

# Non Destructive Testing

Inspecta is accredited by SWEDAC to perform Non Destructive Testing in accordance with rules from the Swedish Board for Labour Protection, the National Inspectorate of Explosives and Flammables and the Swedish Nuclear Power Inspectorate. Inspecta is also authorized by the Swedish Civil Aviation Administration.

## The most frequently used testing methods are:

- Radiographic Testing
- Gamma Radiographic Testing
- Accelerator – High Voltage Radiographic Testing
- Ultrasonic Testing
- Eddy Current Testing
- Dye Penetrant Testing
- Magnetic Particle Testing
- Visual Testing
- Leak Testing

### Radiographic Testing

In order to inspect weld joints and material up to approx. 90-mm of steel thickness and approx. 1 meter of concrete. After the radiation beam has passed the object and been recorded on an X-ray film, defects in the material are shown as variation in density and may be evaluated against given requirements. Equipment for digital registration is available as well (no X-ray film).

### Gamma Radiographic Testing

The source is a radioactive isotope. The same main principle as Radiographic testing but the radiation has shorter wavelength and by that a higher ability to penetrate the material. The method may therefore be used for thicker materials – up to 180 mm in steel.

### Accelerator – High Voltage Radiographic Testing

When energies of 2 – 6 MeV are applied, 250 mm of steel or 1 meter of concrete may be inspected.



### Ultrasonic Testing

Methods to detect cracks, lack of fusion or inclusions. The method is based on reflection of high frequency sound – compare it with sonar. The method is also applied when thickness measurement is to be performed.

### Eddy Current Testing

The method is based on generation of eddy current, in an electrical conductive material, using high frequency current through a coil. Defects in the surface or just beneath are interfering with eddy currents and these variations may be measured and recorded on an instrument. The method is for instance used for surface inspection of welds and for inspection of heat exchanger tubes regarding erosion and corrosion problems as well as cracks, cavities and thickness.

### Dye Penetrant Testing

Surface cracks may be detected using a liquid, so called Penetrant. The liquid is sprayed on the surface and penetrates into cracks. Excessive fluid is dried up and a special development fluid makes the crack appear.

### Magnetic Particle Testing

Is applied for inspection of ferromagnetic material. The objects are magnetised and magnetic powder is scattered over the surface. The powder congregates where cracks and other defects create local magnetic fields. The method admits even very small cracks to be detected. ▶

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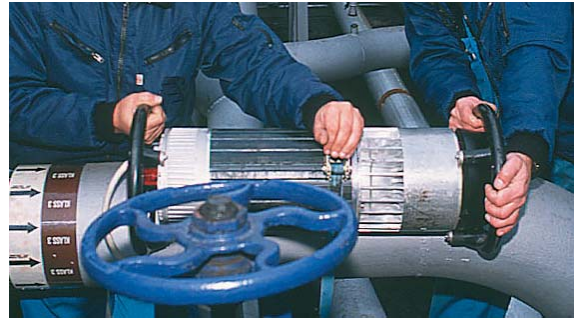
### Visual Testing

One of our most important methods during inspection is to assess the components with respect to geometrical requirements on welds. Sometimes it is necessary for the technician to use different types of borescopes or mirrors to get access in narrow spaces.

### Leak Testing

A commonly used method is testing with a so called Vacuum technique, suitable when bigger leakages are expected. An area is sprayed with a bubble substance. A transparent box is placed over the area. With a vacuum pump most of the air is sucked out and a pressure difference is created. If there is any leakage, air is sucked in and bubbles are formed which indicates the defects. To discover smaller leakages the object is put under overpressure, for instance with helium, and scanned with a sniffing probe connected to a mass spectrometer.

Inspection of Tightness is used to measure the total leakage of the object. In most cases you will find out whether the object is leaking or not.



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