

Tape Application

FFJ Machine – Designed and build in house by PIH



FFJ Machine – Saddle Type



FFJ Machine – Rail Mounted

Typically used at spoolbases where pipe is open ended and can pass through machine

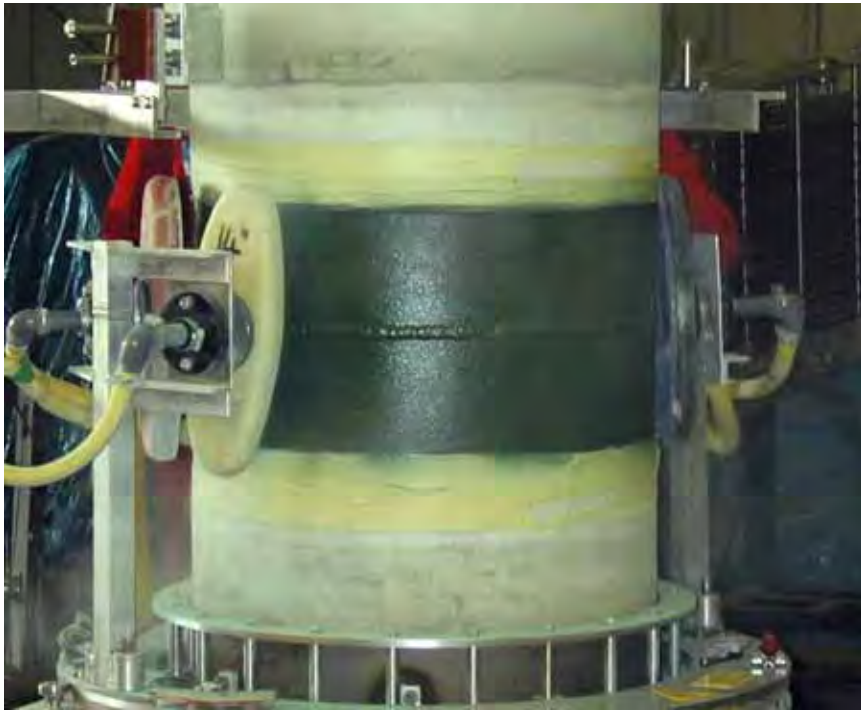


FFJ Machine – Rail Mounted

The machine opens up for access and maintenance



FFJ System – J-Lay Configuration



Project Qualifications

The PIH PP FFJ System has been subjected to extensive Qualification Testing by the following Companies:

- **Total**
- **PTTEP**
- **BP**
- **ADCO**
- **Shell**
- **Petrobras**
- **Transnet**

FFJ - PP

Excellent adhesion properties on steel and parent coating



FFJ - PE

Excellent adhesion properties on steel and parent coating



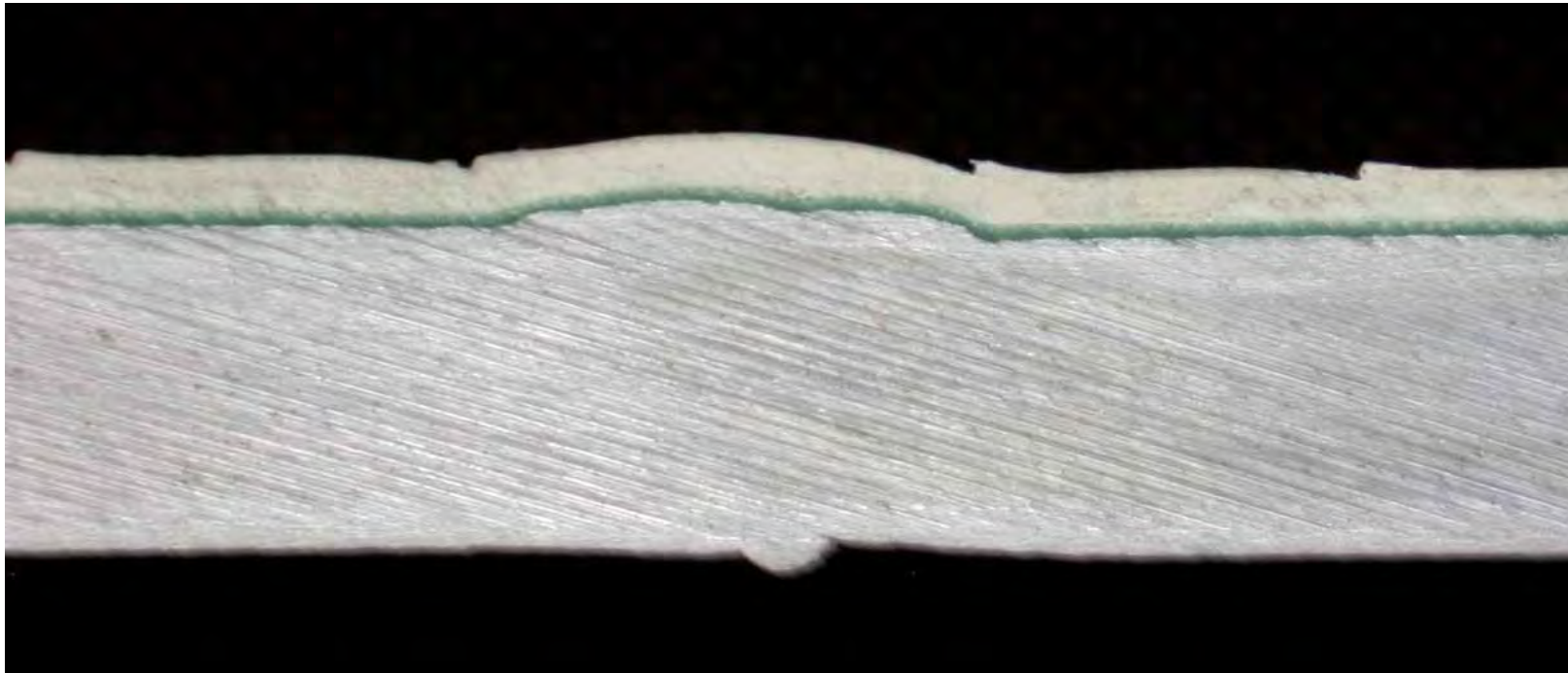
Tape Section

Fully Fused



Tape Section

Excellent Conformation to the Weld



PIH Qualifications



PIH Qualifications

Bend testing in tension and compression at 0°C to 10% strain



PIH Qualifications

High Temperature Adhesion Testing – 110 deg C



Factory Coating



Field Joint Coating

PIH Qualifications

Full scale bend testing at 0°C



Testing and Properties

TYPICAL PROPERTIES OF THE PIH FUSED FIELD JOINT COATING SYSTEMS

(TEST METHODS – NFA 49-711 or ISO 21809-3)

PROPERTY	POLYPROPYLENE		POLYETHYLENE	
	TYPICAL REQUIREMENT	TYPICAL RESULT	TYPICAL REQUIREMENT	TYPICAL RESULT
THICKNESS	2-3 mm	2 – 8 mm	2-3 mm	2 – 8 mm
PEEL ADHESION 23°C	> 150 N/cm	250 – 300 N/cm	>150 N/cm	250 – 300 N/cm
PEEL ADHESION T-Max	> 40 N/cm (90°C)	80 – 120 N/cm	> 15 N/cm (80°C)	50 – 60 N/cm
CD 28 Days/23°C	< 5 mm	1 – 2 mm	< 7 mm	1 – 2 mm
CD 28 Days T-Max	<10 mm (90°C)	2 - 3 mm	< 10 mm (80°C)	2 – 3 mm
HOT WATER SOAK	Rating 3	Rating 1	Rating 3	Rating 1
Impact Resistance	15 J/mm	PASS	15 J/mm	PASS

Fused Field Joint (FFJ) - PP

Finished Joint – Over 100,000 Field Joints coated to date



Fused Field Joint (FFJ) - PE



Production Joints - PP

Spoolbase - 12" Pipe on the Racks



Production Joints - PP

TFE Nuggets – 12" Pipe on the Reel Barge



Production Joints - PE

NMPP Project – South Africa - ONGOING



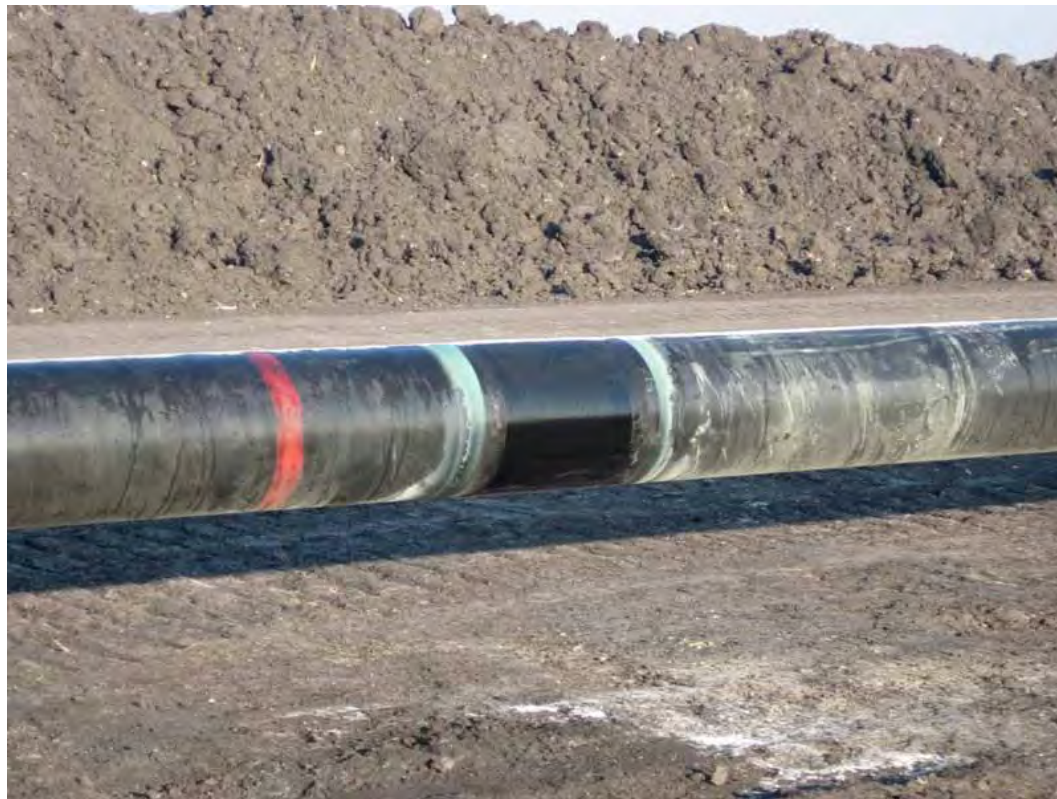
Production Joints - PE

NMPP Project – South Africa - ONGOING



Production Joints - PE

NMPP Project – South Africa - ONGOING



Production Joints - PE

NMPP Project – South Africa - ONGOING



Description of PIH Fused Field Joint Coating System by David Jackson, PIH Technical Director

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