

Manufactures' Data Book

Air Products Inc.
P.O. No.: 4505675605
Project No.: EN207120
Project Name: World Energy Renew Naphtha /PRU US7L
Location: Paramount, CA

Equipment: Equipment: Interstage Pumps
Item Nos.: 18-P-370 A/B
Model No.: MDW5253SA
S/N: 64229 - 1 & 2

VDR Code: SC02
SDDC Code No.: SUP-DBK-003
Doc. No.: MDB-02
Rev. No.: 0

March 27, 2024


Gene S Johnson
Gene S Johnson

MDB Book
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Air Products Inc.
P.O. No.: 4505675605
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Equipment: Interstage Pumps
Item Nos.: 18-P-370 A/B
Model No.: MDW5253SA
S/N: 64229 - 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: 52903	Manufacturer Information Sales Order: 7154509 Line/Unit: 1 Internal Ref #: 50304458 
Device Information Device Type: Scalable Pressure Transmitter Serial #: 23SHPE0236592 Model #: 3051S1TG1A3A11A1ADA2K5M5P1Q4Q8HR7 Output: Linear Device ID: 133408	Test Information Factory: Shakopee, MN, USA Operator ID: 1432276 Test Date: 2/26/2024 10:34:10 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.: 4505675605
Project No.: EN207120
Project Name: World Energy Renew Naphtha /PRU US7L
Location: Paramount, CA

Equipment: Interstage Pumps
Item Nos.: 18-P-370 A
Model No.: MDW5253SA
S/N: 64229 - 1
PT Item No.: 18-PT-P-370 A



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: 52903	Manufacturer Information Sales Order: 7154509 Line/Unit: 1 Internal Ref #: 50304462 
Device Information Device Type: Scalable Pressure Transmitter Serial #: 23SHPE0236592 Model #: 3051S1TG1A3A11A1ADA2K5M5P1Q4Q8HR7 Output: Linear Device ID: 133408	Calibration Information Factory: Shakopee, MN, USA Station Name: SHAK_PRESSURE_CALIBRATION_11 Operator ID: 48970 Calibration Date: 2/26/2024 11:41:51 PM
Permanent Tag Information	Wire-on Tag Information

Attached Models

0306RT32BA21

Equipment Used

Equipment #	Equipment Name	Cal Due Date
P3-54837	Pressure Controller	4/15/2024 2:10:10 PM
P3-55738	Pressure Controller	5/21/2024 12:43:01 PM
E3-58787	Load Box	7/20/2024 9:44:58 AM
E3-56234	Multimeter	11/20/2024 5:54:35 AM

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	19.99940	-0.00375	PASS
80.000	24.000 PSI	16.79834	-0.01037	PASS
60.000	18.000 PSI	13.59866	-0.00837	PASS
40.000	12.000 PSI	10.39918	-0.00512	PASS
20.000	6.000 PSI	7.19946	-0.00337	PASS
0.000	0.000 PSI	4.00010	0.00063	PASS

Air Products Inc.
P.O. No.: 4505675605
Project No.: EN207120
Project Name: World Energy Renew Naphtha /PRU US7L
Location: Paramount, CA

Equipment: Interstage Pumps
Item Nos.: 18-P-370 A
Model No.: MDW5253SA
S/N: 64229 - 1
PT Item No.: 18-PT-P-370 A

Issued Date: February 27, 2024

23SHPE0236592_Q4-Pressure_RSK_Rev1

Form #: Q4-Pressure_Ver 14

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: 52903	Manufacturer Information Sales Order: 7154509 Line/Unit: 1 Internal Ref #: 50304466 
Device Information Device Type: Scalable Pressure Transmitter Serial #: 23SHPE0236592 Model #: 3051S1TG1A3A11A1ADA2K5M5P1Q4Q8HR7	
Permanent Tag Information	Wire-on Tag Information

Attached Models

0306RT32BA21

Heat / Assembly #	Heat / Assembly # Description
224-165	Process Connector
276063951	Isolator
M7013	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.: 4505675605
Project No.: EN207120
Project Name: World Energy Renew Naphtha /PRU US7L
Location: Paramount, CA

Equipment: Interstage Pumps
Item Nos.: 18-P-370 A
Model No.: MDW5253SA
S/N: 64229 - 1
PT Item No.: 18-PT-P-370 A

or 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豪路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

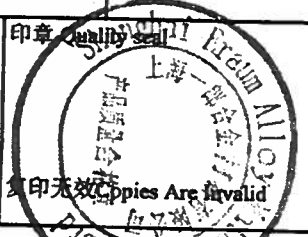
网址: WWW.shyilang.com JL/YL 03-23

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:	2022.10.11
合同号 Contract No.	EV21-22080004			产品标准 Product standard	ASTM B574-2019			固溶退火 Solution annealing	证书编号: CERTIFICATE NO.:	2022101103
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		
					件数PCS	重量 kg	总米数m	尺寸 Size	表面质量Appearance	PMI
1	N10276	224-165	H22092801	Φ32.5*3000~6000	64	1950	/	合格Qualified	合格Qualified	合格Qualified
2	N10276	224-165	H22092801	Φ32.5*3000~6000	5	156	/	合格Qualified	合格Qualified	合格Qualified
3								合格Qualified	合格Qualified	合格Qualified

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
			≤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		
1	224-165	H22092801	0.0057	0.068	0.524	0.0051	0.00055	15.55	5.87	15.71	0.123	/	3.42	0.030	/	/	Bal	/	/
2	224-165	H22092801	0.0057	0.068	0.524	0.0051	0.00055	15.55	5.87	15.71	0.123	/	3.42	0.030	/	/	Bal	/	/
3																	Bal	/	/

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A 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	224-165	H22092801	758	355	63	56	10	/	/	/				
2	224-165	H22092801	758	355	63	56	10	/	/	/				
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) 棒材符合技术要求, 满足NACE MR0175/ISO1515 6 and NACE MR0103/ISO 17945.	制表人 Completed by: 何琳	审核Approved: 张超	印章 Quality seal
1	224-165	H22092801	/	合格Qualified	/	/				
2	224-165	H22092801	/	合格Qualified	/	/				
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 (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 Certificate NO.: 4410017850008 (GB/T19001-ISO9001:2015)
PED工厂认可证书 (PED Certificate NO.): 9030AW-21821/20 TS: TS271015Y-2024/TS271H60-2025

MS-1-22
7-1-22

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 Wednesday, June 29, 2022

PS-#15226
Lot #16353

ORDER ID #: 67327

CUSTOMER: KLESK METAL STAMPING

CUSTOMER P.O. NO.: 59551

SPECIFICATIONS: ROSEMOUNT C10296 REV AJ; ASTM B575 (CHEM ONLY); P/N C10296-0033CPM

MATERIAL

HPM® C-276
HANAR and I-Pad Reg. U.S. Pat TM & Other trademarks are the property of their respective owners

SIZE:

.0015" X 2.000" X COIL

WORK ORDER #

2200837/1

QUANTITY SHIPPED:

3 COILS 25.15 LBS

CHEMICAL ANALYSIS

HEAT NO:

276063951

AG:	AL: .32	B:	BE:	C: .004	CA:	CB:
CO: 1.60	CR: 15.21	CU:	FE: 5.19	H:	MG:	MN: .82
MO: 15.32	N:	NB:	NI: 58.14	O:	P: .008	PB:
S: .004	SI: <.02	SN:	TA:	TI:	V: .01	W: 3.34
Y:	ZN:	ZR:				

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

PHYSICAL TEST RESULTS

HEAT NO.:

276063951

COIL NO.: 15338A

TEMPER	HARDNESS	TENSILE (KSI)	YIELD (KSI)	% ELONGATION In 2"	DIRECTION
ANNEALED	14.0 RC	138.0	82.7	32.6	LONGITUDINAL

SURFACE TREATMENT

OTHER TESTS

GRAIN

SURFACE ROUGHNESS

GRAIN
SIZE:

GRAIN
COUNT:

DATE RECD 7-1-22 MS

DATE CNTD. 7-7-22 MS
Received 26,104"/3 coils

COMMENTS: COUNTRY OF ORIGIN USA

PMI TESTED

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 Eshleman

Authorized Quality Representative

DIVISION OF AMETEK SPECIALTY METAL PRODUCTS

SF 2000 - 14, Rev. 8/18/2015



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

S261223/M/001

Dated 26/12/2023

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	M7013	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%
M7013	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
M7013	525.25 MPa	665.10 MPa	46.50	70.30	197	-	-	-	-

ULTRASONIC TESTING:

We hereby certify that the material mentioned 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 EN10204.

Signature / Seal of
Inspector / Customer

For MICRO PRECISION PRODUCTS PVT.LTD.

Manager Quality Control



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: 52903	Manufacturer Information Sales Order: 7154509 Line/Unit: 1 Internal Ref #: 50304459 
Device Information Device Type: Scalable Pressure Transmitter Serial #: 23SHPE0236593 Model #: 3051S1TG1A3A11A1ADA2K5M5P1Q4Q8HR7 Output: Linear Device ID: 133441	Test Information Factory: Shakopee, MN, USA Operator ID: 1432276 Test Date: 2/26/2024 8:56:09 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.: 4505675605
Project No.: EN207120
Project Name: World Energy Renew Naphtha /PRU US7L
Location: Paramount, CA

Equipment: Interstage Pumps
Item Nos.: 18-P-370 B
Model No.: MDW5253SA
S/N: 64229 - 2
PT Item No.: 18-PT-P-370 B



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: 52903	Manufacturer Information Sales Order: 7154509 Line/Unit: 1 Internal Ref #: 50304463 
Device Information Device Type: Scalable Pressure Transmitter Serial #: 23SHPE0236593 Model #: 3051S1TG1A3A11A1ADA2K5M5P1Q4Q8HR7 Output: Linear Device ID: 133441	Calibration Information Factory: Shakopee, MN, USA Station Name: SHAK_PRESSURE_CALIBRATION_10 Operator ID: 1421397 Calibration Date: 2/26/2024 9:33:47 PM
Permanent Tag Information	Wire-on Tag Information

Attached Models

0306RT32BA21

Equipment Used

Equipment #	Equipment Name	Cal Due Date
P3-54975	Pressure Controller	4/15/2024 12:23:04 PM
E3-58637	Load Box	6/20/2024 7:56:06 AM
E3-56118	Multimeter	1/20/2025 10:01:27 AM

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	19.99926	-0.00462	PASS
80.000	24.000 PSI	16.79802	-0.01237	PASS
60.000	18.000 PSI	13.59808	-0.01200	PASS
40.000	12.000 PSI	10.39806	-0.01212	PASS
20.000	6.000 PSI	7.19762	-0.01487	PASS
0.000	0.000 PSI	3.99980	-0.00125	PASS

Air Products Inc.
P.O. No.: 4505675605
Project No.: EN207120
Project Name: World Energy Renew Naphtha /PRU US7L
Location: Paramount, CA

Equipment: Interstage Pumps
Item Nos.: 18-P-370 B
Model No.: MDW5253SA
S/N: 64229 - 2
PT Item No.: 18-PT-P-370 B

Issued Date: February 27, 2024
Form #: Q4-Pressure_Ver 14

23SHPE0236593_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: 52903	Manufacturer Information Sales Order: 7154509 Line/Unit: 1 Internal Ref #: 50304467 
Device Information Device Type: Scalable Pressure Transmitter Serial #: 23SHPE0236593 Model #: 3051S1TG1A3A11A1ADA2K5M5P1Q4Q8HR7	
Permanent Tag Information	Wire-on Tag Information

Attached Models

0306RT32BA21

Heat / Assembly #	Heat / Assembly # Description
224-165	Process Connector
276063951	Isolator
M7013	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.: 4505675605
Project No.: EN207120
Project Name: World Energy Renew Naphtha /PRU US7L
Location: Paramount, CA

Equipment: Interstage Pumps
Item Nos.: 18-P-370 B
Model No.: MDW5253SA
S/N: 64229 - 2
PT Item No.: 18-PT-P-370 B

or 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 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 OFREPORT:		2022.10.11	
合同号 Contract No.		EV21-22080004			产品标准 Product standard	ASTM B574-2019		固溶 退火 Solution annealing		证书编号： CERTIFICATE NO.:		2022101103	
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	224-165	H22092801	Φ32.5*3000~6000	64	1950	/	合格Qualified	合格Qualified	合格Qualified	合格Qualified		
2	N10276	224-165	H22092801	Φ32.5*3000~6000	5	156	/	合格Qualified	合格Qualified	合格Qualified	合格Qualified		
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
			≤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		
1	224-165	H22092801	0.0057	0.068	0.524	0.0051	0.00055	15.55	5.87	15.71	0.123	/	3.42	0.030	/	/	Bal	/	/
2	224-165	H22092801	0.0057	0.068	0.524	0.0051	0.00055	15.55	5.87	15.71	0.123	/	3.42	0.030	/	/	Bal	/	/
3																	Bal	/	/

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A 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	224-165	H22092801	758	355	63	56	10	/	/	/			
2	224-165	H22092801	758	355	63	56	10	/	/	/			
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) 棒材符合技术要求, 满足NACE MR0175/ISO1515 6 and NACE MR0103/ISO 17945.	制表人 Completed by: 何琳	审核Approved: 张超	印章 Quality Seal
1	224-165	H22092801	/	合格Qualified	/	/				
2	224-165	H22092801	/	合格Qualified	/	/				
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 (DOR/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 Certificate NO.: 4410017850008 (GB/T19001-ISO9001:2015)
PED 工厂认可证书 (PED Certificate NO.): 9030AW-21821/20 TS: TS271015Y-2024/TS2731H60-2025

MS-1-22
7-1-22

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 Wednesday, June 29, 2022

ORDER ID #: 67327

CUSTOMER: KLESK METAL STAMPING

CUSTOMER P.O. NO.: 59551

SPECIFICATIONS: ROSEMOUNT C10296 REV AJ; ASTM B575 (CHEM ONLY); P/N C10296-0033CPM

MATERIAL

HPM® C-276
HARVEY 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 #:

2200837/1

QUANTITY SHIPPED:

3 COILS 25.15 LBS

CHEMICAL ANALYSIS

HEAT NO.:

276063951

AG:	AL: .32	B:	BE:	C: .004	CA:	CB:
CO: 1.60	CR: 15.21	CU:	FE: 5.19	H:	MG:	MN: .52
MO: 15.32	N:	NB:	NI: 58.14	O:	P: .008	PB:
S: .004	SI: <.02	SN:	TA:	TI:	V: .01	W: 3.34
Y:	ZN:	ZR:				

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

PHYSICAL TEST RESULTS

HEAT NO.:

276063951

COIL NO.: 15338A

TEMPER	HARDNESS	TENSILE (KSI)	YIELD (KSI)	% ELONGATION in 2"	DIRECTION
ANNEALED	14.0 RC	138.0	82.7	32.6	LONGITUDINAL

SURFACE TREATMENT

OTHER TESTS

GRAIN

SURFACE ROUGHNESS

GRAIN
SIZE:

GRAIN
COUNT:

DATE RECD 7-1-22 MS

DATE CNTD. 7-7-22 MS

Received 26,104"/3 coils

COMMENTS: COUNTRY OF ORIGIN USA

PMI TESTED

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

Paul Schlemmer

Authorized Quality Representative

DIVISION OF AMETEK SPECIALTY METAL PRODUCTS

SF 2000 - 14, Rev. 8/18/2015



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

S261223/M/001

Dated 26/12/2023

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	M7013	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%
M7013	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
M7013	525.25 MPa	665.10 MPa	46.50	70.30	197	-	-	-	-

ULTRASONIC TESTING:

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.

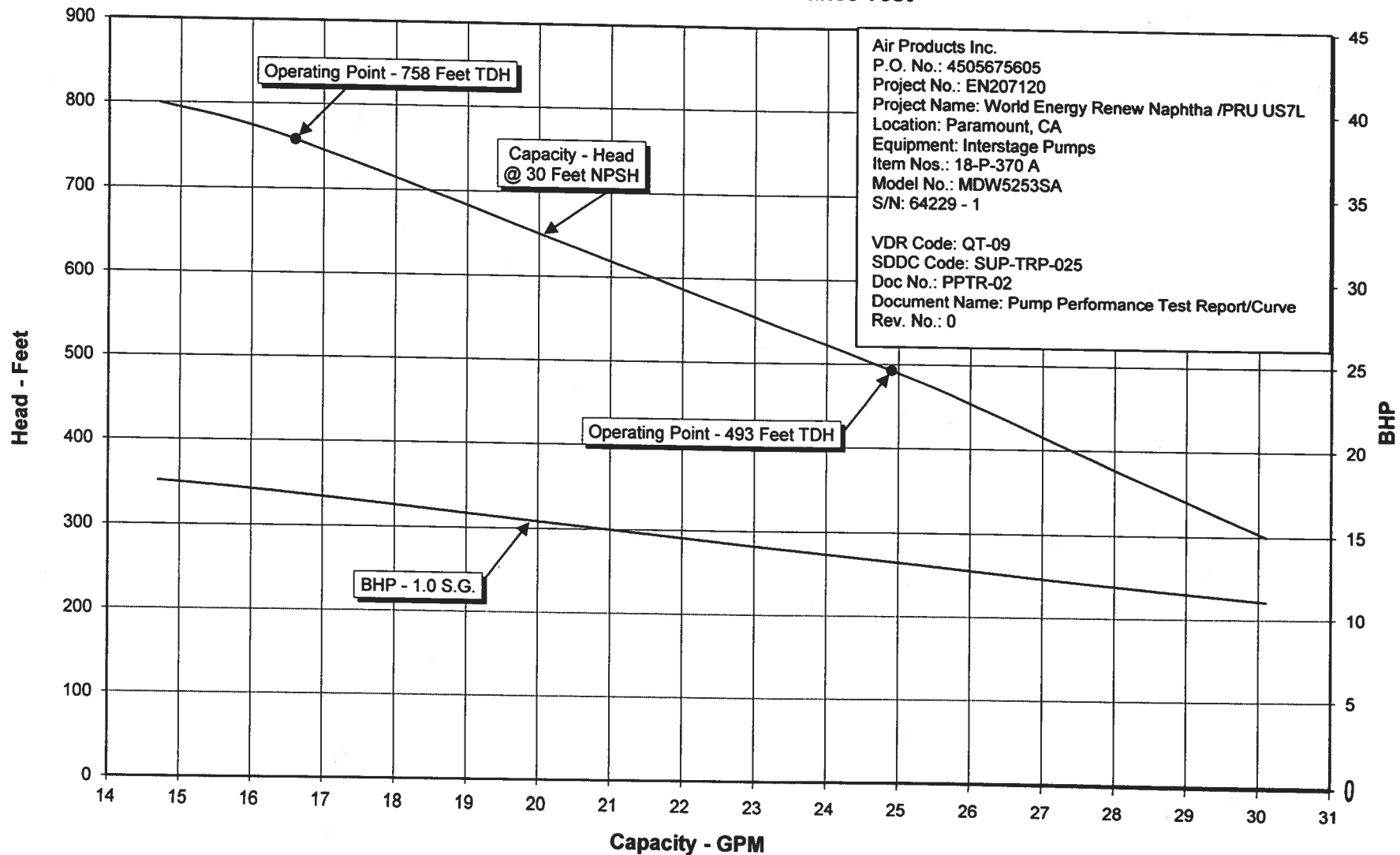
We certify that the above Material Test report
is in accordance with the Inspection certificate
3.1 as per EN10204.

Signature / Seal of
Inspector / Customer

For MICRO PRECISION PRODUCTS PVT.LTD.

Manager Quality Control

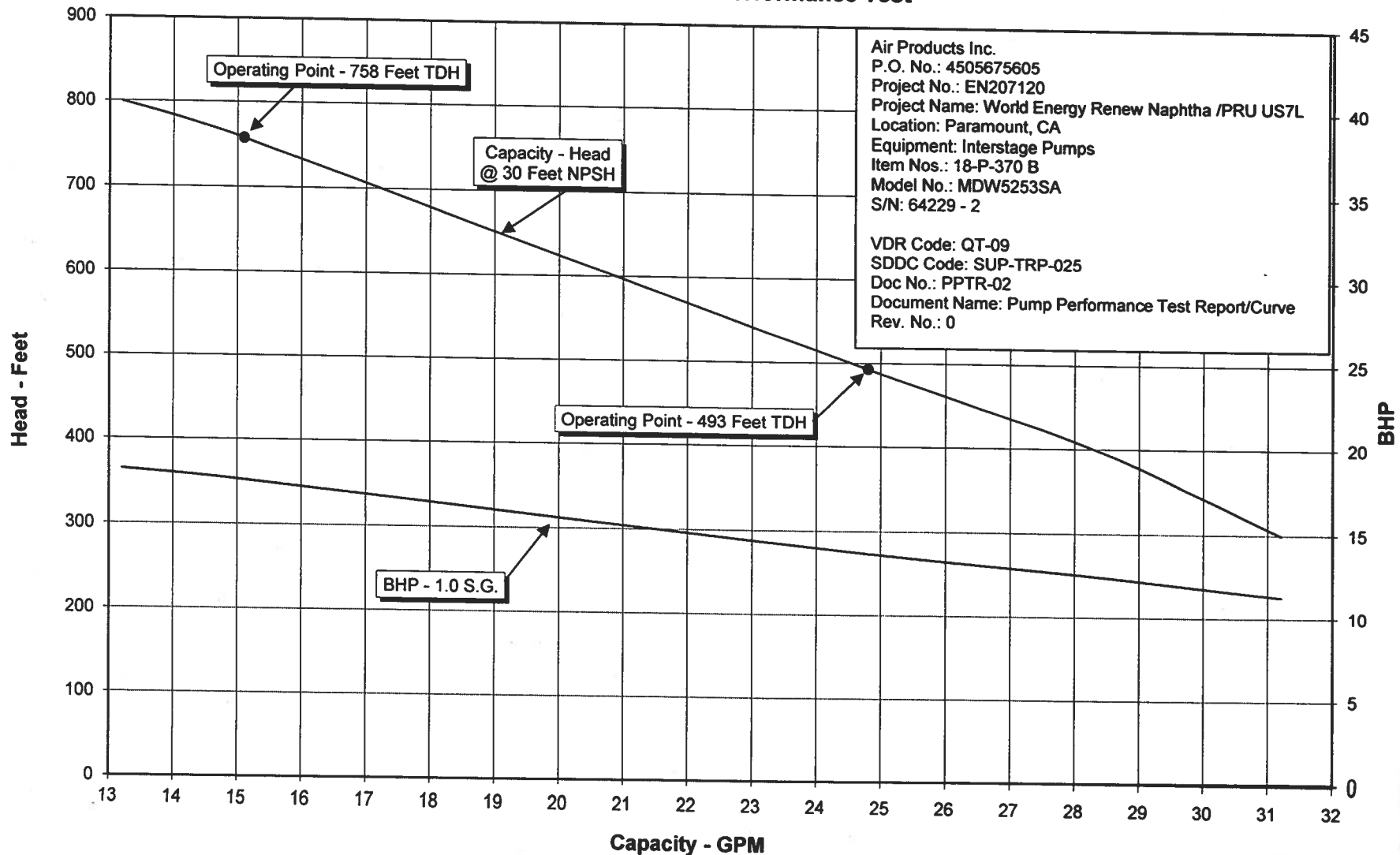
**Roth Pump Company
Model MD5253 @ 3500 RPM
Witnessed Cold Water Performance Test**



Gene S Johnson
Gene S Johnson

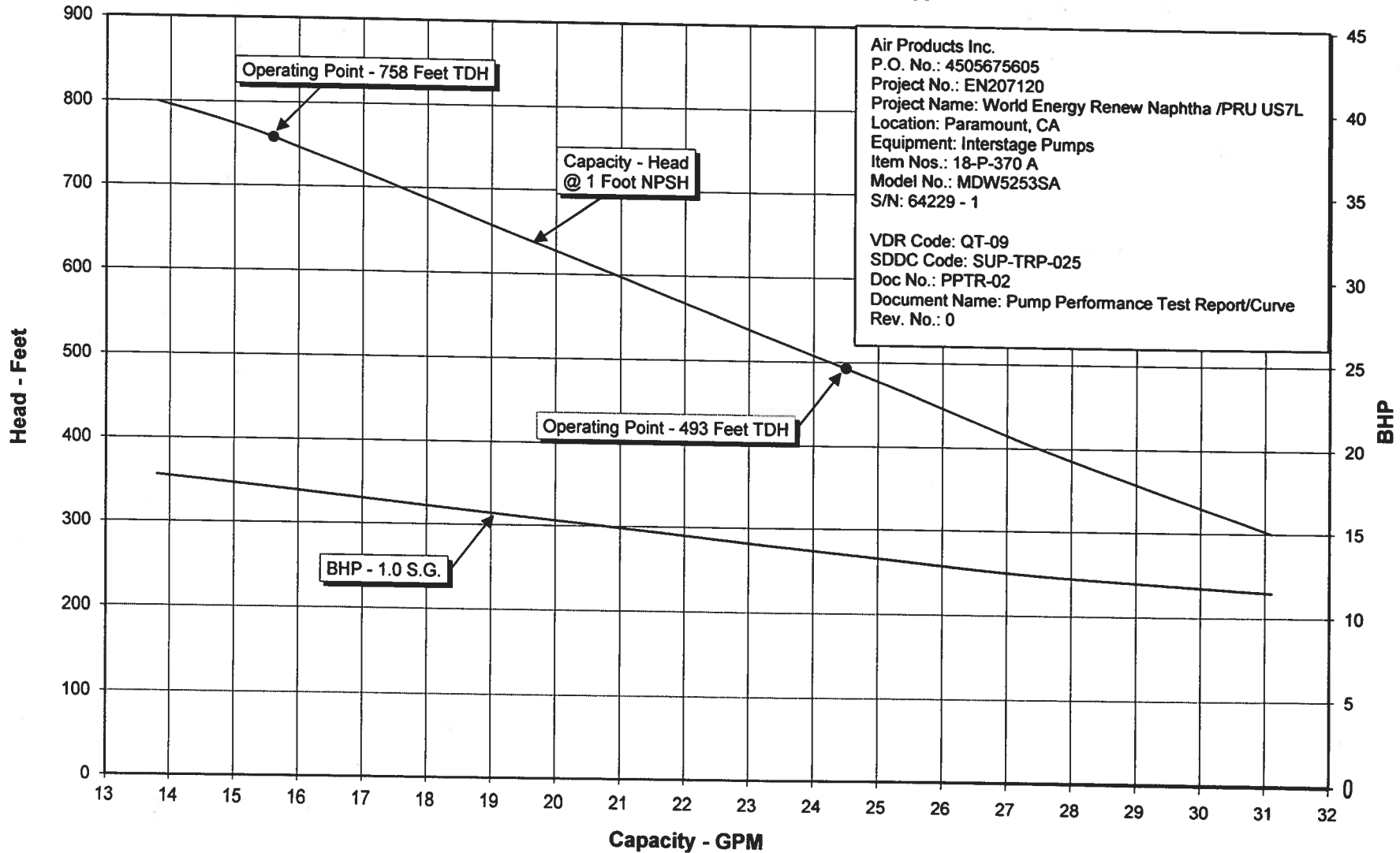
289
March 6, 2014

**Roth Pump Company
Model MD5253 @ 3500 RPM
Witnessed Cold Water Performance Test**



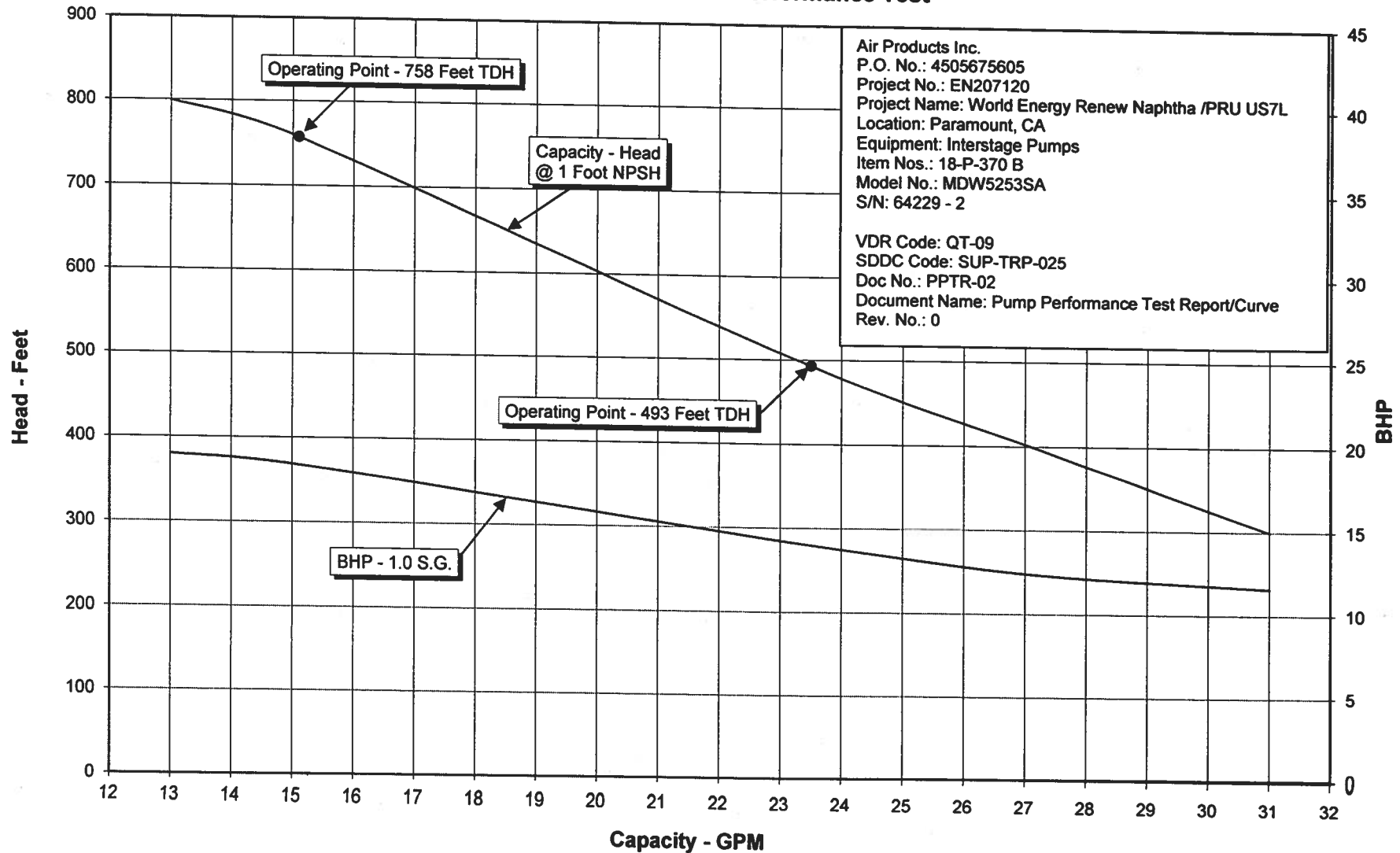
Signature
March 6, 2024

**Roth Pump Company
Model MD5253 @ 3500 RPM
Witnessed 1 Foot NPSH Performance Test**



Handwritten: ~~487~~ March 6, 2024

**Roth Pump Company
Model MD5253 @ 3500 RPM
Witnessed 1 Foot NPSH Performance Test**



YLF March 6, 2024

Release Purpose: IFR

DOCUMENT COVERSHEET

Document Information					
Project No:	EN207120	Project Name:	World Energy Renew Naphtha/PRU US7L		
Project Doc No:	EN207120-ROTH-9V3-00036		Rev:	00	
Client Doc No:			Rev:		
Vendor Doc No:	PPTR-02	Issue Date:	20-Mar-2024	Rev:	0
Document Title:	PUMP PERFORMANCE TEST REPORTS/CURVES FOR INTERSTAGE PUMPS				
VDR Code(s)	QT09				
Tag No(s):(1):	18-P-370A, 18-P-370B				

Note 1 – For multiple Tag No: refer to page 2

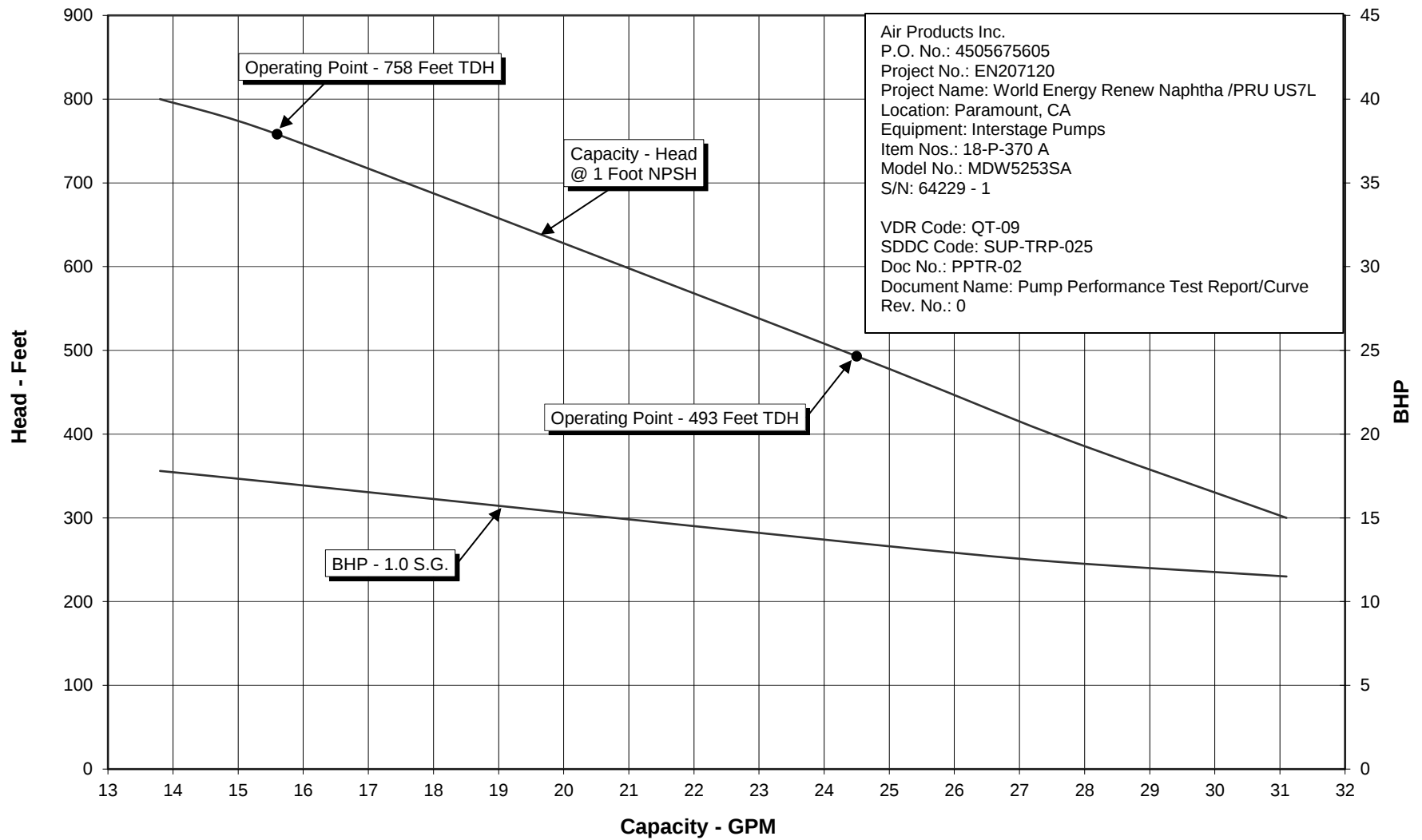
Review Status			
Status Code:	4	Specifer:	Suhas Patil
		Date:	25 March 2024

Status Code Legend	
Code 1	Reviewed by Air Products – REJECTED Resubmit for Review
Code 2	Reviewed by Air Products – COMMENTS AS NOTED Resubmit for Review
Code 4	Reviewed by Air Products – NO COMMENTS , No Further Submittal Required Unless Drawing/Document is Revised
Code 5	ACCEPTED FOR INFORMATION ONLY

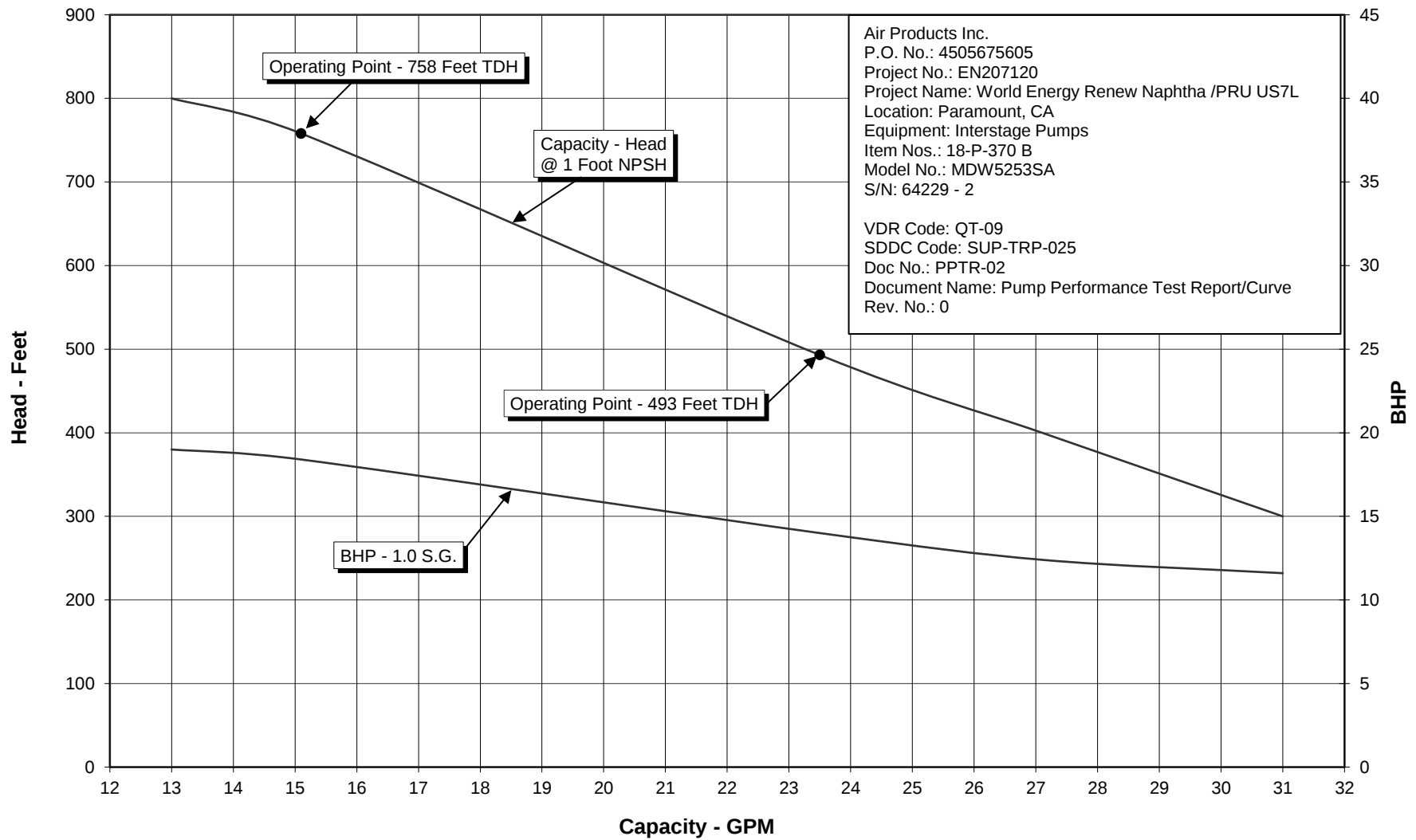
Vendor is not relieved of responsibility for accuracy of dimensions, performance, design, design of details or any code requirements. Further, review by Air Products does not relieve Vendor of responsibility or liability, or from furnishing material in conformance with the contract, purchase order, or other agreement. Air Products' review shall not be construed as an Approval by Air Products of such documents or an opinion by Air Products that such documents are true and accurate.

Purchase Order Information	
Air Products Specifier:	JONESB8
PO Number:	4505675605
PO Date:	23-Mar-2022
Vendor Name:	Roth Pump Company
Vendor Org Code:	ROTH
Vendor SAP ID:	10108755

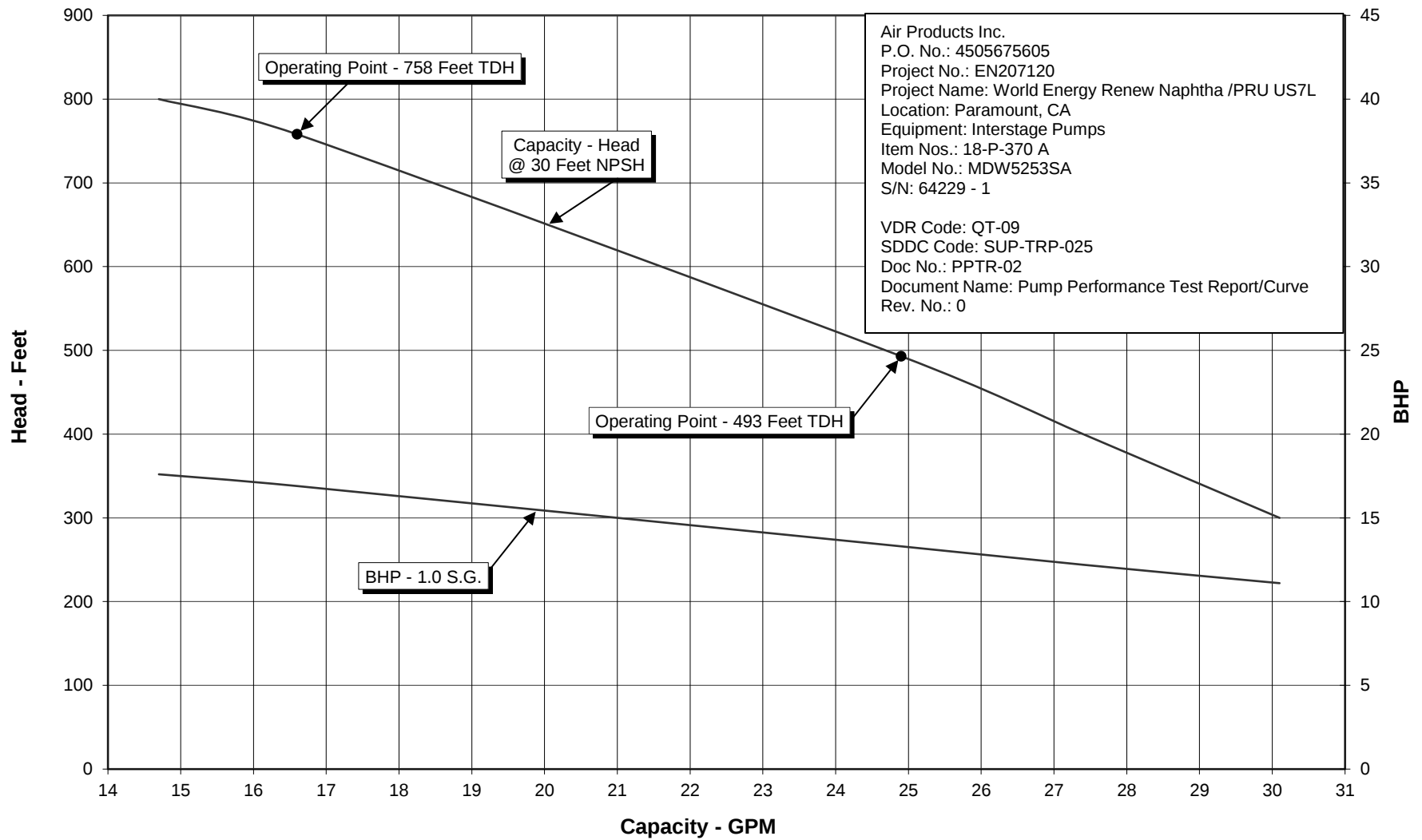
**Roth Pump Company
Model MD5253 @ 3500 RPM
Witnessed 1 Foot NPSH Performance Test**



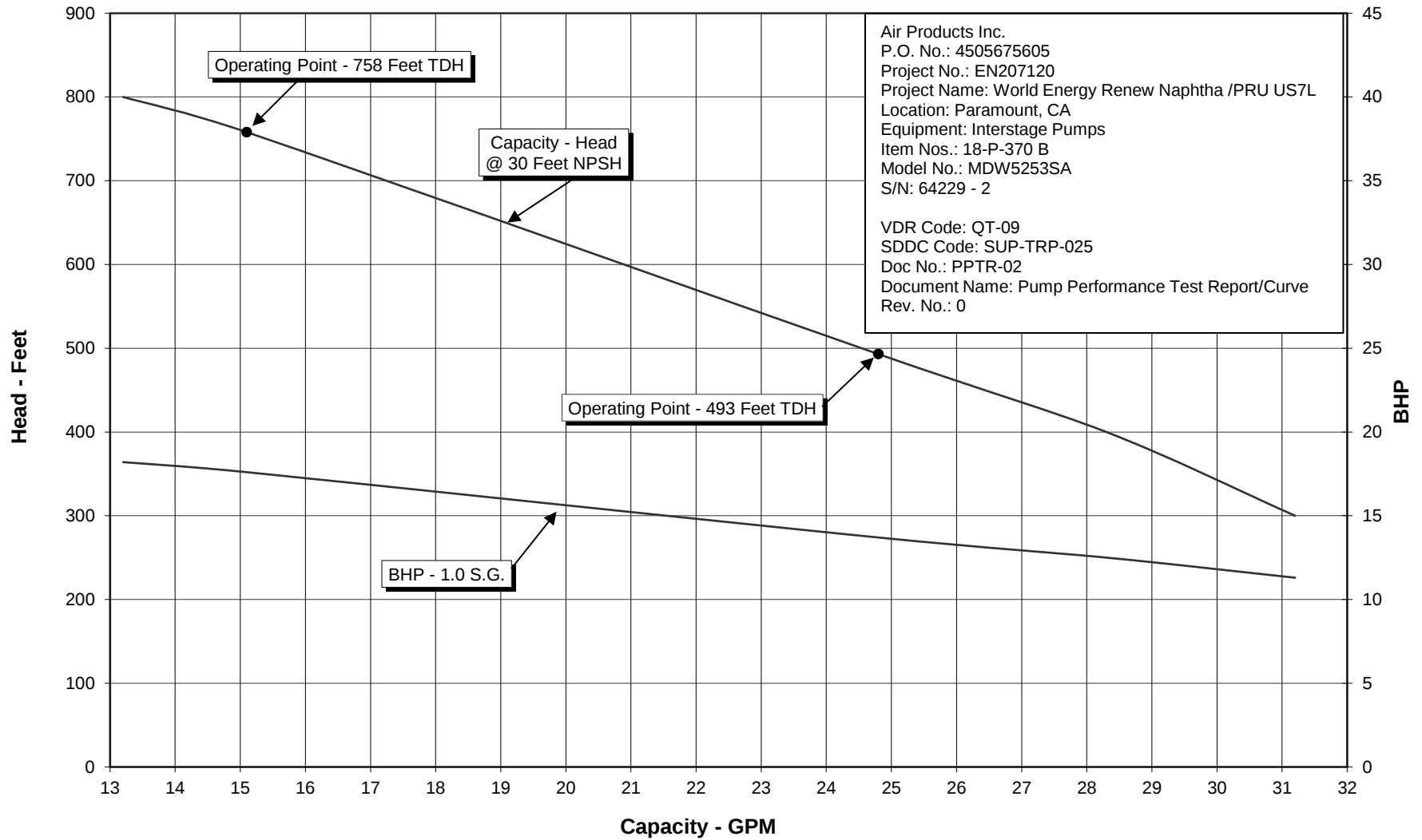
**Roth Pump Company
Model MD5253 @ 3500 RPM
Witnessed 1 Foot NPSH Performance Test**



**Roth Pump Company
Model MD5253 @ 3500 RPM
Witnessed Cold Water Performance Test**



**Roth Pump Company
Model MD5253 @ 3500 RPM
Witnessed Cold Water Performance Test**



Vibration Analysis

Date:

2/22/2024

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)
130	H	0.12	x	2	0.046	0.130	0.294	0.034	0.093	0.268
	V	0.12	x	2	0.057	0.117	0.429	0.025	0.076	0.268
	A	0.12	x	2	0.034	0.102	0.268	x	x	x
	H	x	0.08	x	x	0.040	x	x	0.030	x
	V	x	0.08	x	x	0.050	x	x	0.030	x
	A	x	0.08	x	x	0.030	x	x	x	x
173	H	0.12	x	2	0.042	0.153	0.268	0.034	0.093	0.268
	V	0.12	x	2	0.051	0.110	0.268	0.034	0.076	0.268
	A	0.12	x	2	0.034	0.102	0.268	x	x	x
	H	x	0.08	x	x	0.030	x	x	0.030	x
	V	x	0.08	x	x	0.050	x	x	0.030	x
	A	x	0.08	x	x	0.030	x	x	x	x
213	H	0.12	x	2	0.051	0.161	0.268	0.034	0.110	0.268
	V	0.12	x	2	0.051	0.119	0.268	0.034	0.085	0.268
	A	0.12	x	2	0.042	0.110	0.268	x	x	x
	H	x	0.08	x	x	0.030	x	x	0.030	x
	V	x	0.08	x	x	0.060	x	x	0.030	x
	A	x	0.08	x	x	0.070	x	x	x	x
328	H	0.12	x	2	0.068	0.212	0.268	0.051	0.144	0.268
	V	0.12	x	2	0.068	0.144	0.536	0.042	0.119	0.268
	A	0.12	x	2	0.042	0.127	0.268	x	x	x
	H	x	0.08	x	x	0.050	x	x	0.050	x
	V	x	0.08	x	x	0.080	x	x	0.030	x
	A	x	0.08	x	x	0.050	x	x	x	x
346	H	0.12	x	2	0.059	0.204	0.268	0.051	0.119	0.268
	V	0.12	x	2	0.059	0.136	0.536	0.042	0.110	0.268
	A	0.12	x	2	0.042	0.136	0.268	x	x	x
	H	x	0.08	x	x	0.090	x	x	0.050	x
	V	x	0.08	x	x	0.060	x	x	0.030	x
	A	x	0.08	x	x	0.050	x	x	x	x

Air Products Inc.

P.O. No.: 4505675605

Project No.: EN207120

Project Name: World Energy Renew Naphtha /PRU US7L

Location: Paramount, CA

Equipment: Interstage Pumps

Item Nos.: 18-P-370 a

Model No.: MDW5253SA

S/N: 64229 - 1

VDR Code: QT-09

SDDC Code: SUP-TRP-025

Doc No.: PPTR-02

Document Name: Pump Performance Test Report/Curve

Rev. No.: 0

Vibration Analysis

Date:

2/22/2024

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)
130	H	0.12	x	2	0.068	0.187	0.804	0.059	0.161	0.536
	V	0.12	x	2	0.068	0.195	0.268	0.051	0.170	0.268
	A	0.12	x	2	0.034	0.093	0.268	x	x	x
	H	x	0.08	x	x	0.07	x	x	0.060	x
	V	x	0.08	x	x	0.05	x	x	0.050	x
	A	x	0.08	x	x	0.01	x	x	x	x
173	H	0.12	x	2	0.078	0.187	0.536	0.068	0.153	0.536
	V	0.12	x	2	0.068	0.178	0.268	0.059	0.161	0.268
	A	0.12	x	2	0.034	0.102	0.268	x	x	x
	H	x	0.08	x	x	0.07	x	x	0.060	x
	V	x	0.08	x	x	0.05	x	x	0.050	x
	A	x	0.08	x	x	0.01	x	x	x	x
213	H	0.12	x	2	0.085	0.204	0.536	0.076	0.161	0.536
	V	0.12	x	2	0.068	0.187	0.268	0.059	0.153	0.268
	A	0.12	x	2	0.034	0.102	0.268	x	x	x
	H	x	0.08	x	x	0.08	x	x	0.060	x
	V	x	0.08	x	x	0.03	x	x	0.050	x
	A	x	0.08	x	x	0.05	x	x	x	x
328	H	0.12	x	2	0.102	0.238	0.536	0.085	0.195	0.536
	V	0.12	x	2	0.076	0.195	0.268	0.068	0.170	0.268
	A	0.12	x	2	0.042	0.136	0.268	x	x	x
	H	x	0.08	x	x	0.08	x	x	0.080	x
	V	x	0.08	x	x	0.06	x	x	0.050	x
	A	x	0.08	x	x	0.03	x	x	x	x
346	H	0.12	x	2	0.102	0.229	0.804	0.085	0.204	0.536
	V	0.12	x	2	0.085	0.221	0.536	0.068	0.178	0.936
	A	0.12	x	2	0.042	0.136	0.268	x	x	x
	H	x	0.08	x	x	0.08	x	x	0.080	x
	V	x	0.08	x	x	0.06	x	x	0.050	x
	A	x	0.08	x	x	0.03	x	x	x	x

Air Products Inc.

P.O. No.: 4505675605

Project No.: EN207120

Project Name: World Energy Renew Naphtha /PRU US7L

Location: Paramount, CA

Equipment: Interstage Pumps

Item Nos.: 18-P-370 B

Model No.: MDW5253SA

S/N: 64229 - 2

VDR Code: QT-09

SDDC Code: SUP-TRP-025

Doc No.: PPTR-02

Document Name: Pump Performance Test Report/Curve

Rev. No.: 0

Air Products Inc.
P.O. No.: 4505675605
Project No.: EN207120
Project Name: World Energy Renew Naphtha /PRU US7L
Location: Paramount, CA

Equipment: Interstage Pumps
Item Nos.: 18-P-370 A/B
Model No.: MDW5253SA
S/N: 64229 - 1 & 2

VDR Code: QT09
SDDC Code: SUP-TRP-025
Doc No.: PPTR-02
Rev. No.: 0

CERTIFICATE OF NOISE TEST

S/N: 64229 – 1

Test Point – 300 Feet = 80.8 dba
Test Point – 400 Feet = 81.0 dba
Test Point – 493 Feet = 81.0 dba (Operating Point)
Test Point – 758 Feet = 80.7 dba (Operating Point)
Test Point – 800 Feet = 80.8 dba

S/N: 64229 – 2

Test Point – 300 Feet = 80.5 dba
Test Point – 400 Feet = 80.9 dba
Test Point – 493 Feet = 81.0 dba (Operating Point)
Test Point – 758 Feet = 81.0 dba (Operating Point)
Test Point – 800 Feet = 80.7 dba

Readings taken at 3 Feet from equipment.



ISO 9001:2015 F53692

Cert #: 76645-337

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 0-600 PSI

Serial #: N117

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>
50	50				
100	100				
200	200				
300	300				
400	400				
500	500				
600	600				

GAUGE REPAIRS:

Range/Speed:

Hysteresis:

Scale/Shape:

Zero Shift:

Size & Type: 4 1/2" ASHCROFT

Range: 0-600 PSI

Gage accuracy: +/-2.5% OF F.S

Comments: WITHIN REQUIRED ACCURACY. ASSEMBLY DEPT

Technician: Samuel Welch

Date: 7/28/2023

Process Number: P-070-B

Gage Cond.: GOOD

CALIBRATION CERTIFICATE # 22581

Calibration date : 2024-02-06

Certificate issued : 2024-02-06

RECAL 2/6/2025

Roth Pump
525 4th St West
Milan, Illinois, USA
61264

Calibration of
Volumetric flow meter Rosemount 8711 S/N : 0082351

QUALITY PROGRAM CONFORMANCE

All calibrations are performed in accordance with Polycontrols Laboratory Quality Assurance Manual and conformed to ISO/IEC 17025: 2017, ISO 9001 – 2015 and/or other quality requirements defined in customers purchase descriptions. The results are strictly valid for the device under test or calibration. If applicable, the decision rule is described in the certificate.

TRACEABILITY

The traceability of mass flow is maintained through the fundamental units of mass (Kg) and time (sec) by gravimetric comparison. Mass, time and density are traceable to either the National Research Council Canada (NRC), the National Institute of Standards and Technology (NIST) or a calibration laboratory accredited and conformed to ISO/IEC 17025.

The Calibration Laboratory Assessment Service (CLAS) of the National Research Council of Canada (NRC) has assessed and certified specific calibration capabilities of this laboratory and traceability to the International System of Units (SI) or to standards acceptable to the CLAS program. This certificate of calibration is issued in accordance with the conditions of certification granted by CLAS and the conditions of accreditation granted by the Standards Council of Canada (SCC). Neither CLAS nor SCC guarantee the accuracy of individual calibrations by accredited laboratories.

CALIBRATION OF MEASURING AND TEST EQUIPMENT

For calibration measurement capability, please refer to the Canadian Calibration Network web page at the National Research Council of Canada. This laboratory is accredited by the Standards Council of Canada as part of the Calibration Laboratory Assessment Service (CLAS) program and is listed at nrc.canada.ca.

This document forms part of the Certificate of Accreditation issued by the Standards Council of Canada (SCC). The original version is available in the Directory of Accredited Laboratories on the SCC website at www.scc.ca.

CONDITION SUMMARY OF THE DEVICE UNDER TEST

Initial conditions	In good condition
Work done	Calibration of the instrument.
	Changed cal factor from 1177703711662011 to 1172603711662011
Results	Initial readings in tolerance. Final readings in tolerance
Remarks	Calibration frequency every 12 months



Pierre Larivée
Metrologist



Laboratory Manager

Calibration certificate # 22581

Serial Number:	0082351	Test stand:	6
Indicator S/N:	0860090286	Procedure:	POS-CAL-103
Indicator Model:	8732	Calibration Date:	2024-02-06
Instrument ID:		Decision rule:	Method #3

Standard equipment used for initial calibration

Description	Model	Serial #	Traceability	Due date
Coriolis flow meter	CMF100	481402	21152	2024-08-02
Micro Motion indicator	2700R	4002663	21152	2024-08-02
PRT 200B	200B	941426/150985501	2023004675	2024-06-20
Fluke Calibrator	726	9007012	CAL89927	2024-10-27
ABB Pressure transducer	261ASD	261AS6505007445	2023001319	2024-02-23
Anton Paar DMA4500	DMA4500 M	81774159	19239	2024-04-11

Initial specifications of the device under test

Calibration conditions

Fluid	Water
Operation temperature	20 °C
Operation pressure	
Process fluid density	1000 kg/m ³ @ 4 °C
Process fluid viscosity	1.004 cSt @ 20 °C
Sensor Capacity	
Span	0-28.41 USGM
Output Signal	4-20 mA
Supply	120Vac
Accuracy	±0.025 %F.S. ±0.25 %O.R. ±0.0416 USGM

Fluid	Water
Ambient temperature	22.89 °C
Ambient pressure	1023.9 mbar
Calibration fluid density	1000 kg/m ³ @ 4 °C
Calibration fluid viscosity	1.004 cSt @ 20 °C
Orientation	Horizontal

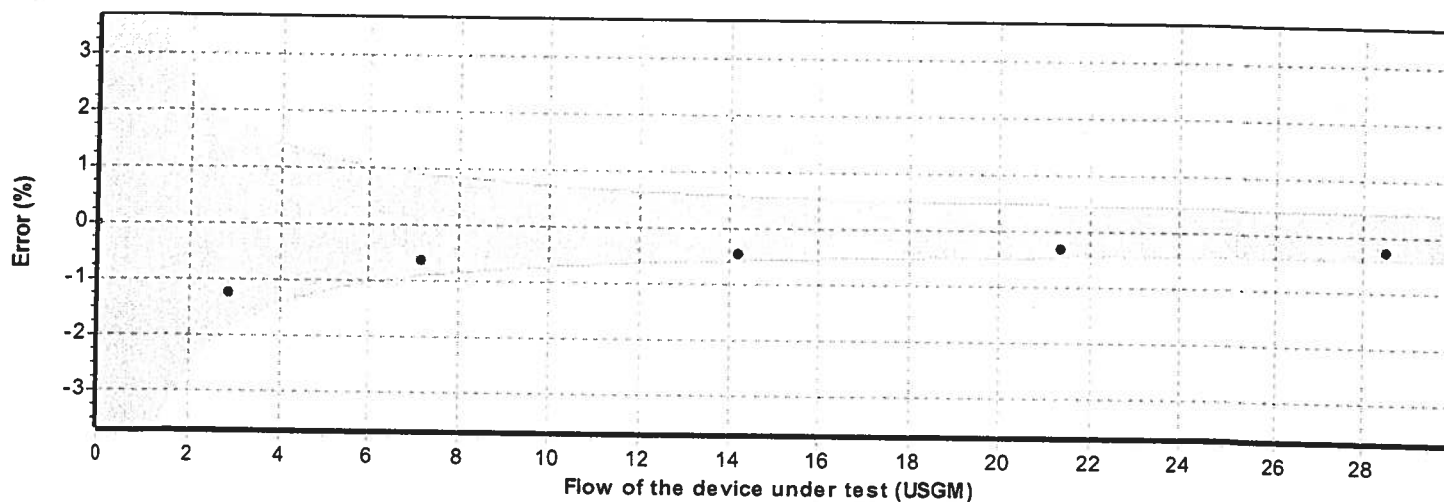
Initial readings

Device under test		Measured values			Calculated reference	Calculated error	Acceptable error	Uncertainty	TUR
mA	USGM	Density g/cm ³	Temperature °C	Reference Kg/min	USGM	USGM	USGM	k = 2 USGM	
4.000	0.000	0.99807	21.57	0.0000	0.0000				
5.618	2.873	0.99814	21.26	10.9916	2.9091	-0.036	0.056	0.0038	>4
8.029	7.154	0.99812	21.31	27.1991	7.1987	-0.045	0.067	0.0088	>4
11.976	14.162	0.99818	21.15	53.7636	14.2287	-0.067	0.084	0.0170	>4
16.012	21.329	0.99819	21.20	80.8422	21.3950	-0.066	0.102	0.0254	>4
20.019	28.444	0.99820	21.21	107.7779	28.5232	-0.079	0.120	0.0336	3.57

Calibration certificate # 22581

Serial Number:	0082351	Test stand:	6
Indicator S/N:	0860090286	Procedure:	POS-CAL-103
Indicator Model:	8732	Calibration Date:	2024-02-06
Instrument ID:		Decision rule:	Method #3

Initial results



See the appendix for the guideline of decision rule

Calibration certificate # 22581

Serial Number:	0082351	Test stand:	6
Indicator S/N:	0860090286	Procedure:	POS-CAL-103
Indicator Model:	8732	Calibration Date:	2024-02-06
Instrument ID:		Decision rule:	Method #3

Standard equipment used for final calibration

Description	Model	Serial #	Traceability	Due date
Coriolis flow meter	CMF100	481402	21152	2024-08-02
Micro Motion indicator	2700R	4002663	21152	2024-08-02
PRT 200B	200B	941426/150985501	2023004675	2024-06-20
Fluke Calibrator	726	9007012	CAL89927	2024-10-27
ABB Pressure transducer	261ASD	261AS6505007445	2023001319	2024-02-23
Anton Paar DMA4500	DMA4500 M	81774159	19239	2024-04-11

Final specifications of the device under test

Calibration conditions

Fluid	Water	Fluid	Water
Operation temperature	20 °C	Ambient temperature	22.86 °C
Operation pressure		Ambient pressure	1024.06 mbar
Process fluid density	1000 kg/m ³ @ 4 °C	Calibration fluid density	1000 kg/m ³ @ 4 °C
Process fluid viscosity	1.004 cSt @ 20 °C	Calibration fluid viscosity	1.004 cSt @ 20 °C
Sensor Capacity		Orientation	Horizontal
Span	0-28.41 USGM		
Output Signal	4-20 mA		
Supply	120Vac		
Accuracy	±0.025 %F.S. ±0.25 %O.R. ±0.0416 USGM		

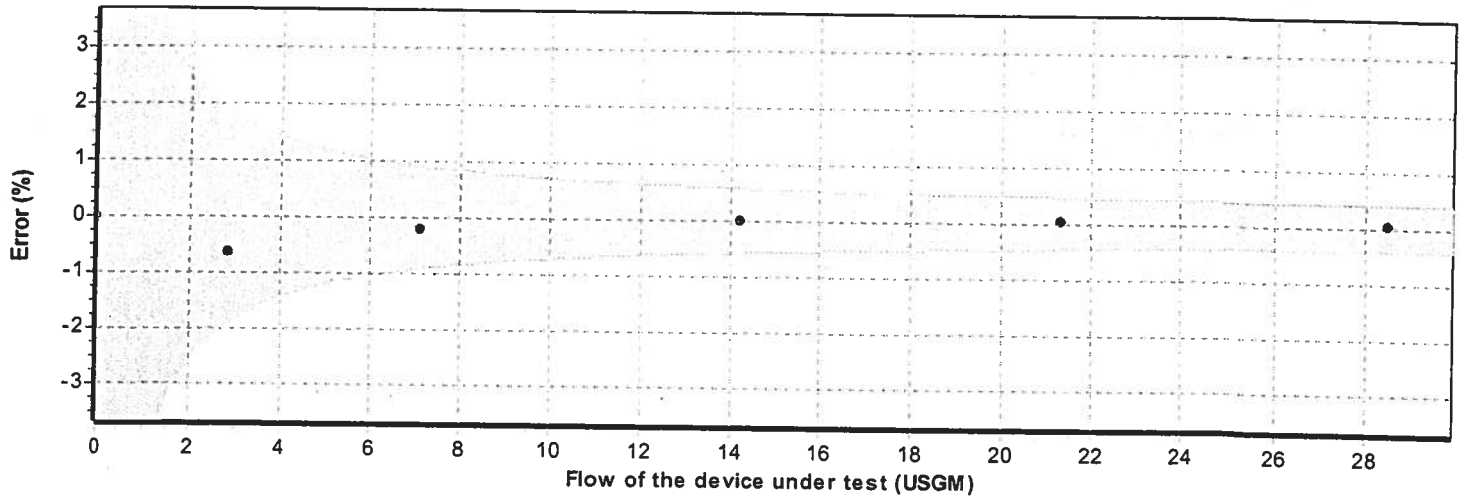
Final readings

Device under test		Measured values			Calculated reference	Calculated error	Acceptable error	Uncertainty	TUR
mA	USGM	Density g/cm ³	Temperature °C	Reference Kg/min	USGM	USGM	USGM	k = 2 USGM	
3.999	-0.002	0.99811	21.37	0.0000	0.0000				
5.603	2.846	0.99815	21.19	10.8193	2.8635	-0.018	0.056	0.0038	>4
8.008	7.117	0.99815	21.21	26.9442	7.1311	-0.014	0.067	0.0087	>4
12.015	14.232	0.99817	21.20	53.7690	14.2303	0.002	0.084	0.0170	>4
16.018	21.339	0.99818	21.25	80.5938	21.3295	0.009	0.102	0.0253	>4
20.041	28.483	0.99818	21.29	107.5998	28.4765	0.006	0.120	0.0336	3.57

Calibration certificate # 22581

Serial Number:	0082351	Test stand:	6
Indicator S/N:	0860090286	Procedure:	POS-CAL-103
Indicator Model:	8732	Calibration Date:	2024-02-06
Instrument ID:		Decision rule:	Method #3

Final results



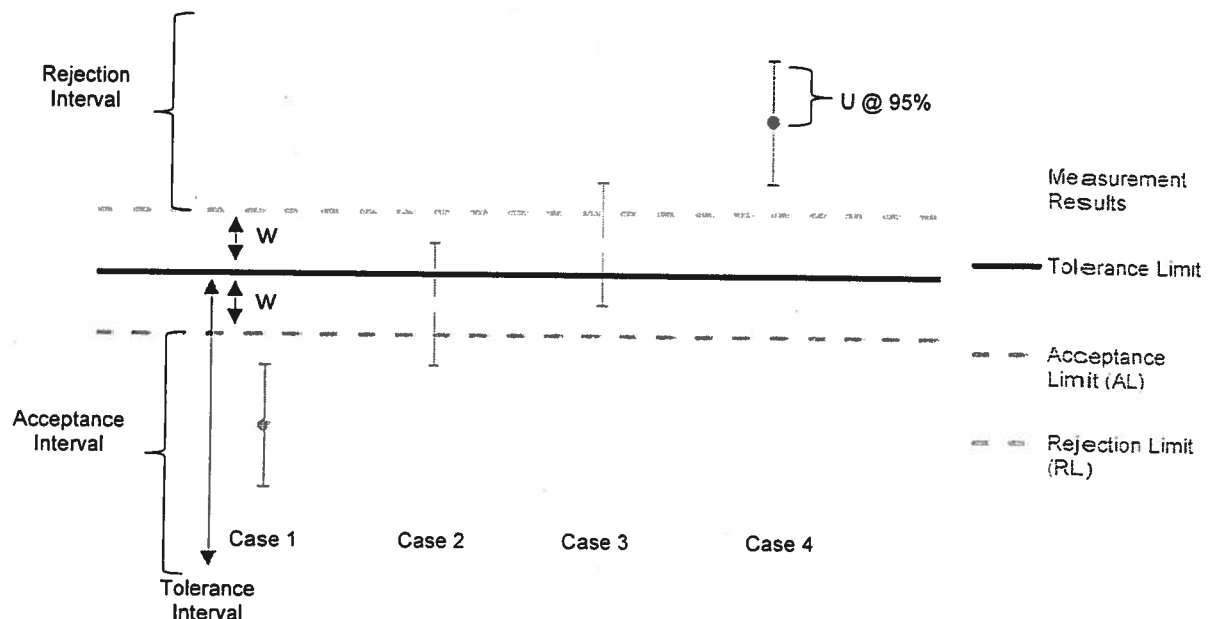
See the appendix for the guideline of decision rule

Appendix for the decision rule

Method #3 Non-binary Statement with Guard Band, uncertainty directly taken into account

This decision rule uses a guard band to define the acceptance and rejection interval. The acceptance limit is defined by the following mathematical formula: $AL = TL - w$ and the rejection limit $RL = TL + w$ where $w = kU$. The multiple k that is multiplied by the expanded measurement uncertainty U can be defined following ILAC G8: 2019 table 1 section 5.2. The expanded measurement uncertainty U has a 95% coverage probability ($k = 2$). Non-binary statement with guard band exists when the result is limited to four choices: pass, conditional pass, conditional fail, and fail.

Statements of conformity are reported as:



Graphical representation of a Non-Binary Statement with a Guard Band

Case 1 – Below acceptance limit AL

Status: In tolerance

- The result is inside the acceptance interval. However, assuming a normal distribution, the risk that the result is outside the tolerance limit could be up to 2.5%. Uncertainty is directly taken into account. *Green*.

Case 2 – Below tolerance limit TL, greater than acceptance limit AL

Status: In tolerance-Conditional

- The result is outside the acceptance interval but below tolerance limit. However, the observed value is inside the guard band $w = TL - AL$ and the status is conditional on the customer's risk assessment. Uncertainty is directly taken into account. *Yellow*.

Case 3 – Greater than tolerance limit, below rejection limit RL

Status: Out of tolerance-Conditional

- The result is greater than tolerance limit but outside the rejection interval. However, the observed value is inside the guard band $w = TL - RL$ and the status is conditional on the customer's risk assessment. Uncertainty is directly taken into account. *Yellow*.

Case 4 – Greater than rejection limit RL

Status: Out of tolerance

- The result is inside the rejection interval. Uncertainty is directly taken into account. *Red*.

Release Purpose: IFR

DOCUMENT COVERSHEET

Document Information					
Project No:	EN207120	Project Name:	World Energy Renew Naphtha/PRU US7L		
Project Doc No:	EN207120-ROTH-9V3-00032		Rev:	00	
Client Doc No:			Rev:		
Vendor Doc No:	MRTR-02	Issue Date:	20-Mar-2024	Rev:	0
Document Title:	MECHANICAL RUN TEST REPORT FOR INTERSTAGE PUMPS				
VDR Code(s)	QT13				
Tag No(s):(1):	18-P-370A, 18-P-370B				

Note 1 – For multiple Tag No: refer to page 2

Review Status			
Status Code:	4	Specifer:	Suhas Patil
		Date:	25 March 2024

Status Code Legend	
Code 1	Reviewed by Air Products – REJECTED Resubmit for Review
Code 2	Reviewed by Air Products – COMMENTS AS NOTED Resubmit for Review
Code 4	Reviewed by Air Products – NO COMMENTS , No Further Submittal Required Unless Drawing/Document is Revised
Code 5	ACCEPTED FOR INFORMATION ONLY

Vendor is not relieved of responsibility for accuracy of dimensions, performance, design, design of details or any code requirements. Further, review by Air Products does not relieve Vendor of responsibility or liability, or from furnishing material in conformance with the contract, purchase order, or other agreement. Air Products' review shall not be construed as an Approval by Air Products of such documents or an opinion by Air Products that such documents are true and accurate.

Purchase Order Information	
Air Products Specifier:	JONESB8
PO Number:	4505675605
PO Date:	23-Mar-2022
Vendor Name:	Roth Pump Company
Vendor Org Code:	ROTH
Vendor SAP ID:	10108755

Air Products Inc.
P.O. No.: 4505675605
Project No.: EN207120
Project Name: World Energy Renew Naphtha /PRU US7L
Location: Paramount, CA

Equipment: Interstage Pumps
Item Nos.: 18-P-370 A/B
Model No.: MDW5253SA
S/N: 64229 - 1 & 2

VDR Code: QT13
SDDC Code: SUP-TRP-010
Doc No.: MRTR-02
Rev. No.: 0

ONE HOUR RUN TEST

We hereby certify that the pumps supplied on the above have been run tested for 1 hour at the respective operating point (758 Feet) and were found to have no leaks or deficiencies in performance.

S/N: 64229 – 1; Item No.: 18-P-370 A

Bearing Temperatures	Start	30 Minutes	60 Minutes
Inboard Bearing	79°F	100°F	104°F
Outboard Bearing	79°F	103°F	104°F

S/N: 64229 – 2; Item No.: 18-P-370 A

Bearing Temperatures	Start	30 Minutes	60 Minutes
Inboard Bearing	78°F	100°F	103°F
Outboard Bearing	78°F	101°F	103°F

Release Purpose: IFR

DOCUMENT COVERSHEET

Document Information					
Project No:	EN207120	Project Name:	World Energy Renew Naphtha/PRU US7L		
Project Doc No:	EN207120-ROTH-9V3-00042		Rev:	00	
Client Doc No:			Rev:		
Vendor Doc No:	NDETR-02	Issue Date:	03-Feb-2024	Rev:	0
Document Title:	NDE TEST REPORTS (PMI AND DYE PENETRANT TESTING) FOR INTERSTAGE PUMPS				
VDR Code(s)	QT06				
Tag No(s):(1):	18-P-370A, 18-P-370B				

Note 1 – For multiple Tag No: refer to page 2

Review Status			
Status Code:	4	Specifer:	APPROVED
		Date:	By PATILS5 at 11:47 am, Feb 20, 2024

Status Code Legend	
Code 1	Reviewed by Air Products – REJECTED Resubmit for Review
Code 2	Reviewed by Air Products – COMMENTS AS NOTED Resubmit for Review
Code 4	Reviewed by Air Products – NO COMMENTS , No Further Submittal Required Unless Drawing/Document is Revised
Code 5	ACCEPTED FOR INFORMATION ONLY

Vendor is not relieved of responsibility for accuracy of dimensions, performance, design, design of details or any code requirements. Further, review by Air Products does not relieve Vendor of responsibility or liability, or from furnishing material in conformance with the contract, purchase order, or other agreement. Air Products' review shall not be construed as an Approval by Air Products of such documents or an opinion by Air Products that such documents are true and accurate.

Purchase Order Information	
Air Products Specifier:	JONESB8
PO Number:	4505675605
PO Date:	23-Mar-2022
Vendor Name:	Roth Pump Company
Vendor Org Code:	ROTH
Vendor SAP ID:	10108755



ACUREN

LIQUID PENETRANT EXAMINATION REPORT

Air Products Inc.
P.O. No.: 4505675605
Project No.: EN207120
Project Name: World Energy Renew Naphtha /PRU US7L
Location: Paramount, CA

VDR Code: QT06
SDDC Code: SUP-TRP-019
Doc No.: NDETR-02
Document Name: NDE Test Reports
(PMI & Dye Penetrant Testing)
Rev. No.: 0

Equipment: Interstage Pumps
Item Nos.: 18-P-370 A/B
Model No.: MDW5253SA
S/N: 64229 - 1 & 2

Acuren Inspection, Inc.

4566 Abrahamson Road
Duluth, Minnesota 55811
Phone: 218.722.5555

www.acuren.com

A Higher Level of Reliability

Report Number: DUL610271

Page 1 of 1

CUSTOMER: Roth Pump Mfg. Company				ACUREN SERVICE CALL #: 358-J106740		DATE: 12/07/2023			
LOCATION/ADDRESS: Acuren Shop - Davenport				CUSTOMER CONTACT: Amanda Sturgill					
PART # / DRAWING #: L3A837SL 58-11D-B / C7M323SL 255-44E-10 IB / L3A838SL 52-2K-1				CUSTOMER PO #: 53148		CUSTOMER WO #: S.O. 64229 #1			
ITEM DESCRIPTION: Booster Case / Cover / Case				STAGE OF MANUFACTURE: Final		SURFACE CONDITION: As Welded			
SURFACE PREPARATION: None		COMMENT: None		PARTS INSPECTED: 14		ACCEPTABLE: 14		REJECTED: 0	
NDE PROCEDURE PT-1		REV. 36		SPECIFICATION/CODE ASME Sec. V		REV./EDITION 2023 Edition		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 #: 22L04C		APPLICATION: Spray		DRYING METHOD / TIME: Normal Evaporation 5 min.		TEMPERATURE: 70 °F	
PENETRANT: SKL-SP2		BATCH #: 15L03K		APPLICATION: Brush		DWELL TIME: 10 min.		TEMPERATURE: 70 °F	
CLEANING (EMULSIFIER): SKC-S		BATCH #: 22L04K		APPLICATION: Wiped		DRYING METHOD / TIME: Normal Evaporation 5 min.		TEMPERATURE: 70 °F	
DEVELOPER: SKD-S2		BATCH #: 22B13C		APPLICATION: Spray		DEVELOP TIME: 10 min.		POST CLEANING: Cleaner / Remover	
BLACKLIGHT MFG. OR LIST APPROVED LIGHT SOURCE: N/A		SERIAL NO. N/A		LIGHTMETER MFG. Extech		SERIAL NO. Z317228		CAL. DUE DATE: 05/29/2024	
								INTENSITY: 160 ☒ FC ☐ LUX ☐ µW/CM²	

Items	Quantity	Comments	Accept/Reject
Booster Case		Booster Case outlet to 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 weld	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: No indications found at the time of inspection. Inspection performed per procedure.		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	
Robert Doyal		12/07/2023	
Print Name / Signature		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.



ACUREN

LIQUID PENETRANT EXAMINATION REPORT

Air Products Inc.
P.O. No.: 4505675605
Project No.: EN207120
Project Name: World Energy Renew Naphtha /PRU US7L
Location: Paramount, CA

VDR Code: QT06
SDDC Code: SUP-TRP-019
Doc No.: NDETR-02
Document Name: NDE Test Reports
(PMI & Dye Penetrant Testing)
Rev. No.: 0

Equipment: Interstage Pumps
Item Nos.: 18-P-370 A/B
Model No.: MDW5253SA
S/N: 64229 - 1 & 2

Acuren Inspection, Inc.

4566 Abrahamson Road
Duluth, Minnesota 55811
Phone: 218.722.5555

www.acuren.com

A Higher Level of Reliability

Report Number: DUL980144

Page 1 of 1

CUSTOMER: Roth Pump Mfg. Company				ACUREN SERVICE CALL #: 358-J106740		DATE: 12/07/2023			
LOCATION/ADDRESS: Acuren Shop - Davenport				CUSTOMER CONTACT: Amanda Sturgill					
PART # / DRAWING #: L3A837SL 58-11D-B / C7M323SL 255-44E-10 IB / L3A838SL 52-2K-1				CUSTOMER PO #: 53148		CUSTOMER WO #: S.O. 64229 #2			
ITEM DESCRIPTION: Booster Case / Cover / Case				STAGE OF MANUFACTURE: Final		SURFACE CONDITION: As Welded			
SURFACE PREPARATION: None		COMMENT: None		PARTS INSPECTED: 14		ACCEPTABLE: 14		REJECTED: 0	
NDE PROCEDURE PT-1		REV. 36		SPECIFICATION/CODE ASME Sec. V		REV./EDITION 2023 Edition		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 #: 22L04C		APPLICATION: Spray		DRYING METHOD / TIME: Normal Evaporation 5 min.		TEMPERATURE: 70 °F	
PENETRANT: SKL-SP2		BATCH #: 15L03K		APPLICATION: Brush		DWELL TIME: 10 min.		TEMPERATURE: 70 °F	
CLEANING (EMULSIFIER): SKC-S		BATCH #: 22L04K		APPLICATION: Wiped		DRYING METHOD / TIME: Normal Evaporation 5 min.		TEMPERATURE: 70 °F	
DEVELOPER: SKD-S2		BATCH #: 22B13C		APPLICATION: Spray		DEVELOP TIME: 10 min.		POST CLEANING: Cleaner / Remover	
BLACKLIGHT MFG. OR LIST APPROVED LIGHT SOURCE: N/A		SERIAL NO. N/A		LIGHTMETER MFG. Extch		SERIAL NO. Z317228		CAL. DUE DATE: 05/29/2024	
								INTENSITY: 160 ☒ FC ☐ LUX ☐ µW/CM²	
Items	Quantity	Comments						Accept/Reject	
Booster Case		Booster Case outlet to 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 weld						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: No indications found at the time of inspection. Inspection performed per procedure.				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

Robert Doyal

12/07/2023

II

Print Name / Signature

Date

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.



Q.C. METALLURGICAL LABORATORY INC.

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

TEST REPORT

December 11, 2023

Customer: Roth Pump

525 4th Street West, Milan IL

Date Sample Arrived: Onsite Testing

Report Number: 48359

Sample I.D.: See Table

Sample Condition: As Received

Test Method(s): ASTM E572

Method Deviations: None

To: Correen Montgomery

cmontgomery@rothpump.com

Date Tested: 12/11/23

A2LA Accreditation: 1238-01, Expires 12/31/2023

Test Location: Roth Pump Milan IL.

Sampling Procedure: NA

A2LA Accredited Test Procedure(s): ASTM E572

P.O.#: 53174

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% 316/L 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.

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

Air Products Inc.
P.O. No.: 4505675605
Project No.: EN207120
Project Name: World Energy Renew Naphtha /PRU US7L
Location: Paramount, CA

Equipment: Interstage Pumps
Item Nos.: 18-P-370 A/B
Model No.: MDW5253SA
S/N: 64229 - 1 & 2

Report 48359

VDR Code: QT06
SDDC Code: SUP-TRP-019
Doc No.: NDETR-02
Document Name: NDE Test Reports (PMI & Dye Penetrant Testing)
Rev. No.: 0

Accredited to
ISO/IEC 17025: 2017

NRC Compliant
10CFR Part 50, App B

IA & IL Certified
Lab Certification 084

Data 48359

**Air Products, Roth Order# 64229
Pump #1**

Sample ID	Part #	Description	Material Grade	Cr%	Ni%	Si%	S%	Mn%	Mo%	Fe%	Cu%
1	C6L704SJ	MD51-10A Driven End Shaft	416	12.7	0.4	0.4	0.3	0.6	0.1	85.0	0.3
2	C8S861SJ	MD51-44A Adapter Flange	416	11.8	0.3	0.6	0.2	1.0	0.1	85.6	0.2
3	L3A838SL	52-2K -1 Case	CF3M	19.1	9.5	1.5	< LOD	0.8	2.5	65.5	< LOD
4		Pipe	CF3M	17.4	12.1	1.3	< LOD	1.0	2.0	65.5	0.2
5		Elbow	316	16.3	11.4	0.5	< LOD	0.9	2.0	67.6	0.3
6		Elbow	316	16.7	11.0	0.6	< LOD	0.8	1.9	67.3	0.3
7		Pipe	316	16.9	12.2	0.8	< LOD	1.0	1.9	65.9	0.2
8		Flange	316	17.1	10.0	0.6	< LOD	1.8	1.9	68.0	0.4
9	C7M323SL	255-44W-10 IB Cover	316	16.7	10.2	0.4	< LOD	1.6	2.0	68.4	0.3
10		Pipe	316	17.0	12.3	0.7	< LOD	1.1	2.0	65.8	0.2
11		Flange	316	16.5	10.1	0.5	< LOD	1.6	1.9	67.4	0.4
12	L3A837SL	58-11D-B Booster Case	CF3M	19.6	9.1	1.1	< LOD	1.0	2.3	66.5	< LOD
13		Pipe	316	17.4	12.7	0.7	< LOD	1.2	2.4	65.3	< LOD
14		Elbow	316	16.2	10.3	0.7	< LOD	1.0	2.0	68.2	0.3
15		Pipe	316	17.2	12.2	0.8	< LOD	1.1	1.9	66.1	0.1
16		Flange	316	16.7	10.5	0.4	< LOD	1.6	2.0	67.9	0.4
17		Pipe	316	17.6	12.0	1.1	< LOD	1.5	2.1	64.3	0.2
18		Elbow	316	16.8	10.1	1.0	< LOD	1.0	2.0	67.7	0.4
19		Flange	316	16.5	10.3	0.4	< LOD	1.8	1.9	68.1	0.5
20	C6L591SA	MD52-10-1 Shaft	316	16.5	10.6	0.4	< LOD	1.3	1.9	67.9	0.4
21	D2P188SA	FNB532-1 liner	CF3M	19.6	9.1	1.0	< LOD	0.9	2.1	66.6	0.3
22	D2P189SL	FNB532-4 liner	CF3M	19.0	9.5	0.8	< LOD	0.7	2.1	66.7	0.3
23	L2M287SA	FHP2253-3B Impeller	316	16.4	10.3	0.7	< LOD	1.5	2.0	68.3	0.3
24	L3B167SA	58F-3 Booster Impeller	CF3M	19.2	10.2	0.8	< LOD	0.9	2.1	66.1	0.3
25	L3A026SA	58C-1 OB Cover	316	16.4	10.3	0.7	< LOD	1.5	1.9	68.0	0.4

<LOD – Below the instruments level of detection

Air Products Inc.
P.O. No.: 4505675605
Project No.: EN207120
Project Name: World Energy Renew Naphtha /PRU US7L
Location: Paramount, CA

Equipment: Interstage Pumps
Item Nos.: 18-P-370 A/B
Model No.: MDW5253SA
S/N: 64229 - 1 & 2

VDR Code: QT06
SDDC Code: SUP-TRP-019
Doc No.: NDETR-02
Document Name: NDE Test Reports (PMI & Dye Penetrant Testing)
Rev. No.: 0

Report 48359

Accredited to
ISO/IEC 17025: 2017

NRC Compliant
10CFR Part 50, App B

IA & IL Certified
Lab Certification 084

7

Data 48359

Air Products, Roth Order# 64229

Pump #2

Sample ID	Part #	Description	Material Grade	Cr%	Ni%	Si%	S%	Mn%	Mo%	Fe%	Cu%
26	C6L704SJ	MD51-10A Driven End Shaft	416	12.8	0.4	0.5	0.3	0.6	0.1	84.8	0.3
27	C8S861SJ	MD51-44A Adapter Flange	416	11.8	0.3	0.4	0.2	1.0	< LOD	85.9	0.2
28	L3A838SL	52-2K -1 Case	CF3M	19.1	9.7	1.3	< LOD	0.7	2.3	66.7	< LOD
29		Pipe	316	17.0	12.9	0.7	< LOD	1.0	2.0	65.7	0.2
30		Elbow	316	16.3	11.0	0.7	< LOD	0.8	2.0	66.0	0.4
31		Elbow	316	16.5	11.2	0.5	< LOD	0.8	2.0	66.9	0.3
32		Pipe	CF3M	17.4	12.1	1.0	< LOD	1.3	2.0	64.8	0.2
33		Flange	316	17.0	10.1	0.6	< LOD	1.7	2.0	67.9	0.4
34	C7M323SL	255-44W-10 IB Cover	316	16.7	10.2	0.5	< LOD	1.5	1.9	68.4	0.2
35		Pipe	316	17.7	12.0	0.6	< LOD	1.1	2.1	65.8	0.2
36		Flange	316	16.6	10.3	0.5	< LOD	1.6	2.0	68.1	0.5
37	L3A837SL	58-11D-B Booster Case	CF3M	18.5	9.5	0.9	< LOD	0.9	2.3	67.9	< LOD
38		Pipe	316	16.8	12.7	0.7	< LOD	1.0	2.1	65.9	0.2
39		Elbow	316	16.0	10.5	1.0	< LOD	1.0	2.1	68.1	0.3
40		Pipe	316	17.2	12.4	0.6	< LOD	1.1	2.0	65.9	0.2
41		Flange	316	16.6	10.0	0.5	< LOD	1.6	2.1	67.0	0.4
42		Pipe	316	17.8	12.6	0.7	< LOD	1.5	2.3	64.9	0.2
43		Elbow	316	16.8	10.2	0.7	< LOD	0.9	2.0	68.6	0.4
44		Flange	316	16.6	10.0	0.8	< LOD	1.5	2.0	67.1	0.4
45	C6L591SA	MD52-10-1 Shaft	316	16.6	10.5	0.5	< LOD	1.3	1.9	67.6	0.3
46	D2P188SA	FNB532-1 liner	CF3M	19.7	9.2	1.0	< LOD	0.6	2.1	66.4	0.4
47	D2P189SL	FNB532-4 liner	CF3M	19.6	10.1	1.0	< LOD	0.7	2.2	64.9	0.2
48	L2M287SA	FHP2253-3B Impeller	316	16.4	10.1	0.7	< LOD	1.7	1.9	67.6	0.4
49	L3B167SA	58F-3 Booster Impeller	CF3M	18.8	9.0	0.8	< LOD	1.0	2.2	67.7	0.3
50	L3A026SA	58C-1 OB Cover	316	16.8	10.4	0.4	< LOD	1.6	2.0	67.6	0.3

<LOD – Below the instruments level of detection

Air Products Inc.
P.O. No.: 4505675605
Project No.: EN207120
Project Name: World Energy Renew Naphtha /PRU US7L
Location: Paramount, CA

Equipment: Interstage Pumps
Item Nos.: 18-P-370 A/B
Model No.: MDW5253SA
S/N: 64229 - 1 & 2

VDR Code: QT06
SDDC Code: SUP-TRP-019
Doc No.: NDETR-02
Document Name: NDE Test Reports (PMI & Dye Penetrant Testing)
Rev. No.: 0

Report 48359

Accredited to
ISO/IEC 17025: 2017

NRC Compliant
10CFR Part 50, App B

IA & IL Certified
Lab Certification 084

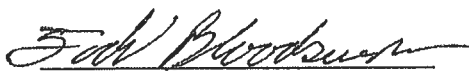
Equivalent ASTM Material Specification

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	0.15 max	12.0-14.0	----	1.0 max	1.25 max.	----	----	Balance	0.15 min

Air Products Inc.
P.O. No.: 4505675605
Project No.: EN207120
Project Name: World Energy Renew Naphtha /PRU US7L
Location: Paramount, CA

Equipment: Interstage Pumps
Item Nos.: 18-P-370 A/B
Model No.: MDW5253SA
S/N: 64229 - 1 & 2

VDR Code: QT06
SDDC Code: SUP-TRP-019
Doc No.: NDETR-02
Document Name: NDE Test Reports (PMI & Dye Penetrant Testing)
Rev. No.: 0


Todd Bloodsworth/Technician


Zahirul M Hoque, Metallurgical Engineer

Report 48359

Accredited to
ISO/IEC 17025: 2017

NRC Compliant
10CFR Part 50, App B

IA & IL Certified
Lab Certification 084

7

Release Purpose: IFR

DOCUMENT COVERSHEET

Document Information					
Project No:	EN207120	Project Name:	World Energy Renew Naphtha/PRU US7L		
Project Doc No:	EN207120-ROTH-9V3-00048		Rev:	1	
Client Doc No:			Rev:		
Vendor Doc No:	MOTR-02	Issue Date:	06-May-24	Rev:	2
Document Title:	Motor Test Report				
VDR Code(s)	QC43				
Tag No(s):(1):	18-P-370 A/B				

Note 1 – For multiple Tag No: refer to page 2

Review Status			
Status Code:	4	Specifer:	APPROVED By PATILS5 at 12:10 pm, May 14, 2024
		Date:	

Status Code Legend	
Code 1	Reviewed by Air Products – REJECTED Resubmit for Review
Code 2	Reviewed by Air Products – COMMENTS AS NOTED Resubmit for Review
Code 4	Reviewed by Air Products – NO COMMENTS , No Further Submittal Required Unless Drawing/Document is Revised
Code 5	ACCEPTED FOR INFORMATION ONLY
Vendor is not relieved of responsibility for accuracy of dimensions, performance, design, design of details or any code requirements. Further, review by Air Products does not relieve Vendor of responsibility or liability, or from furnishing material in conformance with the contract, purchase order, or other agreement. Air Products' review shall not be construed as an Approval by Air Products of such documents or an opinion by Air Products that such documents are true and accurate.	

Purchase Order Information	
Air Products Specifier:	RAUBERFK
PO Number:	4505675605
PO Date:	3/23/2022
Vendor Name:	Roth Pump Company
Vendor Org Code:	ROTH
Vendor SAP ID:	10108755

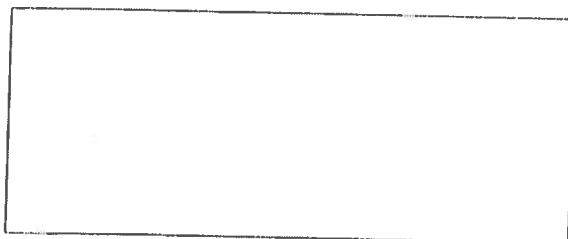


Release Purpose: IFR

Tag No (s):

**ABB Motors and
Mechanical Inc.**

Customer Report of Electrical Test



Customer Purch. Order: 52681
Sales Order No:
Shop Order No.: Z0423/0275
Catalog No: 09-0000-0981
Serial Number: Z2304181562
Customer Number: TAG NO. 18-P-370 AM
Manufacturing Plant: OZARK

Basic Configuration

Power	Enclosure	Enclosure Enhancement		Efficiency	Frame Size		Duty
20	TEFC	N/A		91.0	256TC		N/A
RPM	Phase / Hertz - Voltage	Design Letter	Poles	Motor Std	Bearing Type DE / ODE		Frame Motor Orientation
3510	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	INTERSTAGE PUMP

Motor Data

Test Date	Elect Design	Mech Design	Drive End Bearing	Opposite Drive End Bearing	Full Load Amps	Locked kVA/HP
04/20/23 05:48:07		N/A	6309	6309	22	G

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	457.833433	5.04879	0.870551	60	2551	0.48008	0.479337	0.476576	25

*TEST HELD
FOR 1 SECOND

Vibration Test Results

VELOCITY IN/SEC (P)							ODE HORIZ	ODE VERT	DE HORIZ	DE VERT	DE AXIAL
Frequency(Her)	RPM	ODE HORI	ODE VERT	DE HORIZ	DE VERT	DE AXIAL					
47.00 - 63.00	3600	0.0158	0.0183	0.0106	0.0423	0.0064					
95.00 - 125.00	3600	0.0043	0.0045	0.0151	0.0113	0.0099					
8.00 - 2000.00	3600	0.0237	0.0336	0.0285	0.0545	0.0274					
9.00 - 2000.00	3600	0.0275	0.0388	0.0290	0.0570	0.0271					

Other Information

Power Factor - 91
Locked Rotor Current - 43.9 LB-FT. / 145 Amps

Locked Rotor Current Test Results are provided on IEEE112
Routine Tests (additional cost)

RTJ

Air Products Inc.
P.O. No.: 4505675605
Project No.: EN207120
Project Name: World Energy Renew Naphtha /PRU US7L
Location: Paramount, CA

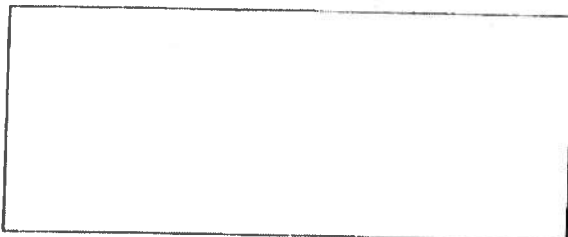
Equipment: Interstage Pumps
Item Nos.: 18-P-370 A/B
Model No.: MDW5253SA
S/N: 64229 - 1 & 2

VDR Code: QC43
SDDC Code: SUP-TRP-017
Doc No.: MOTR-02
Document Name: Motor Test Report
Rev. No.: 2

* if measured, optional

**ABB Motors and
Mechanical Inc.**

Customer Report of Electrical Test



Customer Purch. Order: 52681
Sales Order No:
Shop Order No.: Z0223/0648
Catalog No: 09 0000-0981
Serial Number: Z2303090047
Customer Number: TAG NO. 18-P-370 BM
Manufacturing Plant: OZARK

Basic Configuration

Power	Enclosure	Enclosure Enhancement		Efficiency	Frame Size		Duty
20	TEFC	N/A		91.0	256TC		N/A
RPM	Phase / Hertz - Voltage	Design Letter	Poles	Motor Std	Bearing Type DE / ODE		Frame Motor Orientation
3510	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	INTERSTAGE PUMP

Motor Data

Test Date	Elect Design	Mech Design	Drive End Bearing	Opposite Drive End Bearing	Full Load Amps	Locked kVA/HP
03/13/23 06:01:53		N/A	6309	6309	22	G

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	458.317033	5.213681	1.312682	60	2534	0.485285	0.594818	0.594021	25

*TEST HELD
FOR 1 SECOND

Vibration Test Results

VELOCITY IN/SEC (P)							ODE HORIZ	ODE VERT	DE HORIZ	DE VERT	DE AXIAL
Frequency(Her	RPM	ODE HORI	ODE VERT	DE HORIZ	DE VERT	DE AXIAL					
-	103	60.7043	2.0000	59.8234	2.0000	2.0000					
47.00 - 63.00	3598	0.0263	0.0153	0.0295	0.0280	0.0056					
95.00 - 125.00	3598	0.0020	0.0026	0.0025	0.0025	0.0025					
8.00 - 2000.00	3598	0.0267	0.0174	0.0300	0.0285	0.0071					

Other Information

Power Factor - 91
Locked Rotor Current - 43.9 LB-FT / 145 Amps

Locked Rotor Current Test Results are provided on IEEE112
Routine Tests (additional cost)

Air Products Inc.
P.O. No.: 4505675605
Project No.: EN207120
Project Name: World Energy Renew Naphtha /PRU US7L
Location: Paramount, CA

Equipment: Interstage Pumps
Item Nos.: 18-P-370 A/B
Model No.: MDW5253SA
S/N: 64229 - 1 & 2

VDR Code: QC43
SDDC Code: SUP-TRP-017
Doc No.: MOTR-02
Document Name: Motor Test Report
Rev. No.: 2

RTJ

* if measured, optional

Release Purpose: IFR

DOCUMENT COVERSHEET

Document Information					
Project No:	EN207120	Project Name:	World Energy Renew Naphtha/PRU US7L		
Project Doc No:	EN207120-ROTH-9V3-00038		Rev:	00	
Client Doc No:			Rev:		
Vendor Doc No:	MTR-02	Issue Date:	03-Feb-2024	Rev:	0
Document Title:	MATERIAL TEST REPORTS FOR INTERSTAGE PUMPS				
VDR Code(s)	FG04				
Tag No(s):(1):	18-P-370A, 18-P-370B				

Note 1 – For multiple Tag No: refer to page 2

Review Status			
Status Code:	4	Specifer:	APPROVED By PATILS5 at 11:47 am, Feb 20, 2024
		Date:	

Status Code Legend	
Code 1	Reviewed by Air Products – REJECTED Resubmit for Review
Code 2	Reviewed by Air Products – COMMENTS AS NOTED Resubmit for Review
Code 4	Reviewed by Air Products – NO COMMENTS , No Further Submittal Required Unless Drawing/Document is Revised
Code 5	ACCEPTED FOR INFORMATION ONLY

Vendor is not relieved of responsibility for accuracy of dimensions, performance, design, design of details or any code requirements. Further, review by Air Products does not relieve Vendor of responsibility or liability, or from furnishing material in conformance with the contract, purchase order, or other agreement. Air Products' review shall not be construed as an Approval by Air Products of such documents or an opinion by Air Products that such documents are true and accurate.

Purchase Order Information	
Air Products Specifier:	JONESB8
PO Number:	4505675605
PO Date:	23-Mar-2022
Vendor Name:	Roth Pump Company
Vendor Org Code:	ROTH
Vendor SAP ID:	10108755

Air Products
Roth order 64229

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	52432	SP1824-10
L3A838SL	52-2K -1 Case	316LSS casting(52-2J)	45941 52424	336E 492R
C7M323SL	255-44W-10 IB Cover	9"dia X 1.78 316LSS Slug	52535	SP2810-20
L3A837SL	58-11D-B Booster Case	316LSS casting(58-11D)	52423 52423	371R 372R
C6L591SA	MD52-10-1 Shaft Liquid End	1-3/4" dia 316L SS bar	52657	V88J
D2P188SA	FNB532-1 liner	316L SS casting(512-1)	51959	538P
D2P189SL	FNB532-4 liner	316L SS casting(512-4)	51538	409N
L2M287SA	FHP2253-3B Impeller	6" dia 316L SS	52166	185645
L3B167SA	58F-3 Booster Impeller	316LSS casting(56H-3)	52500	473R
L3A026SA	58C-1 OB Cover	6-1/4" dia 316L SS bar	52166	SP1293-70X

Air Products Inc.
P.O. No.: 4505675605
Project No.: EN207120
Project Name: World Energy Renew Naphtha /PRU US7L
Location: Paramount, CA

Equipment: Interstage Pumps
Item Nos.: 18-P-370 A/B
Model No.: MDW5253SA
S/N: 64229 - 1 & 2

VDR Code: FG04
SDDC Code: SUP-TRP-018
Doc No.: MTR-02
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

Line Total: 379 LB

HEAT: Y45X

ITEM: 509941

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

DESCRIPTION	YLD STR	ULT TEN	%ELONG	%RED	HARDNESS
	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

Line Total: 379 LB

HEAT: Y45X

ITEM: 509941

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

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 01 of 02

Certification Date
1-MAR-2023

CUSTOMER ORDER NUMBER

52432

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

Invoice Number
T635173

CUSTOMER PART NUMBER

C6M072SJ

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: 416 HR ANN RT BAR
6 RD S/C 6'0" (72")
HEAT: SP1824-10

ASTM A582
Line Total: 577 LB

ITEM: 509986

Specifications:

AMS 5610 P
EN 10204 3.1

ASTM A582 21

ASTM A388

CHEMICAL ANALYSIS

C	SI	MN	P	S	NI	CR	CU
0.13	0.37	0.92	0.029	0.36	0.32	12.20	0.15
N	MO						
0.03	0.05						

RCPT: R481707

VENDOR: GLORIA MATERIAL TECHNOLOGY

COUNTRY OF ORIGIN : TAIWAN

MECHANICAL PROPERTIES

DESCRIPTION	YLD STR KSI	ULT TEN KSI	%ELONG IN 02 IN	%RED IN AREA	HARDNESS BHN
	52.0	83.0	26.5	53.0	182

DEVELOPED HARDNESS 43 RC

GRAIN SIZE :7 -

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
1-MAR-2023

CUSTOMER ORDER NUMBER

52432

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

Invoice Number
T635173

CUSTOMER PART NUMBER

C6M072SJ

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: 416 HR ANN RT BAR
6 RD S/C 6'0" (72")
HEAT: SP1824-10

ASTM A582
Line Total: 577 LB

ITEM: 509986

STRAND CAST REDUCTION RATIO 8.0 TO 1
MATERIAL IS FREE FROM MERCURY CONTAMINATION
NO WELD REPAIR PERFORMED ON MATERIAL
ULTRASONIC: YES
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 #: 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

GA 1/9/ 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



Material Certification

Heat #: 492R 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:	0.016	Cu:	0.0461	W:	0.0124
Si:	0.743	Al:	0.0429	Zn:	
Mn:	0.733	Co:	0.0513	Pb:	
P:	0.0112	Mg:		Sb:	
S:	0.0106	Nb:	0.0109	N:	0.0509
Cr:	18.97	Sn:	0.00283	Fe:	66.8
Mo:	2.34	Ti:	0.00493		
Ni:	10.11	V:	0.0421		

Physical Properties

Tensile Strength (PSI)	81,600
Yield Strength (PSI)	38,500
Elongation (%)	50
Hardness (BHN)	156

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

CERTIFICATE OF TEST



Page 01 of 02

Certification Date
10-APR-2023

CUSTOMER ORDER NUMBER

52535

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

Invoice Number
T636518

CUSTOMER PART NUMBER

C6M097SL-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 0'1.93" (1.93")
HEAT: SP2810-20

ASTM A479
Line Total: 208.9225 LB

ITEM: 509379

Specifications:

AMS 5648 M
ASTM A276 17
AMS QQS 763 (EXCEPT D
ISO 17945 EXCEPT 15
ASTM A388/A388M

AMS 5653 J
ASTM A479 20
MIL-H-6875)
HS TEST AND SURFACE
ASTM A262 PR E

QQ S 763
ASME SA479 21
NACE MR0103 15
HARDNESS
ASTM E112

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: R515420

VENDOR: GLORIA MATERIAL TECHNOLOGY

COUNTRY OF ORIGIN : TAIWAN

MECHANICAL PROPERTIES

DESCRIPTION	YLD STR KSI	ULT TEN KSI	%ELONG IN 02 IN	%RED IN AREA	HARDNESS BHN
	41.915	84.121	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
10-APR-2023

CUSTOMER ORDER NUMBER

52535

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

Invoice Number
T636518

CUSTOMER PART NUMBER

C6M097SL-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 0'1.93" (1.93")
HEAT: SP2810-20

ASTM A479
Line Total: 208.9225 LB

ITEM: 509379

VACUUM DEGASSED MATERIAL IS FREE FROM MERCURY CONTAMINATION
NO WELD REPAIR PERFORMED ON MATERIAL
THERMAL TREATMENT: OK
SOLUTION TREATMENT: 1900 DEG F MINIMUM, WATER COOLED
CORROSION: OK
MICRO1: OK

COMMENTS

red. ratio 5.4:1

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



Manager, Quality Assurance



Material Certification

Heat #: 371R Date: 3/29/2023

Customer:	Roth	Material:	ASTM A351 CF3M
Purchase Order	52423	Line #:	1
Part Number:	58-11D	Pieces:	3
Description:		Item #:	L3A62SSL
		Country of Origin:	USA

Chemical Composition

C:	0.0186	Cu:	0.0788	W:	0.0192
Si:	0.775	Al:	0.0395	Zn:	
Mn:	0.834	Co:	0.0662	Pb:	
P:	0.0133	Mg:		Sb:	
S:	0.0127	Nb:	0.0127	N:	0.0597
Cr:	18.18	Sn:	0.00352	Fe:	68.1
Mo:	2.36	Ti:	0.00579		
Ni:	9.43	V:	0.04		

Physical Properties

Tensile Strength (PSI)	79,800
Yield Strength (PSI)	39,200
Elongation (%)	49
Hardness (BHN)	162

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
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F-057 Rev 2 1/17/2019



Material Certification

Heat #: 372R Date: 3/29/2023

Customer:	Roth	Material:	ASTM A351 CF3M
Purchase Order	52423	Line #:	1
Part Number:	58-11D	Pieces:	3
Description:		Item #:	L3A625SL
		Country of Origin:	USA

Chemical Composition

C:	0.0173	Cu:	0.0787	W:	0.0179
Si:	0.757	Al:	0.0502	Zn:	
Mn:	0.811	Co:	0.0676	Pb:	
P:	0.0135	Mg:		Sb:	
S:	0.0115	Nb:	0.0127	N:	0.0593
Cr:	18.22	Sn:	0.00407	Fe:	67.7
Mo:	2.43	Ti:	0.0062		
Ni:	9.7	V:	0.0394		

Physical Properties

Tensile Strength (PSI)	83,000
Yield Strength (PSI)	41,100
Elongation (%)	49
Hardness (BHN)	158

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
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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

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
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

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 #: 538P Date: 10/18/2022

Customer: Roth

Purchase Order 51959

Part Number: 512-1

Description:

Material: ASTM A351 CF8M

Line #: 1 Pieces: 12

Item #: D2P070SA

Country of Origin: USA

Chemical Composition

C:	0.0558	Cu:	0.313	W:	0.0294
Si:	0.816	Al:	0.042	Zn:	
Mn:	0.796	Co:	0.175	Pb:	
P:	0.0347	Mg:		Sb:	
S:	0.0146	Nb:	0.0122	N:	0.078
Cr:	19.28	Sn:	0.00997	Fe:	65.8
Mo:	2.39	Ti:	0.00365		
Ni:	10.07	V:	0.0506		

Physical Properties

Tensile Strength (PSI)	81,200
Yield Strength (PSI)	40,800
Elongation (%)	46

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
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Rev 2

1/17/2019



Material Certification

Heat #: 409N Date: 3/17/2022

Customer: Roth

Material: ASTM A351 CF8M

Purchase Order 51538

Line #: 1

Pieces: 12

Part Number: 512-4

Item #: D2P170SA

Description:

Country of Origin: USA

Chemical Composition

C:	0.0662	Cu:	0.273	W:	0.00615
Si:	0.893	Al:	0.0627	Zn:	
Mn:	0.775	Co:	0.134	Pb:	
P:	0.0238	Mg:		Sb:	
S:	0.0265	Nb:	0.016	N:	0.0539
Cr:	19.56	Sn:	0.00686	Fe:	65.3
Mo:	2.39	Ti:	0.00456		
Ni:	10.34	V:	0.0414		

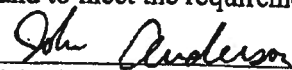
Physical Properties

Tensile Strength (PSI)	79,200
Yield Strength (PSI)	41,300
Elongation (%)	43
Reduction of Area (%)	0
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


John Anderson

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

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(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
17-NOV-2022

CUSTOMER ORDER NUMBER

52166

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

Invoice Number
T632114

CUSTOMER PART NUMBER

C6M072SA

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: 316/316L ANN HR RT BAR
6 RD S/C 6'0" (72")

ASTM A479

HEAT: 185645

ITEM: 509369

Line Total: 577 LB

Specifications:

AMS 5648 M
ASTM A276 17
NACE MR0103 CND A 15
EN 10204 3.1
SAE AMS-QQ-S-763 D
ASTM A314 19
ASTM E112

AMS 5653 J
ASTM A479 21
ASTM A388 19
ASTM A484 21
NACE MR0175 15
ASME SA182 21
ASTM A262-15 PR E/A 21

QQ S 763 F
ASME SA479 15
ASTM A193 B8M CL 1 20
ASME SA320 B8M CL 1 21
UNS S31600/S31603
ASTM E10/E8 18/21

CHEMICAL ANALYSIS

C	MN	P	S	SI	CR	NI	MO
0.011	1.64	0.03	0.024	0.54	16.49	10.11	2.06
CU	CO	N					
0.43	0.14	0.08					

RCPT: R454499

VENDOR: VALBRUNA STAINLESS

COUNTRY OF ORIGIN : CANADA

MECHANICAL PROPERTIES

DESCRIPTION	YLD STR PSI	ULT TEN PSI	%ELONG IN 02 IN	%RED IN AREA	HARDNESS BHN
	35700.0	82100.0	68.7	82.6	149

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.

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

RICHARD PAVLIK

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.

Manager, Quality Assurance

CERTIFICATE OF TEST



Page 02 of 02

Certification Date
17-NOV-2022

CUSTOMER ORDER NUMBER

52166

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

Invoice Number
T632114

CUSTOMER PART NUMBER

C6M072SA

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: 316/316L ANN HR RT BAR
6 RD S/C 6'0" (72")

ASTM A479
Line Total: 577 LB

HEAT: 185645

ITEM: 509369

MATERIAL IS FREE FROM MERCURY CONTAMINATION
NO WELD REPAIR PERFORMED ON MATERIAL
THERMAL TREATMENT: OK
SENS(F) : 1250 / TIME(HR) : 1.5-
CORROSION: OK

COMMENTS

EAF/AOD MELTED & POURED IN CANADA / MFG: USA
ELECTRIC FURNACE MELTED, AOD REFINED
FREE OF MERCURY & LOW MELTING ALLOY CONTAMINATION
HEAT FURNACES USED AIR ATMOSPHERE
CONFORMS TO LISTED SPECIFICATIONS DFARS-BAA 252.225-7009 COMPLIANT
LOCATION OF TENSILE FRACTURE: INSIDE MIDDLE OF GAGE LENGTH %ELONG
AFTER FRACTURE
SPECS CONT: ASTM E1019-18 / E1086-14 / ISO 9001: 2015
RHOS 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



Material Certification

Heat #: 473R Date: 4/14/2023

Customer:	Roth	Material:	ASTM A351 CF8M
Purchase Order	52500	Line #:	1
Part Number:	5611-3	Pieces:	6
Description:		Item #:	L3A165SA
		Country of Origin:	USA

Chemical Composition

C:	0.0447	Cu:	0.351	W:	0.0314
Si:	0.811	Al:	0.0681	Zn:	
Mn:	0.877	Co:	0.159	Pb:	
P:	0.0295	Mg:		Sb:	
S:	0.0307	Nb:	0.0228	N:	0.0744
Cr:	19.36	Sn:	0.00758	Fe:	65.5
Mo:	2.32	Ti:	0.00112		
Ni:	10.31	V:	0.0526		

Physical Properties

Tensile Strength (PSI)	76,900
Yield Strength (PSI)	37,900
Elongation (%)	45
Hardness (BHN)	155

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
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1/17/2019

CERTIFICATE OF TEST



Page 01 of 02

Certification Date
17-NOV-2022

CUSTOMER ORDER NUMBER

52166

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

Invoice Number
T632115

CUSTOMER PART NUMBER

CM070SA

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: 316/316L ANN HR RT BAR
6-1/4 RD S/C 6'0" (72")
HEAT: SP1293-70X

ASTM A479
Line Total: 626 LB

ITEM: 509370

Specifications:

AMS 5648 M
ASTM A276
ASTM A276/A276M 17
AMS QQ S 763 D
ISO 17945 15

AMS 5653 J
ASTM A479
ASTM A479/A479M 20
(EXCEPT MIL H 6875)
ASTM A388/A388M

QQ S 763
ASME SA479
ASME SA479/SA479M 21
NACE MR0103
ASTM A262 PR E

CHEMICAL ANALYSIS

C	SI	MN	P	S	NI	CR	MO
0.03	0.24	1.59	0.032	0.027	10.37	16.65	2.14
CU	W	CO	N	PB			
0.31	0.034	0.16	0.076	0.0001			

RCPT: R458949

VENDOR: GLORIA MATERIAL TECHNOLOGY

COUNTRY OF ORIGIN : TAIWAN

MECHANICAL PROPERTIES

DESCRIPTION	YLD STR	ULT TEN	%ELONG	%RED	HARDNESS
	KSI	KSI	IN 02 IN	IN AREA	BHN
	41.04	84.84	61.0	81.0	151

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.

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
17-NOV-2022

CUSTOMER ORDER NUMBER

52166

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

Invoice Number
T632115

CUSTOMER PART NUMBER

CM070SA

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: 316/316L ANN HR RT BAR

6-1/4 RD S/C 6'0" (72")

HEAT: SP1293-70X

ASTM A479

Line Total: 626 LB

ITEM: 509370

REDUCTION RATIO 10.9 TO 1 MATERIAL IS FREE FROM MERCURY CONTAMINATION
NO WELD REPAIR PERFORMED ON MATERIAL
ULTRASONIC: YES
THERMAL TREATMENT: OK
SOL TREATMT 1900°F MIN WATER COOLED
CORROSION: OK
MACRO: OK
MICRO1: 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.: 4505675605
Project No.: EN207120
Project Name: World Energy Renew Naphtha /PRU US7L
Location: Paramount, CA

Equipment: Interstage Pumps
Item Nos.: 18-P-370 A/B
Model No.: MDW5253SA
S/N: 64229 - 1 & 2

Doc No.: PCR-02
Rev. No.: 0

PAINTING/COATING RECORD

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

Top Coat: Amerlock 400; Grey RAL 7035
Thickness: 4 Mils

Motor has been coated as per manufacture standard two part epoxy; final color will be blue/green.

Release Purpose: #NAME?

DOCUMENT COVERSHEET

Document Information					
Project No:	EN207120	Project Name:	World Energy Renew Naphtha/PRU US7L		
Project Doc No:	EN207120-ROTH-9V3-00052		Rev:	1	
Client Doc No:			Rev:		
Vendor Doc No:	HTR-02	Issue Date:	12/11/2023	Rev:	1
Document Title:	Hydrostatic Test Report				
VDR Code(s)	QC85				
Tag No(s):(1):	18-P-370 A/B				

Note 1 – For multiple Tag No: refer to page 2

Review Status			
Status Code:	4	Specifer:	APPROVED
		Date:	By Vaishnavi Belekar at 3:14 pm, Dec 20, 2023

Status Code Legend	
Code 1	Reviewed by Air Products – REJECTED Resubmit for Review
Code 2	Reviewed by Air Products – COMMENTS AS NOTED Resubmit for Review
Code 4	Reviewed by Air Products – NO COMMENTS , No Further Submittal Required Unless Drawing/Document is Revised
Code 5	ACCEPTED FOR INFORMATION ONLY

Vendor is not relieved of responsibility for accuracy of dimensions, performance, design, design of details or any code requirements. Further, review by Air Products does not relieve Vendor of responsibility or liability, or from furnishing material in conformance with the contract, purchase order, or other agreement. Air Products' review shall not be construed as an Approval by Air Products of such documents or an opinion by Air Products that such documents are true and accurate.

Purchase Order Information	
Air Products Specifier:	RAUBERFK
PO Number:	4505675605
PO Date:	3/23/2022
Vendor Name:	Roth Pump Company
Vendor Org Code:	ROTH
Vendor SAP ID:	10108755

Release Purpose: #NAME?

Tag No (s):

**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.: 4505675605
Project No.: EN207120
Project Name: World Energy Renew Naphtha /PRU US7L
Location: Paramount, CA

Equipment: Interstage Pumps
Item Nos.: 18-P-370 A/B
Model No.: MDW5253SA
S/N: 64229 - 1 & 2

CERTIFICATE OF HYDROSTATIC TEST

Date: October 17, 2023
Items Tested: Pump casing
Test No.: 56876
Test Result: X Pass Fail (check one)
Test Pressure: 1100 PSI Start 1100 PSI Finish
Test Medium: Distilled Water
Test Temperature: 65°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: 10/17/23
For the Roth Pump Company

VDR Code: QC85
SDDC Code: SUP-TRP-029
Doc No.: HTR-02
Rev. No.: 1



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

Gage 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

MDW5253SA
64229 - 1

PO#: 4505675605
ITEM NO.: P-18P370 A

INTERSTAGE PUMP
TRACKING NO
C250000100

MDW5253SA
64229 - 2

PO#: 4505675605
ITEM NO.: P-18P370 B

INTERSTAGE PUMP
TRACKING NO
C250000100



Static Leak Test

Certified Acceptable by Seal Manufacturer

test pressure 25 ☒ psig ☐ barg ☐ MPag
media used ☒ air ☐ nitrogen ☐ water
duration 1 minute(s)
test date 9/5/23 inspector 161293

Experience In Motion

MLA37358225



Static Leak Test

Certified Acceptable by Seal Manufacturer

test pressure 25 ☒ psig ☐ barg ☐ MPag
media used ☒ air ☐ nitrogen ☐ water
duration 1 minute(s)
test date 7/3/23 inspector 5018059

Experience In Motion

MLA37358225

Release Purpose: IFR

DOCUMENT COVERSHEET

Document Information				
Project No:	EN207120	Project Name:	World Energy Renew Naphtha/PRU US7L	
Project Doc No:	EN207120-ROTH-9V3-00061		Rev:	00
Client Doc No:			Rev:	
Vendor Doc No:	B-64229AB	Issue Date:	20-Mar-2024	Rev: 0
Document Title:	AS BUILT OUTLINE DRAWING FOR INTERSTAGE PUMPS			
VDR Code(s)	BA01			
Tag No(s):(1):	18-P-370A, 18-P-370B			

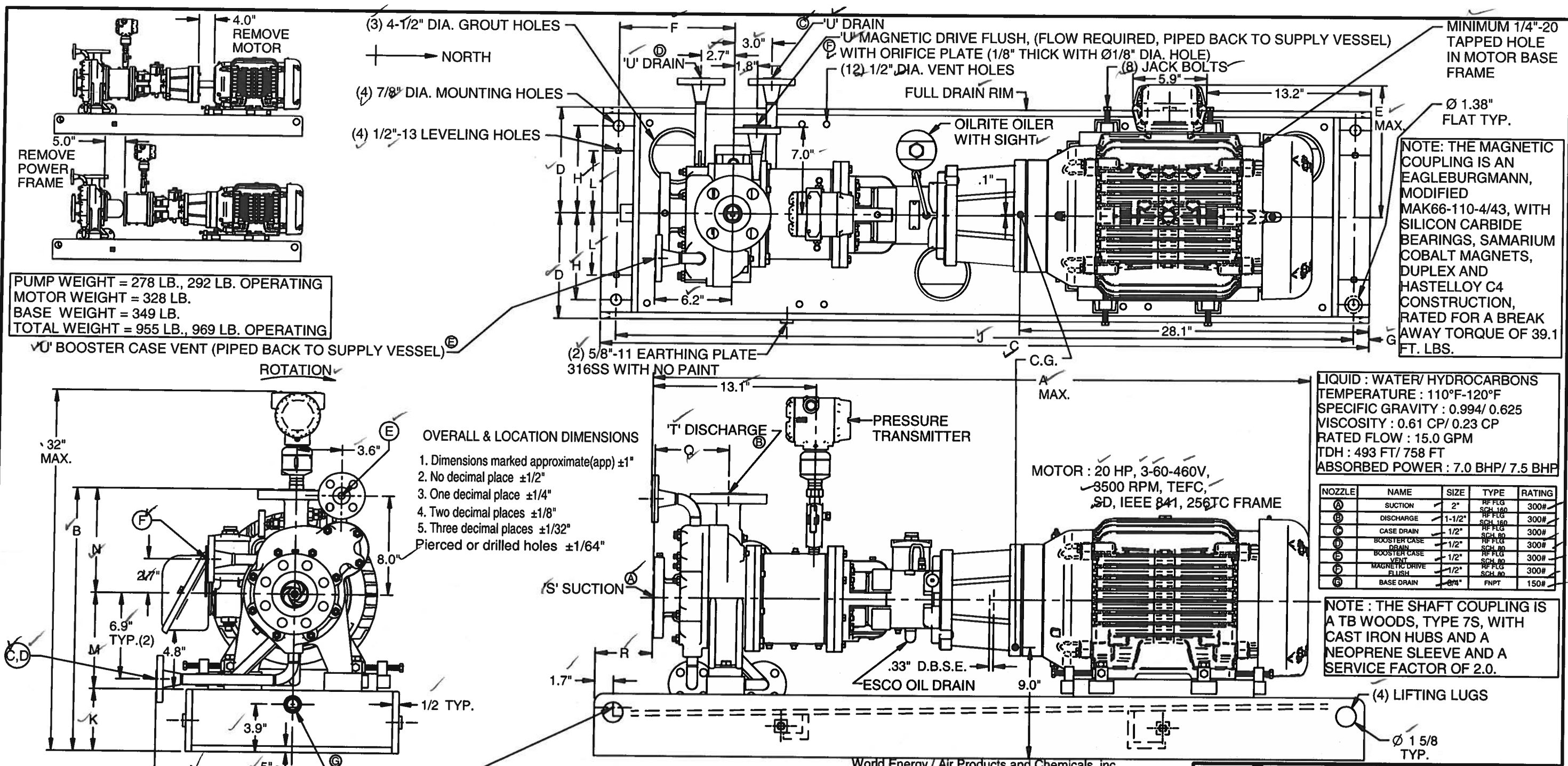
Note 1 – For multiple Tag No: refer to page 2

Review Status			
Status Code:	4	Specifer:	Suhas Patil
		Date:	25 March 2024

Status Code Legend	
Code 1	Reviewed by Air Products – REJECTED Resubmit for Review
Code 2	Reviewed by Air Products – COMMENTS AS NOTED Resubmit for Review
Code 4	Reviewed by Air Products – NO COMMENTS , No Further Submittal Required Unless Drawing/Document is Revised
Code 5	ACCEPTED FOR INFORMATION ONLY

Vendor is not relieved of responsibility for accuracy of dimensions, performance, design, design of details or any code requirements. Further, review by Air Products does not relieve Vendor of responsibility or liability, or from furnishing material in conformance with the contract, purchase order, or other agreement. Air Products' review shall not be construed as an Approval by Air Products of such documents or an opinion by Air Products that such documents are true and accurate.

Purchase Order Information	
Air Products Specifier:	JONESB8
PO Number:	4505675605
PO Date:	23-Mar-2022
Vendor Name:	Roth Pump Company
Vendor Org Code:	ROTH
Vendor SAP ID:	10108755



NOTE : THE SIDES AND ENDS OF THE STRUCTURAL STEEL BASE ARE 5" X 3" X 1/2" ANGLE, THE TOP IS 3/8" PLATE WITH A 3" X 3" X 1/2" AND A 2" X 2" X 3/8" ANGLE UNDER IT.

MOTOR FRAME	A	B	C	D	E	F	G	H	J	K
256TC	55"	21.2"	62.0"	8.5"	13"	9.3"	1.25"	7.0"	59.5"	5.0"
HP	L	M	N		Q	R	S	T	U	
20	5.0"	7.8"	8.4"		5.9"	4.6"	1/2" 300# RF FLG SCH. 160	1-1/2" 300# RF FLG SCH. 160	1/2" 300# RF FLG SCH. 80	

CKD	DATE	LET.	REVISIONS	BY
TM	11-9-22	C	ADDED Ø 1.38" FLAT TYP., FNPT WAS NPT	TM
TM	9-7-22	B	ADDED DIMENSIONS AND BASE FRAME DETAILS, REMOVED APPROXIMATE FROM WEIGHTS, LABELED C.D.E. AND F IN LEFT VIEW, LOCATED BASE DRAIN.	TM
TM	6-23-22	A	ADDED NORTH, Ø 1 5/8 TYP. AND 1/2 TYP. DIMENSIONS TO LIFTING LUGS, 4.8" DIM. DRIFTE DETAILS, PIPE SCHEDULE, DETAILS OF PUMP TABLE, CONNECTIONS TABLE, COUPLING DATA, MAINTENANCE DIMS., 7/8 WAS 5/8. CUSTOMER DATA, OILER, TRANSMITTER, EARTHING PLATE, WEIGHTS, C.G., MOTOR, CALLED OUT MOTOR BASE FRAME HOLE	TM

ROTH TURBINE PUMPS
ROTH PUMP CO.
Subsidiary of Roy E. Roth Company
ROCK ISLAND, ILLINOIS 61204

MDW5253SA PUMPSET

DATE 5-5-22
SCALE
DRAWN TM
CHECKED TM

DRG. NO. B-64229AB

Release Purpose: IFR

DOCUMENT COVERSHEET

Document Information					
Project No:	EN207120	Project Name:	World Energy Renew Naphtha/PRU US7L		
Project Doc No:	EN207120-ROTH-9V3-00005		Rev:	00	
Client Doc No:			Rev:		
Vendor Doc No:	WPS No.: 3 Rev 3	Issue Date:	5/6/2022	Rev:	0
Document Title:	Weld Procedures				
VDR Code(s)	MB02 / MB17				
Tag No(s):(1):	18-P-382 A/B & 18-P-370 A/B				

Note 1 – For multiple Tag No: refer to page 2

Review Status	
Status Code:	4 Specifer: REVIEWED Date: By AMBEKAD at 2:47 pm, May 27, 2022

Status Code Legend	
Code 1	Reviewed by Air Products – REJECTED Resubmit for Review
Code 2	Reviewed by Air Products – COMMENTS AS NOTED Resubmit for Review
Code 4	Reviewed by Air Products – NO COMMENTS , No Further Submittal Required Unless Drawing/Document is Revised
Code 5	ACCEPTED FOR INFORMATION ONLY
Vendor is not relieved of responsibility for accuracy of dimensions, performance, design, design of details or any code requirements. Further, review by Air Products does not relieve Vendor of responsibility or liability, or from furnishing material in conformance with the contract, purchase order, or other agreement. Air Products' review shall not be construed as an Approval by Air Products of such documents or an opinion by Air Products that such documents are true and accurate.	

Purchase Order Information	
Air Products Specifier:	RAUBERFK
PO Number:	4505675605
PO Date:	3/23/2022
Vendor Name:	Roth Pump Company
Vendor Org Code:	ROTH
Vendor SAP ID:	10108755

Release Purpose: IFR

Tag No (s):

18-P-370 A/B & 18-P-382 A/B

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.: 4505675605
Project No.: EN207120
Project Name: World Energy Renew Naphtha /PRU US7L
Location: Paramount, CA

Equipment: Compressor KO Drum Pumps
Item Nos.: 18-P-382 A/B
Model No.: MDW5141SA
S/N: 64228 - 1 & 2

Equipment: Interstage Pumps
Item Nos.: 18-P-370 A/B
Model No.: MDW5253SA
S/N: 64229 - 1 & 2

VDR Code: MB02 / MB17
SDDC Code: SUP-WLD-009
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 <u>Ryan and Associates</u>	By <u>Christopher P. Hill</u>	
Welding Procedure Specification No. <u>03</u>	Date <u>2/7/2014</u>	Supporting PQR No.(s) <u>4, 4A, 4B</u>
Revision No. <u>3</u>	Date <u>5/19/2015</u>	
Welding Process(es) <u>GTAW</u>	Type(s) <u></u>	Manual <u></u>

JOINTS (QW-402)

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)

Details

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)**

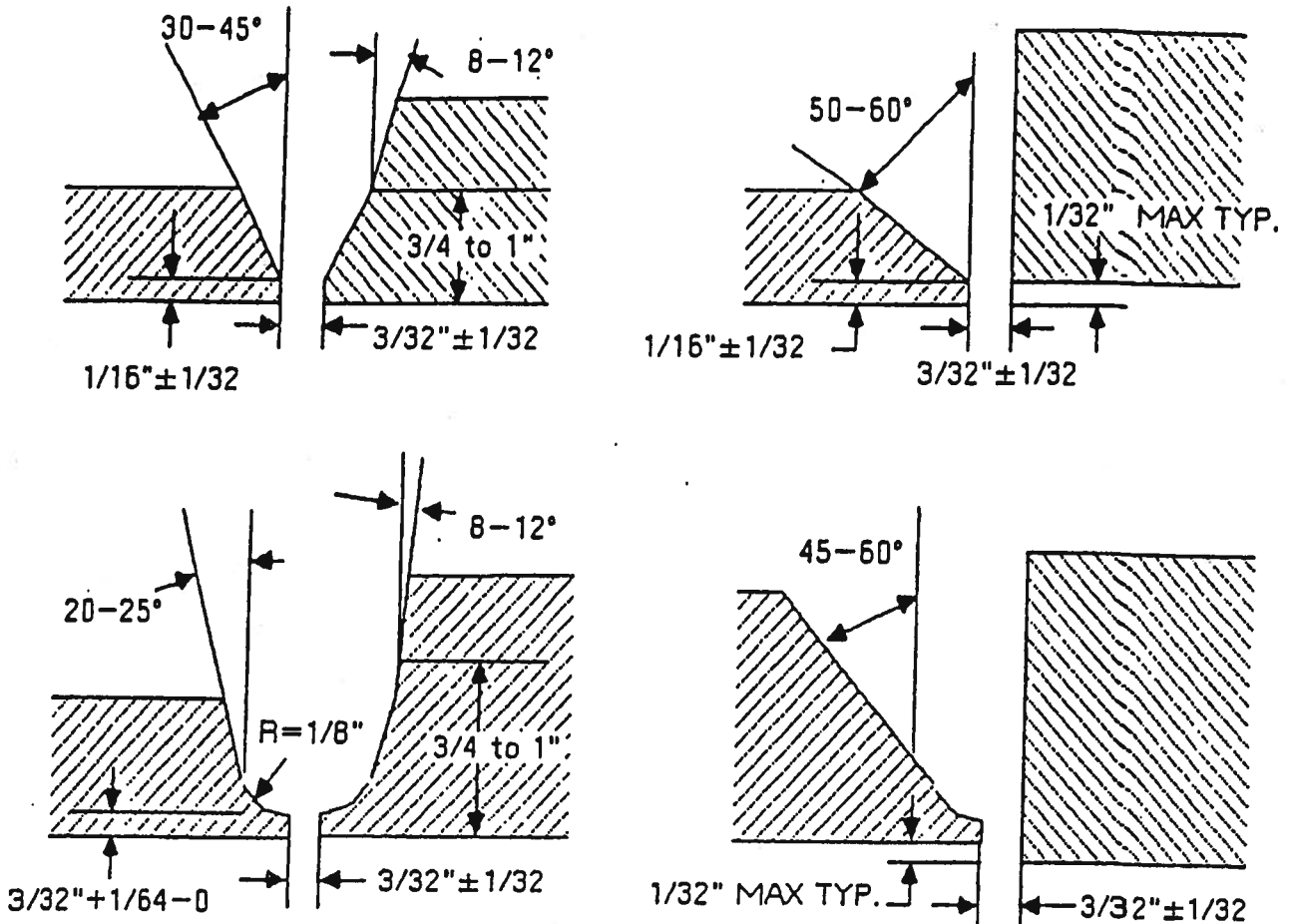
P-No. <u>8</u>	Group No. <u>1</u>	to P-No. <u>8</u>	Group No. <u>1</u>
OR			
Specification type and grade <u></u>		SA-312 TP 304L	
to Specification type and grade <u></u>		SA-312 TP 304L	
OR			
Chem. Analysis and Mech. Prop. <u></u>		N/A	
to Chem. Analysis and Mech. Prop. <u></u>		N/A	
Thickness Range: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

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

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



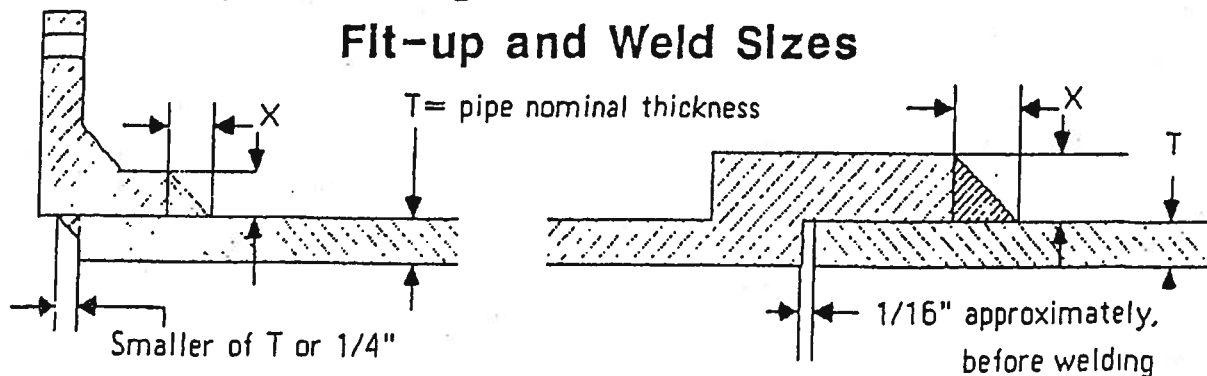
Alternative Root Gap Spacings

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



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

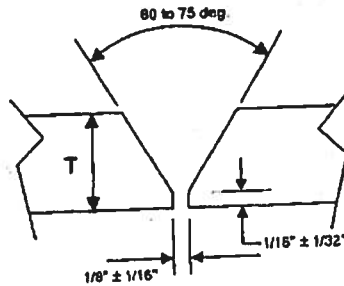
POSITIONS (QW-405) Position(s) of Groove _____ All _____ Welding Progression: Up _____ X _____ Down _____ Position(s) of Fillet _____ All _____				POSTWELD HEAT TREATMENT (QW-407) Temperature Range _____ None _____ Time Range _____ N/A _____																																			
PREHEAT (QW-406) Preheat Temp. Min. _____ 50 Degrees F _____ Interpass Temp. Max. _____ 200 Degrees F _____ Preheat Maintenance _____ None Required _____ (Continuous or special heating where applicable should be recorded)				GAS (QW-408) <table border="1"> <thead> <tr> <th colspan="4">Percent Composition</th> </tr> <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>				Percent Composition					Gas(es)	(Mixture)	Flow Rate	Shielding	Argon	100%	10-50 CFM	Trailing	N/A	N/A	N/A	Backing	Argon	100%	05-40 CFM												
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	Gas(es)	(Mixture)	Flow Rate																																				
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Trailing	N/A	N/A	N/A																																				
Backing	Argon	100%	05-40 CFM																																				
ELECTRICAL CHARACTERISTICS (QW-409) Current AC or DC _____ DC _____ Polarity _____ Straight _____ Amps (Range) _____ See Below _____ Volts (Range) _____ See Below _____ (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 _____ 1/8" 2% Thoriated _____ (Pure Tungsten, 2% Thoriated, etc.)																																							
Mode of Metal Transfer for GMAW _____ N/A _____ (Spray arc, short circuiting arc, etc.)																																							
Electrode Wire feed speed range _____ N/A _____																																							
TECHNIQUE (QW-410) String or Weave Bead _____ Either _____ Orifice or Gas Cup Size _____ As Desired _____ Initial and Interpass Cleaning (Brushing, Grinding, etc.) _____ Brushing, Grinding, Filing, Etc. _____																																							
Method of Back Gouging _____ Arc Gouging, Grinding, Etc. _____ Oscillation _____ N/A _____ Contact Tube to Work Distance _____ N/A _____ Multiple or Single Pass (per side) _____ Either _____ No weld pass greater than 1/2" Thickness. _____ Multiple or Single Electrodes _____ Single _____ Travel Speed (Range) _____ 2 to 8 ipm _____ Peening _____ Not permitted _____ Other _____ When welding different types of 300 Series Stainless to each other, select a filler material designated for both types.																																							
Max. Heat Input 31.7333 kJ/in																																							
<table border="1"> <thead> <tr> <th rowspan="2">Weld Layer(s)</th> <th rowspan="2">Process</th> <th colspan="2">Filler Metal</th> <th colspan="2">Current</th> <th rowspan="2">Volt Range</th> <th rowspan="2">Travel Speed * Range</th> <th rowspan="2">Other (e.g., Remarks, Comments, Hot Wire Addition, Technique, Torch Angle, Etc.)</th> </tr> <tr> <th>Class</th> <th>Dia.</th> <th>Type Polar.</th> <th>Amp. Range</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>GTAW</td> <td>ER308L</td> <td>3/32", 1/8", 1/16", 5/32"</td> <td>Straight</td> <td>60 to 100</td> <td>11 - 18</td> <td>2 to 4.5 ipm</td> <td>*These values are recommended only, Not mandatory</td> </tr> <tr> <td>Balance</td> <td>GTAW</td> <td>ER308L</td> <td>3/32", 1/8", 1/16", 5/32"</td> <td>Straight</td> <td>60 to 180</td> <td>11 - 18</td> <td>2 to 8 ipm</td> <td>304 to 304L use ER308L 304 to 316 use ER316 304, 304L, 316 to 316L use ER316L 304L to 316 use 316L</td> </tr> </tbody> </table>									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
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)



SINGLE VEE GROOVE

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>Percent Composition (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)	Percent Composition (Mixture)	Flow Rate	Shielding	Argon	100%	50	Trailing	N/A	N/A	N/A	Backing	Argon	100%	30
	Gas(es)	Percent Composition (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)
				Fl. 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 [Signature] 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

17045 215th Street, Davenport, Iowa 52806

(563) 386-7927 or (563) 386-8739 • FAX (563) 386-6790

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



www.smt.sandvik.com
www.smt.sandvik.com/nafta

Sandvik Materials Technology

Product Area Wire

P.O. Box 1220, Scranton, PA, PA US 185011220, Ph: 570-585-7500

MATERIAL CERTIFICATE

Cert#: 201301529

Page 1

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: 2013 0114
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 5L 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, Umbergaon - Sanjan Road, Umbergaon - 396 170 Dist. Valsad, Gujarat.

MATERIAL TEST CERTIFICATE (MILL)

CUSTOMER : M/s MERIT BRASS CO-SPARKS. TEST CERTIFICATE No.: PSL/UBR/1239/2013
P. O. No. : 1289026 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 : WFLDED STAINLESS STEEL PIPES

DESCRIPTION											
SL. No.	SIZE (O.D. X WT X LENGTH)	HEAT NO.	Qty. PCS	LENGTH Mtrs (FT)	HTP (Psi/g)	FT	FRT/FLT	RB	FB	RFT/RBT	VOI
1	6 NB X SCH 40S X 20 FEET LONG	21300229	27	184.692(540)	1300	SATIS	-	-	-	-	SATIS
2	6 NB X SCH 40S X 20 FEET LONG	21200442	24	148.304(480)	1200	SATIS	-	-	-	-	SATIS
		21301510	1	8.096 (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	71300229	-	-	-	-	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	8.05	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
	21301510	-	-	-	-	LA	0.019	1.75	0.039	0.005	0.23	18.20	8.08	-
		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.
- 100% MECHANICAL TEST CARRIED OUT AS PER ASTM E 426 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 INDIO-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
IF NO - NACK NR 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, VOI - VISUAL & DIMENSIONAL INSP., LA - LADLE ANALYSIS, RBT - REVERSE BEND TEST, PA - PRODUCT ANALYSIS, RUI - RANDOM TESTING, PSL - PRAKASH STEELAGE LTD., SATIS - SATISFACTORY.

For PRAKASH STEELAGE LTD.



Handwritten signature and date: 1/10/2014

Corporate Office : 701, Mahalaxmi Chambers, Bhulabhai Desai Road, Mumbai - 400 026, India
Reg. Office : Shairunjay Apartment, 1st Floor, 28, Sindhi Lane, Nanubhai Desai Road, Mumbai - 400 004.
E-mail : marketing@prakashsteelage.com . Website : www.prakashsteelage.com

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

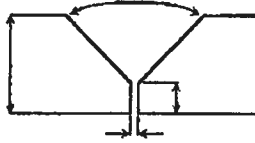
PQR record number	4A	Revision 0	WPS record number	3	Revision 1
Date	5/1/2015		Company name	Ryan & Associates, Inc	
			Welding standard	ASME Section IX and B31.3	

BASE METALS (QW-403)

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

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 (c/h)	30 - 35
Trailing gas:	Type	None
	Flow rate (c/h)	-
Backing gas:	Type	Argon (A5.32 SG-A)
	Flow rate (c/h)	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)

Specimen number	Width (in)	Thickness (in)	Area (in ²)	Ultimate total load (lb)	Ultimate unit stress (ksi)	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	34810	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-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	Base, HAZ, Weld

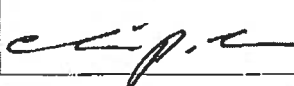
Comments:

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

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

Signature 3

Name	Signature	Name	Signature
Date		Date	

Signature 2

Signature 4



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.





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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.
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SEE REVERSE FOR CONDITIONS.





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

815/987-3200
800/892-2981

Fax: 815/965-3750

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



METALLURGICAL TEST REPORT

6870 Highway 42 East
Ghent, NY 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 2116 PRISTON STREET 2116 PRISTON STREET Steel: 304/304L
ROCKFORD, IL 61102 Finish: HRAP
Your Order: 3201688 /i/c NAS 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
ANS S511H/S513J NICK; MIL-3059D AND 3(X CRN MEAS); MIL-4043B
FACE HR0175/ISO 15136-3:2003 A, HR0103/07/QQ5766D-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 D7ARS Compliant

Skid #	Prod #	Thickness	Width	Weight	-----Length-----	Mark	Pieces
P28997	* 0354C2	.5000	48.0000	4.020	PLATE	96.000	6

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

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

HEAT	CM	C %	CR %	CU %	NI %	MO %	N %	NT %	P %	S %
24C2	US	.0138	16.2580	.4435	1.6815	.4000	.0894	8.0160	.0340	.0018
SI %										
.2985										

MECHANICAL PROPERTIES

Skid #	Prod #	1 d 0 1 0 2	UTS KSI	20C .2% YS KSI	20C ELONG %-2"	% Hard RB	R of A %
P28997	0373C2	F F	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.

Ronijet Bhava

2/23/2015

REVIEWED

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



MATERIAL CERTIFICATE

CUSTOMER'S PURCHASE ORDER NUMBER

5078196

SOLD TO

PRAXAIR DISTRIBUTION, INC.
P.O. BOX 9224
DES MOINES, IA 50306

OUR ORDER NUMBER

16761

INVOICE NUMBER

133483

CERTIFICATE DATE

08/11/2014

SHIP DATE

08/11/2014

DESCRIPTION OF MATERIAL

1/8" X 36" ER308L Tig Wire

HEAT NUMBER

46784

LOT NUMBER

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

AWS/SFA 5.9

CLASSIFICATION

ER308L

PRODUCT CODE

125308LT

PRODUCT PACKAGE

10 Lb. Tube / 60 Lb. Carton

QUANTITY

410.0 Lbs.

REMARKS

CONFORMS TO ASME SEC. II, PART C, 2013 EDITION, EN 10204 3.1, & ISO 10474 3.1B

REVIEWED

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

Gary H. Shrum, Q.A. Manager



www.smt.sandvik.com
www.smt.sandvik.com/nafta

Sandvik Materials Technology

Product Area Wire

P.O. Box 1220, Scranton, PA, PA US 185011220, Ph: 570-585-7500

MATERIAL CERTIFICATE

Cert#: 201433489

Page 1

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

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



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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.





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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 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.



05/11/15 00:03:07

Liebovich Steel & Aluminum Co
Packing List

Manifest: 120838401

PAGE: 1

Sold-To

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

Ship-to

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

563.381.3523 Fax: 563.381.3915

563.381.3914

Date Requested
IN/OUT 05/11/15

Order Date
5/04/15

Ordered By
TERRY

IS 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'

Pro# 3046042

PLASMACUT RECT (HSA) +3/8 -0
CERTIFICATIONS REQUIRED

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

5/11/15
0:03:07

Liebovich Steel & Aluminum
Manifest Summary

Dest/Load: 16/1 QUAD CITIES #2
Truck/Load: 540/1

Manifest # 120838400 Page 1



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

Ship To:
RYAN & ASSOCIATES, INC
10955 160TH ST
DAVENPORT, IA 52804

<u>Cust PO#</u>	<u>Production Order/Ctr</u>
30001800	3046042/1

<u>Qty</u>	<u>Material Description</u>
2	PLT STAIN T-304/304L A240 : 2 X 5' X 10'

<u>Weight</u>	<u>Footage</u>
77	69

CUSTOMER COPY

<u>Tot Wgt</u>	<u>Tot Ftg</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 (S16 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. Hargrave

Quality Manager

NAS NORTH AMERICAN
STAINLESS

METALLURGICAL TEST REPORT

6870 Highway 42 East
Ghent, KY 41045-9615
(602) 347-6000

Certificate: 48787.04

Mail To:

Customer: 5494 002

MAGERTY STEEL & ALUMINUM COMPANY
CUSTOMER PICKUP.
6870 HWY 42 EAST
GHENT, KY 41045

Ship To:

RAGERTY STEEL & ALUMINUM COMPANY
CUSTOMER PICKUP
6870 HWY 42 EAST
GHEAT, KY 41045

Date: 4/10/2015 Page: 1

Steel: 304, 304L

Finish: BRAP

Your Order: 8123400

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, SA566/13
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-S-5059D, 15M3(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

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)

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	.182140	.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 Pr A	R of 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 Bhawe

4/10/2015



MATERIAL CERTIFICATE

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



www.smt.sandvik.com
www.smt.sandvik.com/nafta

Sandvik Materials Technology

Product Area Wire

P.O. Box 1220, Scranton, PA, PA US 185011220, Ph: 570-585-7500

MATERIAL CERTIFICATE

Cert#: 201433489

Page 1

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

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 (WPQ)
(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)	Actual Values	Range Qualified
Welding process(es)	GTAW	GTAW
Type (i.e.; manual, semi-automatic) used	Manual	Manual
Backing (with/without)	Both	Both
☐ Plate ☒ Pipe (enter diameter if pipe or tube)	2.375	1" OD and above
Base metal P-Number to P-Number	P8 to P8	P1- P15, P4 1-P47
Filler metal or electrode specification(s) (SFA) (Info. only)	A5.9	
Filler metal or electrode classification(s) (Info. only)	ER308	
Filler metal F-Number(s)	F6	ALL
Consumable insert (GTAW or PAW)	None	With/Without
Filler Metal Product Form (QW-404.23) (GTAW or PAW)	Bare wire	
Deposit thickness for each process		
Process 1 <u>GTAW</u> 3 layers minimum ☒ Yes ☐ No	.154"	Up to .308"
Process 2 3 layers minimum ☐ Yes ☐ No		
Position(s)	6G	ALL
Vertical progression (uphill or downhill)	Uphill	Uphill
Type of fuel gas (OFW)		
Use of backing gas (GTAW, PAW, GMAW)	100% Argon	
Transfer mode (spray, globular, or pulse to short circuit-GMAW)		
GTAW current type and polarity (AC, DCEP, DCEN)	DC Straight	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 Ryan & Associates, Inc. Company
 Mechanical tests conducted by Ryan & Associates, Inc. Laboratory test no.
 Welding supervised by Mike Arians

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