Non-destructive testing resources receive boost at Keighley Laboratories

Non-destructive testing (NDT) is a quality assurance and analytical technique that helps against the potential failure of engineering material, components, fastenings and structures. Since it enables in-depth evaluation of a material without causing damage, NDT often provides the final QA stage before a new product enters service, while in-service NDT can be the last line of defence against component failure in the field.

As part of its metallurgical solutions, UK group Keighley Laboratories offers an NDT service for clients in the aerospace, automotive, petrochemical, nuclear, defence, mechanical engineering, construction, civil engineering and allied industries, covering both laboratory and site inspection. The company recently added to its NDT resources with a new digital flaw detector for ultrasonic testing and a hand-held ferrite content meter for testing weld seams and piping materials in the oil, gas and petrochemical industries.

The Keighley Labs NDT facility covers the two most common methods of surface crack and flaw detection, Liquid Penetrant Testing and Magnetic Particle Testing, and the volumetric inspection technique, Ultrasonic Flaw Detection, as well as providing Radiographic Testing services on a sub-contracted basis. Non-destructive testing and inspection procedures are operator-dependent, relying upon the skills and experience of NDT technicians to obtain and evaluate results. All members of the Keighley Labs team are certificated to a minimum of PCN Level 2, an internationally recognised symbol of competence.

Although most of its work is carried out in the lab, around 20% of projects are on site, checking fixtures that cannot be moved such as presses, silos, boilers, offshore rigs or miles of installed pipelines in paper mills and petrochemical plants.

Chemical Analysis
Keighley Laboratories is putting the spotlight on its Chemical Analysis facility. Its team of analytical chemists has 150 years’ combined experience, ensuring that samples are assessed by the most economical and efficient method, depending on the type of material, the size and form of specimen, and the degree of accuracy required. It is a level of service that has retained customers for 40 years and attracted business from across the UK and as far afield as Saudi Arabia.

Chemical analysis at the firm involves determining the elemental constituents of materials, including aluminium, cast iron, steel and stainless steel. The laboratory uses spectroscopy equipment, classical gravimetric and volumetric ‘wet’ methods, and qualitative depth profile analysis to check that submitted samples meet a required specification. This is for quality assurance purposes as well as identifying any material coatings and metallurgical treatments.

In addition to analysing samples from engineering companies, foundries, the aerospace industry, galvanisers and platers it also applies reverse engineering principles to unknown components. This enables parts of existing machinery to be identified and replicated where documentation is lost, for example, mixed stock to be reclassified when certification is missing, or corroded parts to be replaced with like-for-like material.

Specimens typically arrive by rail or carrier and range in size from a minute speck of material to a solid component or sample of virtually any size, with pricing dependent on the complexity of analysis and the quantity of material. When dealing with solid pieces of metal, the laboratory’s Glow Discharge Spectrometer is the instrument of choice, since it offers the accurate bulk analysis as well as quantitative depth profiling.

Where the sample size is limited or the format unsuitable, an Inductively Coupled Plasma Spectrometer is employed, which uses an argon plasma and enables low sample weights to be analysed down to parts per million detection limits. It is a sensitive technique for identification and quantification of elements in a sample, although this ‘wet’ process does take a little longer.

Results take the form of material certification, positive material identification or trace element analysis and are emailed to the client. Work is carried out to UKAS Metallurgical Laboratory Service accredited standards and conforms with relevant BS EN ISO specifications.

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