

High-performance Heavy Forging Inspection



Photo courtesy of Actemium Cegelec GmbH



Code Compliant

- Siemens
- EN 588-2

Heavy Forging Inspection

Forging is a process used to manufacture metal components requiring high strength, such as turbine generator shafts and large disks. In this process, metals are most commonly heated and shaped using compressive forces. Forging has the advantage of producing stronger parts than casting or machining.

The forging process is associated with the emergence of natural volumetric defects such as inclusions and porosities. These defects can be located anywhere in the part volume and must be reliably identified and characterized in order to ensure high quality parts.

Natural Defects

Inclusions and voids can be located anywhere in the metal volume, from the subsurface region to the core. These defects must be correctly located and sized regardless of their location inside the part.



Calibration Reference

Forged part inspection systems are usually calibrated using back wall reflection. A distance gain size (DGS) curve is generated based on the expected equivalent reflector size (ERS). This DGS curve can be converted to a time-corrected gain (TCG) curve to simplify defect identification and improve operator efficiency.

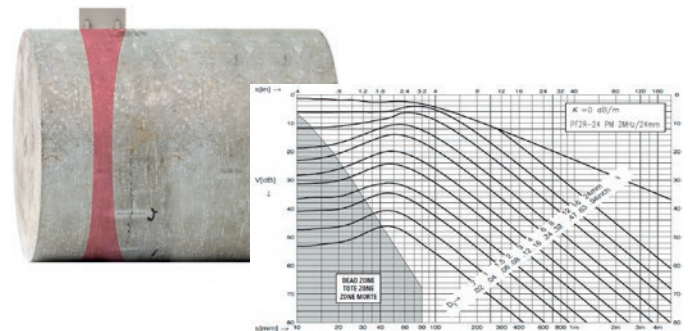
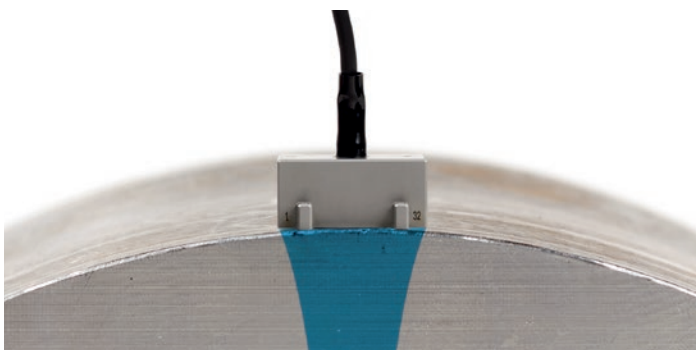


Illustration of beam propagation and corresponding DGS curve diagram.

Inspection Technique

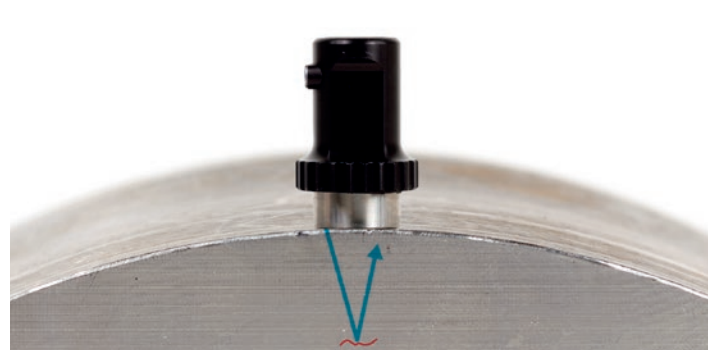
Volumetric Inspection

Volumetric inspection is performed using a phased array probe that generates longitudinal waves at various angles. Conventional ultrasonic (UT) probes are added to generate high-angle shear waves.



Subsurface Inspection

Subsurface inspection is conducted using a pitch-catch conventional UT probe, which minimizes the near-surface dead zone.



High-performance Solution

Quality PA and UT Instrument

The FOCUS PX uses the latest Olympus phased array technology to generate unprecedented signal-to-noise ratio (SNR). Four additional dedicated conventional UT channels are available for added flexibility in heavy forging inspection configurations.



Up to
12 dB

SNR improvement
over TomoScan
FOCUS LT

Up to
4

dedicated
UT channels

Application-dedicated Phased Array Probe and Wedge

The dedicated Olympus heavy forging phased array probe offers improved SNR compared to competing products and also allows multiple angle coverage capability. A custom fit near-contact wedge is available to optimize coupling.

Up to
4 dB

SNR improvement
over competing
probes



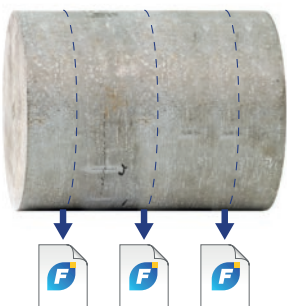
2 MHz phased array probe designed for optimized SNR.

Powerful Software

FocusPC software contains advanced features designed to optimize heavy forging inspection applications, taking full advantage of the high-end FOCUS PX specifications.

Continuous Inspection

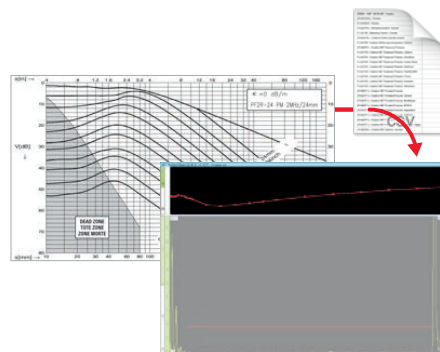
Data files are continuously generated throughout the inspection process, allowing uninterrupted inspection of very large specimens.



FocusPC continuous inspection feature

Custom TCG Inspection

Import DGS-based TCG curves to simplify defect identification and improve operator efficiency.



FocusPC TCG import feature

Worldwide Partners

Olympus has a wide network of trusted partners that can provide a high-end solution for your inspection needs.



Developing a new solution?

Contact Olympus at: Info.IntegratedInstruments@olympus-ossa.com for special Integration Packages including the FOCUS PX, FocusPC, FocusControl and FocusData SDK along with customized training sessions and support.

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