

EXACT EXCHANGER I N C O R P O R A T E D

MATERIAL TEST REPORTS

ORDER #: 320015

CUSTOMER: TESCOP

PO# F-0820-0351



RathGibson Janesville LLC
 2506 FOSTER AVENUE
 JANESVILLE, WISCONSIN 53547-0389 U.S.A.
 PHONE 608-784-2222, FAX 608-784-0889

CERTIFIED REPORTS OF TESTS
 This certificate issued in accordance with EN 10204-3.1

Notified body BSI, BSI Americas UK Limited, certified to PED and ISO 9001 and 9A certificate numbers on file.

AS2C COMPANY SO # 23092-001 43 pcs 48'-1" 2067.583 FT.

CUSTOMER ORDER # C331188/3
 PURCHASE ORDER # 4189-H-19
 CERTIFICATION DATE 1/18/2020 2:14:56PM
 SHIP VIA CSB PPD

SOLD TO TUBES INC
 9401 TELGE ROAD
 HOUSTON, TX 77066
 UNITED STATES

SHIP TO TUBES INC
 900 EAST PECAN STREET
 SAND SPRINGS, OK 74063

DESCRIPTION 0.625" X 0.048" AVG TP316/TP316L ASME/ASTM SA240/A240
 PRODUCT TYPE WELDED TUBE, BEAD REDUCED, BRIGHT SOLUTION ANNEALED
 HEAT TREATMENT 1900F (1040C) MIN, QUENCHED IN INERT GAS ATM
 REVISION DATE ASME SA240-E17, ASTM A240-18a
 COMMENTS TAG: 4189-H-19

ITEM NUMBER JT0625044S3160300000
 QUANTITY 8,030 FT
 NUMBER OF PIECES 167
 MELT ORIGIN USA
 MELT PRACTICE EAM / AOD

MADE IN USA

CHEMICAL ANALYSIS (WT%)

Heat # 858969

	C	Mn	P	S	Si	Cr	Ni	Mo	Cu	Co	N	Obts	Ti
Heat Analysis	0.014	1.44	0.028	0.0120	0.46	16.8	10.1	2.04	0.45	0.21	0.08	0.12	0.002
Product Analysis	0.014	1.44	0.028	0.0120	0.46	16.8	10.2	2.03	0.45	0.20	0.06	0.13	0.004

POSITIVE MATERIAL ID OK (ASTM E1478)

V	B
0.09	0.040
0.09	0.037

PREN: 24.3

MECHANICAL TEST(S)

YIELD STRENGTH (0.2% OFFSET) 58000 PSI (404 MPA) 65100 PSI (449 MPA)	TENSILE STRENGTH 95000 PSI (658 MPA) 94000 PSI (649 MPA)	ELONGATION (% IN 2") 47 48	HARDNESS HRB 85 HRB 85	VISUAL TEST - PASS TUBES, INC. 1-800-847-5745
FLANGE TEST - PASS FLATTENING TEST - PASS	REVERSE BEND - PASS FLARE TEST - PASS	REVERSE FLATTENING - PASS EDDY CURRENT - PASS	DIMENSIONS - PASS	THESE MILL TEST REPORTS APPLY TO: YOUR P.O. NO. <u>59663</u> JOB NUMBER <u>STDCX</u>

ADDITIONAL TEST(S)

N/A

ATTENT: RathGibson Janesville LLC does not use mercury, lead, cadmium, or any specific metal alloy which is liquid at ambient temperature in its product or facility. These are no known deliberate pollutants in the facility. Heat treatment was not used (if manufacturer described heat was annealed, solution, and tempered in accordance with all applicable above stated specifications and the results meet the requirements of those specifications. Technical inquiries regarding this form should be directed to the Technical Services Group. All other assistance concerning this certificate should be directed to the preparer (see below). For purposes of maintaining conformance with the specifications, dimensional requirements shall be rounded in accordance with the rounding-off method of ASTM practice as noted in section 8.1.4. When the product description above includes BPE B1 or BPE B14 the products have been manufactured and tested to comply with the requirements of the ASME BPE specifications and under the authorization granted through ASME BPE Certificate of Authorization No. BPE-143 Expiry on 06/06/2023.

Con ID: 492891-2020-1-16
 MTRB-01 Rev. 14 Rev. Date 2/24/2016

Mike Smith

Mike Smith, Senior Metallographic Technician

Kate Williamson

Kate Williamson, MILL CERTIFICATION

COMPLIANCE Please note - This certificate was issued only in order to state that analysis being covered herein, at which time the responsibility for safe storage in subsequent years for your protection please attention (shown on it address) if any abnormal or change in character, have a safe storage area by your purchase agent or request further analysis.	MSDS - Material Safety Data sheets for the product have been provided to your Purchasing Department and can also be downloaded from www.rathgibson.com . CAUTION: Purchasing Dept must be notified first, or otherwise you may have the wrong data sheet for the product.	SHALL NOT REPRODUCE - This certificate of test results shall not be reproduced, copied or in any way expressed without approval of RathGibson Janesville LLC.
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Address: Survey No. 219-205
 Nr. Sintex Health Care, Indrad,
 Ta. Kadi, D. Mehsana-382715,
 Gujarat (India)
 CIN: U27109GJ2014PTC078248
 GSTIN : 24AAUCS1323H12C



SUN MARK STAINLESS PVT. LTD.

Test Certificate

(AS PER EN 10204 3.1)

T.C.NO		SMPL/EXP/20-21/57 (03)			DATE :		11-05-20				
CUSTOMER		MERIT BRASS COMPANY			DATE :		18-03-20				
W.O NO		067-D / 3 / 20			DATE :		17-03-20				
P.O.NO		P1006194			DATE :		17-03-20				
PRODUCT		STAINLESS STEEL WELDED ANNEALED & PICKLED ROUND PIPES			GRADE :		TP316/316L / 17748				
SPECIFICATION		AS PER ASTM A312-18a / ASME SA312-17 NACE MRO103; NACE MRO175			Nos		Total FEET.		Total Kgs		
Po.Sr. No.		DESCRIPTION OF PRODUCT			Nos		Total FEET.		Total Kgs		
03		3"NB (88.9mm OD) X SCH10S (4.05mm THK) X 20 FEET LONG			20		400		748.00		
CHEMICAL COMPOSITION											
Heat No	Chemistry	C %	SI %	Mn %	P %	S %	Ni %	Cr %	Mo%	N%	OTHER
	Required	0.035	1.000	2.000	0.045	0.030	10.000	16.000	2.000	---	---
5Y860	H	0.019	0.290	1.430	0.029	0.007	10.010	16.970	2.030	---	---
	P	0.023	0.350	1.450	0.032	0.007	10.030	16.900	2.040	---	---
PHYSICAL TEST											
Parameter	Tensile Test	Y.S.	U.T.S	Elongation %	Hardness	IMPACT TEST -R/A					
		(Mpa)	(Mpa)	(G.L: 50 mm)	Test(HRB)	1	2	3	Avg.		
Heat No	Required	205	515	35%	90	WELD	---	---	---	---	
		MIN	MIN	MIN	MAX	HAZ	---	---	---	---	
5Y860	EXP/67-D/03-A	232.00	624.00	54.53%	73	PARENT	---	---	---	---	
	EXP/67-D/03-B	247.00	633.00	54.63%	76	---	---	---	---	---	
FLANGE TEST		N/A									
FLATTENING TEST		OK									
FLARING TEST		N/A									
BEND/R.BEND		N/A									
HYDROSTATIC TEST		OK (Done at 1050 PSIG)									
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 as per ASTM A-999 M/S MFG - Found satisfactory.											
100% Visual & Dimension Inspection carried out By M/S MFG - Found satisfactory.											
Hardness Test carried out by MFG & meet requirement of NACE MRO103; NACE MRO175 and Found Satisfactory											
Marking on Pipes : LOGD MFG NB (MM OD) X SCH (MM THK) X LONG WELDED ASTM A312/ASME SA312 TP HEAT NO. done by MFG : Found Satisfactory											
ABBREVIATION: H - Heat Test P - Product Test, RL- Random Length, N/A- Not Applicable, MFG-Manufacturer											
 MANAGER (QA)											

We hereby certify that the material described herein are in accordance with the specification and that results comply with the requirements of the specification

Regd. Office : 310, Ashirwad Paras, Corporate Road, Prahlad Nagar, Ahmedabad - 380015, Gujarat, (India)
 Tel: +91 79 30221110, 30222110 Fax: +91 79 30221220 • Email: accounts@sunmarkstainless.com Website : www.sunmarkstainless.com



CHANDAN STEEL LIMITED
 (GOVT. OF INDIA RECOGNISED EXPORT HOUSE)
 ISO 9001:2015 CERTIFICATE No. 04 100 011022

ADM. OFFICE: SDA, SUKH SAGAR, N. S. PATILAR MARG,
 MUMBAI 400 007, INDIA
 Tel: 91-22- 66290600, Fax: 91-22-66290533/34
 Website : www.chandansteel.net
 Email : info@chandansteel.net
 L/c No. : ---
 L/c Date: ---

WORKS: Plot No. 35, G. I. D. C., Umbergaon
 Dist. Valsad, Gujarat - 396 171.
 Tel: 91-260-256 2046 / 4357 / 1144, Fax: 91-260-256 2387
 E-mail : export@chandansteel.net

INSPECTION CERTIFICATE 3.1
ACCORDING TO EN 10204

Metl Brass Company One Meet Drive PO Box 45127 Cleveland - OH - 44145 USA	Test Certificate No. : EXP/00713-05/2018-19 Date of Issue : 25.09.2018 P.O. No. : P1001633-9 Invoice No. & Date : EXP/00713/2018-19 Dtd.25.09.2018
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ITEM DESCRIPTION
STAINLESS STEEL FORGED & FULLY MACHINED FLANGES

Po Sr.No.	Part Code	Heat No.	Pcs	Box No.	Wt.Kgs	Grade	Item	Process Route
87	A635BL-128	CH-8985	25	147	518.00	F316/316L	8" BLRF 150LBS	Electric Induction Melting, A.O.D. Refining Continuous Casting & Hot Forging.
134	A653L-64	CH-8944	6	147	34.92	F316/316L	4" SWRF 150LBS S40	
121	A65140L-48	CH-8945	185	147&149	980.40	F316/316L	3" WNRF 150LBS S40	
111	A65110L-48	CH-8658	4	147	20.04	F316/316L	3" WNRF 150LBS S10	
103	A650L-24	CH-8778	293	147	282.17	F316/316L	1 1/2" SORF 150LBS	

CHEMICAL COMPOSITION (Weight %)

Po Sr.No.	Part Code	C	Si	Mn	P	S	Cr	Mo	Ni	Cu	Ti	N	OTHERS
87	A635BL-128	0.024	0.49	1.68	0.044	0.004	16.57	2.07	10.08	-	-	0.071	-
134	A653L-64	0.020	0.41	1.52	0.035	0.014	16.58	2.05	10.02	-	-	0.055	-
121	A65140L-48	0.025	0.43	1.60	0.035	0.009	16.55	2.05	10.07	-	-	0.060	-
111	A65110L-48	0.026	0.44	1.80	0.040	0.014	16.84	2.10	10.1	-	-	0.068	-
103	A650L-24	0.026	0.50	1.60	0.040	0.010	16.64	2.00	10.04	-	-	0.072	-

MECHANICAL PROPERTIES

Po Sr.No.	Part Code	0.2% Yield Strength N/mm ² (R _{0.2})	Tensile Strength N/mm ² (R _m)	Elongation %	Reduction of Area %	Hardness (B, H, N.)
87	A635BL-128	271	585	50	69	170-174
134	A653L-64	282	584	50	70	169-173
121	A65140L-48	288	590	50	70	168-172
111	A65110L-48	285	571	52	74	170-174
103	A650L-24	293	587	51	73	172-176

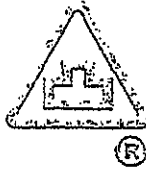
Remarks:

- Each heat treatment batch is having about 6000 Kgs of Weight.
- The material is solution annealed at minimum 1050 °C and water quenched.
- Material is free from mercury and radio-active contamination and is found within the limits of the background radiation.
- PMI test 100% satisfactory.
- Inter-Granular Corrosion Test (ASTM A262 - 15 (Fr.2)):- Satisfactory.
- The material conforms to ASTM A 182 - 17, ASME SA 182 - 17 & Dimension conforms to ASME B16.5 - 13 Specification.
- Visual and Dimensions inspection done and found satisfactory.
- The material hardness conforms to NACE MR0175/ISO 15156-3:2015 & NACE MR0103-2015.
- Marking Details - MATERIAL SPECIFICATION, SIZE, GRADE, HEAT NO., CHANDAN
- Country of Melt - INDIA.

We hereby certify that, the material described herein,
 and supplied are in compliance with the requirements of the order.



V.Y. Narayan
V.Y. NARAYAN
 SR. MANAGER Q. A.



BOTH-WELL STEEL FITTINGS CO., LTD.

NO.303, REN-SIN ROAD, REN-WU DISTRICT, KAOHSIUNG CITY, TAIWAN, R.O.C.(81460)
 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

An ISO 9001 : 2015 Registered Manufacturer

MILL TEST & INSPECTION CERTIFICATE

ACCORDING TO EN 10204 3.1

CUSTOMER : MERIT BRASS COMPANY
 CERT NO. : 183098
 ORDER NO. : P1001092-1

INVOICE NO. : YK-18-07-12
 L/C NO. :

PAGE : 16
 DATE : 07/30/2018
 ORIGIN : TAIWAN

ITEM	RAW HEAT NO. HEAT NO.	QTY	DESC/GRADE OR SPECIFICATION NO. CHEMICAL COMPOSITION(%) MECHANICAL PROPERTIES.
15	9SG209 1E8358	131 PCS	HALF CPLG F316L 1/2" 30MM# NPT 3611UD-08 C:0.017 S:0.47 Mn:1.70 P:0.037 S:0.026 Cu:0.64 Cr:17.23 Ni:10.18 Mo:2.05 N:0.07 TS(KSI):82.5 YS 0.2%(KSI):36.0 EL(%):61.4 R.A.(%):77.1 HARDNESS 1(HBW):152 HARDNESS 2(HBW):154 RAW MATERIAL SUPPLIER:GLORIA MATERIAL TECHNOLOGY CORP.(TAIWAN)

REMARK :

THE MATERIAL SUPPLIED IDENTIFIED AS ASTM A182 -17, ASME SA182-2015 ED, F316/F316L
 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	-	-	-	-	-	-	16.0	10.0	2.00	-	-
MAX	0.030	1.00	2.00	0.045	0.030	-	18.0	14.0	3.00	-	-
	N	Al	Ti	Zr	CE	TS(KSI)	YS(KSI)	YS 0.2%(KSI)	EL(%)	R of A(%)	HARDNESS(HBW)
MIN	-	-	-	-	-	75	-	30	30	50	-
MAX	0.10	-	-	-	-	-	-	-	-	-	235

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

CONFORMS TO NACE MR0175-15/ISO 15156-15/MRO103-15

FREE FROM RADIATION CONTAMINATION AND MERCURY FREE

CONFORMS TO ASTM A262 PRACTICE E SPECIFICATION

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



BOTH-WELL STEEL FITTINGS CO., LTD.

NO.303, REN-SIN ROAD, REN-WU DISTRICT, KAOHSIUNG CITY, TAIWAN, R.O.C.(814020)
 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

An ISO 9001 : 2015 Registered Manufacturer

MILL TEST & INSPECTION CERTIFICATE

ACCORDING TO EN 10204 3.1

CUSTOMER : MERIT BRASS COMPANY
 CERT NO. : 200706
 ORDER NO. : P1006026

INVOICE NO. : YK-20-04-30
 L/C NO. :

PAGE : 14
 DATE : 04/28/2020
 ORIGIN : TAIWAN

ITEM	RAW HEAT NO. HEAT NO.	QTY	DESC/GRADE OR SPECIFICATION NO. CHEMICAL COMPOSITION(%) MECHANICAL PROPERTIES.
36	9SK0107 HT0706	200 PCS	SQUARE PEG F316L 1/2" 5000#/6000# NPT 3617D-08 C:0.017 Si:0.46 Mn:1.67 P:0.032 S:0.028 Cu:0.49 Cr:17.19 Ni:10.17 Mo:2.05 N:0.088 TS(KSI):82.8 YS 0.2%(KSI):36.7 EL(%):61.9 R.A.(%):78.9 HARDNESS 1(HBW):153 HARDNESS 2(HBW):155 RAW MATERIAL SUPPLIER:WALSIN IJUMA CORP.(TAIWAN)

REMARK :

THE MATERIAL SUPPLIED IDENTIFIED AS ASTM A182 -19A. ASME SA182-2019ED, F316/F316L
 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	-	-	-	-	-	-	16.0	10.0	2.00	-	-
MAX	0.030	1.00	2.00	0.045	0.030	-	18.0	14.0	3.00	-	-
	N	Al	Ti	Zr	CE	TS(KSI)	YS(KSI)	YS 0.2%(KSI)	EL(%)	R of A(%)	HARDNESS(HBW)
MIN	-	-	-	-	-	75	-	30	30	50	-
MAX	0.10	-	-	-	-	-	-	-	-	-	235

HEAT TREATMENT : SOLUTION : 1060°C(1940°F) W.Q.
 CONFORMS TO NACE MR0175-15/ISO 15156-15/MRO103-15
 FREE FROM RADIATION CONTAMINATION AND MERCURY FREE
 CONFORMS TO ASTM A262 PRACTICE E SPECIFICATION

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

Y.Y. Qiang
 Q.C. MANAGER

C.L. Ko
 INSPECTOR