TOFD ON HDPE WELDING OF HDPE
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 TOFD on HDPE](image)
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

**Beam coverage**

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

**Calibration block No.3**

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

**Company**

- JDCC & FLUOR

**Address**

- Mongolia, Oyu Tolgoi worksite

**Project Name**

- Oyu Tolgoi - K616-NDE

**Item Name**

- 3750-WP-6274-HOB-6-N1

**Material**

- HDPE

**Equipment**

- TD pocketscan

**Probes**

- 2Mhz, 12mm element, wedge 60 degree in HDPE

**Inspection**

- Inspection Date: 24-09-11
- Inspection By: Ekarach T.
- Inspection Method: TOFD

**Remarks**

- Pipe size inspected: 6" SDR11
- Weld number: 027
- Welder symbol: R006
- Status of inspection: REJECTED (CAT 1)
**TOFD on HDPE** Example signal, Actual signal

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

**Beam coverage**

**Calibration block No.1**

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<tr>
<th>Company</th>
<th>JDCC &amp; FLUOR</th>
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<tbody>
<tr>
<td>Address</td>
<td>Mongolia, Oyu Tolgoi worksite</td>
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<td>Project Name</td>
<td>Oyu Tolgoi - K16-NDE</td>
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<td>Item Name</td>
<td>3765-WD-1441-HOB-4-NI</td>
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<td>Material</td>
<td>HDPE</td>
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<td>Equipment</td>
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**Pipe size inspected:** 4" SDR11  
**Weld number:** 005  
**Welder symbol:** R016  
**Status of inspection:** REJECTED (CAT 1)

**Remarks:**
- Discontinuity: bottom surface breaking
- Depth: 4.4 mm.
- Distance: 210 mm.
- Length: 80 mm.
- Height: 5.5 mm. (from bottom)

**Inspection Date:** 25-08-11  
**Inspection Method:** TOFD

**signature of Inspector**
How Can We Help?

Contact

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www.dacon-inspection.com