

# Data Book

**Order Number:** 52002319  
**Serial Number:** 4357663  
**Customer:** BASF Corporation  
**Equipment:** KC108-5000



This document contains the following for the KC108-5000 in reference:

1. Pfautler US General Documents . . . . .	2
Name Plate Copy . . . . .	2
2. Pfautler US Quality Control Reports. . . . .	4
US MDR R-2 . . . . .	4
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3. Pfautler US Material Certificates. . . . .	16
MTR Index Vessel. . . . .	16
Tracelogs Vessel . . . . .	17

If you would like to request additional documents, please feel free to contact us.

Sincerely,

**QA Manager**  
 December 22, 2020

NAT'L. BD. 48672

CERTIFIED BY

# PFAUDLER, INC.

ROCHESTER, NY

SYMBOLS	INTERNAL MAWP	90/FV	PSIG AT	400	°F
U	JACKET MAWP	125/FV	PSIG AT	400	°F
	JACKET MAWP	125	PSIG W/INT. VACUUM		
W	INTERNAL MDMT	+10	°F AT	90	PSIG
PHI	JACKET MDMT	-20	°F AT	125	PSIG
	S/N	J009818	YR BUILT	1997	
	GLASS LIT & OIL NICKELITE COON				
	NO. CALIF. 1707 BE-250				
	27A 94156-11.01				

THE FOLLOWING PATENTS MAY APPLY

3,572,092	3,775,160	3,788,874	3,791,588	3,882,740	3,887,740	3,897,437	3,897,437	3,897,437
3,922,089	4,200,478	4,204,251	4,279,886	4,364,195	4,382,022	4,384,324	4,422,841	4,422,841
4,552,838	4,550,183	7 INDEPATENTS PENDING						

**DANGER** OPERATE THIS EQUIPMENT WITHIN TEMPERATURE AND PRESSURE LIMITS STATED IN PFAUDLER INSTRUCTION MANUALS. DO NOT EXCEED DESIGN LIMITS SHOWN ABOVE. EQUIPMENT FAILURE AND SEVERE PERSONAL INJURY OR DEATH CAN RESULT.

REPAIRED BY

DE DIERICH, USA, INC.

R	INT MAWP	90/FV	PSIG AT	400	°F
	INT MDMT	10	°F AT	90/FV	PSIG
JKT MAWP	125	PSIG AT	400	°F	
	125	PSIG W/INT FV			
JKT MDMT	-20	°F AT	125	PSIG	
	DATE	9-1998	SC	58181A	

REPAIRED BY

PEAUDLER, INC.

ROCHESTER, NY



INTERVAL VAMP

XX

PSI AT

XX

OF

JACKET VAMP

XX

PSI AT

XX

OF

89

JACKET VAMP

XX

PSI W/INT VACUUM

XX

OF

NATIONAL  
BOARD

DATE

REPAIRED

SEPT 09

CLASS SYSTEM

CERTIFICATE

NUMBER

C108983

XX

NUMBER

S/N

J009818

NY

NOV 1997

RI-689

**DANGER**

DO NOT OPERATE THIS EQUIPMENT WITHIN THE TEMPERATURE AND PRESSURE LIMITS STATED IN PEAUDLER'S INSTRUCTIONS. DO NOT EXCEED DESIGN LIMITS SHOWN ABOVE EQUIPMENT. FAILURE TO FOLLOW THESE LIMITS MAY RESULT IN DEATH OR SERIOUS PERSONAL INJURY OR DEATH. FAILURE TO FOLLOW THESE LIMITS MAY ALSO RESULT IN LOSS OF LIFE OR INJURY. ALL PEAUDLER VESSELS MUST BE OPERATED WITHOUT ALL OPENINGS AND PLUGS SECURELY CLOSED. PLUGS MUST BE REMOVED TO HEAD OF THE VESSEL HAS BEEN REMOVED THE OPENING SHOULD BE SECURED BY A SUITABLE COVER WHILE THE VESSEL IS IN OPERATION. ALL PERSONS OPERATING A PEAUDLER VESSEL SHOULD HAVE PRIOR INSTRUCTION IN THE PROPER USE OF THE VESSEL DURING OPERATION.



The  
National Board  
of Boiler and Pressure Vessel Inspectors

0052002319

FORM R-2 REPORT OF ALTERATION

1705

4357663

In accordance with provisions of the National Board Inspection Code

(Form "R" Registration No.)

4357663/V161094  
(P.O. no., job no., etc.)

1a. DESIGN PERFORMED BY: **Pfaudler, Inc.**

(Name of "R" organization responsible for design)

1000 West Avenue, Rochester, New York, 14611

(address)

1b. CONSTRUCTION PERFORMED BY: **Pfaudler, Inc.**

(Name of "R" organization responsible for construction)

1000 West Avenue, Rochester, New York, 14611

(address)

2. OWNER OF PRESSURE RETAINING ITEM: **BASF Corporation**

(name)

A/P, Mail Stop R-102, Dept. 904, Florham Park, New Jersey, 07932-0686

(address)

3. LOCATION OF INSTALLATION: **BASF Agricultural Solutions US LLC**

(name)

1740 Whitehall Road, Muskegon, Michigan, 49445

(address)

4. ITEM IDENTIFICATION: **Pressure Vessel** NAME OF ORIGINAL MANUFACTURER: **Pfaudler, Inc.**

(boiler, pressure vessel or piping)

5. IDENTIFYING NOS: **J009818**

(mfg. serial no.)

**48672**

(National Board No.)

**N/A**

(Jurisdiction No.)

**N/A**

(other)

**1997**

(year built)

6. NBIC EDITION / ADDENDA: **2019**

(edition)

**N/A**

(addenda)

Original Code of Construction for Item:

**ASME/VIII/1**

(name/ section/ division)

**1995/1995**

(edition/ addenda)

Construction Code Used for Alteration Performed:

**ASME/VIII/1**

(name/ section/ division)

**2019/**

(edition/ addenda)

7a. DESCRIPTION OF SCOPE DESIGN:

This Alteration due to removal of corrosion allowance from original design.

7b. DESCRIPTION OF CONSTRUCTION SCOPE:

Removed glass lining. repaired wasted areas by welding. Reapplied glass lining and installed jacket with backing PN3121651. Replaced (2) nameplate tabs PN3128901, (6) hoist lugs PN3118136, (1) diaphragm collar/ring PN4007463/3105117, (1) 1/2" sealer vent cplg PN1603146, (1) vessel bottom head PN:V161094A, (1) 6" Nozzle PN4008735, (3) handhole pads PN3130295, (3) removable flanged jacket connections PN4033216, (2) 3"CL150 stub end PN1608085, (1) 1-1/2"CL150 stub end PN1608082, (2) 2" inspection cplg PN3147026, (2) backing band PN3120190, (1) 4"CL150 stub end PN3133849 (52 insulation studs PN1610889, (2) channel brackets PN4008878, (1) channel bracket PN4008879, (6) drive bosses PN4004644, (2) baffle bosses PN3146838 and (2) baffle bosses PN3146839.

Hydro Pressure Test, if applied Int:90,Jkt:140

MAWP I:90/FV,J:125/FV

R2-8

Page 1 of 2



The  
National Board  
of Boiler and Pressure Vessel Inspectors

1705  
(Form "R" Registration No.)  
4357663/V161094  
(P.O. no., job no., etc.)

8. **REPLACEMENT PARTS:** Attached are Manufacturer's Partial Data Reports or Form R-3's properly completed for the following items of this report:

N/A

(name of part, item number, data report type or Certificate of Compliance, mfg's name and identifying stamp)

9. **REMARKS:**

Thicknesses are adequate to maintain design pressures and temperatures. Order number: 4357663, Customer PO#: 4956556146

**DESIGN CERTIFICATION**

I, Richard T. Sinsabaugh, certify that to the best of my knowledge and belief the statements in this report are correct and that the Design Change described in this report conforms to the National Board Inspection Code.

National Board "R" Certificate of Authorization No. 89 expires on 12/31/2021

Date 11/06/2020

Pfudler, Inc.

(name of design organization)

Signed

[Signature]  
(authorized representative)

**CERTIFICATE OF DESIGN CHANGE REVIEW**

I, Bruce A. Sawyer, holding a valid Commission issued by The National Board of Boiler and Pressure Vessel Inspectors and certificate of competency, where required, issued by the jurisdiction of NY and employed by The Hartford Steam Boiler Inspection and Insurance Company of Hartford, CT have reviewed the design change as described in this report and state that to the best of my knowledge and belief such change complies with the applicable requirements of the National Board Inspection Code.

By signing this certificate, neither the undersigned nor my employer makes any warranty, expressed or implied, concerning the work described in this report. Furthermore, neither the undersigned nor my employer shall be liable in any manner for any personal injury, or property damage or loss of any kind arising from or connected with this inspection.

Date 11/10/2020

Signed

[Signature]  
(inspector)

Commissions:

10496R, NY4077

(National Board and jurisdiction no. including endorsements)

**CONSTRUCTION CERTIFICATION**

I, Richard T. Sinsabaugh, certify that to the best of my knowledge and belief the statements in this report are correct and that all material, construction, and workmanship on this Alteration conforms to the National Board Inspection Code.

National Board "R" Certificate of Authorization No. 89 expires on 12/31/2021

Date 11/10/2020

Pfudler, Inc.

(name of alteration organization)

Signed

[Signature]  
(authorized representative)

**CERTIFICATE OF INSPECTION**

I, Bruce A. Sawyer, holding a valid Commission issued by The National Board of Boiler and Pressure Vessel Inspectors and certificate of competency, where required, issued by the jurisdiction of NY and employed by The Hartford Steam Boiler Inspection and Insurance Company of Hartford, CT have inspected the work described in this report on October 29, 2020 and state that to the best of my knowledge and belief this work complies with the applicable requirements of the National Board Inspection Code.

By signing this certificate, neither the undersigned nor my employer makes any warranty, expressed or implied, concerning the work described in this report. Furthermore, neither the undersigned nor my employer shall be liable in any manner for any personal injury, or property damage or loss of any kind arising from or connected with this inspection.

Date 11/10/2020

Signed

[Signature]  
(inspector)

Commissions:

10496R, NY4077

(National Board and jurisdiction no. including endorsements)

R2-8

Page 2 of 2



## Certificate of Glass Quality & Compliance


Customer	BASF
Pfaudler Order No.	0052002319
Serial No.	Vessel: J009818, National Board Number: 48672
Description:	Jacketed Vessel, KC108-5000
Item No.	V201094, Repair MO#: 4357663

	<u>Vessel</u>	
Minimum Thickness ( $10^{-3}$ )	38.9	
Maximum Thickness ( $10^{-3}$ )	81.1	
Average Thickness ( $10^{-3}$ )	58.9	
Std. Deviation	6.3	
No. of Readings	410	
No. of Plugs	-0-	

Spark Test                      15,000V OK in Glassing Dept.  
   10,000V OK in skid, prior to shipment

Hydrotest                      Internal: 90 psig, October 29, 2020  
   Jacket: 140 psig, October 28, 2020

I certify that this pressure vessel was repaired in accordance with the requirements of NBIC, 2019 Edition and ASME Section VIII, Div. 1, 2019 Edition.

Signature: 

Richard T. Sinsabaugh  
Quality Supervisor  
December 22, 2020

Post Forming Sealer Inspection Report

Page 1 of 1

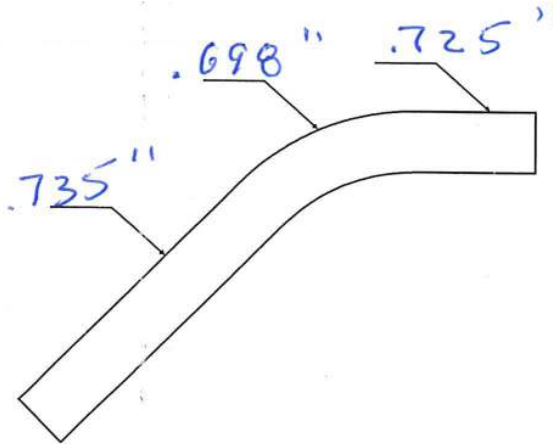
MO Number: 4357663

Item Number: V161094

Item Description: 5000 J.C.W

A Number: A87535

1) Thickness prior to forming: .735"



Inspector Signature: C Gerber

Date: 9/22/20

Return Report To Engineering For Calculations

Product Engineer Approval: Don Al

Date: 9/22/2020



Defining the standard

# Paint Coat Measurements

MO #: 4357663

Order #:

Customer:

BASF

Component	Section	Spot 1			Spot 2			Spot 3			Spot 4			Spot 5		
Top Head	-	Test 1:	Average	Test 1:	Average	Test 1:	Average	Test 1:	Average	Test 1:	Average	Test 1:	Average			
		Test 2:	10	Test 2:	8	Test 2:	9	Test 2:	10	Test 2:	15					
		Test 3:		Test 3:		Test 3:		Test 3:								
Bottom Head	-	Test 1:	Average	Test 1:	Average	Test 1:	Average	Test 1:	Average	Test 1:	Average	Test 1:	Average			
		Test 2:	13	Test 2:	12	Test 2:	13	Test 2:	14	Test 2:	12					
		Test 3:		Test 3:		Test 3:		Test 3:								
Shell	1	Test 1:	Average	Test 1:	Average	Test 1:	Average	Test 1:	Average	Test 1:	Average					
		Test 2:	15	Test 2:	7	Test 2:	10	Test 2:	6	Test 2:	10					
		Test 3:		Test 3:		Test 3:		Test 3:								
	2	Test 1:	Average	Test 1:	Average	Test 1:	Average	Test 1:	Average	Test 1:	Average					
		Test 2:		Test 2:		Test 2:		Test 2:		Test 2:						
		Test 3:		Test 3:		Test 3:		Test 3:								
	3	Test 1:	Average	Test 1:	Average	Test 1:	Average	Test 1:	Average	Test 1:	Average					
		Test 2:		Test 2:		Test 2:		Test 2:		Test 2:						
		Test 3:		Test 3:		Test 3:		Test 3:								
4	Test 1:	Average	Test 1:	Average	Test 1:	Average	Test 1:	Average	Test 1:	Average						
	Test 2:		Test 2:		Test 2:		Test 2:		Test 2:							
	Test 3:		Test 3:		Test 3:		Test 3:									

Inspector Signoff:

Dec.

**THICKNESS MEASUREMENTS CLOSED VESSELS-FISCHER THICKNESS INSTRUMENT**

Order # J4357663  
Descript. 5000 GAL  
Date 10/9/2020

Operator JR  
Coater 159  
Coat 6CC

	TOPHD FLANGE	TOPHD TURN	TOPHD THROAT	TOP HEAD SWAGE	TOP HEAD	TOPHD KNUCKLE	SHELL	BOTHD KNUCKLE	BOTTOM HEAD	BOTHD SWAGE	BOTHD THROAT	BOTHD TURN	BOTHD BTHFL	OVERALL
Target Min	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	
Target Max	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	
AVG	55.7	63.3	57.5	59.8	56.3	62.2	59.3	61.8	61.0	58.7	60.1	64.7	52.7	58.9
STDEV	4.9	5.2	6.4	8.1	4.2	5.9	5.8	4.3	4.1	6.1	4.2	8.0	5.3	6.3
CV%	8.8	8.1	11.1	13.6	7.4	9.5	9.8	7.0	6.7	10.4	7.0	12.4	10.0	10.7
MIN	45.9	52.6	46.4	38.9	50.5	55.1	45.0	53.8	53.1	48.2	50.9	56.6	47.2	38.9
MAX	73.2	73.8	74.5	81.1	69.0	72.9	74.0	67.2	67.8	66.4	65.7	78.8	59.6	81.1
# Readings	56	49	87	45	48	14	44	10	25	8	12	8	4	410
# < Target	0	0	0	1	0	0	0	0	0	0	0	0	0	1
# > Target	0	0	0	1	0	0	0	0	0	0	0	0	0	1

Readings

50.7	68.5	50.8	51.0	53.0	55.1	57.5	56.5	58.5	57.5	57.0	56.6	59.6
59.9	65.0	54.5	64.3	52.0	58.7	54.3	64.1	53.5	57.6	63.8	61.9	47.2
58.7	70.7	63.6	66.6	61.2	55.7	56.0	66.0	57.7	48.2	60.1	57.1	50.6
64.7	61.3	64.2	38.9	54.0	62.5	54.5	61.5	64.5	62.5	65.7	78.8	53.2
55.3	60.1	60.3	53.3	53.3	55.7	63.0	61.6	60.7	66.4	50.9	56.6	
60.0	68.0	64.5	60.8	58.8	60.8	66.4	61.6	61.8	64.6	58.3	68.4	
53.6	70.6	53.7	58.0	57.6	63.1	59.6	59.5	62.4	60.0	59.2	68.1	
60.0	63.8	65.5	71.1	59.3	72.9	61.2	65.9	60.4	62.5	55.3	70.2	
56.9	61.0	46.4	56.3	57.3	72.8	62.7	67.2	67.8		63.3		
50.9	70.1	51.6	69.1	55.6	65.7	52.0	53.8	59.0		62.3		
52.1	72.3	67.1	70.6	69.0	61.0	53.3		53.1		61.2		
59.0	66.8	57.5	56.7	55.5	60.0	56.5		53.3		63.4		
50.9	56.0	47.8	65.1	57.0	58.1	54.1		63.5				
53.2	61.8	58.0	62.5	56.2	68.9	54.0		60.3				
54.0	69.5	60.6	66.6	53.6		68.8		60.1				
45.9	58.0	63.7	58.4	56.1		69.5		64.1				
55.8	57.9	51.1	63.3	55.9		57.3		61.8				
52.2	62.8	55.1	55.7	57.1		54.9		61.8				
47.6	64.8	57.0	57.4	52.7		45.0		67.3				
58.8	57.7	62.0	59.4	54.4		58.2		64.4				
59.1	72.0	46.8	61.3	50.5		60.3		61.9				
57.6	61.2	55.5	64.5	56.7		59.7		66.8				
56.5	61.5	61.5	61.7	55.1		57.5		58.8				
54.3	60.6	49.8	58.7	58.1		58.4		64.7				
61.7	58.6	60.3	59.7	63.9		54.8		56.6				
59.6	61.5	58.6	51.8	56.2		65.8						
73.2	61.3	60.1	51.3	55.0		74.0						
56.2	66.6	48.7	61.6	57.7		63.8						
57.0	64.2	51.3	56.3	57.3		63.1						
48.8	62.4	46.4	81.1	58.2		54.2						
56.2	55.4	54.7	60.7	56.1		49.9						
52.4	65.7	58.5	67.6	50.5		58.8						
52.4	58.5	56.2	75.2	52.6		57.6						
57.5	66.9	61.4	48.1	68.5		66.2						
52.2	56.3	61.0	73.4	60.1		69.6						
50.9	61.4	59.6	53.9	54.8		69.0						
52.2	59.3	49.7	53.7	64.4		57.4						
58.2	67.1	58.6	48.6	55.1		55.8						
55.8	54.3	49.2	62.9	56.4		59.4						
52.9	64.4	55.9	48.7	55.4		65.2						
55.7	60.4	51.8	51.7	57.5		55.7						
64.0	52.6	54.6	60.6	53.1		57.7						
52.8	64.8	58.9	65.5	51.8		59.0						
51.8	61.2	47.5	53.1	51.1		59.0						
52.2	68.5	61.2	52.1	52.9								
53.4	59.8	51.0		50.9								
63.6	64.1	65.4		50.8								
55.3	72.7	59.2		60.8								
51.1	73.8	52.7										
61.8		63.2										
61.6		59.8										
49.4		64.6										
48.8		62.8										
60.0		50.3										
56.0		56.8										
59.4		67.4										
		74.5										
		50.9										
		66.1										
		52.0										
		55.1										
		49.5										
		55.4										
		57.4										
		63.7										
		62.5										
		52.5										
		55.8										
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		53.5										
		64.9										
		49.8										
		59.4										
		63.3										
		59.3										
		50.9										
		69.3										
		68.5										
		61.2										
		60.7										

ATION

AI

04/06/2020

J# 4357663 (V161094)  
 Repaired: SO: 58181A,  
 C108983  
 Original S/N: J009818

BASF (Michigan)  
 108" ID X 111", 5000 JCW  
 Ref. Dwg.V161094, fig #3 sketch, R961286 Sht.2

Fabrication: RR WC3321A		Weld Requirements		Parts Called Out By:		Standard Hours		Completion Target Date
Inspection	AI	Description of work	Recommended Weld Manual Ref #	Notes	Comments/Parts	Standard Hours Given	Standard Hours Used	
C6 9/24		Backgouge and grind sealer inside and outside				6.50		
C6 -		Install (2) hoist loops on each head <i>Remove spatter</i>	J-6-7.1		(6) 3118136	1.50		
C6 -		Make sure there are datum marks on top head			apply datum if marks missing	6.00		
C6 -		Remove vessel bottom head, take ID circ of vessel shell and report circ to Dan Swol						
JL 6/15/20		Fit-up new vessel bottom head <i>A86864 23</i>	H-2-1		V161094A	14.57		
C6 -		Weld new vessel bottom head	H-2-1			28.00		
JL 6/15/20		Fit-up new 6" bottom outlet nozzle <i>A85017 47</i>	J-4-2.1		4008735	6.00		
C6 -		Weld new 6" bottom outlet nozzle	J-4-2.1					
JL 7/1/20		Install new Diaphragm collar (4007463) <i>A86453 45 F Hook JL 7/1/20 47</i>	J-5-1.1		4007463	5.50		
C6 -		Weld repair and grind minor edge corrosion on 24" collar	J-9-1.1			2.00		
C6 -		Weld repair and grind minor edge corrosion on 8" nozzle @ 60 degrees	J-9-1.1			1.00		
C6 -		Weld repair and grind minor edge corrosion on 6" nozzle @ 270 degrees	J-9-1.1			1.00		
C6 -		Weld repair and grind minor edge corrosion on 4" nozzle @ 292.5 degrees	J-9-1.1			0.50		
C6 -		Weld repair and grind minor edge corrosion on 4" nozzle @ 315 degrees	J-9-1.1			0.50		
C6 -		Remove drive bosses, grind flush to boss pad				1.50		
C6 -		Remove baffle bosses, grind flush to baffle boss pad				1.00		
C6 -		Remove firing bucks on top head and grind flush <i>N.A. Per Dan S</i>				2.25		
C6 -		Remove NP bracket (Save in RR Fab) and clean tabs for re-use				0.50		
C6 -		Install (2) nameplate tabs (3128901) adjacent to current bracket on 6-1/4" centers	J-5-4.4		(2) 3128901	0.50		
C6 -		Clean sealer and remove sealer vent cplg.				0.30		
C6 9/24		Final grind				12.00		
C6 9/24		Final inspection <i>*AI HOLD</i>						
Final Blast: WC2110A						Standard Hours		Completion Target Date
Inspection	AI					Standard Hours Given	Standard Hours Used	
						4.48		

Glassing: WC2616A				Comments/Parts		Standard Hours		Completion Target Date
Inspection	AI	Description of work				Standard Hours Given	Standard Hours Used	
10-26-20		9115, plug free				67.65		
C6 -		PWHT - REVIEW <i>*AI HOLD</i>						
Outside Blast: WC2110A		Description of work				Standard Hours		Completion Target Date
Inspection	AI					Standard Hours Given	Standard Hours Used	
		outside blast for paint				4.30		

ALTERATION

AI 04/06/2020

04/06/2020

MO# 4357663 (V161094)  
 Repaired: SO: 58181A,  
 C108983  
 Original S/N: J009818

BASF (Michigan)  
 108" ID X 111", 5000 JCW  
 Ref. Dwg.V161094, fig #3 sketch, R961286 Sht.2

Prep JKT: WC3321A			Weld Requirements		Parts Called Out By	Standard Hours		Completion Target Date
Inspection	AI	Description of work	Weld Procedure #	NOTES	Comments/Parts	Standard Hours Given	Standard Hours Used	
JL 10/16/20		Remove insulation ring and stud on jacket head and grind flush				3.00		
JL 10/16/20		Grind flush insulation stud remnants on upper jacket shell				3.00		
JL 10/16/20		Remove and grind flush to backing plate remnants of channel brackets				4.00		
JL 10/16/20		L/O hand hole pads in place of jacket cplgs J2, J3, and J4						
C.G. 9/30		Fit-up handhole pads A87184	J-5-3.1		(3) 3130295	18.00		
JL 10/16/20		Weld handhole pads 66	J-5-3.1					
JL 10/16/20		Gouge backing band						
JL 10/16/20		Cut Bevel				7.25		
JL 10/16/20		Remove diaphragm ring						
JL 10/16/20		Grind Bevel/Prep Jacket						
JL 10/16/20		Grind diaphragm area				6.25		
Layout/trim JKT: WC3114A			Weld Requirements		Parts Called Out By	Standard Hours		Completion Target Date
Inspection	AI	Description of work	Weld Procedure #	NOTES	Comments/Parts	Standard Hours Given	Standard Hours Used	
JL 10/16/20		Install backing band A87573	J-3-4		(2) 3121651	2.50		
JL 10/16/20		Measure and pull sealer				5.00		
JL 10/16/20	W810/16/20	F/U jacket CAR M875 *AI HOLD	J-3-4			7.00		
Grind/Prep JKT: WC3115A			Weld Requirements		Parts Called Out By	Standard Hours		Completion Target Date
Inspection	AI	Description of work	Weld Procedure #	NOTES	Comments/Parts	Standard Hours Given	Standard Hours Used	
JL 10/16/20		Grind tacks				3.80		
Weld jacket seam: WC3120A			Weld Requirements		Parts Called Out By	Standard Hours		Completion Target Date
Inspection	AI	Description of work	Weld Procedure #	NOTES	Comments/Parts	Standard Hours Given	Standard Hours Used	
JL 10/16/20		Weld jacket circ seam WELD PER WELD VARIANCE JL 10/16/20	J-3-4			9.50		

ALTERATION

AI 04/06/2020  
 BASF (Michigan)  
 108" ID X 111", 5000 JCW  
 Ref. Dwg. V161094, fig #3 sketch, R961286 Sht.2

04/06/2020

WO# 4357663 (V161094)  
 Repaired: SO: 58181A,  
 C108983  
 Original S/N: J009818

Jacket Weld: WC3114A		Weld Requirements		Parts Called Out By		Standard Hours		Completion Target Date
Inspection	AI	Description of work	Weld Procedure #	NOTES	Comments/Parts	Standard Hours Given	Standard Hours Used	
IL 10/20/20		Diaphragm fit up <u>432950</u>	J-5-1.2					
IL 10/23/20		Weld diaphragm ring <u>447</u>	J-5-1.2		3105117	4.50		
IL 10/24/20		Install (3) blind flanges on removable jacket connections to the handhole pads, with gasket and hardware			(3) 1611179, (3) 3132277, (24) 1600369, (24) 1700766	1.00		
C.G. 10/24		Layout, install (3) 3" flanged cplg's in the blind flange of the removable jacket connections. See fig#3 sketch and drawing for location <u>446</u>	J-6-1.1		(3) 4033216	12.00		
IL 10/23/20		Replace (2) 3" flanged stub end only on jacket head. DO NOT REMOVE ENTIRE CPLG <u>447</u>	J-6-1.1		(2) 1608085	7.00		
IL 10/23/20		Replace (1) 1-1/2" flanged stub end only. DO NOT REMOVE ENTIRE CPLG	J-6-1.1		1608082	2.00		
IL 10/23/20		Replace (2) 2" inspection cplgs with backing <u>447</u>	J-6-1.1		(2) 3147026 (2) 3120190	5.00		
IL 10/23/20		Replace (1) 4" flanged overflow stub end only. DO NOT REMOVE ENTIRE CPLG <u>446</u>	J-6-1.1		3133849	3.50		
IL 10/21/20		Install (2) new insulation ring and stud assemblies, (1) on upper jacket shell, and (1) jacket head tangent, (26) studs per location evenly spaced	J-6-8.1 J-6-8.2		(2) 3166925, (52) 1610889	6.00		
		Install (3) channel brackets, (2) bubble 30 on sht.2 of drawing and (1) bubble 38 on sht 2 of drawing <u>440</u>	J-6-3.1		(2) 4008878, (1) 4008879	12.00		
IL 10/28/20		Install NP bracket	J-5-4.4		Single (1120018)	0.60		
IL 10/28/20		Install sealer vent cplg. - 1/2" half cplg. <u>447</u>	J-5-2.3		1603146	0.40		
IL 10/28/20		Final Grind				8.00		
IL 10/28/20		Final inspection <b>*AI HOLD</b>						

KT Hydro: WC3212A		Description of work		Standard Hours		Completion Target Date
Inspection	AI			Standard Hours Given	Standard Hours Used	
IL 10/24/20		Jacket hydro @ 140 psi <b>*AI HOLD</b>				
IL 10/24/20		<u>GAGES 303A, 302G</u>				
Assembly: WC3212A				Standard Hours		Completion Target Date
Inspection	AI	Description of work		Standard Hours Given	Standard Hours Used	
		Install (6) drive bosses				
		Install (4) baffle bosses				
IL 10/24/20		Internal hydrotest @ 90 psi <b>*AI HOLD</b>				
		<u>GAGES 3201, 231</u>				
Paint: WC3702A				Standard Hours		Completion Target Date
Inspection	AI	Description of work		Standard Hours Given	Standard Hours Used	
C.G.		Paint standard Amerlock 400 Horizon Blue		7.30		

**ALTERATION**

MO# 4357663 (V161094)  
 Repaired: SO: 58181A,  
 C108983  
 Original S/N: J009818

AI 04/06/2020  
 BASF (Michigan)  
 108" ID X 111", 5000 JCW  
 Ref. Dwg.V161094 , fig #3 sketch, R961286 Sht.2

04/06/2020

Assembly: WC3212A		Description of work	Comments/Parts	Standard Hours		Completion Target Date
Inspection	AI			Standard Hours Given	Standard Hours Used	
C6. 10/28	10/28/10	Install NP's Pfaudler 'U' , Pfaud. 'R', Pfaud 'A'	AI HOLD			
C6. 10/29		Spark test @ 10kV				
C6. 10/29		Prep to ship				

Shipping: WC3217 A		Description of work	Comments/Parts	Standard Hours		Completion Target Date
Inspection	AI			Standard Hours Given	Standard Hours Used	
C6.		Cut, build, and apply skid		17.70		
C6.		Load truck and ship (Tarp equipment for shipment)				

Thicknesses are such that original pressure ratings apply. See Engineering folder for calculations and actual thicknesses. This is an Alteration due to removal of corrosion allowance

Dan Swol

**Parts Required**

- |  |  |
|--|--|
| (2) Nameplate tabs (3128901)                       | (2) 3" Cl.150 stub end (16008085)      |
| (6) Hoist Lugs (3118136)                           | (1) 1-1/2" Cl.150 stub end (1608082)   |
| (1) Diaphragm Collar (4007463)                     | (2) 2" inspection cplg (3147026)       |
| (2) Backing Band (3121651)                         | (2) backing band (3120190)             |
| (1) Nameplate Bracket (1120018)                    | (1) 4" cl.150 stub end (3133849)       |
| (1) Diaphragm ring (3105117)                       | (2) insulation ring assembly (3166925) |
| (1) Sealer Vent Cplg, 1/2" (1603146)               | (52) insulation studs (1610889)        |
| (1) Vessel bottom head (V161094A)                  | (2) channel brackets (4008878)         |
| (1) 6" nozzle (4008735)                            | (1) channel bracket (4008879)          |
| (2) 5" pipe plugs (1603617)                        | (6) drive bosses (4004644)             |
| (3) handhole pads (3130295)                        | (2) baffle bosses (3146838)            |
| (3) Removable flanged jacket connections (4033216) | (2) baffle bosses (3146839)            |

2nd ADDITIONAL REPORT: REPLACE SEALER DUE TO LACK OF FUSION

ALTERATION

AI from 8/17/20

08/16/2020

MO# 4357663 (V161094)  
 Repaired: SO: 58181A,  
 C108983  
 Original S/N: J009818

BASF (Michigan)  
 108" ID X 111", 5000 JCW  
 Ref. Dwg. V161094 , fig #3 sketch, R961286 Sht.2

Fabrication: RR WC3321A		Weld Requirements		Parts Called Out By:		Standard Hours		
Inspection	AI	Description of work	Recommended Weld Manual Ref #	Notes	Comments/Parts	Standard Hours Given	Standard Hours Used	Completion Target Date
CB		Remove sealer and record circ						
5L 9/6		Fit-up new sealer, circ to be 30' 5-1/8", bottom of the sealer to be 7" from the datum <u>30' 4 3/4"</u>	H-3-4, J-3-2		V161094B			
CB		Weld new sealer <u>162</u>	H-3-4, J-3-2					
CB		FOLLOW ORIGINAL WRITE-UP FOR REMAINING STEPS						

Thicknesses are such that original pressure ratings apply. See Engineering folder for calculations and actual thicknesses. This is an Alteration due to removal of corrosion allowance

Dan Swol

Parts Required  
 (1) Sealer (V161094B)


**ALTERATION**

MO# 4357663 (V161094)  
 Repaired: SO: 58181A,  
 C108983  
 Original S/N: J009818

**ADDITIONAL REPORT: CUSTOMER REQUEST TO ADD (6) TABS TO TOP HEAD**

AI B. King 6/14/20  
 BASF (Michigan)  
 108" ID X 111", 5000 JCW  
 Ref. Dwg.V161094 , fig #3 sketch, R961286 Sht.2

06/10/2020

Fabrication: RR WC3321A				Weld Requirements	Parts Called Out By: _____	Standard Hours		
Inspection	AI	Description of work	Recommended Weld Manual Ref #	Notes	Comments/Parts	Standard Hours Given	Standard Hours Used	Completion Target Date
		F/T/W (6) tabs to top head per drawing			(6) 4034010	6.00		
		FOLLOW ORIGINAL WRITE-UP FOR REMAINING STEPS						

Thicknesses are such that original pressure ratings apply. See Engineering folder for calculations and actual thicknesses. This is an Alteration due to removal of corrosion allowance

Dan Swol

Parts Required  
 (6) tabs (4034010)

**PFAUDLER**  
MATERIAL TRACEABILITY LOG

JOB # **4357663**  
RR # **V161094**

COMPONENT	A # HEAT #	MATERIAL GRADE AND DIMENSIONS	Q.C. INSP DATE	CODE CASES / PFAUDLER SPECS
<b>6" NOZZLE</b>	85017	SA836	JL RTS	APP27-5A, PS0603
	L8389	RING-FRGED,8.5"OD,6"ID,7"L	6/15/2020	
<b>BOTTOM HEAD</b>	86864	SA516-65	JL RTS	APP27-5A, PS0711
	823C69430	HEAD,90/17,108"ID,1.187"TH,97.686"RD	6/15/2020	
<b>DIAPHRAGM COLLAR</b>	86953	SA516-70	JL RTS	APP27-5A, PS0706
	822B37830	PLATE,,437"TH,2.5"W,50.50"LG	7/2/2020	
<b>SEALER BACKING</b>	85693	SA516-70	JL RTS	N/A
	B8W6306	PLATE,,.25"TH,1"W,240"LG	9/17/2020	
<b>SEALER</b>	87535	SA516-70	JL RTS	APP27-5A, PS0706
	9503078	PLATE,,.75"TH,5.5"W,360.375"LG	9/17/2020	
<b>DIAPHRAGM</b>	82950	SA516-70	CG RTS	PS0706
	W6K556	RING,FLAT,13.875"ID,24.5"OD,.313"TH	10/20/2020	
<b>HANDHOLE PAD</b>	87184	SA516-70	CG RTS	N/A
	E0C209	RING,2"TH,4.5"ID,10.5"OD	10/20/2020	
<b>JKT/SEALER BACKING</b>	87578	SA516-70	JL RTS	N/A
	812J32430	PLATE,1.5"W,240"LG,.25"TH	10/20/2020	
<b>3" CPLG BKG</b>	85722	SA414-G	JL RTS	N/A
	R0044	BKG-PLT,.12"TH,3.625"ID,5"OD	10/23/2020	
<b>2" CPLG BKG</b>	86032	SA414-G	JL RTS	N/A
	2139881	5-PL,0.12"THx3"IDx4.5"ODx4.5"Wx4.5"O	10/23/2020	
<b>MTR SUPT CHANNEL</b>	87210	SA36	JL RTS	N/A
	52091428	CHANNEL,C8X18.75#	10/28/2020	



# AMERICAN ALLOY STEEL, INC.

6230 N. HOUSTON ROSSLYN ROAD

HOUSTON, TEXAS 77091

Phone: 713-462-8081 Fax: 713-462-8209

M.T.R. COVER SHEET

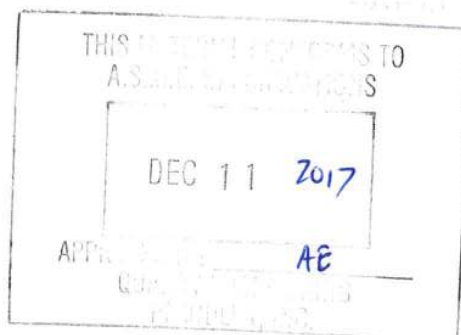
12/06/2017

Customer Name : PFAUDLER COMPANY  
Address :  
City, State Zip : ROCHESTER, NY 14692-3600  
Attention : TOM  
Phone Number : 585-235-1000  
Reference Number : 587955  
Notes 1 : P.O. NO. 5720549

Control Number: 985046  
Queued By : Alex Garza  
Page Number : 1  
Total Pages : 2  
Fax Number : 1-585-235-6393

THE INFORMATION YOU REQUESTED IS ATTACHED.  
THANK YOU FOR YOUR BUSINESS !

AASI PLATE NUMBER	HEAT # / SLAB #	MILL
5179486	W6K556 A07	SSAB



082950

12/06/2017 From: AMERICAN ALLOY STEEL, INC.

To: PFAUDLER COMPANY

P.O.#: 5720549

S.O.#: 587955

AA PL#: 5179486

Item: 1 (3 PC) 5/16" X 24-1/2" OD X 13-7/8"  
ITEM 3125212-KL

# SSAB

12400 Highway 43 North, Axis, Alabama 36505, US

## Test Certificate

82951

AMERICAN ALLOY  
PLATE # 5179486

Form TC1: Revision 2: Date 23 Apr 2014

Customer:  
AMERICAN ALLOY STEEL, INC.  
P.O. BOX 40469  
HOUSTON  
TX 77240 0469

Customer P.O.No.: 109803-NY

Mill Order No. 41-482995-02

Shipping Manifest: AR234429

Product Description: ASTM A516-70(10/15)/ASME SA516-70(15)  
0.20% MAX C; AS-ROLLED, TENSILE COUPON  
NORMALIZED 1650F+/-25.5HR/INCH, 5HR MIN

Size: 0.313 X 96.00 X 480.0 (IN)

Ship Date: 22 Nov 16  
Cert Date: 22 Nov 16  
(Page 1 of 1)

### Tested Pieces:

Heat	Piece Id	Tested Thickness	Charpy Impact Tests										EDWTT Temp %Shr								
			Tst Loc	YS (KSI)	UTS (KSI)	%RA	Elong % 2in 8in	Tst Dir	Hardness	Abs. Energy (FTLB)				%Shear			Tst Temp	Tst Dir	Tst Siz		
W6K556	A07	0.310 (DISCRT)	L 59	81	76		22	T			1	2	3	Avg	1	2	3	Avg	Tst Temp	Tst Dir	Tst Siz
W6K556	A07*	0.310 (DISCRT)	L 51				26	T													

Heat	Id	C	Mn	P	S	Si	Total	Sol Al	Cu	Ni	Cr	Mo	Cb	V	Ti	B
W6K556	A07	1.11	0.11	<.001	.24	.027	.028	.28	.14	.13	.04	.000	.004	.008	.0001	

KILLED STEEL  
MERCURY IS NOT A METALLOGRICAL COMPONENT OF THE STEEL AND NO MERCURY WAS INTENTIONALLY ADDED DURING THE MANUFACTURE OF THIS PRODUCT.

KILLED STEEL, PRODUCED TO A FINE GRAIN PRACTICE  
RESULTS OF TESTS PERFORMED ON NORMALIZED TEST COUPONS ARE LABELED ABOVE WITH \*  
MTR EN 10204:2004 INSPECTION CERTIFICATE 3.1 COMPLIANT  
100% MELTED AND MANUFACTURED IN THE USA.  
WELD REPAIRING HAS NOT BEEN PERFORMED  
PRODUCTS SHIPPED:  
W6K556  
A07  
PCES: 6, LBS: 24540

ORIGIN  
USA

Certified a true copy of the  
original, retained in our file.  
AMERICAN ALLOY STEEL, INC.  
Reviewed By: J.P. 1.4.2017

DEC 11 2017

AE

APPROVED BY

QUALITY CONTROL

Cust Part #:

WE HEREBY CERTIFY THAT THIS MATERIAL WAS  
TESTED IN ACCORDANCE WITH, AND MEETS THE  
REQUIREMENTS OF, THE APPROPRIATE SPECIFICATION

Justin Ward

SENIOR METALLURGIST - PRODUCT



254 North Street  
Auburn, NY 13021  
mattb@hammond-irving.com

# CERTIFICATION

NUMBER: 121302  
PHONE: 315-253-6265  
Fax: 315-253-3136  
www.hammond-irving.com

## MATERIAL CERTIFICATION AND CERTIFICATE OF QUALITY CONFORMANCE

CUSTOMER: PFAUDLER INC  
1000 WEST AVENUE  
ROCHESTER, NY 14611

PAGE: 1  
P.O. NO: 5728087  
S.O. NO: 1902366

MATERIAL: PS-0603 SA836 PS0603  
AS FORGE SOURCE: TIMKENSTEEL

SIZE	QUANTITY	WEIGHT	SHIPPED
1031388 LN/1	10 PCS	760 LBS.	03/27/19

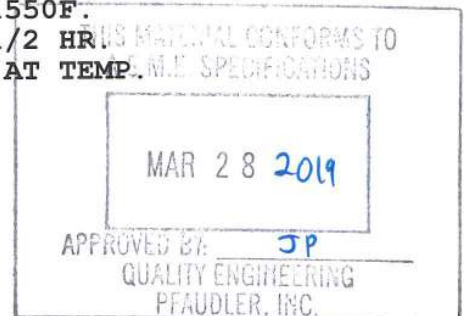
CAPABILITIES:	T.S. (KSI)	Y.S. (KSI)	EL (%)	R/A (%)
2X	56.5	25.1	40.0	85.0
3X	56.0	25.2	41.0	84.0

MATERIAL COMPLIES WITH APPENDIX 27 PARA 27-5A.

REMARKS: 2X=2 FURNACE EXPOSURES 1 AT 1700F AND 1 AT 1475F.

3X=3 FURNACE EXPOSURES AT A MINIMUM OF 1550F.

ALL FURNACE EXPOSURES ARE A MINIMUM OF 1/2 HR PER INCH OF THICKNESS. EXPOSURE IS TIME AT TEMP.



HEAT NO.	C	MN	P	S	SI	CR	NI	MO	CU
L8389	.0700	.7600	.0100	.0150	.2600	.0800	.1200	.0400	.3000
	AL	TI							
	.0400	.5240							

85017

Sworn and subscribed to before me we hereby certify the information listed above  
this 27th day of MARCH 2019 is a true copy of data furnished by the mill.

*Tracy A. Gauthier*

NOTARY PUBLIC

TRACY A. GAUTHIER

Notary Public, State of New York

Cayuga Co. No. 01GA6222489

Commission Expires May 24, 2022

*Edward C. Gallager*  
EDWARD C. GALLAGER  
PRESIDENT

Form: 121

# Steel Certificate of Test

1835 Dueber Ave. S.W.  
Canton, Ohio 44706

ID #0494075-1

Page 1 of 2

3/05/2019

**TIMKEN STEEL**

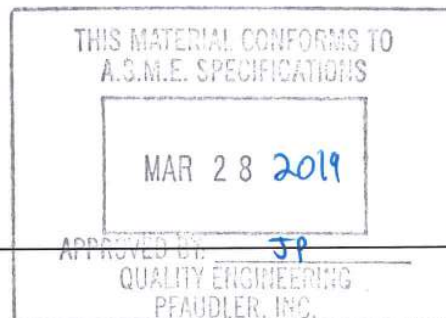
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Hammond & Irving Inc.  
254 NORTH ST  
AUBURN, NY 13021 USA

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P  
Hammond & Irving Inc.  
254 NORTH ST  
AUBURN, NY 13021 USA

Customer Order: A006025 Customer Part Number: 101T-R-0700  
Mill Order: 24101-A (2179402) Heat Number(s): L8389

## Description of Material

DIAMETER: 7.000 in (177.800 mm)  
Shape: RD  
Prod Type: BAR  
Sales Type: 1010M+Ti  
Int Quality: COMMERCIAL  
Condition: HOT ROLL - FORGING QUALITY



## Specification

- ASME SA-836/SA-836M Rev. 2017 EDITION
- PFAUDLER PS-0605 02/01/2013 EXCEPT AS NOTED
- PFAUDLER PS-0603 02/01/2013 EXCEPT AS NOTED

## Chemistry Information

	%C	%Mn	%P	%S	%Si	%Cr	%Ni	%Mo	%Cu	%Al	%Ti
SPEC Ladle Min:	.60				.15						
SPEC Ladle Max:	.12	.90	.040	.040	.35						1.000
L8389 Ladle:	.07	.76	.010	.015	.26	.08	.12	.04	.30	.040	.524

Testing of elements performed at TimkenSteel Chemistry Labs except where noted.

## Metallurgy Information

SPEC: Chemistry

Heat L8389 TI > 4X %C: 0.480

SPEC: Tensile ASTM E8 (Demo Test) (PFAUDLER PS-0605) TENSILE 55,000 Min STRENGTH UOM PSI YIELD .2  
30,000 Min MIN ELONGATION 22.0 Min GAUGE LENGTH 2 IN MIN REDUCTION IN AREA 35.0 Min SPECIMEN  
SIZE .505" SHAPE ROUND DIRECTION LONGITUDINAL TEMPERATURE ROOM LOCATION MID DEMO TYPE  
HEAT

Heat	Piece#	Tensile Strength	.2% Yld Strength	UOM	Elong%	Gauge Length	%Red	Specimen	Direction	Temp	Location	DEMO TYPE
L8389	DEMO	57,718	30,265	PSI	37.6	2 IN	82.1	.505"	RD LONG.	RT	MID	HEAT

All Hardness and Tensile testing performed at TimkenSteel Metallurgical Lab except where noted.

Heat L8389 Melt Source: USA  
Manufacturing: USA

BOTTOM POUR INGOT CAST PROCESS  
REDUCTION RATIO - 20.4:1

When shipping document is attached it becomes part of this certification.

We certify the above materials have been inspected and tested in accordance with the methods prescribed in the governing specifications and consistent with our Standard Commercial Terms and Conditions for Sale, Manufacture, and Shipping, which are incorporated into and made part of this certification. The results of such inspections and tests conform with the applicable requirements including the purchase order, specification(s) and exception(s). This certificate or report shall not be reproduced except in full, without the written approval of TimkenSteel Corporation.

Notarized: \_\_\_\_\_ by \_\_\_\_\_  
NOTARY PUBLIC

Essie Dillard, METALLOGRAPHER

TimkenSteel Corporation

# Steel Certificate of Test

1835 Dueber Ave. S.W.  
Canton, Ohio 44706  
ID #0494075-1



Page 2 of 2

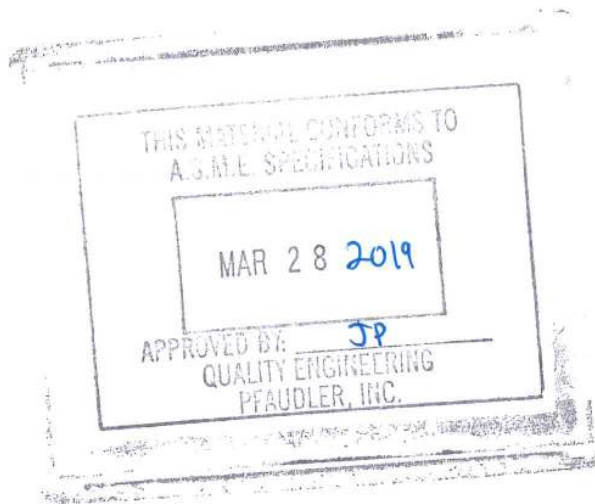
3/05/2019

Customer Order: A006025      Customer Part Number: 101T-R-0700  
Mill Order: 24101-A (2179402)      Heat Number(s): **L8389**

Material melted and produced in the USA

TimkenSteel certifies that there is no mercury or radio-active material used in the melting or processing.

In reference to Section 1502 ("Conflict Minerals") of the Dodd-Frank Wall Street Reform and Consumer Protection Act, no tantalum, tin, tungsten or gold was intentionally added to this material.



85017

January 4, 2018

Matt Babcock  
Hammond & Irving  
254 North Street  
Auburn, NY 13021

## TEST REPORT

IMR Report Number 201713778

PO Number  
B022637

Date Received  
December 26, 2017

Material  
1010 Titanium

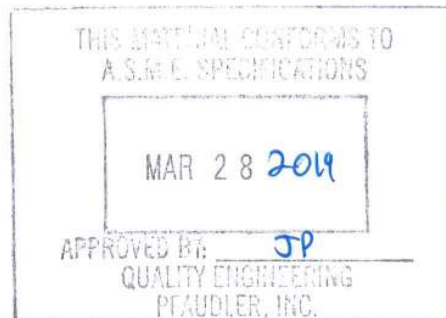
Shop Order  
1708395

Code  
101TR0900

Description  
1010 Titanium – 9"RD –  
SA836

Heat  
L8389

Specification(s)  
PS-0603 (February 2013)  
ASME SA-836:2008a



## SUMMARY

One sample was received for one chemical and two after heat treatment tensile tests.

The specimens **meet** the chemical and after heat treatment tensile requirements of **PS-0603** (February 2013) for a titanium stabilized carbon steel.

The specimens **meets** the chemical and tensile requirements of ASME **SA-836:2008a** for a titanium-stabilized carbon steel.

The results are on the following page(s).



Reviewed by

*Lisa M Wackowicz*  
Lisa Wackowicz for  
Andrew Ensign, Manager  
Chemistry Department

Reviewed by

*Jim Andrews*  
Jim Andrews, CWI  
Manager, Mechanical & Machine Shop

All procedures were performed in accordance with the IMR Quality Manual, current revision, and related procedures; and the PWA MCL Manual F 23 and related procedures. The information contained in this test report represents only the material tested and may not be reproduced, except in full, without the written approval of IMR Test Labs ("IMR"). IMR maintains a quality system in compliance with the ISO/IEC 17025 and is accredited by the American Association for Laboratory Accreditation (A2LA), certificates #1140.01 and #1140.02. IMR will perform all testing in good faith using the proper procedures, trained personnel, and equipment to accomplish the testing required. IMR's liability to the customer or any third party is limited at all times to the amount charged for the services provided. All samples will be retained for a minimum of 6 months and may be destroyed thereafter unless otherwise specified by the customer. The recording of false, fictitious, or fraudulent statements or entries on this document may be punished as a felony under federal statutes. IMR Test Labs is a GEAE S-400 approved lab (Supplier Code T3983).

## CHEMISTRY

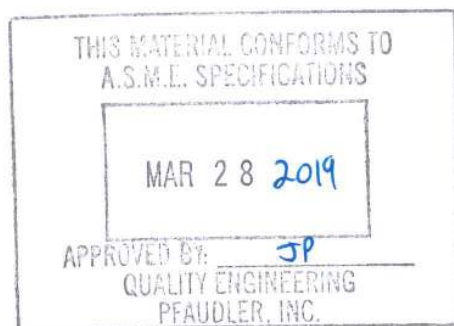
Element	Sample	PS-0603 (February 2013)	ASME SA-836:2008a
C	0.06	0.12 Maximum	0.20 Maximum
Mn	0.75	0.60 - 0.90	0.90 Maximum
S	0.021	0.04 Maximum	0.05 Maximum
P	0.011	0.04 Maximum	0.05 Maximum
Si	0.27	0.15 - 0.35	0.35 Maximum
Ti	0.47	4xC - 1.00	4xC - 1.00
Al	0.04	---	---
Cr	0.08	---	---
Cu	0.31	---	---
Mo	0.05	---	---
Ni	0.12	---	---

Results in weight percent unless otherwise indicated  
Method(s): ASTM E 415-15 (OES)

## HEAT TREATMENT

Temperature	Holding Time	Cooled
1675°F ± 25°F	1 Hour	Air

Temperature	Holding Time	Cooled
1500°F ± 25°F	1 Hour	Air



## AFTER HEAT TREATMENT TENSILE PROPERTIES

Specimen	Tensile Strength (ksi)	Yield Strength (ksi)	Elongation (%)	Reduction in Area (%)
1	56.5	25.1	40	85
PS-0603 (February 2013)	55.0 Minimum	25.0 Minimum	22 Minimum	35 Minimum
ASME SA-836:2008a	55 Minimum	25 Minimum	22 Minimum	35 Minimum

The specimen was machined to a diameter of 0.25 inches, gauge length was 1.00 inch. Yield strength was determined by the 0.2% offset method. Crosshead speed was 0.02 in./min. to yield and 0.3 in./min. to fracture. Method(s): ASTM E 8-16a

THIS MATERIAL CONFORMS TO  
A.S.M.E. SPECIFICATIONS

MAR 28 2014

## HEAT TREATMENT

Temperature	Holding Time	Cooled
1675°F ± 25°F	1 Hour	JP

APPROVED  
QUALITY ENGINEERING  
AIRUDLER, INC.

Temperature	Holding Time	Cooled
1625°F ± 25°F	1 Hour	Air

Temperature	Holding Time	Cooled
1550°F ± 25°F	1 Hour	Air

## AFTER HEAT TREATMENT TENSILE PROPERTIES

Specimen	Tensile Strength (ksi)	Yield Strength (ksi)	Elongation (%)	Reduction in Area (%)
2	56.0	25.2	41	84
PS-0603 (February 2013)	55.0 Minimum	25.0 Minimum	22 Minimum	35 Minimum
ASME SA-836:2008a	55 Minimum	25 Minimum	22 Minimum	35 Minimum

The specimen was machined to a diameter of 0.25 inches, gauge length was 1.00 inch. Yield strength was determined by the 0.2% offset method. Crosshead speed was 0.02 in./min. to yield and 0.3 in./min. to fracture. Method(s): ASTM E 8-16a

ORDER NUMBER: 5731048  
INVOICE ORDER # 109787  
SALES PERSON OR CUSTOMER CLERK  
DATE PREPARED

P.O. Ref

856693

Certificate of Mill Test Results  
PHL-000000-000  
Pg 1.1

ART NO  
MILL NO  
NUCOR

NUCOR  
TUSCALOOSA, INC.

MILL TEST CERTIFICATE

1700 HOLT RD N.E.  
Tuscaloosa, AL 35404-1000  
800 800-8204  
customer.service@nucor.com

Page: 1 of 1

Load Number	Tally	Matl Order Number	PO NO   Line NO	Part Number	Certificate Number	Prepared
R197730	00000000815508	N-167351-002	PHL-13420 2		58150803-1	10/09/2018 05:09
Grade			Customer:			
Order Description: Hot Roll Plate From Coil A516 70, 0.2500 IN x 96.000 IN x 480.000 IN Quality Plan Description: A/SAS16-70: ASTM A516-70-17/ASME SAS16-70-12AR			Solid TO: Ship TO: Sent TO:			

Shipped Item	Heat/Slab Number	Certified By	C	Min	P	S	Si	Cu	Ni	Cr	Mo	Cb	V	Al	Ti	N2	B	Ca	Sn	CEV	ACI
830177B	B8W6306-02 ***	B8W6306	0.21	1.08	0.008	0.002	0.20	0.15	0.05	0.05	0.020	0.003	0.006	0.026	0.002	0.009	0.0002	0.0012		0.42	
830177C	B8W6306-02 ***	B8W6306	0.21	1.08	0.008	0.002	0.20	0.15	0.05	0.05	0.020	0.003	0.006	0.026	0.002	0.009	0.0002	0.0012		0.42	
830177D	B8W6306-02 ***	B8W6306	0.21	1.08	0.008	0.002	0.20	0.15	0.05	0.05	0.020	0.003	0.006	0.026	0.002	0.009	0.0002	0.0012		0.42	

Shipped Item	Certified By	Heat/Slab Number	Yield ksi	Tensile ksi	V/T %	ELONGATION % 2" 8"	Bend OK?	Hard HB	Charpy Impacts (ft-lbs) Size mm 1 2 3 Avg	Shear % 1 2 3 Avg	Test Temp
830177B	830177BTT	B8W6306-02 ***	53.6	73.8	72.6	33.0					
830177B	830177FTT	B8W6306-02 ***	54.5	77.8	70.1	32.7					
830177B	830177MTT	B8W6306-02 ***	50.3	71.2	70.6	31.7					
830177C	830177BTT	B8W6306-02 ***	53.6	73.8	72.6	33.0					
830177C	830177FTT	B8W6306-02 ***	54.5	77.8	70.1	32.7					
830177C	830177MTT	B8W6306-02 ***	50.3	71.2	70.6	31.7					
830177D	830177BTT	B8W6306-02 ***	53.6	73.8	72.6	33.0					
830177D	830177FTT	B8W6306-02 ***	54.5	77.8	70.1	32.7					
830177D	830177MTT	B8W6306-02 ***	50.3	71.2	70.6	31.7					

Items: 3 PCS: 14 Weight: 45739 LBS

Mercury has not come in contact with this product during the manufacturing process nor has any mercury been used by the manufacturing process. Certified in accordance with EN 10204 3.1. No weld repair has been performed on this material. Yield strength is determined by the 0.2% offset method otherwise noted. Hardness complies to NACE MR0175 Annex 2.1.2 < 22 HRC and compliant with NACE MR0103 Paragraph 2.1.2 Manufactured to a fully killed fine grain practice NUTEMPER TEMPER PASSED plate from coil ISO 9001:2015 Registered, PED Certified

We hereby certify that the product described above passed all of the tests required by the specifications.

Dr. Quina Yu, Metallurgist

\*\*\* indicates Heats melted and Manufactured in the USA



\*\*\* R G S T E E L \*\*\*

PAGE 1 of 2

RG STEEL, LLC  
1040 PINE AVE. SE  
WARREN, OHIO 44483-6528

499402

MELTED AND MANUFACTURED IN USA

PURCHASE ORDER:  
04/14/11 31283-D

CERTIFICATE  
OF TESTS

DATE/INVOICE: 05/31/11 690485117  
ORDER: 232 19 37075 03

SOLD TO:

SHIP TO:

I certify that the properties of the items tested are true and accurate. Material was sampled, tested and inspected in accordance with the methods prescribed in the governing specifications. Subject material also conforms to the requirements of the governing specifications. This report shall not be reproduced except in full.

D.L. Moore  
General Manager -  
Met. Services & QC

*D.L. Moore*

All tests are conducted in-house unless noted with an asterisk.

Item	Specification and Description	03:15:36
	HR SHEET SS + ASME SA-414-07 GRADE G ASTM-A-414-07 SMA 45 SK MOD PVQ TEMPER ROLLED DRY NO OIL REST THICK T/R PART: A12516	
3	.118M P008M000 X 36.465 ME X COILS COIL WGT 20000MN/25000MX	
	HEAT-NO 2139881 E264101	COIL NUMBERS E264102 E264105
	HEAT-NO 2139881	C MN P S SI CU NI CR .29 .84 .007 .004 .026 .04 .02 .04 MO SN AL V CB B TI ZR .01 .002 .038 .000 .000 .0000 .001 CA CE SB H N O .0025 .000 .000 .000 .0031
EU	RESALE - TANKS	
TI	01 C T/R TO INCLUDE FRONT, MIDDLE, BACK TESTS PER COIL DGRIMM@LIBERTY-STEEL.COM	
CH	C 31MX MN 1.35MX P 035MX S 035MX NI 40MX CR 30MX MO 12MX CU 40MX AL 020/080 V 03MX CB 020MX	
	HEAT COIL NUMBER NUMBER LOC	YIELD TENSILE ELONG PSI PSI 2" DIR 58000 89100 23.6 T

THIS MATERIAL CONFORMS TO  
A.S.M.E. SPECIFICATIONS

OCT 18, 2019

APPROVED BY: *JD*  
QUALITY ENGINEERING  
PFAUDLER, INC.

Industrial Metals Inc.  
certifies that this is a true copy  
of the original mill test report  
now on file KM 9-21-11

Customer: Bartholmes mfg  
PO# 21523

\*\*\* R G S T E E L \*\*\* 499402

PAGE 2 of 2  
RG STEEL, LLC  
1040 PINE AVE. SE  
WARREN, OHIO 44483-6528

MELTED AND MANUFACTURED IN USA	PURCHASE ORDER: 04/14/11 31283-D
CERTIFICATE OF TESTS	DATE/INVOICE: 05/31/11 690485117 ORDER: 222 19 37075 03
SOLD TO:	SHIP TO:

I certify that the properties of the items tested are true and accurate. Material was sampled, tested and inspected in accordance with the methods prescribed in the governing specifications. Subject material also conforms to the requirements of the governing specifications. This report shall not be reproduced except in full.

D.L. Moore  
General Manager -  
Met. Services & QC

*D.L. Moore*

All tests are conducted in-house unless noted with an asterisk.

Item	Specification and Description						03:15:36
	HEAT NUMBER	COIL NUMBER	LOC	YIELD PSI	TENSILE PSI	ELONG 2"	DIR T
	2139881	E264101	MQ	53700	83500	25.4	T
			LOC	YIELD PSI	TENSILE PSI	ELONG 2"	DIR T
			BQ	54200	85800	24.5	T
		E264102	LOC	YIELD PSI	TENSILE PSI	ELONG 2"	DIR T
			FQ	58000	88900	24.2	T
			LOC	YIELD PSI	TENSILE PSI	ELONG 2"	DIR T
			MQ	52700	82500	25.4	T
			LOC	YIELD PSI	TENSILE PSI	ELONG 2"	DIR T
			BQ	50900	82500	23.8	T
		E264105	LOC	YIELD PSI	TENSILE PSI	ELONG 2"	DIR T
			FQ	62100	92100	24.2	T
			LOC	YIELD PSI	TENSILE PSI	ELONG 2"	DIR T
			MQ	54200	84200	25.3	T
			LOC	YIELD PSI	TENSILE PSI	ELONG 2"	DIR T
			BQ	53700	86300	23.2	T

THIS MATERIAL CONFORMS TO  
A.S.M.E. SPECIFICATIONS

OCT 18, 2019

APPROVED BY: JD  
QUALITY ENGINEERING  
PFAUDLER, INC.

Industrial Metals Inc.  
certifies that this is a true copy  
of the original mill test report  
now on file - Km 9-21-11  
Customer: Barthelmas Mfg  
PO# 21523

**BRIGHTON TRU-EDGE HEADS**  
11861 MOSTELLER RD \* CINCINNATI OH 45241 \* (513)-771-2300  
MTR COVER LETTER

PFAUDLER COMPANY U S INC  
P O BOX 23600  
ROCHESTER NY 14692-3600

ATTN : QC MANAGER  
CUSTOMER P/O: 5734558  
BRIGHTON S/O: 42487 It: 10  
PRODUCTION ORDER: **1055930**

TAG #: 4033885

TO WHOM IT MAY CONCERN:

ATTACHED ARE COPIES OF MILL TEST REPORTS FOR THE FOLLOWING MATERIALS PROVIDED ON YOUR REFERENCED PURCHASE ORDER.

**LABOR AND MATL**

1.00 - SA516-65 - CS2 90/17 STYLE 2:1 ELLIP 108" ID 1.187" MIN. THK. WITH 2" SF

HEAT NUMBER(S)  
823C69430-K052990 (ARC)

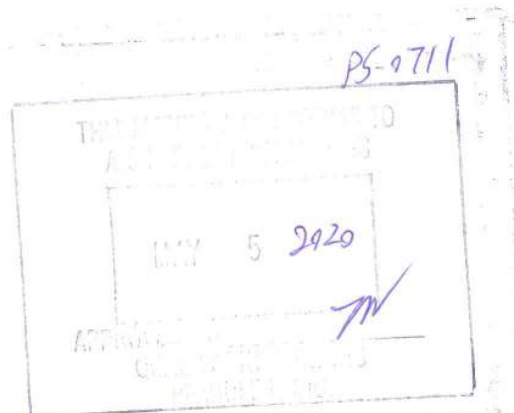
**CERTIFICATE OF COMPLIANCE**

ALL PLATES WERE NORMALIZED AT 1650° F FOR A HALF HOUR PER INCH AND AIR COOLED. ALL HEADS WERE STRESS RELIEVED AT 1100° F MINIMUM AND HELD AT TEMPERATURE ONE HOUR PER INCH PER UCS-56. ALL HEADS WERE HOT FLANGED AT 1650° F - 1400° F MINIMUM.

ALL HEADS WERE COLD FORMED. ALL HEADS ARE IN COMPLIANCE WITH REGULATION UG - 81 AND UCS - 79 (d) AND UG-96 AS STATED IN SECTION VIII DIVISION I OF THE ASME BOILER AND PRESSURE VESSEL CODE. HEADS WERE FORMED WITHOUT COMING IN CONTACT WITH MERCURY OR ANY ITS COMPOUNDS.

IF YOU HAVE ANY FURTHER QUESTIONS CONCERNING MILL TEST REPORTS ONLY, PLEASE CONTACT ME IN CINCINNATI, OHIO AT 1-800-543-1644.

VERY TRULY YOURS,  
**Katherine McKinney**  
BRIGHTON TRU-EDGE HEADS



MILL TEST REPORTS TO GO WITH SHIPMENT.

03/12/2020 From: AMERICAN ALLOY STEEL, INC.

P.O.#: 4500199599

S.O.#:

To: BRIGHTON TRU-EDGE HEADS &  
FABRICATED PL#:

Item: 1 (2 PC) 1-1/2" X R/W 64.375" X R/L

(1) 128.75" DIA PER LAYOUT

655345

5212387

## ArcelorMittal Burns Harbor Plate

QUALITY ASSURANCE  
REPORT OF TEST AND ANALYSES

US HWY 12 Burns Harbor, Indiana

SHIPMENT NO. 803-39097		DATE SHIPPED 09-23-18		CAR OR VEHICLE NO. CSS-CHGO-BNSF		LMIC 200034					
AMERICAN ALLOY STEEL INC PO BOX 40469 HOUSTON TX 77240-0469				AMERICAN ALLOY STEEL INC C/O SKOL TRACK #21 6350 N ERIE AVE OWASSO OK							
S O L D T O	S E R I A L N O	P A T N O	H E A T N O	N O. P C S	SIZE AND QUANTITY			YIELD POINT	TENSILE STRENGTH	AF FRAC. E LONG.	RED.
					THICKNESS	WIDTH OR DIA.	LENGTH				
					INCHES	INCHES	INCHES	POUNDS	PSI	PSI	IN %

QUALITY STEEL MELTED &amp; MANUFACTURED IN THE U. S. A.

PLATES - ASTM A516-10 GR 70 PVQ MOD C.20 MAX KLD FINE GRAIN PRAC, ASTM  
A516-10 GR 65 PVQ, ASTM A516-10 GR 60 PVQ, ASME SA516 GR 70 PVQ  
2017 EDITION, ASME SA516 GR 65 PVQ 2017 EDITION, ASME SA516 GR 60  
PVQ 2017 EDITION, FIRST TST AS ROLLED-ADD'L TENSION PER TST PC HEAT  
TREATMENT --- MILL TEST PCS NORM 1650+/-25F FOR 30MIN/IN (30  
MINUTES MIN), AIRCOOL --- TEST CERTS ARE PREPARED IN ACCORD WITH  
PROCEDURES OUTLINED IN EN 10204:2004 TYPE 3.1  
NO WELD REPAIR WAS PERFORMED ON BELOW PLATE(S)

CO# 116658-OK GH 367-6552L

K052990	823C69430	1	1	1/2	120	240	12252	46100	75700	2	31
								49100	74300	2	36

(M55)MFST REF#:12

K052991	823C69430	1	1	1/2	120	240	12252	46300	76400	2	34
								49600	74700	2	32

(M55)MFST REF#:12

Q-QUENCH TEMPERATURE				T-TEMPERATURE				N-NORMALIZE TEMPERATURE										
<div style="border: 1px solid black; padding: 5px; text-align: center;"> MAY 5 2020  APPROVED  CUTTING  PAPER </div>																		
S E R I A L N O	P A T N O	H E A T N O	H A R D B H N	B E N D	T H I C K N E S S I N C H E S	T Y P E	S I Z E	D I R	T E S T T E M P °	CHARPY IMPACT								
										ENERGY FT LBS			SHEAR(%)			LAT. EXP		
										1	2	3	1	2	3	1	2	3

Certified a true copy of the  
original, retained in our file.  
AMERICAN ALLOY STEEL, INC.

Reviewed By:

Hobbs

H E A T N O	CHEMICAL ANALYSIS														M O Q U A I D G R A I N S I Z E	
	C	Mn	P	S	Si	Cu	Ni	Cr	Mo	V	Ti	Al	B	Cb		N
823C69430	.17	1.12	.013	.003	.340	.026	.01	.13	.081	.002	.002	.035	.0002	.002	.004	.002

I certify that the above results are a true and correct copy of actual results contained in records maintained by ArcelorMittal Burns Harbor and are in full compliance with the requirements of the specification cited above. This test report cannot be altered and must be transmitted intact with any subsequent third party test reports, if required.

BHPLTRPT.TIF

SUPV. QUALITY ASSURANCE

ANDREW SMITH

PER

ELJ

Q.C. DEPT

AMERICAN ALLOY  
PLATE # 5212387

86864

03/12/2020 From: AMERICAN ALLOY STEEL, INC.  
P.O.#: 4500199599  
Item: 2 (1 PC) 1-1/2" X 3" X 3" PLUG MATE  
ITEM 1 CORNER DROP

To: BRIGHTON TRU-EDGE HEADS &  
FABRICATED AA PL#: 5212387

### ArcelorMittal Burns Harbor Plate

SHIPMENT NO. <b>803-39097</b>		DATE SHIPPED <b>09-23-18</b>	CAR OR VEHICLE NO. <b>CSS-CHGO-ENBF</b>	LMIC 200034
AMERICAN ALLOY STEEL INC PO BOX 40469 HOUSTON TX 77240-0469		AMERICAN ALLOY STEEL INC C/O SKOL TRACK #21 6350 N ERIE AVE OWASSO OK		

S E R I A L N O.	P A T N O.	H E A T N U M B E R	N O. P C S.	SIZE AND QUANTITY				Y I E L D P O I N T	T E N S I L E S T R E N G T H	A F F R A C. E L O N G.	R E D.
				THICKNESS	WIDTH OR DIA.	LENGTH	WEIGHT				

QUALITY STEEL MELTED & MANUFACTURED IN THE U. S. A.  
PLATES - ASTM A516-10 GR 70 PVQ MOD C.20 MAX KLD FINE GRAIN PRAC, ASTM A516-10 GR 65 PVQ, ASTM A516-10 GR 60 PVQ, ASME SA516 GR 70 PVQ 2017 EDITION, ASME SA516 GR 65 PVQ 2017 EDITION, ASME SA516 GR 60 PVQ 2017 EDITION, FIRST TST AS ROLLED-ADD'L TENSION PER TST PC HEAT TREATMENT --- MILL TEST PCS NORM 1650+/-25F FOR 30MIN/IN (30 MINUTES MIN), AIRCOOL --- TEST CERTS ARE PREPARED IN ACCORD WITH PROCEDURES OUTLINED IN EN 10204:2004 TYPE 3.1  
NO WELD REPAIR WAS PERFORMED ON BELOW PLATE(S)

CO# 116658-OK GH 367-6552L											
K052990 → 823C69430	1	1	1/2	120	240	12252	46100	75700	2	31	
(M55)MFST REF#:12							49100	74300	2	36	
K052991 823C69430	1	1	1/2	120	240	12252	46300	76400	2	34	
(M55)MFST REF#:12							49600	74700	2	32	

Q-QUENCH TEMPERATURE	T-TEMPERATURE	N-NORMALIZE TEMPERATURE
----------------------	---------------	-------------------------

SERIAL NUMBER	PAT NO.	HEAT NUMBER	HARD BHN	BEND	THICKNESS INCHES	TYPE	SIZE	DIR	TEST TEMP. F	CHARPY IMPACT								
										ENERGY FT LBS			SHEAR(%)			LAT. EXP MILS		
										1	2	3	1	2	3	1	2	3

Certified a true copy of the original, retained in our file.  
AMERICAN ALLOY STEEL, INC.  
Reviewed By: *[Signature]*

H E A T N U M B E R	C H E M I C A L A N A L Y S I S																M O U L D G R A I N S I Z E
	C	Mn	P	S	Si	Cu	Ni	Cr	Mo	V	Ti	Al	B	Co	N	Sn	
823C69430	.17	1.12	.013	.003	.340	.026	.01	.13	.081	.002	.002	.035	.0002	.002	.004	.002	

APPROVED

I certify that the above results are a true and correct copy of actual results contained in records maintained by ArcelorMittal Burns Harbor and are in full compliance with the requirements of the specification cited above. This test report cannot be altered and must be transmitted intact with any subsequent third party test reports, if required.

BHPLTRPT.TIF

SUPV. QUALITY ASSURANCE

ANDREW SMITH PER ELJ

*[Signature]*  
Q.C.

AMERICAN ALLOY  
PLATE # 5212387

05/18/2020 From: AMERICAN ALLOY STEEL, INC.

To: PFAUDLER COMPANY

P.O.#: 5736070 &amp; 5736071

S.O.#: 660235

AA PL#: 5207833

Item: 3 (1 PC) 7/16" X 2-1/2" X 50-1/2"

ITEM 4007463-KL

## ArcelorMittal Burns Harbor Plate

QUALITY ASSURANCE  
REPORT OF TEST AND ANALYSES

US HWY 12 Burns Harbor, Indiana

SHIPMENT NO. 804-14387		DATE SHIPPED 07-18-18	CAR OR VEHICLE NO. CSS-CRGO-CSXT-UTICALMIC 200033	PAGE 1
AMERICAN ALLOY STEEL INC PO BOX 40469 HOUSTON TX 77240-0469		AMERICAN ALLOY STEEL INC THEIR SIDING 650 HARBOR WAY ROME NY 13440		

N O T E	S E R I A L N U M B E R	P A T N O.	H E A T N U M B E R	N O. P C S.	S I Z E A N D Q U A N T I T Y				Y I E L D P O I N T	T E N S I L E S T R E N G T H	A F F R A C. B L O N G.	R E D.
					THICKNESS	WIDTH OR DIA.	LENGTH	WEIGHT				
					INCHES	INCHES	INCHES	POUNDS	PSI	PSI	IN	%

QUALITY STEEL MELTED &amp; MANUFACTURED IN THE U. S. A.

PLATES - ASTM A516-10 GR 70 PVQ MOD C.20 MAX KLD FINE GRAIN PRAC, ASTM  
A516-10 GR 65 PVQ, ASME SA516 GR 70 PVQ 2017 EDITION, ASME SA516 GR  
65 PVQ 2017 EDITION, FIRST TST AS ROLLED-ADD'L TENSION PER TST PC  
HEAT TREATMENT --- MILL TEST PCS NORM 1650+/-25F FOR 30MIN/IN (30  
MINUTES MIN), AIRCOOL --- TEST CERTS ARE PREPARED IN ACCORD WITH  
PROCEDURES OUTLINED IN EN 10204:2004 TYPE 3.1  
NO WELD REPAIR WAS PERFORMED ON BELOW PLATE(S)

CO# 115785-NY GH 367-6471C

MERCURY IN ANY FORM HAS NOT BEEN USED

IN THE PRODUCTION OF THIS ORDER

K540099 822B37830 2 7/16 96 480 11434 55000 79300 8 25  
52900 74700 8 29

(M55)MFST REF#:4

THIS MATERIAL CONFORMS TO  
A.S.M.E. SPECIFICATIONS

MAY 20 2019

APPROVED BY

PFAUDLER, INC.

Q-QUENCH TEMPERATURE	T-TEMPER TEMPERATURE	N-NORMALIZE TEMPERATURE
----------------------	----------------------	-------------------------

SERIAL NUMBER	PAT NO.	HEAT NUMBER	HARD BHN	BEND	THICKNESS INCHES	TYPE	SIZE	DIN	TEST TEMP °F	CHARPY IMPACT								
										ENERGY FT LBS			SHEAR(%)			LAT. EXP MILS		
										1	2	3	1	2	3	1	2	3

Certified a true copy of the  
original, retained in our file.  
AMERICAN ALLOY STEEL, INC.

Reviewed By:  
J.K. 8/31/2018

HEAT NUMBER	CHEMICAL ANALYSIS															MOLAD GRAIN SIZE
	C	Mn	P	S	Si	Cu	Ni	Cr	Mo	V	Ti	Al	B	Co	N	
822B37830	.17	1.04	.010	.004	.325	.232	.18	.03	.006	.001	.002	.035	.0002	.002	.005	.005

I certify that the above results are a true and correct copy of actual results contained in records maintained by ArcelorMittal Burns Harbor and are in full compliance with the requirements of the specification cited above. This test report cannot be altered and must be transmitted intact with any subsequent third party test reports, if required.

BHPLTRPT.TIF

SUPV. QUALITY ASSURANCE

ANDREW SMITH PER ELJ

AMERICAN ALLOY  
PLATE # 5207833

86953

- 871 84

# SSAB

## Test Certificate

12400 Highway 43 North, Axis, Alabama 36505, US

**WARNING:** This product can expose you to chemicals including nickel and nickel compounds, which are known to the State of California to cause cancer. For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov).

Form TC1: Revision 4: Date 6 Feb 2019

Customer:

Customer P.O. No.

Mill Order No. 41-600397-09

Shipping Manifest AR306970

Product Description: ASTM A516-70(11)/ASME SA516-70(15)

0.23% C MAX, 0.43% CEV MAX.

Ship Date: 30 Mar 20  
Cert No: 081768679  
Cert Date: 30 Mar 20 (Page 1 of 1)

Heat Treat Type: NORMALIZED

Size: 2.000 X 96.00 X 240.0 (IN)

Tested Pieces:

Tensiles:

Charpy Impact Tests

Heat Id	Piece Id	Piece Dimensions	Tst Loc	YS (KSI)	UTS (KSI)	%RA	Elong % 2in 8in	Tst Dir	Hardness	Abs. Energy (FTLB) 1 2 3 Avg	% Shear 1 2 3 Avg	Tst Tmp	Tst Dir	Tst Siz (mm)	BDWTT Tmp %Shr
E0C209	C07	1.999 (DISCCT)	C/53	77				T							

Chemical Analysis

Heat Id	C	Mn	P	S	Si	Total	Sol Al	Cu	Ni	Cr	Mo	Co	V	Ti	B	INW	ORGN
E0C209	.15	1.37	.010	.002	.24	.026	.025	.23	.12	.08	.05	.019	.005	.008	.0005	.43	USA

KILLED STEEL.

MERCURY IS NOT A METALLURGICAL COMPONENT OF THE STEEL, AND NO MERCURY WAS INTENTIONALLY ADDED DURING THE MANUFACTURE OF THIS PRODUCT.

KILLED STEEL, PRODUCED TO A FINE GRAIN PRACTICE

CEV (IIV) = C + MN/6 + (CR+MO+V)/5 + (NI+CU)/15

MTR EN 10204:2004 INSPECTION CERTIFICATE 3.1 COMPLIANT

100% MELTED AND MANUFACTURED IN THE USA

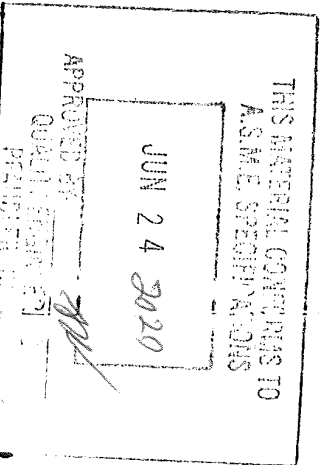
NO WELD REPAIR HAS BEEN PERFORMED ON THIS MATERIAL.

NORMALIZED PLATES. HEATED AT 1656F FOR 77 MINUTES.

TEST COUPONS TAKEN FROM HEAT TREATED PLATE.

PRODUCTS SHIPPED:

E0C209 C07 40037582 PCS: 1, LBS: 13068



CERTIFICATION FROM UPSTATE STEEL INC.

CUSTOMER NAME: Hayden Inc

CUSTOMER PO#: 5736593

UPSTATE ORDER #: 115415

SALESPERSON OR CERTIFICATION CLERK: [Signature] DATE PREPARED: 6/11/2020

P/N: 3130295-14

Heat Number: E0C209

MIL: SSAB

(7)

Cust Part #:

WE HEREBY CERTIFY THAT THIS MATERIAL WAS TESTED IN ACCORDANCE WITH AND MEETS THE REQUIREMENTS OF THE APPROPRIATE SPECIFICATION

Justin Ward

SENIOR METALLURGIST - PRODUCT





# AMERICAN ALLOY STEEL, INC.

6230 N. HOUSTON ROSSLYN ROAD

HOUSTON, TEXAS 77091

Phone: 713-462-8081 Fax: 713-462-8209

M.T.R. COVER SHEET

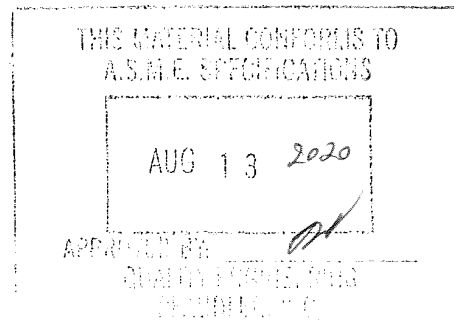
08/07/2020

Customer Name : PFAUDLER COMPANY  
Address :  
City, State Zip : ROCHESTER, NY 14692-3600  
Attention : TOM  
Phone Number : 585-235-1000  
Reference Number : 665067  
Notes 1 : P.O. NO. 5737596

Control Number: 1072912  
Queued By : Alex Garza  
Page Number : 1  
Total Pages : 2  
Fax Number : 1-585-235-6393

THE INFORMATION YOU REQUESTED IS ATTACHED.  
THANK YOU FOR YOUR BUSINESS !

AASI PLATE NUMBER	HEAT # / SLAB #	MILL
5225153	9503078 12	NUCOR



87535

08/07/2020 From: AMERICAN ALLOY STEEL, INC.

To: PFAUDLER COMPANY

P.O.#: 5737596

S.O.#: 665067

AA PL#: 5225153

Item: 1 (2 PC) 3/4" X 5-1/2" X 180-3/16"

ITEM 1013346

**NUCOR**

PLATE MILL

P.O. Box 279  
Winton, NC 27786  
(252) 356-3700

## Mill Test Report

87535

1505 River Rd  
Cortland, NC 27922  
(252) 356-3700AMERICAN ALLOY  
PLATE #5225153  
**NUCOR**  
It's Our Nature

## Issuing Date:

06/08/2019

B/L No.: 535727

Load No.: 546983

Our Order No.: 167093/2

Cust. Order No.: 120250-NY

## Vehicle No:

TPX 804647

## Sold To:

AMERICAN ALLOY STEEL, INC.  
6230 N HOUSTON ROSSLYN RD  
PO BOX 40469  
NORTH HOUSTON, TX 77091

## Ship To:

AMERICAN ALLOY STEEL, INC.  
650 HARBOR WAY  
ROME, NY 13440

## Specification:

0.7500" x 96.000" x 360.000"  
ASTM A516 70-17/ASME SA516 70 P.VQ 2015/2017 Normalized Test  
Coupons at 1650F Hold 30 Min per inch of thickness Air Cooled NACE  
MR0175 Annex 2.1.2 (2015), MR0103(2010) Section 2.1.2 (2015) 13.1.1,  
13.1.2 Compliant

## Marking:

120250-NY

Heat No	C	Mn	P	S	Si	Cu	Ni	Cr	Mo	Al(%)	V	Nb	Ti	N	Ca	B	Sn	Ceq	Pcm
5503078	0.20	1.03	0.011	0.003	0.19	0.27	0.10	0.09	0.02	0.026	0.005	0.003	0.002		0.0046	0.0001	0.012	0.42	0.28
Plate Serial No	Pieces	Tons	Dic.	Yield	Tensile	Elong. % in 2"	Elong. % in 8"												
9503078-12	1	3.67 T		50,500	77,600	20.2	28.1	N											
				47,800	72,600														

## HOT ROLLED CARBON STEEL PLATE

Test coupons only, normalized 30 minutes per inch of thickness at 1650 F ± 25 F, Hold 30 minutes minimum.

Manufactured to fully filled the grain practice by Electric Arc Furnace. Welding or weld repair was not performed on this material. Mercury has not been used in the direct manufacturing of this material. Produced as continuous cast discrete plate as-rolled, unless otherwise noted in Specification. For Metro shipment: ntc-Saleman@NuCor.com

Yield by 0.5EUL method unless otherwise specified. Ceq = C+(Mn/6)+(Cr+Mo+V/5)+(Cu+Ni/15)

Form = C+(S/20)+(Mn/20)+(Cu/20)+(Ni/80)+(Cr/20)+(Mo/15)+(V/10)+68

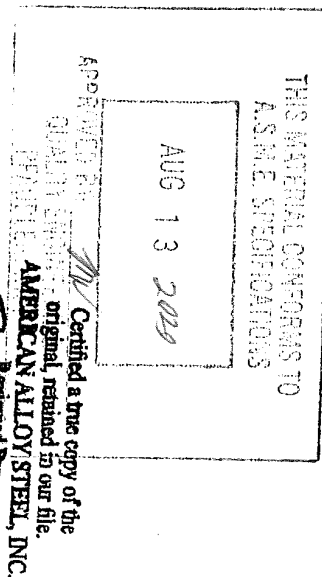
Marked and Manufactured in the USA. ISO 9001:2008 certified (9010540) by SRI Quality System Registrar (09885-09), PED 9723/EC 772 Annex 1, Para. 4.3 Compliant.

DIN 50048 3.1.B(EN 10204 3.1B(2004), DIN EN 10204 3.1(2005) compliant. For ABS grades only. Quality Assurance certificate 144MPC-0A-723

We hereby certify that the contents of this report are accurate and correct. All test results and operations performed by the material manufacturer are in compliance with the applicable specifications, including customer specifications.

T. A. Deprella, Metallurgist

6/9/2019 8:04:55 AM



APPROVED BY: *[Signature]*  
 Certified a true copy of the  
 original, retained in our file.  
 AMERICAN ALLOY STEEL, INC.  
 Marked By: *[Signature]*  
 7/19/2019

03/02/2020 FROM:

TO: UPSTATE STEEL, INC.

P.O.#: 18683

S.O.#: 654716

PL#: 5226109

Item: 1 (1 PC) 1/4" X 96" X 240"

MARK PER CODE

## ArcelorMittal Burns Harbor Plate

QUALITY ASSURANCE  
REPORT OF TEST AND ANALYSIS

US HWY 12 Burns Harbor, Indiana

SHIPMENT NO.  
803-52601DATE SHIPPED  
10-12-19

CAR OR VEHICLE NO.

CSS-CHGO-CSXT-UTICMTC 007218

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NO.	THICKNESS	WIDTH OR DIA.	LENGTH	WEIGHT	YIELD POINT	TENSILE STRENGTH	AFRAC. ELONG.	RED.
INCHES	INCHES	INCHES	POUNDS	PSI	PSI	IN	%	

QUALITY STEEL MELTED &amp; MANUFACTURED IN THE U. S. A.

PLATES - ASTM A516-10 GR 70 PQV KLD FINE GRAIN PRAC, ASTM A516-10 GR 65 PQV,  
ASTM A516-10 GR 60 PQV, ASME SA516 GR 70 PQV 2017 EDITION, ASME  
SA516 GR 65 PQV 2017 EDITION, ASME SA516 GR 60 PQV 2017 EDITION,  
CH-V SA2085 PLT L 15/12 FT LBS AT -50F, VACUUM DEGAUSS --- PLT  
NORMALIZED & COOLED IN STILL AIR --- TEST CERTS ARE PREPARED IN  
ACCORD WITH PROCEDURES OUTLINED IN EN 10204:2004 TYPE 3.1  
NO WELD REPAIR WAS PERFORMED ON BELOW PLATE(S)

CO# 121474-NY GH 367-7075

→ PLATES HEAT TREATED - TEST SPECIMENS ATTACHED &amp; YIELD STRENGTH @ .5% EUL

N030818 812J32430 2 1/4 96 480 6534 56200 76800 8 24  
N 1650 DEG F - 12 MIN

(M55)MFST REF#:1

N030733 812J32440 1 1/4 96 480 3267 55400 76100 8 26  
N 1650 DEG F - 12 MIN

(M55)MFST REF#:1

N030819 822J32430 2 1/4 96 480 6534 55500 78500 8 24  
N 1650 DEG F - 12 MIN

(M55)MFST REF#:1

O-QUENCH TEMPERATURE

T-TEMPERATURE

B-TEMPERATURE

SERIAL NUMBER	PAT NO.	HEAT NUMBER	HARD BHN	BEND	THICKNESS INCHES	TYPE	SIZE	DIR	TEST TEMP	ENERGY FT LBS			SHEAR IN			LAT. EXP IN		
										1	2	3	1	2	3	1	2	3
N030818		812J32430			.250	V	1/2 L	-50		32	33	36						
N030733		812J32440			.250	V	1/2 L	-50		44	43	40						
N030819		822J32430			.250	V	1/2 L	-50		36	34	34						

HEAT NUMBER	CHEMICAL ANALYSIS																ANALYST	ANALYSIS DATE
	C	Mn	P	S	Si	Cu	Ni	Cr	Mo	V	Ti	Al	B	Co	N	Sn		
812J32430	.17	1.03	.021	.005	.337	.215	.18	.03	.005	.002	.002	.036	.0002	.002	.004	.003		
812J32440	.17	1.04	.017	.004	.315	.221	.18	.03	.004	.002	.002	.037	.0002	.002	.004	.003		
822J32430	.17	1.03	.021	.005	.337	.215	.18	.03	.005	.002	.002	.036	.0002	.002	.004	.003		

I certify that the above results are a true and correct copy of results contained in records maintained by ArcelorMittal Burns Harbor and are in full compliance with the requirements of the specification cited above. This test report cannot be altered and must be transmitted intact with any subsequent third party test reports, if required.

BHPLTRPT.TIF

SUPV. QUALITY ASSURANCE

ANDREW SMITH

PER ELJ

CERTIFICATION FROM  
UPSTATE STEEL INC.

CUSTOMER NAME: Powderly Inc

CUSTOMER PO#: 5137834

UPSTATE ORDER #: 116580

SALESPERSON OR CERTIFICATION CLERK

DATE PREPARED

11/11-403 4011-11

Heat Number - 812J32430

MILL: 00100000000000000000

Data Book: 37 of 37