



INDUSTRIAL TESTING LABORATORY SERVICES, LLC
635 Alpha Drive – RIDC Park
Pittsburgh, PA 15238 Phone: 412.963.1900 Fax: 412.963.1926
e-mail: info@itls.com website: itls.com

TEST REPORT
L19352
April 5, 2012

Purchase Order No: 694689-000 OP

To: Shaw Modular Solutions LLC
3191 West Lincoln Road
Lake Charles, LA 70605

Attn: Nick Koseski

**SHAW
POWER**

OCT 09 2012

012

SMS QC
ACCEPT

13

7-25-12

Sample Received:

ITLS received ten (10) samples for Chemical, Mechanical, Hardness, Impact, Ferrite and Intergranular Corrosion evaluation, identified as follows:

Sample #	Heat #	Gauge	Supplier
1	609632-1A	0.625	Outokumpu
2	609632-1A	0.625	Outokumpu
3	609633-1A	0.625	Outokumpu
4	609633-1A	0.625	Outokumpu
5	609642-1A	0.625	Outokumpu
6	609642-1A	0.625	Outokumpu
7	853602-1A	0.625	Outokumpu
8	853602-1A	0.625	Outokumpu
9	853604-1A	0.625	Outokumpu
10	853604-1A	0.625	Outokumpu

Acceptance:

Sample #	Test	Acceptance
All	Chemical Analysis	APP-VL52-Z0-023, Rev. 1, ASTM A240-11b (UNS S32101)
All	Mechanical	APP-VL52-Z0-023, Rev. 1, ASTM A240-11b (UNS S32101), A480-11b
All	Rockwell B	ASTM A240-11b (UNS S32101), A480-11b
All	Ferrite	APP-VL52-Z0-023, Rev. 1, ASTM E562-11, Method A
All	Impact	APP-VL52-Z0-023, Rev. 1, ASTM A923-08, Method B
All	Intergranular Corrosion	ISO 3651-2 Method A



SHAW
POWER
OCT 09 2012
012

Shaw Modular Solutions, LLC
ITLS Report L19352
April 5, 2012

Test References:

Specification	Title
ASTM A751-11	Standard Test Methods, Practices, and Terminology for Chemical Analysis of Steel Products
ASTM A370-11a	Standard Test Methods and Definitions for Mechanical Testing of Steel Products
ASTM E8-11	Standard Test Methods for Tension Testing of Metallic Materials
ASTM E140-07	Standard Hardness Conversion Tables for Metals
ASTM E23-07a ^{e1}	Standard Test Methods for Notched Bar Impact Testing of Metallic Materials
ASTM E3-11	Standard Guide for Preparation of Metallographic Specimens
ASTM E18-08b	Standard Test Methods for Rockwell Hardness of Metallic Materials
ASTM E1245-03 (2008)	Standard Practice for Determining the Inclusion of Second-Phase Constituent Content of Metals by Automatic Image Analysis
ASTM E562-11	Standard Test Method for Determining volume Fraction by Systematic Manual Point Count

Quality References:

Reference
10CFR21, 10CFR50.55(e) and 10CFR50 App.B
ASME NQA-1 – 1994 Basic and Supplementary Requirements
USNRC Regulatory Guide 1.28 Rev. 3
ITLS QA Manual Rev. 3 dated 06/20/08
No ITLS subcontractors used for completion of this order

SMS QC
ACCEPT

13

7-25-12



Shaw Modular Solutions, LLC
ITLS Report L19352
April 5, 2012

Results:

Chemical Analysis – ASTM A751-11 (OES)

SMS QC
ACCEPT
13
7-25-12

SHAW
POWER
OCT 0 9 2012
012

Sample #	Composition (wt%)													
	C	Mn	P	S	Si	Ni	Cr	Mo	N	Cu	Co	Al	V	Total Others
1 -	0.021	4.87	0.015	<0.002	0.67	1.60	21.2	0.19	0.22	0.39	<0.01	0.07	0.07	0.14
2 -	0.022	4.95	0.017	<0.002	0.68	1.62	21.2	0.19	0.22	0.39	<0.01	0.07	0.08	0.14
3	0.023	4.96	0.019	<0.002	0.68	1.63	21.3	0.19	0.21	0.39	<0.01	0.07	0.08	0.14
4	0.023	4.97	0.018	<0.002	0.68	1.63	21.2	0.19	0.22	0.39	<0.01	0.07	0.08	0.14
5 -	0.021	4.86	0.018	<0.002	0.67	1.60	21.2	0.30	0.23	0.35	<0.01	0.07	0.10	0.17
6 -	0.021	4.94	0.019	<0.002	0.68	1.62	21.2	0.30	0.23	0.35	<0.01	0.07	0.10	0.17
7 -	0.023	5.08	0.017	<0.002	0.79	1.56	21.2	0.20	0.22	0.39	<0.01	0.06	0.08	0.15
8 -	0.023	5.15	0.018	<0.002	0.79	1.58	21.2	0.19	0.22	0.38	<0.01	0.06	0.08	0.14
9 -	0.024	5.22	0.019	<0.002	0.78	1.59	21.2	0.20	0.22	0.38	<0.01	0.06	0.08	0.14
10 -	0.023	5.24	0.018	<0.002	0.78	1.58	21.3	0.19	0.21	0.38	<0.01	0.06	0.08	0.14
Required	0.040 Max	4.00 6.00	0.040 Max	0.030 Max	1.00 Max	1.35 1.70	21.0 22.0	0.10 0.80	0.20 0.25	0.10 0.80	0.05 Max	0.10 Max	0.10 Max	0.50 Max

ACCEPTABLE



SHAW
POWER

OCT 09 2012

012

Shaw Modular Solutions, LLC
ITLS Report L19352
April 5, 2012

Mechanical Properties – ASTM E8-09 (Flat) & ASTM E18-08b (HRB)

Sample #	Test Temp (°F)	Initial Dimensions (in)	Initial Area (in ²)	*Yield Strength (ksi)	Tensile Strength (ksi)	Elongation (%) in 2"	Hardness HRB** (Avg. of 3)
1	Room	0.499 x 0.660	0.3293	71	102	46	95
2	Room	0.497 x 0.668	0.3320	73	103	47	96
3	Room	0.508 x 0.659	0.3348	70	100	50	96
4	Room	0.499 x 0.672	0.3353	73	102	50	96
5	Room	0.497 x 0.654	0.3250	72	103	48	95
6	Room	0.500 x 0.642	0.3210	72	102	50	96
7	Room	0.497 x 0.670	0.3330	73	105	45	97
8	Room	0.500 x 0.683	0.3415	73	104	46	96
9	Room	0.496 x 0.650	0.3224	74	105	46	96
10	Room	0.500 x 0.670	0.3350	75	104	46	97
Required				65 Min	94 Min	30 Min	290 HBW Max

*Yield calculated at 0.20% offset

ACCEPTABLE

**Customer requested hardness in Rockwell B. All measured values were between 95 and 97 HRB which is approximately equal to Brinell 210 to 233 based on ASTM E140 Tables 2 and 5. These values are well below the specified max of 290 HBW and are therefore acceptable.

SMS QO
ACCEPT

13

7-25-12



Shaw Modular Solutions, LLC
ITLS Report L19352
April 5, 2012

SHAW
POWER
OCT 09 2012
012

Results (cont.):

Impact Test – ASTM A923-08 Method B

Sample #	Temperature (°F)	Absorbed Energy (ft-lbs)
1	-40	56
2	-40	48
3	-40	59
4	-40	61
5	-40	42
6	-40	45
7	-40	55
8	-40	50
9	-40	60
10	-40	54
Required	-40	20 Min

ACCEPTABLE

Ferrite Testing – ASTM E562-11 Method A

Sample #	Ferrite (%)
1	51
2	51
3	52
4	49
5	52
6	53
7	53
8	53
9	54
10	53
Required	40 - 60%

SMS QC
ACCEPT
13
7-25-12

Ferrite volume fraction tested with Image Analysis per ASTM E1245-03(2008). ASTM E562 offers the use of ASTM E1245 to determine the same measurements.

ACCEPTABLE



SHAW
POWER

OCT 09 2012

012

Shaw Modular Solutions, LLC
ITLS Report L19352
April 5, 2012

Results (cont.):

Intergranular Corrosion Test – ISO 3651-2 Method A

Sample #	Bend Radius	Bend	Result
1	1T	90°	Accept – No Cracking Observed
2	1T	90°	Accept – No Cracking Observed
3	1T	90°	Accept – No Cracking Observed
4	1T	90°	Accept – No Cracking Observed
5	1T	90°	Accept – No Cracking Observed
6	1T	90°	Accept – No Cracking Observed
7	1T	90°	Accept – No Cracking Observed
8	1T	90°	Accept – No Cracking Observed
9	1T	90°	Accept – No Cracking Observed
10	1T	90°	Accept – No Cracking Observed
Required	1T	90°	No Cracking @ 10X

ACCEPTABLE

This certification affirms that the contents are correct and accurate, and that the test operations performed by Industrial Testing Laboratory Services are in compliance with the material specification, ITLS Quality Assurance Manual Rev. 3 dated 6/20/2008, ASME NQA-1 1994, Regulatory Guide 1.28, 10 CFR 50 App. B, 10 CFR Part 21 and any additional requirements of SMS Purchase Order # 694689. Test Results comply with the PO required material specification(s) as noted below.

All Samples: **ACCEPTABLE**

Signature

Date 4/5/2012

SMS QC
ACCEPT

13

7-25-12



INDUSTRIAL TESTING LABORATORY SERVICES, LLC
635 Alpha Drive – RIDC Park
Pittsburgh, PA 15238 Phone: 412.963.1900 Fax: 412.963.1926
e-mail: info@itls.com website: itls.com

TEST REPORT
L19352
April 5, 2012

Purchase Order No: 694689-000 OP

To: Shaw Modular Solutions LLC
3191 West Lincoln Road
Lake Charles, LA 70605

Attn: Nick Koseski

**SHAW
POWER**

OCT 09 2012

012

SMS QC
ACCEPT
13

7-25-12

Sample Received:

ITLS received ten (10) samples for Chemical, Mechanical, Hardness, Impact, Ferrite and Intergranular Corrosion evaluation, identified as follows:

Sample #	Heat #	Gauge	Supplier
1	609632-1A	0.625	Outokumpu
2	609632-1A	0.625	Outokumpu
3	609633-1A	0.625	Outokumpu
4	609633-1A	0.625	Outokumpu
5	609642-1A	0.625	Outokumpu
6	609642-1A	0.625	Outokumpu
7	853602-1A	0.625	Outokumpu
8	853602-1A	0.625	Outokumpu
9	853604-1A	0.625	Outokumpu
10	853604-1A	0.625	Outokumpu

Acceptance:

Sample #	Test	Acceptance
All	Chemical Analysis	APP-VL52-Z0-023, Rev. 1, ASTM A240-11b (UNS S32101)
All	Mechanical	APP-VL52-Z0-023, Rev. 1, ASTM A240-11b (UNS S32101), A480-11b
All	Rockwell B	ASTM A240-11b (UNS S32101), A480-11b
All	Ferrite	APP-VL52-Z0-023, Rev. 1, ASTM E562-11, Method A
All	Impact	APP-VL52-Z0-023, Rev. 1, ASTM A923-08, Method B
All	Intergranular Corrosion	ISO 3651-2 Method A



SHAW
POWER
OCT 09 2012
012

Shaw Modular Solutions, LLC
ITLS Report L19352
April 5, 2012

Test References:

Specification	Title
ASTM A751-11	Standard Test Methods, Practices, and Terminology for Chemical Analysis of Steel Products
ASTM A370-11a	Standard Test Methods and Definitions for Mechanical Testing of Steel Products
ASTM E8-11	Standard Test Methods for Tension Testing of Metallic Materials
ASTM E140-07	Standard Hardness Conversion Tables for Metals
ASTM E23-07a ^{e1}	Standard Test Methods for Notched Bar Impact Testing of Metallic Materials
ASTM E3-11	Standard Guide for Preparation of Metallographic Specimens
ASTM E18-08b	Standard Test Methods for Rockwell Hardness of Metallic Materials
ASTM E1245-03 (2008)	Standard Practice for Determining the Inclusion of Second-Phase Constituent Content of Metals by Automatic Image Analysis
ASTM E562-11	Standard Test Method for Determining volume Fraction by Systematic Manual Point Count

Quality References:

Reference
10CFR21, 10CFR50.55(e) and 10CFR50 App.B
ASME NQA-1 – 1994 Basic and Supplementary Requirements
USNRC Regulatory Guide 1.28 Rev. 3
ITLS QA Manual Rev. 3 dated 06/20/08
No ITLS subcontractors used for completion of this order

SMS QC
ACCEPT

13

7-25-12



Shaw Modular Solutions, LLC
ITLS Report L19352
April 5, 2012

Results:

Chemical Analysis – ASTM A751-11 (OES)

SMS QC
ACCEPT
13
7-25-12

SHAW
POWER
OCT 09 2012
012

Sample #	Composition (wt%)													
	C	Mn	P	S	Si	Ni	Cr	Mo	N	Cu	Co	Al	V	Total Others
1 -	0.021	4.87	0.015	<0.002	0.67	1.60	21.2	0.19	0.22	0.39	<0.01	0.07	0.07	0.14
2 -	0.022	4.95	0.017	<0.002	0.68	1.62	21.2	0.19	0.22	0.39	<0.01	0.07	0.08	0.14
3	0.023	4.96	0.019	<0.002	0.68	1.63	21.3	0.19	0.21	0.39	<0.01	0.07	0.08	0.14
4	0.023	4.97	0.018	<0.002	0.68	1.63	21.2	0.19	0.22	0.39	<0.01	0.07	0.08	0.14
5 -	0.021	4.86	0.018	<0.002	0.67	1.60	21.2	0.30	0.23	0.35	<0.01	0.07	0.10	0.17
6 -	0.021	4.94	0.019	<0.002	0.68	1.62	21.2	0.30	0.23	0.35	<0.01	0.07	0.10	0.17
7 -	0.023	5.08	0.017	<0.002	0.79	1.56	21.2	0.20	0.22	0.39	<0.01	0.06	0.08	0.15
8 -	0.023	5.15	0.018	<0.002	0.79	1.58	21.2	0.19	0.22	0.38	<0.01	0.06	0.08	0.14
9 -	0.024	5.22	0.019	<0.002	0.78	1.59	21.2	0.20	0.22	0.38	<0.01	0.06	0.08	0.14
10 -	0.023	5.24	0.018	<0.002	0.78	1.58	21.3	0.19	0.21	0.38	<0.01	0.06	0.08	0.14
Required	0.040 Max	4.00 6.00	0.040 Max	0.030 Max	1.00 Max	1.35 1.70	21.0 22.0	0.10 0.80	0.20 0.25	0.10 0.80	0.05 Max	0.10 Max	0.10 Max	0.50 Max

ACCEPTABLE



SHAW
POWER

OCT 09 2012

012

Shaw Modular Solutions, LLC
ITLS Report L19352
April 5, 2012

Mechanical Properties – ASTM E8-09 (Flat) & ASTM E18-08b (HRB)

Sample #	Test Temp (°F)	Initial Dimensions (in)	Initial Area (in ²)	*Yield Strength (ksi)	Tensile Strength (ksi)	Elongation (%) in 2"	Hardness HRB** (Avg. of 3)
1	Room	0.499 x 0.660	0.3293	71	102	46	95
2	Room	0.497 x 0.668	0.3320	73	103	47	96
3	Room	0.508 x 0.659	0.3348	70	100	50	96
4	Room	0.499 x 0.672	0.3353	73	102	50	96
5	Room	0.497 x 0.654	0.3250	72	103	48	95
6	Room	0.500 x 0.642	0.3210	72	102	50	96
7	Room	0.497 x 0.670	0.3330	73	105	45	97
8	Room	0.500 x 0.683	0.3415	73	104	46	96
9	Room	0.496 x 0.650	0.3224	74	105	46	96
10	Room	0.500 x 0.670	0.3350	75	104	46	97
Required				65 Min	94 Min	30 Min	290 HBW Max

*Yield calculated at 0.20% offset

ACCEPTABLE

**Customer requested hardness in Rockwell B. All measured values were between 95 and 97 HRB which is approximately equal to Brinell 210 to 233 based on ASTM E140 Tables 2 and 5. These values are well below the specified max of 290 HBW and are therefore acceptable.

SMS QO
ACCEPT

13

7-25-12



Shaw Modular Solutions, LLC
ITLS Report L19352
April 5, 2012

SHAW
POWER

OCT 09 2012

012

Results (cont.):

Impact Test – ASTM A923-08 Method B

Sample #	Temperature (°F)	Absorbed Energy (ft-lbs)
1	-40	56
2	-40	48
3	-40	59
4	-40	61
5	-40	42
6	-40	45
7	-40	55
8	-40	50
9	-40	60
10	-40	54
Required	-40	20 Min

ACCEPTABLE

Ferrite Testing – ASTM E562-11 Method A

Sample #	Ferrite (%)
1	51
2	51
3	52
4	49
5	52
6	53
7	53
8	53
9	54
10	53
Required	40 - 60%

SMS QC
ACCEPT
13
7-25-12

Ferrite volume fraction tested with Image Analysis per ASTM E1245-03(2008). ASTM E562 offers the use of ASTM E1245 to determine the same measurements.

ACCEPTABLE



SHAW
POWER

OCT 09 2012

012

Shaw Modular Solutions, LLC
ITLS Report L19352
April 5, 2012

Results (cont.):

Intergranular Corrosion Test – ISO 3651-2 Method A

Sample #	Bend Radius	Bend	Result
1	1T	90°	Accept – No Cracking Observed
2	1T	90°	Accept – No Cracking Observed
3	1T	90°	Accept – No Cracking Observed
4	1T	90°	Accept – No Cracking Observed
5	1T	90°	Accept – No Cracking Observed
6	1T	90°	Accept – No Cracking Observed
7	1T	90°	Accept – No Cracking Observed
8	1T	90°	Accept – No Cracking Observed
9	1T	90°	Accept – No Cracking Observed
10	1T	90°	Accept – No Cracking Observed
Required	1T	90°	No Cracking @ 10X

ACCEPTABLE

This certification affirms that the contents are correct and accurate, and that the test operations performed by Industrial Testing Laboratory Services are in compliance with the material specification, ITLS Quality Assurance Manual Rev. 3 dated 6/20/2008, ASME NQA-1 1994, Regulatory Guide 1.28, 10 CFR 50 App. B, 10 CFR Part 21 and any additional requirements of SMS Purchase Order # 694689. Test Results comply with the PO required material specification(s) as noted below.

All Samples: **ACCEPTABLE**

Signature 

Date 4/5/2012

SMS QC
ACCEPT

13

7-25-12

Outokumpu Stainless Plate, Inc.



Certificate of Analysis and Tests

OUR ORDER 0278834 - 06

HEAT & PIECE 609641-2A 03/23/12

SOLD TO: SHAW MODULAR SOLUTIONS, L.L.C. SHIP TO: SHAW MODULAR SOLUTIONS, L.L.C.
3191 W LINCOLN ROAD 3191 W LINCOLN ROAD

LAKE CHARLES

LA 70605

LAKE CHARLES

LA 70605

----- YOUR ORDER & DATE -----
746363 12/22/11 TAG# P/N #2232445
----- ITEM DESCRIPTION -----
HEAT & PIECE 609641 - 2A
WEIGHT 8938
FINISH 1
GRADE 2101 UNS S32101
DIMENSIONS .625 X 117.000 X 410.000 EXACT

----- SPECIFICATIONS -----
*** MFG IN NEW CASTLE, IN, USA FROM SLABS IMPORTED FROM SWEDEN
ASTM A240-11A ASMESA240-11ED ASTM A480-11A ASMESA480 11ED
REQUIRES PRODUCT ANALYSIS OSI QA MAN ED 2 R 1 10/15/02
ASTM E562-08 (10% ACCURACY) UHA 51 CHARPY @ -40F (-40C)
ASTM A923-06 METHOD A&B ONLY UT ASTM A578-07 LEVEL B S1
U. T. TEST TO ASTM A 577-90 NON STANDARD PROPERTIES REQD
APP-VL52-ZO-023 R1 W/EXCEPTS ISO 3651-2
COUPONS REQUIRED ASTM A262-02A PRACTICE A
ASTM A262-02A PRACTICE E SMS PO REQMTS WITH EXCEPTS
NO GRIPPER MARKS NO WELD REPAIRS

PLATES & TEST PCS SOLUTION ANNEALED @ 1900 DEGREES FAHRENHEIT MINIMUM.
THEN WATER QUENCHED
FREE FROM MERCURY CONTAMINATION AT CURRENT DETECTION LIMITS
HOT ROLLED, ANNEALED & PICKLED (HRAP)

----- MECHANICAL & OTHER TESTS -----
HARDNESS HRC 15
YIELD STRENGTH (PSI) 70443
TENSILE STRENGTH (PSI) 103990
BEND OK
INTERGRANULAR CORROSION OK
ELONGATION % IN 2" 44.2
REDUCTION OF AREA % 62.2
ASTM E-562 POINT COUNT FERRITE @ 500X = 47% AT 10% RELATIVE ACCURACY
CHARPY TEST AT -40F (TRANS) 54, 49, 50 FT-LBS. FULL SAMPLE SIZE
LATERAL EXPANSION = 40, 40, 38 (MILS)
CHARPY TEST AT -40F (TRANS) 49 FT-LBS. SAMPLE SIZE FULL

SHAW
POWER
OCT 15 2012

003

----- CHEMICAL COMPOSITION ----- PRODUCT ANALYSIS -----
CARBON (C) .022 (C) .017
MANGANESE (MN) 4.75 (MN) 4.29
PHOSPHORUS (P) .023 (P) .021
SULFUR (S) .001 (S) .007
SILICON (SI) .64 (SI) .66
CHROMIUM (CR) 21.43 (CR) 21.00
NICKEL (NI) 1.54 (NI) 1.62
COBALT (CO) .04 (CO) .05
COPPER (CU) .33 (CU) .35
MOLY (MO) .31 (MO) .31
NITROGEN (N) .21 (N) .25
COLUMBIUM (CB) .011 (CB) .010
TITANIUM (TI) .004 (TI) .005
ALUMINUM (AL) .022 (AL) .022
TIN (SN) .006 (SN) .007



8-13-12

WE HEREBY CERTIFY THAT THE MATERIAL HEREIN HAS BEEN MADE AND TESTED IN
ACCORDANCE WITH THE LISTED SPECIFICATION(S) AND THAT THE RESULTS OF ALL
TESTS ARE ACCEPTABLE.

James Douberman

JAMES DOUBMAN, QUALITY ASSURANCE MANAGER

SHAW
POWER
OCT 15 2012
003



NDE TECHNIQUE RECORD ULTRASONIC

Facility QC Control No.	290850	Technique No.	Master
Client	Outokumpu / Shaw Modular Solutions	P.O. No.	28862B
Item Description	Stainless Steel Plate		
Part No.	N/A	Drawing No.	N/A
Specification	ASTM A577-90	Acceptance	ASTM A577-90
Procedure	SP-UT-1 App II-U Rev.5		

WELDS**OTHER TEST ITEMS**

Weld Joint	N/A	Type of Item	Stainless Steel Plate			
Weld Process	N/A	Processing	Rolled			
Base Material	N/A	Material	2101CO			
Material Thickness	N/A	Dimensions	See Page 1			
Weld Length/OD	N/A	Additional Info	N/A			
Surface Condition	N/A	Surface Condition	Smooth			
PRECLEAN:	Method	N/A	Material	N/A	Batch No.	N/A
EQUIPMENT:	Make	Krautkramer	Model	USN 52	S/N	00NC078
PRESENTATION	<input checked="" type="checkbox"/> A-SCAN	<input type="checkbox"/> B-SCAN	<input type="checkbox"/> C-SCAN			

TRANSDUCERS:

Make Krautkramer Model S/N 00W86X Sound Beam Angle (Material) 70°
Crystal Size .76" x .625" Crystal Material Ceramic Frequency 2.25 MHz

COUPLANT: Material Water Manufacturer N/A Batch No. N/A

CALIBRATION BLOCK: Type Part Material 2101CO S/N N/A

METHOD ☒ Contact ☐ Immersion ☐ Water Column
☒ Pulse Echo ☐ Resonance ☐ Through Transmission

SCANNING: ☒ Manual ☐ Automatic

Pattern 100% Scanning Speed < 6"Per/Sec. % Overlap N/A
POST CLEAN: Method N/A 10%

OTHER INFORMATION:**SHAW
POWER**

OCT 15 2012

003

Prepared By: Robert Caddel	Approved by: N/A	Date 3/13/12	PAGE 2 OF 2
-------------------------------	---------------------	-----------------	-------------


3-14-12



NDE RESULT RECORD

Page 1 of 2

REPORT OF NONDESTRUCTIVE EXAMINATION

Customer OUTOKUMPU (Shaw Modular Solutions)				Date 3/13/12	
Address PO BOX 370, 549 W State Rd 38 New Castle, IN 47362				Control No. or Report No. 290850	
Job or Project Location New Castle, Indiana Plant		PO No: 28862B	Owner: Shaw Modular Solutions		Plan or Drawing No. N/A
Surface Condition SMOOTH		Heat No. SEE BELOW	Heat Treat N/A		Type of Material 2101CO
					Temp of Material 65°F
Type of Examination UT (STRAIGHT BEAM)	Examination Standard ASTM A578-07		Acceptance Standard ASTM A578-07 Level B S1		NDT Procedure No. SP-UT-1 App II-U Rev 5
ORDER NO.	HEAT NO.	Acc	Rej	Defect Code	Remarks
278834	609633-5A	X			.250 x 108 x 222
278834	853605-4A	X			.625 x 117 x 410
278834	853602-4A	X			.625 x 117 x 410
278834	853601-2A	X			.625 x 117 x 410
278834	853605-1A	X			.625 x 117 x 410
278834	853605-2A	X			.625 x 117 x 410
278834	853604-1A	X			.625 x 117 x 410
278834	853604-2A	X			.625 x 117 x 410
278834	609642-3A	X			.625 x 117 x 410
278834	609641-2A	X			.625 x 117 x 410
278834	609645-1A	X			.625 x 117 x 410
Type of Work New		No of Items Accepted 11		No of Items Rejected -0-	
Remarks: The plates listed above were ultrasonically tested for indications in accordance with listed standards and procedures.					
Conclusion: No recordable indications were noted at the time of this inspection.					
Client Personnel _____ Technician <u>Robert Caddel</u>  SNT-TC-1A Level II Ultrasonic					

3-14-12


SHAW
POWER

OCT 15 2012

003



NDE TECHNIQUE RECORD ULTRASONIC

Facility QC Control No. <u>290850</u>	Technique No. <u>Master</u>
Client <u>Outokumpu / Shaw Modular Solutions</u>	P.O. No. <u>28862B</u>
Item Description <u>Stainless Steel Plate</u>	
Part No. <u>N/A</u>	Drawing No. <u>N/A</u>
Specification <u>ASTM A578-07</u>	Acceptance <u>ASTM A578-07 Level B S1</u>
Procedure <u>SP-UT-1 App II-U Rev.5</u>	

WELDS		OTHER TEST ITEMS	
Weld Joint <u>N/A</u>	Type of Item <u>Stainless Steel Plate</u>		
Weld Process <u>N/A</u>	Processing <u>Rolled</u>		
Base Material <u>N/A</u>	Material <u>2101CO</u>		
Material Thickness <u>N/A</u>	Dimensions <u>See Page 1</u>		
Weld Length/OD <u>N/A</u>	Additional Info <u>N/A</u>		
Surface Condition <u>N/A</u>	Surface Condition <u>Smooth</u>		
PRECLEAN: Method <u>N/A</u>	Material <u>N/A</u>	Batch No. <u>N/A</u>	
EQUIPMENT: Make <u>Krautkramer</u>	Model <u>USN 52</u>	S/N <u>00NC078</u>	
PRESENTATION <input checked="" type="checkbox"/> A-SCAN		<input type="checkbox"/> B-SCAN	<input type="checkbox"/> C-SCAN
TRANSDUCERS:			
Make <u>Panametric</u>	Model <u>V104</u>	S/N <u>570465</u>	Sound Beam Angle (Material) <u>0°</u>
Crystal Size <u>1" Dia.</u>	Crystal Material <u>Ceramic</u>	Frequency <u>2.25 MHz</u>	
COUPLANT: Material <u>Water</u>	Manufacturer <u>N/A</u>	Batch No. <u>N/A</u>	
CALIBRATION BLOCK: Type <u>Part</u>	Material <u>2101CO</u>	S/N <u>N/A</u>	
METHOD <input checked="" type="checkbox"/> Contact	<input type="checkbox"/> Immersion	<input type="checkbox"/> Water Column	
<input checked="" type="checkbox"/> Pulse Echo	<input type="checkbox"/> Resonance	<input type="checkbox"/> Through Transmission	
SCANNING: <input checked="" type="checkbox"/> Manual	<input type="checkbox"/> Automatic		
Pattern <u>100%</u>	Scanning Speed <u>< 6"Per/Sec.</u>	% Overlap <u>N/A</u>	
POST CLEAN: Method <u>N/A</u>		<u>10%</u>	

OTHER INFORMATION:

**SHAW
POWER**

OCT 15 2012

003

Prepared By: <u>Robert Caddel</u>	Approved by: <u>N/A</u>	Date <u>3/13/12</u>	PAGE 2 OF 2
--------------------------------------	----------------------------	------------------------	-------------

3-14-12



INDUSTRIAL TESTING LABORATORY SERVICES, LLC
635 Alpha Drive – RIDC Park
Pittsburgh, PA 15238 Phone: 412.963.1900 Fax: 412.963.1926
e-mail: info@itls.com website: itls.com

TEST REPORT
L19352
April 5, 2012

Purchase Order No: 694689-000 OP

To: Shaw Modular Solutions LLC
3191 West Lincoln Road
Lake Charles, LA 70605

Attn: Nick Koseski

**SHAW
POWER**

OCT 09 2012

012

SMS QC
ACCEPT

13

7-25-12

Sample Received:

ITLS received ten (10) samples for Chemical, Mechanical, Hardness, Impact, Ferrite and Intergranular Corrosion evaluation, identified as follows:

Sample #	Heat #	Gauge	Supplier
1	609632-1A	0.625	Outokumpu
2	609632-1A	0.625	Outokumpu
3	609633-1A	0.625	Outokumpu
4	609633-1A	0.625	Outokumpu
5	609642-1A	0.625	Outokumpu
6	609642-1A	0.625	Outokumpu
7	853602-1A	0.625	Outokumpu
8	853602-1A	0.625	Outokumpu
9	853604-1A	0.625	Outokumpu
10	853604-1A	0.625	Outokumpu

Acceptance:

Sample #	Test	Acceptance
All	Chemical Analysis	APP-VL52-Z0-023, Rev. 1, ASTM A240-11b (UNS S32101)
All	Mechanical	APP-VL52-Z0-023, Rev. 1, ASTM A240-11b (UNS S32101), A480-11b
All	Rockwell B	ASTM A240-11b (UNS S32101), A480-11b
All	Ferrite	APP-VL52-Z0-023, Rev. 1, ASTM E562-11, Method A
All	Impact	APP-VL52-Z0-023, Rev. 1, ASTM A923-08, Method B
All	Intergranular Corrosion	ISO 3651-2 Method A



SHAW
POWER
OCT 09 2012
012

Shaw Modular Solutions, LLC
ITLS Report L19352
April 5, 2012

Test References:

Specification	Title
ASTM A751-11	Standard Test Methods, Practices, and Terminology for Chemical Analysis of Steel Products
ASTM A370-11a	Standard Test Methods and Definitions for Mechanical Testing of Steel Products
ASTM E8-11	Standard Test Methods for Tension Testing of Metallic Materials
ASTM E140-07	Standard Hardness Conversion Tables for Metals
ASTM E23-07a ^{e1}	Standard Test Methods for Notched Bar Impact Testing of Metallic Materials
ASTM E3-11	Standard Guide for Preparation of Metallographic Specimens
ASTM E18-08b	Standard Test Methods for Rockwell Hardness of Metallic Materials
ASTM E1245-03 (2008)	Standard Practice for Determining the Inclusion of Second-Phase Constituent Content of Metals by Automatic Image Analysis
ASTM E562-11	Standard Test Method for Determining volume Fraction by Systematic Manual Point Count

Quality References:

Reference
10CFR21, 10CFR50.55(e) and 10CFR50 App.B
ASME NQA-1 – 1994 Basic and Supplementary Requirements
USNRC Regulatory Guide 1.28 Rev. 3
ITLS QA Manual Rev. 3 dated 06/20/08
No ITLS subcontractors used for completion of this order

SMS QC
ACCEPT

13

7-25-12



Shaw Modular Solutions, LLC
ITLS Report L19352
April 5, 2012

Results:

Chemical Analysis – ASTM A751-11 (OES)

SMS QC
ACCEPT
13
7-25-12

SHAW
POWER
OCT 09 2012
012

Sample #	Composition (wt%)													
	C	Mn	P	S	Si	Ni	Cr	Mo	N	Cu	Co	Al	V	Total Others
1 -	0.021	4.87	0.015	<0.002	0.67	1.60	21.2	0.19	0.22	0.39	<0.01	0.07	0.07	0.14
2 -	0.022	4.95	0.017	<0.002	0.68	1.62	21.2	0.19	0.22	0.39	<0.01	0.07	0.08	0.14
3	0.023	4.96	0.019	<0.002	0.68	1.63	21.3	0.19	0.21	0.39	<0.01	0.07	0.08	0.14
4	0.023	4.97	0.018	<0.002	0.68	1.63	21.2	0.19	0.22	0.39	<0.01	0.07	0.08	0.14
5 -	0.021	4.86	0.018	<0.002	0.67	1.60	21.2	0.30	0.23	0.35	<0.01	0.07	0.10	0.17
6 -	0.021	4.94	0.019	<0.002	0.68	1.62	21.2	0.30	0.23	0.35	<0.01	0.07	0.10	0.17
7 -	0.023	5.08	0.017	<0.002	0.79	1.56	21.2	0.20	0.22	0.39	<0.01	0.06	0.08	0.15
8 -	0.023	5.15	0.018	<0.002	0.79	1.58	21.2	0.19	0.22	0.38	<0.01	0.06	0.08	0.14
9 -	0.024	5.22	0.019	<0.002	0.78	1.59	21.2	0.20	0.22	0.38	<0.01	0.06	0.08	0.14
10 -	0.023	5.24	0.018	<0.002	0.78	1.58	21.3	0.19	0.21	0.38	<0.01	0.06	0.08	0.14
Required	0.040 Max	4.00 6.00	0.040 Max	0.030 Max	1.00 Max	1.35 1.70	21.0 22.0	0.10 0.80	0.20 0.25	0.10 0.80	0.05 Max	0.10 Max	0.10 Max	0.50 Max

ACCEPTABLE



SHAW
POWER

OCT 09 2012

012

Shaw Modular Solutions, LLC
ITLS Report L19352
April 5, 2012

Mechanical Properties – ASTM E8-09 (Flat) & ASTM E18-08b (HRB)

Sample #	Test Temp (°F)	Initial Dimensions (in)	Initial Area (in ²)	*Yield Strength (ksi)	Tensile Strength (ksi)	Elongation (%) in 2"	Hardness HRB** (Avg. of 3)
1	Room	0.499 x 0.660	0.3293	71	102	46	95
2	Room	0.497 x 0.668	0.3320	73	103	47	96
3	Room	0.508 x 0.659	0.3348	70	100	50	96
4	Room	0.499 x 0.672	0.3353	73	102	50	96
5	Room	0.497 x 0.654	0.3250	72	103	48	95
6	Room	0.500 x 0.642	0.3210	72	102	50	96
7	Room	0.497 x 0.670	0.3330	73	105	45	97
8	Room	0.500 x 0.683	0.3415	73	104	46	96
9	Room	0.496 x 0.650	0.3224	74	105	46	96
10	Room	0.500 x 0.670	0.3350	75	104	46	97
Required				65 Min	94 Min	30 Min	290 HBW Max

*Yield calculated at 0.20% offset

ACCEPTABLE

**Customer requested hardness in Rockwell B. All measured values were between 95 and 97 HRB which is approximately equal to Brinell 210 to 233 based on ASTM E140 Tables 2 and 5. These values are well below the specified max of 290 HBW and are therefore acceptable.

SMS QO
ACCEPT

13

7-25-12



Shaw Modular Solutions, LLC
ITLS Report L19352
April 5, 2012

SHAW
POWER

OCT 09 2012

012

Results (cont.):

Impact Test – ASTM A923-08 Method B

Sample #	Temperature (°F)	Absorbed Energy (ft-lbs)
1	-40	56
2	-40	48
3	-40	59
4	-40	61
5	-40	42
6	-40	45
7	-40	55
8	-40	50
9	-40	60
10	-40	54
Required	-40	20 Min

ACCEPTABLE

Ferrite Testing – ASTM E562-11 Method A

Sample #	Ferrite (%)
1	51
2	51
3	52
4	49
5	52
6	53
7	53
8	53
9	54
10	53
Required	40 - 60%

SMS QC
ACCEPT
13
7-25-12

Ferrite volume fraction tested with Image Analysis per ASTM E1245-03(2008). ASTM E562 offers the use of ASTM E1245 to determine the same measurements.

ACCEPTABLE



SHAW
POWER

OCT 09 2012

012

Shaw Modular Solutions, LLC
ITLS Report L19352
April 5, 2012

Results (cont.):

Intergranular Corrosion Test – ISO 3651-2 Method A

Sample #	Bend Radius	Bend	Result
1	1T	90°	Accept – No Cracking Observed
2	1T	90°	Accept – No Cracking Observed
3	1T	90°	Accept – No Cracking Observed
4	1T	90°	Accept – No Cracking Observed
5	1T	90°	Accept – No Cracking Observed
6	1T	90°	Accept – No Cracking Observed
7	1T	90°	Accept – No Cracking Observed
8	1T	90°	Accept – No Cracking Observed
9	1T	90°	Accept – No Cracking Observed
10	1T	90°	Accept – No Cracking Observed
Required	1T	90°	No Cracking @ 10X

ACCEPTABLE

This certification affirms that the contents are correct and accurate, and that the test operations performed by Industrial Testing Laboratory Services are in compliance with the material specification, ITLS Quality Assurance Manual Rev. 3 dated 6/20/2008, ASME NQA-1 1994, Regulatory Guide 1.28, 10 CFR 50 App. B, 10 CFR Part 21 and any additional requirements of SMS Purchase Order # 694689. Test Results comply with the PO required material specification(s) as noted below.

All Samples: **ACCEPTABLE**

Signature 

Date 4/5/2012

SMS QC
ACCEPT

13

7-25-12



INDUSTRIAL TESTING LABORATORY SERVICES, LLC
 635 Alpha Drive – RIDC Park
 Pittsburgh, PA 15238 Phone: 412.963.1900 Fax: 412.963.1926
 e-mail: info@itls.com website: itls.com

TEST REPORT
L19495
May 7, 2012

Purchase Order No: 694689-000 OP

To: Shaw Modular Solutions LLC
 3191 West Lincoln Road
 Lake Charles, LA 70605

Attn: Nick Koseski

SMS QC

ACCEPT

13

6-30-12

Sample Received:

ITLS received twelve (12) samples for Chemical, Mechanical, Hardness, Impact, Ferrite and Intergranular Corrosion evaluation, identified as follows:

Sample #	Heat #	Description	Supplier
1	853731-1A	0.625" thick Duplex Plate	Outokumpu
2	853731-1A	0.625" thick Duplex Plate	Outokumpu
3	609643-2A	0.625" thick Duplex Plate	Outokumpu
4	609643-2A	0.625" thick Duplex Plate	Outokumpu
5	609644-3A	0.625" thick Duplex Plate	Outokumpu
6	609644-3A	0.625" thick Duplex Plate	Outokumpu
7	853735-3A	0.500" thick Duplex Plate	Outokumpu
8	853735-3A	0.500" thick Duplex Plate	Outokumpu
9	609643-3A	0.625" thick Duplex Plate	Outokumpu
10	609643-3A	0.625" thick Duplex Plate	Outokumpu
11	853843-2A	1.187" thick Duplex Plate	Outokumpu
12	853843-2A	1.187" thick Duplex Plate	Outokumpu

Acceptance:

Sample #	Test	Acceptance
All	Chemical Analysis	APP-VL52-Z0-023, Rev. 1, ASTM A240-11b (UNS S32101)
All	Mechanical	APP-VL52-Z0-023, Rev. 1, ASTM A240-11b (UNS S32101), A480-11b
All	Rockwell B	ASTM A240-11b (UNS S32101), A480-11b
All	Ferrite	APP-VL52-Z0-023, Rev. 1, ASTM E562-11, Method A
All	Impact	APP-VL52-Z0-023, Rev. 1, ASTM A923-08, Method B
All	Intergranular Corrosion	ISO 3651-2 Method A

**SHAW
POWER**

AUG 30 2012

003



Shaw Modular Solutions, LLC
ITLS Report L19495
May 7, 2012

Test References:

Specification	Title
ASTM A751-11	Standard Test Methods, Practices, and Terminology for Chemical Analysis of Steel Products
ASTM A370-12	Standard Test Methods and Definitions for Mechanical Testing of Steel Products
ASTM E8-11	Standard Test Methods for Tension Testing of Metallic Materials
ASTM E140-07	Standard Hardness Conversion Tables for Metals
ASTM E23-07a ¹	Standard Test Methods for Notched Bar Impact Testing of Metallic Materials
ASTM E3-11	Standard Guide for Preparation of Metallographic Specimens
ASTM E18-08b	Standard Test Methods for Rockwell Hardness of Metallic Materials
ASTM E1245-03 (2008)	Standard Practice for Determining the Inclusion of Second-Phase Constituent Content of Metals by Automatic Image Analysis
ASTM E562-11	Standard Test Method for Determining Volume Fraction by Systematic Manual Point Count

Quality References:

Reference
10CFR21, 10CFR50.55(e) and 10CFR50 App.B
ASME NQA-1 – 1994 Basic and Supplementary Requirements
USNRC Regulatory Guide 1.28 Rev. 3
ITLS QA Manual Rev. 3 dated 06/20/08
No ITLS subcontractors used for completion of this order

SMS QC
ACCEPT

13

6-30-12

**SHAW
POWER**

AUG 30 2012

003



Shaw Modular Solutions, LLC
ITLS Report L19495
May 7, 2012

Results:

Chemical Analysis – ASTM A751-11 (OES/Leco)

Sample #	Composition (wt%)													
	C	Mn	P	S	Si	Ni	Cr	Mo	N	Cu	Co	Al	V	Total Others
1	0.027	5.00	0.022	0.001	0.55	1.58	21.6	0.21	0.22	0.41	<0.01	0.01	0.08	0.09
2	0.025	4.89	0.022	0.001	0.57	1.58	21.4	0.22	0.22	0.43	<0.01	0.01	0.08	0.09
3	0.026	4.79	0.022	0.001	0.52	1.57	21.7	0.31	0.23	0.36	0.01	0.02	0.10	0.13
4	0.027	4.78	0.023	0.001	0.51	1.57	21.9	0.31	0.22	0.36	0.01	0.03	0.10	0.13
5	0.027	4.91	0.023	0.001	0.51	1.55	21.8	0.30	0.22	0.35	0.01	0.02	0.10	0.13
6	0.025	4.91	0.022	0.001	0.51	1.54	21.8	0.30	0.22	0.35	0.01	0.03	0.10	0.13
7	0.025	5.05	0.021	0.001	0.55	1.57	21.7	0.21	0.22	0.41	0.01	0.01	0.08	0.09
8	0.025	5.02	0.022	0.001	0.55	1.56	21.5	0.21	0.22	0.42	<0.01	0.01	0.08	0.09
9	0.025	4.84	0.022	0.001	0.50	1.53	21.8	0.30	0.22	0.35	0.01	0.02	0.10	0.13
10	0.026	4.70	0.021	0.001	0.51	1.55	21.9	0.30	0.23	0.36	0.01	0.02	0.10	0.13
11	0.032	4.83	0.021	0.001	0.53	1.45	21.9	0.21	0.22	0.38	0.01	0.02	0.09	0.11
12	0.034	4.75	0.023	0.001	0.54	1.46	21.8	0.21	0.22	0.39	0.01	0.02	0.09	0.11
Required	0.040 Max	4.00 6.00	0.040 Max	0.030 Max	1.00 Max	1.35 1.70	21.0 22.0	0.10 0.80	0.20 0.25	0.10 0.80	0.05 Max	0.10 Max	0.10 Max	0.50 Max

ACCEPTABLE

SMS QC
ACCEPT

13

6-30-12

SHAW
POWER
AUG 30 2012
003
Page 3 of 6

ISO – 17025 Certified - Mechanical 1938.01; Nondestructive 1938.02

DURING OUR MANUFACTURING PROCESSES, TESTS, AND INSPECTIONS, THE PRODUCT DID NOT COME IN DIRECT CONTACT WITH MERCURY OR ANY OF ITS COMPOUNDS NOR WITH ANY MERCURY CONTAINING DEVICES EMPLOYING A SINGLE BOUNDARY OF CONTAINMENT.

"NOTE: THE RECORDING OF FALSE, FICTITIOUS, OR FRAUDULENT STATEMENTS OR ENTRIES ON THIS DOCUMENT MAY BE PUNISHABLE AS A FELONY UNDER FEDERAL STATUTES".



Shaw Modular Solutions, LLC
ITLS Report L19495
May 7, 2012

Results (cont):

Impact Test – ASTM A923-08 Method B

Sample #	Temperature (°F)	Absorbed Energy (ft-lbs)
1	-40	68
2	-40	80
3	-40	45
4	-40	42
5	-40	45
6	-40	44
7	-40	62
8	-40	69
9	-40	44
10	-40	50
11	-40	30
12	-40	31
Required	-40	20 Min

ACCEPTABLE

Ferrite Testing – ASTM E562-11 Method A

Sample #	Ferrite (%)
1	48
2	50
3	52
4	51
5	52
6	50
7	48
8	50
9	52
10	49
11	52
12	53
Required	40 - 60%

SMS QC
ACCEPT
13
6-30-12

SHAW
POWER

AUG 30 2012

003

Ferrite volume fraction tested with Image Analysis per ASTM E1245-03(2008). ASTM E562 offers the use of ASTM E1245 to determine the same measurements.

ACCEPTABLE



Shaw Modular Solutions, LLC
ITLS Report L19495
May 7, 2012

Results (cont.):

Mechanical Properties – ASTM E8-11 (Flat/Round) & ASTM E18-08b (HRB)

Sample #	Test Temp (°F)	Initial Dimensions (in)	Initial Area (in ²)	*Yield Strength (ksi)	Tensile Strength (ksi)	Elongation (%) in 2"	Hardness HRB** (Avg. of 3)
1	Room	0.499 x 0.678	0.3383	72	103	48	96
2	Room	0.498 x 0.661	0.3292	73	104	47	96
3	Room	0.498 x 0.661	0.3292	76	106	47	95
4	Room	0.500 x 0.658	0.3290	73	103	46	96
5	Room	0.500 x 0.671	0.3355	73	102	46	96
6	Room	0.501 x 0.674	0.3377	73	103	45	95
7	Room	0.498 x 0.526	0.2619	73	104	44	97
8	Room	0.497 x 0.529	0.2629	74	104	44	97
9	Room	0.501 x 0.668	0.3347	73	103	46	95
10	Room	0.500 x 0.658	0.3290	72	102	46	96
11	Room	0.500 dia.	0.1963	74	104	42	97
12	Room	0.500 dia.	0.1963	73	104	41	97
Required				65 Min	94 Min	30 Min	290 HBW Max

*Yield calculated at 0.20% offset

ACCEPTABLE

**Customer requested hardness in Rockwell B. All measured values were between 95 and 97 HRB which is approximately equal to Brinell 210 to 233 based on ASTM E140 Tables 2 and 5. These values are well below the specified max of 290 HBW and are therefore acceptable.

SMS QC
ACCEPT

13

6-30-12

**SHAW
POWER**

AUG 30 2012

003



Shaw Modular Solutions, LLC
ITLS Report L19495
May 7, 2012

Results (cont.):

Intergranular Corrosion Test – ISO 3651-2 Method A

Sample #	Bend Radius	Bend	Result
1	1T	90°	Accept – No Cracking Observed
2	1T	90°	Accept – No Cracking Observed
3	1T	90°	Accept – No Cracking Observed
4	1T	90°	Accept – No Cracking Observed
5	1T	90°	Accept – No Cracking Observed
6	1T	90°	Accept – No Cracking Observed
7	1T	90°	Accept – No Cracking Observed
8	1T	90°	Accept – No Cracking Observed
9	1T	90°	Accept – No Cracking Observed
10	1T	90°	Accept – No Cracking Observed
11	1T	90°	Accept – No Cracking Observed
12	1T	90°	Accept – No Cracking Observed
Required	1T	90°	No Cracking @ 10X

ACCEPTABLE

This certification affirms that the contents are correct and accurate, and that the test operations performed by Industrial Testing Laboratory Services are in compliance with the material specification, ITLS Quality Assurance Manual Rev. 3 dated 6/20/2008, ASME NQA-1 1994, Regulatory Guide 1.28, 10 CFR 50 App. B, 10 CFR Part 21 and any additional requirements of SMS Purchase Order # 694689. Test Results comply with the PO required material specification(s) as noted below.

All Samples: **ACCEPTABLE**

Signature 

Date 5/7/2012

SMS QC
ACCEPT

13

6-30-12

**SHAW
POWER**

AUG 30 2012

003



INDUSTRIAL TESTING LABORATORY SERVICES, LLC
 635 Alpha Drive – RIDC Park
 Pittsburgh, PA 15238 Phone: 412.963.1900 Fax: 412.963.1926
 e-mail: info@itls.com website: itls.com

TEST REPORT
 L19495
 May 7, 2012

Purchase Order No: 694689-000 OP

To: Shaw Modular Solutions LLC
 3191 West Lincoln Road
 Lake Charles, LA 70605

Attn: Nick Koseski

SMS QC

ACCEPT

13

6-30-12

Sample Received:

ITLS received twelve (12) samples for Chemical, Mechanical, Hardness, Impact, Ferrite and Intergranular Corrosion evaluation, identified as follows:

Sample #	Heat #	Description	Supplier
1	853731-1A	0.625" thick Duplex Plate	Outokumpu
2	853731-1A	0.625" thick Duplex Plate	Outokumpu
3	609643-2A	0.625" thick Duplex Plate	Outokumpu
4	609643-2A	0.625" thick Duplex Plate	Outokumpu
5	609644-3A	0.625" thick Duplex Plate	Outokumpu
6	609644-3A	0.625" thick Duplex Plate	Outokumpu
7	853735-3A	0.500" thick Duplex Plate	Outokumpu
8	853735-3A	0.500" thick Duplex Plate	Outokumpu
9	609643-3A	0.625" thick Duplex Plate	Outokumpu
10	609643-3A	0.625" thick Duplex Plate	Outokumpu
11	853843-2A	1.187" thick Duplex Plate	Outokumpu
12	853843-2A	1.187" thick Duplex Plate	Outokumpu

Acceptance:

Sample #	Test	Acceptance
All	Chemical Analysis	APP-VL52-Z0-023, Rev. 1, ASTM A240-11b (UNS S32101)
All	Mechanical	APP-VL52-Z0-023, Rev. 1, ASTM A240-11b (UNS S32101), A480-11b
All	Rockwell B	ASTM A240-11b (UNS S32101), A480-11b
All	Ferrite	APP-VL52-Z0-023, Rev. 1, ASTM E562-11, Method A
All	Impact	APP-VL52-Z0-023, Rev. 1, ASTM A923-08, Method B
All	Intergranular Corrosion	ISO 3651-2 Method A

**SHAW
POWER**

AUG 30 2012

003



Shaw Modular Solutions, LLC
ITLS Report L19495
May 7, 2012

Test References:

Specification	Title
ASTM A751-11	Standard Test Methods, Practices, and Terminology for Chemical Analysis of Steel Products
ASTM A370-12	Standard Test Methods and Definitions for Mechanical Testing of Steel Products
ASTM E8-11	Standard Test Methods for Tension Testing of Metallic Materials
ASTM E140-07	Standard Hardness Conversion Tables for Metals
ASTM E23-07a ¹	Standard Test Methods for Notched Bar Impact Testing of Metallic Materials
ASTM E3-11	Standard Guide for Preparation of Metallographic Specimens
ASTM E18-08b	Standard Test Methods for Rockwell Hardness of Metallic Materials
ASTM E1245-03 (2008)	Standard Practice for Determining the Inclusion of Second-Phase Constituent Content of Metals by Automatic Image Analysis
ASTM E562-11	Standard Test Method for Determining Volume Fraction by Systematic Manual Point Count

Quality References:

Reference
10CFR21, 10CFR50.55(e) and 10CFR50 App.B
ASME NQA-1 – 1994 Basic and Supplementary Requirements
USNRC Regulatory Guide 1.28 Rev. 3
ITLS QA Manual Rev. 3 dated 06/20/08
No ITLS subcontractors used for completion of this order

SMS QC
ACCEPT

13

6-30-12

**SHAW
POWER**

AUG 30 2012

003



Shaw Modular Solutions, LLC
ITLS Report L19495
May 7, 2012

Results:

Chemical Analysis – ASTM A751-11 (OES/Leco)

Sample #	Composition (wt%)													
	C	Mn	P	S	Si	Ni	Cr	Mo	N	Cu	Co	Al	V	Total Others
1	0.027	5.00	0.022	0.001	0.55	1.58	21.6	0.21	0.22	0.41	<0.01	0.01	0.08	0.09
2	0.025	4.89	0.022	0.001	0.57	1.58	21.4	0.22	0.22	0.43	<0.01	0.01	0.08	0.09
3	0.026	4.79	0.022	0.001	0.52	1.57	21.7	0.31	0.23	0.36	0.01	0.02	0.10	0.13
4	0.027	4.78	0.023	0.001	0.51	1.57	21.9	0.31	0.22	0.36	0.01	0.03	0.10	0.13
5	0.027	4.91	0.023	0.001	0.51	1.55	21.8	0.30	0.22	0.35	0.01	0.02	0.10	0.13
6	0.025	4.91	0.022	0.001	0.51	1.54	21.8	0.30	0.22	0.35	0.01	0.03	0.10	0.13
7	0.025	5.05	0.021	0.001	0.55	1.57	21.7	0.21	0.22	0.41	0.01	0.01	0.08	0.09
8	0.025	5.02	0.022	0.001	0.55	1.56	21.5	0.21	0.22	0.42	<0.01	0.01	0.08	0.09
9	0.025	4.84	0.022	0.001	0.50	1.53	21.8	0.30	0.22	0.35	0.01	0.02	0.10	0.13
10	0.026	4.70	0.021	0.001	0.51	1.55	21.9	0.30	0.23	0.36	0.01	0.02	0.10	0.13
11	0.032	4.83	0.021	0.001	0.53	1.45	21.9	0.21	0.22	0.38	0.01	0.02	0.09	0.11
12	0.034	4.75	0.023	0.001	0.54	1.46	21.8	0.21	0.22	0.39	0.01	0.02	0.09	0.11
Required	0.040 Max	4.00 6.00	0.040 Max	0.030 Max	1.00 Max	1.35 1.70	21.0 22.0	0.10 0.80	0.20 0.25	0.10 0.80	0.05 Max	0.10 Max	0.10 Max	0.50 Max

ACCEPTABLE

SMS QC
ACCEPT

13

6-30-12

SHAW
POWER
AUG 30 2012
003
Page 3 of 6

ISO – 17025 Certified - Mechanical 1938.01; Nondestructive 1938.02

DURING OUR MANUFACTURING PROCESSES, TESTS, AND INSPECTIONS, THE PRODUCT DID NOT COME IN DIRECT CONTACT WITH MERCURY OR ANY OF ITS COMPOUNDS NOR WITH ANY MERCURY CONTAINING DEVICES EMPLOYING A SINGLE BOUNDARY OF CONTAINMENT.

"NOTE: THE RECORDING OF FALSE, FICTITIOUS, OR FRAUDULENT STATEMENTS OR ENTRIES ON THIS DOCUMENT MAY BE PUNISHABLE AS A FELONY UNDER FEDERAL STATUTES".



Shaw Modular Solutions, LLC
ITLS Report L19495
May 7, 2012

Results (cont):

Impact Test – ASTM A923-08 Method B

Sample #	Temperature (°F)	Absorbed Energy (ft-lbs)
1	-40	68
2	-40	80
3	-40	45
4	-40	42
5	-40	45
6	-40	44
7	-40	62
8	-40	69
9	-40	44
10	-40	50
11	-40	30
12	-40	31
Required	-40	20 Min

ACCEPTABLE

Ferrite Testing – ASTM E562-11 Method A

Sample #	Ferrite (%)
1	48
2	50
3	52
4	51
5	52
6	50
7	48
8	50
9	52
10	49
11	52
12	53
Required	40 - 60%

SMS QC
ACCEPT
13
6-30-12

SHAW
POWER

AUG 30 2012

003

Ferrite volume fraction tested with Image Analysis per ASTM E1245-03(2008). ASTM E562 offers the use of ASTM E1245 to determine the same measurements.

ACCEPTABLE



Shaw Modular Solutions, LLC
ITLS Report L19495
May 7, 2012

Results (cont.):

Mechanical Properties – ASTM E8-11 (Flat/Round) & ASTM E18-08b (HRB)

Sample #	Test Temp (°F)	Initial Dimensions (in)	Initial Area (in ²)	*Yield Strength (ksi)	Tensile Strength (ksi)	Elongation (%) in 2"	Hardness HRB** (Avg. of 3)
1	Room	0.499 x 0.678	0.3383	72	103	48	96
2	Room	0.498 x 0.661	0.3292	73	104	47	96
3	Room	0.498 x 0.661	0.3292	76	106	47	95
4	Room	0.500 x 0.658	0.3290	73	103	46	96
5	Room	0.500 x 0.671	0.3355	73	102	46	96
6	Room	0.501 x 0.674	0.3377	73	103	45	95
7	Room	0.498 x 0.526	0.2619	73	104	44	97
8	Room	0.497 x 0.529	0.2629	74	104	44	97
9	Room	0.501 x 0.668	0.3347	73	103	46	95
10	Room	0.500 x 0.658	0.3290	72	102	46	96
11	Room	0.500 dia.	0.1963	74	104	42	97
12	Room	0.500 dia.	0.1963	73	104	41	97
Required				65 Min	94 Min	30 Min	290 HBW Max

*Yield calculated at 0.20% offset

ACCEPTABLE

**Customer requested hardness in Rockwell B. All measured values were between 95 and 97 HRB which is approximately equal to Brinell 210 to 233 based on ASTM E140 Tables 2 and 5. These values are well below the specified max of 290 HBW and are therefore acceptable.

SMS QC
ACCEPT

13

6-30-12

**SHAW
POWER**

AUG 30 2012

003



Shaw Modular Solutions, LLC
ITLS Report L19495
May 7, 2012

Results (cont.):

Intergranular Corrosion Test – ISO 3651-2 Method A

Sample #	Bend Radius	Bend	Result
1	1T	90°	Accept – No Cracking Observed
2	1T	90°	Accept – No Cracking Observed
3	1T	90°	Accept – No Cracking Observed
4	1T	90°	Accept – No Cracking Observed
5	1T	90°	Accept – No Cracking Observed
6	1T	90°	Accept – No Cracking Observed
7	1T	90°	Accept – No Cracking Observed
8	1T	90°	Accept – No Cracking Observed
9	1T	90°	Accept – No Cracking Observed
10	1T	90°	Accept – No Cracking Observed
11	1T	90°	Accept – No Cracking Observed
12	1T	90°	Accept – No Cracking Observed
Required	1T	90°	No Cracking @ 10X

ACCEPTABLE

This certification affirms that the contents are correct and accurate, and that the test operations performed by Industrial Testing Laboratory Services are in compliance with the material specification, ITLS Quality Assurance Manual Rev. 3 dated 6/20/2008, ASME NQA-1 1994, Regulatory Guide 1.28, 10 CFR 50 App. B, 10 CFR Part 21 and any additional requirements of SMS Purchase Order # 694689. Test Results comply with the PO required material specification(s) as noted below.

All Samples: **ACCEPTABLE**

Signature _____

Date 5/7/2012

SMS QC
ACCEPT

13

6-30-12

**SHAW
POWER**

AUG 30 2012

003



INDUSTRIAL TESTING LABORATORY SERVICES, LLC
 635 Alpha Drive – RIDC Park
 Pittsburgh, PA 15238 Phone: 412.963.1900 Fax: 412.963.1926
 e-mail: info@itls.com website: itls.com

TEST REPORT
L19495
May 7, 2012

Purchase Order No: 694689-000 OP

To: Shaw Modular Solutions LLC
 3191 West Lincoln Road
 Lake Charles, LA 70605

Attn: Nick Koseski

SMS QC

ACCEPT

13

6-30-12

Sample Received:

ITLS received twelve (12) samples for Chemical, Mechanical, Hardness, Impact, Ferrite and Intergranular Corrosion evaluation, identified as follows:

Sample #	Heat #	Description	Supplier
1	853731-1A	0.625" thick Duplex Plate	Outokumpu
2	853731-1A	0.625" thick Duplex Plate	Outokumpu
3	609643-2A	0.625" thick Duplex Plate	Outokumpu
4	609643-2A	0.625" thick Duplex Plate	Outokumpu
5	609644-3A	0.625" thick Duplex Plate	Outokumpu
6	609644-3A	0.625" thick Duplex Plate	Outokumpu
7	853735-3A	0.500" thick Duplex Plate	Outokumpu
8	853735-3A	0.500" thick Duplex Plate	Outokumpu
9	609643-3A	0.625" thick Duplex Plate	Outokumpu
10	609643-3A	0.625" thick Duplex Plate	Outokumpu
11	853843-2A	1.187" thick Duplex Plate	Outokumpu
12	853843-2A	1.187" thick Duplex Plate	Outokumpu

Acceptance:

Sample #	Test	Acceptance
All	Chemical Analysis	APP-VL52-Z0-023, Rev. 1, ASTM A240-11b (UNS S32101)
All	Mechanical	APP-VL52-Z0-023, Rev. 1, ASTM A240-11b (UNS S32101), A480-11b
All	Rockwell B	ASTM A240-11b (UNS S32101), A480-11b
All	Ferrite	APP-VL52-Z0-023, Rev. 1, ASTM E562-11, Method A
All	Impact	APP-VL52-Z0-023, Rev. 1, ASTM A923-08, Method B
All	Intergranular Corrosion	ISO 3651-2 Method A

**SHAW
POWER**

AUG 30 2012

003



Shaw Modular Solutions, LLC
ITLS Report L19495
May 7, 2012

Test References:

Specification	Title
ASTM A751-11	Standard Test Methods, Practices, and Terminology for Chemical Analysis of Steel Products
ASTM A370-12	Standard Test Methods and Definitions for Mechanical Testing of Steel Products
ASTM E8-11	Standard Test Methods for Tension Testing of Metallic Materials
ASTM E140-07	Standard Hardness Conversion Tables for Metals
ASTM E23-07a ¹	Standard Test Methods for Notched Bar Impact Testing of Metallic Materials
ASTM E3-11	Standard Guide for Preparation of Metallographic Specimens
ASTM E18-08b	Standard Test Methods for Rockwell Hardness of Metallic Materials
ASTM E1245-03 (2008)	Standard Practice for Determining the Inclusion of Second-Phase Constituent Content of Metals by Automatic Image Analysis
ASTM E562-11	Standard Test Method for Determining Volume Fraction by Systematic Manual Point Count

Quality References:

Reference
10CFR21, 10CFR50.55(e) and 10CFR50 App.B
ASME NQA-1 – 1994 Basic and Supplementary Requirements
USNRC Regulatory Guide 1.28 Rev. 3
ITLS QA Manual Rev. 3 dated 06/20/08
No ITLS subcontractors used for completion of this order

SMS QC
ACCEPT

13

6-30-12

**SHAW
POWER**

AUG 30 2012

003



Shaw Modular Solutions, LLC
ITLS Report L19495
May 7, 2012

Results:

Chemical Analysis – ASTM A751-11 (OES/Leco)

Sample #	Composition (wt%)													
	C	Mn	P	S	Si	Ni	Cr	Mo	N	Cu	Co	Al	V	Total Others
1	0.027	5.00	0.022	0.001	0.55	1.58	21.6	0.21	0.22	0.41	<0.01	0.01	0.08	0.09
2	0.025	4.89	0.022	0.001	0.57	1.58	21.4	0.22	0.22	0.43	<0.01	0.01	0.08	0.09
3	0.026	4.79	0.022	0.001	0.52	1.57	21.7	0.31	0.23	0.36	0.01	0.02	0.10	0.13
4	0.027	4.78	0.023	0.001	0.51	1.57	21.9	0.31	0.22	0.36	0.01	0.03	0.10	0.13
5	0.027	4.91	0.023	0.001	0.51	1.55	21.8	0.30	0.22	0.35	0.01	0.02	0.10	0.13
6	0.025	4.91	0.022	0.001	0.51	1.54	21.8	0.30	0.22	0.35	0.01	0.03	0.10	0.13
7	0.025	5.05	0.021	0.001	0.55	1.57	21.7	0.21	0.22	0.41	0.01	0.01	0.08	0.09
8	0.025	5.02	0.022	0.001	0.55	1.56	21.5	0.21	0.22	0.42	<0.01	0.01	0.08	0.09
9	0.025	4.84	0.022	0.001	0.50	1.53	21.8	0.30	0.22	0.35	0.01	0.02	0.10	0.13
10	0.026	4.70	0.021	0.001	0.51	1.55	21.9	0.30	0.23	0.36	0.01	0.02	0.10	0.13
11	0.032	4.83	0.021	0.001	0.53	1.45	21.9	0.21	0.22	0.38	0.01	0.02	0.09	0.11
12	0.034	4.75	0.023	0.001	0.54	1.46	21.8	0.21	0.22	0.39	0.01	0.02	0.09	0.11
Required	0.040 Max	4.00 6.00	0.040 Max	0.030 Max	1.00 Max	1.35 1.70	21.0 22.0	0.10 0.80	0.20 0.25	0.10 0.80	0.05 Max	0.10 Max	0.10 Max	0.50 Max

ACCEPTABLE

SMS QC
ACCEPT

13

6-30-12

SHAW
POWER
AUG 30 2012
003
Page 3 of 6

ISO – 17025 Certified - Mechanical 1938.01; Nondestructive 1938.02

DURING OUR MANUFACTURING PROCESSES, TESTS, AND INSPECTIONS, THE PRODUCT DID NOT COME IN DIRECT CONTACT WITH MERCURY OR ANY OF ITS COMPOUNDS NOR WITH ANY MERCURY CONTAINING DEVICES EMPLOYING A SINGLE BOUNDARY OF CONTAINMENT.

"NOTE: THE RECORDING OF FALSE, FICTITIOUS, OR FRAUDULENT STATEMENTS OR ENTRIES ON THIS DOCUMENT MAY BE PUNISHABLE AS A FELONY UNDER FEDERAL STATUTES".



Shaw Modular Solutions, LLC
ITLS Report L19495
May 7, 2012

Results (cont):

Impact Test – ASTM A923-08 Method B

Sample #	Temperature (°F)	Absorbed Energy (ft-lbs)
1	-40	68
2	-40	80
3	-40	45
4	-40	42
5	-40	45
6	-40	44
7	-40	62
8	-40	69
9	-40	44
10	-40	50
11	-40	30
12	-40	31
Required	-40	20 Min

ACCEPTABLE

Ferrite Testing – ASTM E562-11 Method A

Sample #	Ferrite (%)
1	48
2	50
3	52
4	51
5	52
6	50
7	48
8	50
9	52
10	49
11	52
12	53
Required	40 - 60%

SMS QC
ACCEPT

13

6-30-12

SHAW
POWER

AUG 30 2012

003

Ferrite volume fraction tested with Image Analysis per ASTM E1245-03(2008). ASTM E562 offers the use of ASTM E1245 to determine the same measurements.

ACCEPTABLE



Shaw Modular Solutions, LLC
ITLS Report L19495
May 7, 2012

Results (cont.):

Mechanical Properties – ASTM E8-11 (Flat/Round) & ASTM E18-08b (HRB)

Sample #	Test Temp (°F)	Initial Dimensions (in)	Initial Area (in ²)	*Yield Strength (ksi)	Tensile Strength (ksi)	Elongation (%) in 2"	Hardness HRB** (Avg. of 3)
1	Room	0.499 x 0.678	0.3383	72	103	48	96
2	Room	0.498 x 0.661	0.3292	73	104	47	96
3	Room	0.498 x 0.661	0.3292	76	106	47	95
4	Room	0.500 x 0.658	0.3290	73	103	46	96
5	Room	0.500 x 0.671	0.3355	73	102	46	96
6	Room	0.501 x 0.674	0.3377	73	103	45	95
7	Room	0.498 x 0.526	0.2619	73	104	44	97
8	Room	0.497 x 0.529	0.2629	74	104	44	97
9	Room	0.501 x 0.668	0.3347	73	103	46	95
10	Room	0.500 x 0.658	0.3290	72	102	46	96
11	Room	0.500 dia.	0.1963	74	104	42	97
12	Room	0.500 dia.	0.1963	73	104	41	97
Required				65 Min	94 Min	30 Min	290 HBW Max

*Yield calculated at 0.20% offset

ACCEPTABLE

**Customer requested hardness in Rockwell B. All measured values were between 95 and 97 HRB which is approximately equal to Brinell 210 to 233 based on ASTM E140 Tables 2 and 5. These values are well below the specified max of 290 HBW and are therefore acceptable.

SMS QC
ACCEPT

13

6-30-12

**SHAW
POWER**

AUG 30 2012

003



Shaw Modular Solutions, LLC
ITLS Report L19495
May 7, 2012

Results (cont.):

Intergranular Corrosion Test – ISO 3651-2 Method A

Sample #	Bend Radius	Bend	Result
1	1T	90°	Accept – No Cracking Observed
2	1T	90°	Accept – No Cracking Observed
3	1T	90°	Accept – No Cracking Observed
4	1T	90°	Accept – No Cracking Observed
5	1T	90°	Accept – No Cracking Observed
6	1T	90°	Accept – No Cracking Observed
7	1T	90°	Accept – No Cracking Observed
8	1T	90°	Accept – No Cracking Observed
9	1T	90°	Accept – No Cracking Observed
10	1T	90°	Accept – No Cracking Observed
11	1T	90°	Accept – No Cracking Observed
12	1T	90°	Accept – No Cracking Observed
Required	1T	90°	No Cracking @ 10X

ACCEPTABLE

This certification affirms that the contents are correct and accurate, and that the test operations performed by Industrial Testing Laboratory Services are in compliance with the material specification, ITLS Quality Assurance Manual Rev. 3 dated 6/20/2008, ASME NQA-1 1994, Regulatory Guide 1.28, 10 CFR 50 App. B, 10 CFR Part 21 and any additional requirements of SMS Purchase Order # 694689. Test Results comply with the PO required material specification(s) as noted below.

All Samples: **ACCEPTABLE**

Signature 

Date 5/7/2012

SMS QC
ACCEPT

13

6-30-12

**SHAW
POWER**

AUG 30 2012

003

**OUTO
KUMPU****Certificate of Analysis and Tests**

OUR ORDER 0278834 - 01

HEAT & PIECE 609633-5A 03/23/12

SOLD TO: SHAW MODULAR SOLUTIONS, L.L.C. SHIP TO: SHAW MODULAR SOLUTIONS, L.L.C.
3191 W LINCOLN ROAD 3191 W LINCOLN ROAD

LAKE CHARLES

LA 70605

LAKE CHARLES

LA 70605

----- YOUR ORDER & DATE -----
 746363 12/22/11 TAG# P/N #2232423
 ----- ITEM DESCRIPTION -----
 HEAT & PIECE 609633 - 5A
 WEIGHT 1859
 FINISH 1
 GRADE 2101 UNS S32101
 DIMENSIONS .250 X 108.000 X 222.000 EXACT

*** MFG IN NEW CASTLE, IN, USA
 ASTM A240-11A ASMESA240-11ED
 REQUIRES PRODUCT ANALYSIS
 ASTM E562-08 (10% ACCURACY)
 ASTM A923-06 METHOD A&B ONLY
 U. T. TEST TO ASTM A 577-90
 APP-VL52-ZO-023 R1 W/EXCEPTS
 COUPONS REQUIRED
 ASTM A262-02A PRACTICE E
 NO GRIPPER MARKS

SPECIFICATIONS
 FROM SLABS IMPORTED FROM SWEDEN
 ASTM A480-11A ASMESA480 11ED
 OSI QA MAN ED 2 R 1 10/15/02
 UHA 51 CHARPY @ -40F (-40C)
 UT ASTM A578-07 LEVEL B S1
 NON STANDARD PROPERTIES REQD
 ISO 3651-2
 ASTM A262-02A PRACTICE A
 SMS PO REQMTS WITH EXCEPTS
 NO WELD REPAIRS

PLATES & TEST PCS SOLUTION ANNEALED @ 1900 DEGREES FAHRENHEIT MINIMUM.
 THEN WATER QUENCHED
 FREE FROM MERCURY CONTAMINATION AT CURRENT DETECTION LIMITS
 HOT ROLLED, ANNEALED & PICKLED (HRAP)

----- MECHANICAL & OTHER TESTS -----
 HARDNESS HRC 18
 YIELD STRENGTH (PSI) 85159
 TENSILE STRENGTH (PSI) 107540
 BEND OK
 INTERGRANULAR CORROSION OK
 ELONGATION % IN 2" 31.2
 REDUCTION OF AREA % 58.8
 ASTM E-562 POINT COUNT FERRITE @ 500X = 45% AT 10% RELATIVE ACCURACY
 CHARPY TEST AT -40F (TRANS) 33, 32, 34 FT-LBS. 1/2 SAMPLE SIZE
 LATERAL EXPANSION = 42, 45, 46 (MILS)

- CHEMICAL COMPOSITION - PRODUCT ANALYSIS -

CARBON (C)	.023	(C)	.016
MANGANESE (MN)	4.77	(MN)	4.36
PHOSPHORUS (P)	.021	(P)	.020
SULFUR (S)	.001	(S)	.007
SILICON (SI)	.66	(SI)	.65
CHROMIUM (CR)	21.40	(CR)	21.00
NICKEL (NI)	1.54	(NI)	1.61
COBALT (CO)	.03	(CO)	.04
COPPER (CU)	.39	(CU)	.40
MOLY (MO)	.19	(MO)	.21
NITROGEN (N)	.22	(N)	.24
COLUMBIUM (CB)	.001	(CB)	.004
TITANIUM (TI)	.003	(TI)	.004
ALUMINUM (AL)	.021	(AL)	.023
TIN (SN)	.006	(SN)	.006



10/7/12

SHAW
POWER

APR 19 2013

005

WE HEREBY CERTIFY THAT THE MATERIAL HEREIN HAS BEEN MADE AND TESTED IN
 ACCORDANCE WITH THE LISTED SPECIFICATION(S) AND THAT THE RESULTS OF ALL
 TESTS ARE ACCEPTABLE.

JAMES DOUBMAN, QUALITY ASSURANCE MANAGER

CERTIFICATE IN CONFORMANCE WITH EN10204-95 3.1.B/EN10204-2004 3.1

Outokumpu Stainless Plate, Inc.
 P.O. Box 370
 New Castle, Indiana 47362

ISSUED FOR Information (IFI)



ACUREN

NDE RESULT RECORD

Page 1 of 2

REPORT OF NONDESTRUCTIVE EXAMINATION

[illegible]

3-14-12



10/17/12

SHAW
POWER
APR 19 2013

005



NDE TECHNIQUE RECORD ULTRASONIC

Facility QC Control No. <u>290850</u>	Technique No. <u>Master</u>
Client <u>Outokumpu / Shaw Modular Solutions</u>	P.O. No. <u>28862B</u>
Item Description <u>Stainless Steel Plate</u>	
Part No. <u>N/A</u>	Drawing No. <u>N/A</u>
Specification <u>ASTM A577-90</u>	Acceptance <u>ASTM A577-90</u>
Procedure <u>SP-UT-1 App II-U Rev.5</u>	

WELDS	OTHER TEST ITEMS
Weld Joint <u>N/A</u>	Type of Item <u>Stainless Steel Plate</u>
Weld Process <u>N/A</u>	Processing <u>Rolled</u>
Base Material <u>N/A</u>	Material <u>2101CO</u>
Material Thickness <u>N/A</u>	Dimensions <u>See Page 1</u>
Weld Length/OD <u>N/A</u>	Additional Info <u>N/A</u>
Surface Condition <u>N/A</u>	Surface Condition <u>Smooth</u>
PRECLEAN: Method <u>N/A</u>	Material <u>N/A</u> Batch No. <u>N/A</u>
EQUIPMENT: Make <u>Krautkramer</u>	Model <u>USN 52</u> S/N <u>00NC078</u>
PRESENTATION <input checked="" type="checkbox"/> A-SCAN	<input type="checkbox"/> B-SCAN <input type="checkbox"/> C-SCAN

TRANSDUCERS:
 Make Krautkramer Model S/N 00W86X Sound Beam Angle (Material) 70°
 Crystal Size .76" x .625" Crystal Material Ceramic Frequency 2.25 MHz

COUPLANT: Material Water Manufacturer N/A Batch No. N/A

CALIBRATION BLOCK: Type Part Material 2101CO S/N N/A

METHOD ☒ Contact ☐ Immersion ☐ Water Column
☒ Pulse Echo ☐ Resonance ☐ Through Transmission

SCANNING: ☒ Manual ☐ Automatic

Pattern 100% Scanning Speed < 6"Per/Sec. % Overlap N/A

POST CLEAN: Method N/A 10%

OTHER INFORMATION:

**SHAW
POWER**
APR 19 2013
005

Prepared By: <u>Robert Caddel</u>	Approved by: <u>N/A</u>	Date <u>3/13/12</u>	PAGE 2 OF 2
--------------------------------------	----------------------------	------------------------	-------------

3-14-12





ACUREN

NDE RESULT RECORD

Page 1 of 2

REPORT OF NONDESTRUCTIVE EXAMINATION

Customer OUTOKUMPU (Shaw Modular Solutions)				Date 3/13/12	
Address PO BOX 370, 549 W State Rd 38 New Castle ,IN 47362				Control No. or Report No. 290850	
Job or Project Location New Castle, Indiana Plant		PO No: 28862B	Owner: Shaw Modular Solutions		Plan or Drawing No N/A
Surface Condition SMOOTH		Heat No. SEE BELOW	Heat Treat N/A		Type of Material 2101CO
					Temp of Material 65°F
Type of Examination UT (STRAIGHT BEAM)	Examination Standard ASTM A578-07		Acceptance Standard ASTM A578-07 Level B S1		NDT Procedure No. SP-UT-1 App II-U Rev 5
ORDER NO.	HEAT NO.	Acc	Rej	Defect Code	Remarks
278834	609633-5A	X			.250 x 108 x 222
278834	853605-4A	X			.625 x 117 x 410
278834	853602-4A	X			.625 x 117 x 410
278834	853601-2A	X			.625 x 117 x 410
278834	853605-1A	X			.625 x 117 x 410
278834	853605-2A	X			.625 x 117 x 410
278834	853604-1A	X			.625 x 117 x 410
278834	853604-2A	X			.625 x 117 x 410
278834	609642-3A	X			.625 x 117 x 410
278834	609641-2A	X			.625 x 117 x 410
278834	609645-1A	X			.625 x 117 x 410
	Type of Work New	No of Items Accepted 11	No of Items Rejected -0-		
Remarks: The plates listed above were ultrasonically tested for indications in accordance with listed standards and procedures.					
Conclusion: No recordable indications were noted at the time of this inspection.					
Client Personnel _____ Technician Robert Caddel [Signature] SNT-TC-1A Level II Ultrasonic					

24-12

0-44-0



10/17/12

SHAW
POWER
APR 19 2013

005



NDE TECHNIQUE RECORD ULTRASONIC

Facility QC Control No. 290850	Technique No. Master
Client Outokumpu / Shaw Modular Solutions	P.O. No. 28862B
Item Description Stainless Steel Plate	
Part No. N/A	Drawing No. N/A
Specification ASTM A578-07	Acceptance ASTM A578-07 Level B S1
Procedure SP-UT-1 App II-U Rev.5	

WELDS		OTHER TEST ITEMS	
Weld Joint N/A	Type of Item Stainless Steel Plate		
Weld Process N/A	Processing Rolled		
Base Material N/A	Material 2101CO		
Material Thickness N/A	Dimensions See Page 1		
Weld Length/OD N/A	Additional Info N/A		
Surface Condition N/A	Surface Condition Smooth		
PRECLEAN: Method N/A	Material N/A	Batch No. N/A	
EQUIPMENT: Make Krautkramer	Model USN 52	S/N 00NC078	
PRESENTATION <input checked="" type="checkbox"/> A-SCAN	<input type="checkbox"/> B-SCAN	<input type="checkbox"/> C-SCAN	

TRANSDUCERS:
Make Panametric Model V104 S/N 570465 Sound Beam Angle (Material) 0°
Crystal Size 1" Dia. Crystal Material Ceramic Frequency 2.25 MHz

COUPLANT: Material Water Manufacturer N/A Batch No. N/A

CALIBRATION BLOCK: Type Part Material 2101CO S/N N/A

METHOD ☒ Contact ☐ Immersion ☐ Water Column
☒ Pulse Echo ☐ Resonance ☐ Through Transmission

SCANNING: ☒ Manual ☐ Automatic

Pattern 100% Scanning Speed < 6"Per/Sec. % Overlap N/A
POST CLEAN: Method N/A 10%

OTHER INFORMATION:

Prepared By: Robert Caddel	Approved by: N/A	Date 3/13/12	PAGE 2 OF 2
-------------------------------	---------------------	-----------------	-------------

3-14-12

SHAW
POWER
APR 19 2013
005



10/17/12



INDUSTRIAL TESTING LABORATORY SERVICES, LLC
635 Alpha Drive – RIDC Park
Pittsburgh, PA 15238 Phone: 412.963.1900 Fax: 412.963.1926
e-mail: info@itls.com website: itls.com

TEST REPORT
L19352
April 5, 2012

Purchase Order No: 694689-000 OP

To: Shaw Modular Solutions LLC
3191 West Lincoln Road
Lake Charles, LA 70605

Attn: Nick Koseski

**SHAW
POWER**

OCT 09 2012

012

SMS QC
ACCEPT
13

7-25-12

Sample Received:

ITLS received ten (10) samples for Chemical, Mechanical, Hardness, Impact, Ferrite and Intergranular Corrosion evaluation, identified as follows:

Sample #	Heat #	Gauge	Supplier
1	609632-1A	0.625	Outokumpu
2	609632-1A	0.625	Outokumpu
3	609633-1A	0.625	Outokumpu
4	609633-1A	0.625	Outokumpu
5	609642-1A	0.625	Outokumpu
6	609642-1A	0.625	Outokumpu
7	853602-1A	0.625	Outokumpu
8	853602-1A	0.625	Outokumpu
9	853604-1A	0.625	Outokumpu
10	853604-1A	0.625	Outokumpu

Acceptance:

Sample #	Test	Acceptance
All	Chemical Analysis	APP-VL52-Z0-023, Rev. 1, ASTM A240-11b (UNS S32101)
All	Mechanical	APP-VL52-Z0-023, Rev. 1, ASTM A240-11b (UNS S32101), A480-11b
All	Rockwell B	ASTM A240-11b (UNS S32101), A480-11b
All	Ferrite	APP-VL52-Z0-023, Rev. 1, ASTM E562-11, Method A
All	Impact	APP-VL52-Z0-023, Rev. 1, ASTM A923-08, Method B
All	Intergranular Corrosion	ISO 3651-2 Method A



SHAW
POWER
OCT 09 2012
012

Shaw Modular Solutions, LLC
ITLS Report L19352
April 5, 2012

Test References:

Specification	Title
ASTM A751-11	Standard Test Methods, Practices, and Terminology for Chemical Analysis of Steel Products
ASTM A370-11a	Standard Test Methods and Definitions for Mechanical Testing of Steel Products
ASTM E8-11	Standard Test Methods for Tension Testing of Metallic Materials
ASTM E140-07	Standard Hardness Conversion Tables for Metals
ASTM E23-07a ^{e1}	Standard Test Methods for Notched Bar Impact Testing of Metallic Materials
ASTM E3-11	Standard Guide for Preparation of Metallographic Specimens
ASTM E18-08b	Standard Test Methods for Rockwell Hardness of Metallic Materials
ASTM E1245-03 (2008)	Standard Practice for Determining the Inclusion of Second-Phase Constituent Content of Metals by Automatic Image Analysis
ASTM E562-11	Standard Test Method for Determining volume Fraction by Systematic Manual Point Count

Quality References:

Reference
10CFR21, 10CFR50.55(e) and 10CFR50 App.B
ASME NQA-1 – 1994 Basic and Supplementary Requirements
USNRC Regulatory Guide 1.28 Rev. 3
ITLS QA Manual Rev. 3 dated 06/20/08
No ITLS subcontractors used for completion of this order

SMS QC
ACCEPT

13

7-25-12



Shaw Modular Solutions, LLC
ITLS Report L19352
April 5, 2012

Results:

Chemical Analysis – ASTM A751-11 (OES)

SMS QC
ACCEPT
13
7-25-12

SHAW
POWER
OCT 0 9 2012
012

Sample #	Composition (wt%)													
	C	Mn	P	S	Si	Ni	Cr	Mo	N	Cu	Co	Al	V	Total Others
1 -	0.021	4.87	0.015	<0.002	0.67	1.60	21.2	0.19	0.22	0.39	<0.01	0.07	0.07	0.14
2 -	0.022	4.95	0.017	<0.002	0.68	1.62	21.2	0.19	0.22	0.39	<0.01	0.07	0.08	0.14
3	0.023	4.96	0.019	<0.002	0.68	1.63	21.3	0.19	0.21	0.39	<0.01	0.07	0.08	0.14
4	0.023	4.97	0.018	<0.002	0.68	1.63	21.2	0.19	0.22	0.39	<0.01	0.07	0.08	0.14
5 -	0.021	4.86	0.018	<0.002	0.67	1.60	21.2	0.30	0.23	0.35	<0.01	0.07	0.10	0.17
6 -	0.021	4.94	0.019	<0.002	0.68	1.62	21.2	0.30	0.23	0.35	<0.01	0.07	0.10	0.17
7 -	0.023	5.08	0.017	<0.002	0.79	1.56	21.2	0.20	0.22	0.39	<0.01	0.06	0.08	0.15
8 -	0.023	5.15	0.018	<0.002	0.79	1.58	21.2	0.19	0.22	0.38	<0.01	0.06	0.08	0.14
9 -	0.024	5.22	0.019	<0.002	0.78	1.59	21.2	0.20	0.22	0.38	<0.01	0.06	0.08	0.14
10 -	0.023	5.24	0.018	<0.002	0.78	1.58	21.3	0.19	0.21	0.38	<0.01	0.06	0.08	0.14
Required	0.040 Max	4.00 6.00	0.040 Max	0.030 Max	1.00 Max	1.35 1.70	21.0 22.0	0.10 0.80	0.20 0.25	0.10 0.80	0.05 Max	0.10 Max	0.10 Max	0.50 Max

ACCEPTABLE



SHAW
POWER

OCT 09 2012

012

Shaw Modular Solutions, LLC
ITLS Report L19352
April 5, 2012

Mechanical Properties – ASTM E8-09 (Flat) & ASTM E18-08b (HRB)

Sample #	Test Temp (°F)	Initial Dimensions (in)	Initial Area (in ²)	*Yield Strength (ksi)	Tensile Strength (ksi)	Elongation (%) in 2"	Hardness HRB** (Avg. of 3)
1	Room	0.499 x 0.660	0.3293	71	102	46	95
2	Room	0.497 x 0.668	0.3320	73	103	47	96
3	Room	0.508 x 0.659	0.3348	70	100	50	96
4	Room	0.499 x 0.672	0.3353	73	102	50	96
5	Room	0.497 x 0.654	0.3250	72	103	48	95
6	Room	0.500 x 0.642	0.3210	72	102	50	96
7	Room	0.497 x 0.670	0.3330	73	105	45	97
8	Room	0.500 x 0.683	0.3415	73	104	46	96
9	Room	0.496 x 0.650	0.3224	74	105	46	96
10	Room	0.500 x 0.670	0.3350	75	104	46	97
Required				65 Min	94 Min	30 Min	290 HBW Max

*Yield calculated at 0.20% offset

ACCEPTABLE

**Customer requested hardness in Rockwell B. All measured values were between 95 and 97 HRB which is approximately equal to Brinell 210 to 233 based on ASTM E140 Tables 2 and 5. These values are well below the specified max of 290 HBW and are therefore acceptable.

SMS QO
ACCEPT

13

7-25-12



Shaw Modular Solutions, LLC
ITLS Report L19352
April 5, 2012

SHAW
POWER

OCT 09 2012

012

Results (cont.):

Impact Test – ASTM A923-08 Method B

Sample #	Temperature (°F)	Absorbed Energy (ft-lbs)
1	-40	56
2	-40	48
3	-40	59
4	-40	61
5	-40	42
6	-40	45
7	-40	55
8	-40	50
9	-40	60
10	-40	54
Required	-40	20 Min

ACCEPTABLE

Ferrite Testing – ASTM E562-11 Method A

Sample #	Ferrite (%)
1	51
2	51
3	52
4	49
5	52
6	53
7	53
8	53
9	54
10	53
Required	40 - 60%

SMS QC
ACCEPT
13
7-25-12

Ferrite volume fraction tested with Image Analysis per ASTM E1245-03(2008). ASTM E562 offers the use of ASTM E1245 to determine the same measurements.

ACCEPTABLE



SHAW
POWER

OCT 09 2012

012

Shaw Modular Solutions, LLC
ITLS Report L19352
April 5, 2012

Results (cont.):

Intergranular Corrosion Test – ISO 3651-2 Method A

Sample #	Bend Radius	Bend	Result
1	1T	90°	Accept – No Cracking Observed
2	1T	90°	Accept – No Cracking Observed
3	1T	90°	Accept – No Cracking Observed
4	1T	90°	Accept – No Cracking Observed
5	1T	90°	Accept – No Cracking Observed
6	1T	90°	Accept – No Cracking Observed
7	1T	90°	Accept – No Cracking Observed
8	1T	90°	Accept – No Cracking Observed
9	1T	90°	Accept – No Cracking Observed
10	1T	90°	Accept – No Cracking Observed
Required	1T	90°	No Cracking @ 10X

ACCEPTABLE

This certification affirms that the contents are correct and accurate, and that the test operations performed by Industrial Testing Laboratory Services are in compliance with the material specification, ITLS Quality Assurance Manual Rev. 3 dated 6/20/2008, ASME NQA-1 1994, Regulatory Guide 1.28, 10 CFR 50 App. B, 10 CFR Part 21 and any additional requirements of SMS Purchase Order # 694689. Test Results comply with the PO required material specification(s) as noted below.

All Samples: **ACCEPTABLE**

Signature

Date 4/5/2012

SMS QC
ACCEPT

13

7-25-12

Outokumpu Stainless Plate, Inc.

OUTO
KUMPU

Certificate of Analysis and Tests

OUR ORDER 0278834 - 06

HEAT & PIECE 609641-2A 03/23/12

SOLD TO: SHAW MODULAR SOLUTIONS, L.L.C. SHIP TO: SHAW MODULAR SOLUTIONS, L.L.C.
3191 W LINCOLN ROAD 3191 W LINCOLN ROAD

LAKE CHARLES

LA 70605

LAKE CHARLES

LA 70605

----- YOUR ORDER & DATE -----
746363 12/22/11 TAG# P/N #2232445
----- ITEM DESCRIPTION -----
HEAT & PIECE 609641 - 2A
WEIGHT 8938
FINISH 1
GRADE 2101 UNS S32101
DIMENSIONS .625 X 117.000 X 410.000 EXACT

----- SPECIFICATIONS -----
*** MFG IN NEW CASTLE, IN, USA FROM SLABS IMPORTED FROM SWEDEN
ASTM A240-11A ASMESA240-11ED ASTM A480-11A ASMESA480 11ED
REQUIRES PRODUCT ANALYSIS OSI QA MAN ED 2 R 1 10/15/02
ASTM E562-08 (10% ACCURACY) UHA 51 CHARPY @ -40F (-40C)
ASTM A923-06 METHOD A&B ONLY UT ASTM A578-07 LEVEL B S1
U. T. TEST TO ASTM A 577-90 NON STANDARD PROPERTIES REQD
APP-VL52-ZO-023 R1 W/EXCEPTS ISO 3651-2
COUPONS REQUIRED ASTM A262-02A PRACTICE A
ASTM A262-02A PRACTICE E SMS PO REQMTS WITH EXCEPTS
NO GRIPPER MARKS NO WELD REPAIRS

PLATES & TEST PCS SOLUTION ANNEALED @ 1900 DEGREES FAHRENHEIT MINIMUM.
THEN WATER QUENCHED
FREE FROM MERCURY CONTAMINATION AT CURRENT DETECTION LIMITS
HOT ROLLED, ANNEALED & PICKLED (HRAP)

----- MECHANICAL & OTHER TESTS -----
HARDNESS HRC 15
YIELD STRENGTH (PSI) 70443
TENSILE STRENGTH (PSI) 103990
BEND OK
INTERGRANULAR CORROSION OK
ELONGATION % IN 2" 44.2
REDUCTION OF AREA % 62.2
ASTM E-562 POINT COUNT FERRITE @ 500X = 47% AT 10% RELATIVE ACCURACY
CHARPY TEST AT -40F (TRANS) 54, 49, 50 FT-LBS. FULL SAMPLE SIZE
LATERAL EXPANSION = 40, 40, 38 (MILS)
CHARPY TEST AT -40F (TRANS) 49 FT-LBS. SAMPLE SIZE FULL

SHAW
POWER

OCT 15 2012

003

----- CHEMICAL COMPOSITION ----- PRODUCT ANALYSIS -----
CARBON (C) .022 (C) .017
MANGANESE (MN) 4.75 (MN) 4.29
PHOSPHORUS (P) .023 (P) .021
SULFUR (S) .001 (S) .007
SILICON (SI) .64 (SI) .66
CHROMIUM (CR) 21.43 (CR) 21.00
NICKEL (NI) 1.54 (NI) 1.62
COBALT (CO) .04 (CO) .05
COPPER (CU) .33 (CU) .35
MOLY (MO) .31 (MO) .31
NITROGEN (N) .21 (N) .25
COLUMBIUM (CB) .011 (CB) .010
TITANIUM (TI) .004 (TI) .005
ALUMINUM (AL) .022 (AL) .022
TIN (SN) .006 (SN) .007



8-13-12

WE HEREBY CERTIFY THAT THE MATERIAL HEREIN HAS BEEN MADE AND TESTED IN
ACCORDANCE WITH THE LISTED SPECIFICATION(S) AND THAT THE RESULTS OF ALL
TESTS ARE ACCEPTABLE.

James Douberman
JAMES DOUBMAN, QUALITY ASSURANCE MANAGER



NDE RESULT RECORD

Page 1 of 2

REPORT OF NONDESTRUCTIVE EXAMINATION

Customer OUTOKUMPU (Shaw Modular Solutions)				Date 3/13/12	
Address PO BOX 370, 549 W State Rd 38 New Castle, IN 47362				Control No. or Report No. 28933	
Job or Project Location New Castle, Indiana Plant		PO No: 28862B	Owner: Shaw Modular Solutions		Plan or Drawing No N/A
Surface Condition SMOOTH		Heat No. SEE BELOW	Heat Treat N/A		Type of Material 2101CO
					Temp of Material 65°F
Type of Examination UT (SHEAR WAVE)		Examination Standard ASTM A577-90		Acceptance Standard ASTM A577-90	NDT Procedure No. SP-UT-1 App II-U Rev 5
ORDER NO.	HEAT NO.	Acc	Rej	Defect Code	Remarks

ORDER NO.	HEAT NO.	Acc	Rej	Defect Code	Remarks
278834	609633-5A	X			.250 x 108 x 222
278834	853605-4A	X			.625 x 117 x 410
278834	853602-4A	X			.625 x 117 x 410
278834	853601-2A	X			.625 x 117 x 410
278834	853605-1A	X			.625 x 117 x 410
278834	853605-2A	X			.625 x 117 x 410
278834	853604-1A	X			.625 x 117 x 410
278834	853604-2A	X			.625 x 117 x 410
278834	609642-3A	X			.625 x 117 x 410
278834	609641-2A	X			.625 x 117 x 410
278834	609645-1A	X			.625 x 117 x 410
	Type of Work New	No of Items Accepted 11	No of Items Rejected -0-		

Remarks: The plates listed above were ultrasonically tested for indications in accordance with listed standards and procedures.

Conclusion: No recordable indications were noted at the time of this inspection.

Client Personnel _____ Technician Robert Caddel _____ SNT-TC-1A Level II Ultrasonic

3-14-12

**SHAW
POWER**

OCT 15 2012

003

**NDE TECHNIQUE RECORD
ULTRASONIC**

Facility QC Control No. 290850	Technique No. Master
Client Outokumpu / Shaw Modular Solutions	P.O. No. 28862B
Item Description Stainless Steel Plate	
Part No. N/A	Drawing No. N/A
Specification ASTM A577-90	Acceptance ASTM A577-90
Procedure SP-UT-1 App II-U Rev.5	

WELDS**OTHER TEST ITEMS**

Weld Joint N/A	Type of Item Stainless Steel Plate
Weld Process N/A	Processing Rolled
Base Material N/A	Material 2101CO
Material Thickness N/A	Dimensions See Page 1
Weld Length/OD N/A	Additional Info N/A
Surface Condition N/A	Surface Condition Smooth
PRECLEAN: Method N/A	Material N/A Batch No. N/A
EQUIPMENT: Make Krautkramer	Model USN 52 S/N 00NC078
PRESENTATION <input checked="" type="checkbox"/> A-SCAN	<input type="checkbox"/> B-SCAN <input type="checkbox"/> C-SCAN

TRANSDUCERS:

Make Krautkramer Model S/N 00W86X Sound Beam Angle (Material) 70°
Crystal Size .76" x .625" Crystal Material Ceramic Frequency 2.25 MHz

COUPLANT: Material Water Manufacturer N/A Batch No. N/A

CALIBRATION BLOCK: Type Part Material 2101CO S/N N/A

METHOD ☒ Contact ☐ Immersion ☐ Water Column
☒ Pulse Echo ☐ Resonance ☐ Through Transmission

SCANNING: ☒ Manual ☐ Automatic

Pattern 100% Scanning Speed < 6"Per/Sec. % Overlap N/A
POST CLEAN: Method N/A 10%

OTHER INFORMATION:**SHAW
POWER**

OCT 15 2012

003

Prepared By: Robert Caddel	Approved by: N/A	Date 3/13/12	PAGE 2 OF 2
-------------------------------	---------------------	-----------------	-------------


3-14-12



NDE RESULT RECORD

Page 1 of 2

REPORT OF NONDESTRUCTIVE EXAMINATION

Customer OUTOKUMPU (Shaw Modular Solutions)				Date 3/13/12	
Address PO BOX 370, 549 W State Rd 38 New Castle, IN 47362				Control No. or Report No. 290850	
Job or Project Location New Castle, Indiana Plant		PO No: 28862B	Owner: Shaw Modular Solutions		Plan or Drawing No. N/A
Surface Condition SMOOTH		Heat No. SEE BELOW	Heat Treat N/A		Type of Material 2101CO
					Temp of Material 65°F
Type of Examination UT (STRAIGHT BEAM)	Examination Standard ASTM A578-07		Acceptance Standard ASTM A578-07 Level B S1		NDT Procedure No. SP-UT-1 App II-U Rev 5
ORDER NO.	HEAT NO.	Acc	Rej	Defect Code	Remarks
278834	609633-5A	X			.250 x 108 x 222
278834	853605-4A	X			.625 x 117 x 410
278834	853602-4A	X			.625 x 117 x 410
278834	853601-2A	X			.625 x 117 x 410
278834	853605-1A	X			.625 x 117 x 410
278834	853605-2A	X			.625 x 117 x 410
278834	853604-1A	X			.625 x 117 x 410
278834	853604-2A	X			.625 x 117 x 410
278834	609642-3A	X			.625 x 117 x 410
278834	609641-2A	X			.625 x 117 x 410
278834	609645-1A	X			.625 x 117 x 410
Type of Work New		No of Items Accepted 11		No of Items Rejected -0-	
Remarks: The plates listed above were ultrasonically tested for indications in accordance with listed standards and procedures.					
Conclusion: No recordable indications were noted at the time of this inspection.					
Client Personnel _____ Technician <u>Robert Caddel</u>  SNT-TC-1A Level II Ultrasonic					

3-14-12


SHAW
POWER

OCT 15 2012

003



NDE TECHNIQUE RECORD ULTRASONIC

Facility QC Control No. <u>290850</u>	Technique No. <u>Master</u>
Client <u>Outokumpu / Shaw Modular Solutions</u>	P.O. No. <u>28862B</u>
Item Description <u>Stainless Steel Plate</u>	
Part No. <u>N/A</u>	Drawing No. <u>N/A</u>
Specification <u>ASTM A578-07</u>	Acceptance <u>ASTM A578-07 Level B S1</u>
Procedure <u>SP-UT-1 App II-U Rev.5</u>	

WELDS	OTHER TEST ITEMS
Weld Joint <u>N/A</u>	Type of Item <u>Stainless Steel Plate</u>
Weld Process <u>N/A</u>	Processing <u>Rolled</u>
Base Material <u>N/A</u>	Material <u>2101CO</u>
Material Thickness <u>N/A</u>	Dimensions <u>See Page 1</u>
Weld Length/OD <u>N/A</u>	Additional Info <u>N/A</u>
Surface Condition <u>N/A</u>	Surface Condition <u>Smooth</u>
PRECLEAN: Method <u>N/A</u>	Material <u>N/A</u> Batch No. <u>N/A</u>
EQUIPMENT: Make <u>Krautkramer</u>	Model <u>USN 52</u> S/N <u>00NC078</u>
PRESENTATION <input checked="" type="checkbox"/> A-SCAN	<input type="checkbox"/> B-SCAN <input type="checkbox"/> C-SCAN

TRANSDUCERS:
 Make Panametric Model V104 S/N 570465 Sound Beam Angle (Material) 0°
 Crystal Size 1" Dia. Crystal Material Ceramic Frequency 2.25 MHz

COUPLANT: Material Water Manufacturer N/A Batch No. N/A

CALIBRATION BLOCK: Type Part Material 2101CO S/N N/A

METHOD ☒ Contact ☐ Immersion ☐ Water Column
☒ Pulse Echo ☐ Resonance ☐ Through Transmission

SCANNING: ☒ Manual ☐ Automatic

Pattern 100% Scanning Speed < 6"Per/Sec. % Overlap N/A
 POST CLEAN: Method N/A 10%

OTHER INFORMATION:

**SHAW
POWER**

OCT 15 2012

003

Prepared By: <u>Robert Caddel</u>	Approved by: <u>N/A</u>	Date <u>3/13/12</u>	PAGE 2 OF 2
--------------------------------------	----------------------------	------------------------	-------------

3-14-12



INDUSTRIAL TESTING LABORATORY SERVICES, LLC
635 Alpha Drive – RIDC Park
Pittsburgh, PA 15238 Phone: 412.963.1900 Fax: 412.963.1926
e-mail: info@itls.com website: itls.com

TEST REPORT
L19572
May 7, 2012

**SHAW
POWER**

OCT 09 2012

012

Purchase Order No: 694689-000 OP

To: Shaw Modular Solutions LLC
3191 West Lincoln Road
Lake Charles, LA 70605

Attn: Nick Koseski

Sample Received:

ITLS received four (4) samples for Chemical, Mechanical, Hardness, Impact, Ferrite and Intergranular Corrosion evaluation, identified as follows:

Sample #	Heat #	Description	Supplier
1	853603-1A	0.625" thick Duplex Plate	Outokumpu
2	853603-1A	0.625" thick Duplex Plate	Outokumpu
3	853841-5A	0.250" thick Duplex Plate	Outokumpu
4	853841-5A	0.250" thick Duplex Plate	Outokumpu

Acceptance:

Sample #	Test	Acceptance
All	Chemical Analysis	APP-VL52-Z0-023, Rev. 1, ASTM A240-11b (UNS S32101)
All	Mechanical	APP-VL52-Z0-023, Rev. 1, ASTM A240-11b (UNS S32101), A480-11b
All	Rockwell B	ASTM A240-11b (UNS S32101), A480-11b
All	Ferrite	APP-VL52-Z0-023, Rev. 1, ASTM E562-11, Method A
All	Impact	APP-VL52-Z0-023, Rev. 1, ASTM A923-08, Method B
All	Intergranular Corrosion	ISO 3651-2 Method A

SMS QC
ACCEPT

13

7-12-12



Shaw Modular Solutions, LLC
ITLS Report L19572
May 7, 2012

Test References:

Specification	Title
ASTM A751-11	Standard Test Methods, Practices, and Terminology for Chemical Analysis of Steel Products
ASTM A370-12	Standard Test Methods and Definitions for Mechanical Testing of Steel Products
ASTM E8-11	Standard Test Methods for Tension Testing of Metallic Materials
ASTM E140-07	Standard Hardness Conversion Tables for Metals
ASTM E23-07a ^{e1}	Standard Test Methods for Notched Bar Impact Testing of Metallic Materials
ASTM E3-11	Standard Guide for Preparation of Metallographic Specimens
ASTM E18-08b	Standard Test Methods for Rockwell Hardness of Metallic Materials
ASTM E1245-03 (2008)	Standard Practice for Determining the Inclusion of Second-Phase Constituent Content of Metals by Automatic Image Analysis
ASTM E562-11	Standard Test Method for Determining Volume Fraction by Systematic Manual Point Count

Quality References:

Reference
10CFR21, 10CFR50.55(e) and 10CFR50 App.B
ASME NQA-1 – 1994 Basic and Supplementary Requirements
USNRC Regulatory Guide 1.28 Rev. 3
ITLS QA Manual Rev. 3 dated 06/20/08
No ITLS subcontractors used for completion of this order

SHAW
POWER
OCT 09 2012
012

SMS QC
ACCEPT

13

7-12-12



Shaw Modular Solutions, LLC
ITLS Report L19572
May 7, 2012

Results:

Chemical Analysis – ASTM A751-11 (OES/Leco)

Sample #	Composition (wt%)													
	C	Mn	P	S	Si	Ni	Cr	Mo	N	Cu	Co	Al	V	Total Others
1	0.029	4.94	0.021	0.001	0.78	1.52	21.3	0.22	0.22	0.40	<0.01	0.02	0.08	0.10
2	0.031	4.84	0.023	0.001	0.77	1.56	21.3	0.22	0.22	0.39	<0.01	0.02	0.08	0.10
3	0.037	4.83	0.021	0.001	0.67	1.44	21.4	0.21	0.22	0.37	<0.01	0.01	0.09	0.10
4	0.035	4.85	0.022	0.001	0.68	1.56	21.0	0.21	0.22	0.38	<0.01	0.02	0.09	0.11
Required	0.040 Max	4.00 6.00	0.040 Max	0.030 Max	1.00 Max	1.35 1.70	21.0 22.0	0.10 0.80	0.20 0.25	0.10 0.80	0.05 Max	0.10 Max	0.10 Max	0.50 Max

ACCEPTABLE

Impact Test – ASTM A923-08 Method B

Sample #	Temperature (°F)	Absorbed Energy (ft-lbs)
1	-40	52
2	-40	54
3*	-40	27
4*	-40	35
Required	-40	20 Min

*Note: Specimen size 10mm x 6.7mm, 2/3 size per ASTM A673. Absorbed energy values converted per ASTM A673 Table 1.

ACCEPTABLE

SMS QC
ACCEPT

13

7-12-12

SHAW
POWER
OCT 09 2012
012

OCT 09 2012



012

Shaw Modular Solutions, LLC
ITLS Report L19572
May 7, 2012

Results (cont):

Mechanical Properties – ASTM E8-11 (Flat) & ASTM E18-08b (HRB)

Sample #	Test Temp (°F)	Initial Dimensions (in)	Initial Area (in ²)	*Yield Strength (ksi)	Tensile Strength (ksi)	Elongation (%) in 2"	Hardness HRB** (Avg. of 3)
1	Room	0.498 x 0.675	0.3362	72	102	50	97
2	Room	0.498 x 0.675	0.3362	73	103	46	96
3	Room	0.501 x 0.288	0.1443	84	106	41	97
4	Room	0.500 x 0.281	0.1405	86	108	42	98
Required				65 Min	94 Min	30 Min	290 HBW Max

*Yield calculated at 0.20% offset

ACCEPTABLE

**Customer requested hardness in Rockwell B. All measured values were between 96 and 98 HRB which is approximately equal to Brinell 216 to 240 based on ASTM E140 Tables 2 and 5. These values are well below the specified max of 290 HBW and are therefore acceptable.

Ferrite Testing – ASTM E562-11 Method A

Sample #	Ferrite (%)
1	54
2	49
3	49
4	46
Required	40 - 60%

Ferrite volume fraction tested with Image Analysis per ASTM E1245-03(2008). ASTM E562 offers the use of ASTM E1245 to determine the same measurements.

ACCEPTABLE

SMS QC
ACCEPT

13

7-12-12



Shaw Modular Solutions, LLC
ITLS Report L19572
May 7, 2012

Results (cont.):

Intergranular Corrosion Test – ISO 3651-2 Method A

Sample #	Bend Radius	Bend	Result
1	1T	90°	Accept – No Cracking Observed
2	1T	90°	Accept – No Cracking Observed
3	1T	90°	Accept – No Cracking Observed
4	1T	90°	Accept – No Cracking Observed
Required	1T	90°	No Cracking @ 10X

ACCEPTABLE

This certification affirms that the contents are correct and accurate, and that the test operations performed by Industrial Testing Laboratory Services are in compliance with the material specification, ITLS Quality Assurance Manual Rev. 3 dated 6/20/2008, ASME NQA-1 1994, Regulatory Guide 1.28, 10 CFR 50 App. B, 10 CFR Part 21 and any additional requirements of SMS Purchase Order # 694689. Test Results comply with the PO required material specification(s) as noted below.

All Samples: **ACCEPTABLE**

Signature _____

A handwritten signature in black ink, appearing to be "R.D. Brown", is written over a horizontal line.

Date 5/7/2012

SMS QC
ACCEPT

13

7-12-12

SHAW
POWER
OCT 09 2012
012



INDUSTRIAL TESTING LABORATORY SERVICES, LLC
635 Alpha Drive – RIDC Park
Pittsburgh, PA 15238 Phone: 412.963.1900 Fax: 412.963.1926
e-mail: info@itls.com website: itls.com

TEST REPORT
L19352
April 5, 2012

Purchase Order No: 694689-000 OP

To: Shaw Modular Solutions LLC
3191 West Lincoln Road
Lake Charles, LA 70605

Attn: Nick Koseski

**SHAW
POWER**

OCT 09 2012

012

SMS QC
ACCEPT

13

7-25-12

Sample Received:

ITLS received ten (10) samples for Chemical, Mechanical, Hardness, Impact, Ferrite and Intergranular Corrosion evaluation, identified as follows:

Sample #	Heat #	Gauge	Supplier
1	609632-1A	0.625	Outokumpu
2	609632-1A	0.625	Outokumpu
3	609633-1A	0.625	Outokumpu
4	609633-1A	0.625	Outokumpu
5	609642-1A	0.625	Outokumpu
6	609642-1A	0.625	Outokumpu
7	853602-1A	0.625	Outokumpu
8	853602-1A	0.625	Outokumpu
9	853604-1A	0.625	Outokumpu
10	853604-1A	0.625	Outokumpu

Acceptance:

Sample #	Test	Acceptance
All	Chemical Analysis	APP-VL52-Z0-023, Rev. 1, ASTM A240-11b (UNS S32101)
All	Mechanical	APP-VL52-Z0-023, Rev. 1, ASTM A240-11b (UNS S32101), A480-11b
All	Rockwell B	ASTM A240-11b (UNS S32101), A480-11b
All	Ferrite	APP-VL52-Z0-023, Rev. 1, ASTM E562-11, Method A
All	Impact	APP-VL52-Z0-023, Rev. 1, ASTM A923-08, Method B
All	Intergranular Corrosion	ISO 3651-2 Method A



SHAW
POWER
OCT 09 2012
012

Shaw Modular Solutions, LLC
ITLS Report L19352
April 5, 2012

Test References:

Specification	Title
ASTM A751-11	Standard Test Methods, Practices, and Terminology for Chemical Analysis of Steel Products
ASTM A370-11a	Standard Test Methods and Definitions for Mechanical Testing of Steel Products
ASTM E8-11	Standard Test Methods for Tension Testing of Metallic Materials
ASTM E140-07	Standard Hardness Conversion Tables for Metals
ASTM E23-07a ^{e1}	Standard Test Methods for Notched Bar Impact Testing of Metallic Materials
ASTM E3-11	Standard Guide for Preparation of Metallographic Specimens
ASTM E18-08b	Standard Test Methods for Rockwell Hardness of Metallic Materials
ASTM E1245-03 (2008)	Standard Practice for Determining the Inclusion of Second-Phase Constituent Content of Metals by Automatic Image Analysis
ASTM E562-11	Standard Test Method for Determining volume Fraction by Systematic Manual Point Count

Quality References:

Reference
10CFR21, 10CFR50.55(e) and 10CFR50 App.B
ASME NQA-1 – 1994 Basic and Supplementary Requirements
USNRC Regulatory Guide 1.28 Rev. 3
ITLS QA Manual Rev. 3 dated 06/20/08
No ITLS subcontractors used for completion of this order

SMS QC
ACCEPT

13

7-25-12



Shaw Modular Solutions, LLC
ITLS Report L19352
April 5, 2012

Results:

Chemical Analysis – ASTM A751-11 (OES)

SMS QC
ACCEPT
13
7-25-12

SHAW
POWER
OCT 0 9 2012
012

Sample #	Composition (wt%)													
	C	Mn	P	S	Si	Ni	Cr	Mo	N	Cu	Co	Al	V	Total Others
1 -	0.021	4.87	0.015	<0.002	0.67	1.60	21.2	0.19	0.22	0.39	<0.01	0.07	0.07	0.14
2 -	0.022	4.95	0.017	<0.002	0.68	1.62	21.2	0.19	0.22	0.39	<0.01	0.07	0.08	0.14
3	0.023	4.96	0.019	<0.002	0.68	1.63	21.3	0.19	0.21	0.39	<0.01	0.07	0.08	0.14
4	0.023	4.97	0.018	<0.002	0.68	1.63	21.2	0.19	0.22	0.39	<0.01	0.07	0.08	0.14
5 -	0.021	4.86	0.018	<0.002	0.67	1.60	21.2	0.30	0.23	0.35	<0.01	0.07	0.10	0.17
6 -	0.021	4.94	0.019	<0.002	0.68	1.62	21.2	0.30	0.23	0.35	<0.01	0.07	0.10	0.17
7 -	0.023	5.08	0.017	<0.002	0.79	1.56	21.2	0.20	0.22	0.39	<0.01	0.06	0.08	0.15
8 -	0.023	5.15	0.018	<0.002	0.79	1.58	21.2	0.19	0.22	0.38	<0.01	0.06	0.08	0.14
9 -	0.024	5.22	0.019	<0.002	0.78	1.59	21.2	0.20	0.22	0.38	<0.01	0.06	0.08	0.14
10 -	0.023	5.24	0.018	<0.002	0.78	1.58	21.3	0.19	0.21	0.38	<0.01	0.06	0.08	0.14
Required	0.040 Max	4.00 6.00	0.040 Max	0.030 Max	1.00 Max	1.35 1.70	21.0 22.0	0.10 0.80	0.20 0.25	0.10 0.80	0.05 Max	0.10 Max	0.10 Max	0.50 Max

ACCEPTABLE



SHAW
POWER

OCT 09 2012

012

Shaw Modular Solutions, LLC
ITLS Report L19352
April 5, 2012

Mechanical Properties – ASTM E8-09 (Flat) & ASTM E18-08b (HRB)

Sample #	Test Temp (°F)	Initial Dimensions (in)	Initial Area (in ²)	*Yield Strength (ksi)	Tensile Strength (ksi)	Elongation (%) in 2"	Hardness HRB** (Avg. of 3)
1	Room	0.499 x 0.660	0.3293	71	102	46	95
2	Room	0.497 x 0.668	0.3320	73	103	47	96
3	Room	0.508 x 0.659	0.3348	70	100	50	96
4	Room	0.499 x 0.672	0.3353	73	102	50	96
5	Room	0.497 x 0.654	0.3250	72	103	48	95
6	Room	0.500 x 0.642	0.3210	72	102	50	96
7	Room	0.497 x 0.670	0.3330	73	105	45	97
8	Room	0.500 x 0.683	0.3415	73	104	46	96
9	Room	0.496 x 0.650	0.3224	74	105	46	96
10	Room	0.500 x 0.670	0.3350	75	104	46	97
Required				65 Min	94 Min	30 Min	290 HBW Max

*Yield calculated at 0.20% offset

ACCEPTABLE

**Customer requested hardness in Rockwell B. All measured values were between 95 and 97 HRB which is approximately equal to Brinell 210 to 233 based on ASTM E140 Tables 2 and 5. These values are well below the specified max of 290 HBW and are therefore acceptable.

SMS QO
ACCEPT

13

7-25-12



Shaw Modular Solutions, LLC
ITLS Report L19352
April 5, 2012

SHAW
POWER

OCT 09 2012

012

Results (cont.):

Impact Test – ASTM A923-08 Method B

Sample #	Temperature (°F)	Absorbed Energy (ft-lbs)
1	-40	56
2	-40	48
3	-40	59
4	-40	61
5	-40	42
6	-40	45
7	-40	55
8	-40	50
9	-40	60
10	-40	54
Required	-40	20 Min

ACCEPTABLE

Ferrite Testing – ASTM E562-11 Method A

Sample #	Ferrite (%)
1	51
2	51
3	52
4	49
5	52
6	53
7	53
8	53
9	54
10	53
Required	40 - 60%

SMS QC
ACCEPT
13
7-25-12

Ferrite volume fraction tested with Image Analysis per ASTM E1245-03(2008). ASTM E562 offers the use of ASTM E1245 to determine the same measurements.

ACCEPTABLE



SHAW
POWER

OCT 09 2012

012

Shaw Modular Solutions, LLC
ITLS Report L19352
April 5, 2012

Results (cont.):

Intergranular Corrosion Test – ISO 3651-2 Method A

Sample #	Bend Radius	Bend	Result
1	1T	90°	Accept – No Cracking Observed
2	1T	90°	Accept – No Cracking Observed
3	1T	90°	Accept – No Cracking Observed
4	1T	90°	Accept – No Cracking Observed
5	1T	90°	Accept – No Cracking Observed
6	1T	90°	Accept – No Cracking Observed
7	1T	90°	Accept – No Cracking Observed
8	1T	90°	Accept – No Cracking Observed
9	1T	90°	Accept – No Cracking Observed
10	1T	90°	Accept – No Cracking Observed
Required	1T	90°	No Cracking @ 10X

ACCEPTABLE

This certification affirms that the contents are correct and accurate, and that the test operations performed by Industrial Testing Laboratory Services are in compliance with the material specification, ITLS Quality Assurance Manual Rev. 3 dated 6/20/2008, ASME NQA-1 1994, Regulatory Guide 1.28, 10 CFR 50 App. B, 10 CFR Part 21 and any additional requirements of SMS Purchase Order # 694689. Test Results comply with the PO required material specification(s) as noted below.

All Samples: **ACCEPTABLE**

Signature 

Date 4/5/2012

SMS QC
ACCEPT

13

7-25-12

**OUTO
KUMPU****Certificate of Analysis and Tests**

OUR ORDER 0278834 - 05

HEAT & PIECE 853605-4A 03/14/12

SOLD TO: SHAW MODULAR SOLUTIONS, L.L.C. SHIP TO: SHAW MODULAR SOLUTIONS, L.L.C.
3191 W LINCOLN ROAD 3191 W LINCOLN ROAD

LAKE CHARLES

LA 70605

LAKE CHARLES

LA 70605

----- YOUR ORDER & DATE -----
746363 12/22/11 TAG# P/N #2232445
 ----- ITEM DESCRIPTION -----
 HEAT & PIECE **853605 - 4A**
 WEIGHT 8938
 FINISH 1
 GRADE 2101 UNS S32101
 DIMENSIONS .625 X 117.000 X 410.000 EXACT

----- SPECIFICATIONS -----
 *** MFG IN NEW CASTLE, IN, USA FROM SLABS IMPORTED FROM BRITAIN
 ASTM A240-11A ASMESA240-11ED ASTM A480-11A ASMESA480 11ED
 REQUIRES PRODUCT ANALYSIS OSI QA MAN ED 2 R 1 10/15/02
 ASTM E562-08 (10% ACCURACY) UHA 51 CHARPY @ -40F (-40C)
 ASTM A923-06 METHOD A&B ONLY UT ASTM A578-07 LEVEL B S1
 U. T. TEST TO ASTM A 577-90 NON STANDARD PROPERTIES REQD
 APP-VL52-ZO-023 R1 W/EXCEPTS ISO 3651-2
 COUPONS REQUIRED ASTM A262-02A PRACTICE A
 ASTM A262-02A PRACTICE E SMS PO REQMTS WITH EXCEPTS
 NO GRIPPER MARKS NO WELD REPAIRS

PLATES & TEST PCS SOLUTION ANNEALED @ 1900 DEGREES FAHRENHEIT MINIMUM.
 THEN WATER QUENCHED
 FREE FROM MERCURY CONTAMINATION AT CURRENT DETECTION LIMITS
 HOT ROLLED, ANNEALED & PICKLED (HRAP)

----- MECHANICAL & OTHER TESTS -----
 HARDNESS HRC 18
 YIELD STRENGTH (PSI) 65685
 TENSILE STRENGTH (PSI) 94130
 BEND OK
 INTERGRANULAR CORROSION OK
 ELONGATION % IN 2" 34.7
 REDUCTION OF AREA % 57.3
 ASTM E-562 POINT COUNT FERRITE @ 500X = 44% AT 10% RELATIVE ACCURACY
 CHARPY TEST AT -40F (TRANS) 60, 142, 72 FT-LBS. FULL SAMPLE SIZE
 LATERAL EXPANSION = 44, 60, 51 (MILS)

----- CHEMICAL COMPOSITION ----- PRODUCT ANALYSIS -----
 CARBON (C) .028 (C) .016
 MANGANESE (MN) 4.95 (MN) 4.55
 PHOSPHORUS (P) .026 (P) .020
 SULFUR (S) .001 (S) .007
 SILICON (SI) .79 (SI) .75
 CHROMIUM (CR) 21.53 (CR) 21.10
 NICKEL (NI) 1.56 (NI) 1.54
 COBALT (CO) .04 (CO) .04
 COPPER (CU) .35 (CU) .36
 MOLY (MO) .23 (MO) .22
 NITROGEN (N) .22 (N) .23
 COLUMBIUM (CB) .011 (CB) .006
 TITANIUM (TI) .001 (TI) .004
 ALUMINUM (AL) .020 (AL) .017
 TIN (SN) .009 (SN) .007
 TANTALUM (TA) .002 (TA)

**SHAW
POWER**

OCT 15 2012

003

8-13-12

WE HEREBY CERTIFY THAT THE MATERIAL HEREIN HAS BEEN MADE AND TESTED IN
 ACCORDANCE WITH THE LISTED SPECIFICATION(S) AND THAT THE RESULTS OF ALL
 TESTS ARE ACCEPTABLE.

JAMES DOUBMAN, QUALITY ASSURANCE MANAGER



NDE RESULT RECORD

Page 1 of 2

REPORT OF NONDESTRUCTIVE EXAMINATION

Customer OUTOKUMPU (Shaw Modular Solutions)				Date 3/13/12	
Address PO BOX 370, 549 W State Rd 38 New Castle ,IN 47362				Control No. or Report No. 28933	
Job or Project Location New Castle, Indiana Plant		PO No: 28862B	Owner: Shaw Modular Solutions		Plan or Drawing No N/A
Surface Condition SMOOTH		Heat No. SEE BELOW	Heat Treat N/A		Type of Material 2101CO
					Temp of Material 65°F
Type of Examination UT (SHEAR WAVE)		Examination Standard ASTM A577-90		Acceptance Standard ASTM A577-90	
				NDT Procedure No. SP-UT-1 App II-U Rev 5	
ORDER NO.	HEAT NO.	Acc	Rel	Defect Code	Remarks

ORDER NO.	HEAT NO.	Acc	Rej	Defect Code	Remarks
278834	609633-5A	X			.250 x 108 x 222
278834	853605-4A	X			.625 x 117 x 410
278834	853602-4A	X			.625 x 117 x 410
278834	853601-2A	X			.625 x 117 x 410
278834	853605-1A	X			.625 x 117 x 410
278834	853605-2A	X			.625 x 117 x 410
278834	853604-1A	X			.625 x 117 x 410
278834	853604-2A	X			.625 x 117 x 410
278834	609642-3A	X			.625 x 117 x 410
278834	609641-2A	X			.625 x 117 x 410
278834	609645-1A	X			.625 x 117 x 410
	Type of Work New	No of Items Accepted 11	No of Items Rejected -0-		

Remarks: The plates listed above were ultrasonically tested for indications in accordance with listed standards and procedures.

Conclusion: No recordable indications were noted at the time of this inspection.

Client Personnel Technician Robert Caddel SNT-TC-1A Level II Ultrasonic

3-14-12

**SHAW
POWER**

OCT 15 2012

003



NDE TECHNIQUE RECORD ULTRASONIC

Facility QC Control No. <u>290850</u>	Technique No. <u>Master</u>
Client <u>Outokumpu / Shaw Modular Solutions</u>	P.O. No. <u>28862B</u>
Item Description <u>Stainless Steel Plate</u>	
Part No. <u>N/A</u>	Drawing No. <u>N/A</u>
Specification <u>ASTM A577-90</u>	Acceptance <u>ASTM A577-90</u>
Procedure <u>SP-UT-1 App II-U Rev.5</u>	

WELDS

OTHER TEST ITEMS

Weld Joint <u>N/A</u>	Type of Item <u>Stainless Steel Plate</u>
Weld Process <u>N/A</u>	Processing <u>Rolled</u>
Base Material <u>N/A</u>	Material <u>2101CO</u>
Material Thickness <u>N/A</u>	Dimensions <u>See Page 1</u>
Weld Length/OD <u>N/A</u>	Additional Info <u>N/A</u>
Surface Condition <u>N/A</u>	Surface Condition <u>Smooth</u>
PRECLEAN: Method <u>N/A</u>	Material <u>N/A</u> Batch No. <u>N/A</u>
EQUIPMENT: Make <u>Krautkramer</u>	Model <u>USN 52</u> S/N <u>00NC078</u>
PRESENTATION <input checked="" type="checkbox"/> A-SCAN	<input type="checkbox"/> B-SCAN <input type="checkbox"/> C-SCAN

TRANSDUCERS:

Make <u>Krautkramer</u> Model <u>00W86X</u>	S/N <u>00W86X</u>	Sound Beam Angle (Material) <u>70°</u>
Crystal Size <u>.76" x .625"</u>	Crystal Material <u>Ceramic</u>	Frequency <u>2.25 MHz</u>
COUPLANT: Material <u>Water</u>	Manufacturer <u>N/A</u>	Batch No. <u>N/A</u>
CALIBRATION BLOCK: Type <u>Part</u>	Material <u>2101CO</u>	S/N <u>N/A</u>
METHOD <input checked="" type="checkbox"/> Contact	<input type="checkbox"/> Immersion	<input type="checkbox"/> Water Column
<input checked="" type="checkbox"/> Pulse Echo	<input type="checkbox"/> Resonance	<input type="checkbox"/> Through Transmission
SCANNING: <input checked="" type="checkbox"/> Manual	<input type="checkbox"/> Automatic	
Pattern <u>100%</u>	Scanning Speed <u>< 6"Per/Sec.</u>	% Overlap <u>N/A</u>
POST CLEAN: Method <u>N/A</u>		10%

OTHER INFORMATION:

**SHAW
POWER**

OCT 15 2012

003

Prepared By: <u>Robert Caddel</u>	Approved by: <u>N/A</u>	Date <u>3/13/12</u>	PAGE 2 OF 2
--------------------------------------	----------------------------	------------------------	-------------

3-14-12



NDE RESULT RECORD

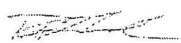
Page 1 of 2

REPORT OF NONDESTRUCTIVE EXAMINATION

Customer OUTOKUMPU (Shaw Modular Solutions)				Date 3/13/12	
Address PO BOX 370, 549 W State Rd 38 New Castle, IN 47362				Control No. or Report No. 290850	
Job or Project Location New Castle, Indiana Plant		PO No: 28862B	Owner: Shaw Modular Solutions		Plan or Drawing No N/A
Surface Condition SMOOTH		Heat No. SEE BELOW	Heat Treat N/A		Type of Material 2101CO
					Temp of Material 65°F
Type of Examination UT (STRAIGHT BEAM)	Examination Standard ASTM A578-07		Acceptance Standard ASTM A578-07 Level B S1		NDT Procedure No. SP-UT-1 App II-U Rev 5
ORDER NO.	HEAT NO.	Acc	Rej	Defect Code	Remarks
278834	609633-5A	X			.250 x 108 x 222
278834	853605-4A	X			.625 x 117 x 410
278834	853602-4A	X			.625 x 117 x 410
278834	853601-2A	X			.625 x 117 x 410
278834	853605-1A	X			.625 x 117 x 410
278834	853605-2A	X			.625 x 117 x 410
278834	853604-1A	X			.625 x 117 x 410
278834	853604-2A	X			.625 x 117 x 410
278834	609642-3A	X			.625 x 117 x 410
278834	609641-2A	X			.625 x 117 x 410
278834	609645-1A	X			.625 x 117 x 410
Type of Work New		No of Items Accepted 11		No of Items Rejected -0-	

Remarks: The plates listed above were ultrasonically tested for indications in accordance with listed standards and procedures.

Conclusion: No recordable indications were noted at the time of this inspection.

Client Personnel _____ Technician Robert Caddel  SNT-TC-1A Level II Ultrasonic

3-14-12


**SHAW
POWER**

OCT 15 2012

003

**NDE TECHNIQUE RECORD
ULTRASONIC**

Facility QC Control No. <u>290850</u>	Technique No. <u>Master</u>
Client <u>Outokumpu / Shaw Modular Solutions</u>	P.O. No. <u>28862B</u>
Item Description <u>Stainless Steel Plate</u>	
Part No. <u>N/A</u>	Drawing No. <u>N/A</u>
Specification <u>ASTM A578-07</u>	Acceptance <u>ASTM A578-07 Level B S1</u>
Procedure <u>SP-UT-1 App II-U Rev.5</u>	

WELDS		OTHER TEST ITEMS	
Weld Joint <u>N/A</u>	Type of Item <u>Stainless Steel Plate</u>		
Weld Process <u>N/A</u>	Processing <u>Rolled</u>		
Base Material <u>N/A</u>	Material <u>2101CO</u>		
Material Thickness <u>N/A</u>	Dimensions <u>See Page 1</u>		
Weld Length/OD <u>N/A</u>	Additional Info <u>N/A</u>		
Surface Condition <u>N/A</u>	Surface Condition <u>Smooth</u>		
PRECLEAN: Method <u>N/A</u>	Material <u>N/A</u>	Batch No. <u>N/A</u>	
EQUIPMENT: Make <u>Krautkramer</u>	Model <u>USN 52</u>	S/N <u>00NC078</u>	
PRESENTATION <input checked="" type="checkbox"/> A-SCAN	<input type="checkbox"/> B-SCAN	<input type="checkbox"/> C-SCAN	

TRANSDUCERS:
Make Panametric Model V104 S/N 570465 Sound Beam Angle (Material) 0°
Crystal Size 1" Dia. Crystal Material Ceramic Frequency 2.25 MHz

COUPLANT: Material Water Manufacturer N/A Batch No. N/A

CALIBRATION BLOCK: Type Part Material 2101CO S/N N/A

METHOD ☒ Contact ☐ Immersion ☐ Water Column
☒ Pulse Echo ☐ Resonance ☐ Through Transmission

SCANNING: ☒ Manual ☐ Automatic

Pattern 100% Scanning Speed < 6"Per/Sec. % Overlap N/A

POST CLEAN: Method N/A 10%

OTHER INFORMATION:

**SHAW
POWER**

OCT 15 2012

003

Prepared By: <u>Robert Caddel</u>	Approved by: <u>N/A</u>	Date <u>3/13/12</u>	PAGE 2 OF 2
--------------------------------------	----------------------------	------------------------	-------------

3-14-12

**OUTO
KUMPU****Certificate of Analysis and Tests**

OUR ORDER 0278834 - 01

HEAT & PIECE 609633-5A 03/23/12

SOLD TO: SHAW MODULAR SOLUTIONS, L.L.C. SHIP TO: SHAW MODULAR SOLUTIONS, L.L.C.
3191 W LINCOLN ROAD 3191 W LINCOLN ROAD

LAKE CHARLES

LA 70605

LAKE CHARLES

LA 70605

----- YOUR ORDER & DATE -----
 746363 12/22/11 TAG# P/N #2232423
 ----- ITEM DESCRIPTION -----
 HEAT & PIECE 609633 - 5A
 WEIGHT 1859
 FINISH 1
 GRADE 2101 UNS S32101
 DIMENSIONS .250 X 108.000 X 222.000 EXACT

 *** MFG IN NEW CASTLE, IN, USA
 ASTM A240-11A ASMESA240-11ED
 REQUIRES PRODUCT ANALYSIS
 ASTM E562-08 (10% ACCURACY)
 ASTM A923-06 METHOD A&B ONLY
 U. T. TEST TO ASTM A 577-90
 APP-VL52-ZO-023 R1 W/EXCEPTS
 COUPONS REQUIRED
 ASTM A262-02A PRACTICE E
 NO GRIPPER MARKS

----- SPECIFICATIONS -----
 FROM SLABS IMPORTED FROM SWEDEN
 ASTM A480-11A ASMESA480 11ED
 OSI QA MAN ED 2 R 1 10/15/02
 UHA 51 CHARPY @ -40F (-40C)
 UT ASTM A578-07 LEVEL B S1
 NON STANDARD PROPERTIES REQD
 ISO 3651-2
 ASTM A262-02A PRACTICE A
 SMS PO REQMTS WITH EXCEPTS
 NO WELD REPAIRS

PLATES & TEST PCS SOLUTION ANNEALED @ 1900 DEGREES FAHRENHEIT MINIMUM.
 THEN WATER QUENCHED
 FREE FROM MERCURY CONTAMINATION AT CURRENT DETECTION LIMITS
 HOT ROLLED, ANNEALED & PICKLED (HRAP)

----- MECHANICAL & OTHER TESTS -----
 HARDNESS HRC 18
 YIELD STRENGTH (PSI) 85159
 TENSILE STRENGTH (PSI) 107540
 BEND OK
 INTERGRANULAR CORROSION OK
 ELONGATION % IN 2" 31.2
 REDUCTION OF AREA % 58.8
 ASTM E-562 POINT COUNT FERRITE @ 500X = 45% AT 10% RELATIVE ACCURACY
 CHARPY TEST AT -40F (TRANS) 33, 32, 34 FT-LBS. 1/2 SAMPLE SIZE
 LATERAL EXPANSION = 42, 45, 46 (MILS)

----- CHEMICAL COMPOSITION ----- PRODUCT ANALYSIS -----

CARBON (C)	.023	(C)	.016
MANGANESE (MN)	4.77	(MN)	4.36
PHOSPHORUS (P)	.021	(P)	.020
SULFUR (S)	.001	(S)	.007
SILICON (SI)	.66	(SI)	.65
CHROMIUM (CR)	21.40	(CR)	21.00
NICKEL (NI)	1.54	(NI)	1.61
COBALT (CO)	.03	(CO)	.04
COPPER (CU)	.39	(CU)	.40
MOLY (MO)	.19	(MO)	.21
NITROGEN (N)	.22	(N)	.24
COLUMBIUM (CB)	.001	(CB)	.004
TITANIUM (TI)	.003	(TI)	.004
ALUMINUM (AL)	.021	(AL)	.023
TIN (SN)	.006	(SN)	.006



10/7/12

SHAW
POWER

APR 19 2013

005

WE HEREBY CERTIFY THAT THE MATERIAL HEREIN HAS BEEN MADE AND TESTED IN
 ACCORDANCE WITH THE LISTED SPECIFICATION(S) AND THAT THE RESULTS OF ALL
 TESTS ARE ACCEPTABLE.

JAMES DOUBMAN, QUALITY ASSURANCE MANAGER

CERTIFICATE IN CONFORMANCE WITH EN10204-95 3.1.B/EN10204-2004 3.1

Outokumpu Stainless Plate, Inc.
 P.O. Box 370
 New Castle, Indiana 47362

ISSUED FOR Information (IFI)

**ACUREN**

NDE RESULT RECORD

Page 1 of 2

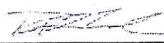
REPORT OF NONDESTRUCTIVE EXAMINATION

Customer OUTOKUMPU (Shaw Modular Solutions)		Date 3/13/12	
Address PO BOX 370, 549 W State Rd 38 New Castle ,IN 47362		Control No. or Report No. 28933	
Job or Project Location New Castle, Indiana Plant	PO No: 28862B	Owner: Shaw Modular Solutions	Plan or Drawing No N/A
Surface Condition SMOOTH	Heat No. SEE BELOW	Heat Treat N/A	Type of Material 2101CO
Type of Examination UT (SHEAR WAVE)	Examination Standard ASTM A577-90	Acceptance Standard ASTM A577-90	Temp of Material 65°F
		NDT Procedure No. SP-UT-1 App II-U Rev 5	

ORDER NO.	HEAT NO.	Acc	Rej	Defect Code	Remarks
278834	609633-5A	X			.250 x 108 x 222
278834	853605-4A	X			.625 x 117 x 410
278834	853602-4A	X			.625 x 117 x 410
278834	853601-2A	X			.625 x 117 x 410
278834	853605-1A	X			.625 x 117 x 410
278834	853605-2A	X			.625 x 117 x 410
278834	853604-1A	X			.625 x 117 x 410
278834	853604-2A	X			.625 x 117 x 410
278834	609642-3A	X			.625 x 117 x 410
278834	609641-2A	X			.625 x 117 x 410
278834	609645-1A	X			.625 x 117 x 410
Type of Work New		No of Items Accepted 11		No of Items Rejected -0-	

Remarks: The plates listed above were ultrasonically tested for indications in accordance with listed standards and procedures.

Conclusion: No recordable indications were noted at the time of this inspection.

Client Personnel _____ Technician Robert Caddel  SNT-TC-1A Level II Ultrasonic

3-14-12



10/17/12

SHAW
POWER
APR 19 2013

005



NDE TECHNIQUE RECORD ULTRASONIC

Facility QC Control No. <u>290850</u>		Technique No. <u>Master</u>	
Client <u>Outokumpu / Shaw Modular Solutions</u>		P.O. No. <u>28862B</u>	
Item Description <u>Stainless Steel Plate</u>			
Part No. <u>N/A</u>		Drawing No. <u>N/A</u>	
Specification <u>ASTM A577-90</u>		Acceptance <u>ASTM A577-90</u>	
Procedure <u>SP-UT-1 App II-U Rev.5</u>			
WELDS		OTHER TEST ITEMS	
Weld Joint <u>N/A</u>		Type of Item <u>Stainless Steel Plate</u>	
Weld Process <u>N/A</u>		Processing <u>Rolled</u>	
Base Material <u>N/A</u>		Material <u>2101CO</u>	
Material Thickness <u>N/A</u>		Dimensions <u>See Page 1</u>	
Weld Length/OD <u>N/A</u>		Additional Info <u>N/A</u>	
Surface Condition <u>N/A</u>		Surface Condition <u>Smooth</u>	
PRECLEAN: Method <u>N/A</u>		Material <u>N/A</u> Batch No. <u>N/A</u>	
EQUIPMENT: Make <u>Krautkramer</u>		Model <u>USN 52</u> S/N <u>00NC078</u>	
PRESENTATION <input checked="" type="checkbox"/> A-SCAN		<input type="checkbox"/> B-SCAN	<input type="checkbox"/> C-SCAN
TRANSDUCERS:			
Make <u>Krautkramer</u> Model <u></u>		S/N <u>00W86X</u> Sound Beam Angle (Material) <u>70°</u>	
Crystal Size <u>.76" x .625"</u>		Crystal Material <u>Ceramic</u> Frequency <u>2.25 MHz</u>	
COUPLANT: Material <u>Water</u>		Manufacturer <u>N/A</u> Batch No. <u>N/A</u>	
CALIBRATION BLOCK: Type <u></u> Part <u></u>		Material <u>2101CO</u> S/N <u>N/A</u>	
METHOD <input checked="" type="checkbox"/> Contact		<input type="checkbox"/> Immersion <input type="checkbox"/> Water Column	
<input checked="" type="checkbox"/> Pulse Echo		<input type="checkbox"/> Resonance <input type="checkbox"/> Through Transmission	
SCANNING: <input checked="" type="checkbox"/> Manual		<input type="checkbox"/> Automatic	
Pattern <u>100%</u>		Scanning Speed <u>< 6"Per/Sec.</u> % Overlap <u>N/A</u>	
POST CLEAN: Method <u>N/A</u>		<u>10%</u>	
OTHER INFORMATION:			
Prepared By: <u>Robert Caddel</u>		Approved by: <u>N/A</u>	Date <u>3/13/12</u>
		PAGE 2 OF 2	

**SHAW
POWER**
APR 19 2013
005

3-14-12

[Signature]





ACUREN

NDE RESULT RECORD

Page 1 of 2

REPORT OF NONDESTRUCTIVE EXAMINATION

[illegible]

24-12

0-44-0



10/17/12

SHAW
POWER
APR 19 2013

005



NDE TECHNIQUE RECORD ULTRASONIC

Facility QC Control No. <u>290850</u>		Technique No. <u>Master</u>	
Client <u>Outokumpu / Shaw Modular Solutions</u>		P.O. No. <u>28862B</u>	
Item Description <u>Stainless Steel Plate</u>			
Part No. <u>N/A</u>		Drawing No. <u>N/A</u>	
Specification <u>ASTM A578-07</u>		Acceptance <u>ASTM A578-07 Level B S1</u>	
Procedure <u>SP-UT-1 App II-U Rev.5</u>			
WELDS		OTHER TEST ITEMS	
Weld Joint <u>N/A</u>		Type of Item <u>Stainless Steel Plate</u>	
Weld Process <u>N/A</u>		Processing <u>Rolled</u>	
Base Material <u>N/A</u>		Material <u>2101CO</u>	
Material Thickness <u>N/A</u>		Dimensions <u>See Page 1</u>	
Weld Length/OD <u>N/A</u>		Additional Info <u>N/A</u>	
Surface Condition <u>N/A</u>		Surface Condition <u>Smooth</u>	
PRECLEAN: Method <u>N/A</u>		Material <u>N/A</u> Batch No. <u>N/A</u>	
EQUIPMENT: Make <u>Krautkramer</u>		Model <u>USN 52</u> S/N <u>00NC078</u>	
PRESENTATION <input checked="" type="checkbox"/> A-SCAN		<input type="checkbox"/> B-SCAN <input type="checkbox"/> C-SCAN	
TRANSDUCERS:			
Make <u>Panametric</u> Model <u>V104</u>		S/N <u>570465</u> Sound Beam Angle (Material) <u>0°</u>	
Crystal Size <u>1" Dia.</u>		Crystal Material <u>Ceramic</u> Frequency <u>2.25 MHz</u>	
COUPLANT: Material <u>Water</u>		Manufacturer <u>N/A</u> Batch No. <u>N/A</u>	
CALIBRATION BLOCK: Type <u>Part</u>		Material <u>2101CO</u> S/N <u>N/A</u>	
METHOD <input checked="" type="checkbox"/> Contact		<input type="checkbox"/> Immersion <input type="checkbox"/> Water Column	
<input checked="" type="checkbox"/> Pulse Echo		<input type="checkbox"/> Resonance <input type="checkbox"/> Through Transmission	
SCANNING: <input checked="" type="checkbox"/> Manual		<input type="checkbox"/> Automatic	
Pattern <u>100%</u>		Scanning Speed <u>< 6"Per/Sec.</u> % Overlap <u>N/A</u>	
POST CLEAN: Method <u>N/A</u>		<u>10%</u>	
<p>SHAW POWER</p> <p>APR 19 2013</p> <p>005</p>			
Prepared By: <u>Robert Caddel</u>		Approved by: <u>N/A</u>	
		Date <u>3/13/12</u>	
		PAGE 2 OF 2	

3-14-12



10/17/12

Outokumpu Stainless Plate, Inc.

OUTO
KUMPU

Certificate of Analysis and Tests

OUR ORDER 0278834 - 06

HEAT & PIECE 609641-2A 03/23/12

SOLD TO: SHAW MODULAR SOLUTIONS, L.L.C. SHIP TO: SHAW MODULAR SOLUTIONS, L.L.C.
3191 W LINCOLN ROAD 3191 W LINCOLN ROAD

LAKE CHARLES

LA 70605

LAKE CHARLES

LA 70605

----- YOUR ORDER & DATE -----
746363 12/22/11 TAG# P/N #2232445
----- ITEM DESCRIPTION -----
HEAT & PIECE 609641 - 2A
WEIGHT 8938
FINISH 1
GRADE 2101 UNS S32101
DIMENSIONS .625 X 117.000 X 410.000 EXACT

----- SPECIFICATIONS -----
*** MFG IN NEW CASTLE, IN, USA FROM SLABS IMPORTED FROM SWEDEN
ASTM A240-11A ASMESA240-11ED ASTM A480-11A ASMESA480 11ED
REQUIRES PRODUCT ANALYSIS OSI QA MAN ED 2 R 1 10/15/02
ASTM E562-08 (10% ACCURACY) UHA 51 CHARPY @ -40F (-40C)
ASTM A923-06 METHOD A&B ONLY UT ASTM A578-07 LEVEL B S1
U. T. TEST TO ASTM A 577-90 NON STANDARD PROPERTIES REQD
APP-VL52-ZO-023 R1 W/EXCEPTS ISO 3651-2
COUPONS REQUIRED ASTM A262-02A PRACTICE A
ASTM A262-02A PRACTICE E SMS PO REQMTS WITH EXCEPTS
NO GRIPPER MARKS NO WELD REPAIRS

PLATES & TEST PCS SOLUTION ANNEALED @ 1900 DEGREES FAHRENHEIT MINIMUM.
THEN WATER QUENCHED
FREE FROM MERCURY CONTAMINATION AT CURRENT DETECTION LIMITS
HOT ROLLED, ANNEALED & PICKLED (HRAP)

----- MECHANICAL & OTHER TESTS -----
HARDNESS HRC 15
YIELD STRENGTH (PSI) 70443
TENSILE STRENGTH (PSI) 103990
BEND OK
INTERGRANULAR CORROSION OK
ELONGATION % IN 2" 44.2
REDUCTION OF AREA % 62.2
ASTM E-562 POINT COUNT FERRITE @ 500X = 47% AT 10% RELATIVE ACCURACY
CHARPY TEST AT -40F (TRANS) 54, 49, 50 FT-LBS. FULL SAMPLE SIZE
LATERAL EXPANSION = 40, 40, 38 (MILS)
CHARPY TEST AT -40F (TRANS) 49 FT-LBS. SAMPLE SIZE FULL

SHAW
POWER

OCT 15 2012

003

----- CHEMICAL COMPOSITION ----- PRODUCT ANALYSIS -----
CARBON (C) .022 (C) .017
MANGANESE (MN) 4.75 (MN) 4.29
PHOSPHORUS (P) .023 (P) .021
SULFUR (S) .001 (S) .007
SILICON (SI) .64 (SI) .66
CHROMIUM (CR) 21.43 (CR) 21.00
NICKEL (NI) 1.54 (NI) 1.62
COBALT (CO) .04 (CO) .05
COPPER (CU) .33 (CU) .35
MOLY (MO) .31 (MO) .31
NITROGEN (N) .21 (N) .25
COLUMBIUM (CB) .011 (CB) .010
TITANIUM (TI) .004 (TI) .005
ALUMINUM (AL) .022 (AL) .022
TIN (SN) .006 (SN) .007



8-13-12

WE HEREBY CERTIFY THAT THE MATERIAL HEREIN HAS BEEN MADE AND TESTED IN
ACCORDANCE WITH THE LISTED SPECIFICATION(S) AND THAT THE RESULTS OF ALL
TESTS ARE ACCEPTABLE.

James Douberman
JAMES DOUBMAN, QUALITY ASSURANCE MANAGER

Page 1 of 2

Customer OUTOKUMPU (Shaw Modular Solutions)			Date 3/13/12		
Address PO BOX 370, 549 W State Rd 38 New Castle ,IN 47362			Control No. or Report No. 28933		
Job or Project Location New Castle, Indiana Plant		PD No: 28862B	Owner: Shaw Modular Solutions		Plan or Drawing No N/A
Surface Condition SMOOTH		Heat No. SEE BELOW	Heat Treat N/A		Type of Material 2101CO
Temp of Material 65°F		Examination Standard ASTM A577-90		Acceptance Standard ASTM A577-90	
Type of Examination UT (SHEAR WAVE)		NDT Procedure No. SP-UT-1 App II-U Rev 5			

Client Personnel _____ Technician Robert Caddel _____ SNT-TC-1A Level II Ultrasonic

3-4-12

**SHAW
POWER**

OCT 15 2012

003



NDE TECHNIQUE RECORD ULTRASONIC

Facility QC Control No.	290850	Technique No.	Master
Client	Outokumpu / Shaw Modular Solutions	P.O. No.	28862B
Item Description	Stainless Steel Plate		
Part No.	N/A	Drawing No.	N/A
Specification	ASTM A577-90	Acceptance	ASTM A577-90
Procedure	SP-UT-1 App II-U Rev.5		

WELDS**OTHER TEST ITEMS**

Weld Joint	N/A	Type of Item	Stainless Steel Plate			
Weld Process	N/A	Processing	Rolled			
Base Material	N/A	Material	2101CO			
Material Thickness	N/A	Dimensions	See Page 1			
Weld Length/OD	N/A	Additional Info	N/A			
Surface Condition	N/A	Surface Condition	Smooth			
PRECLEAN:	Method	N/A	Material	N/A	Batch No.	N/A
EQUIPMENT:	Make	Krautkramer	Model	USN 52	S/N	00NC078
PRESENTATION	<input checked="" type="checkbox"/> A-SCAN	<input type="checkbox"/> B-SCAN	<input type="checkbox"/> C-SCAN			

TRANSDUCERS:

Make Krautkramer Model S/N 00W86X Sound Beam Angle (Material) 70°
Crystal Size .76" x .625" Crystal Material Ceramic Frequency 2.25 MHz

COUPLANT: Material Water Manufacturer N/A Batch No. N/A

CALIBRATION BLOCK: Type Part Material 2101CO S/N N/A

METHOD ☒ Contact ☐ Immersion ☐ Water Column
☒ Pulse Echo ☐ Resonance ☐ Through Transmission

SCANNING: ☒ Manual ☐ Automatic

Pattern 100% Scanning Speed < 6"Per/Sec. % Overlap N/A
POST CLEAN: Method N/A 10%

OTHER INFORMATION:**SHAW
POWER**

OCT 15 2012

003

Prepared By: Robert Caddel	Approved by: N/A	Date 3/13/12	PAGE 2 OF 2
-------------------------------	---------------------	-----------------	-------------


3-14-12




NDE RESULT RECORD

Page 1 of 2

REPORT OF NONDESTRUCTIVE EXAMINATION

Customer OUTOKUMPU (Shaw Modular Solutions)				Date 3/13/12	
Address PO BOX 370, 549 W State Rd 38 New Castle, IN 47362				Control No. or Report No. 290850	
Job or Project Location New Castle, Indiana Plant		PO No: 28862B	Owner: Shaw Modular Solutions		Plan or Drawing No N/A
Surface Condition SMOOTH		Heat No. SEE BELOW	Heat Treat N/A		Type of Material 2101CO
					Temp of Material 65°F
Type of Examination UT (STRAIGHT BEAM)	Examination Standard ASTM A578-07		Acceptance Standard ASTM A578-07 Level B S1		NDT Procedure No. SP-UT-1 App II-U Rev 5
ORDER NO.	HEAT NO.	Acc	Rej	Defect Code	Remarks
278834	609633-5A	X			.250 x 108 x 222
278834	853605-4A	X			.625 x 117 x 410
278834	853602-4A	X			.625 x 117 x 410
278834	853601-2A	X			.625 x 117 x 410
278834	853605-1A	X			.625 x 117 x 410
278834	853605-2A	X			.625 x 117 x 410
278834	853604-1A	X			.625 x 117 x 410
278834	853604-2A	X			.625 x 117 x 410
278834	609642-3A	X			.625 x 117 x 410
278834	609641-2A	X			.625 x 117 x 410
278834	609645-1A	X			.625 x 117 x 410
Type of Work New		No of Items Accepted 11		No of Items Rejected -0-	
Remarks: The plates listed above were ultrasonically tested for indications in accordance with listed standards and procedures.					
Conclusion: No recordable indications were noted at the time of this inspection.					
Client Personnel _____ Technician <u>Robert Caddel</u>  SNT-TC-1A Level II Ultrasonic					

3-14-12


SHAW
POWER

OCT 15 2012

003



NDE TECHNIQUE RECORD ULTRASONIC

Facility QC Control No. <u>290850</u>	Technique No. <u>Master</u>
Client <u>Outokumpu / Shaw Modular Solutions</u>	P.O. No. <u>28862B</u>
Item Description <u>Stainless Steel Plate</u>	
Part No. <u>N/A</u>	Drawing No. <u>N/A</u>
Specification <u>ASTM A578-07</u>	Acceptance <u>ASTM A578-07 Level B S1</u>
Procedure <u>SP-UT-1 App II-U Rev.5</u>	

WELDS		OTHER TEST ITEMS	
Weld Joint <u>N/A</u>	Type of Item <u>Stainless Steel Plate</u>		
Weld Process <u>N/A</u>	Processing <u>Rolled</u>		
Base Material <u>N/A</u>	Material <u>2101CO</u>		
Material Thickness <u>N/A</u>	Dimensions <u>See Page 1</u>		
Weld Length/OD <u>N/A</u>	Additional Info <u>N/A</u>		
Surface Condition <u>N/A</u>	Surface Condition <u>Smooth</u>		
PRECLEAN: Method <u>N/A</u>	Material <u>N/A</u>	Batch No. <u>N/A</u>	
EQUIPMENT: Make <u>Krautkramer</u>	Model <u>USN 52</u>	S/N <u>00NC078</u>	
PRESENTATION <input checked="" type="checkbox"/> A-SCAN		<input type="checkbox"/> B-SCAN	<input type="checkbox"/> C-SCAN
TRANSDUCERS:			
Make <u>Panametric</u>	Model <u>V104</u>	S/N <u>570465</u>	Sound Beam Angle (Material) <u>0°</u>
Crystal Size <u>1" Dia.</u>	Crystal Material <u>Ceramic</u>	Frequency <u>2.25 MHz</u>	
COUPLANT: Material <u>Water</u>	Manufacturer <u>N/A</u>	Batch No. <u>N/A</u>	
CALIBRATION BLOCK: Type <u>Part</u>	Material <u>2101CO</u>	S/N <u>N/A</u>	
METHOD <input checked="" type="checkbox"/> Contact	<input type="checkbox"/> Immersion	<input type="checkbox"/> Water Column	
<input checked="" type="checkbox"/> Pulse Echo	<input type="checkbox"/> Resonance	<input type="checkbox"/> Through Transmission	
SCANNING: <input checked="" type="checkbox"/> Manual	<input type="checkbox"/> Automatic		
Pattern <u>100%</u>	Scanning Speed <u>< 6"Per/Sec.</u>	% Overlap <u>N/A</u>	
POST CLEAN: Method <u>N/A</u>		<u>10%</u>	

OTHER INFORMATION:

**SHAW
POWER**

OCT 15 2012

003

Prepared By: <u>Robert Caddel</u>	Approved by: <u>N/A</u>	Date <u>3/13/12</u>	PAGE 2 OF 2
--------------------------------------	----------------------------	------------------------	-------------

3-14-12

OUTOKUMPU

Certificate of Analysis and Tests

OUR ORDER 0278834 - 05

HEAT & PIECE 853605-4A 03/14/12

SOLD TO: SHAW MODULAR SOLUTIONS, L.L.C. SHIP TO: SHAW MODULAR SOLUTIONS, L.L.C.
3191 W LINCOLN ROAD 3191 W LINCOLN ROAD

LAKE CHARLES

LA 70605

LAKE CHARLES

LA 70605

----- YOUR ORDER & DATE -----
 746363 12/22/11 TAG# P/N #2232445
 ----- ITEM DESCRIPTION -----
 HEAT & PIECE 853605 - 4A
 WEIGHT 8938
 FINISH 1
 GRADE 2101 UNS S32101
 DIMENSIONS .625 X 117.000 X 410.000 EXACT

 *** MFG IN NEW CASTLE, IN, USA
 ASTM A240-11A ASMESA240-11ED
 REQUIRES PRODUCT ANALYSIS
 ASTM E562-08 (10% ACCURACY)
 ASTM A923-06 METHOD A&B ONLY
 U. T. TEST TO ASTM A 577-90
 APP-VL52-ZO-023 R1 W/EXCEPTS
 COUPONS REQUIRED
 ASTM A262-02A PRACTICE E
 NO GRIPPER MARKS

----- SPECIFICATIONS -----
 FROM SLABS IMPORTED FROM BRITAIN
 ASTM A480-11A ASMESA480 11ED
 OSI QA MAN ED 2 R 1 10/15/02
 UHA 51 CHARPY @ -40F (-40C)
 UT ASTM A578-07 LEVEL B S1
 NON STANDARD PROPERTIES REQD
 ISO 3651-2
 ASTM A262-02A PRACTICE A
 SMS PO REQMTS WITH EXCEPTS
 NO WELD REPAIRS

PLATES & TEST PCS SOLUTION ANNEALED @ 1900 DEGREES FAHRENHEIT MINIMUM.
 THEN WATER QUENCHED
 FREE FROM MERCURY CONTAMINATION AT CURRENT DETECTION LIMITS
 HOT ROLLED, ANNEALED & PICKLED (HRAP)

----- MECHANICAL & OTHER TESTS -----
 HARDNESS HRC 18
 YIELD STRENGTH (PSI) 65685
 TENSILE STRENGTH (PSI) 94130
 BEND OK
 INTERGRANULAR CORROSION OK
 ELONGATION % IN 2" 34.7
 REDUCTION OF AREA % 57.3
 ASTM E-562 POINT COUNT FERRITE @ 500X = 44% AT 10% RELATIVE ACCURACY
 CHARPY TEST AT -40F (TRANS) 60, 142, 72 FT-LBS. FULL SAMPLE SIZE
 LATERAL EXPANSION = 44, 60, 51 (MILS)

- CHEMICAL COMPOSITION -			PRODUCT ANALYSIS -		
CARBON (C)	.028		(C)	.016	
MANGANESE (MN)	4.95		(MN)	4.55	
PHOSPHORUS (P)	.026		(P)	.020	
SULFUR (S)	.001		(S)	.007	
SILICON (SI)	.79		(SI)	.75	
CHROMIUM (CR)	21.53		(CR)	21.10	
NICKEL (NI)	1.56		(NI)	1.54	
COBALT (CO)	.04		(CO)	.04	
COPPER (CU)	.35		(CU)	.36	
MOLY (MO)	.23		(MO)	.22	
NITROGEN (N)	.22		(N)	.23	
COLUMBIUM (CB)	.011		(CB)	.006	
TITANIUM (TI)	.001		(TI)	.004	
ALUMINUM (AL)	.020		(AL)	.017	
TIN (SN)	.009		(SN)	.007	
TANTALUM (TA)	.002		(TA)		

SHAW
POWER

OCT 15 2012

003



8-13-12

WE HEREBY CERTIFY THAT THE MATERIAL HEREIN HAS BEEN MADE AND TESTED IN
 ACCORDANCE WITH THE LISTED SPECIFICATION(S) AND THAT THE RESULTS OF ALL
 TESTS ARE ACCEPTABLE.

JAMES DOUBMAN, QUALITY ASSURANCE MANAGER

Client Personnel Technician Robert Caddel SNT-TC-1A Level II Ultrasonic



NDE TECHNIQUE RECORD ULTRASONIC

Facility QC Control No. <u>290850</u>	Technique No. <u>Master</u>
Client <u>Outokumpu / Shaw Modular Solutions</u>	P.O. No. <u>28862B</u>
Item Description <u>Stainless Steel Plate</u>	
Part No. <u>N/A</u>	Drawing No. <u>N/A</u>
Specification <u>ASTM A577-90</u>	Acceptance <u>ASTM A577-90</u>
Procedure <u>SP-UT-1 App II-U Rev.5</u>	

WELDS

OTHER TEST ITEMS

Weld Joint <u>N/A</u>	Type of Item <u>Stainless Steel Plate</u>
Weld Process <u>N/A</u>	Processing <u>Rolled</u>
Base Material <u>N/A</u>	Material <u>2101CO</u>
Material Thickness <u>N/A</u>	Dimensions <u>See Page 1</u>
Weld Length/OD <u>N/A</u>	Additional Info <u>N/A</u>
Surface Condition <u>N/A</u>	Surface Condition <u>Smooth</u>
PRECLEAN: Method <u>N/A</u>	Material <u>N/A</u> Batch No. <u>N/A</u>
EQUIPMENT: Make <u>Krautkramer</u>	Model <u>USN 52</u> S/N <u>00NC078</u>
PRESENTATION <input checked="" type="checkbox"/> A-SCAN	<input type="checkbox"/> B-SCAN <input type="checkbox"/> C-SCAN

TRANSDUCERS:

Make <u>Krautkramer</u> Model <u>00W86X</u>	S/N <u>00W86X</u>	Sound Beam Angle (Material) <u>70°</u>
Crystal Size <u>.76" x .625"</u>	Crystal Material <u>Ceramic</u>	Frequency <u>2.25 MHz</u>
COUPLANT: Material <u>Water</u>	Manufacturer <u>N/A</u>	Batch No. <u>N/A</u>
CALIBRATION BLOCK: Type <u>Part</u>	Material <u>2101CO</u>	S/N <u>N/A</u>
METHOD <input checked="" type="checkbox"/> Contact	<input type="checkbox"/> Immersion	<input type="checkbox"/> Water Column
<input checked="" type="checkbox"/> Pulse Echo	<input type="checkbox"/> Resonance	<input type="checkbox"/> Through Transmission
SCANNING: <input checked="" type="checkbox"/> Manual	<input type="checkbox"/> Automatic	
Pattern <u>100%</u>	Scanning Speed <u>< 6"Per/Sec.</u>	% Overlap <u>N/A</u>
POST CLEAN: Method <u>N/A</u>		10%

OTHER INFORMATION:

**SHAW
POWER**

OCT 15 2012

003

Prepared By: <u>Robert Caddel</u>	Approved by: <u>N/A</u>	Date <u>3/13/12</u>	PAGE 2 OF 2
--------------------------------------	----------------------------	------------------------	-------------

3-14-12



NDE RESULT RECORD

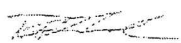
Page 1 of 2

REPORT OF NONDESTRUCTIVE EXAMINATION

Customer OUTOKUMPU (Shaw Modular Solutions)				Date 3/13/12	
Address PO BOX 370, 549 W State Rd 38 New Castle, IN 47362				Control No. or Report No. 290850	
Job or Project Location New Castle, Indiana Plant		PO No: 28862B	Owner: Shaw Modular Solutions		Plan or Drawing No. N/A
Surface Condition SMOOTH		Heat No. SEE BELOW	Heat Treat N/A		Type of Material 2101CO
					Temp of Material 65°F
Type of Examination UT (STRAIGHT BEAM)	Examination Standard ASTM A578-07		Acceptance Standard ASTM A578-07 Level B S1		NDT Procedure No. SP-UT-1 App II-U Rev 5
ORDER NO.	HEAT NO.	Acc	Rej	Defect Code	Remarks
278834	609633-5A	X			.250 x 108 x 222
278834	853605-4A	X			.625 x 117 x 410
278834	853602-4A	X			.625 x 117 x 410
278834	853601-2A	X			.625 x 117 x 410
278834	853605-1A	X			.625 x 117 x 410
278834	853605-2A	X			.625 x 117 x 410
278834	853604-1A	X			.625 x 117 x 410
278834	853604-2A	X			.625 x 117 x 410
278834	609642-3A	X			.625 x 117 x 410
278834	609641-2A	X			.625 x 117 x 410
278834	609645-1A	X			.625 x 117 x 410
Type of Work New		No of Items Accepted 11		No of Items Rejected -0-	

Remarks: The plates listed above were ultrasonically tested for indications in accordance with listed standards and procedures.

Conclusion: No recordable indications were noted at the time of this inspection.

Client Personnel _____ Technician Robert Caddel  SNT-TC-1A Level II Ultrasonic

3-14-12


**SHAW
POWER**

OCT 15 2012

003

**NDE TECHNIQUE RECORD
ULTRASONIC**

Facility QC Control No. <u>290850</u>	Technique No. <u>Master</u>
Client <u>Outokumpu / Shaw Modular Solutions</u>	P.O. No. <u>28862B</u>
Item Description <u>Stainless Steel Plate</u>	
Part No. <u>N/A</u>	Drawing No. <u>N/A</u>
Specification <u>ASTM A578-07</u>	Acceptance <u>ASTM A578-07 Level B S1</u>
Procedure <u>SP-UT-1 App II-U Rev.5</u>	

WELDS		OTHER TEST ITEMS	
Weld Joint <u>N/A</u>	Type of Item <u>Stainless Steel Plate</u>		
Weld Process <u>N/A</u>	Processing <u>Rolled</u>		
Base Material <u>N/A</u>	Material <u>2101CO</u>		
Material Thickness <u>N/A</u>	Dimensions <u>See Page 1</u>		
Weld Length/OD <u>N/A</u>	Additional Info <u>N/A</u>		
Surface Condition <u>N/A</u>	Surface Condition <u>Smooth</u>		
PRECLEAN: Method <u>N/A</u>	Material <u>N/A</u>	Batch No. <u>N/A</u>	
EQUIPMENT: Make <u>Krautkramer</u>	Model <u>USN 52</u>	S/N <u>00NC078</u>	
PRESENTATION <input checked="" type="checkbox"/> A-SCAN	<input type="checkbox"/> B-SCAN	<input type="checkbox"/> C-SCAN	

TRANSDUCERS:
Make Panametric Model V104 S/N 570465 Sound Beam Angle (Material) 0°
Crystal Size 1" Dia. Crystal Material Ceramic Frequency 2.25 MHz

COUPLANT: Material Water Manufacturer N/A Batch No. N/A

CALIBRATION BLOCK: Type Part Material 2101CO S/N N/A

METHOD ☒ Contact ☐ Immersion ☐ Water Column
☒ Pulse Echo ☐ Resonance ☐ Through Transmission

SCANNING: ☒ Manual ☐ Automatic

Pattern 100% Scanning Speed < 6"Per/Sec. % Overlap N/A

POST CLEAN: Method N/A 10%

OTHER INFORMATION:**SHAW
POWER**

OCT 15 2012

003

Prepared By: <u>Robert Caddel</u>	Approved by: <u>N/A</u>	Date <u>3/13/12</u>	PAGE 2 OF 2
--------------------------------------	----------------------------	------------------------	-------------

3-14-12

Outokumpu Stainless Plate, Inc.

OUTO
KUMPU

Certificate of Analysis and Tests

OUR ORDER 0278834 - 06

HEAT & PIECE 609641-2A 03/23/12

SOLD TO: SHAW MODULAR SOLUTIONS, L.L.C. SHIP TO: SHAW MODULAR SOLUTIONS, L.L.C.
3191 W LINCOLN ROAD 3191 W LINCOLN ROAD

LAKE CHARLES

LA 70605

LAKE CHARLES

LA 70605

----- YOUR ORDER & DATE -----
746363 12/22/11 TAG# P/N #2232445
----- ITEM DESCRIPTION -----
HEAT & PIECE 609641 - 2A
WEIGHT 8938
FINISH 1
GRADE 2101 UNS S32101
DIMENSIONS .625 X 117.000 X 410.000 EXACT

----- SPECIFICATIONS -----
*** MFG IN NEW CASTLE, IN, USA
ASTM A240-11A ASMESA240-11ED
REQUIRES PRODUCT ANALYSIS
ASTM E562-08 (10% ACCURACY)
ASTM A923-06 METHOD A&B ONLY
U. T. TEST TO ASTM A 577-90
APP-VL52-ZO-023 R1 W/EXCEPTS
COUPONS REQUIRED
ASTM A262-02A PRACTICE E
NO GRIPPER MARKS
FROM SLABS IMPORTED FROM SWEDEN
ASTM A480-11A ASMESA480 11ED
OSI QA MAN ED 2 R 1 10/15/02
UHA 51 CHARPY @ -40F (-40C)
UT ASTM A578-07 LEVEL B S1
NON STANDARD PROPERTIES REQD
ISO 3651-2
ASTM A262-02A PRACTICE A
SMS PO REQMTS WITH EXCEPTS
NO WELD REPAIRS

PLATES & TEST PCS SOLUTION ANNEALED @ 1900 DEGREES FAHRENHEIT MINIMUM.
THEN WATER QUENCHED
FREE FROM MERCURY CONTAMINATION AT CURRENT DETECTION LIMITS
HOT ROLLED, ANNEALED & PICKLED (HRAP)

----- MECHANICAL & OTHER TESTS -----
HARDNESS HRC 15
YIELD STRENGTH (PSI) 70443
TENSILE STRENGTH (PSI) 103990
BEND OK
INTERGRANULAR CORROSION OK
ELONGATION % IN 2" 44.2
REDUCTION OF AREA % 62.2
ASTM E-562 POINT COUNT FERRITE @ 500X = 47% AT 10% RELATIVE ACCURACY
CHARPY TEST AT -40F (TRANS) 54, 49, 50 FT-LBS. FULL SAMPLE SIZE
LATERAL EXPANSION = 40, 40, 38 (MILS)
CHARPY TEST AT -40F (TRANS) 49 FT-LBS. SAMPLE SIZE FULL

SHAW
POWER

OCT 15 2012

003

----- CHEMICAL COMPOSITION ----- PRODUCT ANALYSIS -----
CARBON (C) .022 (C) .017
MANGANESE (MN) 4.75 (MN) 4.29
PHOSPHORUS (P) .023 (P) .021
SULFUR (S) .001 (S) .007
SILICON (SI) .64 (SI) .66
CHROMIUM (CR) 21.43 (CR) 21.00
NICKEL (NI) 1.54 (NI) 1.62
COBALT (CO) .04 (CO) .05
COPPER (CU) .33 (CU) .35
MOLY (MO) .31 (MO) .31
NITROGEN (N) .21 (N) .25
COLUMBIUM (CB) .011 (CB) .010
TITANIUM (TI) .004 (TI) .005
ALUMINUM (AL) .022 (AL) .022
TIN (SN) .006 (SN) .007



8-13-12

WE HEREBY CERTIFY THAT THE MATERIAL HEREIN HAS BEEN MADE AND TESTED IN
ACCORDANCE WITH THE LISTED SPECIFICATION(S) AND THAT THE RESULTS OF ALL
TESTS ARE ACCEPTABLE.

James Douberman
JAMES DOUBMAN, QUALITY ASSURANCE MANAGER

Page 1 of 2

Customer OUTOKUMPU (Shaw Modular Solutions)				Date 3/13/12	
Address PO BOX 370, 549 W State Rd 38 New Castle, IN 47362				Control No. or Report No. 28933	
Job or Project Location New Castle, Indiana Plant		PO No: 28862B	Owner: Shaw Modular Solutions		Plan or Drawing No N/A
Surface Condition SMOOTH		Heat No. SEE BELOW	Heat Treat N/A		Type of Material 2101CO
Temp of Material 65°F		Type of Examination UT (SHEAR WAVE)		Examination Standard ASTM A577-90	
Acceptance Standard ASTM A577-90		NDT Procedure No. SP-UT-1 App II-U Rev 5		ORDER NO.	
HEAT NO.		Acc		Rej	
Defect Code		Remarks			

Client Personnel _____ Technician Robert Caddel _____ SNT-TC-1A Level II Ultrasonic

3-14-12

SHAW
POWER
OCT 15 2012

003



NDE TECHNIQUE RECORD ULTRASONIC

Facility QC Control No. <u>290850</u>	Technique No. <u>Master</u>
Client <u>Outokumpu / Shaw Modular Solutions</u>	P.O. No. <u>28862B</u>
Item Description <u>Stainless Steel Plate</u>	
Part No. <u>N/A</u>	Drawing No. <u>N/A</u>
Specification <u>ASTM A577-90</u>	Acceptance <u>ASTM A577-90</u>
Procedure <u>SP-UT-1 App II-U Rev.5</u>	

WELDS

OTHER TEST ITEMS

Weld Joint <u>N/A</u>	Type of Item <u>Stainless Steel Plate</u>
Weld Process <u>N/A</u>	Processing <u>Rolled</u>
Base Material <u>N/A</u>	Material <u>2101CO</u>
Material Thickness <u>N/A</u>	Dimensions <u>See Page 1</u>
Weld Length/OD <u>N/A</u>	Additional Info <u>N/A</u>
Surface Condition <u>N/A</u>	Surface Condition <u>Smooth</u>
PRECLEAN: Method <u>N/A</u>	Material <u>N/A</u> Batch No. <u>N/A</u>
EQUIPMENT: Make <u>Krautkramer</u>	Model <u>USN 52</u> S/N <u>00NC078</u>
PRESENTATION <input checked="" type="checkbox"/> A-SCAN	<input type="checkbox"/> B-SCAN <input type="checkbox"/> C-SCAN

TRANSDUCERS:

Make Krautkramer Model S/N 00W86X Sound Beam Angle (Material) 70°
 Crystal Size .76" x .625" Crystal Material Ceramic Frequency 2.25 MHz

COUPLANT: Material Water Manufacturer N/A Batch No. N/A

CALIBRATION BLOCK: Type Part Material 2101CO S/N N/A

METHOD ☒ Contact ☐ Immersion ☐ Water Column
☒ Pulse Echo ☐ Resonance ☐ Through Transmission

SCANNING: ☒ Manual ☐ Automatic

Pattern 100% Scanning Speed < 6"Per/Sec. % Overlap N/A
 POST CLEAN: Method N/A 10%

OTHER INFORMATION:

**SHAW
POWER**

OCT 15 2012

003

Prepared By: <u>Robert Caddel</u>	Approved by: <u>N/A</u>	Date <u>3/13/12</u>	PAGE 2 OF 2
--------------------------------------	----------------------------	------------------------	-------------


3-14-12




NDE RESULT RECORD

Page 1 of 2

REPORT OF NONDESTRUCTIVE EXAMINATION

Customer OUTOKUMPU (Shaw Modular Solutions)				Date 3/13/12	
Address PO BOX 370, 549 W State Rd 38 New Castle, IN 47362				Control No. or Report No. 290850	
Job or Project Location New Castle, Indiana Plant		PO No: 28862B	Owner: Shaw Modular Solutions		Plan or Drawing No. N/A
Surface Condition SMOOTH		Heat No. SEE BELOW	Heat Treat N/A		Type of Material 2101CO
					Temp of Material 65°F
Type of Examination UT (STRAIGHT BEAM)	Examination Standard ASTM A578-07		Acceptance Standard ASTM A578-07 Level B S1		NDT Procedure No. SP-UT-1 App II-U Rev 5
ORDER NO.	HEAT NO.	Acc	Rej	Defect Code	Remarks
278834	609633-5A	X			.250 x 108 x 222
278834	853605-4A	X			.625 x 117 x 410
278834	853602-4A	X			.625 x 117 x 410
278834	853601-2A	X			.625 x 117 x 410
278834	853605-1A	X			.625 x 117 x 410
278834	853605-2A	X			.625 x 117 x 410
278834	853604-1A	X			.625 x 117 x 410
278834	853604-2A	X			.625 x 117 x 410
278834	609642-3A	X			.625 x 117 x 410
278834	609641-2A	X			.625 x 117 x 410
278834	609645-1A	X			.625 x 117 x 410
Type of Work New		No of Items Accepted 11		No of Items Rejected -0-	
Remarks: The plates listed above were ultrasonically tested for indications in accordance with listed standards and procedures.					
Conclusion: No recordable indications were noted at the time of this inspection.					
Client Personnel _____ Technician <u>Robert Caddel</u>  SNT-TC-1A Level II Ultrasonic					

3-14-12


SHAW
POWER

OCT 15 2012

003



NDE TECHNIQUE RECORD ULTRASONIC

Facility QC Control No. <u>290850</u>	Technique No. <u>Master</u>
Client <u>Outokumpu / Shaw Modular Solutions</u>	P.O. No. <u>28862B</u>
Item Description <u>Stainless Steel Plate</u>	
Part No. <u>N/A</u>	Drawing No. <u>N/A</u>
Specification <u>ASTM A578-07</u>	Acceptance <u>ASTM A578-07 Level B S1</u>
Procedure <u>SP-UT-1 App II-U Rev.5</u>	

WELDS	OTHER TEST ITEMS
Weld Joint <u>N/A</u>	Type of Item <u>Stainless Steel Plate</u>
Weld Process <u>N/A</u>	Processing <u>Rolled</u>
Base Material <u>N/A</u>	Material <u>2101CO</u>
Material Thickness <u>N/A</u>	Dimensions <u>See Page 1</u>
Weld Length/OD <u>N/A</u>	Additional Info <u>N/A</u>
Surface Condition <u>N/A</u>	Surface Condition <u>Smooth</u>
PRECLEAN: Method <u>N/A</u>	Material <u>N/A</u> Batch No. <u>N/A</u>
EQUIPMENT: Make <u>Krautkramer</u>	Model <u>USN 52</u> S/N <u>00NC078</u>
PRESENTATION <input checked="" type="checkbox"/> A-SCAN	<input type="checkbox"/> B-SCAN <input type="checkbox"/> C-SCAN

TRANSDUCERS:
 Make Panametric Model V104 S/N 570465 Sound Beam Angle (Material) 0°
 Crystal Size 1" Dia. Crystal Material Ceramic Frequency 2.25 MHz

COUPLANT: Material Water Manufacturer N/A Batch No. N/A

CALIBRATION BLOCK: Type Part Material 2101CO S/N N/A

METHOD ☒ Contact ☐ Immersion ☐ Water Column
☒ Pulse Echo ☐ Resonance ☐ Through Transmission

SCANNING: ☒ Manual ☐ Automatic

Pattern 100% Scanning Speed < 6"Per/Sec. % Overlap N/A
 POST CLEAN: Method N/A 10%

OTHER INFORMATION:

**SHAW
POWER**

OCT 15 2012

003

Prepared By: <u>Robert Caddel</u>	Approved by: <u>N/A</u>	Date <u>3/13/12</u>	PAGE 2 OF 2
--------------------------------------	----------------------------	------------------------	-------------

3-14-12

**OUTO
KUMPU****Certificate of Analysis and Tests**

OUR ORDER 0278834 - 05

HEAT & PIECE 853605-4A 03/14/12

SOLD TO: SHAW MODULAR SOLUTIONS, L.L.C. SHIP TO: SHAW MODULAR SOLUTIONS, L.L.C.
3191 W LINCOLN ROAD 3191 W LINCOLN ROAD

LAKE CHARLES

LA 70605

LAKE CHARLES

LA 70605

----- YOUR ORDER & DATE -----
746363 12/22/11 TAG# P/N #2232445
 ----- ITEM DESCRIPTION -----
 HEAT & PIECE **853605 - 4A**
 WEIGHT 8938
 FINISH 1
 GRADE 2101 UNS S32101
 DIMENSIONS .625 X 117.000 X 410.000 EXACT

 *** MFG IN NEW CASTLE, IN, USA
 ASTM A240-11A ASMESA240-11ED
 REQUIRES PRODUCT ANALYSIS
 ASTM E562-08 (10% ACCURACY)
 ASTM A923-06 METHOD A&B ONLY
 U. T. TEST TO ASTM A 577-90
 APP-VL52-ZO-023 R1 W/EXCEPTS
 COUPONS REQUIRED
 ASTM A262-02A PRACTICE E
 NO GRIPPER MARKS

----- SPECIFICATIONS -----
 FROM SLABS IMPORTED FROM BRITAIN
 ASTM A480-11A ASMESA480 11ED
 OSI QA MAN ED 2 R 1 10/15/02
 UHA 51 CHARPY @ -40F (-40C)
 UT ASTM A578-07 LEVEL B S1
 NON STANDARD PROPERTIES REQD
 ISO 3651-2
 ASTM A262-02A PRACTICE A
 SMS PO REQMTS WITH EXCEPTS
 NO WELD REPAIRS

PLATES & TEST PCS SOLUTION ANNEALED @ 1900 DEGREES FAHRENHEIT MINIMUM.
 THEN WATER QUENCHED
 FREE FROM MERCURY CONTAMINATION AT CURRENT DETECTION LIMITS
 HOT ROLLED, ANNEALED & PICKLED (HRAP)

----- MECHANICAL & OTHER TESTS -----
 HARDNESS HRC 18
 YIELD STRENGTH (PSI) 65685
 TENSILE STRENGTH (PSI) 94130
 BEND OK
 INTERGRANULAR CORROSION OK
 ELONGATION % IN 2" 34.7
 REDUCTION OF AREA % 57.3
 ASTM E-562 POINT COUNT FERRITE @ 500X = 44% AT 10% RELATIVE ACCURACY
 CHARPY TEST AT -40F (TRANS) 60, 142, 72 FT-LBS. FULL SAMPLE SIZE
 LATERAL EXPANSION = 44, 60, 51 (MILS)

- CHEMICAL COMPOSITION -			PRODUCT ANALYSIS -		
CARBON (C)	.028		(C)	.016	
MANGANESE (MN)	4.95		(MN)	4.55	
PHOSPHORUS (P)	.026		(P)	.020	
SULFUR (S)	.001		(S)	.007	
SILICON (SI)	.79		(SI)	.75	
CHROMIUM (CR)	21.53		(CR)	21.10	
NICKEL (NI)	1.56		(NI)	1.54	
COBALT (CO)	.04		(CO)	.04	
COPPER (CU)	.35		(CU)	.36	
MOLY (MO)	.23		(MO)	.22	
NITROGEN (N)	.22		(N)	.23	
COLUMBIUM (CB)	.011		(CB)	.006	
TITANIUM (TI)	.001		(TI)	.004	
ALUMINUM (AL)	.020		(AL)	.017	
TIN (SN)	.009		(SN)	.007	
TANTALUM (TA)	.002		(TA)		

**SHAW
POWER**

OCT 15 2012

003

8-13-12

WE HEREBY CERTIFY THAT THE MATERIAL HEREIN HAS BEEN MADE AND TESTED IN
 ACCORDANCE WITH THE LISTED SPECIFICATION(S) AND THAT THE RESULTS OF ALL
 TESTS ARE ACCEPTABLE.

JAMES DOUBMAN, QUALITY ASSURANCE MANAGER



NDE RESULT RECORD

Page 1 of 2

REPORT OF NONDESTRUCTIVE EXAMINATION

Customer OUTOKUMPU (Shaw Modular Solutions)				Date 3/13/12	
Address PO BOX 370, 549 W State Rd 38 New Castle ,IN 47362				Control No. or Report No. 28933	
Job or Project Location New Castle, Indiana Plant		PO No: 28862B	Owner: Shaw Modular Solutions		Plan or Drawing No N/A
Surface Condition SMOOTH		Heat No. SEE BELOW	Heat Treat N/A		Type of Material 2101CO
					Temp of Material 65°F
Type of Examination UT (SHEAR WAVE)		Examination Standard ASTM A577-90		Acceptance Standard ASTM A577-90	
				NDT Procedure No. SP-UT-1 App II-U Rev 5	
ORDER NO.	HEAT NO.	Acc	Rel	Defect Code	Remarks

ORDER NO.	HEAT NO.	Acc	Rej	Defect Code	Remarks
278834	609633-5A	X			.250 x 108 x 222
278834	853605-4A	X			.625 x 117 x 410
278834	853602-4A	X			.625 x 117 x 410
278834	853601-2A	X			.625 x 117 x 410
278834	853605-1A	X			.625 x 117 x 410
278834	853605-2A	X			.625 x 117 x 410
278834	853604-1A	X			.625 x 117 x 410
278834	853604-2A	X			.625 x 117 x 410
278834	609642-3A	X			.625 x 117 x 410
278834	609641-2A	X			.625 x 117 x 410
278834	609645-1A	X			.625 x 117 x 410
	Type of Work New	No of Items Accepted 11	No of Items Rejected -0-		

Remarks: The plates listed above were ultrasonically tested for indications in accordance with listed standards and procedures.

Conclusion: No recordable indications were noted at the time of this inspection.

Client Personnel Technician Robert Caddel SNT-TC-1A Level II Ultrasonic

3-14-12

**SHAW
POWER**

OCT 15 2012

003



NDE TECHNIQUE RECORD ULTRASONIC

Facility QC Control No. <u>290850</u>	Technique No. <u>Master</u>
Client <u>Outokumpu / Shaw Modular Solutions</u>	P.O. No. <u>28862B</u>
Item Description <u>Stainless Steel Plate</u>	
Part No. <u>N/A</u>	Drawing No. <u>N/A</u>
Specification <u>ASTM A577-90</u>	Acceptance <u>ASTM A577-90</u>
Procedure <u>SP-UT-1 App II-U Rev.5</u>	

WELDS

OTHER TEST ITEMS

Weld Joint <u>N/A</u>	Type of Item <u>Stainless Steel Plate</u>
Weld Process <u>N/A</u>	Processing <u>Rolled</u>
Base Material <u>N/A</u>	Material <u>2101CO</u>
Material Thickness <u>N/A</u>	Dimensions <u>See Page 1</u>
Weld Length/OD <u>N/A</u>	Additional Info <u>N/A</u>
Surface Condition <u>N/A</u>	Surface Condition <u>Smooth</u>
PRECLEAN: Method <u>N/A</u>	Material <u>N/A</u> Batch No. <u>N/A</u>
EQUIPMENT: Make <u>Krautkramer</u>	Model <u>USN 52</u> S/N <u>00NC078</u>
PRESENTATION <input checked="" type="checkbox"/> A-SCAN	<input type="checkbox"/> B-SCAN <input type="checkbox"/> C-SCAN

TRANSDUCERS:

Make Krautkramer Model _____ S/N 00W86X Sound Beam Angle (Material) 70°
Crystal Size .76" x .625" Crystal Material Ceramic Frequency 2.25 MHz

COUPLANT: Material Water Manufacturer N/A Batch No. N/A

CALIBRATION BLOCK: Type _____ Part _____ Material 2101CO S/N N/A

METHOD ☒ Contact ☐ Immersion ☐ Water Column
☒ Pulse Echo ☐ Resonance ☐ Through Transmission

SCANNING: ☒ Manual ☐ Automatic

Pattern 100% Scanning Speed < 6"Per/Sec. % Overlap N/A
POST CLEAN: Method N/A 10%

OTHER INFORMATION:

**SHAW
POWER**

OCT 15 2012

003

Prepared By: <u>Robert Caddel</u>	Approved by: <u>N/A</u>	Date <u>3/13/12</u>	PAGE 2 OF 2
--------------------------------------	----------------------------	------------------------	-------------

3-14-12



NDE RESULT RECORD

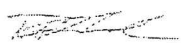
Page 1 of 2

REPORT OF NONDESTRUCTIVE EXAMINATION

Customer OUTOKUMPU (Shaw Modular Solutions)				Date 3/13/12	
Address PO BOX 370, 549 W State Rd 38 New Castle, IN 47362				Control No. or Report No. 290850	
Job or Project Location New Castle, Indiana Plant		PO No: 28862B	Owner: Shaw Modular Solutions		Plan or Drawing No. N/A
Surface Condition SMOOTH		Heat No. SEE BELOW	Heat Treat N/A		Type of Material 2101CO
					Temp of Material 65°F
Type of Examination UT (STRAIGHT BEAM)	Examination Standard ASTM A578-07		Acceptance Standard ASTM A578-07 Level B S1		NDT Procedure No. SP-UT-1 App II-U Rev 5
ORDER NO.	HEAT NO.	Acc	Rej	Defect Code	Remarks
278834	609633-5A	X			.250 x 108 x 222
278834	853605-4A	X			.625 x 117 x 410
278834	853602-4A	X			.625 x 117 x 410
278834	853601-2A	X			.625 x 117 x 410
278834	853605-1A	X			.625 x 117 x 410
278834	853605-2A	X			.625 x 117 x 410
278834	853604-1A	X			.625 x 117 x 410
278834	853604-2A	X			.625 x 117 x 410
278834	609642-3A	X			.625 x 117 x 410
278834	609641-2A	X			.625 x 117 x 410
278834	609645-1A	X			.625 x 117 x 410
Type of Work New		No of Items Accepted 11		No of Items Rejected -0-	

Remarks: The plates listed above were ultrasonically tested for indications in accordance with listed standards and procedures.

Conclusion: No recordable indications were noted at the time of this inspection.

Client Personnel _____ Technician Robert Caddel  SNT-TC-1A Level II Ultrasonic

3-14-12


**SHAW
POWER**

OCT 15 2012

003

**NDE TECHNIQUE RECORD
ULTRASONIC**

Facility QC Control No.	290850	Technique No.	Master
Client	Outokumpu / Shaw Modular Solutions	P.O. No.	28862B
Item Description	Stainless Steel Plate		
Part No.	N/A	Drawing No.	N/A
Specification	ASTM A578-07	Acceptance	ASTM A578-07 Level B S1
Procedure	SP-UT-1 App II-U Rev.5		

WELDS		OTHER TEST ITEMS	
Weld Joint	N/A	Type of Item	Stainless Steel Plate
Weld Process	N/A	Processing	Rolled
Base Material	N/A	Material	2101CO
Material Thickness	N/A	Dimensions	See Page 1
Weld Length/OD	N/A	Additional Info	N/A
Surface Condition	N/A	Surface Condition	Smooth
PRECLEAN:	Method N/A	Material	N/A
EQUIPMENT:	Make Krautkramer	Model	USN 52
PRESENTATION	<input checked="" type="checkbox"/> A-SCAN	<input type="checkbox"/> B-SCAN	<input type="checkbox"/> C-SCAN

TRANSDUCERS:			
Make	Panametric	Model	V104
S/N	570465	Sound Beam Angle (Material)	0°
Crystal Size	1" Dia.	Crystal Material	Ceramic
Frequency	2.25 MHz	Batch No.	N/A
COUPLANT:	Material	Water	Manufacturer
N/A			N/A
CALIBRATION BLOCK:	Type	Part	Material
2101CO			S/N
N/A			
METHOD	<input checked="" type="checkbox"/> Contact	<input type="checkbox"/> Immersion	<input type="checkbox"/> Water Column
	<input checked="" type="checkbox"/> Pulse Echo	<input type="checkbox"/> Resonance	<input type="checkbox"/> Through Transmission
SCANNING:	<input checked="" type="checkbox"/> Manual	<input type="checkbox"/> Automatic	
Pattern	100%	Scanning Speed	< 6"Per/Sec.
% Overlap	N/A		
POST CLEAN:	Method	N/A	10%

OTHER INFORMATION:

**SHAW
POWER**

OCT 15 2012

003

Prepared By: Robert Caddel	Approved by: N/A	Date 3/13/12	PAGE 2 OF 2
-------------------------------	---------------------	-----------------	-------------

3-14-12



INDUSTRIAL TESTING LABORATORY SERVICES, LLC
 635 Alpha Drive – RIDC Park
 Pittsburgh, PA 15238 Phone: 412.963.1900 Fax: 412.963.1926
 e-mail: info@itls.com website: itls.com

TEST REPORT
L19495
May 7, 2012

Purchase Order No: 694689-000 OP

To: Shaw Modular Solutions LLC
 3191 West Lincoln Road
 Lake Charles, LA 70605

Attn: Nick Koseski

SMS QC

ACCEPT

13

6-30-12

Sample Received:

ITLS received twelve (12) samples for Chemical, Mechanical, Hardness, Impact, Ferrite and Intergranular Corrosion evaluation, identified as follows:

Sample #	Heat #	Description	Supplier
1	853731-1A	0.625" thick Duplex Plate	Outokumpu
2	853731-1A	0.625" thick Duplex Plate	Outokumpu
3	609643-2A	0.625" thick Duplex Plate	Outokumpu
4	609643-2A	0.625" thick Duplex Plate	Outokumpu
5	609644-3A	0.625" thick Duplex Plate	Outokumpu
6	609644-3A	0.625" thick Duplex Plate	Outokumpu
7	853735-3A	0.500" thick Duplex Plate	Outokumpu
8	853735-3A	0.500" thick Duplex Plate	Outokumpu
9	609643-3A	0.625" thick Duplex Plate	Outokumpu
10	609643-3A	0.625" thick Duplex Plate	Outokumpu
11	853843-2A	1.187" thick Duplex Plate	Outokumpu
12	853843-2A	1.187" thick Duplex Plate	Outokumpu

Acceptance:

Sample #	Test	Acceptance
All	Chemical Analysis	APP-VL52-Z0-023, Rev. 1, ASTM A240-11b (UNS S32101)
All	Mechanical	APP-VL52-Z0-023, Rev. 1, ASTM A240-11b (UNS S32101), A480-11b
All	Rockwell B	ASTM A240-11b (UNS S32101), A480-11b
All	Ferrite	APP-VL52-Z0-023, Rev. 1, ASTM E562-11, Method A
All	Impact	APP-VL52-Z0-023, Rev. 1, ASTM A923-08, Method B
All	Intergranular Corrosion	ISO 3651-2 Method A

**SHAW
POWER**

AUG 30 2012

003



Shaw Modular Solutions, LLC
ITLS Report L19495
May 7, 2012

Test References:

Specification	Title
ASTM A751-11	Standard Test Methods, Practices, and Terminology for Chemical Analysis of Steel Products
ASTM A370-12	Standard Test Methods and Definitions for Mechanical Testing of Steel Products
ASTM E8-11	Standard Test Methods for Tension Testing of Metallic Materials
ASTM E140-07	Standard Hardness Conversion Tables for Metals
ASTM E23-07a ¹	Standard Test Methods for Notched Bar Impact Testing of Metallic Materials
ASTM E3-11	Standard Guide for Preparation of Metallographic Specimens
ASTM E18-08b	Standard Test Methods for Rockwell Hardness of Metallic Materials
ASTM E1245-03 (2008)	Standard Practice for Determining the Inclusion of Second-Phase Constituent Content of Metals by Automatic Image Analysis
ASTM E562-11	Standard Test Method for Determining Volume Fraction by Systematic Manual Point Count

Quality References:

Reference
10CFR21, 10CFR50.55(e) and 10CFR50 App.B
ASME NQA-1 – 1994 Basic and Supplementary Requirements
USNRC Regulatory Guide 1.28 Rev. 3
ITLS QA Manual Rev. 3 dated 06/20/08
No ITLS subcontractors used for completion of this order

SMS QC
ACCEPT

13

6-30-12

**SHAW
POWER**

AUG 30 2012

003



Shaw Modular Solutions, LLC
ITLS Report L19495
May 7, 2012

Results:

Chemical Analysis – ASTM A751-11 (OES/Leco)

Sample #	Composition (wt%)													
	C	Mn	P	S	Si	Ni	Cr	Mo	N	Cu	Co	Al	V	Total Others
1	0.027	5.00	0.022	0.001	0.55	1.58	21.6	0.21	0.22	0.41	<0.01	0.01	0.08	0.09
2	0.025	4.89	0.022	0.001	0.57	1.58	21.4	0.22	0.22	0.43	<0.01	0.01	0.08	0.09
3	0.026	4.79	0.022	0.001	0.52	1.57	21.7	0.31	0.23	0.36	0.01	0.02	0.10	0.13
4	0.027	4.78	0.023	0.001	0.51	1.57	21.9	0.31	0.22	0.36	0.01	0.03	0.10	0.13
5	0.027	4.91	0.023	0.001	0.51	1.55	21.8	0.30	0.22	0.35	0.01	0.02	0.10	0.13
6	0.025	4.91	0.022	0.001	0.51	1.54	21.8	0.30	0.22	0.35	0.01	0.03	0.10	0.13
7	0.025	5.05	0.021	0.001	0.55	1.57	21.7	0.21	0.22	0.41	0.01	0.01	0.08	0.09
8	0.025	5.02	0.022	0.001	0.55	1.56	21.5	0.21	0.22	0.42	<0.01	0.01	0.08	0.09
9	0.025	4.84	0.022	0.001	0.50	1.53	21.8	0.30	0.22	0.35	0.01	0.02	0.10	0.13
10	0.026	4.70	0.021	0.001	0.51	1.55	21.9	0.30	0.23	0.36	0.01	0.02	0.10	0.13
11	0.032	4.83	0.021	0.001	0.53	1.45	21.9	0.21	0.22	0.38	0.01	0.02	0.09	0.11
12	0.034	4.75	0.023	0.001	0.54	1.46	21.8	0.21	0.22	0.39	0.01	0.02	0.09	0.11
Required	0.040 Max	4.00 6.00	0.040 Max	0.030 Max	1.00 Max	1.35 1.70	21.0 22.0	0.10 0.80	0.20 0.25	0.10 0.80	0.05 Max	0.10 Max	0.10 Max	0.50 Max

ACCEPTABLE

SMS QC
ACCEPT

13

6-30-12

SHAW
POWER
AUG 30 2012
003
Page 3 of 6

ISO – 17025 Certified - Mechanical 1938.01; Nondestructive 1938.02

DURING OUR MANUFACTURING PROCESSES, TESTS, AND INSPECTIONS, THE PRODUCT DID NOT COME IN DIRECT CONTACT WITH MERCURY OR ANY OF ITS COMPOUNDS NOR WITH ANY MERCURY CONTAINING DEVICES EMPLOYING A SINGLE BOUNDARY OF CONTAINMENT.

"NOTE: THE RECORDING OF FALSE, FICTITIOUS, OR FRAUDULENT STATEMENTS OR ENTRIES ON THIS DOCUMENT MAY BE PUNISHABLE AS A FELONY UNDER FEDERAL STATUTES".



Shaw Modular Solutions, LLC
ITLS Report L19495
May 7, 2012

Results (cont):

Impact Test – ASTM A923-08 Method B

Sample #	Temperature (°F)	Absorbed Energy (ft-lbs)
1	-40	68
2	-40	80
3	-40	45
4	-40	42
5	-40	45
6	-40	44
7	-40	62
8	-40	69
9	-40	44
10	-40	50
11	-40	30
12	-40	31
Required	-40	20 Min

ACCEPTABLE

Ferrite Testing – ASTM E562-11 Method A

Sample #	Ferrite (%)
1	48
2	50
3	52
4	51
5	52
6	50
7	48
8	50
9	52
10	49
11	52
12	53
Required	40 - 60%

SMS QC
ACCEPT
13
6-30-12

SHAW
POWER

AUG 30 2012

003

Ferrite volume fraction tested with Image Analysis per ASTM E1245-03(2008). ASTM E562 offers the use of ASTM E1245 to determine the same measurements.

ACCEPTABLE



Shaw Modular Solutions, LLC
ITLS Report L19495
May 7, 2012

Results (cont.):

Mechanical Properties – ASTM E8-11 (Flat/Round) & ASTM E18-08b (HRB)

Sample #	Test Temp (°F)	Initial Dimensions (in)	Initial Area (in ²)	*Yield Strength (ksi)	Tensile Strength (ksi)	Elongation (%) in 2"	Hardness HRB** (Avg. of 3)
1	Room	0.499 x 0.678	0.3383	72	103	48	96
2	Room	0.498 x 0.661	0.3292	73	104	47	96
3	Room	0.498 x 0.661	0.3292	76	106	47	95
4	Room	0.500 x 0.658	0.3290	73	103	46	96
5	Room	0.500 x 0.671	0.3355	73	102	46	96
6	Room	0.501 x 0.674	0.3377	73	103	45	95
7	Room	0.498 x 0.526	0.2619	73	104	44	97
8	Room	0.497 x 0.529	0.2629	74	104	44	97
9	Room	0.501 x 0.668	0.3347	73	103	46	95
10	Room	0.500 x 0.658	0.3290	72	102	46	96
11	Room	0.500 dia.	0.1963	74	104	42	97
12	Room	0.500 dia.	0.1963	73	104	41	97
Required				65 Min	94 Min	30 Min	290 HBW Max

*Yield calculated at 0.20% offset

ACCEPTABLE

**Customer requested hardness in Rockwell B. All measured values were between 95 and 97 HRB which is approximately equal to Brinell 210 to 233 based on ASTM E140 Tables 2 and 5. These values are well below the specified max of 290 HBW and are therefore acceptable.

SMS QC
ACCEPT

13

6-30-12

**SHAW
POWER**

AUG 30 2012

003



Shaw Modular Solutions, LLC
ITLS Report L19495
May 7, 2012

Results (cont.):

Intergranular Corrosion Test – ISO 3651-2 Method A

Sample #	Bend Radius	Bend	Result
1	1T	90°	Accept – No Cracking Observed
2	1T	90°	Accept – No Cracking Observed
3	1T	90°	Accept – No Cracking Observed
4	1T	90°	Accept – No Cracking Observed
5	1T	90°	Accept – No Cracking Observed
6	1T	90°	Accept – No Cracking Observed
7	1T	90°	Accept – No Cracking Observed
8	1T	90°	Accept – No Cracking Observed
9	1T	90°	Accept – No Cracking Observed
10	1T	90°	Accept – No Cracking Observed
11	1T	90°	Accept – No Cracking Observed
12	1T	90°	Accept – No Cracking Observed
Required	1T	90°	No Cracking @ 10X

ACCEPTABLE

This certification affirms that the contents are correct and accurate, and that the test operations performed by Industrial Testing Laboratory Services are in compliance with the material specification, ITLS Quality Assurance Manual Rev. 3 dated 6/20/2008, ASME NQA-1 1994, Regulatory Guide 1.28, 10 CFR 50 App. B, 10 CFR Part 21 and any additional requirements of SMS Purchase Order # 694689. Test Results comply with the PO required material specification(s) as noted below.

All Samples: **ACCEPTABLE**

Signature _____

Date 5/7/2012

SMS QC
ACCEPT

13

6-30-12

**SHAW
POWER**

AUG 30 2012

003

OUTO
KUMPU

Certificate of Analysis and Tests

OUR ORDER 0278834 - 09

HEAT & PIECE 853732-3A 04/13/12

SOLD TO: SHAW MODULAR SOLUTIONS, L.L.C. SHIP TO: SHAW MODULAR SOLUTIONS, L.L.C.
3191 W LINCOLN ROAD 3191 W LINCOLN ROAD

LAKE CHARLES

LA 70605

LAKE CHARLES

LA 70605

----- YOUR ORDER & DATE -----
746363 12/22/11 TAG# P/N #2232445
----- ITEM DESCRIPTION -----
HEAT & PIECE 853732 - 3A
WEIGHT 8938
FINISH 1
GRADE 2101 UNS S32101
DIMENSIONS .625 X 117.000 X 410.000 EXACT

----- SPECIFICATIONS -----
*** MFG IN NEW CASTLE, IN, USA FROM SLABS IMPORTED FROM BRITAIN
ASTM A240-11A ASMESA240-11ED ASTM A480-11A ASMESA480 11ED
REQUIRES PRODUCT ANALYSIS OSI QA MAN ED 2 R 1 10/15/02
ASTM E562-08 (10% ACCURACY) UHA 51 CHARPY @ -40F (-40C)
ASTM A923-06 METHOD A&B ONLY UT ASTM A578-07 LEVEL B S1
U. T. TEST TO ASTM A 577-90 NON STANDARD PROPERTIES REQD
APP-VL52-ZO-023 R1 W/EXCEPTS ISO 3651-2
COUPONS REQUIRED ASTM A262-02A PRACTICE A
ASTM A262-02A PRACTICE E SMS PO REOMTS WITH EXCEPTS
NO GRIPPER MARKS NO WELD REPAIRS

PLATES & TEST PCS SOLUTION ANNEALED @ 1900 DEGREES FAHRENHEIT MINIMUM.
THEN WATER QUENCHED
FREE FROM MERCURY CONTAMINATION AT CURRENT DETECTION LIMITS
HOT ROLLED, ANNEALED & PICKLED (HRAP)

----- MECHANICAL & OTHER TESTS -----
HARDNESS HRC 15
YIELD STRENGTH (PSI) 69865
TENSILE STRENGTH (PSI) 101260
BEND OK
INTERGRANULAR CORROSION OK
ELONGATION % IN 2" 40.7
REDUCTION OF AREA % 62.9
ASTM E-562 POINT COUNT FERRITE @ 500X = 46% AT 10% RELATIVE ACCURACY
CHARPY TEST AT -40F (TRANS) 71, 86, 68 FT-LBS. FULL SAMPLE SIZE
LATERAL EXPANSION = 51, 63, 57 (MILS)
A923 METHOD C CORROSION TEST M.D.D. = 0.00 @ 50 DEGREES C 24HRS.

----- CHEMICAL COMPOSITION ----- PRODUCT ANALYSIS -----
CARBON (C) .023 (C) .012
MANGANESE (MN) 4.86 (MN) 4.48
PHOSPHORUS (P) .027 (P) .021
SULFUR (S) .001 (S) .007
SILICON (SI) .68 (SI) .68
CHROMIUM (CR) 21.42 (CR) 21.00
NICKEL (NI) 1.67 (NI) 1.62
COBALT (CO) .04 (CO) .04
COPPER (CU) .43 (CU) .39
MOLY (MO) .22 (MO) .22
NITROGEN (N) .22 (N) .22
COLUMBIUM (CB) .012 (CB) .008
TITANIUM (TI) .004 (TI) .004
ALUMINUM (AL) .011 (AL) .009
TIN (SN) .009 (SN) .005

SMS QA

ACCEPT

13

7-12-12

SHAW
POWER
APR 20 2013

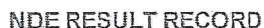
005

WE HEREBY CERTIFY THAT THE MATERIAL HEREIN HAS BEEN MADE AND TESTED IN
ACCORDANCE WITH THE LISTED SPECIFICATION(S) AND THAT THE RESULTS OF ALL
TESTS ARE ACCEPTABLE.

JAMES DOUBMAN, QUALITY ASSURANCE MANAGER

Outokumpu Stainless Plate, Inc.
P.O. Box 370
New Castle, Indiana 47362


CERTIFICATE IN CONFORMANCE WITH EN10204-95 3.1.3/EN10204-2004 3.1



Page 1 of 2

REPORT OF NONDESTRUCTIVE EXAMINATION

SMS QC
ACCEPT
13
7-19-12

 ACUREN		NDE TECHNIQUE RECORD ULTRASONIC	
Facility QC Control No. <u>295585</u>		Technique No. <u>Master</u>	
Client <u>Outokumpu Inc.</u>		P.O. No. <u>28862 B</u>	
Item Description <u>Steel Plate</u>			
Part No. <u>N/A</u>		Drawing No. <u>N/A</u>	
Specification <u>ASTM A577-90</u>		Acceptance <u>ASTM A577-90</u>	
Procedure <u>SP-UT-1 App II-U Rev.5</u>			
WELDS		OTHER TEST ITEMS	
Weld Joint <u>N/A</u>		Type of Item <u>Steel Plate</u>	
Weld Process <u>N/A</u>		Processing <u>Rolled</u>	
Base Material <u>N/A</u>		Material <u>2101CO</u>	
Material Thickness <u>N/A</u>		Dimensions <u>See Page 1</u>	
Weld Length/OD <u>N/A</u>		Additional Info <u>N/A</u>	
Surface Condition <u>N/A</u>		Surface Condition <u>Smooth</u>	
PRECLEAN: Method <u>N/A</u>		Material <u>N/A</u> Batch No. <u>N/A</u>	
EQUIPMENT: Make <u>Krautkramer</u>		Model <u>USN 60</u> S/N <u>00R5W2</u>	
PRESENTATION <input checked="" type="checkbox"/> A-SCAN		<input type="checkbox"/> B-SCAN <input type="checkbox"/> C-SCAN	
TRANSDUCERS:			
Make <u>GE</u> Model <u>Benchmark</u> S/N <u>0228W1</u> Sound Beam Angle (Material) <u>45°</u>			
Crystal Size <u>.63"X.75"</u> Crystal Material <u>Ceramic</u> Frequency <u>2.25 MHz</u>			
COUPLANT: Material <u>Water</u> Manufacturer <u>N/A</u> Batch No. <u>N/A</u>			
CALIBRATION BLOCK: Type <u>Notch</u> Material <u>2101CO</u> S/N <u>N/A</u>			
METHOD <input checked="" type="checkbox"/> Contact <input type="checkbox"/> Immersion <input type="checkbox"/> Water Column			
<input checked="" type="checkbox"/> Pulse Echo <input type="checkbox"/> Resonance <input type="checkbox"/> Through Transmission			
SCANNING: <input checked="" type="checkbox"/> Manual <input type="checkbox"/> Automatic			
Pattern <u>100%</u> Scanning Speed <u>< 6"Per/Sec.</u> % Overlap <u>10%</u>			
POST CLEAN: Method <u>N/A</u>			
OTHER INFORMATION:			
<p>SMS QC ACCEPT 13 7-19-12</p> <p>SHAW POWER APR 20 2013 005</p>			
Prepared By: David B. Klingstein		Approved by: N/A	Date 04/12/12 PAGE 2 OF 2

4-13-12




Page 1 of 2

REPORT OF NONDESTRUCTIVE EXAMINATION

Client Personnel _____ Technician David Klingstein SNT-TC-1A Level III Ultrasonic

SMS QC
ACCEPT
13
7-19-12

 ACUREN		NDE TECHNIQUE RECORD ULTRASONIC	
Facility QC Control No. <u>295585</u>		Technique No. <u>Master</u>	
Client <u>Outokumpu Inc.</u>		P.O. No. <u>28862 B</u>	
Item Description <u>Steel Plate</u>			
Part No. <u>N/A</u>		Drawing No. <u>N/A</u>	
Specification <u>ASTM A578-07</u>		Acceptance <u>ASTM A578-07 Level B S1</u>	
Procedure <u>SP-UT-1 App II-U Rev.5</u>			
WELDS		OTHER TEST ITEMS	
Weld Joint <u>N/A</u>		Type of Item <u>Steel Plate</u>	
Weld Process <u>N/A</u>		Processing <u>Rolled</u>	
Base Material <u>N/A</u>		Material <u>2101CO</u>	
Material Thickness <u>N/A</u>		Dimensions <u>See Page 1</u>	
Weld Length/OD <u>N/A</u>		Additional Info <u>N/A</u>	
Surface Condition <u>N/A</u>		Surface Condition <u>Smooth</u>	
PRECLEAN: Method <u>N/A</u>		Material <u>N/A</u> Batch No. <u>N/A</u>	
EQUIPMENT: Make <u>Krautkramer</u>		Model <u>USN 60</u> S/N <u>00R5W2</u>	
PRESENTATION <input checked="" type="checkbox"/> A-SCAN		<input type="checkbox"/> B-SCAN <input type="checkbox"/> C-SCAN	
TRANSDUCERS:			
Make <u>Panamet</u> Model <u>A 420</u> S/N <u>263733</u> Sound Beam Angle (Material) <u>0°</u>			
Crystal Size <u>1" Dia.</u> Crystal Material <u>Ceramic</u> Frequency <u>2.25 MHz</u>			
COUPLANT: Material <u>Water</u> Manufacturer <u>N/A</u> Batch No. <u>N/A</u>			
CALIBRATION BLOCK: Type <u>Notch</u> Material <u>2101CO</u> S/N <u>N/A</u>			
METHOD <input checked="" type="checkbox"/> Contact <input type="checkbox"/> Immersion <input type="checkbox"/> Water Column			
<input checked="" type="checkbox"/> Pulse Echo <input type="checkbox"/> Resonance <input type="checkbox"/> Through Transmission			
SCANNING: <input checked="" type="checkbox"/> Manual <input type="checkbox"/> Automatic			
Pattern <u>100%</u> Scanning Speed <u>< 6"Per/Sec.</u> % Overlap <u>10%</u>			
POST CLEAN: Method <u>N/A</u>			
OTHER INFORMATION:			
<p>SMS QC ACCEPT 13 7-19-12</p> <p>SHAW POWER APR 20 2013 005</p>			
Prepared By: David B. Klingstein		Approved by: N/A	Date 04/12/12 PAGE 2 OF 2

4-13-12





INDUSTRIAL TESTING LABORATORY SERVICES, LLC
635 Alpha Drive – RIDC Park
Pittsburgh, PA 15238 Phone: 412.963.1900 Fax: 412.963.1926
e-mail: info@itls.com website: itls.com

TEST REPORT
L19844
June 11, 2012

Purchase Order No: 694689-000 OP

To: Shaw Modular Solutions LLC
3191 West Lincoln Road
Lake Charles, LA 70605

Attn: Nick Koseski

Sample Received:

ITLS received four (4) samples for Chemical, Mechanical, Hardness, Impact, Ferrite and Intergranular Corrosion evaluation, identified as follows:

Sample #	Heat #	Description	Supplier
1	853844-4A	1.250" thick Duplex Plate	Outokumpu
2	853844-4A	1.250" thick Duplex Plate	Outokumpu
3	854143-2A	0.625" thick Duplex Plate	Outokumpu
4	854143-2A	0.625" thick Duplex Plate	Outokumpu

Acceptance:

Sample #	Test	Acceptance
All	Chemical Analysis	APP-VL52-Z0-023, Rev. 1, ASTM A240-11b (UNS S32101)
All	Mechanical	APP-VL52-Z0-023, Rev. 1, ASTM A240-11b (UNS S32101), A480-11b
All	Rockwell B	ASTM A240-11b (UNS S32101), A480-11b
All	Ferrite	APP-VL52-Z0-023, Rev. 1, ASTM E562-11, Method A
All	Impact	APP-VL52-Z0-023, Rev. 1, ASTM A923-08, Method B
All	Intergranular Corrosion	ISO 3651-2 Method A

SHAW
POWER
APR 19 2013
005

AMS
QMS QC
ACCEPT
15
10/22/12

Page 1 of 5

ISO - 17025 Certified - Mechanical 1938.01; Nondestructive 1938.02

DURING OUR MANUFACTURING PROCESSES, TESTS, AND INSPECTIONS, THE PRODUCT DID NOT COME IN DIRECT CONTACT WITH MERCURY OR ANY OF ITS COMPOUNDS NOR WITH ANY MERCURY CONTAINING DEVICES EMPLOYING A SINGLE BOUNDARY OF CONTAINMENT.

"NOTE: THE RECORDING OF FALSE, FICTITIOUS, OR FRAUDULENT STATEMENTS OR ENTRIES ON THIS DOCUMENT MAY BE PUNISHABLE AS A FELONY UNDER FEDERAL STATUTES".

Shaw Modular Solutions, LLC
ITLS Report L19844
June 11, 2012

Test References:

Specification	Title
ASTM A751-11	Standard Test Methods, Practices, and Terminology for Chemical Analysis of Steel Products
ASTM A370-12	Standard Test Methods and Definitions for Mechanical Testing of Steel Products
ASTM E8-11	Standard Test Methods for Tension Testing of Metallic Materials
ASTM E140-07	Standard Hardness Conversion Tables for Metals
ASTM E23-07a ^{e1}	Standard Test Methods for Notched Bar Impact Testing of Metallic Materials
ASTM E3-11	Standard Guide for Preparation of Metallographic Specimens
ASTM E18-08b	Standard Test Methods for Rockwell Hardness of Metallic Materials
ASTM E1245-03 (2008)	Standard Practice for Determining the Inclusion of Second-Phase Constituent Content of Metals by Automatic Image Analysis
ASTM E562-11	Standard Test Method for Determining Volume Fraction by Systematic Manual Point Count

Quality References:

Reference
10CFR21, 10CFR50.55(e) and 10CFR50 App.B
ASME NQA-1 – 1994 Basic and Supplementary Requirements
USNRC Regulatory Guide 1.28 Rev. 3
ITLS QA Manual Rev. 3 dated 06/20/08
No ITLS subcontractors used for completion of this order

SHAW
POWER
APR 19 2013
005

10/22/12

Shaw Modular Solutions, LLC
ITLS Report L19844
June 11, 2012

Results:

Chemical Analysis – ASTM A751-11 (OES/Leco)

Sample #	Composition (wt%)													
	C	Mn	P	S	Si	Ni	Cr	Mo	N	Cu	Co	Al	V	Total Others
1	0.032	5.15	0.022	<0.001	0.77	1.40	21.4	0.21	0.21	0.39	0.01	0.01	0.09	0.11
2	0.031	5.07	0.021	<0.001	0.74	1.38	21.4	0.21	0.21	0.38	0.01	0.01	0.09	0.10
3	0.030	5.09	0.018	<0.001	0.86	1.40	21.3	0.21	0.20	0.42	0.01	0.02	0.08	0.09
4	0.028	5.11	0.017	0.001	0.82	1.40	21.3	0.21	0.20	0.43	0.01	0.01	0.09	0.11
Required	0.040 Max	4.00 6.00	0.040 Max	0.030 Max	1.00 Max	1.35 1.70	21.0 22.0	0.10 0.80	0.20 0.25	0.10 0.80	0.05 Max	0.10 Max	0.10 Max	0.50 Max

ACCEPTABLE

Impact Test – ASTM A923-08 Method B

Sample #	Temperature (°F)	Absorbed Energy (ft-lbs)
1	-40	21
2	-40	21
3	-40	65
4	-40	56
Required	-40	20 Min

ACCEPTABLE



10/22/12

SHAW
POWER
APR 19 2012
005



Shaw Modular Solutions, LLC
ITLS Report L19844
June 11, 2012

Results (cont):

Ferrite Testing – ASTM E562-11 Method A

Sample #	Ferrite (%)
1	50
2	50
3	51
4	49
Required	40 - 60%

Ferrite volume fraction tested with Image Analysis per ASTM E1245-03(2008). ASTM E562 offers the use of ASTM E1245 to determine the same measurements.

ACCEPTABLE

Mechanical Properties – ASTM E8-11 (Flat/Round) & ASTM E18-08b (HRB)

Sample #	Test Temp (°F)	Initial Dimensions (in)	Initial Area (in ²)	*Yield Strength (ksi)	Tensile Strength (ksi)	Elongation (%) in 2"	Hardness HRB** (Avg. of 3)
1	Room	0.499 dia.	0.1956	74	99	42	96
2	Room	0.499 dia.	0.1956	75	98	44	95
3	Room	0.501 x 0.660	0.3307	70	99	44	95
4	Room	0.502 x 0.672	0.3373	72	100	44	96
Required				65 Min	94 Min	30 Min	290 HBW Max

*Yield calculated at 0.20% offset

ACCEPTABLE

**Customer requested hardness in Rockwell B. All measured values were between 95 and 96 HRB which is approximately equal to Brinell 210 to 226 based on ASTM E140 Tables 2 and 5. These values are well below the specified max of 290 HBW and are therefore acceptable.

SHAW
POWER
APR 19 2013
005



10/22/12

Shaw Modular Solutions, LLC
ITLS Report L19844
June 11, 2012**Results (cont.):**

Intergranular Corrosion Test – ISO 3651-2 Method A

Sample #	Bend Radius	Bend	Result
1	1T	90°	Accept – No Cracking Observed
2	1T	90°	Accept – No Cracking Observed
3	1T	90°	Accept – No Cracking Observed
4	1T	90°	Accept – No Cracking Observed
Required	1T	90°	No Cracking @ 10X

ACCEPTABLE

This certification affirms that the contents are correct and accurate, and that the test operations performed by Industrial Testing Laboratory Services are in compliance with the material specification, ITLS Quality Assurance Manual Rev. 3 dated 6/20/2008, ASME NQA-1 1994, Regulatory Guide 1.28, 10 CFR 50 App. B, 10 CFR Part 21 and any additional requirements of SMS Purchase Order # 694689. Test Results comply with the PO required material specification(s) as noted below.

All Samples: **ACCEPTABLE**

Signature _____

Date 6/11/2012

Electronic Copy – Original and Signed Report Located at ITLS



10/22/12

SHAW
POWER
APR 19 2013
005



INDUSTRIAL TESTING LABORATORY SERVICES, LLC
635 Alpha Drive – RIDC Park
Pittsburgh, PA 15238 Phone: 412.963.1900 Fax: 412.963.1926
e-mail: info@itls.com website: itls.com

TEST REPORT
L20474
August 30, 2012

Purchase Order No: 694689-000 OP

To: Shaw Modular Solutions LLC
3191 West Lincoln Road
Lake Charles, LA 70605

Attn: Nick Koseski



**SHAW
POWER**
OCT 19 2012
012

Sample Received:

ITLS received one (1) sample for Chemical, Mechanical, Hardness, Impact, Ferrite and Intergranular Corrosion evaluation, identified as follows:

Sample #	Heat #	Description	Supplier
1	854385-1A	0.625" thick Duplex Plate	Outokumpu

Acceptance:

Sample #	Test	Acceptance
All	Chemical Analysis	APP-VL52-Z0-023, Rev. 1, ASTM A240-11b (UNS S32101)
All	Mechanical	APP-VL52-Z0-023, Rev. 1, ASTM A240-11b (UNS S32101), A480-11b
All	Rockwell B	ASTM A240-11b (UNS S32101), A480-11b
All	Ferrite	APP-VL52-Z0-023, Rev. 1, ASTM E562-11, Method A
All	Impact	APP-VL52-Z0-023, Rev. 1, ASTM A923-08, Method B
All	Intergranular Corrosion	ISO 3651-2 Method A



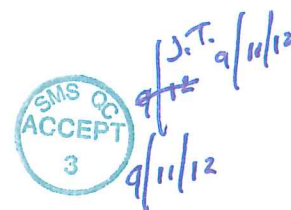
Shaw Modular Solutions, LLC
ITLS Report L20474
August 30, 2012

Test References:

Specification	Title
ASTM A751-11	Standard Test Methods, Practices, and Terminology for Chemical Analysis of Steel Products
ASTM A370-12	Standard Test Methods and Definitions for Mechanical Testing of Steel Products
ASTM E8-11	Standard Test Methods for Tension Testing of Metallic Materials
ASTM E140-07	Standard Hardness Conversion Tables for Metals
ASTM E23-07a ^{e1}	Standard Test Methods for Notched Bar Impact Testing of Metallic Materials
ASTM E3-11	Standard Guide for Preparation of Metallographic Specimens
ASTM E18-11	Standard Test Methods for Rockwell Hardness of Metallic Materials
ASTM E1245-03 (2008)	Standard Practice for Determining the Inclusion of Second-Phase Constituent Content of Metals by Automatic Image Analysis
ASTM E562-11	Standard Test Method for Determining Volume Fraction by Systematic Manual Point Count

Quality References:

Reference
10CFR21, 10CFR50.55(e) and 10CFR50 App.B
ASME NQA-1 – 1994 Basic and Supplementary Requirements
USNRC Regulatory Guide 1.28 Rev. 3
ITLS QA Manual Rev. 4 dated 12/3/11
No ITLS subcontractors used for completion of this order



SHAW
POWER
OCT 19 2012
012



Shaw Modular Solutions, LLC
ITLS Report L20474
August 30, 2012

Results:

Chemical Analysis – ASTM A751-11 (OES/Leco)

Sample #	Composition (wt%)													
	C	Mn	P	S	Si	Ni	Cr	Mo	N	Cu	Co*	Al*	V*	Total Others*
1	0.030	5.17	0.020	<0.002	0.55	1.47	21.9	0.22	0.22	0.38	0.01	0.01	0.08	0.10
Required	0.040 Max	4.00 6.00	0.040 Max	0.030 Max	1.00 Max	1.35 1.70	21.0 22.0	0.10 0.80	0.20 0.25	0.10 0.80	0.05 Max	0.10 Max	0.10 Max	0.50 Max

*Note: Customer-supplied requirement

ACCEPTABLE

Impact Test – ASTM A923-08 Method B

Sample #	Temperature (°F)	Absorbed Energy (ft-lbs)
1	-40	91
Required	-40 or below	20 Min

ACCEPTABLE

Intergranular Corrosion Test – ISO 3651-2 Method A

Sample #	Bend Radius	Bend	Result
1	1T	90°	Accept – No Cracking Observed
Required	1T	90°	No Cracking @ 10X

ACCEPTABLE



SHAW
POWER
OCT 19 2012
012



Shaw Modular Solutions, LLC
ITLS Report L20474
August 30, 2012

Results (cont):

Ferrite Testing – ASTM E562-11 Method A

Sample #	Ferrite (%)
1	50
Required	40 - 60%

**SHAW
POWER**
OCT 19 2012
012

Ferrite volume fraction tested with Image Analysis per ASTM E1245-03(2008). ASTM E562 offers the use of ASTM E1245 to determine the same measurements.

ACCEPTABLE

Mechanical Properties – ASTM E8-11 (flat) & ASTM E18-11 (HRB)

Sample #	Test Temp (°F)	Initial Dimensions (in)	Initial Area (in ²)	*Yield Strength (ksi)	Tensile Strength (ksi)	Elongation (%) in 2"	Hardness HRB** (Avg. of 3)
1	Room	0.499 x 0.662	0.3303	71	100	51	100
Required				65 Min	94 Min	30 Min	290 HBW Max

*Yield calculated at 0.20% offset

ACCEPTABLE

**Customer requested hardness in Rockwell B. All measured values were 100 HRB which is approximately equal to Brinell 240 to 256 based on ASTM E140 Tables 2 and 5. These values are well below the specified max of 290 HBW and are therefore acceptable.

This certification affirms that the contents are correct and accurate, and that the test operations performed by Industrial Testing Laboratory Services are in compliance with the material specification, ITLS Quality Assurance Manual Rev. 4 dated 12/3/11, ASME NQA-1 1994, Regulatory Guide 1.28, 10 CFR 50 App. B, 10 CFR Part 21 and any additional requirements of SMS Purchase Order # 694689. Test Results comply with the PO required material specification(s) as noted below.

All Samples **ACCEPTABLE**

Signature 

Date 8/30/2012



Electronic Copy – Original and Signed Report Located at ITLS