

Postweld Inspection and Repair

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In order to determine the suitability of the weldment for its intended purpose, some degree of nondestructive examination/testing (NDE/NDT) should be conducted as part of sound fabrication practice and quality assurance. For non-code fabrication, NDE may be as simple as visual or liquid/dye penetrant inspection. For code fabrication, certain mandatory inspections may be required. These NDE methods should be considered for both intermediate inspections during multi-pass welding, as well as for final acceptance of the weldment.

NDE methods are similar to those used for carbon and stainless steels. Liquid/dye penetrant inspection is commonly used to reveal surface defects, such as hot-cracking. Radiographic and ultrasonic testing can be used to detect for subsurface defects and thoroughly check the soundness of the weldment; however, the results can be difficult to interpret and these methods are generally not well suited for inspection of fillet welds. Magnetic particle inspection is not an effective NDE method for Ni-/Co-base alloys since they are non-magnetic. If further information is required, it is suggested that the fabricator consult with an outside laboratory that is experienced with NDE of Ni-/Co-base alloy welds.

Welding defects that are believed to affect quality or mechanical integrity should be removed and repaired. Removal techniques include grinding, plasma arc gouging, and air carbon-arc gouging. As explained previously in the [weld joint preparation](#) section, extreme care must be exercised during air carbon-arc gouging to insure that carbon contamination of the weld joint area does not occur. It is suggested that the prepared cavity is liquid/dye penetrant inspected to insure that all objectionable defects have been removed. The repair cavity should then be thoroughly cleaned prior to any welding repair. Since Ni-/Co-base alloys have low weld penetration characteristics, the ground cavity must be broad enough and have sufficient sidewall clearance in the weld groove to allow for weld electrode/bead manipulation. The technique of "healing" or "washing out" cracks and defects by autogenously re-melting weld beads, or by depositing additional filler metal over the defect, is not recommended.