ADVANCE ULTRASONIC INSPECTION

TOFD ON HDPE WELDING OF HDPE

DACON INSPECTION SERVICES
Who we are

Conventional and Advanced NDT and Inspection Services

Oil and Gas, Refinery, Petrochemical, Heavy Industry, Mining

Over 400 personnel including more than 300 inspectors

Thailand headquarters with International expertise since 1979
TOFD on HDPE Defects in HDPE welds

- Cold weld; severe lack of fusion/non fusion
- Poor fusion
- Foreign contamination
TOFD on HDPE Conventional Testing methods

- **Visual exam**
  - Poor correlation to weld quality for heavy wall

- **Bent-strap test (ASTM D2657)**
  - Low probability of detection:

- **Traditional UT pulse-echo**
  - Ineffective for heavy wall

- **Hydro testing**
  - Derived from metallic systems
  - Viscoelastic plastics
    - deformation depends on time and temperature
    - does not ensure long-term performance

![Diagram of test strap and butt fusion with dimensions and labels: t, 15t (150mm min), 15t (150mm min), 1-1/2t (25mm min), TEST STRAP, BUTT FUSION, External Surface, Internal Surface.]
TOFD on HDPE Testing and development
TOFD on HDPE On site work execution
TOFD on HDPE

Example signal, Test pipe

No defect

Contamination

Voids
TOFD on HDPE Example signal, Actual signal

Result: Found lack of fusion interpass  Focus at 2/3 thickness

Temp of pipe: 15 degree C
Temp of calibration block: 19 degree C
Nominal thickness: 15.3 mm
Actual thickness: 15.6 mm

Remarks:
Found lack of fusion interpass
Discontinuity: Lack of fusion interpass
Depth: 11.2 mm
Distance: 85 mm
Length: 29 mm
Height: N/A

Pipe size inspected: 6" SDR11
Weld number: 027
Welder symbol: R006
Status of inspection: REJECTED (CAT 1)

Company: JDCC & FLUOR
Address: Mongolia, Oyu Tolgoi worksite
Project Name: Oyu Tolgoi - K516-NDE
Item Name: 3750-WP-6274-ROB-6-6I
Material: HDPE
Equipment: TD pocket scan
Probes: 2MHz, 12mm element, wedge 60 degree in HDPE
Inspection Date: 24-09-11
Inspection By: Etarach T.
Inspection Method: TOFD

Team 1
Report No: 0004
TOFD on HDPE  Example signal, Actual signal

Result: Found bottom surface breaking  Focus at 2/3 thickness

Temp of pipe: 24 degree C  Temp of calibration block: 23 degree C
Nominal thickness: 10.4 mm  Actual thickness: 10.6 mm

Remarks:
Found bottom surface breaking
Discontinuity: bottom surface breaking
Depth: 4.4 mm.
Distance: 210 mm.
Length: 80 mm.
Height: 5.6 mm. (from bottom)

Beam coverage  Calibration block No.1

Pipe size inspected: 4" SDR11  Team: 1
Weld number: 005  Report No: 0001
Welder symbol: R016  Status of inspection: REJECTED (CAT 1)

Company: JDCC & FLUOR
Address: Mongolia, Oyu Tolgoi work site
Project Name: Oyu Tolgoi - K516-NDE
Item Name: 3765-WD-1441-HOB-4-N1
Material: HDPE
Equipment: TD pocket scan
Probes: 2Mhz, 12mm element, wedge 60 degree in HDPE
Inspection Date: 26-08-11
Inspection By: Ekmarch T.
Inspection Method: TOFD

Signature of Inspector
How Can We Help?

Contact

Email: info@dacon-inspection.com
Phone: +66 (0) 33 012 484-7

www.dacon-inspection.com