VNE
NEUMO Ehrenberg Group

MaxCore 6Mo ™
Comparison to AL-6XN®

AL-6XN is a registered trademark of ATI Technologies Inc.

What's in a name?

- When working with 6% molybdenum alloys, the most common brand is AL-6XN®. What is this?
  - AL-6XN® is a trade name owned by Allegheny Ludlum Corporation.
  - "A" stands for Allegheny
  - "L" stands for Ludlum
  - "6" is representative of 6% Molybdenum content
  - "X" was Allegheny Ludlum's internal designation for Molybdenum
  - "N" is representative of the Nitrogen content within the alloy
- AL-6XN® is a name no different than "Kleenex®" or "Coca-Cola®"

What's in a name?

- What is MaxCore 6Mo ™?
  - "Max" is representative of Maximum and is branded along the same lines as our MaxPure ™ line of fittings.
  - "Co" is representative of Corrosion
  - "re" is representative of Resistance
  - "6" is representative of 6% Molybdenum content
  - "Mo" is stands for Molybdenum
- MaxCore 6Mo ™ is a trade name no different than "Kleenex ®", "Coca-Cola ®" or AL-6XN ®

So if it's not the name, what is important?

- What is important is the chemical composition of the material.
- ASTM International (formerly known as American Society for Testing and Materials) develops and publishes a wide range of technical standards for materials, products, systems and services.
  - Adhering to the chemical composition as published in ASTM Standards guarantees materials meet the quality and performance levels as designed.

Chemical Composition AL6XN®

Ni	Cr	Mo	C	N	Mn	Si	P	S	Cu	Fe
23.5-25.5	20.00-22.00	6.00-7.00	0.03 Max	0.18-0.25	2.0 Max	1.00 Max	.040 Max	0.03 Max	0.75 Max	Remainder

Chemical Composition MaxCore 6Mo ™

Ni	Cr	Mo	C	N	Mn	Si	P	S	Cu	Fe
23.5-25.5	20.00-22.00	6.00-7.00	0.03 Max	0.18-0.25	2.0 Max	1.00 Max	.040 Max	0.03 Max	0.75 Max	Remainder

So if it's not the name, what is important?

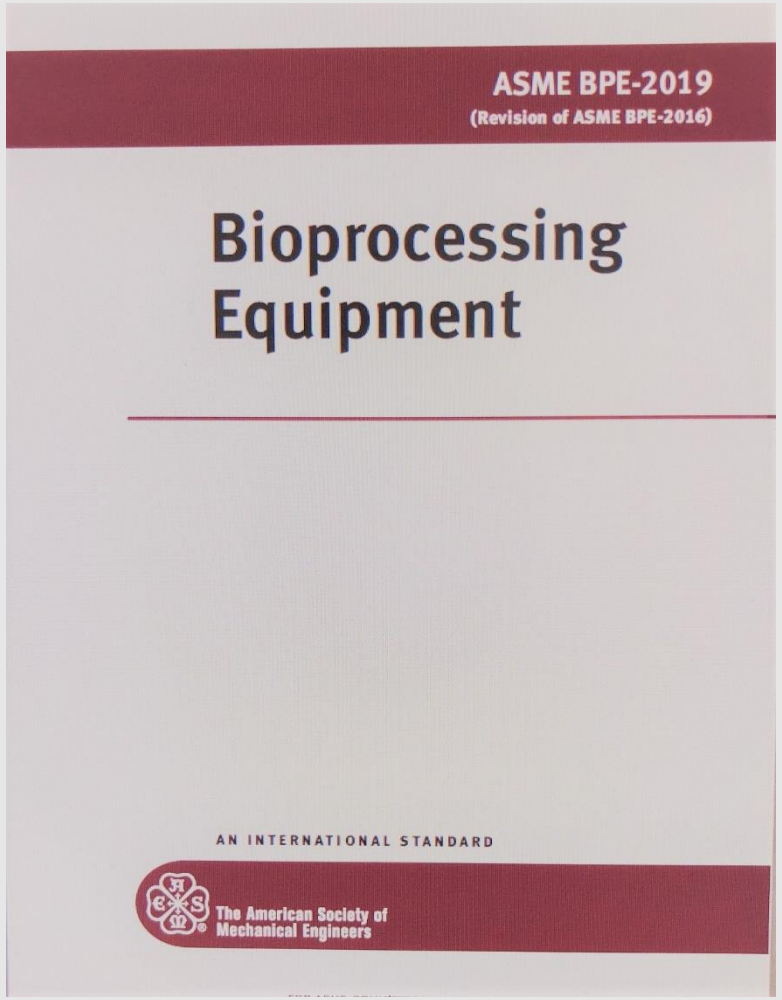
- Alloys are given a number designator. That number is issued by The Unified Numbering System for Metals and Alloys (UNS). The UNS # in itself, is not a specification but is instead a unified identifier of a metal or alloy for which controlling limits have been specified elsewhere. (i.e. ASTM Specifications).
- The UNS Number commonly associated with AL-6XN® is N08367
- The UNS Number associated with MaxCore 6Mo™ is N08367

So far, we have established the chemical composition and UNS number designators of AL-6XN® and MaxCore 6Mo™ are identical.

If MaxCore 6Mo ™ and AL-6XN ® are identical, what is the difference?

- In some cases there is no difference. VNE's line of MaxCore Tube and Fittings are fabricated from raw material fabricated from Allegheny Ludlum AL-6XN ® brand of steel and Outokumpu's brand name of Ultra 6XN ®.
- To be clear, we are not focused on the trade name of the material, but more on the chemical composition and UNS # designator guaranteeing the material adheres to the requirements of the ASTM standards. Both Allegheny Ludlum and Outokumpu's material meet this requirement and must be identical in order to carry the same UNS designator.
- The difference is the producing mill that fabricates the raw material from which the final product is made.

What does the BPE say about using AL-6XN® and MaxCore 6Mo™?



The BPE Standard does not use trade names within the document and has settled on the use of the UNS Designation number when possible as the identifier for materials of construction.

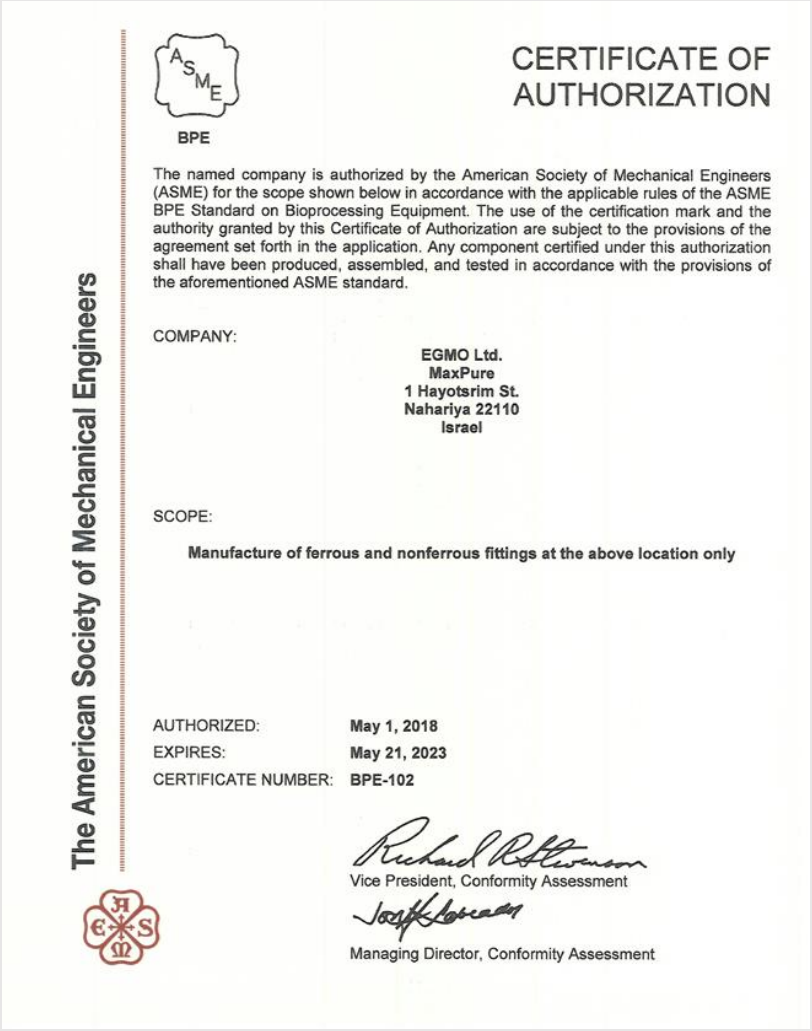
MaxCore 6MO and AL-6XN fall withing the category of Superaustenitic Stainless Steels in Table MM-2.1-1 and are listed as UNS N08367.

As further evidence to the support the removal of common alloy names, BPE has removed 316L callouts from the Standard and now refer to those when necessary as “316L type” in order to allow the use of European steels such as 1.4435 in its place.

It is recommended all specifications be revised to remove trade names in favor of the UNS designator.

What's the benefit of MaxCore 6Mo™ over AL-6XN®?

- MaxCore 6Mo™ fittings are manufactured at our BPE Certified facility in Israel and carries the BPE certification Stamp.
- MaxCore 6Mo™ tubing is manufactured at a BPE Certified facility carries the BPE certification Stamp.



The American Society of Mechanical Engineers

BPE

CERTIFICATE OF AUTHORIZATION

The named company is authorized by the American Society of Mechanical Engineers (ASME) for the scope shown below in accordance with the applicable rules of the ASME BPE Standard on Bioprocessing Equipment. The use of the certification mark and the authority granted by this Certificate of Authorization are subject to the provisions of the agreement set forth in the application. Any component certified under this authorization shall have been produced, assembled, and tested in accordance with the provisions of the aforementioned ASME standard.

COMPANY:

EGMO Ltd.
MaxPure
1 Hayotsrim St.
Nahariya 22110
Israel

SCOPE:

Manufacture of ferrous and nonferrous fittings at the above location only

AUTHORIZED: **May 1, 2018**
EXPIRES: **May 21, 2023**
CERTIFICATE NUMBER: **BPE-102**

Vice President, Conformity Assessment

Managing Director, Conformity Assessment

*Max*Core Benefits

- **MaxCore** 6Mo ™ fittings are the only 6Moly Alloy BPE Certified fittings available on the market today.

2019 BPE Standard
Organizations that are authorized to use the ASME Single Certification Mark for marking items or constructions that have been constructed and inspected in compliance with ASME Codes and Standards are issued Certificates of Authorization. It is the aim of the Society to maintain the standing of the ASME Single Certification Mark for the benefit of the users, the enforcement jurisdictions, and the holders of the ASME Single Certification Mark who comply with all requirements.

- **MaxCore** 6Mo tubing is BPE Certified on sizes
- 1-1/2" and above.

Tubing Specifications:

A269 spec indicates compliance with B31.1 Process Piping Code
SA 249 indicates compliance with the BPVC
A270 indicates compliance with 3A and BPE

United LASER WELDED 1.500" x 0.064" MIN MAXCORE 6MO UNS N08367 DIN 1.4529 ASME BPE SF5 SA249/ SB676 CL 1 ASTM A249/A269/A270 /B676 CL 1 NDE HT#12345 XXX 2/06/19

MaxCore Benefits

- MaxCore BPE fittings are plastic zip-lock bagged with a QR code for simple MTR download. Allows for immediate QA/QC reviews on the go or at a job site

MaxCore MTR's

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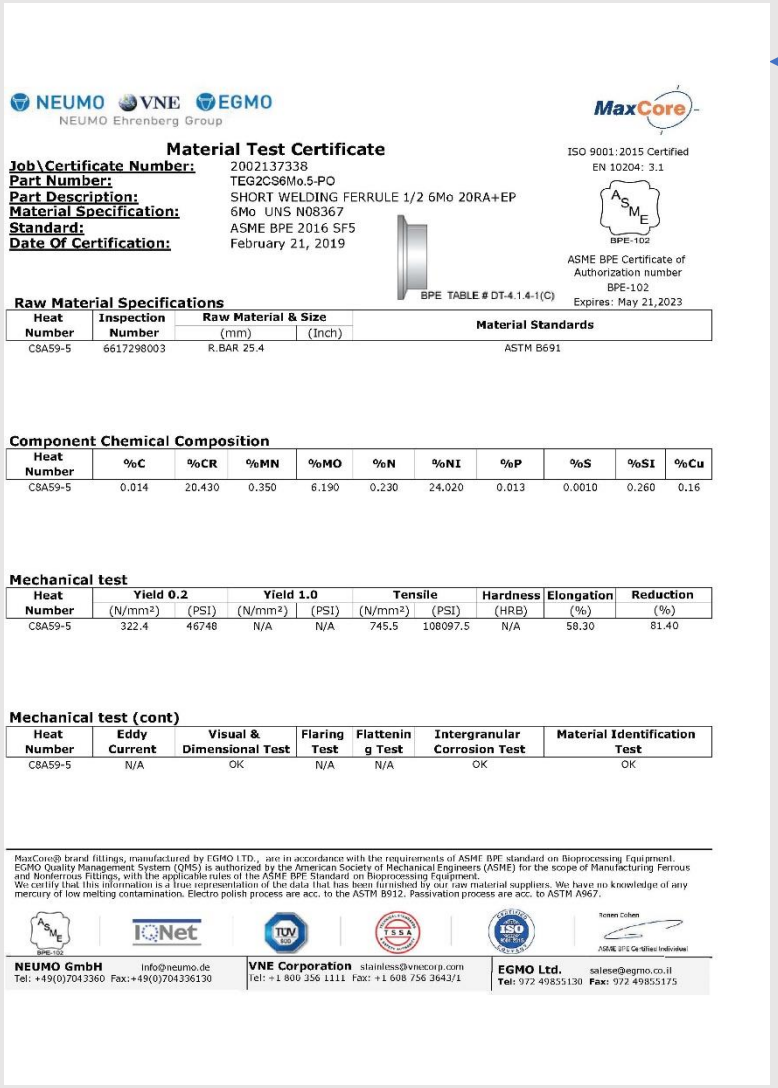

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MaxCore

ISO 9001:2015 Certified
EN 10204: 3.1

ASME BPE-102

ASME BPE Certificate of Authorization number BPE-102
Expires: May 21,2023

Material Test Certificate

Job\Certificate Number: 2002137338
Part Number: TEG2CS6Mo.5-PO
Part Description: SHORT WELDING FERRULE 1/2 6Mo 20RA+EP
Material Specification: 6Mo UNS N08367
Standard: ASME BPE 2016 SF5
Date Of Certification: February 21, 2019

BPE TABLE # DT-4.1.4-1(C)

Raw Material Specifications

Heat Number	Inspection Number	Raw Material & Size (mm)	Raw Material & Size (Inch)	Material Standards
C8A59-5	6617298003	R.BAR 25.4		ASTM B691

Component Chemical Composition

Heat Number	%C	%CR	%MN	%MO	%N	%NI	%P	%S	%SI	%Cu
C8A59-5	0.014	20.430	0.350	6.190	0.230	24.020	0.013	0.0010	0.260	0.16

Mechanical test

Heat Number	Yield 0.2 (N/mm²)	Yield 0.2 (PSI)	Yield 1.0 (N/mm²)	Yield 1.0 (PSI)	Tensile (N/mm²)	Tensile (PSI)	Hardness (HRB)	Elongation (%)	Reduction (%)
C8A59-5	322.4	46748	N/A	N/A	745.5	108097.5	N/A	58.30	81.40

Mechanical test (cont)

Heat Number	Eddy Current	Visual & Dimensional Test	Flaring Test	Flattening Test	Intergranular Corrosion Test	Material Identification Test
C8A59-5	N/A	OK	N/A	N/A	OK	OK

MaxCore® brand fittings, manufactured by EGMO LTD., are in accordance with the requirements of ASME BPE standard on Bioprocessing Equipment. EGMO Quality Management System (QMS) is authorized by the American Society of Mechanical Engineers (ASME) for the scope of Manufacturing Ferrous and Nonferrous Fittings, with the applicable rules of the ASME BPE Standard on Bioprocessing Equipment.
We certify that this information is a true representation of the data that has been furnished by our raw material suppliers. We have no knowledge of any mercury of low melting contamination. Electro polish process are acc. to the ASTM B912. Passivation process are acc. to ASTM A967.

Yoram Cohen
ASME BPE Certified Individual

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EGMO Ltd. salese@egmo.co.il Tel: 972 49855130 Fax: 972 49855175

← Original Mill Certs available if required

NEUMO VNE EGMO
NEUMO Ehrenberg Group

MaxCore

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EN 10204: 3.1

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BPE TABLE # DT-4.1.4-1(C)

Raw Material Specifications

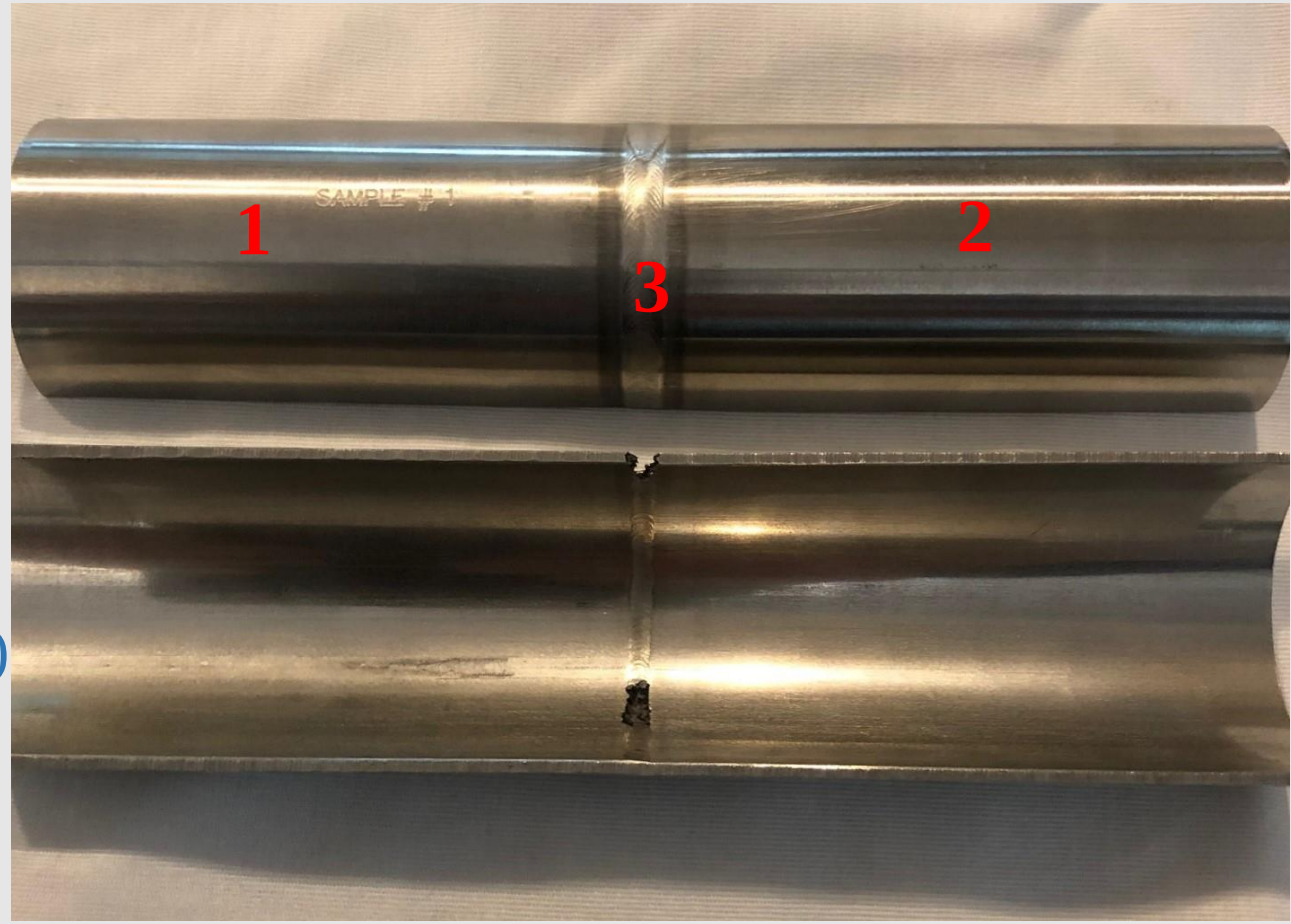
MaxCore BPE fittings MTR have a picture depicting the fitting for easy identification

Corrosion Study

Sample:

1. 6 Mo Tube
2. 6 Mo Tube
3. Automatic fusion weld no insert ring

The top sample is ½ of the sample representing the piece prior to testing. The bottom sample is representative of the test results after immersion in the test solution.



Corrosion Test

ASTM G-48 Practice C (modified immersion test)

6%$FeCl_3$ + 1% HCl at 50° C (122° F) for 72 hours

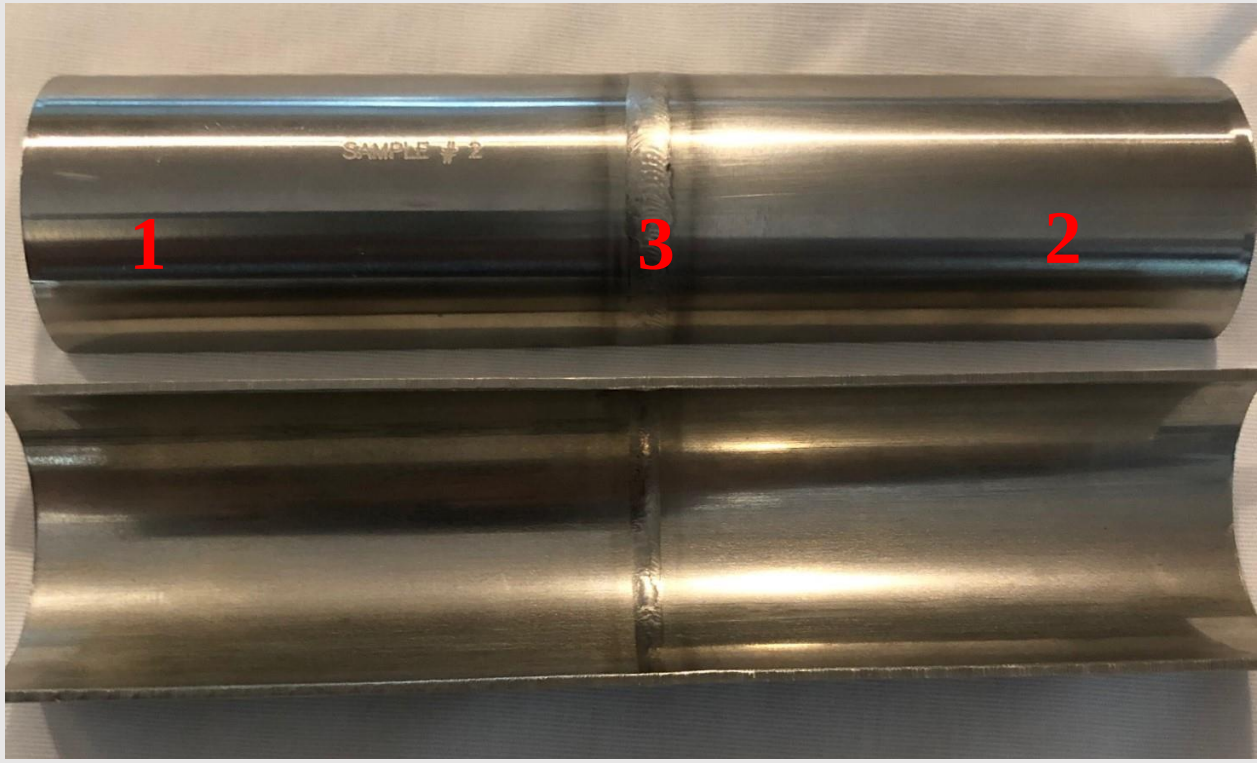
Each test run independently with fresh solution

Corrosion Study

Sample:

1. 6 Mo Tube
2. 6 Mo Tube
3. Automatic fusion weld
   Alloy 625 washer style
   insert ring

The top sample is ½ of the sample representing the piece prior to testing. The bottom sample is representative of the test results after immersion in the test solution.



Corrosion Test

ASTM G-48 Practice C (modified immersion test)

6%$FeCl_3$ + 1% HCl at 50° C (122° F) for 72 hours

Each test run independently with fresh solution

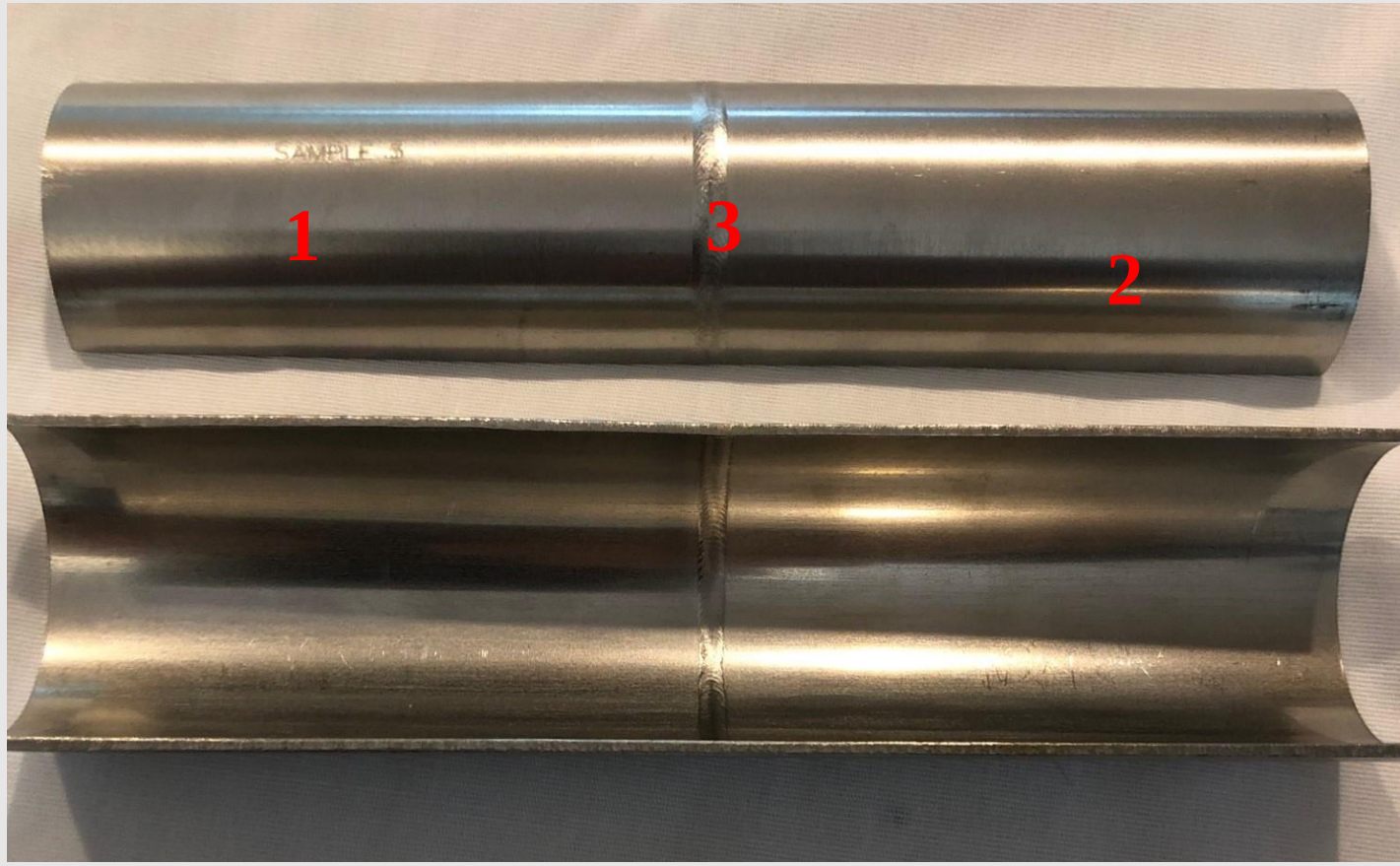
Corrosion Study

Sample:

1. 6 Mo Tube
2. 6 Mo Tube
3. Automatic fusion weld

No insert ring- *full solution anneal* after welding @ 2100° F with rapid nitrogen quench

The top sample is ½ of the sample representing the piece prior to testing. The bottom sample is representative of the test results after immersion in the test solution.



Corrosion Test

ASTM G-48 Practice C (modified immersion test)

6%$FeCl_3$ + 1% HCl at 50º C (122º F) for 72 hours

Each test run independently with fresh solution

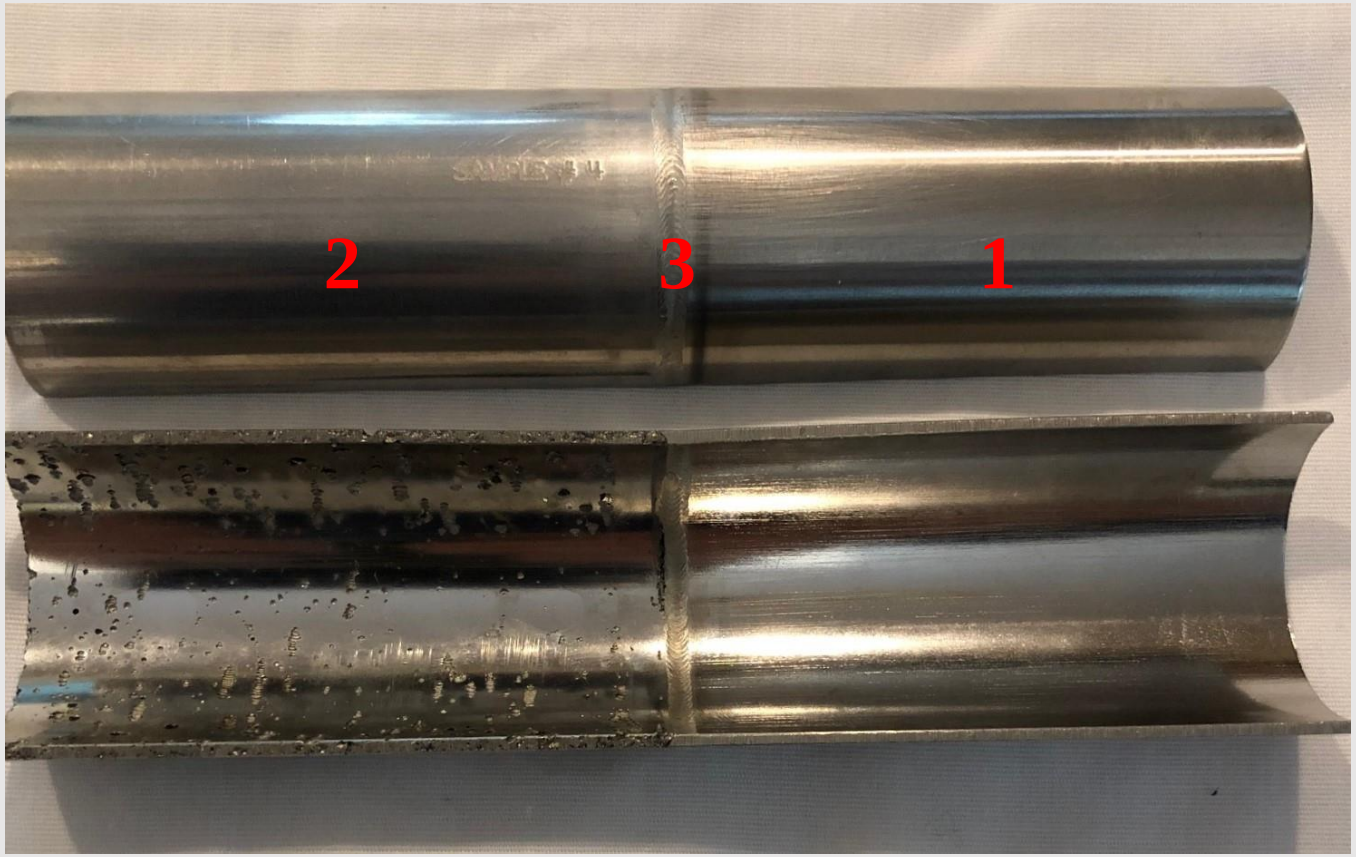
Corrosion Study

Sample:

1. 6 Mo Tube
2. 316L S/S Tube
3. Automatic fusion weld

No insert ring, No anneal

The top sample is ½ of the sample representing the piece prior to testing. The bottom sample is representative of the test results after immersion in the test solution.



Corrosion Test

ASTM G-48 Practice C (modified immersion test)

6%$FeCl_3$ + 1% HCl at 50º C (122º F) for 72 hours

Each test run independently with fresh solution

Questions

Questions or Comments?

Please Contact your Regional Sales Manager or

Ken Kimbrel

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