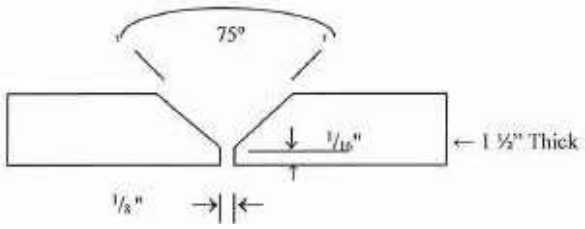
INSPECTION SPECIALISTS, INC.

**PROCEDURE QUALIFICATION RECORD (PQR)**
**(See QW-200.2, Section IX, ASME Boiler and Pressure Vessel Code)**
**Record Actual Conditions Used to Weld Test Coupon.**

Company Name: Jacobs Technology
Procedure Qualification Record No.: NASA-A572-SMAW-PQR  Date: 4/24/13
WPS No.: NASA-A572-SMAW
Welding Process(es): SMAW
Types (Manual, Automatic, Semi-Auto.): Manual

JOINTS (QW-402)




Groove Design of Test Coupon
(For combination qualifications, the deposited weld metal thickness shall be recorded for each filler metal or process used.)

**BASE METALS (QW-403)**
Material Spec.: ASTM A572
Type or Grade: 50
P-No.: ____ to P-No. ____
Thickness of Test Coupon: 1.500"
Diameter of Test Coupon: N/A
Other: ____

**POSTWELD HEAT TREATMENT (QW-407)**
Temperature: N/A
Time: N/A
Other: ____

**GAS (QW-408)**

| | Gas(es) | Percent Composition (Mixture) | Flow Rate |
|---|---|---|---|
| Shielding | N/A | N/A | N/A |
| Trailing | N/A | N/A | N/A |
| Backing | N/A | N/A | N/A |

**FILLER METALS (QW-404)**

| | | |
|---|---|---|
| SFA Specification | 5.1 | 5.1 |
| AWS Classification | E6010 | E7018 |
| Filler Metal F-No. | 3 | 4 |
| Weld Metal Analysis A-No. | 1 | 1 |
| Size of Filler Metal | 1/8" | 1/8" |
| Other | | |
| Deposited Weld Metal | 0.250" | 1.250" |

**ELECTRICAL CHARACTERISTICS (QW-409)**
Current: DC
Polarity: EP
Amps.: E6010 (80) E7018(85-126)  Volts: E6010 (25) E7018(24-26)
Tungsten Electrode Size: N/A
Other: ____

**POSITION (QW-405)**
Position of Groove: 1G
Weld Progression (Uphill, Downhill): N/A
Other: ____

**TECHNIQUE (QW-410)**
Travel Speed: 4-14 IPM
String or Weave Bead: String
Oscillation: 1 ½ times the rod diameter
Multipass or Single Pass (per side): Multi-pass
Single or Multiple Electrodes: Single
Other: ____

**PREHEAT (QW-406)**
Preheat Temp.: 330°F Min.
Interpass Temp.: 330°F - 460°F
Other: ____

A
B
C
D
E

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CWI 99041251
QC1 EXP. 4/1/2026

QW-483 (Back)

PQR No. NASA-A572-SMAW-PQR

**Tensile Test (QW-150)**

| Specimen No. | Width | Thickness | Area | Ultimate Total Load lb | Ultimate Unit Stress psi | Type of Failure & Location |
|---|---|---|---|---|---|---|
| 6990.90 -T1 | 0.751" | 1.474" | 1.1070" | 93,747 | 84,686 | Weld |
| 6990.90 -T2 | 0.744" | 1.467" | 1.0914" | 93,797 | 85,942 | Weld |
| | | | | | | |
| | | | | | | |

**Guided-Bend Tests (QW-160)**

| Type and Figure No. | | | Result |
|---|---|---|---|
| 6990.90 –S1 | Side Bend | QW-462.2 | Acceptable |
| 6990.90 –S2 | Side Bend | QW-462.2 | Acceptable |
| 6990.90 –S3 | Side Bend | QW-462.2 | Acceptable |
| 6990.90 –S4 | Side Bend | QW-462.2 | Acceptable |

**Toughness Tests (QW-170)**

| Specimen No. | Notch Location | Notch Type | Test Temp. | Impact Values | Lateral Exp. | | Drop Weight | |
|---|---|---|---|---|---|---|---|---|
| | | | | | % Shear | Mils | Break | No Break |
| N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

**Fillet-Weld Test (QW-180)**

Result – Satisfactory: Yes N/A No N/A Penetration into Parent Metal: Yes N/A No N/A

Macro – Results N/A

**Other Tests**

Type of Test N/A

Deposit Analysis N/A

Other N/A

Welder's Name Robert Jones Soc.Sec. No. Stamp No. 52

Tests conducted by: Inspection Specialists, Inc. - MTL Div. Laboratory Test No. 6990.90

We certify that the statements in this record are correct and that the test welds were prepared, welded, and tested in accordance with the requirements of Section IX of the ASME Code.

Manufacturer Jacobs Technology

Date April 24, 2013 By

Travis G. Moore
CWI 99041251
QC1 EXP. 4/1/2026

INSPECTION SPECIALISTS, INC.

MECHANICAL TESTING LABORATORY DIVISION

# CERTIFICATE OF ANALYSIS

Client: Jacobs Technology  Job No: 6990.90

Client Representative: Benny McGrath  Purchase Order:

Test Specification: ASME Section IX

Sample Identification: One (1) – 1.500" Plate Procedure Qualification WPS # NASA-A572-SMAW
Welder: Robert Jones

The above referenced sample was prepared and tested in accordance with the welding procedure qualification requirements of ASME Section IX. Two (2) tensile test specimens and four (4) guided bend test specimens were prepared and tested. The results of these tests are reported herein.

***TENSILE TEST***

| SPECIMEN ID | WIDTH INCHES | THICKNESS INCHES | AREA SQ. IN. | ULTIMATE LOAD POUNDS | TENSILE STRENGTH PSI | NATURE OF FRACTURE |
|---|---|---|---|---|---|---|
| 6990.90 -T1 | 0.751" | 1.474" | 1.1070" | 93,747 | 84,686 | Weld |
| 6990.90 -T2 | 0.744" | 1.467" | 1.0914" | 93,797 | 85,942 | Weld |

***GUIDED BEND TEST***

| SPECIMEN ID | TYPE TEST | TEST RESULT |
|---|---|---|
| 6990.90 –S1 | Side Bend | Acceptable |
| 6990.90 –S2 | Side Bend | Acceptable |
| 6990.90 –S3 | Side Bend | Acceptable |
| 6990.90 –S4 | Side Bend | Acceptable |

The tests expressed herein meet or exceed the requirements of ASME Section IX.

Travis G Moore
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DCI EXP 4/1/2014

**CERTIFIED BY:**

Date: April 24, 2013  Certificate No: 1 of 1

Travis G. Moore, Lab Manager

ALL TEST SPECIMENS, SAMPLES, DROPS, ETC. WILL BE DISCARDED THIRTY (30) DAYS AFTER TESTING UNLESS OTHERWISE INSTRUCTED IN WRITING