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Non-Destructive Testing

Most materials processes and fabrication techniques require considerable knowledge of a variety of combinations of the parameters involved. In welded assemblies, considerable skill and experience in the welding process is required to bring about a good product. It is therefore inevitable that mistakes during subsequent processes and flaws within the material are a likely occurrence. To prevent these unwanted occurrences, pre- and post-fabrication inspection is becoming more and more essential to detect such flaws caused by deficient processes. This enables us to define corrective actions to be applied and to ensure the integrity of the finished product prior to putting it into use. Such a quality assurance scheme involves non-destructive testing in the inspection process.

Non-destructive testing (NDT) processes employed singularly or together can create a clear picture of flaws present in a component. These provide evaluation of such flaws that may impair the performance of the end product and may require removal. Furthermore, NDT aids in monitoring welding performance can provide evidence (almost in real-time) of flaws created by inefficient combinations of welding parameters, thus providing a cost-effective fabrication process through the prevention of reworks. Radiography, ultrasonic testing, magnetic particle testing and liquid penetrant testing can all be employed in various fabrication processes without degrading the component being tested. Because of the portability of equipment used, non-destructive testing may be carried out on-site or in the laboratory. Methods and procedures may be prepared to meet the requirements of the governing specifications, codes or standards.

Note: Our NDT services are backed up by destructive techniques.

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Welding Inspection

Radiography

Radiography involves passing X-rays or Gamma-rays through a material into a film, producing a permanent latent image of the material's exterior and interior. This is one of the most accurate NDT methods as it provides a permanent record that can be directly compared to the specimen for defect location, although the depth of a flaw may only be determined after a considerable amount of time by using a multiple exposure technique.

Liquid Penetrant Testing

This method is one of the oldest and simplest forms of NDT and is used to detect surface breaking discontinuity. A penetrant liquid is applied to the surface of the part, seeps into a surface and a powdery substance is applied to absorb the residual penetrant by reverse capillary action. Excess penetrant will then be removed from the substance and the powdery background gives a clear indication of the substance discontinuity.

Magnetic Particle Testing

Is an effective means of detecting surface or subsurface discontinuities in ferromagnetic materials such as iron, steel, nickel and cobalt alloys. The material is magnetised by inducing either electrical current or magnetic field. Any discontinuity in the direction transverse to the lines of force creates a flux leakage or distortion of the magnetic field. The flux leakage field then attracts magnetic particles, and in turn creates a discernible pattern.

Ultrasonic Testing

This method can be used to detect internal defects as well as surface irregularities by inducing high frequency sound waves into the material in the form of mechanical vibrations. Any disturbances or flaws along the path of the sound wave signals that can be correlated to the size and location of the signal along the horizontal scale of the screen correspond to the depth of the reflector flaw. Ultrasonic method can also be used for accurate thickness monitoring or corrosion surveys.

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