

## Laboratory Report - EAR-Controlled Data

**Material:** Steel

**Description:** (3) NPS 4 XXH Welded Pipes, Material: A519-4130, PWHT. Position: 6G

### Guided Bend Test As Received

Weld Code: ASME Sec. IX (2013)

Bend Specimen Type: Side Bend

Number of specimens: 4

Bend Acceptance Criteria: No defects greater than 1/8"

Bend Radius, inches: 0.750

Bend Width, inches: 0.33

Bend Angle/Type: 180°

	Results
1st Side Bend	Satisfactory
2nd Side Bend	Satisfactory
3rd Side Bend	Satisfactory
4th Side Bend	Satisfactory

### Impact Test ASTM A370-14, ASTM E23-12c, V-Notch, Perpendicular to the Weld, As Received

Specification Referenced: ASME B31.3-2014

Notch Orientation: Perpendicular to Surface

Specimen Size: 10mm x 10mm

Notch Location: Base

Temperature °F: +70

Specimen ID	Impact Value (Ft-Lbs)	Lateral Expansion (mils)	Shear (%)
1	156, 155, 151(Avg. 154)	64, 64, 59(Avg. 62)	100, 100, 100(Avg. 100)

Comments: Absorbed energy values above 80% of the 300 ft-lb scale range are approximate. Absorbed energy values below 6 ft-lbs (8 Joules) or above 240 ft-lbs (407 Joules) are outside the verified range.

When subsize specimens are permitted or necessary, or both, specified test requirement may be modified according to Table 9 of ASTM A370 (latest revision).

## Laboratory Report - EAR-Controlled Data

### Impact Test ASTM A370-14, ASTM E23-12c, V-Notch, Transverse Across the Weld, As Received

Specification Referenced: ASME B31.3-2014

Notch Orientation: Perpendicular to Surface

Specimen Size: 10mm x 10mm

Notch Location: HAZ

Temperature °F: +70

Specimen ID	Impact Value (Ft-Lbs)	Lateral Expansion (mils)	Shear (%)
2	168, 159, 162(Avg. 163)	62, 58, 64(Avg. 61)	100, 100, 100(Avg. 100)

Comments: Absorbed energy values above 80% of the 300 ft-lb scale range are approximate. Absorbed energy values below 6 ft-lbs (8 Joules) or above 240 ft-lbs (407 Joules) are outside the verified range. When subsize specimens are permitted or necessary, or both, specified test requirement may be modified according to Table 9 of ASTM A370 (latest revision).

### Impact Test ASTM A370-14, ASTM E23-12c, V-Notch, Transverse Across the Weld, As Received

Specification Referenced: ASME B31.3-2014

Notch Orientation: Perpendicular to Surface

Specimen Size: 10mm x 10mm

Notch Location: Weld

Temperature °F: +70

Specimen ID	Impact Value (Ft-Lbs)	Lateral Expansion (mils)	Shear (%)
3	90, 64, 68(Avg. 74)	47, 25, 39(Avg. 37)	85, 95, 85(Avg. 88)

Comments: Absorbed energy values above 80% of the 300 ft-lb scale range are approximate. Absorbed energy values below 6 ft-lbs (8 Joules) or above 240 ft-lbs (407 Joules) are outside the verified range. When subsize specimens are permitted or necessary, or both, specified test requirement may be modified according to Table 9 of ASTM A370 (latest revision).

### Room Temperature Tensile Testing ASTM A370-14/ASTM E8/E8M-15a, Transverse Across the Weld, As Received

Weld Code: ASME Sec. IX (2013)

Width, Initial, in	Thickness, Initial, in	Area, Initial, in <sup>2</sup>	Tensile Load, Lbs	Tensile Strength, ksi	Yield (0.2% Offset), ksi	Location of Fracture
0.753	0.532	0.4006	34255	86	71.3	Weld

Type of Fracture: Ductile

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### Room Temperature Tensile Testing ASTM A370-14/ASTM E8/E8M-15a, Transverse Across the Weld, As Received

Weld Code: ASME Sec. IX (2013)

Width, Initial, in	Thickness, Initial, in	Area, Initial, in <sup>2</sup>	Tensile Load, Lbs	Tensile Strength, ksi	Yield (0.2% Offset), ksi	Location of Fracture
0.753	0.528	0.3976	41322	104	84.9	Weld

Type of Fracture: Ductile

### Hardness Test ASTM E18-15/ASTM A370-14, As Received

Testing Location, Hardness: Base

Sample ID	Results
1	228 HBW (98 HRBW)

Reading No. 1: 226.8 HBW(97.8 HRBW)

Reading No. 2: 235.2 HBW(99.2 HRBW)

Reading No. 3: 221.4 HBW(96.9 HRBW)

Hardness converted per ASTM E140-12be1 - Conversions should be considered as approximations only, and may vary greatly between alloy groups.

### Hardness Test ASTM E18-15/ASTM A370-14, As Received

Testing Location, Hardness: HAZ

Sample ID	Results
2	204 HBW (94 HRBW)

Reading No. 1: 209 HBW(94.8 HRBW)

Reading No. 2: 200 HBW(93 HRBW)

Reading No. 3: 203.5 HBW(93.7 HRBW)

Hardness converted per ASTM E140-12be1 - Conversions should be considered as approximations only, and may vary greatly between alloy groups.

## Laboratory Report - EAR-Controlled Data

### Hardness Test ASTM E18-15/ASTM A370-14, As Received

Testing Location, Hardness: Weld

Sample ID	Results
3	223 HBW (97 HRBW)

Reading No. 1: 236.4 HBW(99.4 HRBW)

Reading No. 2: 226.8 HBW(97.8 HRBW)

Reading No. 3: 205.5 HBW(94.1 HRBW)

Hardness converted per ASTM E140-12be1 - Conversions should be considered as approximations only, and may vary greatly between alloy groups.

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