

PR433346

COPY

DESIGN SPECIFICATION

FOR

CHARGING PUMP GEAR OIL HEAT EXCHANGER  
ASME III, DIVISION 1, CLASS 3

DSP-MX-1

Rev. 0

Rev. 1

January 10, 1994

January 25, 1994

Applicable to  
Virgil C. Summer Nuclear Station  
South Carolina Electric & Gas Company

Originator

D.V. Reitz

Date

1/25/94

Project Engineer

EB Tall

Date

1-25-94

Certification: This Design Specification, consisting of 4 pages and 2 tables is correct, complete, and complies with the requirements of paragraph NA-3250 of the ASME Boiler and Pressure Vessel Code, Section III, "Nuclear Power Plant Components" regarding provisions of the Design Specifications.

Certified:

D.V. Reitz

, P.E.

Date

1/25/94

Reg. No.

35834-E

State

PA

9702120269 970206  
PDR GA999 E\*\*\*\*\*  
99901292 PDR

Gilbert/Commonwealth, Inc.  
P. O. Box 1498  
Reading, Pennsylvania

D. V. R. - C.L.  
W.O. 04-7003-047

# COPY

## 1.00 SCOPE

- 1.01 This Design Specification is provided for Class 3 heat exchangers in accordance with the ASME Boiler and Pressure Vessel Code, Section III Nuclear Power Components, 1971 Edition. This code is hereinafter referred to as ASME Code III.
- 1.02 Components covered by this Design Specification are for application in the Virgil C. Summer Nuclear Station, of the South Carolina Electric & Gas Company, located in Fairfield County, South Carolina.
- 1.03 Certain technical requirements and administrative details are contained in the Procurement Technical Requirement (PTR) sheets.
- 1.04 If any conflict arises between this Design Specification and the above referenced document, the Vendor shall not proceed; but shall request clarification, in writing, from the OWNER.
- 1.05 The Certification on the cover of this Document applies only to information contained within the Design Specification and does not apply to the documents referenced in Item 1.03.

## 2.00 DEFINITIONS

Definitions of Operating Conditions shall be in accordance with ASME III, Division 1, NB-3113.

## 3.00 DESIGN INFORMATION

### 3.01 Description and Identification

This Design Specification presents design information for ASME Code III, Class 3 heat exchangers identified by the PTR sheets, PTR-MX-1.

### 3.02 Function

Charging/Safety Injection Pump speed increaser lube oil cooling.

### 3.03 Location

This heat exchanger is to be used on the Charging/Safety Injection Pump skid.

### 3.04 Environmental Conditions

See Table 2. Loss of Coolant Accident and Small Line Break Accident Conditions are considered a plant faulted operation.

### 3.05 Special Reports and Analyses

#### 3.05.1 Design Report:

A design report shall be submitted in accordance with ASME Code Section III. Two copies of the design report shall be submitted to the OWNER.



COPY

☐ YES[illegible]

H.M. 5/17/94

RECEIVING &amp; INSPECTION REPORT



AMER INDUSTRIAL TECHNOLOGIES, INC.

1000 SOUTH MADISON STREET  
WILMINGTON, DELAWARE 19801  
(302) 652-3900

FAX (302) 652-6400

ADDENDUM #3 TO #20726

## PURCHASE ORDER

ORDER DATE	8-10-94
------------	---------

A.I.T.

PRIORITY

SOURCE INSPECTION

☐ A.I.T. ☐ OTHER SOURCE

☐

CERTIFICATE OF COMPLIANCE  
TO ACCOMPANY EACH  
SHIP TEST

☐ CHEMICAL ANALYSIS  
☐ PHYSICAL ANALYSIS

### ADDITIONAL REQUIREMENTS

## Q.A. REVIEW

☐

# M. 8/10/94

TO: RAMBALL TESTLAB, INC.  
1703 Industrial Hwy., Unit 3  
Cinnaminson, NJ 08077

TEL: (800) 768-3200 FAX: (609) 786-3144

SHIP TO (SAME AS SOLD TO UNLESS OTHERWISE INDICATED)

COPY

DRAWINGS ENCLOSED

☐ YES☐ NO

CONFIRMING VERBAL ORDER TO & DATE

Mr. Bill Freeborn

REF. QUOTATION NO. &amp; DATE

VERBAL

☐

TERMS  
Net 30

FOB

SHIP VIA

REQUIRED DELIVERY	
-------------------	--

NOT FOR

RESALE

TAX

EXEMP

ITEM	QUANTITY	DESCRIPTION	UNIT PRICE	EXTENSION
		<p>TO PERFORM &amp; CERTIFY CHEMICAL ANALYSIS FOR MATERIAL VERIFICATION FOR 35 SAMPLES IN ACCORDANCE WITH ASME SEC. II &amp; SEC. III, DIV. 1, CLASS 3; 1971 ED.</p> <p>MAT'L. DESCRIPTION: 1/2" O.D. x .049" Tubes, SA249, TP316  HEAT NO.: 714652  A.I.T. TRACEABILITY: M-2627-1 THRU M-2627-35.</p>		
1	35	CHEMICAL ANALYSIS	\$25.00	\$875.00
		<p style="text-align: right;">TOTAL</p> <p>ALL OTHER TERMS &amp; CONDITIONS OF THE ORIGINAL PURCHASE ORDER #20726 SHALL APPLY.</p>		\$875.00
		<p>REFER ALL INQUIRIES TO: A.I.T. Q.A. MANAGER</p> <p><u>Hanan Magaid 8/10/94</u> <u>[Signature]</u></p> <p style="text-align: center;">Date Date</p>		

REFER ALL INQUIRIES TO:

A.I.T. Q.A. MANAGER

Hanan Mageid 8/10/94

A. E. Lee

Date \_\_\_\_\_

Date \_\_\_\_\_

[illegible]



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**AMER INDUSTRIAL TECHNOLOGIES INC**

1000 SOUTH MADISON STREET • WILMINGTON, DELAWARE 19801 • (302) 652-3900 • FAX (302) 652-64

CERTIFIED MATERIAL TEST REPORT

CMTR NO. : 442-1

AIT JOB NO. : N442

CUSTOMER P. O. NO. : Q 650395

SOLD TO : SOUTH CAROLINA ELECTRIC & GAS COMP.

ASME SECTION III : Class 3, 1971 Edition.

MATERIAL SPECIFICATION :

ASME SA249, Type 316.

TESTING PERFORMED :

- CHEMICAL ANALYSIS . - FLATTENING TEST. - FLANGE TESTS.  
- PHYSICAL TESTING . - BEND TESTS. - HYDRO TEST.

The following material was tested in accordance with ASME Section III and Section II and found to be in compliance with the above listed material specification and grade.

<u>CONTROL NO.</u>	<u>DESCRIPTION</u>	<u>HEAT NO.</u>	<u>QUANTITY</u>
M-2627	$\frac{1}{2}$ " x .049 TUBES, SA249, TP316	714652	36

The above and attached information is certified correct by Amer Industrial Technologies, Inc., under our NPT certificate No. N-2794, Expiration date February 6, 1995.

Hamm Magid 8/1/94  
Signature of A.I.T. Representative Date

S.O.#: 46707

Customer PO#: 75S31828

Date: April 18, 1994

0819720

Specification: .500 O.D. X .049 Wall TP316 TP316L X Straight Length WELDED ASTM A269-92/A249-92A/ASME-SA249-92A

MECHANICAL TESTS:

TENSILE TESTS:

Reverses	Reverse Rockwell	Eddy	Hydrostatic	Under Water	Nitrogen	Air Test High Pressure
Flattening	Flange	Hardness	Current	P.S.I.	P.S.I.	Tensile Str. Yield Str.
718652 OK	OK	B68	OK	85937	46875	in 2"
						59

HEAT ANALYSIS

Heat #	C	MS	P	S	SI	CR	NI	MO	TI	CU	AL	FE	M	CO	V	N	TA
718652	0.016	1.760	0.030	0.004	0.360	16.330	10.180	2.060	.000	.000	.000	.000	.000	.000	.000	.000	.000

ADDITIONAL INFORMATION

MATERIAL MEETS ALL MECHANICAL AND CHEMICAL REQUIREMENTS

CF ASTM 269/249

NO WELD REPAIR HAS BEEN PERFORMED ON THIS MATERIAL

W-2627  
REVIEWED  
7/28/94  
by HM

WARNING

MATERIAL SAFETY DATA SHEETS FOR THIS PRODUCT HAVE BEEN SUPPLIED TO YOUR PURCHASING DEPARTMENT. FOR AN ADDITIONAL COPY PHONE 908-469-8990. CAUTION: PROCESSING THAT MAKES FUMES, DUST, OR SOLUTIONS MAY CAUSE LUNG DISEASE. SEE MATERIAL SAFETY DATA SHEETS FOR FURTHER INFORMATION.

WE HEREBY CERTIFY THAT THE ABOVE FIGURES ARE CORRECT AS CONTAINED IN THE RECORDS OF THE COMPANY.

*Anthony Graviano*

ANTHONY GRAVIANO  
MANAGER, QUALITY ASSURANCE

Q.C. FORM #114  
REV: 06-29-94

**RAMBALL TESTLAB, INC.**

1703 INDUSTRIAL HIGHWAY - UNIT 3

CINNAMINSON, NJ 08077-2546

(609) 786-8880

FAX (609) 786-3144

**LABORATORY REPORT**

Submitted to:

07-22-1994

Amer Industrial Technologies, Inc.

P.O.# 20735

1000 South Madison Str.

Wilmington DE 19801

Page 1 of 1

ATTENTION: H. Mageid

Item: 1/2"O.D. x .049"Wall Tube

Material Specification: ASME SA249

Material: 316 S.S.

Heat Number: 714652

Test Specification: ASME Sec.II &amp; III, Div.1, Cl.3, '71 Ed

A.I.T. Traceability #: M-2627

NOTE: 10CFR21 APPLIES

**CHEMICAL ANALYSIS**

LAB NUMBER A22494

Carbon	0.020%
Manganese	1.73%
Phosphorus	0.028%
Sulfur	0.006%
Silicon	0.39%
Chromium	16.59%
Nickel	10.36%
Molybdenum	2.25%

**TENSILE TEST**

LAB NUMBER: A22495

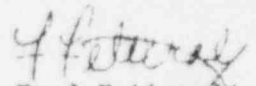
YIELD STRENGTH: 40,700 psi

TENSILE STRENGTH: 89,500 psi

ELONGATION: 60 %

ROCKWELL B HARDNESS: 74

Full-Section Pipe; 2.0" Gauge Length.

**REVIEWED & ACCEPTED**by HM date 7/22/94  
Fred Fetteroli  
General ManagerTesting was performed in accordance with Ramball Testlab, Inc.  
Quality Manual, Rev.2 dated 4/04/92, as audited and approved by A.I.T.

We certify that the above results are correct  
as contained in the records of this company.  
This report shall not be reproduced, except in full,  
without the permission of Ramball Testlab, Inc.

**RAMBALL TESTLAB, INC.**

1703 INDUSTRIAL HIGHWAY - UNIT 3

CINNAMINSON, NJ 08077-2546

(609) 786-8880

FAX (609) 786-3144

**LABORATORY REPORT**

Submitted to:

07-22-1994

Amer Industrial Technologies, Inc.

P.O. # 20735

1000 South Madison Str.

Wilmington DE 19801

Page 1 of 1

ATTENTION: H. Mageid

Item: 1/2"O.D. x .049"Wall Tube

Material Specification: ASME SA249

Material: 316 S.S.

Heat Number: 714652

Test Specification: ASME Sec.II &amp; III, Div.1, Cl.3, '71 Ed

A.I.T. Traceability #: M-2627

NOTE: 10CFR21 APPLIES

**FLATTENING TEST**

LAB NUMBER A22497

Defects Absent

Disposition Acceptable

**BEND TEST**

LAB NUMBER A22498


Bend Diameter 4T

QUANTITY  
TESTEDQUANTITY  
ACCEPTEDQUANTITY  
REJECTED

1

1

0

Fred Fetterolf  
General Manager

Testing was performed in accordance with Ramball Testlab, Inc.

Quality Manual, Rev.2 dated 4/84/92, as audited and approved by A.I.T.

We certify that the above results are correct

as contained in the records of this company.

This report shall not be reproduced, except in full,

without the permission of Ramball Testlab, Inc.

REVIEWED &amp; ACCEPTED

by H.M. date 7/22/94

**RAMBALLTESTLAB, INC.**

1703 INDUSTRIAL HIGHWAY - UNIT 3

CINNAMINSON, NJ 08077-2548

1-800-768 3200 FAX (609) 786-3144

FROM 009 &amp; 215: (609) 786-8080

# LABORATORY REPORT

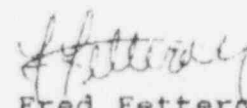
Amer Industrial Technologies, Inc.  
1000 South Madison St  
Wilmington, DE 19801  
Attention: Mr. H. Magied

July 22, 1994  
P.O. # 20735  
Lab # A22496  
Page 1 of 1

Sample: 1/2" O.D. x .049" Wall Tube  
Material Specification: ASME SA249  
Material: 316 S.S.  
Heat #: 714652  
A.I.T. Traceability#: M-2627  
Test Specification: ASME Sec. II & III, Div.1, Class 3,  
'71 Edition  
NOTE: 10CFR21 Applies

## FLANGE TEST

SPECIMEN #	DEFECTS:	DISPOSITION
1	Absent	Acceptable
2	Absent	Acceptable

  
Fred Fetterolf  
General Manager

We certify that the above results are correct as contained in the records of this company

This report shall not be reproduced, except in full, without the permission of Ramball Testlab, Inc.

Testing was performed in accordance with Ramball Testlab, Inc. Quality Assurance Manual, Rev. 2  
dated 4/04/92, audited and approved by A.I.T.

During tests and inspections this product did not come in direct contact with mercury or any of  
its compounds, nor with any mercury containing device employing a single boundary of containment

REVIEWED & ACCEPTED

by H.H. date 7/22/94

Metallurgical and Nondestructive Testing





## Hydro test for .049 x 1/2 Tubes

Spec:- SA 450 / SA 45M

$$P = 32,000 \frac{t}{D}$$

$$= 32,000 \times \frac{.049}{.5} = 3136$$

$$\approx \underline{\underline{3200}} \text{ PSI}$$

Use hydro from table 7:

for Under 1" hydro test = 1000 PSI

**AMER INDUSTRIAL TECHNOLOGIES INC.**

1000 SOUTH MADISON STREET • WILMINGTON, DELAWARE 19801 • (302) 652-3900 • FAX (302) 652-6400

## HYDROSTATIC TEST RECORDS

PROCEDURE NO. SA450/SA450M REVISION NO. 1992 ed CODE: ASME Sec II & III  
& H601, Rev 8 den 3

GAGE USED "G" LEAKAGE        YES        NO ☒ MEDIUM: Water  
265°F

JOB NO. N442 QTY. & UNIT TYPE 1" TUBE HYDRO PRESSURE 3200 PSI

[illegible]

SIGNATURE [Signature]  
PROJECT ENGINEER

SIGNATURE Wasson Maynard  
Q.A. MANAGER

DATE: 7/20/24

DATE: 7/20/94

REPAIRS REQUIRED\_\_\_\_\_ YES

NO

Describe on additional sheet  
if yes.

## Hydro test for .049 x 1/2 Tubes

Spec:- SA 450 / SA 45M

$$P = 32,000 \frac{t}{D}$$

$$= 32,000 \times \frac{.049}{.5} = 3136$$

$$\approx \underline{\underline{3200}} \text{ PSI}$$

Use hydro from table 7:

$$\text{for Under 1"} \quad \text{hydro test} = \underline{\underline{1000}} \text{ PSI}$$

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## AMER INDUSTRIAL TECHNOLOGIES INC

1000 SOUTH MADISON STREET • WILMINGTON, DELAWARE 19801 • (302) 652-3900 • FAX (302) 652-6400

### CERTIFIED MATERIAL TEST REPORT

CMTR NO. : 442 - 1A

AIT JOB NO. : N442

CUSTOMER P. O. NO. : Q 650395

SOLD TO : South Carolina Electric & Gas Corp.

ASME SECTION III : Class 3, 1971 Edition

MATERIAL SPECIFICATION : \_\_\_\_\_

ASME SA 249 / Type 316

TESTING PERFORMED : \_\_\_\_\_

- Chemical Analysis - Flattening Test - Flange Test  
- Tensile Testing - Bend Test - Hydro Test

The following material was tested in accordance with ASME Section III and Section II and found to be in compliance with the above listed material specification and grade.

<u>CONTROL NO.</u>	<u>DESCRIPTION</u>	<u>HEAT NO.</u>	<u>QUANTITY</u>
M-2627-1 THRU 35	1/2" x .04 Tubes, SA 249, TP 316	714652	35

The above and attached information is certified correct by Amer Industrial Technologies, Inc., under our NPT certificate No. N-2794, Expiration date 1995.

Hassan Magid 4/17/95  
Signature of A.I.T. Representative Date



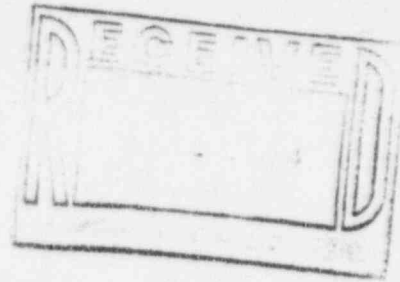
**RAMBALL TESTLAB, INC.**

1703 INDUSTRIAL HIGHWAY - UNIT 3

CINNAMINSON, NJ 08077-2546

(609) 786-8880

FAX (609) 786-3144



**LABORATORY REPORT**

Submitted to:

08-18-1994

Amer Industrial Technologies, Inc.  
1000 South Madison Str.  
Wilmington DE 19801  
ATTENTION: H. Mageid

P.O.# 20726, Addendum 3

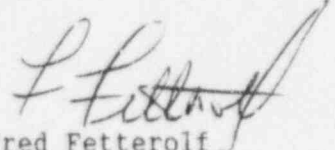
Page 1 of 1

Item: 1/2"O.D. x .049"Wall Tube  
Material Specification: ASME SA249  
Material: TP316  
Heat Number: 714652  
Test Specification: ASME Sec.II & III, Div.1, Cl.3, '71 Ed  
Job Number: N442  
A.I.T. Traceability #: M-2627-1

**CHEMICAL ANALYSIS**

LAB NUMBER A23045

Carbon	0.018%
Manganese	1.86%
Phosphorus	0.030%
Sulfur	0.012%
Silicon	0.36%
Nickel	10.86%
Chromium	17.76%
Molybdenum	2.16%

  
Fred Fetterolf  
General Manager

Testing was performed in accordance with Ramball Testlab, Inc.  
Quality Manual, Rev.2 dated 4/04/92, as audited and approved by A.I.T.

We certify that the above results are correct  
as contained in the records of this company.  
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without the permission of Ramball Testlab, Inc.

# RAMBALL TESTLAB, INC.

1703 INDUSTRIAL HIGHWAY - UNIT 3  
CINNAMINSON, NJ 08077-2546  
(609) 786-8880 FAX (609) 786-3144

## LABORATORY REPORT

Submitted to:

08-18-1994

Amer Industrial Technologies, Inc.  
1000 South Madison Str.  
Wilmington DE 19801  
ATTENTION: H. Mageid

P.O.# 20726, Addendum 3

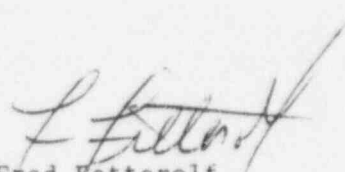
Page 1 of 1

Item: 1/2"O.D. x .049"Wall Tube  
Material Specification: ASME SA249  
Material: TP316  
Heat Number: 714652  
Test Specification: ASME Sec.II & III, Div.1, Cl.3, '71 Ed  
Job Number: N442  
A.I.T. Traceability #: M-2627-2

## CHEMICAL ANALYSIS

LAB NUMBER A23046

Carbon	0.019%
Manganese	1.86%
Phosphorus	0.031%
Sulfur	0.012%
Silicon	0.35%
Chromium	17.88%
Nickel	10.54%
Molybdenum	2.20%

  
Fred Fetterolf  
General Manager

Testing was performed in accordance with Ramball Testlab, Inc.  
Quality Manual, Rev.3 dated 4/04/92, as audited and approved by A.I.T.

We certify that the above results are correct  
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**RAMBALL TESTLAB, INC.**

1703 INDUSTRIAL HIGHWAY - UNIT 3  
CINNAMINSON, NJ 08077-2546  
(609) 786-8880 FAX (609) 786-3144

**LABORATORY REPORT**

Submitted to:

08-18-1994

Amer Industrial Technologies, Inc.  
1000 South Madison Str.  
Wilmington DE 19801  
ATTENTION: H. Mageid

P.O.# 20726, Addendum 3


Page 1 of 1

Item: 1/2"O.D. x .049"Wall Tube  
Material Specification: ASME SA249  
Material: TP316  
Heat Number: 714652  
Test Specification: ASME Sec.II & III, Div.1, Cl.3, '71 Ed  
Job Number: N442  
A.I.T. Traceability #: M-2627-3

**CHEMICAL ANALYSIS**

LAB NUMBER A23047

Carbon	0.018%
Manganese	1.73%
Phosphorus	0.024%
Sulfur	0.011%
Silicon	0.30%
Chromium	16.86%
Nickel	10.32%
Molybdenum	2.03%

  
Fred Fetterolf  
General Manager

Testing was performed in accordance with Ramball Testlab, Inc.  
Quality Manual, Rev.2 dated 4/04/92, as audited and approved by A.I.T.

We certify that the above results are correct  
as contained in the records of this company.  
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# RAMBALL TESTLAB, INC.

1703 INDUSTRIAL HIGHWAY - UNIT 3

CINNAMINSON, NJ 08077-2546

(609) 786-8880

FAX (609) 786-3144

## LABORATORY REPORT

Submitted to:

08-18-1994

Amer Industrial Technologies, Inc.

P.O.# 20726, Addendum 3

1000 South Madison Str.

Wilmington DE 19801

Page 1 of 1

ATTENTION: H. Mageid

Item: 1/2"O.D. x .049"Wall Tube

Material Specification: ASME SA249

Material: TP316

Heat Number: 714652

Test Specification: ASME Sec.II & III, Div.1, Cl.3, '71 Ed

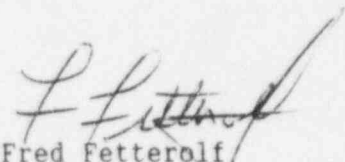
Job Number: N442

A.I.T. Traceability #: M-2627-4

## CHEMICAL ANALYSIS

LAB NUMBER A23048

Carbon	0.019%
Manganese	1.82%
Phosphorus	0.026%
Sulfur	0.012%
Silicon	0.31%
Chromium	17.39%
Nickel	10.52%
Molybdenum	2.05%

  
Fred Fetterolf  
General Manager

Testing was performed in accordance with Ramball Testlab, Inc.

Quality Manual, Rev.2 dated 4/04/92, as audited and approved by A.I.T.

We certify that the above results are correct  
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FAX (609) 786-3144

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Submitted to:

08-18-1994

Amer Industrial Technologies, Inc.

P.O.# 20726, Addendum 3

1000 South Madison Str.

Wilmington DE 19801

Page 1 of 1

ATTENTION: H. Mageid

Item: 1/2"O.D. x .049"Wall Tube

Material Specification: ASME SA249

Material: TP316

Heat Number: 714652

Test Specification: ASME Sec.II & III, Div.1, Cl.3, '71 Ed

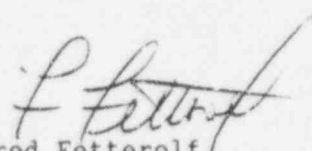
Job Number: N442

A.I.T. Traceability #: M-2627-5

**CHEMICAL ANALYSIS**

LAB NUMBER A23049

Carbon	0.016%
Manganese	1.74%
Phosphorus	0.024%
Sulfur	0.011%
Silicon	0.30%
Chromium	16.94%
Nickel	10.63%
Molybdenum	2.41%

  
Fred Fetterolf  
General Manager

Testing was performed in accordance with Ramball Testlab, Inc.

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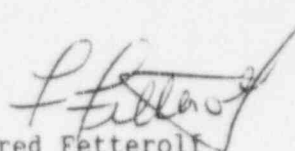
Page 1 of 1

Item: 1/2"O.D. x .049"Wall Tube  
Material Specification: ASME SA249  
Material: TP316  
Heat Number: 714652  
Test Specification: ASME Sec.II & III, Div.1, Cl.3, '71 Ed  
Job Number: N442  
A.I.T. Traceability #: M-2627-6

**CHEMICAL ANALYSIS**

LAB NUMBER A23050

Carbon	0.018%
Manganese	1.85%
Phosphorus	0.026%
Sulfur	0.012%
Silicon	0.34%
Chromium	17.66%
Nickel	10.55%
Molybdenum	2.09%

  
Fred Fetteroli  
General Manager

Testing was performed in accordance with Ramball Testlab, Inc.  
Quality Manual, Rev.2 dated 4/04/92, as audited and approved by A.I.T.

We certify that the above results are correct  
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**RAMBALL TESTLAB, INC.**

1703 INDUSTRIAL HIGHWAY - UNIT 3  
CINNAMINSON, NJ 08077-2546  
(609) 786-8380 FAX (609) 786-3144

**LABORATORY REPORT**

Submitted to:

08-18-1994

Amer Industrial Technologies, Inc.  
1000 South Madison Str.  
Wilmington DE 19801  
ATTENTION: H. Mageid

P.O.# 20726, Addendum 3

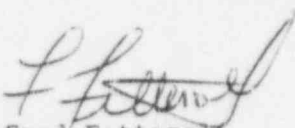
Page 1 of 1

Item: 1/2"O.D. x .049"Wall Tube  
Material Specification: ASME SA249  
Material: TP316  
Heat Number: 714652  
Test Specification: ASME Sec.II & III, Div.1, Cl.3, '71 Ed  
Job Number: N442  
A.I.T. Traceability #: M-2627-7

**CHEMICAL ANALYSIS**

LAB NUMBER A23051

Carbon	0.016%
Manganese	1.80%
Phosphorus	0.026%
Sulfur	0.014%
Silicon	0.32%
Chromium	17.32%
Nickel	10.24%
Molybdenum	2.02%

  
Fred Fetteroli  
General Manager

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FAX (609) 786-3144

**LABORATORY REPORT**

Submitted to:

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Amer Industrial Technologies, Inc.  
1000 South Madison Str.  
Wilmington DE 19801  
ATTENTION: H. Mageid

P.O.# 20726, Addendum 3


Page 1 of 1

Item: 1/2"O.D. x .049"Wall Tube  
Material Specification: ASME SA249  
Material: TP316  
Heat Number: 714652  
Test Specification: ASME Sec.II & III, Div.1, Cl.3, '71 Ed  
Job Number: N442  
A.I.T. Traceability #: M-2627-8

**CHEMICAL ANALYSIS**

LAB NUMBER A23052

Carbon	0.016%
Manganese	1.79%
Phosphorus	0.028%
Sulfur	0.011%
Silicon	0.31%
Chromium	17.40%
Nickel	10.47%
Molybdenum	2.02%

  
Fred Fetterolf  
General Manager

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**LABORATORY REPORT**

Submitted to:

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P.O.# 20726, Addendum 3

1000 South Madison Str.

Wilmington DE 19801

Page 1 of 1

ATTENTION: H. Mageid

Item: 1/2"O.D. x .049"Wall Tube

Material Specification: ASME SA249

Material: TP316

Heat Number: 714652

Test Specification: ASME Sec.II & III, Div.1, Cl.3, '71 Ed

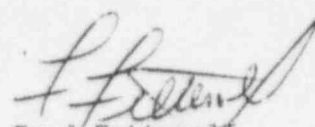
Job Number: N442

A.I.T. Traceability #: M-2627-9

**CHEMICAL ANALYSIS**

LAB NUMBER A23053

Carbon	0.032%
Manganese	1.79%
Phosphorus	0.023%
Sulfur	0.009%
Silicon	0.30%
Chromium	16.70%
Nickel	10.35%
Molybdenum	2.06%



Fred Fetteroff  
General Manager

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**LABORATORY REPORT**

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Wilmington DE 19801  
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Page 1 of 1

Item: 1/2"O.D. x .049"Wall Tube  
Material Specification: ASME SA249  
Material: TP316  
Heat Number: 714652  
Test Specification: ASME Sec.II & III, Div.1, Cl.3, '71 Ed  
Job Number: N442  
A.I.T. Traceability #: M-2627-10

**CHEMICAL ANALYSIS**

LAB NUMBER A23054

Carbon	0.023%
Manganese	1.84%
Phosphorus	0.026%
Sulfur	0.012%
Silicon	0.36%
Chromium	17.32%
Nickel	10.44%
Molybdenum	2.20%

  
Fred Fetterolf  
General Manager

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**LABORATORY REPORT**

Submitted to:

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1000 South Madison Str.  
Wilmington DE 19801  
ATTENTION: H. Mageid

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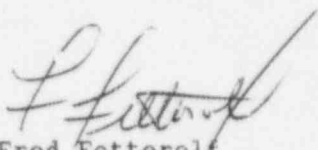
Page 1 of 1

Item: 1/2"O.D. x .049"Wall Tube  
Material Specification: ASME SA249  
Material: TP316  
Heat Number: 714652  
Test Specification: ASME Sec.II & III, Div.1, Cl.3, '71 Ed  
Job Number: N442  
A.I.T. Traceability #: M-2627-11

**CHEMICAL ANALYSIS**

LAB NUMBER A23055

Carbon	0.018%
Manganese	1.79%
Phosphorus	0.026%
Sulfur	0.011%
Silicon	0.33%
Chromium	17.30%
Nickel	10.40%
Molybdenum	2.00%

  
Fred Fetterolf  
General Manager

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**LABORATORY REPORT**

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P.O.# 20726, Addendum 3

1000 South Madison Str.

Wilmington DE 19801

Page 1 of 1

ATTENTION: H. Mageid

Item: 1/2"O.D. x .049"Wall Tube

Material Specification: ASME SA249

Material: TP316

Heat Number: 714652

Test Specification: ASME Sec.II & III, Div.1, Cl.3, '71 Ed


Job Number: N442

A.I.T. Traceability #: M-2627-12

**CHEMICAL ANALYSIS**

LAB NUMBER A23056

Carbon	0.016%
Manganese	1.83%
Phosphorus	0.026%
Sulfur	0.012%
Silicon	0.33%
Chromium	17.34%
Nickel	10.50%
Molybdenum	2.09%

  
Fred Fetteroli  
General Manager

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**LABORATORY REPORT**

Submitted to:

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1000 South Madison Str.  
Wilmington DE 19801  
ATTENTION: H. Mageid

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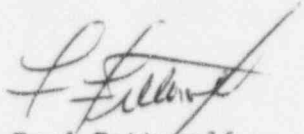
Page 1 of 1

Item: 1/2"O.D. x .049"Wall Tube  
Material Specification: ASME SA249  
Material: TP316  
Heat Number: 714652  
Test Specification: ASME Sec.II & III, Div.1, Cl.3, '71 Ed  
Job Number: N442  
A.I.T. Traceability #: M-2627-13

**CHEMICAL ANALYSIS**

LAB NUMBER A23057

Carbon	0.019%
Manganese	1.79%
Phosphorus	0.026%
Sulfur	0.012%
Silicon	0.32%
Chromium	17.30%
Nickel	10.54%
Molybdenum	2.04%

  
Fred Fetterolf  
General Manager

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**LABORATORY REPORT**

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Wilmington DE 19801  
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Page 1 of 1

Item: 1/2"O.D. x .049"Wall Tube  
Material Specification: ASME SA249  
Material: TP316  
Heat Number: 714652  
Test Specification: ASME Sec.II & III, Div.1, Cl.3, '71 Ed  
Job Number: N442  
A.I.T. Traceability #: M-2627-14

**CHEMICAL ANALYSIS**

LAB NUMBER A23058

Carbon	0.018%
Manganese	1.80%
Phosphorus	0.026%
Sulfur	0.011%
Silicon	0.32%
Chromium	17.41%
Nickel	10.16%
Molybdenum	2.04%

  
Fred Fetterolf  
General Manager

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## LABORATORY REPORT

Submitted to:

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Amer Industrial Technologies, Inc.

1000 South Madison Str.

Wilmington DE 19801

ATTENTION: A. Mageid

P.O.# 20726, Addendum 3

Page 1 of 1

Item: 1/2"O.D. x .049"Wall Tube

Material Specification: ASME SA249

Material: TP316

Heat Number: 714652

Test Specification: ASME Sec.II & III, Div.1, Cl.3, '71 Ed


Job Number: N442

A.I.T. Traceability #: M-2627-15

## CHEMICAL ANALYSIS

LAB NUMBER A23059

Carbon	0.016%
Manganese	1.78%
Phosphorus	0.024%
Sulfur	0.011%
Silicon	0.31%
Chromium	17.11%
Nickel	10.30%
Molybdenum	2.02%

  
Fred Fetterolf  
General Manager

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**LABORATORY REPORT**

Submitted to:

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1000 South Madison Str.  
Wilmington DE 19801  
ATTENTION: H. Mageid

P.O.# 20726, Addendum 3


Page 1 of 1

Item: 1/2"O.D. x .049"Wall Tube  
Material Specification: ASME SA249  
Material: TP316  
Heat Number: 714652  
Test Specification: ASME Sec.II & III, Div.1, Cl.3, '71 Ed  
Job Number: N442  
A.I.T. Traceability #: M-2627-16

**CHEMICAL ANALYSIS**

LAB NUMBER A23060

Carbon	0.019%
Manganese	1.73%
Phosphorus	0.024%
Sulfur	0.011%
Silicon	0.30%
Chromium	16.94%
Nickel	10.28%
Molybdenum	2.07%

  
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General Manager

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P.O.# 20726, Addendum 3

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Page 1 of 1

ATTENTION: H. Mageid

Item: 1/2"O.D. x .049"Wall Tube

Material Specification: ASME SA249

Material: TP316

Heat Number: 714652

Test Specification: ASME Sec.II & III, Div.1, Cl.3, '71 Ed


Job Number: N442

A.I.T. Traceability #: M-2627-17

**CHEMICAL ANALYSIS**

LAB NUMBER A23061

Carbon	0.018%
Manganese	1.77%
Phosphorus	0.024%
Sulfur	0.011%
Silicon	0.31%
Chromium	17.16%
Nickel	10.33%
Molybdenum	2.04%

  
Fred Fetteroli  
General Manager

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Page 1 of 1

Item: 1/2"O.D. x .049"Wall Tube  
Material Specification: ASME SA249  
Material: TP316  
Heat Number: 714652  
Test Specification: ASME Sec.II & III, Div.1, Cl.3, '71 Ed  
Job Number: N442  
A.I.T. Traceability #: M-2627-18

CHEMICAL ANALYSIS

LAB NUMBER A23062

Carbon	0.015%
Manganese	1.73%
Phosphorus	0.023%
Sulfur	0.011%
Silicon	0.29%
Chromium	16.77%
Nickel	10.40%
Molybdenum	2.07%

  
Fred Fetterolf  
General Manager

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**LABORATORY REPORT**

Submitted to:

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1000 South Madison Str.  
Wilmington DE 19801  
ATTENTION: H. Mageid

P.O.# 20726, Addendum 3


Page 1 of 1

Item: 1/2"O.D. x .049"Wall Tube  
Material Specification: ASME SA249  
Material: TP316  
Heat Number: 714652  
Test Specification: ASME Sec.II & III, Div.1, Cl.3, '71 Ed  
Job Number: N442  
A.I.T. Traceability #: M-2627-19

**CHEMICAL ANALYSIS**

LAB NUMBER A23063

Carbon	0.016%
Manganese	1.75%
Phosphorus	0.026%
Sulfur	0.011%
Silicon	0.30%
Chromium	17.11%
Nickel	10.29%
Molybdenum	2.00%

  
Fred Fetterolf  
General Manager

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**LABORATORY REPORT**

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1000 South Madison Str.  
Wilmington DE 19801  
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P.O.# 20726, Addendum 3

Page 1 of 1

Item: 1/2"O.D. x .049"Wall Tube

Material Specification: ASME SA249

Material: TP316

Heat Number: 714652

Test Specification: ASME Sec.II & III, Div.1, Cl.3, '71 Ed

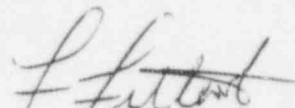
Job Number: N442

A.I.T. Traceability #: M-2627-20

**CHEMICAL ANALYSIS**

LAB NUMBER A23064

Carbon	0.015%
Manganese	1.78%
Phosphorus	0.026%
Sulfur	0.012%
Silicon	0.30%
Chromium	17.38%
Nickel	10.26%
Molybdenum	2.00%

  
Fred Fetterolf  
General Manager

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Wilmington DE 19801

Page 1 of 1

ATTENTION: H. Mageid

Item: 1/2"O.D. x .049"Wall Tube

Material Specification: ASME SA249

Material: TP316

Heat Number: 714652

Test Specification: ASME Sec.II & III, Div.1, Cl.3, '71 Ed


Job Number: N442

A.I.T. Traceability #: M-2627-21

**CHEMICAL ANALYSIS**

LAB NUMBER A23065

Carbon	0.014%
Manganese	1.74%
Phosphorus	0.024%
Sulfur	0.011%
Silicon	0.29%
Chromium	16.91%
Nickel	10.30%
Molybdenum	2.01%

  
Fred Fetterolf  
General Manager

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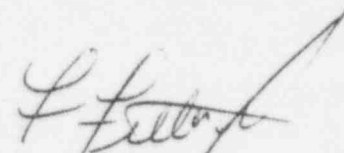
Page 1 of 1

Item: 1/2"O.D. x .049"Wall Tube  
Material Specification: ASME SA249  
Material: TP316  
Heat Number: 714652  
Test Specification: ASME Sec.II & III, Div.1, Cl.3, '71 Ed  
Job Number: N442  
A.I.T. Traceability #: M-2627-22

**CHEMICAL ANALYSIS**

LAB NUMBER A23066

Carbon	0.014%
Manganese	1.66%
Phosphorus	0.023%
Sulfur	0.009%
Silicon	0.25%
Chromium	16.31%
Nickel	10.93%
Molybdenum	2.20%

  
Fred Fetterolf  
General Manager

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**LABORATORY REPORT**

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P.O.# 20726, Addendum 3

1000 South Madison Str.

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Page 1 of 1

ATTENTION: H. Mageid

Item: 1/2"O.D. x .049"Wall Tube

Material Specification: ASME SA249

Material: TP316

Heat Number: 714652

Test Specification: ASME Sec.II & III, Div.1, Cl.3, '71 Ed

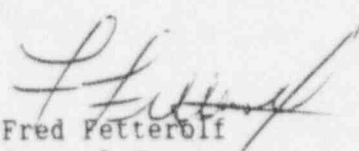
Job Number: N442

A.I.T. Traceability #: M-2627-23

**CHEMICAL ANALYSIS**

LAB NUMBER A23067

Carbon	0.014%
Manganese	1.68%
Phosphorus	0.024%
Sulfur	0.01%
Silicon	0.27%
Chromium	16.74%
Nickel	10.47%
Molybdenum	2.10%

  
Fred Fetterolf  
General Manager

Testing was performed in accordance with Ramball Testlab, Inc.

Quality Manual, Rev.2 dated 4/04/92, as audited and approved by A.I.T.

We certify that the above results are correct  
as contained in the records of this company.

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**RAMBALL TESTLAB, INC.**

1703 INDUSTRIAL HIGHWAY - UNIT 3

CINNAMINSON, NJ 08077-2546

(609) 786-8880

FAX (609) 786-3144

**LABORATORY REPORT**

Submitted to:

08-18-1994

Amer Industrial Technologies, Inc.  
1000 South Madison Str.  
Wilmington DE 19801  
ATTENTION: H. Mageid

P.O.# 20726, Addendum 3

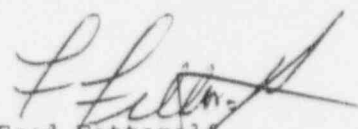
Page 1 of 1

Item: 1/2"O.D. x .049"Wall Tube  
Material Specification: ASME SA249  
Material: TP316  
Heat Number: 714652  
Test Specification: ASME Sec.II & III, Div.1, Cl.3, '71 Ed  
Job Number: N442  
A.I.T. Traceability #: M-2627-24

**CHEMICAL ANALYSIS**

LAB NUMBER A23068

Carbon	0.014%
Manganese	1.87%
Phosphorus	0.023%
Sulfur	0.011%
Silicon	0.28%
Chromium	16.88%
Nickel	10.65%
Molybdenum	2.06%

  
Fred Fetterolf  
General Manager

Testing was performed in accordance with Ramball Testlab, Inc.  
Quality Manual, Rev.2 dated 4/04/92, as audited and approved by A.I.T.

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1703 INDUSTRIAL HIGHWAY - UNIT 3  
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(609) 786-8880 FAX (609) 786-3144

**LABORATORY REPORT**

Submitted to:

08-18-1994

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Wilmington DE 19801  
ATTENTION: H. Mageid

P.O.# 20726, Addendum 3

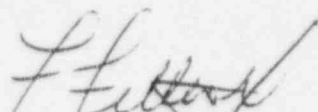
Page 1 of 1

Item: 1/2"O.D. x .049"Wall Tube  
Material Specification: ASME SA249  
Material: TP316  
Heat Number: 714652  
Test Specification: ASME Sec.II & III, Div.1, Cl.3, '71 Ed  
Job Number: N442  
A.I.T. Traceability #: M-2627-25

**CHEMICAL ANALYSIS**

LAB NUMBER A23069

Carbon	0.015%
Manganese	1.72%
Phosphorus	0.026%
Sulfur	0.011%
Silicon	0.28%
Chromium	17.12%
Nickel	10.29%
Molybdenum	2.04%

  
Fred Fetterolf  
General Manager

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CINNAMINSON, NJ 08077-2546  
(609) 786-8880 FAX (609) 786-3144

**LABORATORY REPORT**

Submitted to:

08-18-1994

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1000 South Madison Str.  
Wilmington DE 19801  
ATTENTION: H. Mageid

P.O.# 20726, Addendum 3

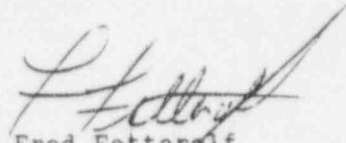
Page 1 of 1

Item: 1/2"O.D. x .049"Wall Tube  
Material Specification: ASME SA249  
Material: TP316  
Heat Number: 714652  
Test Specification: ASME Sec.II & III, Div.1, Cl.3, '71 Ed  
Job Number: N442  
A.I.T. Traceability #: M-2627-26

**CHEMICAL ANALYSIS**

LAB NUMBER A23070

Carbon	0.013%
Manganese	1.74%
Phosphorus	0.023%
Sulfur	0.011%
Silicon	0.28%
Chromium	16.70%
Nickel	10.70%
Molybdenum	2.00%

  
Fred Fetterolf  
General Manager

Testing was performed in accordance with Ramball Testlab, Inc.  
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**LABORATORY REPORT**

Submitted to:

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Amer Industrial Technologies, Inc.

P.O.# 20726, Addendum 3

1000 South Madison Str.

Wilmington DE 19801

Page 1 of 1

ATTENTION: H. Mageid

Item: 1/2"O.D. x .049"Wall Tube

Material Specification: ASME SA249

Material: TP316

Heat Number: 714652

Test Specification: ASME Sec.II & III, Div.1, Cl.3, '71 Ed


Job Number: N442

A.I.T. Traceability #: M-2627-27

**CHEMICAL ANALYSIS**

LAB NUMBER A23071

Carbon	0.012%
Manganese	1.64%
Phosphorus	0.023%
Sulfur	0.009%
Silicon	0.25%
Chromium	16.54%
Nickel	10.17%
Molybdenum	2.01%

  
Fred Petteroli  
General Manager

Testing was performed in accordance with Ramball Testlab, Inc.

Quality Manual, Rev.3 dated 4/04/92, as audited and approved by A.I.T.

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CINNAMINSON, NJ 08077-2546  
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**LABORATORY REPORT**

Submitted to:

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1000 South Madison Str.  
Wilmington DE 19801  
ATTENTION: H. Mageid

P.O.# 20726, Addendum 3

Page 1 of 1

Item: 1/2"O.D. x .049"Wall Tube  
Material Specification: ASME SA249  
Material: TP316  
Heat Number: 714652  
Test Specification: ASME Sec.II & III, Div.1, Cl.3, '71 Ed  
Job Number: N442  
A.I.T. Traceability #: M-2627-28

**CHEMICAL ANALYSIS**

LAB NUMBER A23072

Carbon	0.013%
Manganese	1.66%
Phosphorus	0.023%
Sulfur	0.009%
Silicon	0.26%
Chromium	16.44%
Nickel	10.56%
Molybdenum	2.09%

  
Fred Fetterolf  
General Manager

Testing was performed in accordance with Ramball Testlab, Inc.  
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CINNAMINSON, NJ 08077-2546

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FAX (609) 786-3144

**LABORATORY REPORT**

Submitted to:

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Amer Industrial Technologies, Inc.

P.O.# 20726, Addendum 3

1000 South Madison Str.

Wilmington DE 19801

Page 1 of 1

ATTENTION: H. Mageid

Item: 1/2"O.D. x .049"Wall Tube

Material Specification: ASME SA249

Material: TP316

Heat Number: 714652

Test Specification: ASME Sec.II & III, Div.1, Cl.3, '71 Ed

Job Number: N442

A.I.T. Traceability #: M-2627-29

**CHEMICAL ANALYSIS**

LAB NUMBER A23073

Carbon	0.014%
Manganese	1.65%
Phosphorus	0.024%
Sulfur	0.009%
Silicon	0.26%
Chromium	16.60%
Nickel	10.41%
Molybdenum	2.07%

  
Fred Fatteroli  
General Manager

Testing was performed in accordance with Ramball Testlab, Inc.

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## LABORATORY REPORT

Submitted to:

08-18-1994

Amer Industrial Technologies, Inc.  
1000 South Madison Str.  
Wilmington DE 19801  
ATTENTION: H. Mageid

P.O.# 20726, Addendum 3


Page 1 of 1

Item: 1/2"O.D. x .049"Wall Tube  
Material Specification: ASME SA249  
Material: TP316  
Heat Number: 714652  
Test Specification: ASME Sec.II & III, Div.1, Cl.3, '71 Ed  
Job Number: N442  
A.I.T. Traceability #: M-2627-30

## CHEMICAL ANALYSIS

LAB NUMBER A23074

Carbon	0.023%
Manganese	1.84%
Phosphorus	0.027%
Sulfur	0.015%
Silicon	0.32%
Chromium	17.77%
Nickel	10.63%
Molybdenum	2.06%

  
Fred Fetterolf  
General Manager

Testing was performed in accordance with Ramball Testlab, Inc.  
Quality Manual, Rev.2 dated 4/04/92, as audited and approved by A.I.T.

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**LABORATORY REPORT**

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Wilmington DE 19801

ATTENTION: H. Mageid

P.O.# 20726, Addendum 3

Page 1 of 1

Item: 1/2"O.D. x .049"Wall Tube

Material Specification: ASME SA249

Material: TP316

Heat Number: 714652

Test Specification: ASME Sec.II & III, Div.1, Cl.3, '71 Ed

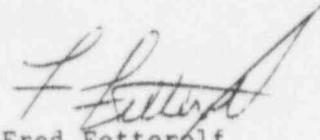
Job Number: N442

A.I.T. Traceability #: M-2627-31

**CHEMICAL ANALYSIS**

LAB NUMBER A23075

Carbon	0.019%
Manganese	1.77%
Phosphorus	0.027%
Sulfur	0.010%
Silicon	0.32%
Chromium	17.50%
Nickel	10.12%
Molybdenum	2.11%

  
Fred Fetterolf  
General Manager

Testing was performed in accordance with Ramball Testlab, Inc.

Quality Manual, Rev.2 dated 4/04/92, as audited and approved by A.I.T.

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CINNAMINSON, NJ 08077-2546  
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## LABORATORY REPORT

Submitted to:

08-18-1994

Amer Industrial Technologies, Inc.  
1000 South Madison Str.  
Wilmington DE 19801  
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P.O.# 20726, Addendum 3

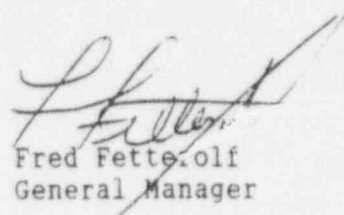
Page 1 of 1

Item: 1/2"O.D. x .049"Wall Tube  
Material Specification: ASME SA249  
Material: TP316  
Heat Number: 714652  
Test Specification: ASME Sec.II & III, Div.1, Cl.3, '71 Ed  
Job Number: N442  
A.I.T. Traceability #: M-2627-32

## CHEMICAL ANALYSIS

LAB NUMBER A23076

Carbon	0.018%
Manganese	1.77%
Phosphorus	0.027%
Sulfur	0.010%
Silicon	0.31%
Chromium	17.51%
Nickel	10.24%
Molybdenum	2.05%

  
Fred Fetteolf  
General Manager

Testing was performed in accordance with Ramball Testlab, Inc.  
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(609) 786-8880

FAX (609) 786-3144

**LABORATORY REPORT**

Submitted to:

08-18-1994

Amer Industrial Technologies, Inc.  
1000 South Madison Str.  
Wilmington DE 19801  
ATTENTION: H. Mageid

P.O.# 20726, Addendum 3

Page 1 of 1

Item: 1/2"C.D. x .049"Wall Tube  
Material Specification: ASME SA249  
Material: TP316  
Heat Number: 714652  
Test Specification: ASME Sec.II & III, Div.1, Cl.3, '71 Ed  
Job Number: N442  
A.I.T. Traceability #: M-2627-33

**CHEMICAL ANALYSIS**

LAB NUMBER A23077

Carbon	0.020%
Manganese	1.77%
Phosphorus	0.027%
Sulfur	0.012%
Silicon	0.31%
Chromium	17.75%
Nickel	10.51%
Molybdenum	2.14%

  
Fred Fetterolf  
General Manager

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FAX (609) 786-3144

**LABORATORY REPORT**

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Amer Industrial Technologies, Inc.

P.O.# 20726, Addendum 3

1000 South Madison Str.

Wilmington DE 19801

Page 1 of 1

ATTENTION: H. Mageid

Item: 1/2"O.D. x .049"Wall Tube

Material Specification: ASME SA249

Material: TP316

Heat Number: 714652

Test Specification: ASME Sec.II & III, Div.1, Cl.3, '71 Ed

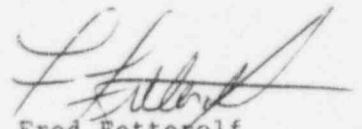
Job Number: N442

A.I.T. Traceability #: M-2627-34

**CHEMICAL ANALYSIS**

LAB NUMBER A23078

Carbon	0.015%
Manganese	1.79%
Phosphorus	0.027%
Sulfur	0.012%
Silicon	0.31%
Chromium	17.50%
Nickel	10.54%
Molybdenum	2.01%

  
Fred Fetterolf  
General Manager

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Wilmington DE 19801  
ATTENTION: H. Mageid

P.O.# 20726, Addendum 3


Page 1 of 1

Item: 1/2"O.D. x .049"Wall Tube  
Material Specification: ASME SA249  
Material: TP316  
Heat Number: 714652  
Test Specification: ASME Sec.II & III, Div.1, Cl.3, '71 Ed  
Job Number: N442  
A.I.T. Traceability #: M-2627-35

**CHEMICAL ANALYSIS**

LAB NUMBER A23079

Carbon	0.017%
Manganese	1.76%
Phosphorus	0.027%
Sulfur	0.010%
Silicon	0.31%
Chromium	17.40%
Nickel	10.65%
Molybdenum	2.04%

  
Fred Fetterolf  
General Manager

Testing was performed in accordance with Ramball Testlab, Inc.  
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# Certificate of Conformance

No. 135454

TERMS: NET - 30 DAYS



**LABORATORY  
TESTING INC.**

P.O. Box 249 Dublin, Pennsylvania 18917

**SOLD TO**

Amer Industrial Technologies, Inc.  
1000 South Madison Street  
Wilmington, DE 19801  
Attn: Accounts Payable

**SHIP TO**

Attn: \*Hassan Mageid

**SHIPPING ADDRESS**

120 MILL STREET, DUBLIN, PA 18917

**CUST. P.O.**  
20824

**LAB REPORT NO.**  
T-12134

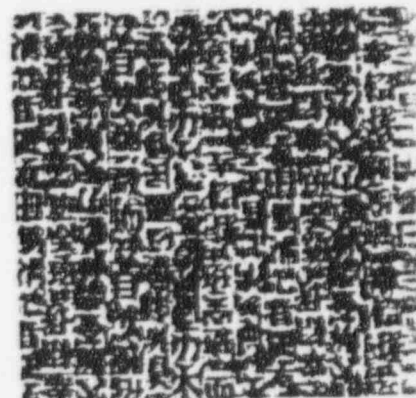
**SHIPMENT**  
Complete

**INVOICE DATE**  
4/17/95

**DESCRIPTION**

Page 1 of 3

35 pcs. 1/2" OD x .049" Tubes, ASME Sections II, Part A and III, Class 3, 1971 Edition, No Addenda, ASME SA-249, Grade TP316 Stainless Steel, Heat No. 714652, A.I.T. Traceability: M-2627-1 through M-2627-35



**\*AMENDED CERTIFICATION (4/18/95)**

- A. A Tensile test was performed on (35) pieces of the above Test Specimens and (35) pieces were found to be in conformance to ASME SA-249, Grade TP316 Stainless Steel per the following results:

<u>TRACE NO.</u> <u>REQUIRED</u>	<u>TENSILE</u> <u>STRENGTH</u> 75,000 PSI	<u>YIELD (.2%)</u> <u>STRENGTH</u> 30,000 PSI	<u>ELONGATION</u> <u>(IN 2")</u> 35.0%
M-2627-1	84,641 PSI	49,940 PSI	57.3%
M-2627-2	82,246 PSI	47,515 PSI	57.5%
M-2627-3	82,515 PSI	47,425 PSI	56.3%
M-2627-4	84,147 PSI	49,401 PSI	57.0%
M-2627-5	82,919 PSI	48,683 PSI	57.9%
M-2627-6	84,970 PSI	50,749 PSI	55.2%
M-2627-7	82,694 PSI	48,323 PSI	57.3%
M-2627-8	83,084 PSI	48,413 PSI	54.8%
M-2627-9	82,949 PSI	49,222 PSI	56.1%
M-2627-10	83,099 PSI	49,042 PSI	55.9%

- - - TENSILE TEST RESULTS CONTINUED ON NEXT PAGE - - -

**MERCURY CONTAMINATION** - During the testing and inspection, the product did not come in direct contact with mercury or any of its compounds nor with any mercury containing devices employing a single boundary of containment.

Sherri L. Lengyel  
QA Coordinator

By: Sherri L. Lengyel  
AUTHORIZED SIGNATURE

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TELE: (215) 249-9898  
FAX: (215) 249-9656

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TERMS: NET - 30 DAYS



**LABORATORY  
TESTING INC.**

P.O. Box 249 Dublin, Pennsylvania 18917

## SHIPPING ADDRESS

120 MILL STREET, DUBLIN, PA 18917

**AMER INDUSTRIAL TECHNOLOGIES, INC.**  
P.O. #20824

L.T.I. Lab Report #T-12134  
Page 2 of 3

**A. TENSILE TEST RESULTS (Continued...) - (35) pieces in conformance to ASME SA-249, Grade TP316 Stainless Steel:**

TRACE NO. REQUIRED	TENSILE STRENGTH 75,000 PSI	YIELD (.2%) STRENGTH 30,000 PSI	ELONGATION (IN 2") 35.0%
M-2627-11	84,716 PSI	50,389 PSI	57.0%
M-2627-12	84,656 PSI	51,018 PSI	56.2%
M-2627-13	82,710 PSI	48,683 PSI	56.3%
M-2627-14	82,829 PSI	48,952 PSI	53.5%
M-2627-15	82,470 PSI	48,683 PSI	57.0%
M-2627-16	83,668 PSI	49,491 PSI	53.8%
M-2627-17	83,099 PSI	48,593 PSI	57.8%
M-2627-18	83,009 PSI	49,581 PSI	54.0%
M-2627-19	83,249 PSI	49,671 PSI	55.8%
M-2627-20	83,084 PSI	48,683 PSI	55.9%
M-2627-21	82,500 PSI	48,683 PSI	58.0%
M-2627-22	83,129 PSI	49,132 PSI	55.2%
M-2627-23	83,982 PSI	50,210 PSI	54.3%
M-2627-24	83,144 PSI	48,503 PSI	58.3%
M-2627-25	84,850 PSI	51,108 PSI	57.0%
M-2627-26	83,099 PSI	48,683 PSI	57.3%
M-2627-27	82,559 PSI	48,503 PSI	56.4%
M-2627-28	83,054 PSI	49,132 PSI	54.6%
M-2627-29	83,111 PSI	48,952 PSI	56.1%
M-2627-30	83,576 PSI	49,671 PSI	59.2%
M-2627-31	82,904 PSI	48,772 PSI	58.1%
M-2627-32	82,844 PSI	48,593 PSI	57.3%
M-2627-33	83,548 PSI	49,940 PSI	52.9%
M-2627-34	82,934 PSI	49,311 PSI	55.5%
M-2627-35	82,725 PSI	49,222 PSI	56.9%

- B. A Flange test was performed on (70) pieces (Trace Nos. M-2627-1 through M-2627-35 - (2) pieces of each Trace No.) of the submitted Test Specimens in accordance with ASME SA-249, Grade TP316 Stainless Steel and (70) pieces were found to be in conformance to ASTM A-450 with no cracks after a 15% flange of their O.D.'s.

**MERCURY CONTAMINATION** - During the testing and inspection, the product did not come in direct contact with mercury or any of its compounds nor with any mercury containing devices employing a single boundary of containment.

Sherri L. Lengyel  
QA Coordinator

*Sherri L. Lengyel*  
AUTHORIZED SIGNATURE

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**LABORATORY  
TESTING INC.**

P.O. Box 249 Dublin, Pennsylvania 18917

**SHIPPING ADDRESS**

120 MILL STREET DUBLIN, PA 18917

**AMER INDUSTRIAL TECHNOLOGIES, INC.**  
P.O. #20824

L.T.I. Lab Report #T-12134  
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- C. A Flattening test was performed on (70) pieces (Trace Nos. M-2627-1 through M-2627-35 - (2) pieces of each Trace No.) of the submitted Test Specimens in accordance with ASME SA-249, Grade TP316 Stainless Steel and (70) pieces were found to be in conformance to ASTM A-450 with no cracks after flattening to 0.284".
- D. A Reverse-Bend test was performed on (35) pieces (Trace Nos. M-2627-1 through M-2627-35) of the submitted Test Specimens in accordance with ASME SA-249, Grade TP316 Stainless Steel and (35) pieces were found to be in conformance to ASTM A-450 with no cracks.
- E. A Hardness test was performed on (35) pieces of the submitted Test Specimens and (35) pieces were found to be in conformance to ASME SA-249, Grade TP316 Stainless Steel per the following results:

**REQUIRED: RB 90 MAXIMUM**

TRACE NO. M-2627-1: RB 80.5	TRACE NO. M-2627-18: RB 81.0
TRACE NO. M-2627-2: RB 76.0	TRACE NO. M-2627-19: RB 78.0
TRACE NO. M-2627-3: RB 81.0	TRACE NO. M-2627-20: RB 76.0
TRACE NO. M-2627-4: RB 78.5	TRACE NO. M-2627-21: RB 80.5
TRACE NO. M-2627-5: RB 73.5	TRACE NO. M-2627-22: RB 82.0
TRACE NO. M-2627-6: RB 79.0	TRACE NO. M-2627-23: RB 76.0
TRACE NO. M-2627-7: RB 79.0	TRACE NO. M-2627-24: RB 80.0
TRACE NO. M-2627-8: RB 81.0	TRACE NO. M-2627-25: RB 83.0
TRACE NO. M-2627-9: RB 81.0	TRACE NO. M-2627-26: RB 77.5
TRACE NO. M-2627-10: RB 76.5	TRACE NO. M-2627-27: RB 78.5
TRACE NO. M-2627-11: RB 79.5	TRACE NO. M-2627-28: RB 81.0
TRACE NO. M-2627-12: RB 74.5	TRACE NO. M-2627-29: RB 89.0
TRACE NO. M-2627-13: RB 76.5	TRACE NO. M-2627-30: RB 79.5
TRACE NO. M-2627-14: RB 81.5	TRACE NO. M-2627-31: RB 78.0
TRACE NO. M-2627-15: RB 76.5	TRACE NO. M-2627-32: RB 74.0
TRACE NO. M-2627-16: RB 80.0	TRACE NO. M-2627-33: RB 74.0
TRACE NO. M-2627-17: RB 79.0	TRACE NO. M-2627-34: RB 79.0
	TRACE NO. M-2627-35: RB 72.0

No welding was performed on the referenced items.

The provisions of 10CFR21 apply to this order.

The above testing was performed in accordance with L.T.I. Quality System Program Manual, Rev. 10 dated 10/17/94 as approved by Amer Industrial Technologies, Inc.

**MERCURY CONTAMINATION** - During the testing and inspection, the product did not come in direct contact with mercury or any of its compounds nor with any mercury containing devices employing a single boundary of containment.

Sherri L. Lengyel  
QA Coordinator

By: *Sherri L. Lengyel*  
AUTHORIZED SIGNATURE

SUBJECT TO TERMS AND CONDITIONS PRINTED ON REVERSE SIDE OF THIS FORM  
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AMER INDUSTRIAL TECHNOLOGIES INC

TEST RECORDS .

GAGE USED "F" LEAKAGE        YES        NO ☒ MEDIUM: Water  
260° F

JOB NO. N1442 QTY. & UNIT TYPE 35 Tubes PRESSURE 1000 PSI

[illegible]

SIGNATURE \_\_\_\_\_  
PROJECT ENGINEER

SIGNATURE James Mayes  
O.A. MANAGER

DATE: 3/13/95

DATE: 3/13/95

REPAIRS REQUIRED \_\_\_\_\_ YES \_\_\_\_\_ NO \_\_\_\_\_ Describe on additional sheet if yes.