Destructive Materials Testing

When engineers design equipment and structures, they specify the required physical properties of the construction materials. Destructive materials testing is used to verify that material properties meet these design specifications, which in themselves usually reference the requirements of standards and regulatory bodies. Testing may be carried out when materials are initially manufactured, for example at a steel mill. Further testing may also be required to verify that material properties have not changed during the fabrication of the equipment or structure. A common application for materials testing is to look at the properties of welds. It is usually a requirement that welds have equal, or better, material properties that the pieces being joined. Destructive testing can be carried out on representative weld samples, known as coupons, to confirm the welds’ properties.

THE Applus+ SOLUTION

Applus+ operates a global network of materials-testing labs that are accredited to CSA, NADCAP and ISO standards and offer the following services:

- Uniaxial tensile strength testing with computerised stress-strain plots
- Charpy impact testing (CVN)
- Macro and micro hardness testing (Vickers, Brinell, Rockwell)
- Macro etch
- Metallurgical microscopy
- Bend testing

Our skilled lab technicians work closely with our materials and welding engineers as well as non-destructive-testing technicians to deliver fully integrated services. We operate a modern materials-testing laboratory with equipment verified and calibrated to industry requirements.
Target customers

Companies normally require destructive materials testing at the start of new construction projects.

Tests are carried out to verify the properties of construction materials as well as to qualify welders and welding procedures. Materials tests may also be required during retrofit or repair work, especially if the material composition of the structure being repaired is unknown.

Engineers may also require materials testing when defects have been detected in structures through non-destructive testing (NDT) so that defect-tolerance calculations (fracture mechanics) can be carried out.

Finally, materials testing is normally required during failure investigations and analysis. Specifically, to determine how material properties may have evolved over time.

Key customer benefits

Benefits of the Applus+ destructive-materials testing service include:

- Quick turnaround times
- Skilled technicians
- Modern equipment
- Integrated services with NDT and engineering departments