliable means of non-destructive inspection.

InnospeXion has developed, constructed and supplied a number of tailored X-ray systems for manual, semi-automatic and automatic inspection of both light alloy castings, and large sand cast iron castings.
The systems are used for quality control, as well as for production and process control, in direct relation to the production line.

The InnospeXion know-how combines the best possible technology for the specific inspection task, in the most cost-effective way. The cast iron system is based on a powerful X-ray tube, combined with a flat panel CMOS detector for detection of voids. Microporosity (evenly distributed), however, cannot be detected by imaging, but requires measurement of the radiation attenuation within a small volume, and correlated to a reference. The cast iron inspection system integrates both the imaging and the microporosity measurement inspection. Sample scanning is accomplished using servo-motors with a pre-programmed scan sequence, controlled through PLC software. This provides a robust solution with high user friendliness relative to adjustments and fine-tuning sequences for new products.

In the cast iron inspection system, image and data (microporosity) validation is based on human decision-taking, but may optionally be computer-based.

Basic Specifications, Cast Iron X-ray system

- High contrast, high resolution imaging with flat panel detector;
- 300 kVp X-ray source for imaging through up to 50 mm of iron
- Radiation cabinet designed for pieces up to 600 x 600 x 300 mm
- Complete X-Y manipulation system, PLC controlled and prepared for automatic operation
- Optional counting detector technology – for micro-porosity determination & quantification
- PC based operation with PLC as master
- High performance image acquisition and processing hardware and software
- Automatic image analysis and reject of “out of compliance” samples
- X-ray safety certification according to prevailing regulations, or US/European general regulations
- Inspection cycle 30 s or less (sample size and inspection area-number dependent)
- Operator-based or automatic decision taking

Special offer, Cast Iron X-ray system

The complete system is offered at a strongly reduced price of 95.000,- EURO, EXW.

Please contact InnospeXion at ps@innospexion.dk, +45 4640 9070.

Figures:

Fig. 1. X-ray imaging of a cast iron sample, showing abundant voids and porosity.

Fig. 2. The cast iron X-ray inspection system: High energy X-ray imaging up to 300 kV for revelation of defects in sand cast iron samples for high performance usage

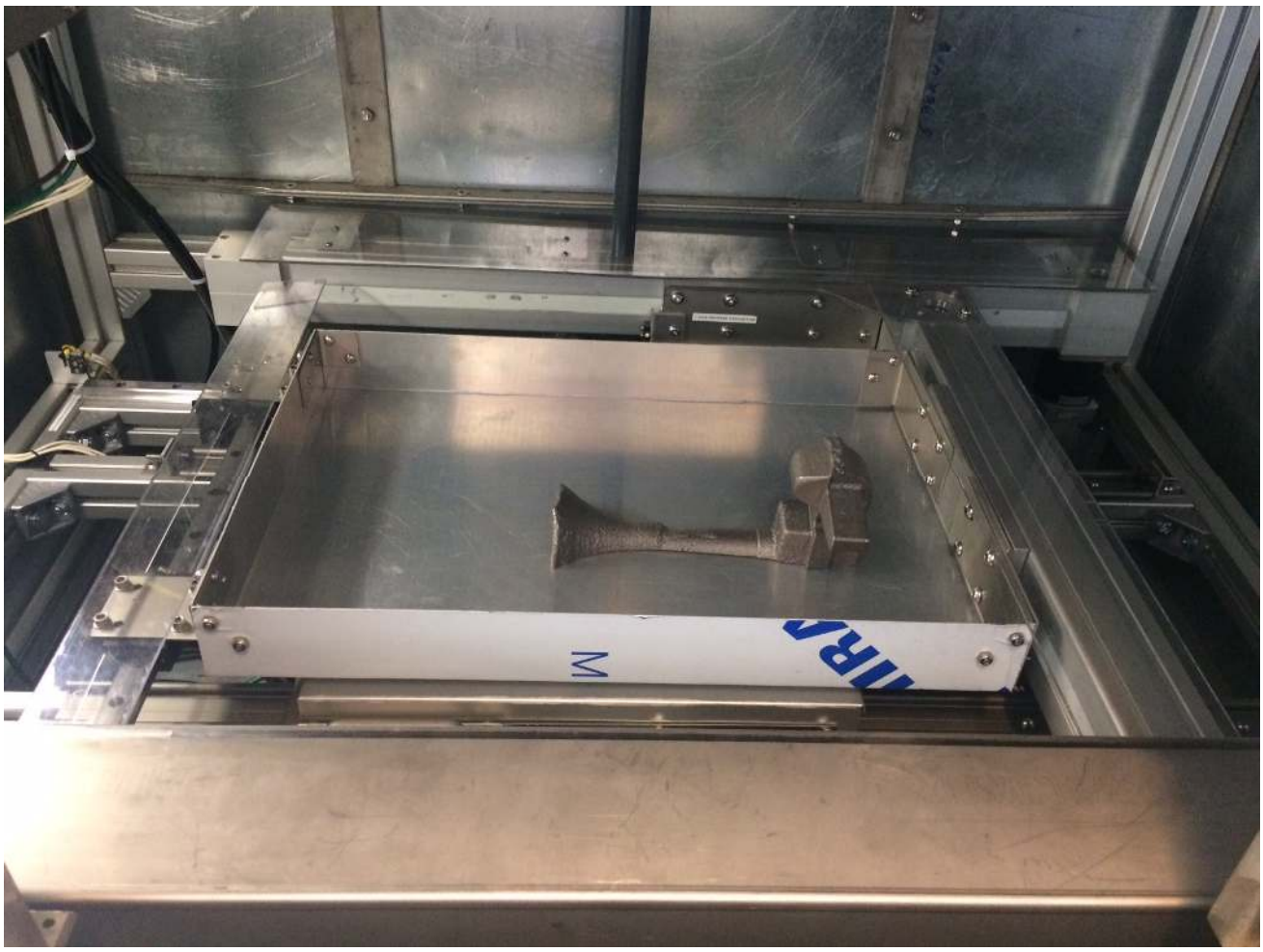

Fig. 3. Samples are positioned on a tray and scanned according to a pre-defined scan sequence programmed into the system master PLC.

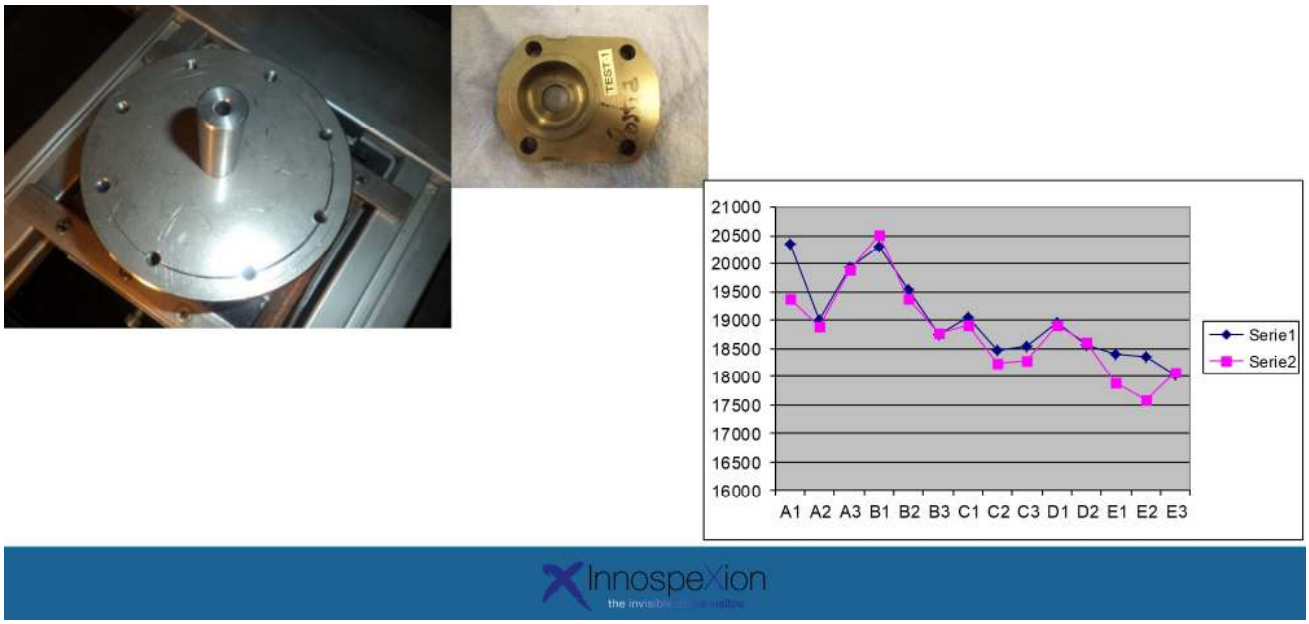

Fig. 4. Microporosity detection by attenuation measurements through critical volumes of the sample is accomplished by comparison to a reference with no porosity. In the curve to the right, the “series 1” sample is deviating significantly in positions A1, E1 and E2, consistent with marked microporosity in these volumes.