



**Ability**  
Engineering  
Technology Inc.

**DOCUMENTATION PACKAGE  
for  
BEST VALUE VACS  
(PO NUMBER # 68311)**

SUBMITTED TO:

BEST VALUE VACS

1251 FRONTENAC ROAD

NAPERVILLE, IL 60563

SUBMITTED BY:

Eugene Botsoe

Ability Engineering Technology Inc

16140 South Vincennes Ave

South Holland, IL

Date: 1/28/20

Notice of Confidential Information

Information contained herein is the property of Ability Engineering Technology, and is to be considered confidential and used solely for the purpose provided and, is not to be disclosed to others without the written consent of Ability Engineering Technology, Inc.

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ABILITY ENGINEERING TECHNOLOGY, INC.  
16140 SOUTH VINCENNES AVENUE, SOUTH HOLLAND IL 60473

# **1. CERTIFICATE OF CONFORMANCE**



ABILITY ENGINEERING TECHNOLOGY, INC.  
16140 SOUTH VINCENNES AVENUE, SOUTH HOLLAND IL 60473



CERTIFICATE OF CONFORMANCE
AET-SR-10

PO NUMBER: 68311 CUSTOMER: BEST VALUE VACS JOB #: 9030

Table with columns: ITEM, QTY, DESCRIPTION, REFERENCE (DWG #), MATERIAL. Row 1: 1, 1, STAINLESS STEEL JACKETED VESSELS, 9030-6093 REV 2, SS. Includes a red 'QC APPROVED' stamp.

SUPPLIER'S CERTIFICATION

THIS IS TO CERTIFY THAT THE PRODUCTS IDENTIFIED HEREIN HAVE BEEN MANUFACTURED UNDER A CONTROLLED QUALITY ASSURANCE PROGRAM AND ARE TO THE BEST OF OUR KNOWLEDGE IN CONFORMANCE WITH THE PROCUREMENT REQUIREMENTS INCLUDING APPLICABLE CODES, STANDARDS AND SPECIFICATIONS AS IDENTIFIED IN THE ABOVE REFERENCED DOCUMENTS: UNLESS NOTED BELOW. ANY SUPPORTING DOCUMENTATION WILL BE RETAINED IN ACCORDANCE WITH PURCHASE ORDER REQUIREMENT

SIGNED: [Signature]

DATE: 1-24-20

TITLE: QA MANAGER

ORGANIZATION: AET

CUSTOMER (AUTHORIZED REPRESENTATIVE) SHIPPING RELEASE

THIS IS TO CERTIFY THAT EVIDENCE SUPPORTING THE ABOVE SUPPLIER CERTIFICATION STATEMENT HAS BEEN AUDITED AND NO PRODUCT NONCONFORMANCE FROM PROCUREMENT REQUIREMENTS HAVE BEEN FOUND UNLESS NOTED BELOW. THIS COMPONENT IS HERBY RELEASED FOR SHIPMENT.

NONCONFORMANCE FROM PROCUREMENTS QUALITY REQUIREMENTS:

REMARKS:

CUSTOMER QA REPRESENTATIVE (OR DESIGNATE): DATE:

# **2. FINAL INSPECTION AND PACKING CHECKLIST**



ABILITY ENGINEERING TECHNOLOGY, INC.  
16140 SOUTH VINCENNES AVENUE, SOUTH HOLLAND IL 60473



**FINAL INSPECTION AND PACKING CHECKLIST**  
**AET-FI-11**

Job Number: 9030 Customer: BEST VALUE VACS Date: 1/24/2020

Reference Drawing #/specification: SEE C OF C

Inspection Acceptance: CAS Date: 1/24/20

Packing Acceptance: CAS Date: 1/24/20

*personnel will use initials to verify acceptance*

1. Special customer requirement for final inspection: Yes: \_\_\_\_\_ No: X

2. Required number of assemblies: 1 Number Packed: 1

3. Required number of parts: \_\_\_\_\_ Number Packed: \_\_\_\_\_

**Final Inspection**

4. All inspection and testing completed CAS

5. Acceptance of general condition and appearance of all parts CAS

6. Cleanliness of all parts (dirt and oil) CAS

7. Proper AET tags and specification plates on all assemblies CAS

**Packing**

8. Adequate packing container CAS

9. Proper tie-down of large assemblies CAS

10. Document Package including all required reports, material and personnel certifications CAS

11. Proper shipment tags (customer address) attached CAS

12. Final inspection of complete shipping package CAS

QC APPROVED

### **3. MATERIAL TEST REPORTS**



ABILITY ENGINEERING TECHNOLOGY, INC.  
16140 SOUTH VINCENNES AVENUE, SOUTH HOLLAND IL 60473

# ASME MATERIAL TRACEABILITY LOG

NB# **444**

JOB ORDER# <b>9030</b>	DWG.# <b>9030-6093</b>	ENGINEER: <b>HW</b>
CUSTOMER: <b>BEST VALUE</b>		
VESSEL DESCRIPTION: <b>12 3/4" OD x 48 1/2" OAL</b>		
MAWP <b>350</b> PSI	MAX. TEMP. <b>120</b> °F	MIN. TEMP. <b>-20</b> °F
		HYDRO AT <b>455</b> PSI
		PNEU AT <b>PSI</b>

PRESSURE RETAINING ITEM	DWG ITEM #	MATERIAL				
		SPECIFICATION	NOM. THICKNESS	HEAT NUMBERS	DATE	SUPPLIER
12" SCH 10 PIPE	1	SA-312-TP 304	0.180"	897M		
12" SCH 10 PIPE CAP	2	SA-403-WP 304	0.180"	CFA136-01-112P		
14" SCH 10 PIPE CAP	3	SA-403-WP 304	0.180"	A1601908		
14" SCH 10 PIPE	4	SA-312-TP 304	0.180"	475B		
1/4" PLATE	5	SA-240-T 304	0.250"	524435		
6" ASME FERRULE	17	SA-312-TP 304	0.562"	180804F08		
1 1/2" ASME FERRULE	8	SA-479-T 304	0.396"	150703S10		
1/2" 3000# F. COLLG	9	SA-182-F 304	3000#	HNO684		
1 1/4" SCH 40 PIPE	11	SA-312-TP 304	0.109	948048		
10						
11						
12						
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28						
29						
30						



12" - SCH 10 PIPE

1



FELKER BROTHERS CORPORATION  
22 NORTH CHESTNUT AVE  
MARSHFIELD, WI. USA 54449  
(800) 828-2304

### CERTIFIED MATERIAL REPORT

Heat #: 847M  
Purchase Order: AQ0168  
Certified Date: 8/10/2018

#### PRODUCT

Part Description	PIPE A312-304L 12 SCH10S		
Primary Specification	ASTM A312 17		
Grade	TP304/TP304L		
Other Specifications	ASME SA312 15	B36.19M	MIL-P-24801 / 3
	NACE MRO 103	NACE MRO 175/ISO 15156	

#### CHEMICAL COMPOSITION

Carbon	.0234
Chromium	18.0680
Copper	.4000
Manganese	1.7615
Molybdenum	.3250
Nickel	8.1425
Nitrogen	.0638
Phosphorus	.0315
Silicon	.2040
Sulfur	.0111

#### MECHANICAL PROPERTIES

Elongation	2IN	52.0
Hardness	RB	84
Tensile	PSI	91010
Yield	PSI	47660

#### MANUFACTURER STEPS

Anneal Temperature	F	1900
Band / Reverse Bend Test		Pass
Corrosion Test A282 Practice E		Pass
Dimensional / Visual		Pass
Etching Test - Weld		Pass
Flattening / Rev Flattening Test		Pass
Hydrostatic Pressure Test	PSI	400
Pickling / Passivation ASTM A380		Yes

#### COMMENTS

Country of melt is UNITED STATES OF AMERICA  
Manufactured in USA  
TP304/TP304L Dual Cert, Welded  
Felker does not use mercury or radioactive material in the production nor testing of its products

#### CERTIFICATION

It is certified that all figures are correct as contained in the records of the company.  
We certify that these products conform to specifications listed above.  
ISO 9001 Certified  
PED 2014/68/EU Annex I Para 4.3  
DIN 50049 3.1/EN 10204 3.1  
FAR BAA Complies  
DFARS BAA Complies  
FAR TAA Complies  
NSF/ANSI 61 & 372 Certified by WQA  
No weld repairs on base material

Gary Habermeyer  
Quality Manager



3

14" SCH 10 PIPE CAP

**SUPERINOX**  
TUBES & PIPES & FITTINGS



ISO 9001:2008 CERT NO: 01 100 106091/01  
DIRECTIVE 2014/68/EU CERT NO: 01 202 CHN/Q-130513  
AD 2000-MERKBLATT W0 : 01 202 CHN/Q-130513

### INSPECTION CERTIFICATE

**SUPERINOX MAX FITTINGS INDUSTRY SDN. BHD.** (405083-T)  
No. 1564, MK 12, Jalan Nafiri,  
Valdor Industrial Estate,  
14200 Sungai Jawi, Penang, Malaysia.  
Tel. : +604-5825511 Fax. : +604-5828611  
E-mail : enquiry@superinox.com.my  
Website : www.superinoxtubes.com

EN 10204 3.1

CONTRACT NO. :  
SHIPPER : SUPERINOX MAX FITTINGS INDUSTRY SDN. BHD.  
CUSTOMER : PRIME STAINLESS PRODUCTS  
PURCHASE ORDER NO. : PO: 001518-00  
DELIVERY ORDER NO. : 01060  
PRODUCT SPECIFICATION : WROUGHT AUSTENITIC STAINLESS STEEL FITTINGS  
ASTM/ASME A/SA403-13

CERTIFICATE NO. : 1210

DATE OF ISSUE : 25/10/2017

PAGE : 2 OF 8

PRODUCT & SIZE	QTY PCS	HEAT NO.	TENSILE TEST			HARD- NESS TEST HRB	FLAT- TENING TEST	CHEMICAL COMPOSITION (%)							
			Y.S.	T.S.	EL.			C	Mn	P	S	SI	Cr	Ni	Mo
			N/mm <sup>2</sup>	N/mm <sup>2</sup>	%										
14" CAP WP304/304L-S SCH 10S	30	A1601908	250	640	58.5	≤ 90	Passed	0.015	1.55	0.030	0.002	0.42	18.19	8.01	-
18" CAP WP304/304L-S SCH 10S	10	A1601908	250	640	58.5	≤ 90	Passed	0.015	1.55	0.030	0.002	0.42	18.19	8.01	-
18" CAP WP304/304L-S SCH 10S	10	A1601908	250	640	58.5	≤ 90	Passed	0.015	1.55	0.030	0.002	0.42	18.19	8.01	-
20" CAP WP304/304L-S SCH 10S	6	A2501111	269	648	56.5	≤ 90	Passed	0.020	1.61	0.028	0.003	0.50	18.35	8.03	-
24" CAP WP304/304L-S SCH 10S	10	A1600850	250	662	49.5	≤ 90	Passed	0.020	1.59	0.026	0.002	0.39	18.31	8.14	-
14"x10" C.REDUCER WP304/304L- WX SCH 10S	4	A1601908	250	640	58.5	≤ 90	Passed	0.015	1.55	0.030	0.002	0.42	18.19	8.01	-
14"x12" C.REDUCER WP304/304L- WX SCH 10S	5	A1601908	250	640	58.5	≤ 90	Passed	0.015	1.55	0.030	0.002	0.42	18.19	8.01	-

DEFINITION: T.S. = TENSILE STRENGTH, Y.S. = YIELD STRENGTH, E.L. = ELONGATION%

HEAT TREATMENT : MIN. 1040°C ±10°C QUENCHED IN WATER

Pickled and Passivated  
No weld repair  
Material Resistant to Intergranular Corrosion Test According to ASTM A262, Practice E.  
Material is Mercury and Radiation Free  
Material in accordance with NACE MRO-175/ISO 15156  
ISO 9001: 2008 Certified ( 01 100 106091/02 )  
PED Directive 97/23/EC Certified ( 01 202 CHN/Q-130513 )  
AD 2000-Merkblatt W0 Certified ( 01 202 CHN/Q-130513 )

Materials was Manufactured, sampled, test and inspected in accordance with Indicated Specification and had been found meeting the requirements  
We hereby certify that the material described has been manufactured and tested with satisfactory results in accordance  
with requirement of the above material specification.

QA DEPARTMENT





14" SCH 10 PIPE

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FELKER BROTHERS CORPORATION  
22 NORTH CHESTNUT AVE  
MARSHFIELD, WI. USA 54449  
(800) 826-2304

### CERTIFIED MATERIAL REPORT

Heat #: 475B  
Purchase Order: AQ0002  
Certified Date: 9/01/2017

#### PRODUCT

Part Description	PIPE A312-304L 14 SCH10S		
Primary Specification	ASTM A312 17		
Grade	TP304/TP304L		
Other Specifications	ASME SA312 15	B36.19M	MIL-P-24691 / 3
	NACE MRO 103	NACE MRO 175/ISO 15156	

#### CHEMICAL COMPOSITION

Carbon	.0144
Chromium	18.2130
Copper	.3755
Manganese	1.7730
Molybdenum	.3205
Nickel	8.0955
Nitrogen	.0815
Phosphorus	.0315
Silicon	.2475
Sulfur	.0118

#### MECHANICAL PROPERTIES

Elongation	2IN	51.0
Hardness	RB	87
Tensile	PSI	92390
Yield	PSI	49150

#### MANUFACTURER STEPS

Anneal Temperature	F	1900
Bend / Reverse Bend Test		Pass
Corrosion Test A262 Practice E		Pass
Dimensional / Visual		Pass
Etching Test - Weld		Pass
Flattening / Rev Flattening Test		Pass
Hydrostatic Pressure Test	PSI	400
Pickling / Passivation ASTM A380		Yes

#### COMMENTS

Country of melt is UNITED STATES OF AMERICA  
Manufactured in USA  
TP304/TP304L Dual Cert, Welded  
Felker does not use mercury or radioactive material in the production nor testing of it's products

#### CERTIFICATION

It is certified that all figures are correct as contained in the records of the company.  
We certify that these products conform to specifications listed above.  
ISO 9001 Certified  
PED 2014/68/EU Annex I Para 4.3  
DIN 50049 3.1/EN 10204 3.1  
FAR BAA Complies  
DFARS BAA Complies  
FAR TAA Complies  
NSF/ANSI 61 & 372 Certified by WQA  
No weld repairs on base material

Gary Habermeyer

1/4" PLATE

5

MILL TEST REPORT



TA CHEN INTERNATIONAL, INC.

This MTR contains 1 page (Page # 1)

Customer: ROLHOU PO#:0173560-HOU SO#:LBAYE7

MTR#:TSLC00397806.GIF

Item#:25048120304L#1 Bundle:3174811 Heat#:524435

Manufacturer / Fabricante 		Type of document / Tipo de documento <b>INSPECTION CERTIFICATE</b> CERTIFICADO DE INSPECCION according to / de acuerdo con <b>EN 10204-3.1</b>				Document number / N° de certificado <b>0000397806 /</b> Page / Páginas <b>1 / 2</b>		
1 Steel Drive; P.O. Box 13000; Calvert, AL 36513-1300  TA CHEN INTERNATIONAL CORP. 5855 OBISPO AVE LONG BEACH CA 90805-3715 USA				Customer/Ship to / Cliente <b>TA CHEN INTERNATIONAL CORP., LONG BEACH</b> Customer's order number / N° de Pedido Cliente <b>LB1650</b> Manufacturer's market order no. / N° de Pedido Fabricación <b>901254030 / 002</b> Delivery note no. / N° de Entrega <b>05599220 / 020</b> Product / Producto <b>SHEET/HOJAS/PLATE</b>				
Terms of delivery / Condiciones de entrega ASTM A240/A240M-17, ASME SA-240 Sec. II part A Ed.2017 ASTM A240/A240M-18, ASME SA-240 Sec. II part A Ed.2017 ASTM A480/A480M-18, ASME SA-480 Sec. II part A Ed.2017 ASTM A480/A480M-18a, ASME SA-480 Sec. II part A Ed.2017 SAE AMS 5511 H SAE AMS 5513 J ASTM A276-17, A312-18a, A479-18, A484-18a. Chemical Only ASTM A666-15 ASME SA312-17, SA479-17 Chemical only NACE MR0175 / ISO 15156-3: 2015 NACE MR0103 / ISO 17945: 2015				Steel Grade and Quality / Acero <b>TYPE 304L/304</b> <b>UNS S30403</b> <b>UNS S30400</b>				
Customer's material no. / N° de material del cliente <b>.25040120304L#1/TA</b>		Product dimensions (Thickness / Width / Length) / Dimensiones (Espesor / Ancho / Largo) <b>6.35 mm x 1,219.20 mm x 3,048.00 mm</b> <b>0.2500 inch x 48.0000 inch x 120.0000 inch</b>		Stripping procedure / Proceso de manufact. <b>AOD</b>		Finish / Acabado <b>11a / 1D / No.1</b>		
Picking-Id. / N° de Limpieza <b>3174790</b>	Heat / process / Forja <b>7</b>	Actual weight / Peso actual <b>2,840 lb / 1,292 kg</b>		Coil No. / Bobina No. <b>842927</b>	Heat No. / Calent. <b>524435</b>	Inspection lot / Lote de inspección <b>1000602279</b>	Inspection lot / Lote de inspección <b>1000602280</b>	
<b>3174799</b>	<b>7</b>	<b>2,859 lb / 1,297 kg</b>		<b>842927</b>	<b>524435</b>	<b>1000602279</b>	<b>1000602280</b>	
<b>3174800</b>	<b>7</b>	<b>3,029 lb / 1,374 kg</b>		<b>842927</b>	<b>524435</b>	<b>1000602279</b>	<b>1000602280</b>	
<b>3174805</b>	<b>7</b>	<b>2,840 lb / 1,288 kg</b>		<b>842927</b>	<b>524435</b>	<b>1000602279</b>	<b>1000602280</b>	
<b>3174810</b>	<b>7</b>	<b>2,840 lb / 1,288 kg</b>		<b>842927</b>	<b>524435</b>	<b>1000602279</b>	<b>1000602280</b>	
<b>3174811</b>	<b>7</b>	<b>2,844 lb / 1,290 kg</b>		<b>842927</b>	<b>524435</b>	<b>1000602279</b>	<b>1000602280</b>	
<b>3174812</b>	<b>7</b>	<b>2,833 lb / 1,285 kg</b>		<b>842927</b>	<b>524435</b>	<b>1000602279</b>	<b>1000602280</b>	
<b>3174813</b>	<b>7</b>	<b>2,842 lb / 1,289 kg</b>		<b>842927</b>	<b>524435</b>	<b>1000602279</b>	<b>1000602280</b>	
Sum / Suma <b>56</b>		<b>22,935 lb / 10,403 kg</b>						
Heat / Calent. <b>524435</b>	Country of Heat / País de Calent. <b>USA</b>	Chemical composition / Composición Química % C    % Si    % Mn    % P    % S    % Cr    % Mo    % Ni    % N    % Cu <b>0.022    0.33    1.33    0.030    0.0018    18.11    0.36    8.08    0.068    0.52</b>				Chemical analysis per ASTM A751-14a		
Sample Position / Localización de la muestra <b>TRANSVERSE</b>		Mechanical testing per ASTM A370-11 <b>ASTM A 262-15, PRACTICE E - Sample Acceptable</b>						
Inspection lot / Lote de inspección <b>1000602279</b>	<b>YS0.2%</b> <b>PSI / MPa</b> <b>51,486 / 355</b>	<b>TS</b> <b>PSI / MPa</b> <b>93,401 / 644</b>	<b>E1. A2"</b> <b>%</b> <b>53.9</b>	<b>HRB</b> <b>82</b>				
<b>1000602280</b>	<b>50,326 / 347</b>	<b>93,256 / 643</b>	<b>54.6</b>	<b>82</b>				
Originator of the document / Originador del documento <b>Outokumpu Stainless USA, LLC</b> An ISO 9001:2015 certified company An ISO 17025:2005 accredited lab EU PED 2014/68/EU, Annex I, 4.3 certified Certificate is generated automatically / Certificado es generado automáticamente		The information provided is a true copy of data on file / Los valores mostrados corresponden a los datos archivados  Alejandro Carrizo Flores Name of expert / Nombre del experto		Date of issue and validation / Fecha de emisión y validación <b>03/11/2019</b> This document shall not be altered or reproduced, except in full. Falsification, fabrication or false statements or omissions may be prosecuted by law.				

HEAT # 524435  
  
 TRACER # 0564681US

RECEIVED  
 By:   
 Date: 3/22/19

2869

ZHEJIANG BNJIS(BENJI) STAINLESS STEEL CO.,LTD  
 INSPECTION MILL TEST CERTIFICATE  
 EN10204 Type 3.1



Certificate No : BNJIS19011601  
 Purchaser: MARMON/KEYSTONE CANADA INC  
 P/O NO: BN6338  
 P/O DATE: Oct 17,2018

Manufacturer address and contact  
 Tel:0086-577-86989917  
 Fax:0086-0577-86989970  
 No 3,Jingang Avenue,Tashu.,Longquan,Zhejiang,China

Item NO&Products	Steel Materials	Heat No.	Dimensions	QTY FT	QTY PCS	Delivery condition	Standard
1, stainless steel pipe	TP304L seamless	180804F08	6" S/120	60	3	Annealed/pickled	ASTM/ASME A/S312-2017

ITEM	Chemical Composition%									Yield point (MPA≥170)	TENSILE STRENGTH (MPA≥485)	Elongation ≥35%	Hardness Test HRB ≤90	Hydro Test Pressure (MPa/time)
	C	Si	Mn	P	S	Cr	Ni	Mo	N					
1	0.021	0.43	1.13	0.036	0.002	18.39	8.15	/	/	260	596	65	63	17/10s

SIZE TOLERENCE ASTM A999/A312	SURFACE CONDITION	INTERGRANULAR CORROSION	EDDY CURRENT TEST	HYDROSTATIC TEST	ULTRASONIC TEST	FLATTENING TEST	HEAT TREATMENT ≥1040°C	COOLING TREATMENT IN WATER
qualified	qualified	qualified	/	qualified	/	qualified	1060°C/30min	qualified

Remarks:  
 1, ISO9001:2015 certificate No:11713QU0076-03 ROM  
 2, Hardness testing conform to MR-0103  
 3, Materials conform to NACE MR-0175/ISO15156-3.  
 4, Intergranular corrosion test according to ASTM A262 PRATICE E  
 5, Materials are 100% PMI tested  
 6, Materials are free of Mercury and Radioactive contamination

1, WE HEREBY CERTIFY THAT MATERIALS DESCRIBED HEREIN HAS MANUFACTURED AND TESTED WITH SATISFACTORY RESULTS IN ACCORDANCE WITH THE REQUIREMENTS OF THE ABOVE MATERIALS SPECIFICATION  
 2, THIS CERTIFICATE IS VALID WITH THE ORIGINAL STAMP OF THE QUALITY DEPARTMENT OR THE ORIGINAL STAMP OF THE AUTHORIZED SALES DEPARTMENT  
 3, IF ANY QUALITY QUERY, PLEASE CLARIFY VIA PHONE CALL OR FAX, INDICATING THE CERTIFICATE NO

QUALITY INSPECTION STAMP:

Inspector: 陈舒斌 Quality Engineer: 林恩豪 Issued Date: 2019-01-16



6" ASME PIPE

6



Marmon / Keystone Canada Inc. MK#-B14674 Item-SBH 2.055 .396 1.263 304L Heat #-150703S10

1379 1 1/2" FERROVE (7)



**ZHEJIANG STELLAR PIPE INDUSTRY CO.,LTD**  
 XIAOZHI INDUSTRIAL ZONE, QINGTIAN COUNTY, ZHEJIANG PROVINCE, CHINA  
**MILL TEST CERTIFICATES to EN 10204/3.1 PED 97/23**  
 PED Certificate no.:331/2007/MUC

Customer : MARMON/KEYSTONE CANADA INC.  
 Contract No. : TA16WRX0224-01 P.O NO. : BN5068  
 Specification : ASTM A511-2015 ASTM /ASME A/SA479-2015 Cert No. : ST160503-01  
 Material Grade : TP304L Delivery Condition : Solution Treated  
 Goods : STAINLESS STEEL SEAMLESS PIPES Appearance : Pickling

Heat No.		Chemical Composition (%)									
		C	Si	Mn	P	S	Cr	Ni	Mo	Ti	N
Spec.	Min.						18.00	8.00			
	Max.	0.030	1.00	2.00	0.040	0.030	20.00	12.00			
Ladle Analysis		0.019	0.35	1.37	0.035	0.001	18.30	8.03			
Product Analysis	150703S10	0.019	0.37	1.36	0.036	0.003	18.61	8.12			
Batch No.	Size	Quantity				Visual Examination					
3T160329-13	52.2*10.06*6096(2.055**0.396")	15 PCS		944 KGS		300 FT		OK			

Test No.		Mechanical Properties (Acc to ASTM A370)								
		Tensile Strength MPa	Yield Strength MPa Rp0.2	Elongation G.L.:50mm A(%)	Flattening Test	Ring Tensile Test	Flaring Test	Ring Expanding Test	Impact Test	Hardness Test HRB
Spec.	Min.	515	210	35						
	Max.								90	
L1		570/575	238/240	53/54	GOOD	/	/	/	/	75/77

Leak Tightness Test		Non-destructive Testing		Intergranular Corrosion Test	
Hydrostatic Test Acc to ASTM A1016	Eddy Current Test Acc to ASTM E426	Ultrasonic Test Acc to ASTM E213		Acc to ASTM A262-E	
/	/	GOOD		GOOD	

**Additional Remarks:**  
 Country of Origin: China 2.100% PMI 3.No weld repair  
 Solution Temperature :1050°C. Hold 30minutes.Rapid Water Cooling. 5.Hardness Acc. to NACE MR0175/ISO15156

We hereby certify that the material described above has been tested and complies with the terms of the contract and we confirm that M.I has been done.  
 May/07/2016  
 Date



1/2" - 3000# F. CAPG

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# BOTH-WELL STEEL FITTINGS CO., LTD.

NO.303, REN-SIN ROAD, REN-WU DISTRICT, KAOHSIUNG CITY, TAIWAN, R.O.C.(61460)  
TEL : (886)7-3711536, 3710497, 3720260 FAX : (886)7-371-3864, 3713882  
WEB SITE : <http://www.bothwell.com.tw> E-Mail : [box@bothwell.com.tw](mailto:box@bothwell.com.tw)

An ISO 9001 : 2015 Registered Manufacturer

## MILL TEST & INSPECTION CERTIFICATE

ACCORDING TO EN 10204 3.1

CUSTOMER : SILBO INDUSTRIES, INC.  
CERT NO. : 181219  
ORDER NO. : 68917

INVOICE NO. : 5200011417  
L/C NO. :

PAGE : 31  
DATE : 04/26/2018  
ORIGIN : TAIWAN

ITEM	RAW HEAT NO. HEAT NO.	QTY	DESC/GRADE OR SPECIFICATION NO. CHEMICAL COMPOSITION(%) MECHANICAL PROPERTIES.
30	95H0320 H0684	300 PCS	CAP F304L 1/2" 3000# NPT C:0.021 Si:0.40 Mn:1.82 P:0.030 S:0.025 Cu:0.31 Cr:18.12 Ni:8.09 N:0.08 TS(KSI):88.6 YS 0.2%(KSI):33.6 EL(%):60.5 R.A.(%):76.6 HARDNESS 1(HBW):157 HARDNESS 2(HBW):158

REMARK :

THE MATERIAL SUPPLIED IDENTIFIED AS ASTM A182 -17, ASME SA182-2015 ED. F304/F304L  
THE FITTING SUPPLIED IDENTIFIED AS ASME B16.11 - 2016  
THE PRODUCT SUPPLIED WAS INSPECTED IN ACCORDANCE WITH SPECIFICATION(SURFACE & DIM) : GOOD  
STANDARD : CHEMICAL COMPOSITION(%) & MECHANICAL PROPERTIES.

	C	Si	Mn	P	S	Cu	Cr	Ni	Mo	V	Cb(Nb)
MIN	-	-	-	-	-	-	18.0	8.0	-	-	-
MAX	0.030	1.00	2.00	0.045	0.030	-	20.0	11.0	-	-	-
	N	Al	Ti	Zr	CE	TS(KSI)	YS(KSI)	YS 0.2%(KSI)	EL(%)	R of A(%)	HARDNESS(HBW)
MIN	-	-	-	-	-	75	30	30	30	50	-
MAX	0.10	-	-	-	-	-	-	-	-	-	235

HEAT TREATMENT : SOLUTION: 1060°C(1940°F) W.Q.

MERCURY FREE

CONFORMS TO NACE MRO175-15/ISO 15156-15/MRO103-15

FREE FROM RADIATION CONTAMINATION

CONFORMS TO ASTM A262 PRACTICE E SPECIFICATION

PED 97/23/EC CERTIFIED BY TUV

MATERIAL MERCURY FREE AND DETECTED FREE FROM RADIOACTIVE CONTAMINATION.

WE CERTIFY THE ABOVE MENTIONED FITTINGS HAVE BEEN MANUFACTURED,  
SAMPLED, TESTED, AND INSPECTED IN ACCORDANCE WITH THE  
SPECIFICATIONS SHOWN

C.C. Huang  
Q.C. MANAGER

C.L. Ko  
INSPECTOR



1 1/4" - SCH 10 PIPE

9

**MARCEGAGLIA USA INC.**  
 Munhall Plant  
 1001 East Waterfront Drive  
 Munhall, PA 15120  
 Tel: 412-462-2185  
 Fax: 412-462-4160



# Certificate of Test

Order Information	
Packing Slip #	0080062237
Mill Order #	0060232699
PO #	AI 1219
Ship Date	12/21/2010

Sold to 0000036265  
 ROBERT JAMES  
 7999  
 BUFFALO, NY 14225-7999

Ship to 6036265001  
 ROBERT JAMES  
 2585 WALDEN AVE  
 BUFFALO, NY 14225  
 716-651-6000

## Material Specifications

ASTM A312-09 & ASME SA312-08  
 EN 10204 SEC. 3.1.B  
 NACE MRO-175 03  
 NACE MRO-103 07  
 WELDED

## Other Specifications

BRIGHT ANNEALED

## Item Description

Item #	Material #	Mat Description	Pcs	Forma	Country of MFG	Flare	Hydro	Flatten	Flange	Key Band	Key Flat	Air Water
1	2000083	0.500" SCH 10 304/304L A/SA-312	48	1020	USA	OK		OK				
2	2000099	0.500" SCH 40 304/304L A/SA-312	384	8160	USA	OK		OK		OK		
3	2000164	0.750" SCH 40 316/316L A/SA-312	96	2040	USA	OK		OK		OK		
4	2000164	0.750" SCH 40 316/316L A/SA-312	48	1020	USA	OK		OK		OK		
5	2000298	1.250" SCH 10 304/304L A/SA-312	120	2550	USA	OK		OK		OK		
6	2000298	1.250" SCH 10 304/304L A/SA-312	68	1445	USA	OK		OK		OK		
7	2000580	2.500" SCH 10 304/304L A/SA-312	48	1020	USA	OK		OK		OK		
8	2000580	2.500" SCH 10 304/304L A/SA-312	144	3060	USA	OK		OK		OK		
9	2001812	4.000" SCH 10 316/316L A/SA-312	100	2125	USA	OK		OK		OK		

## Chemical Composition

Item #	Heat #	Alloy	C	Mn	P	S	Si	Cr	Ni	Mo	Cu	Co	N	T	Cb
1	976885	TP304/304L	0.011	1.690	0.032	0.011	0.430	18.200	8.100	0.330	0.450	0.240	0.000	0.000	
2	832490	TP304/304L	0.017	1.680	0.032	0.010	0.380	18.200	8.100	0.390	0.450	0.300	0.000	0.000	
3	832391	TP316L	0.017	1.790	0.030	0.010	0.420	16.800	10.100	2.050	0.380	0.400			
4	977060	TP316L	0.015	1.480	0.033	0.008	0.440	16.800	10.100	2.080	0.540	0.410			
5	948048	TP304/304L	0.018	1.720	0.035	0.015	0.410	18.400	8.200	0.370	0.450	0.190	0.000	0.000	
6	976697	TP304/304L	0.017	1.640	0.034	0.014	0.430	18.200	8.120	0.400	0.430	0.240	0.000	0.000	
7	947963	TP304/304L	0.025	1.690	0.035	0.010	0.440	18.200	8.110	0.340	0.410	0.230	0.000	0.000	
8	976631	TP304/304L	0.015	1.610	0.040	0.012	0.420	18.100	8.120	0.280	0.440	0.220	0.000	0.000	
9	948416	TP316L	0.016	1.480	0.033	0.009	0.450	16.600	10.100	2.040	0.500	0.420			

**ical Tests and Other**

Rockwell Hardness	Yield Strength (PSI)	Tensile Strength (PSI)	Elongation (%)	Country of Melt	DFARS-BAA	FAR BAA	FAR TAA
B85	48900	89600	60	USA	Complies	Complies	Complies
B87	49000	90200	61	USA	Complies	Complies	Complies
B88	48000	90700	61	USA	Complies	Complies	Complies
4 B88	49000	90200	59	USA	Complies	Complies	Complies
5 B87	49500	88700	60	USA	Complies	Complies	Complies
6 B86	48700	96000	58	USA	Complies	Complies	Complies
7 B90	49300	90800	59	USA	Complies	Complies	Complies
8 B84	48300	89600	61	USA	Complies	Complies	Complies
9 B89	48900	90600	61	USA	Complies	Complies	Complies

**Additional Notes:**

**Certification:**

WE CERTIFY THAT THIS MATERIAL IS FREE FROM MERCURY CONTAMINATION & CONTINUOUS CARBIDE NETWORK DURING ITS MANUFACTURE AND PROCESSING. WE CERTIFY THAT THE CHEMICAL, PHYSICAL, AND MECHANICAL TESTS REPORTED HEREIN ARE CORRECT AS SHOWN ON OUR RECORDS.

ISO 9001:2008 CERTIFIED

*David Roeser*  
**David Roeser**  
 Q.C. MANAGER

# **4. ASME CODE DOCUMENTATION**



ABILITY ENGINEERING TECHNOLOGY, INC.  
16140 SOUTH VINCENNES AVENUE, SOUTH HOLLAND IL 60473

**COPY**

**FORM U-3A MANUFACTURER'S CERTIFICATE OF COMPLIANCE (ALTERNATIVE FORM) Page 1 of 2**  
**COVERING PRESSURE VESSELS TO BE STAMPED WITH THE UM DESIGNATOR [SEE U-1(j)]**  
**As Required by the Provisions of the ASME Boiler and Pressure Vessel Code Rules, Section VIII, Division 1**

1. Manufactured and certified by ABILITY ENGINEERING TECHNOLOGY INC. 16140 VINCENNES AVENUE, SOUTH HOLLAND, IL 60473  
(Name and address of Manufacturer)
2. Manufactured for BEST VALUE VACS 1251 Frontenac Rd. STE 150. Naperville IL 60563 USA  
(Name and address of Purchaser)
3. Location of installation UNKNOWN  
(Name and address)
4. Type VERTICAL VESSEL 14.5 GAL 199030B  
(Horizontal, vertical, or sphere) (Tank, separator, etc.) (Capacity) (Manufacturer's serial number)  
N/A 9030-6093 444 2019  
(CRN) (Drawing number) (National Board number) (Year built)
5. ASME Code, Section VIII, Div. 1 2017 1518-5  
(Edition and Addenda, if applicable (date)) (Code Case number)
6. Shell: (a) Number of course(s) 1 (b) Overall length 3'- 10 1/2"

No.	Course(s)		Material Spec./Grade or Type	Thickness		Long. Joint (Cat. A)			Circum. Joint (Cat. A, B & C)			Heat Treatment	
	Diameter	Length		Nom.	Corr.	Type	Full, Spot, None	Eff.	Type	Full, Spot, None	Eff.	Temp.	Time
1	12.75"	30"	SA-312-TP-304	.180"	.180"	N/A	NONE	.85	N/A	N/A	N/A	N/A	N/A
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-

Body Flanges on Shells													
No.	Type	ID	OD	Flange Thk	Min Hub Thk	Material	How Attached	Location	Bolting				
									Num & Size	Bolting Material	Washer (OD, ID, thk)	Washer Material	
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-

7. Heads: (a) SA-403-WP-304 (b) SA-403-WP-304  
(Material spec. number, grade or type) (H.T. -- time and temp.) (Material spec. number, grade or type) (H.T. -- time and temp.)

	Location (Top, Bottom, Ends)	Thickness		Radius		Elliptical Ratio	Conical Apex Angle	Hemis. Radius	Flat Diameter	Side to Pressure		Category A		
		Min.	Corr.	Crown	Knuckle					Convex	Concave	Type	Full, Spot, None	Eff.
(a)	TOP	.1514"	.1514"	-	-	2:1	-	-	-		X	1	NONE	85
(b)	BOTTOM	.1514"	.1514"	-	-	2:1	-	-	-		X	1	NONE	85

Body Flanges on Heads													
	Location	Type	ID	OD	Flange Thk	Min Hub Thk	Material	How Attached	Bolting				
									Num & Size	Bolting Material	Washer (OD, ID, thk)	Washer Material	
(a)	-	-	-	-	-	-	-	-	-	-	-	-	-
(b)	-	-	-	-	-	-	-	-	-	-	-	-	-

8. Type of jacket 2 Jacket closure .25" THK PLATE SA -240-T-304  
(Describe as ogee and weld, bar, etc.)  
 If bar, give dimensions N/A If bolted, describe or sketch.
9. MAWP 350 PSIG - at max. temp. 120 F 120 F Min. design metal temp. -20 at 350 PSIG  
(Internal) (External) (Internal) (External)
10. Impact test EXEMPT PER UHA-51(d) at test temperature of N/A  
(Indicate yes or no and the component(s) impact tested)
11. Hydro., pneu., or comb. test pressure 455 PSI HYDRO Proof test NO

Manufactured by ABILITY ENGINEERING TECHNOLOGY INC. 16140 VINCENNES AVENUE, SOUTH HOLLAND, IL 60473  
 Manufacturer's Serial No. 199030B CRN N/A National Board No. 444

12. Nozzles, inspection, and safety valve openings:

Purpose (Inlet, Outlet, Drain, etc.)	No.	Diameter or Size	Type	Material		Nozzle Thickness		Reinforcement Material	Attachment Details		Location (Insp. Open.)
				Nozzle	Flange	Nom.	Corr.		Nozzle	Flange	
MISC.	2	1/2"	CPLG	SA-182-F-304	N/A	#3000	#3000	NONE	UW-16.1(j)	N/A	-
MISC.	2	1 1/2"	TUBE	SA-312-TP-304	N/A	.250"	.250"	NONE	UW-16.1(j)	N/A	-
MISC.	2	6"	TUBE	SA-312-TP-304	N/A	.375"	.375"	NONE	UW-16.1(j)	N/A	-

13. Supports: Skirt NO Lugs 0 Legs 0 Others N/A Attached -  
(Yes or no) (Number) (Number) (Describe) (Where and how)

14. Manufacturer's Partial Data Reports properly identified and signed by Commissioned Inspectors have been furnished for the following items of the report (list the name of part, item number, Manufacturer's name, and identifying number):

15. Remarks

PRESSURE RELIEF BY OTHERS

CERTIFICATE OF SHOP COMPLIANCE			
We certify that the statements in this report are correct and that all details of design, material, construction, and workmanship of this vessel conform to the ASME BOILER AND PRESSURE VESSEL CODE, Section VIII, Division 1.			
UM Certificate of Authorization Number <u>40,478</u>		Expires <u>03/16/2020</u>	
Date <u>7/01/19</u>	Name <u>ABILITY ENGINEERING TECHNOLOGY INC.</u>	Signed 	
<small>(Manufacturer)</small>		<small>(Representative)</small>	
Signed <u>V. N. Patel</u>	Certificate Number <u>4231</u>		<small>(National Board CI number)</small>
<small>(Certified individual)</small>			

# **5. TEST REPORTS**



ABILITY ENGINEERING TECHNOLOGY, INC.  
16140 SOUTH VINCENNES AVENUE, SOUTH HOLLAND IL 60473





Area Code 708-331-0025  
Fax 708-331-0509

16140 Vincennes Avenue, South Holland, Illinois 60473  
(Rt. 6 & Vincennes)

**TEST REPORT FORM**  
**AET-TR-10 (REV. 1 / 06-13-17)**

HELIUM LEAK TEST PERFORMED IN ACCORDANCE WITH, AET-LT-102  
HYDROSTATIC TEST PERFORMED IN ACCORDANCE WITH, AET-HP-104  
PNEUMATIC TEST PERFORMED IN ACCORDANCE WITH, AET-PT-105

CUSTOMER: BV

JOB #: 9030 B

ITEM TESTED: Vac Vessel B

TYPE OF TEST ( CHECK ANY THAT APPLY):

DRAWING #: 9030-6093

HYDRO: \_\_\_\_\_

PNEUMATIC: \_\_\_\_\_

MASS SPECTROMETER VAC: X

BUBBLE: \_\_\_\_\_

S/N: \_\_\_\_\_

OTHER (SPECIFY) : \_\_\_\_\_

PRESSURE TEST

MASS. SPEC TEST

UNITS, STD CC'S/SEC

TEST PRESS: \_\_\_\_\_

CALIBRATED LEAK S/N: \_\_\_\_\_

GAUGE RANGE: \_\_\_\_\_

ASM 182T - HLD1070536: \_\_\_\_\_

GAUGE #: \_\_\_\_\_

ASM 180T - 021120101: X

CAL. DATE: \_\_\_\_\_

MAX. ALLOW LEAK/ SPEC: \_\_\_\_\_

BKG. TEST START: 140-9

BKG. TEST COMPLETE: 940-11

DURATION (BAGGING TEST): \_\_\_\_\_

TEST HISTORY  
LEAK (YES OR NO): NO

COMMENTS - SKETCHES:

NUMBER / LOCATION

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_

SIGNATURE OF  
Q.C. OPERATOR: [Signature]

DATE: 01/15/2020

SIGNATURE OF  
Q.C. VERIFICATION: [Signature]

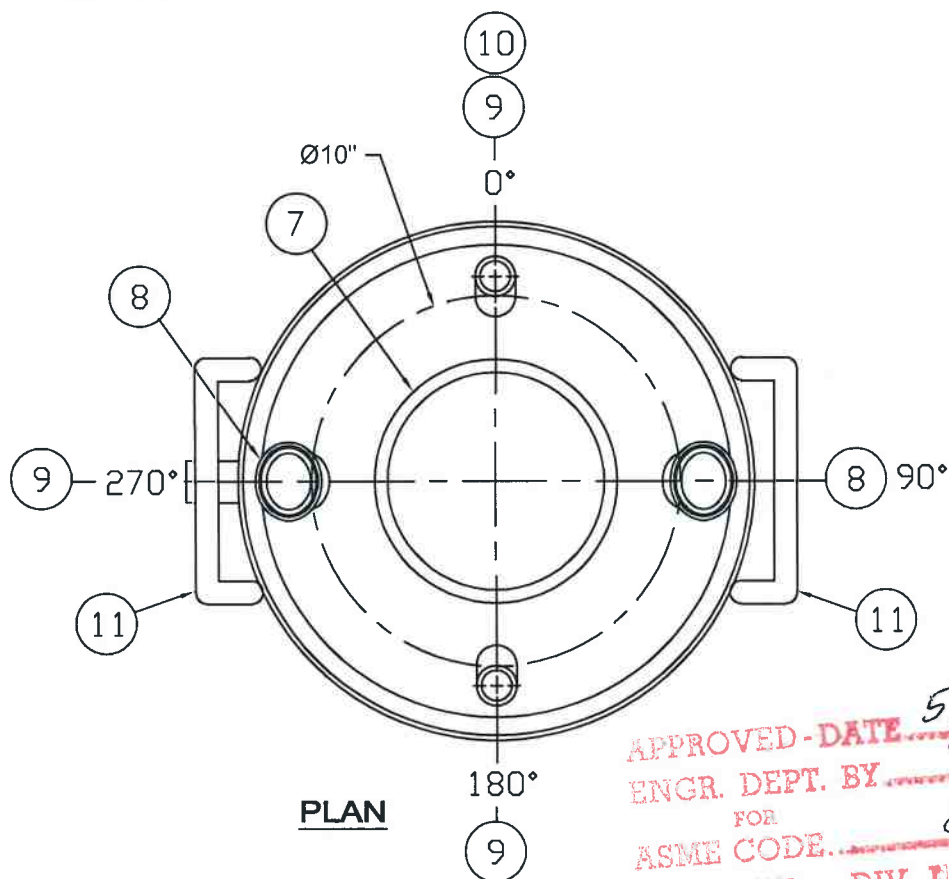
## 6. AS-BUILT DRAWING



ABILITY ENGINEERING TECHNOLOGY, INC.  
16140 SOUTH VINCENNES AVENUE, SOUTH HOLLAND IL 60473



ITEM	QTY.	BILL OF MATERIALS	MATERIAL	PART NO.
1	1	12"-SCH10 (.180" WALL) PIPE 30" LONG	SA-312-TP-304	
2	2	12"-SCH10 (.180" WALL) PIPE CAP	SA-403-WP-304	
3	1	14"-SCH10 (.180" WALL) PIPE CAP	SA-403-WP-304	
4	1	14"-SCH10 (.180" WALL) PIPE 33 3/8" LONG	SA-312-TP-304	
5	1	1/4" PLATE 13 3/4" O.D. X 12.80" I.D.	SA-240-T-304	
7A	2	6" ASME CODE FERRULE x 3 1/2" LONG	SA-182-F-304	
7B	2	6" ASME CODE FERRULE x 3 3/4" LONG	SA-182-F-304	
8	2	1 1/2" ASME CODE FERRULE	SA-182-F-304	
9	4	1/2"-3000# FULL COUPLING	SA-182-F-304	
10	1	ASME CODE BRACKET AND NAMEPLATE	S.S.	
11	2	5/8" HANDLE	S.S.	
12	2	1 1/4"-SCH40 PIPE X 2-1/16" LNG.	SA-312-TP-304	

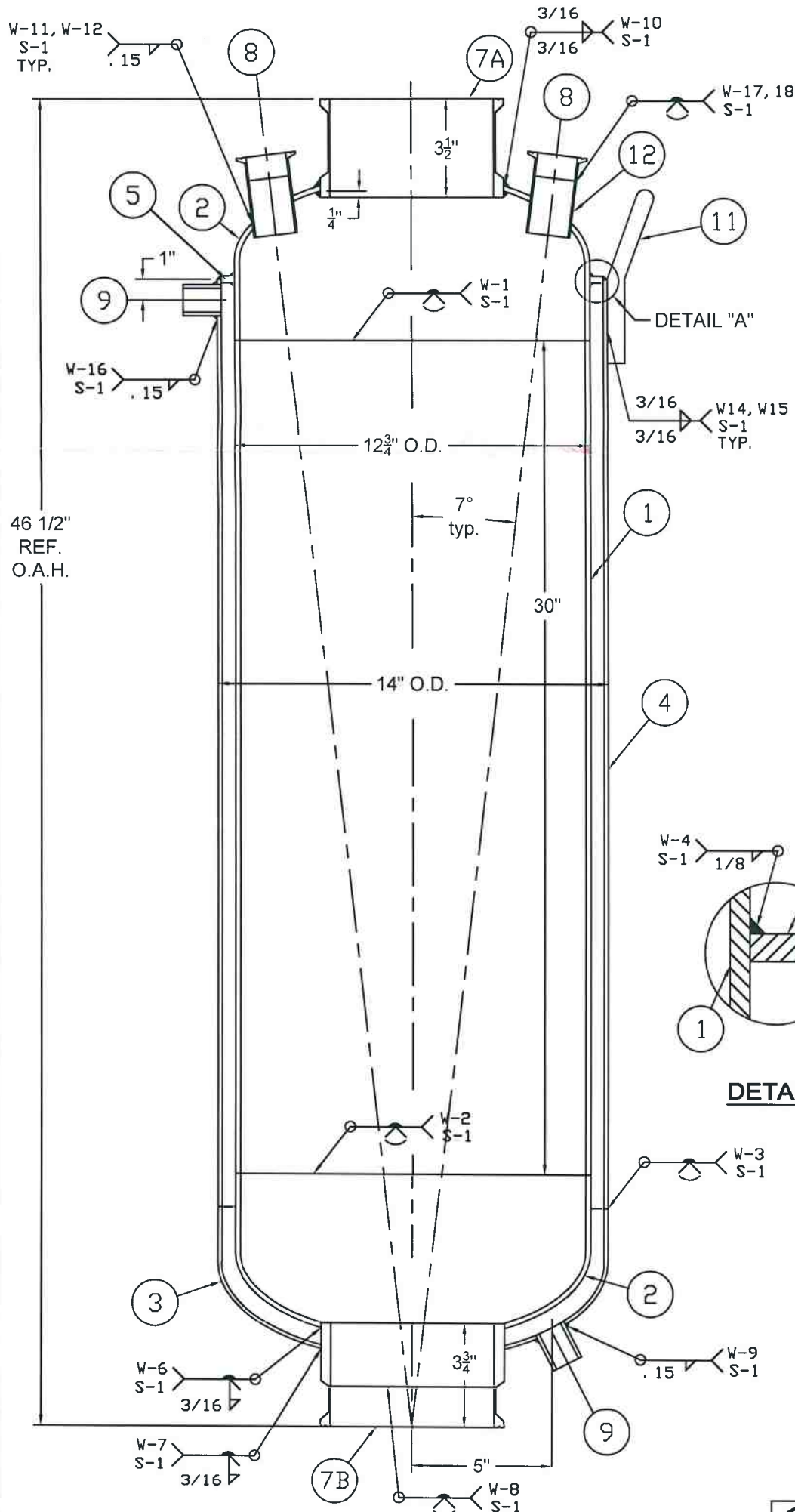


PLAN

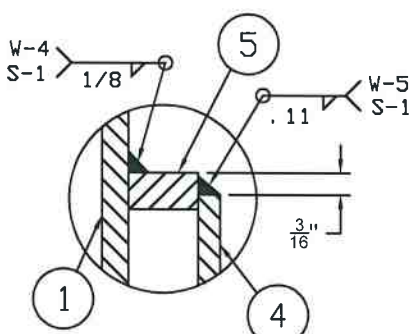
APPROVED - DATE 5/10/19  
 ENGR. DEPT. BY [Signature]  
 FOR ASME CODE. 2017  
 SECT. VIII - DIV. I

**DESIGN AND MANUFACTURING REQUIREMENTS**

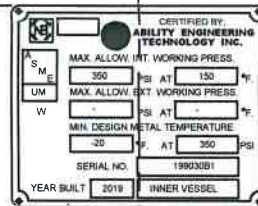
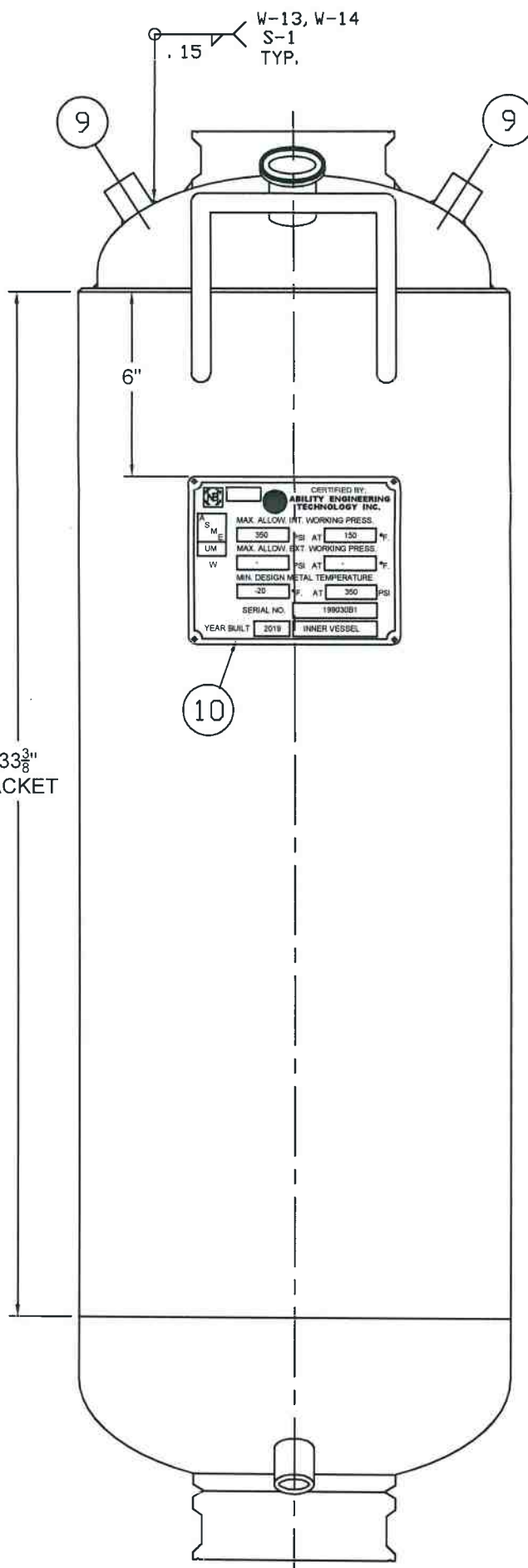
- INNER VESSEL IS DESIGNED, FABRICATED IN ACCORDANCE WITH THE LAST EDITION OF THE ASME BOILER AND PRESSURE VESSEL CODE SECTION VIII DIVISION 1 FOR INTERNAL PRESSURE OF INNER VESSEL 350 PSIG AT 120 °F MAX. AND -20°F MIN. TEMPERATURE (NO PRESSURE IN THE NON STAMPED JACKET).
- TEST:
  - VESSEL: 455 PSIG HYDRO.
  - JACKET: VACUUM LEAK TEST.
- ALL SURFACES ARE TO BE PRE-CLEANED TO REMOVE GREASE, OIL, PAINT, SOIL, GRIT AND OTHER GROSS CONTAMINATION,
- CALCULATED WEIGHT EMPTY: 186 LBS
- LARGEST SHIPPING DIM.: 14" DIA, X 46 1/2" O.A.L.
- ASME NAMEPLATE ATTACHED TO INNER TANK, DUPLICATE TO JACKET.
- ELECTROPOLISH INSIDE OF INNER VESSEL



46 1/2" REF. O.A.H.



DETAIL "A"



THE DRAWING AND IDEAS SHOWN THEREON ARE THE EXCLUSIVE PROPERTY OF ABILITY ENGINEERING TECHNOLOGY AND ARE NOT TO BE USED OR REPRODUCED IN WHOLE OR IN PART WITHOUT THE WRITTEN CONSENT OF ABILITY ENGINEERING TECHNOLOGY.

UNLESS OTHERWISE SPECIFIED, TOLERANCES:

UNLESS OTHERWISE SPECIFIED:

1. BREAK ALL SHARP EDGES  
 2. MACHINED SURFACE FINISH SHALL NOT EXCEED ANSI Y14.1994

DECIMALS  
 XX.XX ±.015 XX.XXX ±.005

**ABILITY ENGINEERING TECHNOLOGY**

16140 VINCENNES AVENUE, SOUTH HOLLAND, IL 60473  
 Phone No. (708) 331-0025, Fax No. (708) 331-5090

16140 VINCENNES AVENUE, SOUTH HOLLAND, IL 60473  
 Phone No. (708) 331-0025, Fax No. (708) 331-5090

16140 VINCENNES AVENUE, SOUTH HOLLAND, IL 60473  
 Phone No. (708) 331-0025, Fax No. (708) 331-5090

JOB.#: 9030	QTY: 1
DESCRIPTION: 12 3/4" DIA X 46 1/2" O. A. H. ASME VESSEL	
FOR: BEST VALUE	
ADDRESS:	
DATE: 2/24/17	SCALE: 1=4
DWN BY: MH	APPROVED BY: [Signature]
DATE:	REV. 2