



FAST UT – Thin Wall Applications

Until recently, contact ultrasonic inspection of thin walled components was not reliable, and in many cases, it was not possible. Many of those applications are now being done with outstanding reliability using FAST UT.

Applications, which are being done successfully include:

- ◆ Inconel tube circumferential butt welds made with orbital welder. Material is 5/8" diameter to 1" diameter tube .056" wall. Conditions found include
 - ✓ Sugared root
 - ✓ Lack of Penetration
 - ✓ Lack of Fusion
 - ✓ Cracks

- ◆ Piping welds for inservice cracks. Welds as thin as .125" and as small in diameter as 1". Conditions found include:
 - ✓ ID cracks
 - ✓ OD cracks
 - Note 1: OD flaws and most ID flaws are sized for through wall extent
 - Note 2: Ability to resolve cracks from geometric reflectors is key to reliability.
 - Note 3: Sizes from 2" ϕ and .200" T and up have been qualified through PDI at EPRI
 - Note 4: Reliable single side detection even through stainless welds.

- ◆ Stainless steel piping circumferential welds made with orbital welder and/or with manual tig. Material is Sch 10 with thickness as low as .08". Conditions found include:
 - ✓ Sugared root
 - ✓ Lack of Penetration
 - ✓ Lack of Fusion
 - ✓ Cracks

- ◆ Sheet metal welds in aerospace application. Thickness of .06" to .09". Material is stainless alloy. Welds are made using manual tig. Condition found include:
 - ✓ Lack of Fusion
 - ✓ Lack of Penetration
 - ✓ Cracks

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- ◆ Various size boiler tube butt welds. Diameters from 1.0” to 3.0” with wall thickness from .15” to .56”. Materials include carbon steel, and various alloys. Many of the applications include dissimilar metal bonds. Conditions found include:
 - ✓ Lack of Penetration
 - ✓ Lack of Fusion
 - ✓ Cracks (Inservice thermal and fatigue cracks)
 - ✓ Porosity
 - ✓ Inclusions
 - ✓ Inservice OD and ID cracks in the dissimilar metal welds. (This application was for detection and sizing)

- ◆ Fillet weld toe crack inspection
 - ✓ Depth of cracks from scanning surface

- ◆ Pipeline long seams. Thicknesses from .180 to .375. Longseams welded using flash welding, ERW welding, Flash welding and submerged arc welding. Conditions found include:
 - ✓ Lack of Fusion
 - ✓ Cracks (Inservice fatigue cracks primarily)
 - ✓ Inclusions
 - Note1: OD and ID planar flaws were sized for through wall extent
 - Note2: Ability to resolve cracks from geometric reflectors is the key to reliability.

FAST™ UT is a new technology, developed and patented by the principal of PfiNDE. New applications are being found frequently. Some of the most exciting areas for new applications are for weld inspection in lieu of radiography and fitness for duty applications whereby inservice flaws are evaluated for repair **or** continued service.

PfiNDE, LLC is pleased to assist in procedure qualification exercises for any application. For more information regarding past applications, and for specific application questions call Rick Pfannenstiel.

Rights to use the patented technology may be obtained from PfiNDE, LLC. Training approved by PfiNDE, LLC as well as other criteria may be required before the granting of those rights.

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