Positive Material Identification (PMI)

As part of our quality assurance program, Alltemp Sensors traces all materials used to construct thermowells and protection tubes e.g., bar, flanges and pipe. For critical service where additional confidence in the materials is required, the material composition can be measured using a nuclear analyzer. This non-destructive technique utilizes a probe that exposes the metal to low energy X-rays. A sensor receives the resulting radiation from the metal and determines the chemical composition.

The analyzer is limited to certain metals e.g., Cr, Ni, Mo, Mn, Ti, V, Nb, Cu, W, Co and Fe. Nonmetals such as Carbon, Sulphur and Phosphorus are not detected.

This technique works best on stainless steels e.g., grade 304, 316, 410 and low alloy steels (Cr-Mo), but poorly on alloys with low Nickel content (less than 1%). PMI service is provided as an option and is carried out by independent technicians. Full reports are available on request.

Liquid Penetrant Inspection (LPI)

Liquid penetrant inspection is a non-destructive technique used to locate and evaluate surface defects on nonporous materials. It is used commonly on weldments where additional confidence is needed to ensure a high quality weld surface. The major advantages of this technique are cost, portability and ease of use.

The surface to be examined must be cleaned before testing. A penetrant is applied to the surface. This penetrant leaches into any surface defects that may be present. After a short time, excess penetrant is removed and a developer is applied. The developer draws penetrant out of any defects that may be present and gives an indication of location, shape and approximate size. Following the test, both penetrant and developer are removed by washing to restore the original clean surface.

Alltemp Sensors has qualified personnel, complete with documented procedures for performing liquid penetrant inspection. Inspection reports can be provided upon request.

Hydrostatic Pressure Testing (External and Internal)

Hydrostatic testing is a non-destructive test used to examine the integrity of a thermowell by subjecting it to a pressure for a specified time. The thermowell is tested for leaks or pressure drops using chart recorders and visual inspection methods. Test pressures are generally one and a half times the maximum allowable working pressure of the process and may be applied to the internal or external surface of the thermowell depending on the requirements of the customer.

Alltemp Sensors has in-house capabilities for hydrostatic testing thermowells in both external and internal configurations. We are able to use these techniques to verify welds, threaded connections and wall thicknesses.