

Manufactures' Data Book

Air Products Inc.

P.O. No.: SM00004584

Project No.: EN207119

Project Name: World Energy Renew Naphtha /PRU US7L

Location: Paramount, CA

Equipment: Jet Stripper Vapor KO Drum Pumps

Item Nos.: 18-P-357 A/B

Model No.: MDW5133SA

S/N: 65061 - 1 & 2

VDR Code: SC02

SDDC Code No.: SUP-DBK-003

Doc. No.: MDB-01

Rev. No.: 0

MDB Book *Table of Contents*

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Air Products Inc.
P.O. No.: SM00004584
Project No.: EN207119
Project Name: World Energy Renew Naphtha /PRU US7L
Location: Paramount, CA

Equipment: Jet Stripper Vapor KO Drum Pumps
Item Nos.: 18-P-357 A/B
Model No.: MDW5133SA
S/N: 65061 - 1 & 2



Emerson Automation Solutions
6021 Innovation Blvd
Shakopee, MN U.S. 55379

Certificate of Hydrostatic Testing - consistent with "type 3.1" ISO 10474:2013 / EN 10204:2004

Customer Information Name: ROTH PUMP MANUFACTURING CO PO: 52514	Manufacturer Information Sales Order: 6947116 Line/Unit: 1 Internal Ref #: 50024332 
Device Information Device Type: Scalable Pressure Transmitter Customer Ref/ID: R4B635RM Serial #: 23SHPE0206101 Model #: 3051S1TG1A3A11A1ADA2K5M5P1Q4Q8HR7 Output: Linear Device ID: 126318	Test Information Factory: Shakopee, MN, USA Operator ID: 1404734 Test Date: 6/14/2023 1:35:43 PM
Permanent Tag Information	Wire-on Tag Information

Attached Models

0306RT32BA21

Target Pressure			Applied Pressure			Test Result
PSI	BAR	MPa	PSI	BAR	MPa	
375.00	25.85	2.59	375.00	25.85	2.59	Pass

This is to certify that the listed serialized equipment was hydrostatically tested per applicable Emerson procedures (GP 1746) and specifications. Pressure was applied for a minimum of 10 minutes. No leaks were observed.


Yoshan Peiris
Quality Manager

Air Products Inc.
P.O. No.: SM00004584
Project No.: EN207119
Project Name: World Energy Renew Naphtha /PRU US7L
Location: Paramount, CA

Equipment: Jet Stripper Vapor KO Drum Pump
Item Nos.: 18-P-357 A
Model No.: MDW5133SA
S/N: 65061 - 1

Tag No.: 18PT-P-357 AC



Emerson Automation Solutions
6021 Innovation Blvd
Shakopee, MN U.S. 55379

Calibration Certificate - consistent with "type 3.1" ISO 10474:2013 / EN 10204:2004

Customer Information Name: ROTH PUMP MANUFACTURING CO PO: 52514	Manufacturer Information Sales Order: 6947116 Line/Unit: 1 Internal Ref #: 50024339 
Device Information Device Type: Scalable Pressure Transmitter Customer Ref/ID: R4B635RM Serial #: 23SHPE0206101 Model #: 3051S1TG1A3A11A1ADA2K5M5P1Q4Q8HR7 Output: Linear Device ID: 126318	Calibration Information Factory: Shakopee, MN, USA Station Name: SHAK_PRESSURE_CALIBRATION_12 Operator ID: 33016 Calibration Date: 6/14/2023 2:24:06 PM
Permanent Tag Information	Wire-on Tag Information

Attached Models

0306RT32BA21

Equipment Used

Equipment #	Equipment Name	Cal Due Date
P3-55798	Pressure Controller	8/20/2023 10:26:19 AM
E3-65415	Multimeter	12/20/2023 9:54:30 AM
E3-58646	Load Box	6/20/2024 9:34:40 AM

Calibration Data

Range: 0.000 TO 30.000 PSI

Reference of Calibration: Gauge

Damping: 0.40 seconds

% of Range	Applied Pressure	Analog Output (mA)	% Span Error	Pass/Fail
100.000	30.000 PSI	19.99944	-0.00350	PASS
80.000	24.000 PSI	16.79908	-0.00575	PASS
60.000	18.000 PSI	13.59890	-0.00687	PASS
40.000	12.000 PSI	10.39920	-0.00500	PASS
20.000	6.000 PSI	7.19908	-0.00575	PASS
0.000	0.000 PSI	3.99930	-0.00437	PASS

Air Products Inc.
P.O. No.: SM00004584
Project No.: EN207119
Project Name: World Energy Renew Naphtha /PRU US7L
Location: Paramount, CA

Equipment: Jet Stripper Vapor KO Drum Pump
Item Nos.: 18-P-357 A
Model No.: MDW5133SA
S/N: 65061 - 1

Tag No.: 18PT-P-357 AC

Issued Date: June 14, 2023
Form #: Q4-Pressure_Ver 14

23SHPE0206101_Q4-Pressure_RSK_Rev1

This document certifies that the listed serialized instrument meets applicable Emerson specifications, has been calibrated per Emerson's calibration procedures and that the instrument conforms fully to all data and engineering requirements provided to Emerson and acknowledged by Emerson. The calibration of measuring and test equipment used in the manufacture and inspection of the listed product is traceable, through an unbroken chain of calibrations or comparisons, to standards maintained by internationally recognized National Metrology Institutes (NMI) such as NIM, NIST, PTB, etc.



Yoshan Peiris
Quality Manager



Emerson Automation Solutions
6021 Innovation Blvd
Shakopee, MN U.S. 55379

Material Certificate of Conformance - consistent with "type 3.1" ISO 10474:2013 / EN 10204:2004

Customer Information Name: ROTH PUMP MANUFACTURING CO PO: 52514	Manufacturer Information Sales Order: 6947116 Line/Unit: 1 Internal Ref #: 50024348 
Device Information Device Type: Scalable Pressure Transmitter Customer Ref/ID: R4B635RM Serial #: 23SHPE0206101 Model #: 3051S1TG1A3A11A1ADA2K5M5P1Q4Q8HR7	
Permanent Tag Information	Wire-on Tag Information

Attached Models

0306RT32BA21

Heat / Assembly #	Heat / Assembly # Description
205-088	Process Connector
276063957	Isolator
M6752	Manifold Body

This is to certify that materials as manufactured, assembled and shipped by Emerson for this order are in accordance with the material section as specified on the applicable Emerson drawings. Test reports from Emerson suppliers are attached.

Yoshan Peiris

Yoshan Peiris
Quality Manager

Air Products Inc.
P.O. No.: SM00004584
Project No.: EN207119
Project Name: World Energy Renew Naphtha /PRU US7L
Location: Paramount, CA

Equipment: Jet Stripper Vapor KO Drum Pump
Item Nos.: 18-P-357 A
Model No.: MDW5133SA
S/N: 65061 - 1

Tag No.: 18PT-P-357 AC



DOC. NO. QAF/28
REV. 01
DATED- 26/10/2018

WORKS TEST CERTIFICATE

MICRO PRECISION PRODUCTS PVT. LTD.

H.B. NO. 40, REVENUE ESTATE, VILLAGE-DUDHOLA,
DISTRICT PALWAL - 121102, (HARYANA) INDIA

Tel. :+91-1275-249900

FAX: +91-1275-249999

E- Mail : Info@micro-precision.co.in ,

Info.Inpal@wika.com

Web_Site:<https://www.wika.co.in>

Certificate No

S060223/M/010

Dated 06/02/2023

Customer

M/S EMERSON PROCESS MANAGEMENT(ROSEMOUNT INC.)

Item

2 Valve Pressure Gauge Valve

Model No.

0306RT32BA21

Part No.

C30612-2126-0000

Job Number

STOCK

S.No.	Description	Group No. / Heat No.	Name of Mill or Foundry	Heat Treatment Details	Material Specification
1	BODY	M6752	AVTAR STEEL LIMITED	SOLUTION ANNEALED ASTM A479-17	ASTM A479-17-316/316L

CHEMICAL ANALYSIS

Group No./ Heat No.	C%	Si%	Mn%	P%	S%	Ni%	Cr%	Mo%	V%	N%	Cb%
M6752	0.024	0.33	1.51	0.042	0.007	10.06	16.60	2.02	-	0.0810	-

PHYSICAL PROPERTIES

Group No./ Heat No.	Yield Strength	Ultimate Tensile Strength	Elongation %	Reduction in Area %	Hardness (BHN)	Charpy V- notch Impact Test			
						Test Standard- Test Temp.-	1	2	3
M6752	520.10 MPa	660.25 MPa	46.00	71.30	194	-	-	-	-

ULTRASONIC TESTING:

MT / PT :

We hereby certify that the material mentioend above has been manufactured and tested in accordance with specification (s)
stipulated in the Purchase Order :

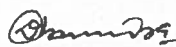
Inspection Agency:

MICRO PRECISION PRODUCTS PVT. LTD.

We certify that the above Material Test report
is in accordance with the Inspection certificate
3.1 as per EN 10204.

Signature / Seal of
Inspector / Customer

For MICRO PRECISION PRODUCTS PVT.LTD.


Manager Quality Control

HAMILTON PRECISION METALS
CERTIFICATE OF CHEMICAL ANALYSIS AND PHYSICAL TESTS

1780 Rohrerstown Road Lancaster, PA 17601-2334

Phone: (717) 569-7061 Web: www.hpmetals.com

DATE

Thursday, July 22, 2021

ORDER ID #

66788

CUSTOMER

KLESK METAL STAMPING

CUSTOMER P O NO

58843

SPECIFICATIONS

ROSE MOUNT C10296 REV AJ; ASTM B575; P/N C10296-0033CPM

MATERIAL

HPM® C-276

HAVAR and HPM Reg. U.S. Pat. TM Off. Other trademarks are the property of their respective owners

SIZE

.0015" X 2.000" X COIL

WORK ORDER #

2100926/1

QUANTITY SHIPPED

3 COILS 13.88 LBS

CHEMICAL ANALYSIS

HEAT NO:

276063957

AG:	AL:	.38	B:	BE:	C:	.002	CA:	CB:			
CO:	1.72	CR:	16.28	CU:	FE:	6.56	H:	MG:	MN:	.62	
MO:	15.36	N:		NB:	NI:	57.32	O:	P:	.007	PB:	
S:	.005	SI:	<.02	SN:	TA:		TI:	V:	.01	W:	3.40
Y:		ZN:		ZR:							

Composition In Wt % (*Denotes PPM) (< Denotes Less Than)

PHYSICAL TEST RESULTS

HEAT NO:

276063957

COIL NO.

15732B-1

TEMPER	HARDNESS	TENSILE (KSI)	YIELD (KSI)	% ELONGATION in 2	DIRECTION
ANNEALED	24.0 RC	138.3	82.9	34.5	LONGITUDINAL

SURFACE TREATMENT

OTHER TESTS

GRAIN

SURFACE ROUGHNESS

GRAIN
SIZE

GRAIN
COUNT

PMI TESTED

COMMENTS: COUNTRY OF ORIGIN USA

DATE RECD 7/27/21 *mf*
DATE CNTD. 7/29/21 *mf*
3 coils / 14,405" *mf*

HPM'S QUALITY MANAGEMENT SYSTEM IS CERTIFIED TO THE REQUIREMENTS OF ISO 9001:2015.
CERTIFICATE OF TEST PREPARED IN ACCORDANCE WITH PARA 3.1 OF EN 10264
TEST METHODS ARE PER APPLICABLE ASTM STANDARDS
MATERIAL HAS NOT COME IN CONTACT WITH MERCURY OR MERCURY CONTAINING SUBSTANCES

ALL PRODUCTS MANUFACTURED BY HPM ARE BOTH REACH AND RoHS COMPLIANT AND DO NOT CONTAIN ANY CONFLICT MATERIALS

I HEREBY CERTIFY THAT THE CHEMICAL AND PHYSICAL OR MECHANICAL TESTS REPORTED ABOVE ARE CORRECT IN THE RECORDS OF THE COMPANY. THE MATERIAL DESCRIBED BY THIS CERTIFICATE IS IN FULL COMPLIANCE WITH THE SUBJECT PURCHASE ORDER AND DRAWINGS OR SPECIFICATIONS REFERENCED ON SAID PURCHASE ORDER EXCEPT AS MAY BE SPECIFICALLY NOTED ON THIS CERTIFICATE.

Harold Eschleman
Authorized Quality Representative

DIVISION OF AMETEK SPECIALTY METAL PRODUCTS

SF 2000-14 Rev 3/18/20

For P/N:03151-1714-1003



上海一郎合金材料有限公司
SHANGHAI ERAUM ALLOY MATERIALS Co., LTD.
质量证明书

地址: 上海市金山区枫泾镇兴塔工业区兴泰路89号 201502

ADD:NO.89 XinghaoRoad,Fengjing Town ,Jinshan District,
Shanghai 201502,China.

TEL: 021-69213298 Fax: 021-51210375

Inspection Certificate EN10204:2004/3.1

MILL INSPECTION CERTIFICATE

网址: WWW.shyilang.com

JL/YL 03 23

订货单位 Ordering unit	西安时硕机械制造有限公司			产品名称 Product name	光棒			交货状态 Delivery condition	报告日期: DATE OF REPORT:			2022.01.14								
合同号 Contract No.	EV21-21110005 FHQ-42-2111			产品标准 Product standard	ASTM B574-2019			固溶退火 Solution annealing	证书编号: CERTIFICATE NO.:			2022011401								
序号 No.	钢号 Steel Grade	炉号 Heat NO.	批号 Lot NO.	规格Size (mm)	数量Quantity			宏观检验Macroscopic Inspection						PMI						
					件数PCS	重量 kg	总米数m	尺寸 Size		表面质量Appearance										
1	N10276	205-088	H21121301	Φ32.5*2000~6000	102	1688	/	合格Qualified		合格Qualified		合格Qualified								
2																				
3																				
化学成分Chemical Composition (WT.%)																		金相试验Metallographic Test		
序号 No.	炉号 Heat NO.	批号 Lot NO.	C	Si	Mn	P	S	Cr	Fe	Mo	V	Cu	W	Co	Al	Ti	Ni	晶粒度 (NO.) Grain size	微观组织 Micro.Structure	
1	205-088	H21121301	≤0.010	≤0.08	≤1.0	≤0.04	≤0.03	14.5-16.5	4.0-7.0	15-17	<0.35	/	3.0-4.5	≤2.50	/	/	Bal	/	/	
2																				
3																				
室温力学性能Mechanical Properties At Room Temperature																		晶间腐蚀 Inter. Corrosion.T.		
序号 No.	炉号 Heat NO.	批号 Lot NO.	抗拉强度 Rm T.S.(MPa) ≥690	屈服强度Rp0.2 Y.S.(MPa) ≥283	延伸率A50mm EL.(%) >40	断面收缩率Z(%) Reduction of Area	硬度 Hardness HRC≤35	冲击试验 Impact.T	扩口试验 Flaring.T.	压扁试验 Flatten.T.										
1	205-088	H21121301	798	432	64	65	10	/	/	/										
2																				
3																				
序号 No.	炉号 Heat NO.	批号 Lot NO.	涡流探伤 Eddy Current.T.	超声波探伤 Ultrasonic.T.	渗透检验 Penetrant.T.	液压试验 Hydro.T.	备注(Remark)	制表人 Completed by:	审核Approved: 张超	印章 Quality seal										
1	205-088	H21121301	/	合格Qualified	/	/		何琳												
2																				
3																				

兹本证书所列产品完全按照上述产品标准的要求进行制造和检验,并满足订货合同规定。

We hereby certify that the material described herein has been made and tested completely in accordance with the above product standard and with the requirement of the purchase order: acc.to ped(DGR/PED 2014/68/EU)by Notified body for pressure equipment (0045),of TUV NORD systems GmbH & Co,KG Approved

注: 质量体系证书号Quality System CertificateNO.:4410017850008(GB/T19001-ISO9001:2015)

PED工厂认可证书 (PED Certificate NO.): 9030AW-21821/20 TS: TS271015Y-2024/TS2731H60-2025



Emerson Automation Solutions
6021 Innovation Blvd
Shakopee, MN U.S. 55379

Certificate of Hydrostatic Testing - consistent with "type 3.1" ISO 10474:2013 / EN 10204:2004

Customer Information Name: ROTH PUMP MANUFACTURING CO PO: 52514	Manufacturer Information Sales Order: 6947116 Line/Unit: 1 Internal Ref #: 50024333 
Device Information Device Type: Scalable Pressure Transmitter Customer Ref/ID: R4B635RM Serial #: 23SHPE0206102 Model #: 3051S1TG1A3A11A1ADA2K5M5P1Q4Q8HR7 Output: Linear Device ID: 126451	Test Information Factory: Shakopee, MN, USA Operator ID: 1404734 Test Date: 6/14/2023 1:35:43 PM
Permanent Tag Information	Wire-on Tag Information

Attached Models

0306RT32BA21

Target Pressure			Applied Pressure			Test Result
PSI	BAR	MPa	PSI	BAR	MPa	
375.00	25.85	2.59	375.00	25.85	2.59	Pass

This is to certify that the listed serialized equipment was hydrostatically tested per applicable Emerson procedures (GP 1746) and specifications. Pressure was applied for a minimum of 10 minutes. No leaks were observed.

Yoshan Peiris

Yoshan Peiris
Quality Manager

Air Products Inc.
P.O. No.: SM00004584
Project No.: EN207119
Project Name: World Energy Renew Naphtha /PRU US7L
Location: Paramount, CA

Equipment: Jet Stripper Vapor KO Drum Pump
Item Nos.: 18-P-357 B
Model No.: MDW5133SA
S/N: 65061 - 2

Tag No.: 18PT-P-357 BC



Emerson Automation Solutions
6021 Innovation Blvd
Shakopee, MN U.S. 55379

Calibration Certificate - consistent with "type 3.1" ISO 10474:2013 / EN 10204:2004

Customer Information Name: ROTH PUMP MANUFACTURING CO PO: 52514	Manufacturer Information Sales Order: 6947116 Line/Unit: 1 Internal Ref #: 50024341 
Device Information Device Type: Scalable Pressure Transmitter Customer Ref/ID: R4B635RM Serial #: 23SHPE0206102 Model #: 3051S1TG1A3A11A1ADA2K5M5P1Q4Q8HR7 Output: Linear Device ID: 126451	Calibration Information Factory: Shakopee, MN, USA Station Name: SHAK_PRESSURE_CALIBRATION_11 Operator ID: 33016 Calibration Date: 6/14/2023 2:21:36 PM
Permanent Tag Information	Wire-on Tag Information

Attached Models

0306RT32BA21

Equipment Used

Equipment #	Equipment Name	Cal Due Date
P3-54837	Pressure Controller	7/15/2023 11:41:29 AM
E3-58787	Load Box	7/20/2023 3:32:12 PM
P3-55738	Pressure Controller	8/21/2023 11:04:08 AM
E3-56234	Multimeter	11/20/2023 1:15:59 PM

Calibration Data

Reference of Calibration: Gauge

Range: 0.000 TO 30.000 PSI

Damping: 0.40 seconds

% of Range	Applied Pressure	Analog Output (mA)	% Span Error	Pass/Fail
100.000	30.000 PSI	19.99930	-0.00437	PASS
80.000	24.000 PSI	16.79916	-0.00525	PASS
60.000	18.000 PSI	13.59880	-0.00750	PASS
40.000	12.000 PSI	10.39806	-0.01212	PASS
20.000	6.000 PSI	7.19896	-0.00650	PASS
0.000	0.000 PSI	4.00004	0.00025	PASS

Air Products Inc.
P.O. No.: SM00004584
Project No.: EN207119
Project Name: World Energy Renew Naphtha /PRU US7L
Location: Paramount, CA

Equipment: Jet Stripper Vapor KO Drum Pump
Item Nos.: 18-P-357 B
Model No.: MDW5133SA
S/N: 65061 - 2

Issued Date: June 14, 2023
Form #: Q4-Pressure_Ver 14

Tag No.: 18PT-P-357 BC

23SHPE0206102_Q4-Pressure_RSK_Rev1

This document certifies that the listed serialized instrument meets applicable Emerson specifications, has been calibrated per Emerson's calibration procedures and that the instrument conforms fully to all data and engineering requirements provided to Emerson and acknowledged by Emerson. The calibration of measuring and test equipment used in the manufacture and inspection of the listed product is traceable, through an unbroken chain of calibrations or comparisons, to standards maintained by internationally recognized National Metrology Institutes (NMI) such as NIM, NIST, PTB, etc.



Yoshan Peiris
Quality Manager



Emerson Automation Solutions
6021 Innovation Blvd
Shakopee, MN U.S. 55379

Material Certificate of Conformance - consistent with "type 3.1" ISO 10474:2013 / EN 10204:2004

Customer Information Name: ROTH PUMP MANUFACTURING CO PO: 52514	Manufacturer Information Sales Order: 6947116 Line/Unit: 1 Internal Ref #: 50024350 
Device Information Device Type: Scalable Pressure Transmitter Customer Ref/ID: R4B635RM Serial #: 23SHPE0206102 Model #: 3051S1TG1A3A11A1ADA2K5M5P1Q4Q8HR7	
Permanent Tag Information	Wire-on Tag Information

Attached Models

0306RT32BA21

Heat / Assembly #	Heat / Assembly # Description
205-088	Process Connector
276063957	Isolator
M6752	Manifold Body

This is to certify that materials as manufactured, assembled and shipped by Emerson for this order are in accordance with the material section as specified on the applicable Emerson drawings. Test reports from Emerson suppliers are attached.

Yoshan Peiris

Yoshan Peiris
Quality Manager

Air Products Inc.
P.O. No.: SM00004584
Project No.: EN207119
Project Name: World Energy Renew Naphtha /PRU US7L
Location: Paramount, CA

Equipment: Jet Stripper Vapor KO Drum Pump
Item Nos.: 18-P-357 B
Model No.: MDW5133SA
S/N: 65061 - 2

Tag No.: 18PT-P-357 BC



DOC. NO. QA/F/28
REV. 01
DATED- 26/10/2018

WORKS TEST CERTIFICATE

MICRO PRECISION PRODUCTS PVT. LTD.

H.B. NO. 40, REVENUE ESTATE, VILLAGE-DUDHOLA,
DISTRICT PALWAL - 121102, (HARYANA) INDIA

Tel. : +91-1275-249900

FAX: +91-1275-249999

E- Mail : Info@micro-precision.co.in ,

Info.Inpal@wika.com

Web_Site:<https://www.wika.co.in>

Certificate No

S060223/M/010

Dated 06/02/2023

Customer

M/S EMERSON PROCESS MANAGEMENT(ROSEMOUNT INC.)

Item

2 Valve Pressure Gauge Valve

Model No.

0306RT32BA21

Part No.

C30612-2126-0000

Job Number

STOCK

S.No.	Description	Group No. / Heat No.	Name of Mill or Foundry	Heat Treatment Details	Material Specification
1	BODY	M6752	AVTAR STEEL LIMITED	SOLUTION ANNEALED ASTM A479-17	ASTM A479-17-316/316L

CHEMICAL ANALYSIS

Group No./ Heat No.	C%	Si%	Mn%	P%	S%	Ni%	Cr%	Mo%	V%	N%	Cb%
M6752	0.024	0.33	1.51	0.042	0.007	10.06	16.60	2.02	-	0.0810	-

PHYSICAL PROPERTIES

Group No./ Heat No.	Yield Strength	Ultimate Tensile Strength	Elongation %	Reduction in Area %	Hardness (BHN)	Charpy V- notch Impact Test Test Standard- Test Temp.-			
						1	2	3	Average
M6752	520.10 MPa	660.25 MPa	46.00	71.30	194	-	-	-	-

ULTRASONIC TESTING:

MT / PT :

We hereby certify that the material mentioend above has been manufactured and tested in accordance with specification (s)
stipulated in the Purchase Order :

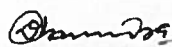
Inspection Agency:

MICRO PRECISION PRODUCTS PVT. LTD.

We certify that the above Material Test report
is in accordance with the Inspection certificate
3.1 as per EN 10204.

Signature / Seal of
Inspector / Customer

For MICRO PRECISION PRODUCTS PVT.LTD.


Manager Quality Control

7/27/21

HAMILTON PRECISION METALS

CERTIFICATE OF CHEMICAL ANALYSIS AND PHYSICAL TESTS

1780 Rohrerstown Road Lancaster, PA 17601-2334

Phone: (717) 569-7061 Web: www.hpmetals.com

DATE

Thursday, July 22, 2021

ORDER ID #

66788

CUSTOMER

KLESK METAL STAMPING

CUSTOMER P O NO

58843

SPECIFICATIONS

ROSE MOUNT C10296 REV AJ; ASTM B575; P/N C10296-0033CPM

MATERIAL

HPM® C-276

HAVAR and HPM Reg. U.S. Pat. TM. All other trademarks are the property of their respective owners.

SIZE

.0015" X 2.000" X COIL

WORK ORDER #

2100926/1

QUANTITY SHIPPED

3 COILS 13.88 LBS

CHEMICAL ANALYSIS

HEAT NO:

276063957

AG:	AL:	.38	B:	BE:	C:	.002	CA:	CB:			
CO:	1.72	CR:	16.28	CU:	FE:	6.66	H:	MG:	MN:	.62	
MO:	15.36	N:		NB:	NI:	57.32	O:	P:	.007	PB:	
S:	.005	SI:	<.02	SN:	TA:		Ti:	V:	.01	W:	3.40
Y:		ZN:		ZR:							

Composition In Wt % (*Denotes PPM) (< Denotes Less Than)

PHYSICAL TEST RESULTS

HEAT NO:

276063957

COIL NO.

15732B-1

TEMPER	HARDNESS	TENSILE (KSI)	YIELD (KSI)	% ELONGATION IN 2	DIRECTION
ANNEALED	24.0 RC	138.3	82.9	34.5	LONGITUDINAL

SURFACE TREATMENT

OTHER TESTS

GRAIN

SURFACE ROUGHNESS

GRAIN
SIZE

GRAIN
COUNT

PMI TESTED

COMMENTS: COUNTRY OF ORIGIN USA

DATE RECD 7/27/21 *mf*
DATE CNTD. 7/29/21 *mf*
3 coils / 14,405" *mf*

HPM'S QUALITY MANAGEMENT SYSTEM IS CERTIFIED TO THE REQUIREMENTS OF ISO 9001:2015

CERTIFICATE OF TEST PREPARED IN ACCORDANCE WITH PARA 3.1 OF EN 10204
TEST METHODS ARE PER APPLICABLE ASTM STANDARDS

MATERIAL HAS NOT COME IN CONTACT WITH MERCURY OR MERCURY CONTAINING SUBSTANCES

ALL PRODUCTS MANUFACTURED BY HPM ARE BOTH REACH AND RoHS COMPLIANT AND DO NOT CONTAIN ANY CONFLICT MATERIALS

I HEREBY CERTIFY THAT THE CHEMICAL AND PHYSICAL OR MECHANICAL TESTS REPORTED ABOVE ARE CORRECT IN THE RECORDS OF THE COMPANY. THE MATERIAL DESCRIBED BY THIS CERTIFICATE IS IN FULL COMPLIANCE WITH THE SUBJECT PURCHASE ORDER AND DRAWINGS OR SPECIFICATIONS REFERENCED ON SAID PURCHASE ORDER EXCEPT AS MAY BE SPECIFICALLY NOTED ON THIS CERTIFICATE

Harold Eschleman
Authorized Quality Representative

DIVISION OF AMETEK SPECIALTY METAL PRODUCTS

SF 2000-14 Rev 3/18/20

For P/N:03151-1714-1003



上海一郎合金材料有限公司
SHANGHAI ERAUM ALLOY MATERIALS Co., LTD.
质量证明书

地址: 上海市金山区枫泾镇兴塔工业区兴塔路89号 201502
ADD: NO.89 Xinghao Road, Fengjing Town, Jinshan District, Shanghai 201502, China.
TEL: 021-69213298 Fax: 021-51210375

Inspection Certificate EN10204:2004/3.1

MILL INSPECTION CERTIFICATE

网址: WWW.shyilang.com

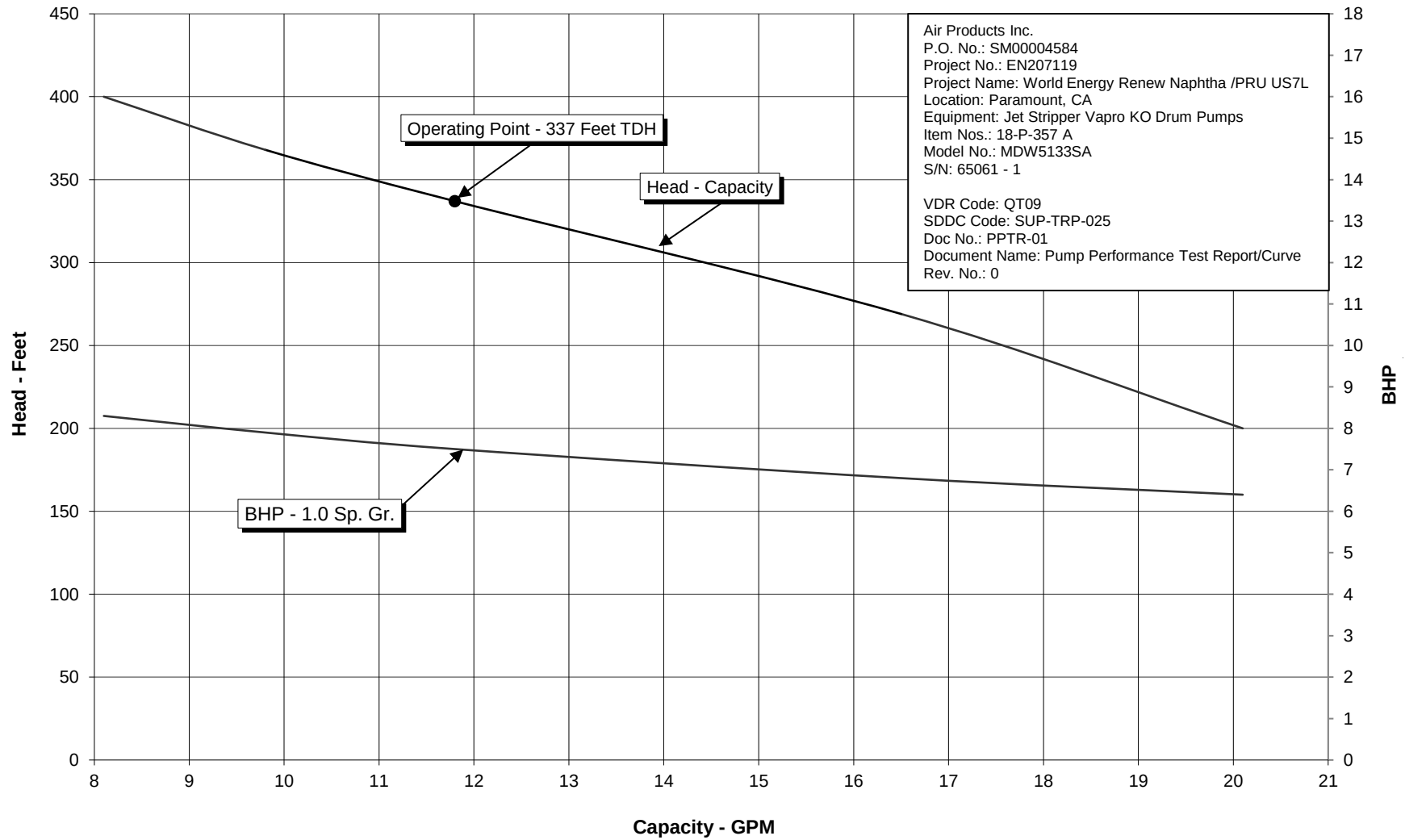
JL/YL 03 23

订货单位 Ordering unit		西安时硕机械制造有限公司		产品名称 Product name		光棒		交货状态 Delivery condition		报告日期: DATE OF REPORT:		2022.01.14							
合同号 Contract No.		EV21-21110005 FHQ-42-2111		产品标准 Product standard		ASTM B574-2019		固溶退火 Solution annealing		证书编号: CERTIFICATE NO.:		2022011401							
序号 No.	钢号 Steel Grade	炉号 Heat NO.	批号 Lot NO.	规格Size (mm)	数量Quantity			宏观检验Macroscopic Inspection					PMI						
					件数PCS	重量 kg	总米数m	尺寸 Size	表面质量Appearance										
1	N10276	205-088	H21121301	Φ32.5*2000~6000	102	1688	/	合格Qualified	合格Qualified	合格Qualified									
2																			
3																			
化学成分Chemical Composition (WT.%)												金相试验Metallographic Test							
序号 No.	炉号 Heat NO.	批号 Lot NO.	C	Si	Mn	P	S	Cr	Fe	Mo	V	Cu	W	Co	Al	Ti	Ni	晶粒度 (NO.) Grain size	微观组织 Micro Structure
1	205-088	H21121301	≤0.010	≤0.08	≤1.0	≤0.04	≤0.03	14.5-16.5	4.0-7.0	15-17	≤0.35	/	3.0-4.5	≤2.50	/	/	Bal	/	/
2																			
3																			
室温力学性能Mechanical Properties At Room Temperature												晶间腐蚀 Inter. Corrosion.T.							
序号 No.	炉号 Heat NO.	批号 Lot NO.	抗拉强度 Rm T.S.(MPa) ≥690	屈服强度Rp0.2 Y.S.(MPa) ≥283	延伸率A50mm EL.(%) >40	断面收缩率Z(%) Reduction of Area	硬度 Hardness HRC≤35	冲击试验 Impact.T	扩口试验 Flaring.T.	压扁试验 Flatten.T.	晶间腐蚀 Inter. Corrosion.T.								
1	205-088	H21121301	798	432	64	65	10	/	/	/	/								
2																			
3																			
序号 No.	炉号 Heat NO.	批号 Lot NO.	涡流探伤 Eddy Current.T.	超声波探伤 Ultrasonic.T.	渗透检验 Penetrant.T.	液压试验 Hydro.T.	备注(Remark)	制表人 Completed by:	审核Approved: 张超	印章 Quality seal									
1	205-088	H21121301	/	合格Qualified	/	/		何琳											
2																			
3																			

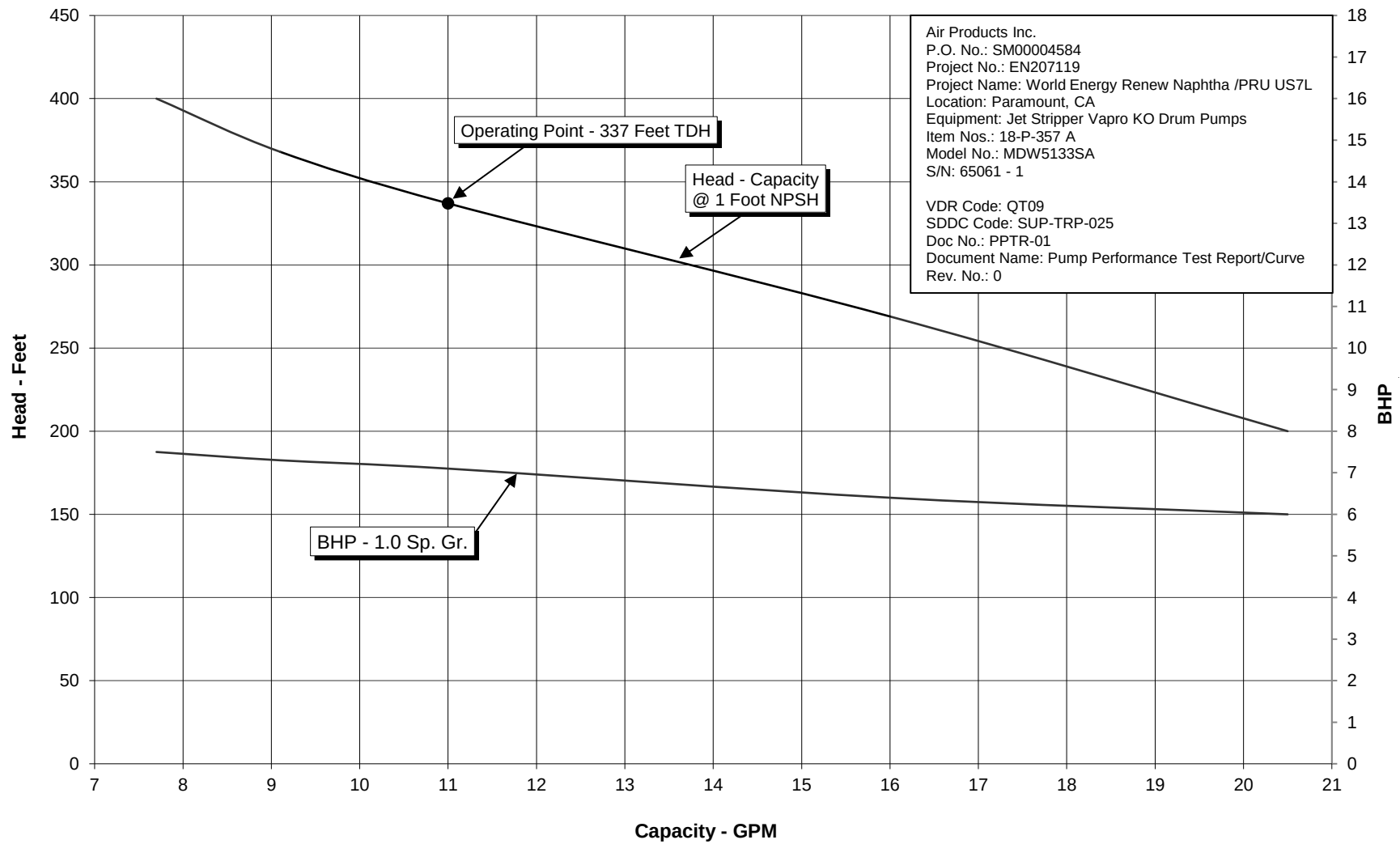
兹本证书所列产品完全按照上述产品标准的要求进行制造和检验, 并满足订货合同规定。
We hereby certify that the material described herein has been made and tested completely in accordance with the above product standard and with the requirement of the purchase order: acc.to ped(DGR/PED 2014/68/EU)by Notified body for pressure equipment (0045),of TUV NORD systems GmbH & Co,KG Approved

注: 质量体系证书号Quality System CertificateNO.:4410017850008(GB/T19001-ISO9001:2015)
PED工厂认证书 (PED Certificate NO.): 9030AW-21821/20 TS: TS271015Y-2024/TS2731H60-2025

**Roth Pump Company
Model MDW5133SA @ 3500 RPM
Cold Water Performance Test**



**Roth Pump Company
Model MDW5133SA @ 3500 RPM
1 Foot NPSH Performance Test**



Vibration Analysis

Date:

4/22/2024

Operating Point (PSI)	Position	Unfiltered (V) RMS Limit (in/sec.)	Filtered (V) Limit (in/sec.)	Unfiltered (D) Limit (mil p-p)	Outboard Bearing RMS (in/sec.)	Outboard Bearing Peak (in/sec.)	Outboard Bearing Displacement (mil p-p)	Inboard Bearing RMS (in/sec.)	Inboard Bearing Peak (in/sec.)	Inboard Bearing Displacement (mil p-p)
87	H	0.12	x	2	0.048	0.113	0.348	0.042	0.102	0.268
	V	0.12	x	2	0.107	0.174	0.804	0.068	0.127	0.536
	A	0.12	x	2	0.119	0.204	0.804	x	x	x
	H	x	0.08	x	x	0.040	x	x	0.030	x
	V	x	0.08	x	x	0.080	x	x	0.060	x
	A	x	0.08	x	x	0.070	x	x	x	x
116	H	0.12	x	2	0.051	0.143	0.375	0.039	0.105	0.268
	V	0.12	x	2	0.118	0.198	0.911	0.085	0.153	0.536
	A	0.12	x	2	0.119	0.195	0.804	x	x	x
	H	x	0.08	x	x	0.040	x	x	0.040	x
	V	x	0.08	x	x	0.070	x	x	0.060	x
	A	x	0.08	x	x	0.070	x	x	x	x
146	H	0.12	x	2	0.061	0.141	0.429	0.034	0.110	0.268
	V	0.12	x	2	0.102	0.170	0.804	0.076	0.136	0.536
	A	0.12	x	2	0.119	0.214	0.804	x	x	x
	H	x	0.08	x	x	0.050	x	x	0.030	x
	V	x	0.08	x	x	0.070	x	x	0.070	x
	A	x	0.08	x	x	0.070	x	x	x	x
159	H	0.12	x	2	0.064	0.139	0.482	0.051	0.110	0.268
	V	0.12	x	2	0.101	0.177	0.777	0.076	0.144	0.536
	A	0.12	x	2	0.119	0.212	0.804	x	x	x
	H	x	0.08	x	x	0.060	x	x	0.050	x
	V	x	0.08	x	x	0.080	x	x	0.080	x
	A	x	0.08	x	x	0.070	x	x	x	x
173	H	0.12	x	2	0.069	0.128	0.348	0.042	0.127	0.268
	V	0.12	x	2	0.108	0.183	0.831	0.068	0.136	0.536
	A	0.12	x	2	0.119	0.221	0.804	x	x	x
	H	x	0.08	x	x	0.050	x	x	0.080	x
	V	x	0.08	x	x	0.070	x	x	0.060	x
	A	x	0.08	x	x	0.080	x	x	x	x

Air Products Inc.

P.O. No.: SM00004584

Project No.: EN207119

Project Name: World Energy Renew Naphtha /PRU US7L

Location: Paramount, CA

Equipment: Jet Stripper Vapor KO Drum Pumps

Item Nos.: 18-P-357 A

Model No.: MDW5133SA

S/N: 65061 - 1

VDR Code: QT09

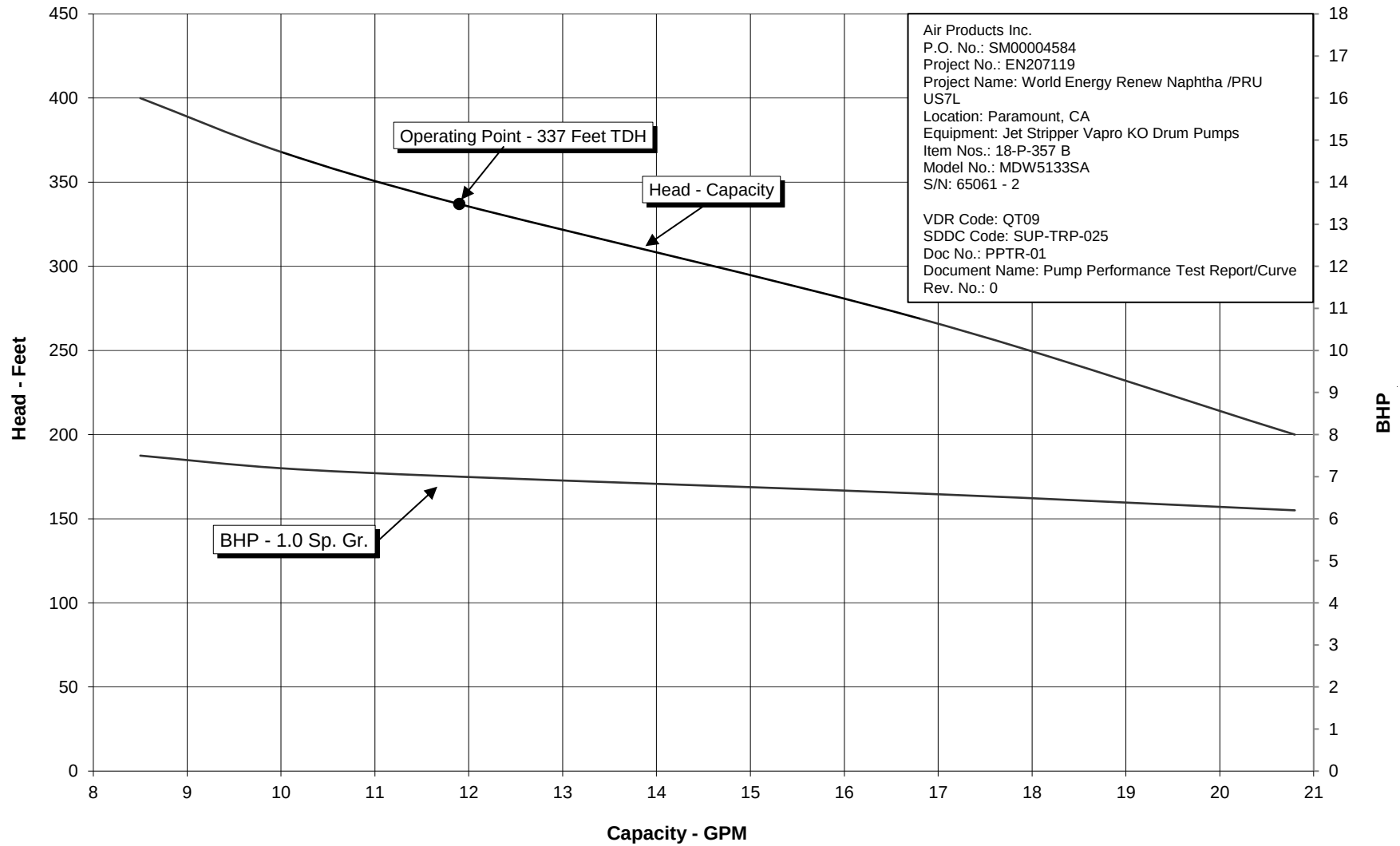
SDDC Code: SUP-TRP-025

Doc No.: PPTR-01

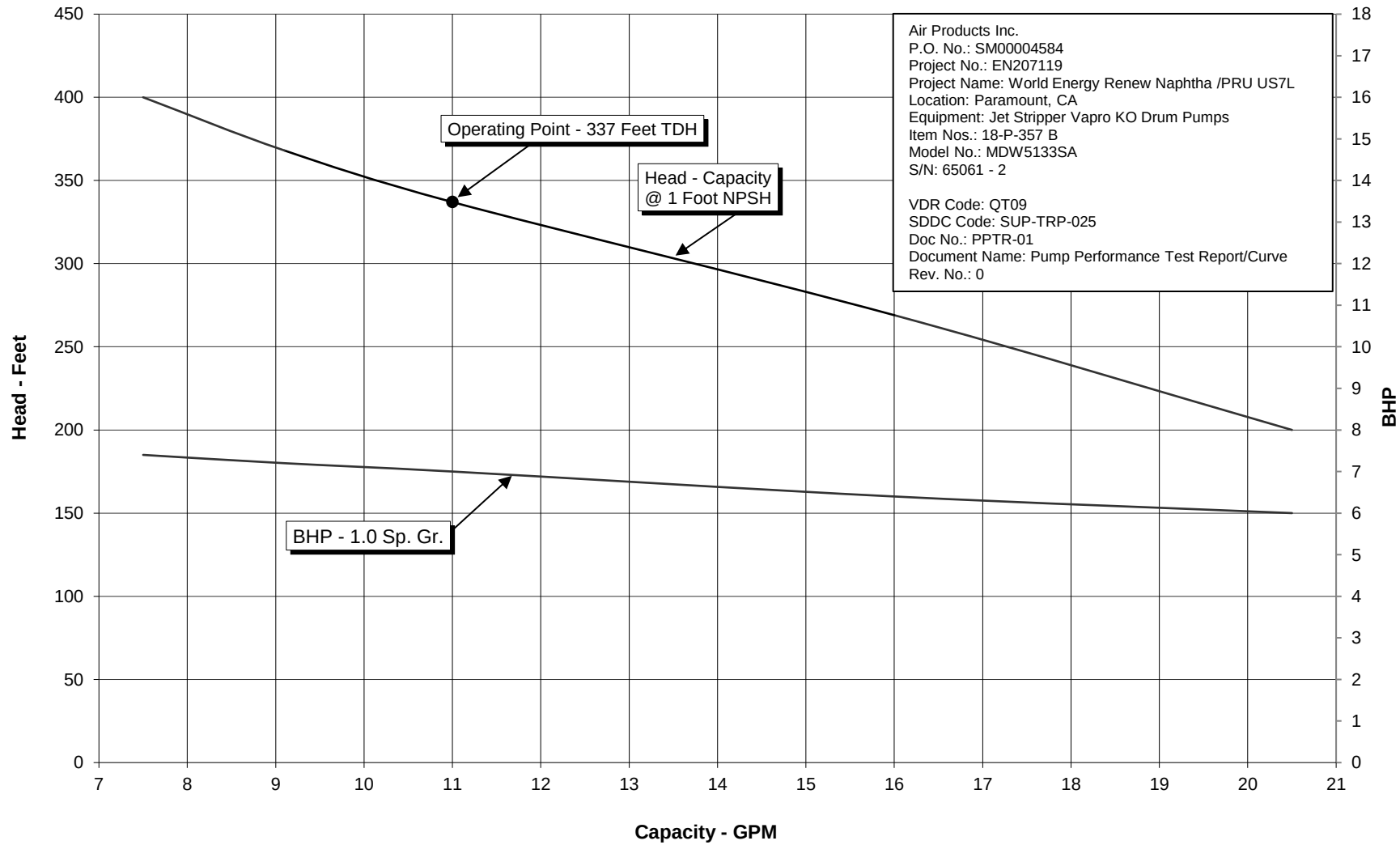
Document Name: Pump Performance Test Report/Curve

Rev. No.: 0

**Roth Pump Company
Model MDW5133SA @ 3500 RPM
Cold Water Performance Test**



**Roth Pump Company
Model MDW5133SA @ 3500 RPM
1 Foot NPSH Performance Test**



Vibration Analysis

Date:

4/23/2024

Operating Point (PSI)	Position	Unfiltered (V) RMS Limit (in/sec.)	Filtered (V) Limit (in/sec.)	Unfiltered (D) Limit (mil p-p)	Outboard Bearing RMS (in/sec.)	Outboard Bearing Peak (in/sec.)	Outboard Bearing Displacement (mil p-p)	Inboard Bearing RMS (in/sec.)	Inboard Bearing Peak (in/sec.)	Inboard Bearing Displacement (mil p-p)
87	H	0.12	x	2	0.102	0.221	0.804	0.102	0.187	0.536
	V	0.12	x	2	0.068	0.119	0.536	0.042	0.093	0.268
	A	0.12	x	2	0.085	0.178	0.536	x	x	x
	H	x	0.08	x	x	0.050	x	x	0.030	x
	V	x	0.08	x	x	0.060	x	x	0.030	x
	A	x	0.08	x	x	0.080	x	x	x	x
116	H	0.12	x	2	0.111	0.228	0.831	0.105	0.210	0.911
	V	0.12	x	2	0.068	0.127	0.536	0.059	0.110	0.536
	A	0.12	x	2	0.093	0.178	0.536	x	x	x
	H	x	0.08	x	x	0.060	x	x	0.040	x
	V	x	0.08	x	x	0.060	x	x	0.060	x
	A	x	0.08	x	x	0.070	x	x	x	x
146	H	0.12	x	2	0.110	0.238	0.804	0.110	0.221	0.804
	V	0.12	x	2	0.051	0.136	0.268	0.059	0.110	0.536
	A	0.12	x	2	0.093	0.187	0.536	x	x	x
	H	x	0.08	x	x	0.050	x	x	0.040	x
	V	x	0.08	x	x	0.030	x	x	0.050	x
	A	x	0.08	x	x	0.050	x	x	x	x
159	H	0.12	x	2	0.119	0.246	0.804	0.110	0.221	0.804
	V	0.12	x	2	0.059	0.119	0.268	0.059	0.110	0.268
	A	0.12	x	2	0.093	0.161	0.536	x	x	x
	H	x	0.08	x	x	0.060	x	x	0.060	x
	V	x	0.08	x	x	0.050	x	x	0.050	x
	A	x	0.08	x	x	0.080	x	x	x	x
173	H	0.12	x	2	0.119	0.238	0.804	0.068	0.110	0.536
	V	0.12	x	2	0.051	0.110	0.268	0.110	0.204	0.804
	A	0.12	x	2	0.093	0.187	0.536	x	x	x
	H	x	0.08	x	x	0.070	x	x	0.080	x
	V	x	0.08	x	x	0.060	x	x	0.060	x
	A	x	0.08	x	x	0.080	x	x	x	x

Air Products Inc.

P.O. No.: SM00004584

Project No.: EN207119

Project Name: World Energy Renew Naphtha /PRU US7L

Location: Paramount, CA

Equipment: Jet Stripper Vapor KO Drum Pumps

Item Nos.: 18-P-357 B

Model No.: MDW5133SA

S/N: 65061 - 2

VDR Code: QT09

SDDC Code: SUP-TRP-025

Doc No.: PPTR-01

Document Name: Pump Performance Test Report/Curve

Rev. No.: 0



Air Products Inc.
P.O. No.: SM00004584
Project No.: EN207119
Project Name: World Energy Renew Naphtha /PRU US7L
Location: Paramount, CA

Equipment: Jet Stripper Vapor KO Drum Pumps
Item Nos.: 18-P-357 A/B
Model No.: MDW5133SA
S/N: 65061 - 1 & 2

VDR Code: QT06
SDDC Code: SUP-TRP-019
Doc No.: NDE-01
Document Name: NDE Record
Rev. No.: 0

Acuren Inspection, Inc.
21112 South Scott Park Road
Davenport, Iowa 52807
Phone: 563.391.8500

www.acuren.com
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Report Number: DAV857233

LIQUID PENETRANT EXAMINATION REPORT

Page 1 of 1

CUSTOMER Roth Pump Mfg. Company		ACUREN SERVICE CALL #:		DATE 03/15/2024	
LOCATION/ADDRESS: Davenport Shop		CUSTOMER CONTACT:			
PART # / DRAWING #: L3C100SL 58-11D-T / C7M323SL 255-44W-10 / L3C099SL 52-2K-2		CUSTOMER PO #:		CUSTOMER WO #: 65081 #1	
ITEM DESCRIPTION: Booster Case / Cover / Case		STAGE OF MANUFACTURE: Final		SURFACE CONDITION: As Welded	
SURFACE PREPARATION: Cleaned		COMMENT: None		PARTS INSPECTED: 14	
NDE PROCEDURE PT-1		REV. / EDITION 36		ACCEPTANCE STANDARD ASME Sec. VIII, Div 1, 2023 Edition	
SPECIFICATION/CODE ASME Sec. V		REV. / EDITION 2023		ACCEPTANCE STANDARD ASME Sec. VIII, Div 1, 2023 Edition	
MATERIAL: Stainless Steel		THICKNESS: 1" sch. 40		QUANTITY: 14	
TYPE: ☒ Visible ☐ Fluorescent		METHOD: ☒ Solvent Removable ☐ Post-Emulsified ☐ Water Washable ☐ Hydrophilic ☐ Lipophilic		ITEM TEMP.: 70 °F	
MANUFACTURER: Magnaflux					
SURFACE PREPARATION: SKC-S		BATCH #: 21H15C		APPLICATION: Wiped	
PENETRANT: SKL-SP2		BATCH #: 23A08C		APPLICATION: Spray	
CLEANING (EMULSIFIER): SKC-S		BATCH #: 21H15C		APPLICATION: Wiped	
DEVELOPER: SKD-S2		BATCH #: 21H08C		APPLICATION: Sprayed	
BLACKLIGHT MFG. OR LIST APPROVED LIGHT SOURCE: N/A		SERIAL NO. N/A		LIGHTMETER MFG. Spectroline Acumax	
		SERIAL NO. 1998582		CAL. DUE DATE: 04/16/2024	
				INTENSITY: 100 Minimum ☒ FC ☐ LUX ☐ µW/CM²	
Items	Quantity	Comments			Accept/Reject
Booster Case		Booster Case outlet to pipe weld			Accept
		Pipe to 90° elbow weld			Accept
		90° elbow to flange weld			Accept
		Booster Case to inlet pipe weld			Accept
		Pipe to 90° elbow weld			Accept
		90° elbow to pipe weld			Accept
		Pipe to flange weld			Accept
Cover		Cover to pipe fitting			Accept
		Pipe to flange weld			Accept
Case		Case to pipe weld			Accept
		Pipe to 90° elbow weld			Accept
		90° elbow to 90° elbow weld			Accept
		90° elbow to pipe weld			Accept
		Pipe to flange weld			Accept
☐ High Temp		Wire Wheel:		Other:	
Per Diam:		Unit #:		Customer Contact:	
No. on Job:		Travel if Applicable:		Hours Worked:	
Hours:		Miles Total:		to and to	
Total Hours:					

CLIENT REPRESENTATIVE

ACUREN INSPECTOR

Print Name / Signature

Date

James J Napolitano

Print Name / Signature

03/15/2024

II

Inspection Level

PEER REVIEW (IF APPLICABLE):

Print Name / Signature

Date

Client acknowledges receipt and custody of the report or other work ("Deliverable"). Client agrees that it is responsible for assuring that acceptance standards, specifications and criteria in the Deliverable and Statement of Work ("SOW") are correct. Client acknowledges that Acuren is providing the Deliverable according to the SOW, and not any other standards.

Client acknowledges that it is responsible for the failure of any items inspected to meet standards, and for remediation. Client has 15 business days following the date Acuren provides the Deliverable to inspect it, identify deficiencies in writing, and provide written rejection, or else the Deliverable will be deemed accepted. The Deliverable and other services provided by Acuren are governed by a Master Services Agreement ("MSA"). If the parties have not entered into an MSA, then the Deliverable and services are governed by the SOW and the "Acuren Standard Service Terms" (www.acuren.com/service/terms) in effect when the services were ordered.



Air Products Inc.
P.O. No.: SM00004584
Project No.: EN207119
Project Name: World Energy Renew Naphtha /PRU USL
Location: Paramount, CA

Equipment: Jet Stripper Vapor KO Drum Pumps
Item Nos.: 18-P-357 A/B
Model No.: MDW5133SA
S/N: 65061 - 1 & 2

VDR Code: QT06
SDDC Code: SUP-TRP-019
Doc No.: NDE-01
Document Name: NDE Record
Rev. No.: 0

Acuren Inspection, Inc.
21112 South Scott Park Road
Davenport, Iowa 52807
Phone: 563.391.8500

www.acuren.com
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Report Number: DAV417707

Page 1 of 1

LIQUID PENETRANT EXAMINATION REPORT

CUSTOMER Roth Pump Mfg. Company		ACUREN SERVICE CALL #:		DATE: 03/15/2024	
LOCATION/ADDRESS: Davenport Shop		CUSTOMER CONTACT:			
PART # / DRAWING #: L3C100SL 58-11D-T / C7M323SL 255-44W-10 / L3C099SL 52-2K-2		CUSTOMER PO #:		CUSTOMER WO #: 65061 #2	
ITEM DESCRIPTION: Booster Case / Cover / Case		STAGE OF MANUFACTURE: Final		SURFACE CONDITION: As Welded	
SURFACE PREPARATION: Cleaned		COMMENT: None		PARTS INSPECTED: 14	ACCEPTABLE: 14
				REJECTED: 0	
NDE PROCEDURE PT-1	REV. 36	SPECIFICATION/CODE ASME Sec. V	REV./EDITION 2023	ACCEPTANCE STANDARD ASME Sec. VIII, Div 1, 2023 Edition	
MATERIAL: Stainless Steel		THICKNESS: 1" sch. 40		QUANTITY: 14	ITEM TEMP.: 70 °F
TYPE: ☒ Visible ☐ Fluorescent		METHOD: ☒ Solvent Removable ☐ Post-Emulsified ☐ Water Washable ☐ Hydrophilic ☐ Lipophilic		MANUFACTURER: Magnaflux	
SURFACE PREPARATION: SKC-S		BATCH #: 21H15C	APPLICATION: Wiped	DRYING METHOD / TIME: Air 10 min.	TEMPERATURE: 70 °F
PENETRANT: SKL-SP2		BATCH #: 23A08C	APPLICATION: Spray	DWELL TIME: 10 min.	TEMPERATURE: 70 °F
CLEANING (EMULSIFIER): SKC-S		BATCH #: 21H15C	APPLICATION: Wiped	DRYING METHOD / TIME: Air 10 min.	TEMPERATURE: 70 °F
DEVELOPER: SKD-S2		BATCH #: 21H08C	APPLICATION: Sprayed	DEVELOP TIME: 10 min.	POST CLEANING: Wiped
BLACKLIGHT MFG. OR LIST APPROVED LIGHT SOURCE: N/A		SERIAL NO. N/A	LIGHTMETER MFG. Spectroline Acumax	SERIAL NO. 1998562	CAL DUE DATE: 04/16/2024
				INTENSITY: 100 Minimum	☒ FC ☐ LUX ☐ μW/CM²
Items	Quantity	Comments			Accept/Reject
Booster Case		Booster Case outlet to pipe weld			Accept
		Pipe to 90° elbow weld			Accept
		90° elbow to flange weld			Accept
		Booster Case to inlet pipe weld			Accept
		Pipe to 90° elbow weld			Accept
		90° elbow to pipe weld			Accept
		Pipe to flange weld			Accept
Cover		Cover to pipe fitting			Accept
		Pipe to flange weld			Accept
Case		Case to pipe weld			Accept
		Pipe to 90° elbow weld			Accept
		90° elbow to 90° elbow weld			Accept
		90° elbow to pipe weld			Accept
		Pipe to flange weld			Accept
☐ High Temp		Wire Wheel:		Other:	
Per Diam:		Unit #:		Customer Contact:	
No. on Job:		Travel if Applicable:		Hours Worked:	
Hours:		Miles Total:		to and to	
Total Hours:					

CLIENT REPRESENTATIVE

ACUREN INSPECTOR

Print Name / Signature

Date

James J Napolitano

James Napolitano

03/15/2024

II

Print Name / Signature

Date

Inspection Level

PEER REVIEW (IF APPLICABLE):

Print Name / Signature

Date

Client acknowledges receipt and custody of the report or other work ("Deliverable"). Client agrees that it is responsible for assuring that acceptance standards, specifications and criteria in the Deliverable and Statement of Work ("SOW") are correct. Client acknowledges that Acuren is providing the Deliverable according to the SOW, and not any other standards.

Client acknowledges that it is responsible for the failure of any items inspected to meet standards, and for remediation. Client has 15 business days following the date Acuren provides the Deliverable to inspect it, identify deficiencies in writing, and provide written rejection, or else the Deliverable will be deemed accepted. The Deliverable and other services provided by Acuren are governed by a Master Services Agreement ("MSA"). If the parties have not entered into an MSA, then the Deliverable and services are governed by the SOW and the "Acuren Standard Service Terms" (www.acuren.com/service/terms) in effect when the services were ordered.



Air Products Inc.
P.O. No.: SM00004584
Project No.: EN207119
Project Name: World Energy Renew Naphtha /PRU US7L
Location: Paramount, CA

Equipment: Jet Stripper Vapor KO Drum Pumps
Item Nos.: 18-P-357 A/B
Model No.: MDW5133SA
S/N: 65061 - 1 & 2

VDR Code: QT06
SDDC Code: SUP-TRP-019
Doc No.: NDE-01
Document Name: NDE Record
Rev. No.: 0

Acuren Inspection, Inc.
21112 South Scott Park Road
Davenport, Iowa 52807
Phone: 563.391.8500

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Report Number: DAV857233

Page 1 of 1

LIQUID PENETRANT EXAMINATION REPORT

CUSTOMER Roth Pump Mfg. Company				ACUREN SERVICE CALL #		DATE 03/15/2024			
LOCATION/ADDRESS Davenport Shop				CUSTOMER CONTACT					
PART # / DRAWING # L3C100SL 58-11D-T / C7M323SL 255-44W-10 / L3C099SL 52-2K-2				CUSTOMER PO #		CUSTOMER WO # 65061 #1			
ITEM DESCRIPTION Booster Case / Cover / Case				STAGE OF MANUFACTURE Final		SURFACE CONDITION As Welded			
SURFACE PREPARATION Cleaned		COMMENT None		PARTS INSPECTED 14		ACCEPTABLE 14		REJECTED 0	
NDE PROCEDURE PT-1		REV 36		SPECIFICATION/CODE ASME Sec. V		REV/EDITION 2023		ACCEPTANCE STANDARD ASME Sec. VIII, Div 1, 2023 Edition	
MATERIAL Stainless Steel				THICKNESS 1" sch. 40		QUANTITY 14		ITEM TEMP. 70 °F	
TYPE: ☒ Visible ☐ Fluorescent		METHOD: ☒ Solvent Removable ☐ Water Washable		☐ Post-Emulsified ☐ Hydrophilic ☐ Lipophilic		MANUFACTURER: Magnaflux			
SURFACE PREPARATION SKC-S		BATCH # 21H15C		APPLICATION Wiped		DRYING METHOD / TIME Air 10 min.		TEMPERATURE 70 °F	
PENETRANT SKL-SP2		BATCH # 23A08C		APPLICATION Spray		DWELL TIME 10 min.		TEMPERATURE 70 °F	
CLEANING (EMULSIFIER) SKC-S		BATCH # 21H15C		APPLICATION Wiped		DRYING METHOD / TIME Air 10 min.		TEMPERATURE 70 °F	
DEVELOPER SKD-S2		BATCH # 21H08C		APPLICATION Sprayed		DEVELOP TIME 10 min.		POST CLEANING Wiped	
BLACKLIGHT MFG. OR LIST APPROVED LIGHT SOURCE N/A		SERIAL NO. N/A		LIGHTMETER MFG. Spectroline Acumax		SERIAL NO. 1998582		CAL DUE DATE 04/16/2024	
								INTENSITY: 100 Minimum ☒ FC ☐ LUX ☐ μW/CM²	
Items	Quantity	Comments						Accept/Reject	
Booster Case		Booster Case outlet to pipe weld						Accept	
		Pipe to 90° elbow weld						Accept	
		90° elbow to flange weld						Accept	
		Booster Case to Inlet pipe weld						Accept	
		Pipe to 90° elbow weld						Accept	
		90° elbow to pipe weld						Accept	
		Pipe to flange weld						Accept	
Cover		Cover to pipe fitting						Accept	
		Pipe to flange weld						Accept	
Case		Case to pipe weld						Accept	
		Pipe to 90° elbow weld						Accept	
		90° elbow to 90° elbow weld						Accept	
		90° elbow to pipe weld						Accept	
		Pipe to flange weld						Accept	
☐ High Temp		Wire Wheel:		Other:		Customer Contact:			
Per Diam:	Unit #:	No. on Job:	Travel if Applicable: Hours: Miles Total	Hours Worked: to and to	Total Hours:				

CLIENT REPRESENTATIVE		ACUREN INSPECTOR	
James J Napolitano		James J Napolitano	
03/15/2024		II	
Print Name / Signature		Date	
Date		Inspection Level	

Client acknowledges receipt and custody of the report or other work ("Deliverable"). Client agrees that it is responsible for assuring that acceptance standards, specifications and criteria in the Deliverable and Statement of Work ("SOW") are correct. Client acknowledges that Acuren is providing the Deliverable according to the SOW, and not any other standards.

PEER REVIEW (IF APPLICABLE):

Print Name / Signature

Date

Client acknowledges that it is responsible for the failure of any items inspected to meet standards, and for remediation. Client has 15 business days following the date Acuren provides the Deliverable to inspect it, identify deficiencies in writing, and provide written rejection, or else the Deliverable will be deemed accepted. The Deliverable and other services provided by Acuren are governed by a Master Services Agreement ("MSA"). If the parties have not entered into an MSA, then the Deliverable and services are governed by the SOW and the "Acuren Standard Service Terms" (www.acuren.com/service/terms) in effect when the services were ordered.



Air Products Inc.
P.O. No.: SM00004584
Project No.: EN207119
Project Name: World Energy Renew Naphtha /PRU US7L
Location: Paramount, CA

Equipment: Jet Stripper Vapor KO Drum Pumps
Item Nos.: 18-P-357 A/B
Model No.: MDW5133SA
S/N: 65061 - 1 & 2

65061 #2

VDR Code: QT06
SDDC Code: SUP-TRP-019
Doc No.: NDE-01
Document Name: NDE Record
Rev. No.: 0

Acuren Inspections, Inc.
21112 South Scott Park Road
Davenport, Iowa 52807
Phone: 563.391.8500

www.acuren.com
A Higher Level of Reliability

Report Number: DAV417707

Page 1 of 1

LIQUID PENETRANT EXAMINATION REPORT

CUSTOMER: Roth Pump Mfg. Company				ACUREN SERVICE CALL #:		DATE: 03/15/2024			
LOCATION/ADDRESS: Davenport Shop				CUSTOMER CONTACT:					
PART # / DRAWING #: L3C100SL 58-11D-T / C7M323SL 255-44W-10 / L3C099SL 52-2K-2				CUSTOMER PO #:		CUSTOMER WO #: 65061 #2			
ITEM DESCRIPTION: Booster Case / Cover / Case				STAGE OF MANUFACTURE: Final		SURFACE CONDITION: As Welded			
SURFACE PREPARATION: Cleaned		COMMENT: None		PARTS INSPECTED: 14		ACCEPTABLE: 14		REJECTED: 0	
NDE PROCEDURE PT-1		REV. 36		SPECIFICATION/CODE ASME Sec. V		REV./EDITION 2023		ACCEPTANCE STANDARD ASME Sec. VIII, Div 1, 2023 Edition	
MATERIAL: Stainless Steel				THICKNESS: 1" sch. 40		QUANTITY: 14		ITEM TEMP.: 70 °F	
TYPE ☒ Visible ☐ Fluorescent		METHOD ☒ Solvent Removable ☐ Water Washable		☐ Post-Emulsified ☐ Hydrophilic ☐ Lipophilic		MANUFACTURER: Magnaflux			
SURFACE PREPARATION: SKC-S		BATCH #: 21H15C		APPLICATION: Wiped		DRYING METHOD / TIME: Air 10 min.		TEMPERATURE: 70 °F	
PENETRANT: SKL-SP2		BATCH #: 23A08C		APPLICATION: Spray		DWELL TIME: 10 min.		TEMPERATURE: 70 °F	
CLEANING (EMULSIFIER): SKC-S		BATCH #: 21H15C		APPLICATION: Wiped		DRYING METHOD / TIME: Air 10 min.		TEMPERATURE: 70 °F	
DEVELOPER: SKD-S2		BATCH #: 21H08C		APPLICATION: Sprayed		DEVELOP TIME: 10 min.		POST CLEANING: Wiped	
BLACKLIGHT MFG. OR LIST APPROVED LIGHT SOURCE: N/A		SERIAL NO. N/A		LIGHTMETER MFG. Spectroline Acumax		SERIAL NO. 1998582		CAL. DUE DATE: 04/16/2024	
						INTENSITY: 100 Minimum		☒ FC ☐ LUX ☐ µW/CM²	
Items	Quantity	Comments						Accept/Reject	
Booster Case		Booster Case outlet to pipe weld						Accept	
		Pipe to 90° elbow weld						Accept	
		90° elbow to flange weld						Accept	
		Booster Case to inlet pipe weld						Accept	
		Pipe to 90° elbow weld						Accept	
		90° elbow to pipe weld						Accept	
		Pipe to flange weld						Accept	
Cover		Cover to pipe fitting						Accept	
		Pipe to flange weld						Accept	
Case		Case to pipe weld						Accept	
		Pipe to 90° elbow weld						Accept	
		90° elbow to 90° elbow weld						Accept	
		90° elbow to pipe weld						Accept	
		Pipe to flange weld						Accept	
☐ High Temp		Wire Wheel		Other:		Customer Contact:			
Per Diam:	Unit #:	No. on Job:	Travel if Applicable: Hours: Miles Total:		Hours Worked: to and to		Total Hours:		

CLIENT REPRESENTATIVE

ACUREN INSPECTOR

Print Name / Signature

Date

James J Napolitano

James Napolitano

03/15/2024

II

Print Name / Signature

Date

Inspection Level

PEER REVIEW (IF APPLICABLE):

Print Name / Signature

Date

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Client acknowledges that it is responsible for the failure of any items inspected to meet standards, and for remediation. Client has 15 business days following the date Acuren provides the Deliverable to inspect it, identify deficiencies in writing, and provide written rejection, or else the Deliverable will be deemed accepted. The Deliverable and other services provided by Acuren are governed by a Master Services Agreement ("MSA"). If the parties have not entered into an MSA, then the Deliverable and services are governed by the SOW and the "Acuren Standard Service Terms" (www.acuren.com/service/terms) in effect when the services were ordered.



Q.C. METALLURGICAL LABORATORY INC.

17048 215th St.
Davenport IA 52806
P: 563.386.7827
F: 563.386.6780
Website: QCML.COM

TEST REPORT

April 9, 2024

Customer: Roth Pump

525 4th Street West, Milan IL

Date Sample Arrived: Onsite Testing

Report Number: 48611

Sample I.D.: See Table

Sample Condition: As Received

Test Method(s): ASTM E572

Method Deviations: None

Date Tested: 04/09/24

A2LA Accreditation: 1238-01

Test Location: Roth Pump Milan IL.

Sampling Procedure: NA

A2LA Accredited Test Procedure(s): ASTM E572

P.O.#: 53500

TEST RESULTS:

POSITIVE MATERIAL IDENTIFICATION TEST (ASTM E572)

Instrument ID: Niton XL2 86739

The parts identified in the table that follows were analyzed using a Niton XRF Spectrometer XL2, Serial# 86739. The elements reported are shown at the top of each data table. All results are in % by weight. Material grades identified in the report are within a 95% confidence limit based on the instrument's standard deviation for the reported elements.

The instrument calibration was verified with a certified 316/CF8M equivalent standard NIST#1155 and a low alloy steel CRM 35KN, prior to testing and at the conclusion of testing.

The chemical composition requirements of casting material grade CF3M are cast equivalent grade for wrought 316L. The material grades 316/CF8M and 316L/CF3M are nearly identical, with only significant difference in percent content of carbon, which is 0.08 % 316/CF8M and 0.03% 316L/CF3M /, respectively and carbon content is not detectable by XRF analysis.

This report shall not be reproduced except in full and the results only apply to the item(s) tested as received.

Air Products Inc.
P.O. No.: SM00004584
Project No.: EN207119
Project Name: World Energy Renew Naphtha /PRU US7L
Location: Paramount, CA

Equipment: Jet Stripper Vapor KO Drum Pumps
Item Nos.: 18-P-357 A/B
Model No.: MDW5133SA
S/N: 65061 - 1 & 2

Report 48611, Page 1 of 4

VDR Code: QT06
SDDC Code: SUP-TRP-019
Doc No.: NDE-01
Document Name: NDE Record
Rev. No.: 0

All statements of conformance are based on criteria provided by the customer and are made using simple acceptance as the decision rule.

Accredited to
ISO 17025: 2017

NRC Compliant
10CFR Part 50, App B

IA & IL Certified
Lab Certification 084

Air Products Inc.
P.O. No.: SM00004584
Project No.: EN207119
Project Name: World Energy Renew Naphtha /PRU US7L
Location: Paramount, CA

Equipment: Jet Stripper Vapor KO Drum Pumps
Item Nos.: 18-P-357 A/B
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VDR Code: QT06
SDDC Code: SUP-TRP-019
Doc No.: NDE-01
Document Name: NDE Record
Rev. No.: 0

Data 48611

Worley/Air Products, Roth Order# 65061
Pump #1

Sample ID	Part#	Description	Spec ID	Cr%	Ni%	Si%	S%	Mn%	Mo%	Fe%	Cu%
1	C6L704SJ	MD51-10A Driven End Shaft	416 SS	12.5	0.5	0.4	0.3	0.7	0.1	85.1	0.2
2	C8S861SJ	MD51-44A Adapter Flange	416 SS	11.8	0.3	0.5	0.2	1.0	0.1	85.8	0.1
3	L3C099SL	52-2K-2 Case	316 SS	CF8M	9.6	0.8	< LOD	0.8	2.2	66.8	< LOD
4		Pipe	316 SS	17.0	12.0	0.6	< LOD	1.1	2.0	66.6	0.2
5		Elbow	316 SS	16.3	10.8	0.5	< LOD	0.9	2.0	67.0	0.3
6		Elbow	316 SS	16.3	10.2	0.5	< LOD	0.9	2.0	68.1	0.2
7		Pipe	316 SS	17.7	12.2	0.7	< LOD	1.4	2.1	65.0	0.2
8		Flange	316 SS	16.7	10.5	0.5	< LOD	1.8	2.0	67.5	0.7
9	C7M323SL	255-44W-10 IB Cover	316 SS	16.6	10.2	0.4	< LOD	1.6	1.9	67.7	0.3
10	L3C100SL	58-11D-T Booster Case	CF8M	20.0	9.0	0.9	< LOD	0.9	2.4	66.6	< LOD
11		Pipe	316 SS	16.9	11.8	0.7	< LOD	1.3	2.2	66.5	< LOD
12		Elbow	316 SS	16.2	10.2	0.8	< LOD	0.9	2.0	68.8	0.3
13		Pipe	316 SS	17.9	12.0	0.8	< LOD	1.4	2.1	65.0	0.2
14		Flange	316 SS	16.9	10.2	0.4	< LOD	1.7	1.9	67.6	0.7
15		Pipe	316 SS	17.5	11.8	0.6	< LOD	1.0	2.2	66.4	0.2
16		Elbow	316 SS	16.3	10.4	0.4	< LOD	0.7	2.0	69.5	0.2
17		Flange	316 SS	16.8	10.1	0.5	< LOD	1.8	1.9	67.1	0.7
18	C6L591SA	MD52-10-1 Shaft	316 SS	16.5	10.6	0.4	< LOD	1.4	1.9	67.9	0.3
19	D2M473SA	FNDCT332B-1-2 liner	316 SS	16.2	10.2	0.6	< LOD	1.7	1.9	67.9	0.4
20	D2M474SA	FNDCT332B-4-2 liner	316 SS	16.3	10.0	0.7	< LOD	1.7	1.9	68.4	0.4
21	L1M292SA	FHP2133-3-2 Impeller	316 SS	16.4	10.5	0.4	< LOD	1.6	1.9	67.5	0.3
22	L3B167SA	58F-3 Booster Impeller	CF8M	19.3	10.0	0.8	< LOD	0.8	2.1	66.4	0.3
23	L3A026SA	58C-1 OB Cover	316 SS	16.7	10.4	0.3	< LOD	1.7	2.0	67.8	0.3

<LOD – Below the instruments level of detection

Report 48611, Page 2 of 4

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Accredited to
ISO 17025: 2017

NRC Compliant
10CFR Part 50, App B

IA & IL Certified
Lab Certification 084

Air Products Inc.
P.O. No.: SM00004584
Project No.: EN207119
Project Name: World Energy Renew Naphtha /PRU US7L
Location: Paramount, CA

Equipment: Jet Stripper Vapor KO Drum Pumps
Item Nos.: 18-P-357 A/B
Model No.: MDW5133SA
S/N: 65061 - 1 & 2

VDR Code: QT06
SDDC Code: SUP-TRP-019
Doc No.: NDE-01
Document Name: NDE Record
Rev. No.: 0

Data 48611

Worley/Air Products , Roth Order# 65061
Pump #2

Sample ID	Part#	Description	Spec ID	Cr%	Ni%	Si%	S%	Mn%	Mo%	Fe%	Cu%
24	C6L704SJ	MD51-10A Driven End Shaft	416 SS	12.4	0.5	0.6	0.3	0.7	0.1	85.0	0.2
25	C8S861SJ	MD51-44A Adapter Flange	416 SS	11.8	0.4	0.5	0.3	1.0	0.1	85.7	0.2
26	L3C099SL	52-2K-2 Case	CF8M	19.4	9.4	0.9	< LOD	0.8	2.5	66.2	< LOD
27		Pipe	316 SS	16.9	12.9	0.5	< LOD	1.0	2.0	66.4	0.2
28		Elbow	316 SS	16.7	11.2	0.5	< LOD	0.8	2.0	67.6	0.3
29		Elbow	316 SS	16.3	10.4	0.5	< LOD	1.0	2.0	68.4	0.3
30		Pipe	316 SS	17.8	12.4	0.7	< LOD	1.5	2.1	64.9	0.2
31		Flange	316 SS	16.5	11.2	0.4	< LOD	1.7	2.0	67.4	0.8
32	C7M323SL	255-44W-10 IB Cover	316 SS	16.8	10.5	0.6	< LOD	1.6	2.0	67.9	0.3
33	L3C100SL	58-11D-T Booster Case	CF8M	19.7	9.2	0.9	< LOD	1.0	2.4	66.8	< LOD
34		Pipe	316 SS	17.4	12.3	0.5	< LOD	1.2	2.1	65.6	0.2
35		Elbow	316 SS	16.1	10.3	0.5	< LOD	0.8	1.9	67.7	0.3
36		Pipe	316 SS	17.7	12.1	0.8	< LOD	1.4	2.1	64.9	0.2
37		Flange	316 SS	16.7	10.7	0.5	< LOD	1.8	2.0	67.1	0.7
38		Pipe	316 SS	17.2	12.5	0.6	< LOD	1.1	2.2	65.8	0.1
39		Elbow	316 SS	16.2	10.1	0.7	< LOD	1.0	2.0	69.4	0.3
40		Flange	316 SS	16.6	10.3	0.5	< LOD	1.6	2.0	68.1	0.5
41	C6L591SA	MD52-10-1 Shaft	316 SS	16.8	10.5	0.4	< LOD	1.5	2.5	66.7	0.4
42	D2M473SA	FNDCT332B-1-2 liner	316 SS	16.1	10.3	0.5	< LOD	1.7	2.0	68.4	0.4
43	D2M474SA	FNDCT332B-4-2 liner	316 SS	16.2	10.2	0.7	< LOD	1.6	1.9	68.3	0.4
44	L1M292SA	FHP2133-3-2 Impeller	316 SS	16.6	10.5	0.5	< LOD	1.5	2.0	67.8	0.3
45	L3B167SA	58F-3 Booster Impeller	316 SS	CF8M	9.1	1.0	< LOD	0.8	2.1	66.2	0.4
46	L3A026SA	58C-1 OB Cover	316 SS	16.7	10.3	0.4	< LOD	1.6	2.1	68.2	0.3

<LOD – Below the instruments level of detection

Report 48611, Page 3 of 4

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Lab Certification 084



Material Grade Chemistry

Material Specifications	Grade /Type	C%	Cr %	Ni %	Si %	Mn %	Mo %	Cu %	Fe%	S%
ASTM A351	CF3M Austenitic Stainless Steel Casting	0.03 max	17.0-21.0	9.0-13.0	1.5 max	1.5 max	2.0-3.0	----	Balance	0.04 max
	CF8M Austenitic Stainless Steel Casting	0.08 max	18.0-21.0	9.0-12.0	1.5 max	1.5 max	2.0-3.0	----	Balance	0.04 max
ASTM A276	316L Austenitic Stainless Steel ,Bars and Shapes	0.03 max	16.0-18.0	10.0-14.0	1.0 max	2.0 max	2.0-3.0	----	Balance	0.03 max
	316 Austenitic Stainless Steel ,Bars and Shapes	0.08 max	16.0-18.0	10.0-14.0	1.0 max	2.0 max	2.0-3.0	----	Balance	0.03 max
ASTM A582	Grade 416 Free Machining (Resulphurized Martensitic Stainless Steel Bars		12-14	-----	1.0 Max	1.25 Max.	----	----	Balance	0.15 min

Air Products Inc.
 P.O. No.: SM00004584
 Project No.: EN207119
 Project Name: World Energy Renew Naphtha /PRU US7L
 Location: Paramount, CA

Equipment: Jet Stripper Vapor KO Drum Pumps
 Item Nos.: 18-P-357 A/B
 Model No.: MDW5133SA
 S/N: 65061 - 1 & 2

VDR Code: QT06
 SDDC Code: SUP-TRP-019
 Doc No.: NDE-01
 Document Name: NDE Record
 Rev. No.: 0


 Todd Bloodsworth/Technician

Report 48611, Page 4 of 4

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Accredited to
 ISO 17025: 2017

NRC Compliant
 10CFR Part 50, App B

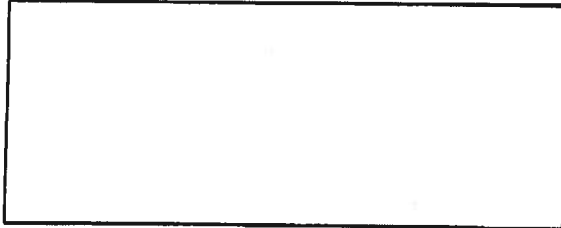
IA & IL Certified
 Lab Certification 084

7

ABB Motors and
Mechanical Inc.

Customer Report of Electrical Test

TIR. 000
.001



Customer Purch. Order:

Sales Order No.:

Shop Order No.:

Catalog No.:

Serial Number:

Customer Number:

Manufacturing Plant:

F0423/7000

06H770X822G I

F2305046705

FORT SMITH

Basic Configuration

Power	Enclosure	Enclosure Enhancement		Efficiency	Frame Size		Duty
5 TE	TEFC	N/A		88.5	184TC		N/A
RPM	Phase / Hertz - Voltage	Design Letter	Poles	Motor Std	Bearing Type DE / ODE		Frame Motor Orientation
3440	3/60-460	B	02	NEMA	N/A		N/A
Mounting Position	Frame Mounting	Multi Speed	Insulation	Service Factor	Maximum Ambient (°C)	Maximum Altitude	Customer Application
F1	R	N	F	1.15		3300	GP

Motor Data

Test Date	Elect Design	Mech Design	Drive End Bearing	Opposite Drive End Bearing	Full Load Amps	Locked kVA/HP
05/16/23 06:51:03	06WGX822	06H770	6206	6206	5.7	J

No Load Test Results					AC Hi-Pot	DC Resistance			
RPM	Test Voltage	Test Amps	kWatts*	Freq (Hz)	Test Voltage	A-B Ohms	A-C Ohms	B-C Ohms	°C
3600	463.183033	1.079021	0.235024	60	2534	2.599402	2.600898	2.600661	25

Vibration Test Results

VELOCITY IN/SEC (P)											
Frequency(Her	RPM	ODE HORI	ODE VERT	DE HORIZ	DE VERT	DE AXIAL	ODE HORIZ	ODE VERT	DE HORIZ	DE VERT	DE AXIAL
8.00 - 2000.00	3581	0.0516	0.0531	0.0714	0.0701	0.0387					

Air Products Inc.

P.O. No.: SM00004584

Project No.: EN207119

Project Name: World Energy Renew Naphtha /PRU US7L

Location: Paramount, CA

Equipment: Jet Stripper Vapor KO Drum Pumps

Item Nos.: 18-P-357 A/B

Model No.: MDW5133SA

S/N: 65061 - 1 & 2

VDR Code: QC43

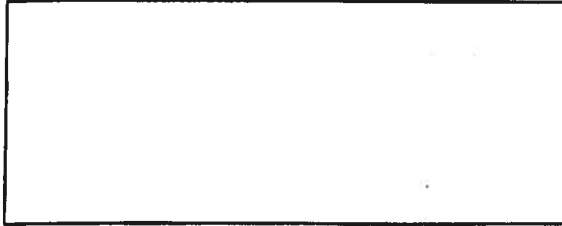
SDDC Code: SUP-TRP-017

Doc No.: MOTR-01

Document Name: Manufacture Test Report

Rev. No.: 0

* If measured, optional



Customer Purch. Order:

Sales Order No:
Shop Order No.: F0423-7000
Catalog No: 06H770X822G1
Serial Number: F2305046713
Customer Number:
Manufacturing Plant: FORT SMITH

Basic Configuration

Power	Enclosure	Enclosure Enhancement		Efficiency	Frame Size		Duty
5 TE	TEFC	N/A		88.5	184TC		N/A
RPM	Phase / Hertz - Voltage	Design Letter	Poles	Motor Std.	Bearing Type DE / ODE		Frame Motor Orientation
3440	3/60-460	B	02	NEMA	N/A		N/A
Mounting Position	Frame Mounting	Multi Speed	Insulation	Service Factor	Maximum Ambient (°C)	Maximum Altitude	Customer Application
F1	R	N	F	1.15	40	3300	GP

Motor Data

Test Date	Elect Design	Mech Design	Drive End Bearing	Opposite Drive End Bearing	Full Load Amps	Locked kVA/HP
05/16/23 07:28:19	06WGX822	06H770	6206	6206	5.7	J

No Load Test Results					AC Hi-Pot	DC Resistance			
RPM	Test Voltage	Test Amps	kWatts*	Freq (Hz)	Test Voltage	A-B Ohms	A-G Ohms	B-G Ohms	°C
3600	461.173567	1.082056	0.264253	60	2527	2.627528	2.627293	2.628563	25

Vibration Test Results

VELOCITY IN/SEC (P)											
Frequency(Her)	RPM	ODE HORIZ	ODE VERT	DE HORIZ	DE VERT	DE AXIAL	ODE HORIZ	ODE VERT	DE HORIZ	DE VERT	DE AXIAL
8.00 - 2000.00	3601	0.0295	0.0260	0.0333	0.0313	0.0214					

Air Products Inc.
P.O. No.: SM00004584
Project No.: EN207119
Project Name: World Energy Renew Naphtha /PRU US7L
Location: Paramount, CA

Equipment: Jet Stripper Vapor KO Drum Pumps
Item Nos.: 18-P-357 A/B
Model No.: MDW5133SA
S/N: 65061 - 1 & 2

VDR Code: QC43
SDDC Code: SUP-TRP-017
Doc No.: MOTR-01
Document Name: Manufacture Test Report
Rev. No.: 0

* If measured, optional

Worley/Air Products
Roth order 65061

Material test reports

<u>Part number</u>	<u>Description</u>	<u>Material Description</u>	<u>Material PO</u>	<u>Heat #</u>
C6L704SJ	MD51-10A Driven End Shaft	1-3/8" dia 416 SS bar	52865	Y45X
C8S861SJ	MD51-44A Adapter Flange	6" dia 416 SS bar	52699	500375
L3C099SL	52-2K-2 Case	316LSS casting(52-2J)	52424 45941	49 1R 336E
C7M323SL	255-44W-10 IB Cover	9"dia x 1.78 316LSS Slug	52959	SP2810-20
L3C100SL	58-11D-T Booster Case	316LSS casting(58-11D)	52950	517S
C6L591SA	MD52-10-1 Shaft	1-3/4" dia 316 SS bar	52657	V88J
D2M473SA	FNDCT332B-1-2 liner	6-1/2" dia 316 SS bar	52649	183654
D2M474SA	FNDCT332B-4-2 liner	6-1/2" dia 316 SS bar	52649	183654
L1M292SA	FHP2133-3-2 Impeller	4-3/4" dia 316 SS bar	51195	12A615
L3B167SA	58F-3 Booster Impeller	316SS casting(56H-3)	53129	721S
L3A026SA	58C-1 OB Cover	6-1/4" dia 316 SS bar	52921	SP0896-30

Air Products Inc.
P.O. No.: SM00004584
Project No.: EN207119
Project Name: World Energy Renew Naphtha /PRU US7L
Location: Paramount, CA

Equipment: Jet Stripper Vapor KO Drum Pumps
Item Nos.: 18-P-357 A/B
Model No.: MDW5133SA
S/N: 65061 - 1 & 2

VDR Code: FG04
SDDC Code: SUP-TRP-018
Doc No.: MTR-01
Document Name: Material Test Reports
Rev. No.: 0

CERTIFICATE OF TEST



Page 01 of 02

Certification Date
29-AUG-2023

CUSTOMER ORDER NUMBER

52865

EARLE M. JORGENSEN COMPANY
325 N. 16TH AVENUE
ELDRIDGE IA 52748

Invoice Number
S232192

CUSTOMER PART NUMBER

C6M022SJ

SOLD TO: ROTH PUMP MFG CO INC

BOX 4358
ROCK ISLAND IL 61204

SHIP TO:

ROTH PUMP MFG CO INC

525 4TH ST WEST
MILAN IL 61264

Description: 416 CF ANN BAR ASTM A582
1-3/8 RD X 12' R/L
HEAT: Y45X ITEM: 509941

Line Total: 379 LB

Specifications:

AMS 5610 R*	ASTM A582 22	*TYPE 2
UNS S41600	EN 10204 3.1	ASTM A484/A484M 22
QQS 764 B	DFAR 252.225-7014	ASTM A751 CHEM 20

CHEMICAL ANALYSIS

C	CO	CR	CU	MN	MO	N	NI
0.128	0.02	12.89	0.11	0.64	0.111	0.019	0.20
P	S	SI					
0.028	0.3005	0.21					

RCPT: R597956

VENDOR: NORTH AMERICAN STAINLESS

COUNTRY OF ORIGIN : USA

MECHANICAL PROPERTIES

	YLD STR	ULT TEN	%ELONG	%RED	HARDNESS
DESCRIPTION	KSI	KSI	IN 02 IN	IN AREA	BHN
	62.14	88.76	24.65	53.71	187

DEVELOPED HARDNESS 41 RC

The above data were transcribed from the manufacturer's Certificate of Test after verification for completeness and specification requirements of the information on the certificate. All test results remain on file subject to examination.

We hereby certify that the material covered by this report will meet the applicable requirements described herein, including any specification forming a part of the description.

The willful recording of false, fictitious, or fraudulent statements in connection with test results may be punishable as a felony under federal statutes.

Material did not come in contact with mercury while in our possession.

RICHARD PAVLIK

Manager, Quality Assurance

CERTIFICATE OF TEST



Page 02 of 02

Certification Date
29-AUG-2023

CUSTOMER ORDER NUMBER

52865

EARLE M. JORGENSEN COMPANY
325 N. 16TH AVENUE
ELDRIDGE IA 52748

Invoice Number
S232192

CUSTOMER PART NUMBER

C6M022SJ

SOLD TO: ROTH PUMP MFG CO INC
BOX 4358
ROCK ISLAND IL 61204

SHIP TO: ROTH PUMP MFG CO INC
525 4TH ST WEST
MILAN IL 61264

Description: 416 CF ANN BAR ASTM A582
1-3/8 RD X 12' R/L
HEAT: Y45X ITEM: 509941

Line Total: 379 LB

MATERIAL IS FREE FROM MERCURY CONTAMINATION
NO WELD REPAIR PERFORMED ON MATERIAL

COMMENTS

red. ratio 39.1:1
eu directive 2014/65/eu.rohs.
melted & mfg in usa

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Material did not come in contact with mercury while in our possession.

RICHARD PAVLIK

Manager, Quality Assurance

CERTIFICATE OF TEST



Page 01 of 02

Certification Date
29-JUN-2023**CUSTOMER ORDER NUMBER**

52699

EARLE M. JORGENSEN COMPANY
325 N. 16TH AVENUE
ELDRIDGE IA 52748Invoice Number
T638750**CUSTOMER PART NUMBER**

C6M072SJ

SOLD TO: ROTH PUMP MFG CO INCBOX 4358
ROCK ISLAND IL 61204**SHIP TO:**

ROTH PUMP MFG CO INC

525 4TH STREET WEST
MILAN IL 61204Description: 416 HR ANN RT BAR
6 RD S/C 6'0" (72")
HEAT: 500375

ASTM A582

Line Total: 577 LB

ITEM: 509986

Specifications:

AMS 5610 P*

COND A

UNS S41600

ASTM E8 22

ASTM A751 CHEM 21

ASTM A582 22

ASTM A484 22

ASTM E10 18

ASTM E340 15

*TYPE II

QQS 764 AMD.2 B

ASTM E18 22

ASTM E381 20

CHEMICAL ANALYSIS

C	MN	P	S	SI	CR	NI	MO
0.11	1.20	0.015	0.32	0.23	12.06	0.45	0.05
CU	N						
0.12	0.00						

RCPT: R572782

VENDOR: VALBRUNA STAINLESS

COUNTRY OF ORIGIN : USA

MECHANICAL PROPERTIES

DESCRIPTION	YLD STR	ULT TEN	%ELONG	%RED	HARDNESS
	PSI	PSI	IN 02 IN	IN AREA	BHN
	72100.0	91800.0	20.5	46.3	212

DEVELOPED HARDNESS 43 RC

The above data were transcribed from the manufacturer's Certificate of Test after verification for completeness and specification requirements of the information on the certificate. All test results remain on file subject to examination.

We hereby certify that the material covered by this report will meet the applicable requirements described herein, including any specification forming a part of the description.

The willful recording of false, fictitious, or fraudulent statements in connection with test results may be punishable as a felony under federal statutes.

Material did not come in contact with mercury while in our possession.

RICHARD PAVLIK

Manager, Quality Assurance

CERTIFICATE OF TEST



Page 02 of 02

Certification Date
29-JUN-2023

CUSTOMER ORDER NUMBER

52699

EARLE M. JORGENSEN COMPANY
325 N. 16TH AVENUE
ELDRIDGE IA 52748

Invoice Number
T638750

CUSTOMER PART NUMBER

C6M072SJ

SOLD TO: ROTH PUMP MFG CO INC
BOX 4358
ROCK ISLAND IL 61204

SHIP TO: ROTH PUMP MFG CO INC
525 4TH STREET WEST
MILAN IL 61204

Description: 416 HR ANN RT BAR ASTM A582
6 RD S/C 6'0" (72") Line Total: 577 LB
HEAT: 500375 ITEM: 509986

MATERIAL IS FREE FROM MERCURY CONTAMINATION
NO WELD REPAIR PERFORMED ON MATERIAL
THERMAL TREATMENT: OK
ANNEALED AT 1450 DEG F - MIN 4 HURS - FURNACE COOL
TO 1100 DEG F - AIR COOL
MACRO: OK

COMMENTS

eaf/aod or vod melted and poured in the usa
conforms to listed specifications. dfars-baa 252.225-7009
compliant
produced in accordance with en 10204 3.1

The above data were transcribed from the manufacturer's Certificate of Test after verification for completeness and specification requirements of the information on the certificate. All test results remain on file subject to examination.

We hereby certify that the material covered by this report will meet the applicable requirements described herein, including any specification forming a part of the description.

The willful recording of false, fictitious, or fraudulent statements in connection with test results may be punishable as a felony under federal statutes.

Material did not come in contact with mercury while in our possession.

RICHARD PAVLIK

A handwritten signature in black ink, appearing to read 'Richard Pavlik'.

Manager, Quality Assurance

Material Certification

Heat #: 491R Date: 4/14/2023

Customer:	Roth	Material:	ASTM A351 CF3M
Purchase Order	52424	Line #:	1
Part Number:	52-2J	Pieces:	3
Description:		Item #:	L3A476SL
		Country of Origin:	USA

Chemical Composition

C:	0.0182	Cu:	0.068	W:	0.0145
Si:	0.727	Al:	0.0415	Zn:	
Mn:	0.736	Co:	0.0579	Pb:	
P:	0.0118	Mg:		Sb:	
S:	0.0108	Nb:	0.011	N:	0.061
Cr:	18.89	Sn:	0.00306	Fe:	66.9
Mo:	2.35	Ti:	0.00499		
Ni:	10.06	V:	0.0435		

Physical Properties

Tensile Strength (PSI)	83,700
Yield Strength (PSI)	40,400
Elongation (%)	51
Hardness (BHN)	157

This certification complies with EN10204 3.1, and all castings have been visually inspected to MSS-SP-55 and are mercury free and asbestos free.

I certify that the referenced material has been manufactured, sampled, and tested in accordance with the listed PO requirements and the current revision of the material specification, and has been found to meet the requirements.

Authorized Signature

Michael Beining
Michael Beining

MANUFACTURERS OF IRON, BRONZE, STEEL, STAINLESS STEEL AND HIGH ALLOY CASTINGS
845 Hickory Street * P.O. Box 46 * Pewaukee, WI 53072-0046
(262) 691-3060 * Fax (262) 691-3885 * WWW.NORTHERNSTAINLESS.COM

F-057

Rev 2

1/17/2019



Material Certification

Heat #: 336E

Customer: Roth
Purchase Order 45941
Part Number: 52-2J
Description:

Material: ASTM A351 CF3M
Pieces: 6
Date: 9/18/2017
Country of Origin: USA

Chemical Composition

C:	0.013	Cu:	0.039	W:	0.012
Si:	0.765	Al:	0.054	Zn:	
Mn:	0.825	Co:	0.022	Pb:	
P:	0.008	Mg:		Sb:	
S:	0.011	Nb:	0.014	N:	0.032
Cr:	19.342	Sn:	0.001	Fe:	66.751
Mo:	2.615	Ti:	0.006		
Ni:	9.461	V:	0.028		

Physical Properties

Tensile Strength (PSI)	79,300
Yield Strength (PSI)	36,300
Elongation (%)	47
Reduction of Area (%)	0
Hardness	0

This certification complies with EN10204 3.1, and all castings have been visually inspected to MSS-SP-55 and are mercury free and asbestos free.

I certify that the referenced material has been tested in accordance with the listed PO requirements and specifications and has been found to have the chemical and physical properties noted hereon.

Authorized Signature 
Lee Hansen

QA Mgr 9/18/17

MANUFACTURERS OF IRON, BRONZE, STEEL, STAINLESS STEEL AND HIGH ALLOY CASTINGS
845 Hickory Street * P.O. Box 46 * Pewaukee, WI 53072-0046
(262) 691-3060 * Fax (262) 691-3885 * WWW.NORTHERNSTAINLESS.COM

CERTIFICATE OF TEST



Page 01 of 02

Certification Date
22-SEP-2023**CUSTOMER ORDER NUMBER**

52959

EARLE M. JORGENSEN COMPANY
325 N. 16TH AVENUE
ELDRIDGE IA 52748Invoice Number
T641752**CUSTOMER PART NUMBER**

C6M097LS-1.9375

SOLD TO: ROTH PUMP MFG CO INC
BOX 4358
ROCK ISLAND IL 61204**SHIP TO:** ROTH PUMP MFG CO INC
525 4TH STREET WEST
MILAN IL 61204Description: 316/316L ANN HR RT BAR
9 RD S/C 0'1.9375" (1.9375")
HEAT: SP2810-20

ITEM: 509379

ASTM A479
Line Total: 69.9113 LB**Specifications:**AMS 5648 M
ASTM A276
ASTM E112
ASME SA479/SA479M 21
ASTM A388/A388MAMS 5653 J
ASTM A479
ASTM A276/A276M 17
AMS QQ S 763 D
ASTM A262 PRA EQQ S 763
ASME SA479
ASTM A479/A479M 20
NACE MR0103/ISO17945 15
EN 10204 3.1**CHEMICAL ANALYSIS**

C	SI	MN	P	S	NI	CR	MO
0.026	0.35	1.62	0.0360	0.025	10.35	16.68	2.05
CU	W	CO	N	PB			
0.29	0.041	0.17	0.077	0.0043			

RCPT: R517014

VENDOR: GLORIA MATERIAL TECHNOLOGY

COUNTRY OF ORIGIN : TAIWAN

MECHANICAL PROPERTIES

	YLD STR	ULT TEN	%ELONG	%RED	HARDNESS
DESCRIPTION	KSI	KSI	IN 02 IN	IN AREA	BHN
	289.0	580.0	64.0	80.0	146

GRAIN SIZE : 3 -

The above data were transcribed from the manufacturer's Certificate of Test after verification for completeness and specification requirements of the information on the certificate. All test results remain on file subject to examination.

We hereby certify that the material covered by this report will meet the applicable requirements described herein, including any specification forming a part of the description.

The willful recording of false, fictitious, or fraudulent statements in connection with test results may be punishable as a felony under federal statutes.

Material did not come in contact with mercury while in our possession.

RICHARD PAVLIK

Manager, Quality Assurance

CERTIFICATE OF TEST



Page 02 of 02

Certification Date
22-SEP-2023

CUSTOMER ORDER NUMBER

52959

EARLE M. JORGENSEN COMPANY
325 N. 16TH AVENUE
ELDRIDGE IA 52748

Invoice Number
T641752

CUSTOMER PART NUMBER

C6M097LS-1.9375

SOLD TO: ROTH PUMP MFG CO INC
BOX 4358
ROCK ISLAND IL 61204

SHIP TO: ROTH PUMP MFG CO INC
525 4TH STREET WEST
MILAN IL 61204

Description: 316/316L ANN HR RT BAR
9 RD S/C 0'1.9375" (1.9375")
HEAT: SP2810-20

ASTM A479
Line Total: 69.9113 LB

ITEM: 509379

REDUCTION RATIO 5.4 TO 1 MATERIAL IS FREE FROM MERCURY CONTAMINATION
NO WELD REPAIR PERFORMED ON MATERIAL
ULTRASONIC: YES
CORROSION: OK
MACRO: OK
MICRO: OK

The above data were transcribed from the manufacturer's Certificate of Test after verification for completeness and specification requirements of the information on the certificate. All test results remain on file subject to examination.

We hereby certify that the material covered by this report will meet the applicable requirements described herein, including any specification forming a part of the description.

The willful recording of false, fictitious, or fraudulent statements in connection with test results may be punishable as a felony under federal statutes.

Material did not come in contact with mercury while in our possession.

RICHARD PAVLIK

A handwritten signature in black ink, appearing to read 'Richard Pavlik'.

Manager, Quality Assurance



Material Certification

Heat #: 517S Date: 11/28/2023

Customer:	Roth	Material:	ASTM A351 CF3M
Purchase Order	52950	Line #:	1
Part Number:	58-11D	Pieces:	6
Description:		Item #:	L3A625SL
		Country of Origin:	USA

Chemical Composition

C:	0.0186	Cu:	0.0508	W:	0.00819
Si:	0.802	Al:	0.0809	Zn:	
Mn:	0.846	Co:	0.0529	Pb:	
P:	0.0128	Mg:		Sb:	
S:	0.0118	Nb:	0.0213	N:	0.0535
Cr:	18.69	Sn:	0.00302	Fe:	67.4
Mo:	2.49	Ti:	0.00982		
Ni:	9.45	V:	0.0245		

Physical Properties

Tensile Strength (PSI)	85,100
Yield Strength (PSI)	45,300
Elongation (%)	44
Hardness (BHN)	174

This certification complies with EN10204 3.1, and all castings have been visually inspected to MSS-SP-55 and are mercury free and asbestos free.

I certify that the referenced material has been manufactured, sampled, and tested in accordance with the listed PO requirements and the current revision of the material specification, and has been found to meet the requirements.

Authorized Signature Michael Beining
Michael Beining

MANUFACTURES OF IRON, BRONZE, STEEL, STAINLESS STEEL AND HIGH ALLOY CASTINGS
845 Hickory Street * P.O. Box 46 * Pewaukee, WI 53072-0046
(262) 691-3060 * Fax (262) 691-3885 * WWW.NORTHERNSTAINLESS.COM

F-057

Rev 2

1/17/2019



CERTIFICATE OF TEST

Page 01 of 02

Certification Date
18-MAY-2023

CUSTOMER ORDER NUMBER

52657

EARLE M. JORGENSEN COMPANY
325 N. 16TH AVENUE
ELDRIDGE IA 52748

Invoice Number
S226418

CUSTOMER PART NUMBER

C6M028SA

SOLD TO: ROTH PUMP MFG CO INC
BOX 4358
ROCK ISLAND IL 61204

SHIP TO: ROTH PUMP MFG CO INC
525 4TH STREET WEST
MILAN IL 61204

Description: 316/316L CF ANN BAR
1-3/4 RD X 12' R/L
HEAT: V88J

ITEM: 525420

Line Total: 406 LB

Specifications:

AMS 5648 M	AMS 5653 J	ASTM A276 17
ASTM A479 21	ASME SA479 21	QQ S 763 F
UNS S31600/S31603	EN 10204 3.1	ASTM A484 21
ASTM A182 CHEM ONLY 21	ASME SA182 CHEM ONLY 21	AMS QQS 763 D
NACE MR0175 15*	NACE MR0103 15*	*(MID RADIUS ONLY)
ASTM A320 CL1 B8M 18	ASME SA193 CL1 B8M 21	(EXC PAR 7.3.1)
ASTM F899 20	ASTM A751 20	

CHEMICAL ANALYSIS

C	CO	CR	CU	MN	MO	N	NI
0.014	0.38	16.69	0.33	1.33	2.047	0.04	10.65
P	S	SI					
0.031	0.023	0.34					

RCPT: R443838

VENDOR: NORTH AMERICAN STAINLESS

COUNTRY OF ORIGIN : USA

MECHANICAL PROPERTIES

DESCRIPTION	YLD STR	ULT TEN	%ELONG	%RED	HARDNESS
	KSI	KSI	IN 02 IN	IN AREA	BHN
	42.85	87.91	52.5	75.0	156

GRAIN SIZE : 6 - 8

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We hereby certify that the material covered by this report will meet the applicable requirements described herein, including any specification forming a part of the description.

The willful recording of false, fictitious, or fraudulent statements in connection with test results may be punishable as a felony under federal statutes.

Material did not come in contact with mercury while in our possession.

RICHARD PAVLIK

Manager, Quality Assurance



CERTIFICATE OF TEST

Page 02 of 02

Certification Date
18-MAY-2023

CUSTOMER ORDER NUMBER

52657

EARLE M. JORGENSEN COMPANY
325 N. 16TH AVENUE
ELDRIDGE IA 52748

Invoice Number
S226418

CUSTOMER PART NUMBER

C6M028SA

SOLD TO: ROTH PUMP MFG CO INC
BOX 4358
ROCK ISLAND IL 61204

SHIP TO: ROTH PUMP MFG CO INC
525 4TH STREET WEST
MILAN IL 61204

Description: 316/316L CF ANN BAR
1-3/4 RD X 12' R/L
HEAT: V88J

ITEM: 525420

Line Total: 406 LB

STRAND CAST REDUCTION RATIO 24.5 TO 1
MATERIAL IS FREE FROM MERCURY CONTAMINATION
NO WELD REPAIR PERFORMED ON MATERIAL
THERMAL TREATMENT: OK
SOL ANNEAL TEMP 1900F MIN
CORROSION: OK

COMMENTS

SPEC CONT:
ASTM A193/20 CL1 B8M (EXC PAR 6.2.1) ISO/IEC 17025 ASTM A262/15 PR A/E
DFARS COMPLIANT

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Material did not come in contact with mercury while in our possession.

RICHARD PAVLIK

Manager, Quality Assurance



CERTIFICATE OF TEST

Page 01 of 02

Certification Date
16-MAY-2023

CUSTOMER ORDER NUMBER

52649

EARLE M. JORGENSEN COMPANY
325 N. 16TH AVENUE
ELDRIDGE IA 52748

Invoice Number
S226328

CUSTOMER PART NUMBER

C6M0715SA

SOLD TO: ROTH PUMP MFG CO INC
BOX 4358
ROCK ISLAND IL 61204

SHIP TO: ROTH PUMP MFG CO INC
BOX 4358
6TH AVENUE AT 4TH STREET
MILAN IL 61204

Description: 316/316L ANN HR RT BAR
6-1/2 RD X 2'0" (24") REMNANT
HEAT: 183654

ITEM: 509371

ASTM A479
Line Total: 226 LB

Specifications:

AMS 5648 M
ASTM A276 17
ASTM A370 19E1
ASTM A473 CHEM 19
USN S31600/S31603
ASTM A484 20
ASTM A314 19

AMS 5653 J
ASTM A479 20
ASME SA182 BAR FORM 19
ASTM A193 20
ASTM A182 BAR FORM 20
ASTM A262 15
ASME SA484 10ED

QQ S 763 F
ASME SA479 19
AMS QQ S 763 D
EN 10204 3.1
ASME SA320 13
ASME SA276 13E1

CHEMICAL ANALYSIS

C	MN	P	S	SI	CR	NI	MO
0.012	1.58	0.03	0.024	0.55	16.12	10.20	2.06
CU	CO	N					
0.40	0.24	0.07					

RCPT: R112395

VENDOR: VALBRUNA STAINLESS

COUNTRY OF ORIGIN : USA

MECHANICAL PROPERTIES

DESCRIPTION	YLD STR PSI	ULT TEN PSI	%ELONG IN 02 IN	%RED IN AREA	HARDNESS BHN
	35100.0	81200.0	60.5	78.2	143

GRAIN SIZE : 6 -

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We hereby certify that the material covered by this report will meet the applicable requirements described herein, including any specification forming a part of the description.

The willful recording of false, fictitious, or fraudulent statements in connection with test results may be punishable as a felony under federal statutes.

Material did not come in contact with mercury while in our possession.

RICHARD PAVLIK

Manager, Quality Assurance

CERTIFICATE OF TEST



Page 02 of 02

Certification Date
16-MAY-2023

CUSTOMER ORDER NUMBER

52649

EARLE M. JORGENSEN COMPANY
325 N. 16TH AVENUE
ELDRIDGE IA 52748

Invoice Number
S226328

CUSTOMER PART NUMBER

C6M0715SA

SOLD TO: ROTH PUMP MFG CO INC
BOX 4358
ROCK ISLAND IL 61204

SHIP TO: ROTH PUMP MFG CO INC
BOX 4358
6TH AVENUE AT 4TH STREET
MILAN IL 61204

Description: 316/316L ANN HR RT BAR
6-1/2 RD X 2'0" (24") REMNANT
HEAT: 183654

ITEM: 509371

ASTM A479
Line Total: 226 LB

MATERIAL IS FREE FROM MERCURY CONTAMINATION
NO WELD REPAIR PERFORMED ON MATERIAL
CORROSION: OK
MACRO: OK

COMMENTS

EAF/AOD MELTED AND POURED IN CANADA/MFG USA
DFARS BAA 252.225-7009 COMPLIANT

The above data were transcribed from the manufacturer's Certificate of Test after verification for completeness and specification requirements of the information on the certificate. All test results remain on file subject to examination.

We hereby certify that the material covered by this report will meet the applicable requirements described herein, including any specification forming a part of the description.

The willful recording of false, fictitious, or fraudulent statements in connection with test results may be punishable as a felony under federal statutes.

Material did not come in contact with mercury while in our possession.

RICHARD PAVLIK

Manager, Quality Assurance

CERTIFICATE OF TEST



Page 01 of 02

Certification Date
14-OCT-2021

CUSTOMER ORDER NUMBER

51195

EARLE M. JORGENSEN COMPANY
325 N. 16TH AVENUE
ELDRIDGE IA 52748

Invoice Number
S190038

CUSTOMER PART NUMBER

C6M067SA

SOLD TO: ROTH PUMP MFG CO INC
BOX 4358
ROCK ISLAND IL 61204

SHIP TO: ROTH PUMP MFG CO INC
BOX 4358
6TH AVENUE AT 4TH STREET
MILAN IL 61204

Description: 316/316L ANN HR RT BAR
4-3/4 RD X 5'0" (60") REMNANT
HEAT: 12A615

ASTM A479
Line Total: 302 LB

ITEM: 509363

Specifications:

AMS 5648 M	AMS 5653 H	QQ S 763 F
ASTM A276 17	ASTM A479 17	ASME SA479 17
ASTM A193 16	ASME SA193 10	ASTM A320 16
ASME SA320 20	AMS QQ S 763 D	EN 10204 3.1
ASTM E112	ASTM A484 11	ASTM A182 10
ASME SA182 17		

CHEMICAL ANALYSIS

C	SI	MN	P	S	NI	CR	MO
0.0090	0.3900	1.49	0.034	0.024	10.09	16.26	2.10
CU	N						
0.25	0.058						

RCPT: R194294

VENDOR: TA CHEN INTERNATIONAL

COUNTRY OF ORIGIN : CHINA

MECHANICAL PROPERTIES

DESCRIPTION	YLD STR	ULT TEN	%ELONG	%RED	HARDNESS
	KSI	KSI	IN 02 IN	IN AREA	BHN
	70.0	88.0	47.0	76.0	187

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We hereby certify that the material covered by this report will meet the applicable requirements described herein, including any specification forming a part of the description.

The willful recording of false, fictitious, or fraudulent statements in connection with test results may be punishable as a felony under federal statutes.

Material did not come in contact with mercury while in our possession.

RICHARD PAVLIK

Manager, Quality Assurance

CERTIFICATE OF TEST



Page 02 of 02

Certification Date
14-OCT-2021

CUSTOMER ORDER NUMBER

51195

EARLE M. JORGENSEN COMPANY
325 N. 16TH AVENUE
ELDRIDGE IA 52748

Invoice Number
S190038

CUSTOMER PART NUMBER

C6M067SA

SOLD TO: ROTH PUMP MFG CO INC
BOX 4358
ROCK ISLAND IL 61204

SHIP TO: ROTH PUMP MFG CO INC
BOX 4358
6TH AVENUE AT 4TH STREET
MILAN IL 61204

Description: 316/316L ANN HR RT BAR
4-3/4 RD X 5'0" (60") REMNANT
HEAT: 12A615

ASTM A479
Line Total: 302 LB

ITEM: 509363

MATERIAL IS FREE FROM MERCURY CONTAMINATION
NO WELD REPAIR PERFORMED ON MATERIAL
ULTRASONIC: YES
CORROSION: OK
MACRO: OK
MICRO: OK

The above data were transcribed from the manufacturer's Certificate of Test after verification for completeness and specification requirements of the information on the certificate. All test results remain on file subject to examination.

We hereby certify that the material covered by this report will meet the applicable requirements described herein, including any specification forming a part of the description.

The willful recording of false, fictitious, or fraudulent statements in connection with test results may be punishable as a felony under federal statutes.

Material did not come in contact with mercury while in our possession.

RICHARD PAVLIK

Manager, Quality Assurance

Material Certification

Heat #: 721S **Date:** 1/11/2024

Customer:	Roth	Material:	ASTM A351 CF8M
Purchase Order	53129	Line #:	1
Part Number:	56H-3	Pieces:	4
Description:		Item #:	L3A165SA
		Country of Origin:	USA

Chemical Composition

C:	0.0546	Cu:	0.28	W:	0.0539
Si:	0.83	Al:	0.0406	Zn:	
Mn:	0.808	Co:	0.207	Pb:	
P:	0.0333	Mg:		Sb:	
S:	0.00963	Nb:	0.0265	N:	0.0914
Cr:	19.15	Sn:	0.00684	Fe:	66
Mo:	2.16	Ti:	0.00118		
Ni:	10.24	V:	0.0558		

Physical Properties

Tensile Strength (PSI)	82,600
Yield Strength (PSI)	40,300
Elongation (%)	36
Hardness (BHN)	152

This certification complies with EN10204 3.1, and all castings have been visually inspected to MSS-SP-55 and are mercury free and asbestos free.

I certify that the referenced material has been manufactured, sampled, and tested in accordance with the listed PO requirements and the current revision of the material specification, and has been found to meet the requirements.

Authorized Signature Michael Beining
Michael Beining

MANUFACTURES OF IRON, BRONZE, STEEL, STAINLESS STEEL AND HIGH ALLOY CASTINGS

845 Hickory Street * P.O. Box 46 * Pewaukee, WI 53072-0046

(262) 691-3060 * Fax (262) 691-3885 * WWW.NORTHERNSTAINLESS.COM

F-057

Rev 2

1/17/2019

CERTIFICATE OF TEST



Page 01 of 02

Certification Date
12-SEP-2023**CUSTOMER ORDER NUMBER**

52921

EARLE M. JORGENSEN COMPANY
325 N. 16TH AVENUE
ELDRIDGE IA 52748Invoice Number
T641368**CUSTOMER PART NUMBER**

C6M070SA

SOLD TO: ROTH PUMP MFG CO INC
BOX 4358
ROCK ISLAND IL 61204**SHIP TO:** ROTH PUMP MFG CO INC
BOX 4358
6TH AVENUE AT 4TH STREET
MILAN IL 61204Description: 316/316L ANN HR RT BAR
6-1/4 RD S/C 6'0" (72")
HEAT: SP0896-30

ITEM: 509370

ASTM A479
Line Total: 626 LB**Specifications:**

AMS 5648 M	AMS 5653 J	QQ S 763 D
ASTM A276	ASTM A479	ASME SA479
ASTM A276/A276M 17	ASTM A479/A479M 20	ASME SA479/SA479M 21
NACE MR0103/ISO17945 15	ASTM A388/A388M	ASTM A262 PR E
AS9100	ISO9001	EN10204 3.1

CHEMICAL ANALYSIS

C	SI	MN	P	S	NI	CR	MO
0.022	0.25	1.62	0.032	0.025	10.32	16.76	2.1200
CU	W	CO	N	PB			
0.33	0.024	0.17	0.069	0.0001			

RCPT: R441851

VENDOR: GLORIA MATERIAL TECHNOLOGY COUNTRY OF ORIGIN :

MECHANICAL PROPERTIES IES

DESCRIPTION	YLD STR	ULT TEN	%ELONG	%RED	HARDNESS
	KSI	KSI	IN 02 IN	IN AREA	BHN
	39.5	83.39	59.0	78.0	152

GRAIN SIZE :5 -

The above data were transcribed from the manufacturer's Certificate of Test after verification for completeness and specification requirements of the information on the certificate. All test results remain on file subject to examination.

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Material did not come in contact with mercury while in our possession.

RICHARD PAVLIK

Manager, Quality Assurance

CERTIFICATE OF TEST



Page 02 of 02

Certification Date
12-SEP-2023

CUSTOMER ORDER NUMBER

52921

EARLE M. JORGENSEN COMPANY
325 N. 16TH AVENUE
ELDRIDGE IA 52748

Invoice Number
T641368

CUSTOMER PART NUMBER

C6M070SA

SOLD TO: ROTH PUMP MFG CO INC
BOX 4358
ROCK ISLAND IL 61204

SHIP TO: ROTH PUMP MFG CO INC
BOX 4358
6TH AVENUE AT 4TH STREET
MILAN IL 61204

Description: 316/316L ANN HR RT BAR
6-1/4 RD S/C 6'0" (72")
HEAT: SP0896-30

ASTM A479
Line Total: 626 LB

ITEM: 509370

REDUCTION RATIO 7.4 TO 1 MATERIAL IS FREE FROM MERCURY CONTAMINATION
NO WELD REPAIR PERFORMED ON MATERIAL
ULTRASONIC: YES
THERMAL TREATMENT: OK
SOLUTION TREATMENT 1900 DEGREE F MINIMUM , WATER COOLED
CORROSION: OK
MACRO: OK
MICRO: OK

The above data were transcribed from the manufacturer's Certificate of Test after verification for completeness and specification requirements of the information on the certificate. All test results remain on file subject to examination.

We hereby certify that the material covered by this report will meet the applicable requirements described herein, including any specification forming a part of the description.

The willful recording of false, fictitious, or fraudulent statements in connection with test results may be punishable as a felony under federal statutes.

Material did not come in contact with mercury while in our possession.

RICHARD PAVLIK

Manager, Quality Assurance



ROTH PUMP COMPANY

P.O. Box 4330
Rock Island, IL 61204-4330
U.S.A.

(309) 787-1791 phone
888-444-ROTH toll-free
(309) 787-5142 fax

Air Products Inc.
P.O. No.: SM00004584
Project No.: EN207119
Project Name: World Energy Renew Naphtha /PRU US7L
Location: Paramount, CA

Equipment: Jet Stripper Vapor KO Drum Pumps
Item Nos.: 18-P-357 A/B
Model No.: MDW5133SA
S/N: 65061 - 1 & 2

Doc No.: PCR-01
Rev. No.: 0

PAINTING/COATING RECORD

Equipment has been painted and coated with Roth standard paint as follows:

Top Coat: Amerlock 400; Grey RAL 7035
Thickness: 5 Mils

**ROTH PUMP COMPANY**

P.O. Box 4330
Rock Island, IL 61204-4330
U.S.A.

(309) 787-1791 phone
888-444-ROTH toll-free
(309) 787-5142 fax

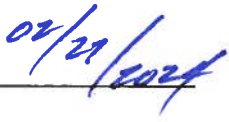
Air Products Inc.
P.O. No.: SM00004584
Project No.: EN207119
Project Name: World Energy Renew Naphtha /PRU US7L
Location: Paramount, CA

Equipment: Jet Stripper Vapor KO Drum Pumps
Item Nos.: 18-P-357 A/B
Model No.: MDW5133SA
S/N: 65061 - 1 & 2

CERTIFICATE OF HYDROSTATIC TEST

Date: February 27, 2024
Items Tested: Pump casing
Test No.: 57169
Test Result: X Pass Fail (check one)
Test Pressure: 1100 PSI Start 1100 PSI Finish
Test Medium: Distilled Water
Test Temperature: 67°F
Test Length: 30 Minutes
Gauge ID No.: N0010
Gauge Calibration Due Date: July 25, 2024
Person Conducting Test: CA

After completion of test, casing will be tagged with hydrostatic test tag, showing test pressure and serial number.

Certified By:  Date: 
For the Roth Pump Company

VDR Code: QC85
SDDC Code No.: SUP-TRP-029
Doc. No.: HTR-01
Rev. No.: 0



ISO 9001:2015 F53692

Cert #: 76645-136

ACUREN

Calibration Laboratory
21112 Scott Park Road
Davenport, Iowa 52807
(800) 391-8501

CERTIFICATE of CALIBRATION

Customer Name: ROTH PUMP

Job #: 76645

Address: 525 4th St W

PO #:

City/State/Zip: MILAN, IL 61264

Description: PRESSURE GAGE 0 TO 3000 PSI

Serial #: N0010

Testing Date: 07/25/2023

Recalibration Date: 07/25/2024

Traceability: Results are traceable to NIST#: 683/283809-13, 822/275872-11 These gages have been inspected to the requirements of ANSI/NCSL Z540-1, ISO 10012:2003 revisions or supplements.

<u>Standard</u>	<u>Deviation</u>	<u>Standard</u>	<u>Deviation</u>	<u>Vac Standard</u>	<u>Vac Deviation</u>
500	500				
1000	1000				
1500	1500				
2000	2000				
2500	2500				
3000	3000				

GAUGE REPAIRS:

Range/Speed:

Hysteresis:

Scale/Shape:

Zero Shift:

Size & Type: 2 1/2" WIKA

Range: 0-3000 PSI

Gauge accuracy: $\pm 2.5\%$ FULL SCALE

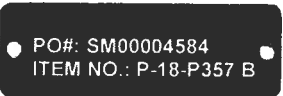
Comments: WITHIN REQUIRED ACCURACY. ASSEMBLE DEPT

Technician: Samuel Welch

Date: 7/28/2023

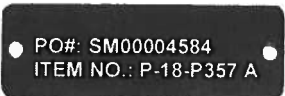
Process Number: P-070-B

Gage Cond.: GOOD



Air Products Inc.
P.O. No.: SM00004584
Project No.: EN207119
Project Name: World Energy Renew Naphtha /PRU US7L
Location: Paramount, CA

Equipment: Jet Stripper Vapor KO Drum Pump
Item Nos.: 18-P-357 B
Model No.: MDW5133SA
S/N: 65061 - 2



Air Products Inc.
P.O. No.: SM00004584
Project No.: EN207119
Project Name: World Energy Renew Naphtha /PRU US7L
Location: Paramount, CA

Equipment: Jet Stripper Vapor KO Drum Pump
Item Nos.: 18-P-357 A
Model No.: MDW5133SA
S/N: 65061 - 1

FLOWSERVE

Static Leak Test

Certified Acceptable by Seal Manufacturer

test pressure 27 ☐ psig ☐ barg ☐ MPag
media used ☒ air ☐ nitrogen ☐ water
duration 5 minute(s)
test date 11/11/23 inspector _____



Experience In Motion

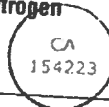
MLA37358225

FLOWSERVE

Static Leak Test

Certified Acceptable by Seal Manufacturer

test pressure 27 ☐ psig ☐ barg ☐ MPag
media used ☒ air ☐ nitrogen ☐ water
duration 5 minute(s)
test date 11/11/23 inspector _____

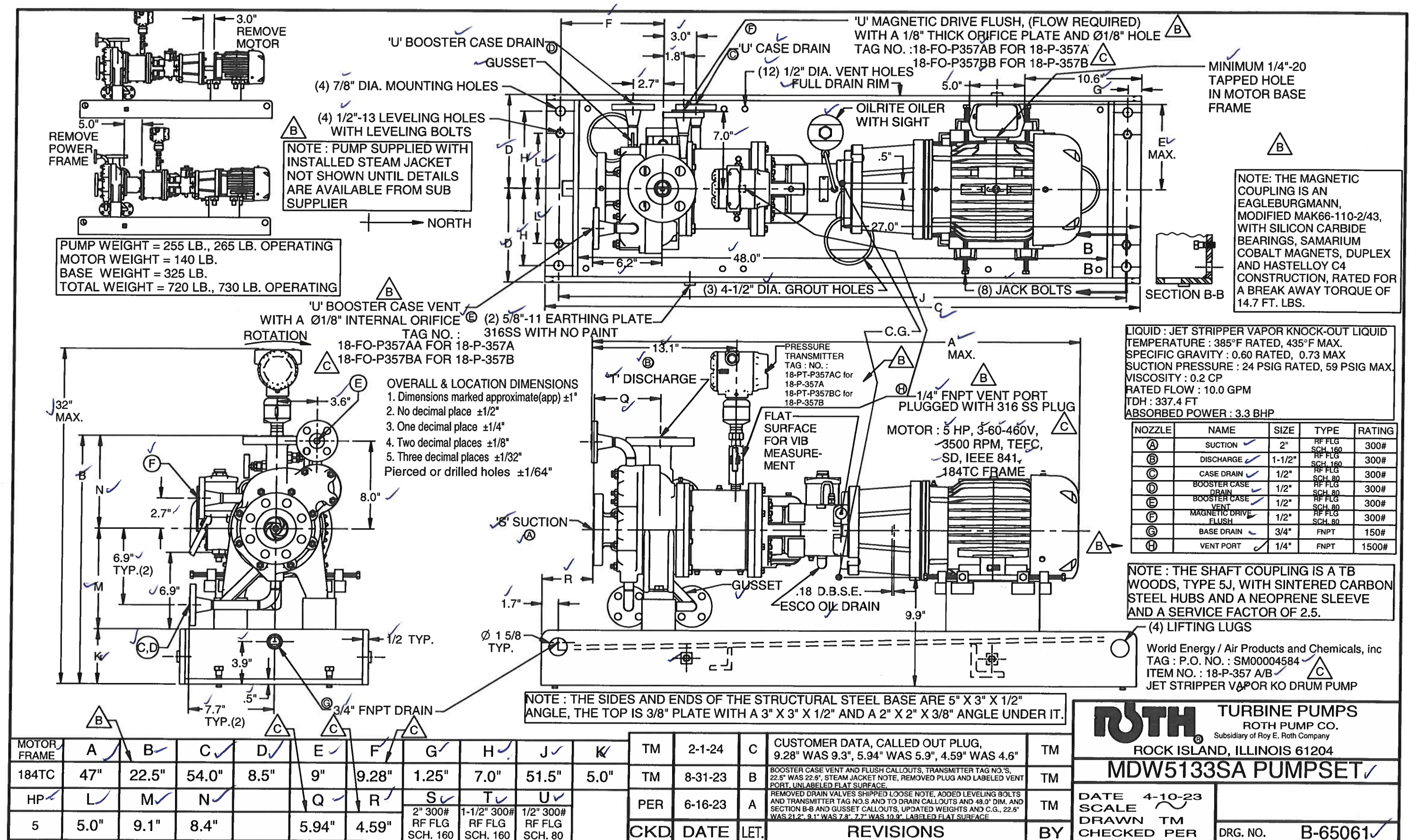


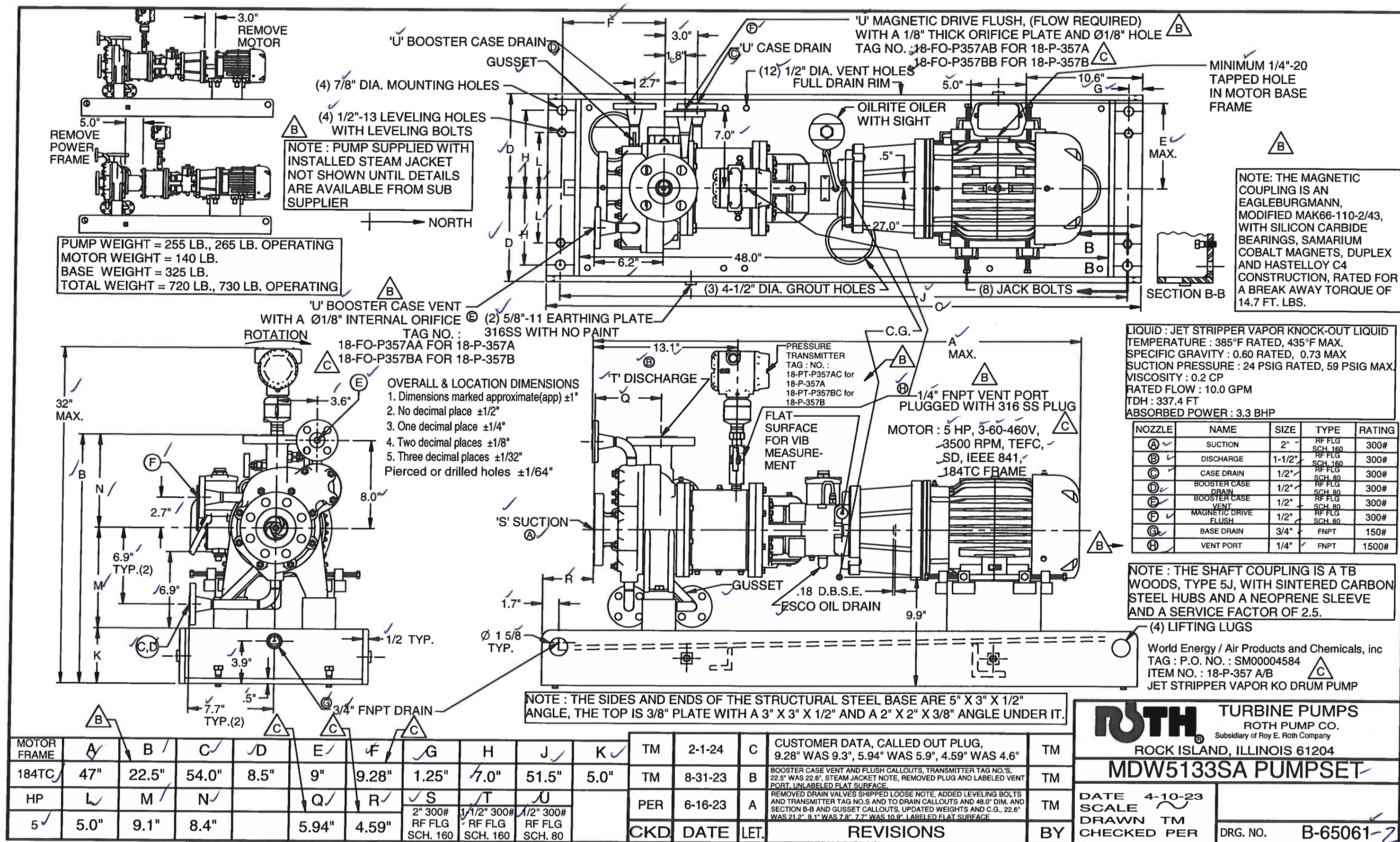
Experience In Motion

MLA37358225

Air Products Inc.
P.O. No.: SM00004584
Project No.: EN207119
Project Name: World Energy Renew Naphtha /PRU US7L
Location: Paramount, CA

Equipment: Jet Stripper Vapor KO Drum Pumps
Item Nos.: 18-P-357 A/B
Model No.: MDW5133SA
S/N: 65061 - 1 & 2





Ryan and Associates

WELDING PROCEDURE SPECIFICATION

WPS: 3 Rev. 3

For

GAS TUNGSTON ARC WELDING (GTAW)

OF

Stainless Steel Pipe, Valves, Fittings and Flanges

Using ER308L Without PWHT

Air Products Inc.
P.O. No.: SM00004584
Project No.: EN207119
Project Name: World Energy Renew Naphtha /PRU US7L
Location: Paramount, CA

Equipment: Jet Stripper Vapor KO Drum Pumps
Item Nos.: 18-P-357 A/B
Model No.: MDW5133SA
S/N: 65061 - 1 & 2

VDR Code: MB02 / MB17
SDDC Code: SUP-WLD-001
Doc No.: WPS No.: 3 Rev. 3
Document Name: Weld Procedures
Rev. No.: 0

QW-482 PROCEDURE SPECIFICATION (WPS)
(See QW-200.1, Section IX, ASME Boiler and Pressure Vessel Code)

Company Name	Ryan and Associates	By	Christopher P. Hill
Welding Procedure Specification No.	03	Date	2/7/2014
Revision No.	3	Date	5/19/2015
Welding Process(es)	GTAW	Type(s)	Manual
		Supporting PQR No.(s)	4, 4A, 4B

JOINTS (QW-402)

Details

Joint Design SQ, V, U, J, Fillet, Repair, Build Up
 Backing Optional GTAW
 Backing Material (Type) Weld Material / P8 Base Metal
 (Refer to both backing and retainers)

See Attached

☒ Metal ☐ Nonfusing Metal

☐ Nonmetallic ☐ Other

Sketches, Production Drawings, Weld Symbols or Written Description should show the general arrangement of the parts to be welded. Where applicable, the root spacing and the details of weld groove may be specified.

(At the option of the Mfr., sketches may be attached to illustrate joint design, weld layers and bead sequence, e.g. for notch toughness procedures, for multiple process procedures, etc.)

***BASE METALS (QW-403)**

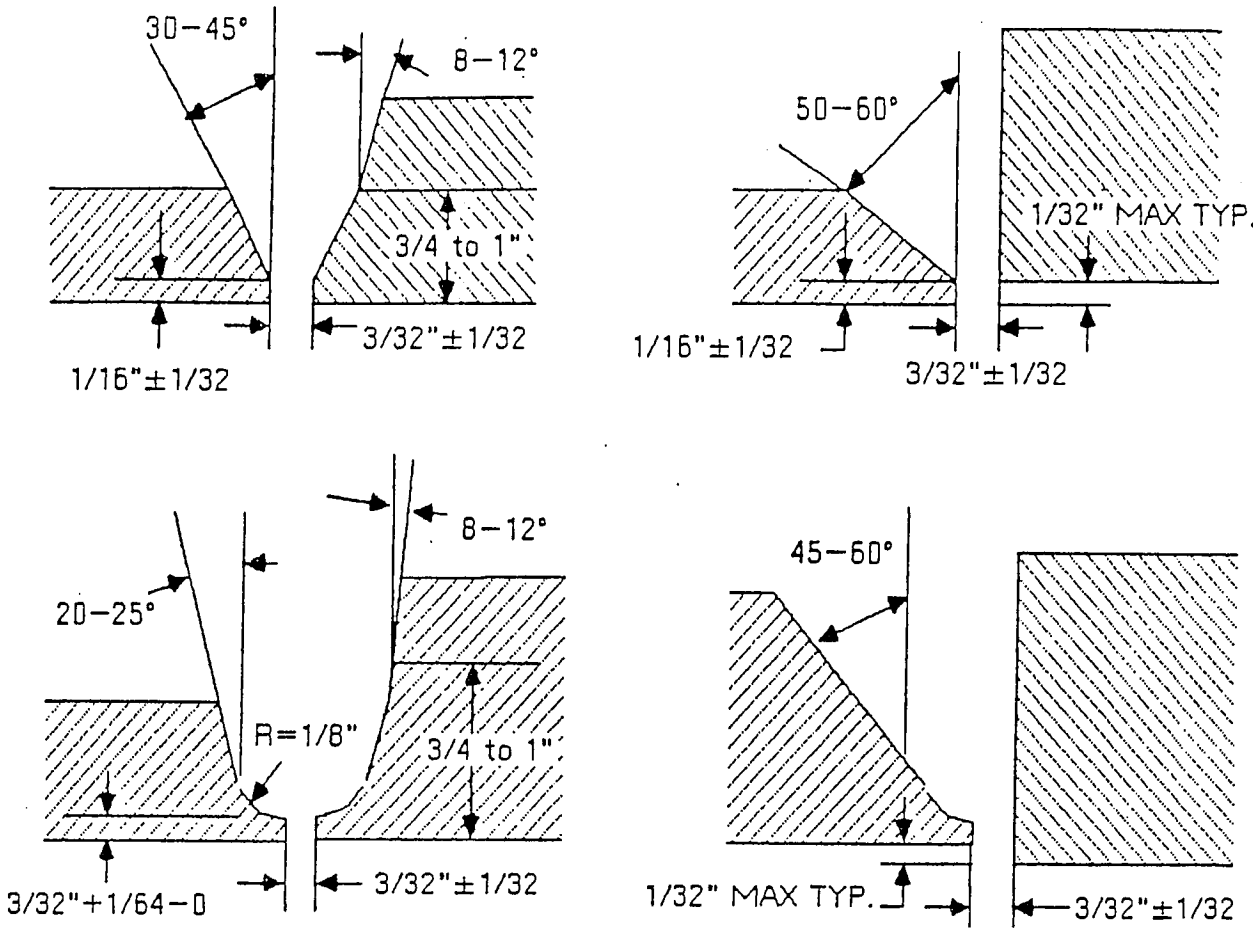
P-No.	<u>8</u>	Group No.	<u>1</u>	to P-No.	<u>8</u>	Group No.	<u>1</u>
OR							
Specification type and grade	<u>SA-312 TP 304L</u>						
to Specification type and grade	<u>SA-312 TP 304L</u>						
OR							
Chem. Analysis and Mech. Prop.	<u>N/A</u>						
to Chem. Analysis and Mech. Prop.	<u>N/A</u>						
Thickness Range:							
Base Metal:	Groove	<u>.110" to 4.00"</u>	Fillet	<u>Unlimited</u>			
Pipe Dia. Range:	Groove	<u>Unlimited</u>	Fillet	<u>Unlimited</u>			
Other	<u>No weld pass to exceed 1/2" Thickness</u>						

***FILLER METALS (QW-404)**

	Root	Balance
Spec. No. (SFA)	SFA 5.9	SFA 5.9
AWS No. (Class)	ER308L	ER308L
F-No.	6	6
A-No.	8	8
Size of Filler Metals	1/8", 3/32, 5/32	1/8", 3/32, 5/32
Weld Metal		
Thickness Range:		
Groove	.073"	3.927"
Fillet	All	All
Electrode-Flux (Class)	N/A	N/A
Flux Trade Name	N/A	N/A
Consumable Insert	N/A	N/A
Other	Filler Metal Production Form: Solid/Bare, no supplemental filler used	Filler Metal Production Form: Solid/Bare, no supplemental filler used

*Each base metal-filler metal combination should be recorded individually.

Typical Joints

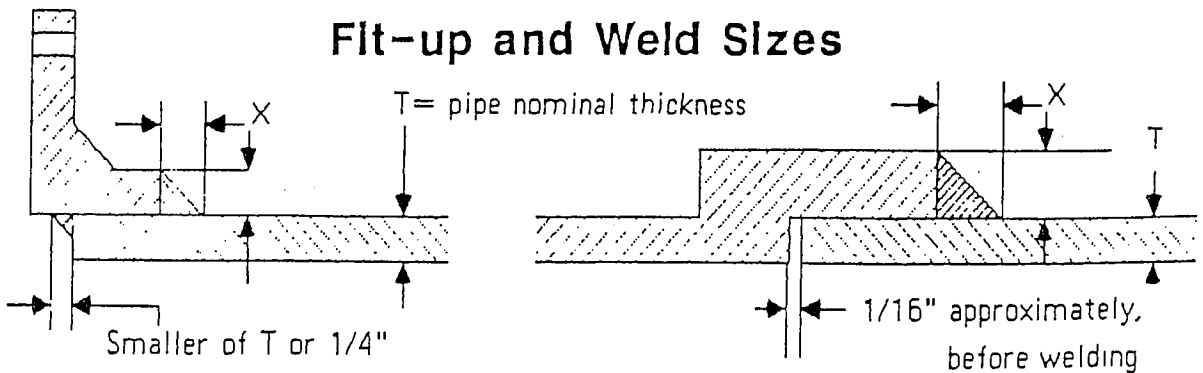


Alternative Root Gap Spacings

When Backing Rings Are Used, the Root Gap Spacing Shall be $3/16"$ Nominal.

When Consumable Inserts Are Used, the Root Gap Spacing Shall be the Width of the Insert Plus No More than $1/32"$. Refer to SFA5.30 for Standard Dimensions for Consumable Inserts.

Slip-on Flange and Socket Fillet Weld Fit-up and Weld Sizes



$X_{min} = \begin{cases} = \text{the lesser of } 1.4T \text{ or the hub thickness when using B31.3.} \\ = \text{the lesser of } 1.09T \text{ or the hub thickness when using B31.1.} \\ = \text{the size shown on engineering drawings (This size supersedes above sizes.)} \end{cases}$

POSITIONS (QW-405) Position(s) of Groove <u> All </u> Welding Progression: Up <u> X </u> Down <u> </u> Position(s) of Fillet <u> All </u>	POSTWELD HEAT TREATMENT (QW-407) Temperature Range <u> None </u> Time Range <u> N/A </u>																
PREHEAT (QW-406) Preheat Temp. Min. <u> 50 Degrees F </u> Interpass Temp. Max. <u> 200 Degrees F </u> Preheat Maintenance <u> None Required </u> (Continuous or special heating where applicable should be recorded)	GAS (QW-408) Percent Composition <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>Gas(es)</th> <th>(Mixture)</th> <th>Flow Rate</th> </tr> </thead> <tbody> <tr> <td>Shielding</td> <td>Argon</td> <td>100%</td> <td>10-50 CFM</td> </tr> <tr> <td>Trailing</td> <td>N/A</td> <td>N/A</td> <td>N/A</td> </tr> <tr> <td>Backing</td> <td>Argon</td> <td>100%</td> <td>05-40 CFM</td> </tr> </tbody> </table>		Gas(es)	(Mixture)	Flow Rate	Shielding	Argon	100%	10-50 CFM	Trailing	N/A	N/A	N/A	Backing	Argon	100%	05-40 CFM
	Gas(es)	(Mixture)	Flow Rate														
Shielding	Argon	100%	10-50 CFM														
Trailing	N/A	N/A	N/A														
Backing	Argon	100%	05-40 CFM														

ELECTRICAL CHARACTERISTICS (QW-409) Current AC or DC <u> DC </u> Polarity <u> Straight </u> Amps (Range) <u> See Below </u> Volts (Range) <u> See Below </u> (Amps and volts range should be recorded for each electrode size, position, and thickness, etc. This information may be listed in a tabular form similar to that shown below.)	
Tungsten Electrode Size and Type	<u> 1/8" 2% Thoriated </u> (Pure Tungsten, 2% Thoriated, etc.)
Mode of Metal Transfer for GMAW	<u> N/A </u> (Spray arc, short circuiting arc, etc.)
Electrode Wire feed speed range	<u> N/A </u>

TECHNIQUE (QW-410) String or Weave Bead <u> Either </u> Orifice or Gas Cup Size <u> As Desired </u> Initial and Interpass Cleaning (Brushing, Grinding, etc.) <u> Brushing, Grinding, Filing, Etc. </u>	
Method of Back Gouging	<u> Arc Gouging, Grinding, Etc. </u>
Oscillation	<u> N/A </u>
Contact Tube to Work Distance	<u> N/A </u>
Multiple or Single Pass (per side)	<u> Either No weld pass greater than 1/2" Thickness. </u>
Multiple or Single Electrodes	<u> Single </u>
Travel Speed (Range)	<u> 2 to 8 ipm </u>
Peening	<u> Not permitted </u>
Other	<u> When welding different types of 300 Series Stainless to each other, select a filler material designated for both types. </u> Max. Heat Input 31.7333 kJ/in

Weld Layer(s)	Process	Filler Metal		Current		Volt Range	Travel Speed * Range	Other (e.g., Remarks, Comments, Hot Wire Addition, Technique, Torch Angle, Etc.)
		Class	Dia.	Type Polar.	Amp. Range			
1	GTAW	ER308L	3/32", 1/8", 1/16", 5/32"	Straight	60 to 100	11 - 18	2 to 4.5 ipm	*These values are recommended only, Not mandatory
Balance	GTAW	ER308L	3/32", 1/8", 1/16", 5/32"	Straight	60 to 180	11 - 18	2 to 8 ipm	304 to 304L use ER308L 304 to 316 use ER316 304, 304L, 316 to 316L use ER316L 304L to 316 use 316L

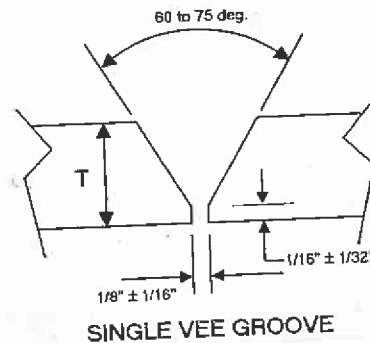
NOTE: Rev. 2 – Added PQR 4A increasing Base Metal Range to 1.00", Added Max. Heat Input Value.

NOTE: Rev. 3 – Added PQR 4B increasing Base Metal Range to 4.00"

QW-483 PROCEDURE QUALIFICATION RECORD (PQR)
(See QW-200.2, Section IX, ASME Boiler and Pressure Vessel Code)
Record Actual Conditions Used to Weld Test Coupon.

Company Name Ryan & Associates, Inc.
Procedure Qualification Record No. 4 Date 1/28/2014
WPS No. 3
Welding Process(es) GTAW
Types (Manual, Automatic, Semi-Auto.) Manual

JOINTS (QW-402)



Groove Design of Test Coupon

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

BASE METALS (QW-403) Material Spec. <u>SA-312</u> Type or Grade <u>TP304/304L</u> P-No. <u>8</u> to P-No. <u>8</u> Thickness of Test Coupon <u>.218"</u> Diameter of Test Coupon <u>2.375"</u> Other <u>N/A</u>		POSTWELD HEAT TREATMENT (QW-407) Temperature <u>None</u> Time <u>N/A</u> Other <u>N/A</u>																	
FILLER METALS (QW-404) SFA Specification <u>SFA 5.9</u> AWS Classification <u>ER308L</u> Filler Metal F-No. <u>6</u> Weld Metal Analysis A-No. <u>8</u> Size of Filler Metal <u>1/8"</u> Other <u>N/A</u> Weld Metal Thickness <u>.218"</u>		GAS (QW-408) <table border="1"> <thead> <tr> <th></th><th>Gas(es)</th><th>(Mixture)</th><th>Flow Rate</th></tr> </thead> <tbody> <tr> <td>Shielding</td><td>Argon</td><td>100%</td><td>50</td></tr> <tr> <td>Trailing</td><td>N/A</td><td>N/A</td><td>N/A</td></tr> <tr> <td>Backing</td><td>Argon</td><td>100%</td><td>30</td></tr> </tbody> </table>			Gas(es)	(Mixture)	Flow Rate	Shielding	Argon	100%	50	Trailing	N/A	N/A	N/A	Backing	Argon	100%	30
	Gas(es)	(Mixture)	Flow Rate																
Shielding	Argon	100%	50																
Trailing	N/A	N/A	N/A																
Backing	Argon	100%	30																
POSITION (QW-405) Position of Groove <u>1G Rotated</u> Weld Progression (Uphill/Downhill) <u>Uphill</u> Other <u>N/A</u>		ELECTRICAL CHARACTERISTICS (QW-409) Current <u>DC</u> Polarity <u>Straight</u> Amps. <u>75</u> Volts <u>N/A</u> Tungsten Electrode Size <u>1/8"</u> Other <u>N/A</u>																	
PREHEAT (QW-406) Preheat Temp. <u>50 Deg. F</u> Interpass Temp. <u>350 Deg. F</u> Other <u>N/A</u>		TECHNIQUE (QW-410) Travel Speed <u>2" ipm</u> String or Weave Bead <u>Either</u> Oscillation <u>N/A</u> Multipass or Single Pass (per side) <u>Multiple</u> Single or Multiple Electrodes <u>Single</u> Other <u>N/A</u>																	

Tensile Test (QW-150)

Specimen No.	Width	Thickness	Area	Ultimate Total Load lb.	Ultimate Unit Stress psi	Type of Failure & Location
Tensile #1	.746"	.214	.1596	13,500	84,586	Broke in base
Tensile #2	.748"	.210	.1570	13,700	87,261	Broke in base

Minimum Tensile = 70,000 PSI

Guided-Bend Tests (QW-160)

Type and Figure No.	Results
Face bend #1 QW-462.3 (a)	Acceptable
Root bend #2 QW-462.3 (a)	Acceptable
Face bend #3 QW-462.3 (a)	Acceptable
Root bend #4 QW-462.3 (a)	Acceptable

Toughness Tests (QW-170)

Specimen No.	Notch Location	Notch Type	Test Temp.	Lateral Exp.			Drop Weight Break (Y/N)
				Ft. lb.	% Shear	Mils	

Fillet-Weld Test (QW-180)

Result -- Satisfactory; Yes ☐ No ☐ Penetration into Parent Metal: Yes ☐ No ☐
 Macro -- Results _____

Other Tests

Type of Test *See attached QC Metallurgical report on Delta Ferrite test results

Deposit Analysis _____

Other _____

Welder's Name Travis Schmidt Clock No. N/A Stamp No. TS-1
 Tests conducted by *Jason E. Hill* JEC Level II ASNT Laboratory Test No. N-5823
Quad City Testing Laboratory Date: 02-07-2014

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

Manufacturer Ryan and Associates, Inc.Date 02-07-2014By Christopher P. Hill

Q.C. METALLURGICAL LABORATORY, INC.

Mechanical Testing • Metallographers • Chemical Analysis • Consultants

17048 215th Street, Davenport, Iowa 52806

(563) 386-7827 or (563) 386-8739 • FAX (563) 386-6780

TEST REPORT

February 6, 2014

Customer: Quad City Testing Laboratory
21112 Scott Park Road, Davenport IA 52806

Date Sample Arrived: 01/29/14

Report Number: 38414

Sample I.D.: PQR #4 Pipe SS Weld

Sample Condition: As received

Test Method(s): Delta Ferrite Test

Method Deviations: None

To: Fran Adams

Date Tested: 02/06/14

A2LA Accreditation: 1238-01, Expires 07/31/15

Test Location: QCML

Sampling Procedure: None

A2LA Accredited Test Procedure(s): None

P.O. N-5823

Test Results:

DELTA FERRITE TEST

Test was performed on the weld using a Fischer Feritscope FMP 30 Serial 041-27201A. Standard blocks %Fe-WRC 1,5/30, Serial No. N3-0124 were used to verify the calibration.

Sample	% Delta Ferrite
PQR #4 Pipe SS Weld	10.1
PQR #4 Pipe SS Weld	11.2
PQR #4 Pipe SS Weld	10.6
PQR #4 Pipe SS Weld	9.7
PQR #4 Pipe SS Weld	10.1
Average	10.3

This report shall not be reproduced except in full and the results only apply to the item(s) tested.

Bob Olson
Bob Olson/Metallurgical Engineer

Mark A. Weidner
Q.C. Manager

Mark A. Weidner
Mark A. Weidner/Analyst

Plant Location: 982 Griffin Pond Road, Clarks Summit, PA 18411
Sold To: 498811 Ship To:
PRAXAIR-CENTRAL-Des Moines PRAXAIR-Rock Island
DES MOINES IA ROCK ISLAND IL
Customer Order No: 4216855 Certification Date: 20130114
Sandvik Order No: 230033/7
Work Order/Lot: 857357

AWS A5.9-12, ASME SFA 5.9, 2010 EDITION, 2011 ADDENDA, EN 10204.3.1.B

Stainless Steel Welding Wire
Type ER308/ER308L

Size: .125" X 36"

Heat: 532297

Analysis %

Heat	C	Si	Mn	P	S	Cr	Ni
	.016 ✓	.40 ✓	1.92 ✓	.030 ✓	.014 ✓	19.67 ✓	9.05 ✓
	Fe	Mo	Co	Cu	Al	Sn	Ta
		.36 ✓	.086	.49 ✓	.003		.005
	N	*FD	*FS	*FW			
	.074	11	13	12			

*FD = Delta Ferrite (FN) from the DeLong Diagram

*FS = Delta Ferrite (%) from the Schaeffler Diagram

*FW = Delta Ferrite (FN) from ASME Fig. NB 2433.1-1 (WRC 1992 Diagram)

Country Of Origin: United States

The following mechanical test results are typical values representative of this grade of material.

Tensile (psi): 85000

Elongation % : 45

The Heat analysis is an actual Chemistry Analysis.

CWB (Canadian Welding Bureau) approval has been attained by Sandvik for the following steel grades: ER308L, ER308LSi, ER309L, ER309LSi, ER316L, ER316LSi, ER317L, ER347. The material has not come in contact with mercury or mercury containing compounds and as such is certified mercury free. Material has been manufactured in accordance with Sandvik Sandvik Materials Technology Quality Manual Revision 13 dated November 20, 2012

Quality system approved to ISO 9001:2008.

Certificate produced in accordance with EN 10204 3.1 (formerly EN 10204 3.1.B)

This is to certify that the contents of this certificate are correct and accurate as contained in Sandvik's records, and that all above test results and operations performed are in compliance with the requirements of the purchase order.

*Reviewed
gnt 1/27/2014*

MATERIAL CERTIFICATE

Cert#: 201301529

Page 2

Electronically Generated Certificate-Valid without signature
J.Treadway, Quality Specialist
15 (TIG BEMA SPEC R30) (15) (US36385)

PRAKASH STEELAGE LTD.

An ISO 9001:2008, ISO 14001:2004, OHSAS 18001:2007, PED, API Spec 5LC Certified and AD 2000-Merkblatt WO, EIL, Lloyds, IBR approved and Government Recognised Export House



Manufacturers & Exporters of Stainless Steel Welded, Seamless Pipes, Tubes & U-Tubes"

Factory : Plot No. 131/1, Umbargaon - Sanjan Road, Umbargaon - 396 170. Dist. Valsad, Gujarat.

MATERIAL TEST CERTIFICATE (MILL)

EN-10204 3.1

CUSTOMER : M/s MERIT BRASS CO-SPARKS. TEST CERTIFICATE No.: PSL/UBR/1239/2013
P. O. No. : P289926 DTD.26.07.2013 DATE : 31.10.2013
SPECIFICATION & GRADE : ASTM A 312-09/ ASME SA 312-09 TP 304/304L END FINISH : P.E.
PRODUCT : WELDED STAINLESS STEEL PIPES

SOL. NO. & SPECIFICATION		DESCRIPTION									
SL. No.	SIZE (O.D. X WT X LENGTH)	HEAT NO.	Qty. PCS	LENGTH Mtrs (FT)	HTP (Psi) (HOLDING TIME: 06 SEC)	FT	FRT/ FLT	RB	FB	RFT/ RBT	VDI
1	6 NB X SCH 40S X 20 FEET LONG	21300229	27	164.592(540)	1300	SATIS	-	-	-	-	SATIS
2	6 NB X SCH 40S X 20 FEET LONG	21200442	24	146.304(480)	1200	SATIS	-	-	-	-	SATIS
		21301510	1	6.096 (20)	1200	SATIS	-	-	-	-	SATIS

MECHANICAL PROPERTIES					CHEMICAL COMPOSITION (%)									
SL. No.	HEAT No.	Y.S. MPa	U.T.S. MPa	EL (%) GL= 50mm	HARDNESS HRB	LA / PA	C	Mn	P	S	Si	Cr	Ni	Pb
REQ. (MAX)		-	-	-	22 HRC (-99 HRB)	-	0.035	2.00	0.045	0.030	1.00	20.00	13.00	0.10
REQ. (MIN)		205	515	35	-	-	-	-	-	-	-	18.00	8.00	-
1	21300229	-	-	-	-	LA	0.020	1.02	0.032	0.003	0.42	18.30	8.05	-
		309.68	617.12	55.8	77 - 78	PA	0.019	1.05	0.035	0.002	0.44	18.36	8.09	0.001
2	21200442	-	-	-	-	LA	0.020	1.85	0.038	0.002	0.24	18.10	8.05	-
		294.54	589.08	60.0	73 - 75	PA	0.023	1.82	0.037	0.005	0.25	18.21	8.07	0.003
2	21301510	-	-	-	-	LA	0.019	1.75	0.039	0.005	0.23	18.20	8.09	-
		315.62	597.14	62.4	71 - 74	PA	0.020	1.73	0.035	0.002	0.24	18.38	8.12	0.001

REMARKS:

- SOLUTION ANNEALING AT MINIMUM TEMP. 1040° C WITH WATER QUENCHING.
- PICKLING & PASSIVATION CARRIED OUT AS PER ASTM A 380 - FOUND SATISFACTORY.
- 100% HYDROSTATIC TEST CARRIED OUT BY M/S PSL - FOUND SATISFACTORY.
- 100% VISUAL & DIMENSIONAL INSPECTION CARRIED OUT BY M/S PSL - FOUND SATISFACTORY.
- PERCENT DYE PENETRANT TEST CARRIED OUT AS PER ASTM E 428 BY PSL - FOUND SATISFACTORY.
- MICROSTRUCTURE CONSISTS OF AUSTENITE, NO CARBIDE PRECIPITATION ON GRAIN BOUNDRIES.ASTM GRAIN SIZE NO 5-6.
- MATERIAL CONFORMS TO NACE MR 0175.
- IND 9723/EC CERTIFICATE NO. : 01 202 IND/Q-11 0010 VALID UNTILL JUNE 09, 2014.
- MATERIAL DESCRIBED ABOVE IS FREE FROM MERCURY & RADIOACTIVE CONTAMINATION.

MARKING / STENCILLING: PSL WLD PIPE (B36.10-B36.19) - 6 NB X SCH - X 20 FEET LONG ASME SA 312/ ASTM A 312 TP 304/ 304L
HTG NO. NACE MR 0175 MADE IN INDIA

WE HEREBY CERTIFY THAT THE MATERIAL DESCRIBED ABOVE CONFORMS TO THE ABOVE SPECIFICATION & P.O. REQUIREMENTS.

LEGENDS: HTP - HYDROSTATIC TEST PRESSURE, FT - FLATTENING, FRT - FLARING TEST, FLT - FLANGE TEST, RB - ROOT BEND, FB - FACE BEND, RFT - REVERSE FLATTENING, VDI - VISUAL & DIMENSIONAL INSP., LA - LADLE ANALYSIS, RBT - REVERSE BEND TEST, PA - PRODUCT ANALYSIS, RUI - RANDOM LENGTH, PSL - PRAKASH STEELAGE LTD., SATIS - SATISFACTORY.

For PRAKASH STEELAGE LTD.



*Reviewed
gnt 1/30/2014*

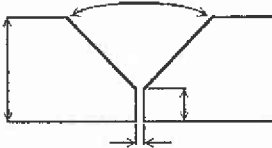
Ryan & Associates, Inc.
ASME - Procedure Qualification Record (PQR) - QW-483
WeldOffice WPS

PQR record number	4A	Revision 0	WPS record number	3	Revision 1
Date	5/1/2015		Company name	Ryan & Associates, Inc.	
			Welding standard	ASME Section IX and B31.3	

BASE METALS (QW-403)

	Product form	Specification (type or grade)	P no.	Grp.no.	Size	Sch.	Thick.	(in.)	Dia.	(in.)
Weilded to:	Plate	SA-240 (Type 304L)	8	1	-	-	.500	-	-	-
	Plate	SA-240 (Type 304L)	8	1	-	-	.500	-	-	-
and tested:	Without PWHT									
Notes										

JOINTS (QW-402)

Joint design:	Single-V-groove		
Backing:	None		
Retainers	None		
Groove angle (deg.)	70		
Root opening (in.)	1/8		
Root face (in.)	1/16		

WELDING PROCESSES

Welding process	GTAW
Type	

FILLER METALS (QW-404)

SFA specification	5.9
AWS classification	ER308L
Filler metal F-number	6
Weld metal A-number	8
Filler metal nominal composition	
Filler metal trade name	
Filler metal size (in.)	3/32, 1/8
Deposited thickness (in.)	.500
Maximum pass thickness (in.)	.500
Weld deposit chemistry	

POSITION (QW-405)

Position	1G
Weld progression	

PREHEAT (QW-406)

Preheat temperature (°F)	50
Maximum interpass temperature (°F)	200

GAS (QW-408)

Shielding gas:	Type	Argon (A5.32 SG-A)
	Flow rate (cfh)	30 - 35
Trailing gas:	Type	None
	Flow rate (cfh)	-
Backing gas:	Type	Argon (A5.32 SG-A)
	Flow rate (cfh)	50

ELECTRICAL (QW-409)

Filler metal size (in.)	3/32, 1/8
Amperes	100 - 140
Volts	11 - 17
Travel speed (in./min)	4.5
Maximum heat input (kJ/in.)	31.7333
Tungsten size (in.)	3/32, 1/8
Tungsten type	SFA 5.12 EWTh-2
Current/polarity	DCEN
DC pulsing current	Not used

TECHNIQUE (QW-410)

String or weave	Stringer and Weave
Orifice/gas cup size	As Desired
Multi/Single pass per side	Single and Multiple passes
Peening	Not used
Initial/interpass cleaning	Brushing and Grinding
Back gouging method	None

Ryan & Associates, Inc.
ASME - Procedure Qualification Record (PQR) - Test results (as welded)
WeldOffice WPS

PQR record number	4A	Revision	0	WPS record number	3	Revision	1
Date	5/1/2015			Company name	Ryan & Associates, Inc.		
				Welding standard	ASME Section IX and B31.3		

TENSILE TESTS (QW-150)

Reduced section

Specimen number	Width (in.)	Thickness (in.)	Area (in ²)	Ultimate total load (lb)	Ultimate unit stress (psi)	Type of failure and location
4A-2	0.755	0.505	0.3813	34580	90700	Ductile-Base Metal
4A-5	0.7580	0.508	0.3851	34610	89900	Ductile-Base Metal

Comments 2 reduced section tension tests per QW-151.1 and QW-462.1(a)

GUIDED BEND TESTS (QW-160)

Type of test	Acceptance criteria	Result	Comments
4 transverse side bends per QW-151.1 and QW-462.2	QW-163	Acceptable	see - ASME IX - QW-451.1

Comments

OTHER TESTS

Type of test	Acceptance criteria	Result	Comments
Delta Ferrite	ASTM A342/342M-14	Acceptable	Base, HAZ, Weld

Comments

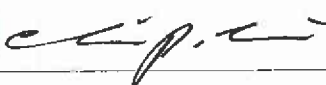
CERTIFICATION

Welder's name	ID Number	Stamp number	Mechanical testing by	St. Louis Testing Laboratories
Jeremy Edfors	1933	JE-1	Laboratory test number	15P-2150
			Test file number	4A
			Tests conducted by	Karl Schmitz

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

Signature 1

Signature 2

Name	Signature	Name	Signature
Christopher P. Hill			
Date		Date	
5/1/2015			

Signature 3

Signature 4

Name	Signature	Name	Signature
Date		Date	



2810 Clark Avenue • St. Louis, MO 63103-2574 • (314) 531-8080 • FAX (314) 531-8085
Chemical, Metallurgical, Mechanical, Nondestructive, Environmental Testing, Analyses and Field Service.

RYAN & ASSOCIATES, INC.
10955 160th Street
Davenport, IA 52804

April 29, 2015
Lab No. 15P-2150
Page 1 of 2

Attention: Christopher Hill

WELD PROCEDURE QUALIFICATION

PQR: 4A-GTAW(ER308L)

SPECIFICATION: ASME Section IX-2013

REDUCED SECTION TENSILE

SAMPLE ID	WIDTH INCHES	THICKNESS INCHES	AREA SQ. INCHES	ACTUAL LBS.	TENSILE STRENGTH PSI	FRACTURE
4A-2	0.7550	0.5050	0.3813	34580	90700	Base Material/Ductile
4A-5	0.7580	0.5080	0.3851	34610	89900	Base Material/Ductile

GUIDED BEND TEST

SAMPLE ID	BEND	RESULTS
4A-1	Side	Acceptable – No Discontinuities
4A-1	Side	Acceptable – No Discontinuities
4A-1	Side	Acceptable – No Discontinuities
4A-1	Side	Acceptable – No Discontinuities

KS/bnd

Karl Schmitz, Director
Materials Testing
CWI No. 92120161

REVIEWED

By Christopher P. Hill at 8:32 am, May 01, 2015



Certificate No. 0397-01
Certificate No. 0397-02

AN OFFICIAL COPY OF TEST REPORT WILL BE PROVIDED BY THIS LABORATORY ON REQUEST.
NOT OFFICIAL WITHOUT THE RAISED SEAL OF ST. LOUIS TESTING LABORATORIES, INC.
SEE REVERSE FOR CONDITIONS.





2810 Clark Avenue • St. Louis, MO 63103-2574 • (314) 531-8080 • FAX (314) 531-8085
Chemical, Metallurgical, Mechanical, Nondestructive, Environmental Testing, Analyses and Field Service.

RYAN & ASSOCIATES, INC.
10955 160th Street
Davenport, IA 52804

April 29, 2015
Lab No. 15P-2150
Page 2 of 2

Attention: Christopher Hill

REPORT OF ANALYSIS

PQR: 4A-GTAW(ER308L)
PROCESS: GTAW **FILLER:** ER308L
MATERIAL: SA240- Type 304L
SUBJECT: Percent Ferrite Testing
METHOD: Severn Gauge

PROCEDURE AND RESULTS:

The percent ferrite present in the base metal, heat affected zone, and weld deposit was tested utilizing a Severn ferrite indicator gauge, per ASTM A342/342M-14. See the following table for results:

GTAW	
LOCATION	% FERRITE
Base	0.5% - 1.5% Ferrite
HAZ	1.5% - 2.5% Ferrite
WELD	7.5% - 10.0% Ferrite

KS/sen

Karl Schmitz, Director
Materials Testing
CWI No. 92120161



Certificate No. 0397-01
Certificate No. 0397-02

REVIEWED

By Christopher P. Hill at 8:32 am, May 01, 2015

AN OFFICIAL COPY OF TEST REPORT WILL BE PROVIDED BY THIS LABORATORY ON REQUEST.
NOT OFFICIAL WITHOUT THE RAISED SEAL OF ST. LOUIS TESTING LABORATORIES, INC.
SEE REVERSE FOR CONDITIONS.





Liebovich Steel & Aluminum Co

2116 Preston Street
Rockford, IL 61102-1975

815/987-3200

Fax: 815/965-3750

800/892-2981

Material Certification Cover Sheet

For: RYAN & ASSOCIATES, INC.
Email: shellymiller@ryangrp.com

4/14/15

2:15:50

Product Information:

Item Description: PLT STAIN T-304/304L A240
1/2 X 48" X 96"

Purchase Order: 30001669

Customer Part #:

Heat Number: T4C2 - 1 Piece

Coil Number:

Tag Number:

Production Order#: 2995280/1

This document serves as reference between the above order and attached information as supplied by the material vendor and/or manufacturer.

Authorized By:

Eric D. Hargreaves

Quality Manager



NORTH AMERICAN
STAINLESS

METALLURGICAL TEST REPORT

6870 Highway 42 East
Ghent, KY 41045-9615
(502) 347-6000

Certificate: 34672 02 Mail To: LIEBOVICH STEEL & ALUMINUM CO. Ship To: LIEBOVICH STEEL & ALUMINUM CO. Date: 2/23/2015 Page: 2
Customer: 2985 003 2115 PRESTON STREET 2115 PRESTON STREET
ROCKFORD, IL 61102 ROCKFORD, IL 61102
Steel: 304/304L
Finish: HRAP
Your Order: 3201688 / 10 HAS Order: AN 0652302 01 Corrosion: ASTM A262/10 A

PRODUCT DESCRIPTION:

STAINLESS STEEL PLATE, HRAP; UNS 30400/30403
ASTM A240/13c, A480/13, A666/10; ASME SA240/13, SA480/13a, SA666/13
CHEM ONLY ON FOLLOWING ASTM: A276/13, A479/13a, A484/13a, A312/13
CHEM ONLY ON FOLLOWING ASME: SA312/13, SA479/13
AMS 5511H/5513J MARK; MIL-5059D AMD3(X CRN MEAS); MIL-4043B
NACE MR0175/ISO 15156-3:2003 A, MR0103/07; QQS766D-A X MAG PERM
MIN. SOLUTION ANNEAL TEMP 1900F, WATER QUENCHED

REMARKS:

Mat'l is Free of Mercury Contamination. No weld repairs.
EN 10204:2004 3.1; RoHS 1 & 2 Compliant
Material is Free of Radioactive Contamination
Steel Making Process: EAF, AOD, & Cont. Casting
Product Mfg. by a Quality Mgt. Sys. in Conf. w/ISO 9001
*Melted & Manufactured in the USA; Mat'l is DFARS Compliant

Skid #	Prod #	Thickness	Width	Weight	-----Length-----	Mark	Pieces
PE8997	* 05T4C2	.5000	48.0000	4,020	PLATE	96.000	6

Lab Accreditation Bureau, ISO/IEC 17025, Certificate# L2323

CHEMICAL ANALYSIS CM(Country of Melt) ES(Spain) US(United States) ZA(South Africa) JP(Japan) Chemical analysis per ASTM A751/08

HEAT	CM	C %	CR %	CU %	MN %	MO %	N %	NI %	P %	S %
T4C2	US	.0138	18.2580	.4435	1.6815	.4000	.0894	8.0160	.0340	.0018
SI %										
.2985										

MECHANICAL PROPERTIES

Skid #	Prod #	1 d o 1 c r	UTS KSI	20C .2% YS KSI	20C ELONG %-2"	% Hard RB	R of A %
PE8997	05T4C2	F T	92.04	42.32	56.08	81.00	70.99

NAS hereby certifies that the analysis on this certification is correct. Based upon the results and the accuracy of the test methods used, the material meets the specifications stated. These results relate only to the items tested and this report cannot be reproduced, except in its entirety, without the written approval of NAS.

Technical
Dept. Mgr.

Ashjeet Bhavsar
Ashjeet Bhavsar

2/23/2015

REVIEWED

By Christopher P. Hill at 10:11 am, Apr 30, 2015

CUSTOMER'S PURCHASE ORDER NUMBER				SOLD TO					
5076196				PRAXAIR DISTRIBUTION, INC. P.O. BOX 9224 DES MOINES, IA 50306					
OUR ORDER NUMBER		INVOICE NUMBER							
16761		133483							
CERTIFICATE DATE		SHIP DATE							
08/11/2014		08/11/2014							
DESCRIPTION OF MATERIAL				HEAT NUMBER			LOT NUMBER		
1/8" X 36" ER308L Tig Wire				46784			204918		
ACTUAL CHEMICAL ANALYSIS - PERCENTAGE OF EACH									
C	Cr	Ni	Mo	Mn	Si	P	S	N	Cu
0.0170	19.5600	9.6800	0.0900	1.9500	0.3800	0.0160	0.0090	0.0560	0.0900
Nb	Ti	Co	W	Ta	Al	V	Other	Other1	Other2
0.0100	0.0100	0.1300			0.0040	0.0600	B 0.0009		
FERRITE	Sch	DeLong	WRC92	X FACTOR CALCULATED TO BE:					
	9.1%	8.3 FN	9.8 FN	Ni + Mn =					
TYPICAL MECHANICAL PROPERTIES									
TENSILE STRENGTH			YIELD STRENGTH			ELONGATION IN 2"			
83,500 PSI			56,000 PSI			40%			
TYPICAL CHARPY IMPACT									
SPECIFICATIONS			CLASSIFICATION			PRODUCT CODE			
AWS/SFA 5.9			ER308L			125308LT			
PRODUCT PACKAGE						QUANTITY			
10 Lb. Tube / 60 Lb. Carton						410.0 Lbs.			
REMARKS									
CONFORMS TO ASME SEC. II, PART C, 2013 EDITION, EN 10204 3.1, & ISO 10474 3.1B									

This is to certify that all required samplings, inspections and tests have been performed in accordance with the specification requirements. The test report represents the actual attributes of the material furnished and the values shown are correct and true. The material described by this certificate is in full compliance with all order and inspection requirements. We hereby certify that the above data are in accordance with the specification requirements.

REVIEWED

By Christopher P. Hill at 8:19 am, May 01, 2015



Gary H. Shrum, Q.A. Manager

Plant Location: 982 Griffin Pond Road, Clarks Summit, PA 18411
Sold To: 498811 Ship To:
PRAXAIR-CENTRAL-Des Moines RYAN & ASSOC
DES MOINES IA DAVENPORT IA
Customer Order No: 5165938 Certification Date: 20141003
Sandvik Order No: 262132/1

Work Order/Lot: **250652**-----
AWS A5.9-12, ASME SFA 5.9, 2013 EDITION, EN 10204 Type 3.1

Stainless Steel Welding Wire

Type **ER308/ER308L**Size: **.093"** X 36"Heat: **538059**

Analysis %

Heat	C	Si	Mn	P	S	Cr	Ni
	.015	.40	1.91	.028	.015	19.69	9.13
	Fe	Mo	Co	Cu	Al	Sn	Ta
		.38	.089	.26	.003		.005
	N	*FD	*FS	*FW			
	.076	10	13	12			

*FD = Delta Ferrite (FN) from the DeLong Diagram

*FS = Delta Ferrite (%) from the Schaeffler Diagram

*FW = Delta Ferrite (FN) from ASME Fig. NB 2433.1-1 (WRC 1992 Diagram)

Country Of Origin: United States

The following mechanical test results are typical values representative of this grade of material.

Tensile (psi): 85000

Elongation % : 45

The Heat analysis is an actual Chemistry Analysis.

CWB (Canadian Welding Bureau) approval has been attained by Sandvik for the following steel grades: ER308L, ER308LSi, ER309L, ER309LSi, ER316L, ER316LSi, ER317L, ER347, ER2209

The material has not come in contact with mercury or mercury containing compounds and as such is certified mercury free.

Material has been manufactured in accordance with Sandvik

Sandvik Materials Technology Quality Manual Revision 15

dated July 25, 2014

Quality system approved to ISO 9001:2008.

Certificate produced in accordance with EN 10204 3.1

(formerly EN 10204 3.1.B)

No unauthorized alterations. The contents of this Inspection

Certificate may not be modified or revised in any way

without the prior written approval of Sandvik Materials

Technology. Unauthorized alterations to the Inspection

Certificate, including introduction of false, fictitious,

or fraudulent statements or entries, may be punishable by

REVIEWED

By Christopher P. Hill at 3:24 pm, Apr 30, 2015

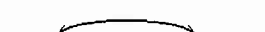
Ryan & Associates, Inc.
ASME - Procedure Qualification Record (PQR) - QW-483
WeldOffice WPS

PQR record number	4B	Revision 0	WPS record number	3	Revision 3
Date	5/19/2015		Company name	Ryan & Associates, Inc.	
			Welding standard	ASME Section IX and B31.3	

BASE METALS (QW-403)

	Product form	Specification (type or grade)	P no.	Grp-no.	Size	Sch.	Thick. (in.)	Dia. (in.)
Welded to:	Plate	SA-240 (Type 304L)	8	1	-	-	2	-
	Plate	SA-240 (Type 304L)	8	1	-	-	2	-
and tested:	Without PWHT							
Notes								

JOINTS (QW-402)

Joint design	Single-V-groove	
Backing:	None	
Retainers		
Groove angle (deg.)	70	
Root opening (in.)	1/8	
Root face (in.)	1/16	

WELDING PROCESSES

Welding process	GTAW
Type	Manual

FILLER METALS (QW-404)

SFA specification	5.9
AWS classification	ER308L
Filler metal F-number	6
Weld metal A-number	8
Filler metal nominal composition	
Filler metal trade name	
Filler metal size (in.)	1/8, 3/32, 5/32
Deposited thickness (in.)	2.00
Maximum pass thickness (in.)	0.500
Weld deposit chemistry	

POSITION (QW-405)

Position	1G
Weld progression	-

PREHEAT (QW-406)

Preheat temperature (°F)	50
Maximum interpass temperature (°F)	200

GAS (QW-408)

Shielding gas: Type	Argon (A5.32 SG-A)
Flow rate (cfh)	30 - 35
Trailing gas: Type	None
Flow rate (cfh)	-
Backing gas: Type	Argon (A5.32 SG-A)
Flow rate (cfh)	50

ELECTRICAL (QW-409)

Filler metal size (in.)	1/8, 3/32, 5/32
Amperes	100 - 180
Volts	11 - 18
Travel speed (in./min)	3
Maximum heat input (kJ/in.)	64.8
Tungsten size (in.)	1/8
Tungsten type	SFA 5.12 EWTh-2
Current/polarity	DCEN
DC pulsing current	Not used

TECHNIQUE (QW-410)

String or weave	Stringer and Weave
Orifice/gas cup size	As Desired
Multi/Single pass per side	Single and Multiple passes
Peening	Not used
Initial/interpass cleaning	Brushing and Grinding
Back gouging method	None

Ryan & Associates, Inc.
ASME - Procedure Qualification Record (PQR) - Test results (as welded)
WeldOffice WPS

PQR record number	4B	Revision	0	WPS record number	3	Revision	3
Date	5/19/2015			Company name	Ryan & Associates, Inc.		
				Welding standard	ASME Section IX and B31.3		

TENSILE TESTS (QW-150)

Reduced section

Specimen number	Width (in.)	Thickness (in.)	Area (in ²)	Ultimate total load (lb)	Ultimate unit stress (psi)	Type of failure and location
4B-2	0.741	1.975	1.4635	127440	87100	Ductile-Base Metal
4B-5	0.742	1.982	1.4706	128860	87600	Ductile-Base Metal
Comments						
2 reduced section tension tests per QW-151.1 and QW-462.1(a)						

GUIDED BEND TESTS (QW-160)

Type of test	Acceptance criteria	Result	Comments
4 transverse side bends per QW-161.1 and QW-462.2	QW-163	Acceptable	see - ASME IX - QW-451.1
Comments			

OTHER TESTS

Type of test	Acceptance criteria	Result	Comments
Delta Ferrite	ASTM A342/342M-14	Acceptable	
Comments			

CERTIFICATION

Welder's name	ID Number	Stamp number	Mechanical testing by	
Jeremy Edfors	1933	JE-1	Laboratory test number	St. Louis Testing Laboratories
			Test file number	15P-2555
			Tests conducted by	4B
				Karl Schmitz

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

Signature 1

Signature 2

Name	Signature	Name	Signature
Christopher P. Hill			
Date		Date	
5/19/2015			

Signature 3

Signature 4

Name	Signature	Name	Signature
Date		Date	



2810 Clark Avenue • St. Louis, MO 63103-2574 • (314) 531-8080 • FAX (314) 531-8085
Chemical, Metallurgical, Mechanical, Nondestructive, Environmental Testing, Analyses and Field Service.

RYAN & ASSOCIATES, INC.
10955 160th Street
Davenport, IA 52804

May 18, 2015
Lab No. 15P-2555
Invoice No. 199555
Page 1 of 2

Attention: Christopher Hill

WELD PROCEDURE QUALIFICATION

PQR: 4B-GTAW(ER308L)
MATERIAL: 2.000" SA-312 Type 304L
SPECIFICATION: ASME Section IX-2013

REDUCED SECTION TENSILE

SAMPLE ID	WIDTH INCHES	THICKNESS INCHES	AREA SQ. INCHES	ACTUAL LBS.	TENSILE STRENGTH PSI	FRACTURE
4B-2	0.741	1.975	1.4635	127440	87100	Base Material/Ductile
4B-5	0.742	1.982	1.4706	128860	87600	Base Material/Ductile

GUIDED BEND TEST

SAMPLE ID	BEND	RESULTS
4B-1	Side	Acceptable – No Discontinuities
4B-1	Side	Acceptable – No Discontinuities
4B-1	Side	Acceptable – No Discontinuities
4B-1	Side	Acceptable – No Discontinuities

KS/jlm

Karl Schmitz, Director
Materials Testing
CWI No. 92120161



Certificate No. 0397-01
Certificate No. 0397-02

AN OFFICIAL COPY OF TEST REPORT WILL BE PROVIDED BY THIS LABORATORY ON REQUEST.
NOT OFFICIAL WITHOUT THE RAISED SEAL OF ST. LOUIS TESTING LABORATORIES, INC.
SEE REVERSE FOR CONDITIONS.





2810 Clark Avenue • St. Louis, MO 63103-2574 • (314) 531-8080 • FAX (314) 531-8085
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RYAN & ASSOCIATES, INC.
10955 160th Street
Davenport, IA 52804

May 18, 2015
Lab No. 15P-2555
Invoice No. 199555
Page 2 of 2

Attention: Christopher Hill

REPORT OF ANALYSIS

PQR: 4B-GTAW(ER308L)
PROCESS: GTAW **FILLER:** ER308L
MATERIAL: SA240- Type 304L
SUBJECT: Percent Ferrite Testing
METHOD: Severn Gauge

PROCEDURE AND RESULTS:

The percent ferrite present in the base metal, heat affected zone, and weld deposit was tested utilizing a Severn ferrite indicator gauge, per ASTM A342/342M-14. See the following table for results:

GTAW	
LOCATION	% FERRITE
Base	0.5% - 1.5% Ferrite
HAZ	2.5% - 5.0% Ferrite
WELD	10.5% - 12.5% Ferrite

KS/jlm

Karl Schmitz, Director
Materials Testing
CWI No. 92120161



Certificate No. 0397-01
Certificate No. 0397-02

AN OFFICIAL COPY OF TEST REPORT WILL BE PROVIDED BY THIS LABORATORY ON REQUEST.
NOT OFFICIAL WITHOUT THE RAISED SEAL OF ST. LOUIS TESTING LABORATORIES, INC.
SEE REVERSE FOR CONDITIONS.



Liebovich Steel & Aluminum Co
Packing List

Manifest: 120838401

Sold-To
62592 RYAN & ASSOCIATES, INC.
10955 160TH ST
DAVENPORT IA 52804Ship-to
RYAN & ASSOCIATES, INC
10955 160TH ST
DAVENPORT IA 52804

563.381.3523 Fax: 563.381.3915

563.381.3914

Date Requested
IN/OUT 05/11/15Order Date
5/04/15Ordered By
TERRYIS PO#
AN 30001800

5322537/1

Delivery instructions

REC HRS 7:00-3:30

FORKLIFT & CRANE UNLOAD

	<u>Qty</u>	<u>Wgt</u>	<u>Product</u>
1 ORD	2	77	PLT STAIN T-304/304L A240
SHP	2	77	2 X 5' X 10' PLASMACUT RECT (HSA) +3/8 -0

CERTIFICATIONS REQUIRED

Pro# 3046042

Heat#: T3N4 PO#: 5322537/1 QTY: 2

CUSTOMER COPY

*** End of Packing List ***

This order subject to standard terms and conditions as posted on our website at www.liebovich.com.

Signature confirms receipt of material on above date shipped.

Liebovich Steel & Aluminum

2116 Preston St, Rockford, IL, 61102

800-892-2981 815-987-3200 Fax:800-747-4567 815-987-9865

REVIEWED

By Christopher P. Hill at 8:21 am, May 12, 2015



Sold To: 62592 AN	Ship To:
RYAN & ASSOCIATES, INC.	RYAN & ASSOCIATES, INC
10955 160TH ST	10955 160TH ST
DAVENPORT, IA 52804	DAVENPORT, IA 52804

<u>Cust PO#</u>	<u>Production Order/Ctr</u>	<u>Ship Qty</u>	<u>Material Description</u>	<u>Weight</u>	<u>Footage</u>
30001800	3046042/1	2	PLT STAIN T-304/304L A240 : 2 X 5' X 10'	77	69

CUSTOMER COPY

<u>Tot Wgt</u>	<u>Tot Ftq</u>
77	.69

Liebovich Steel & Aluminum Co . 2116 Preston Street . Rockford, IL 61102-1975 . (815) 987-3200
Above goods received in good shape and subject to terms and conditions @ www.liebovich.com. Refer to packing list for details.



Liebovich Steel & Aluminum Co
2116 Preston Street
Rockford, IL 61102-1975

800/892-2981
815/987-3200

Fax: 800/747-4567
815/987-9865

Page Number

1

Material Certification

Date
5/11/15

62592
RYAN & ASSOCIATES, INC.
10955 160TH ST
DAVENPORT IA 52804

Liebovich Pro Number
3046042

Customer Purchase Order Number
30001800

Item	Customer Part Number	Item Description	Quantity	Heat Number	Slab Number (516 GR70)
1		PLT STAIN T-304/304L A240 2 X 5' X 10'	2	T3N4	
REVIEWED By Christopher P. Hill at 8:21 am, May 12, 2015					

This document serves as reference between the above order and attached information as supplied by the material vendor and/or manufacturer.

Authorized By:

Eric D. Henggraves

Quality Manager



**NORTH AMERICAN
STAINLESS**

METALLURGICAL TEST REPORT

6870 Highway 42 East
Ghent, KY 41045-9615
(502) 347-6000

Certificate: 48787 04
Customer: 5494 002
Your Order: 8123400

Mail To:
HAGERTY STEEL & ALUMINUM COMPANY
CUSTOMER PICKUP
6870 HWY 42 EAST
GHENT, KY 41045

Ship To:
HAGERTY STEEL & ALUMINUM COMPANY
CUSTOMER PICKUP
6870 HWY 42 EAST
GHENT, KY 41045

Date: 4/10/2015 Page: 1

Steel: 304/304L

Finish: HRAP

NAS Order: XN 0657035 01

Corrosion: ASTM A262/10 A

PRODUCT DESCRIPTION:

STAINLESS STEEL PLATE, HRAP, UNS 30400/30403
ASTM A240/13c, A480/13, A666/10, ASME SA240/13, SA480/13a, SA666/13
CHEM ONLY ON FOLLOWING ASTM: A276/13, A479/13a, A484/13a, A312/13
CHEM ONLY ON FOLLOWING ASME: SA312/13, SA479/13
AMS 5511H/5513J XMRK; MIL-S-5059D AMD3(X CRN MEAS); MIL-S-4043B
NACE MR0175/ISO 15156-3:2003 A, MR0103/07/Q08766D-A X MAG PERM
MIN. SOLUTION ANNEAL TEMP 1900F, WATER QUENCHED

REMARKS:

Mat'l is Free of Mercury Contamination. No weld repairs.
EN 10204:2004 3.1, RoHS 1 & 2 Compliant
Material is Free of Radioactive Contamination
Steel Making Process: EAF, AOD, & Cont. Casting
Product Mfg. by a Quality Mgt. Sys. in Conf. w/ISO 9001

8123400

Skid #	Prod #	Thickness	Width	Weight	Length	Mark	Pieces
PE9804	* 04T3N4	2.0213	60.0000	8.230	PLATE 240.00		1

CHEMICAL ANALYSIS

CM(Country of Melt)

ES(Spain) US(United States)

ZA(South Africa) JP(Japan)

Lab Accreditation Bureau, ISO/IEC 17025, Certificate# L2323

Chemical analysis per ASTM A751/08

HEAT	CM	C %	CR %	CU %	MN %	MO %	N %	NI %	P %	S %
T3N4	US	.0294	18.2140	.4515	1.7670	.3065	.0704	8.0170	.0290	.0010
	SI %									
	.2415									

MECHANICAL PROPERTIES

Skid #	Prod #	UTS KSI	20C .2% YS KSI	20C ELONG. %-2"	Hard RB	A 262 Pr A R of A Pr A %
PE9804	04T3N4	83.30	43.30	69.00	76.00	OK 69.51

REVIEWED

By Christopher P. Hill at 8:21 am, May 12, 2015

NAS hereby certifies that the analysis on this certification is correct. Based upon the results and the accuracy of the test methods used, the material meets the specifications stated. These results relate only to the items tested and this report cannot be reproduced, except in its entirety, without the written approval of NAS.

Technical
Dept. Mgr.

Abhijeet Bhava

4/10/2015

CUSTOMER'S PURCHASE ORDER NUMBER				SOLD TO					
5076196				PRAXAIR DISTRIBUTION, INC. P.O. BOX 9224 DES MOINES, IA 50306					
OUR ORDER NUMBER		INVOICE NUMBER							
16761		133483							
CERTIFICATE DATE		SHIP DATE							
08/11/2014		08/11/2014							
DESCRIPTION OF MATERIAL				HEAT NUMBER			LOT NUMBER		
1/8" X 36" ER308L Tig Wire				46784			204918		
ACTUAL CHEMICAL ANALYSIS - PERCENTAGE OF EACH									
C	Cr	Ni	Mo	Mn	Si	P	S	N	Cu
0.0170	19.5600	9.6800	0.0900	1.9500	0.3800	0.0160	0.0090	0.0560	0.0900
Nb	Ti	Co	W	Ta	Al	V	Other	Other1	Other2
0.0100	0.0100	0.1300			0.0040	0.0600	B 0.0009		
FERRITE	Sch	DeLong	WRC92	X FACTOR CALCULATED TO BE:					
	9.1%	8.3 FN	9.8 FN	Ni + Mn =					
TYPICAL MECHANICAL PROPERTIES									
TENSILE STRENGTH			YIELD STRENGTH			ELONGATION IN 2"			
83,500 PSI			56,000 PSI			40%			
TYPICAL CHARPY IMPACT									
SPECIFICATIONS			CLASSIFICATION			PRODUCT CODE			
AWS/SFA 5.9			ER308L			125308LT			
PRODUCT PACKAGE						QUANTITY			
10 Lb. Tube / 60 Lb. Carton						410.0 Lbs.			
REMARKS									
CONFORMS TO ASME SEC. II, PART C, 2013 EDITION, EN 10204 3.1, & ISO 10474 3.1B									

This is to certify that all required samplings, inspections and tests have been performed in accordance with the specification requirements. The test report represents the actual attributes of the material furnished and the values shown are correct and true. The material described by this certificate is in full compliance with all order and inspection requirements. We hereby certify that the above data are in accordance with the specification requirements.

REVIEWED

By Christopher P. Hill at 8:19 am, May 01, 2015



Gary H. Shrum, Q.A. Manager

Plant Location: 982 Griffin Pond Road, Clarks Summit, PA 18411
Sold To: 498811 Ship To:
PRAXAIR-CENTRAL-Des Moines RYAN & ASSOC
DES MOINES IA DAVENPORT IA
Customer Order No: 5165938 Certification Date: 20141003
Sandvik Order No: 262132/1

Work Order/Lot: **250652**-----
AWS A5.9-12, ASME SFA 5.9, 2013 EDITION, EN 10204 Type 3.1

Stainless Steel Welding Wire

Type **ER308/ER308L**Size: **.093"** X 36"Heat: **538059**

Analysis %

Heat	C	Si	Mn	P	S	Cr	Ni
	.015	.40	1.91	.028	.015	19.69	9.13
	Fe	Mo	Co	Cu	Al	Sn	Ta
		.38	.089	.26	.003		.005
	N	*FD	*FS	*FW			
	.076	10	13	12			

*FD = Delta Ferrite (FN) from the DeLong Diagram

*FS = Delta Ferrite (%) from the Schaeffler Diagram

*FW = Delta Ferrite (FN) from ASME Fig. NB 2433.1-1 (WRC 1992 Diagram)

Country Of Origin: United States

The following mechanical test results are typical values representative of this grade of material.

Tensile (psi): 85000

Elongation % : 45

The Heat analysis is an actual Chemistry Analysis.

CWB (Canadian Welding Bureau) approval has been attained by Sandvik for the following steel grades: ER308L, ER308LSi, ER309L, ER309LSi, ER316L, ER316LSi, ER317L, ER347, ER2209

The material has not come in contact with mercury or mercury containing compounds and as such is certified mercury free.

Material has been manufactured in accordance with Sandvik

Sandvik Materials Technology Quality Manual Revision 15

dated July 25, 2014

Quality system approved to ISO 9001:2008.

Certificate produced in accordance with EN 10204 3.1

(formerly EN 10204 3.1.B)

No unauthorized alterations. The contents of this Inspection

Certificate may not be modified or revised in any way

without the prior written approval of Sandvik Materials

Technology. Unauthorized alterations to the Inspection

Certificate, including introduction of false, fictitious,

or fraudulent statements or entries, may be punishable by

REVIEWED

By Christopher P. Hill at 3:24 pm, Apr 30, 2015



Supplier of Welding Alloys

2632 Tee Drive
Baton Rouge, Louisiana 70814 USA
Phone: (800) 562-3355 / (225) 273-4814
Fax: (225) 273-4814
Web: www.oxfordalloys.com

ISO 9001:2008 Certified Company

CERTIFIED MATERIAL TEST REPORT

TYPE:	308L	
DIAMETER:	5/32 X 36	2.4mm
PRODUCT FORM:	GTAW	
SPECIFICATION:	AWS A5.9, Schedule F ASME SFA 5.9, Section II, Part C	
CLASSIFICATION:	ER308/308L	
UNS NUMBER:	S30880/S30883	
CERTIFICATE:	3.1 AS IN EN 10204	
HEAT:	3Y937	
LOT:	13324015	
CODE:	02-101	
DATE OF ISSUE:	4/23/2013	

ACTUAL CHEMICAL ANALYSIS – PERCENTAGE OF EACH ELEMENT

C	Cr	Ni	Mo	Mn	Si	P	S
0.015	19.65	10.32	0.03	1.89	0.55	0.019	0.0132
Cu	N						
0.16	0.0355						
FERRITE	SCH	DELONG	WRC				
	8.3	9.8	9.2				

TYPICAL MECHANICAL PROPERTIES

TENSILE STRENGTH	85,000psi 590MPa	ELONGATION IN 2"	40%
YIELD STRENGTH	57,000psi 390MPa	CHARPY IMPACT	

We certify that this chemical analysis is correct and conforms to the above specifications, as contained in the records of the company. Material, when shipped is free from contamination by mercury, radium, alpha source, and low melting point elements.

Melanie Speyrer

Quality Assurance Representative

CMTR document
Rev.No.0, Date 03/16/11

REVIEWED

By Christopher P. Hill at 4:57 pm, May 15, 2014

FORM QW-484A SUGGESTED FORMAT A FOR WELDER PERFORMANCE QUALIFICATIONS (WPO)
(See QW-301, Section IX, ASME Boiler and Pressure Vessel Code)

Welder's name John Schadt Identification no. R-181

Test Description

Identification of WPS followed 3 ☒ Test coupon ☐ Production weld Date welded 7/14/2020
Specification and type/grade or UNS Number of base metal(s) SA 312 Grade 304 Thickness .154"

Testing Variables and Qualification Limits

Welding Variables (QW-350)

Welding process(es)
Type (i.e.; manual, semi-automatic) used
Backing (with/without)
☐ Plate ☒ Pipe (enter diameter if pipe or tube)
Base metal P-Number to P-Number
Filler metal or electrode specification(s) (SFA) (info. only)
Filler metal or electrode classification(s) (info. only)
Filler metal F-Number(s)
Consumable insert (GTAW or PAW)
Filler Metal Product Form (QW-404.23) (GTAW or PAW)
Deposit thickness for each process
Process 1 GTAW 3 layers minimum ☒ Yes ☐ No
Process 2 3 layers minimum ☐ Yes ☐ No
Position(s)
Vertical progression (uphill or downhill)
Type of fuel gas (OFW)
Use of backing gas (GTAW, PAW, GMAW)
Transfer mode (spray, globular, or pulse to short circuit-GMAW)
GTAW current type and polarity (AC, DCEP, DCEN)

Actual Values

GTAW
Manual
Both
2.375
P8 to P8
A5.9
ER308
F6
None
Bare wire
.154"
6G
Uphill
100% Argon
DC Straight

Range Qualified

GTAW
Manual
Both
1" OD and above
P1- P15, P41-P47
ALL
With/Without
Up to .308"
ALL
Uphill
DC Straight

RESULTS

Visual examination of completed weld (QW-302.4) Acceptable

- ☒ Transverse face and root bends [QW-462.3(a)] ☐ Longitudinal bends [QW-462.3(b)] ☐ Side bends [QW-462.2]
☐ Pipe bend specimen, corrosion-resistant weld metal overlay [QW-462.5(c)]
☐ Plate bend specimen, corrosion-resistant weld metal overlay [QW-462.5(d)]
☐ Pipe specimen, macro test for fusion [QW-462.5(b)] ☐ Plate specimen, macro test for fusion [QW-462.5(e)]

Type	Result	Type	Result	Type	Result
Root #1	Acceptable	Face #1	Acceptable		
Root #2	Acceptable	Face #2	Acceptable		

Alternative Volumetric Examination Results (QW-191): _____ RT ☐ or UT ☐ (check one)

Fillet weld — fracture test (QW-181.2) _____ Length and percent of defects _____

- ☐ Fillet welds in plate [QW-462.4(b)] ☐ Fillet welds in pipe [QW-462.4(c)]

Macro examination (QW-184) _____ Fillet size (in.) _____ x _____ Concavity or convexity (in.) _____

Other tests _____

Film or specimens evaluated by _____ Company _____

Mechanical tests conducted by Ryan & Associates, Inc. Laboratory test no. _____

Welding supervised by Mike Ariens

We certify that the statements in this record are correct and that the test coupons were prepared, welded, and tested in accordance with the requirements of Section IX of the ASME BOILER AND PRESSURE VESSEL CODE.

Organization Ryan & Associates, Inc.

Date 7/15/2020 Certified by Benjamin C. Paustian



Benjamin C Paustian
CWI 15060871
QC1 EXP. 6/1/2021