Energy Industries of Ohio

Contract # S005242-F

Modular Coil Winding Form

C-4 Documentation Package

7/17/06

This C-4 Documentation consists of:

Part 1

Final documentation package Metal Tek Intl. – Pages 3 – 86
Latest revision 7/14/2006
Foundry documentation

Part 2

Final documentation package Major Tool - Pages 87 - 221
Latest revision 7/17/2006
Machine shop documentation

Part 3

Metal Tek radiographic films from part 1 (shipped to PPPL)

Major Tool radiographic films from part 2 (shipped to PPPL)

Energy Industries of Ohio

Contract # S005242-F

Modular Coil Winding Forms

C-4 Documentation Package

Part 1 – Metal Tek International
Casting Data Package

Revised 7/14/2006

****Note – Document #'s listed in the TOC (page 4) are not necessarily the same as the number hand written on the top of the document. Please use page # to find relevant document.**

C-4 Documentation Package

List of Documents 7-14-06

MetalTek INTERNATIONAL

Carondelet Division

8600 Commercial Blvd. - Pevely, MO 63070 USA
Phone: 636-479-4499 - Fax: 636-479-3399

Material Test Report

ENERGY INDUSTRIES OF OHIO

Purchase Order Number PPPL-FP-LTS-2
Pattern Number MCWF-C4
CAF Metal Designation CF8MNMnMod
Material Spec CF8MNMnMOD

Cert Number S75920-3
Pour Date 7/12/2005

Weighted average of 3 heats – 30108(38%),30109(23%),30112(39%) Total Weight 32028 lbs.

Revised 10/26/05

Element	Min	Actual	Max
C	0.04	0.04	0.07
MN	2.3	2.5	2.8
SI	0.0	0.4	0.7
CR	18.0	18.2	18.5
NI	13.0	13.2	13.5
MO	2.1	2.2	2.5
P*	0.0	0.030	0.035
S*	0.0	0.013	0.025
N	0.24	0.26	0.28

*P & S taken from ladle sample button and analyzed by wet chemistry, ASTM E1019-03 for sulfur and Colormetric for phosphorous.

PRODUCT ANALYSIS

Results of spectrometer analysis of cast on test bar after spectrometer preventive maintenance performed and at Wisconsin Centrifugal.
***Not analyzed on spectrograph.

Element	CAF after PM	WC Analysis
C	***	0.04
MN	1.4	1.5
SI	0.6	0.6
CR	18.2	17.8
NI	13.6	13.6
MO	2.4	2.4
P	0.031	0.030
S	0.009	0.012
N	***	0.25

Charles A. Ruud
Quality Assurance Manager

Superior Quality Engineered Metal Products

www.MetalTekInt.Com

MetalTek INTERNATIONAL

Carondelet Division

8600 Commercial Blvd. - Pevely, MO 63070 USA
Phone: 636-479-4499 - Fax: 636-479-3399

Material Test Report

ENERGY INDUSTRIES OF OHIO

Purchase Order Number PPPL-FP-LTS-2
Pattern Number MCWF-C4
CAF Metal Designation CF8MNMnMod
Material Spec CF8MNMnMOD
Analysis performed by Wisconsin Centrifugal

Cert Number S75920-3
Pour Date 7/12/2005

Revised 11/3/05

Element	Min	Actual	Max
C	0.04	0.04	0.07
MN*	2.3	1.5	2.8
SI	0.0	0.6	0.7
CR*	18.0	17.8	18.5
NI*	13.0	13.6	13.5
MO	2.1	2.4	2.5
P	0.0	0.030	0.035
S	0.0	0.012	0.025
N	0.24	0.25	0.28

* See Corrective Action Number 1323.

Respectfully Submitted,
Charles A. Ruud
Quality Assurance Manager

Superior Quality Engineered Metal Products

www.MetalTekInt.Com

Carondelet Division

8600 Commercial Blvd. - Pevely, MO 63070 USA
Phone: 636-479-4499 - Fax: 636-479-3399

Material Test Report

ENERGY INDUSTRIES OF OHIO

Purchase Order Number	PPPL-FP-LTS-2	Heat Number 29198	Pour Date 4/28/2005
Pattern Number	SE-141-073 COIL C SHIM (-3 thru -6 Parts) Cert Number S73220-2 and		
	SE-141-033 COIL A SHIM (-1 thru -6 Parts) Cert Number S76220-1		
CAF Metal Designation	CF8MNMnMod		
Material Spec	CF8MNMN MOD		

Revised 9/24/05

Element	Min	Actual	Max
C	0.040	0.070	0.070
CR	18.000	18.100	18.500
MN	2.300	2.970	2.800
MO	2.100	2.450	2.500
N	0.240	0.255	0.280
NI	13.000	13.120	13.500
P*	0.000	0.013	0.035
S*	0.000	0.010	0.025
SI	0.000	0.700	0.700

MN & SI previously reported on CA 1308 and were accepted.

*P & S taken from test from heat parts were poured from and analyzed by wet chemistry, ASTM E1019-03 for sulfur and Gravimetric for phosphorous.

This report covers the eleven castings poured from heat 29198. Only parts listed above however will be shipped for this order. Each casting has a unique number stamped in the part adjacent to the pattern number to differentiate the part and subsequent reporting that will be traced to the casting.

Specification limits have been updated to latest specification.

Respectfully Submitted,
Charles A. Ruud
Quality Assurance Manager

-045 ER316 MNH F 9

PRODUCT CONFORMANCE REPORT

LINCOLN ELECTRIC

Product	LNM 4455	Size(s) mm	1,2
Class.	EN 12072-99: G 20 16 3 Mn L	Lot/Batch	3018926/78309
		Item No.	692129
Customer	CK SUPPLY Contact Ernie Simpson Eureka (MISSOURI) 63025 UNITED STATES	Quantity	450,0 KG
		Customer ref.	P.O.: SL 057549
		LSW Order No.	SD424496

Chemical analysis (%) EN10204 3.1B

C	Si	Mn	P	S	Cr	Ni	Mo	Cu	N
0,02	**0,4**	**7,3**	**0,019**	**0,001**	**20,1**	**16,3**	**2,9**	**0,1**	**0,200**

Mechanical tests, all weld metal EN10204

Additional information EN10204
Other tests

Remarks

The product identified above has been manufactured, tested and supplied in compliance with a Quality Assurance Programme that fulfils the requirements of EN 29000/ ISO 9000/BS 5750 or similar standard.
We herewith certify that the product complies with the above-mentioned standards.
Certified ISO 9001:2000.

Company	Issued by	Function	Date	Cert.No.
Lincoln Smitweld B.V.	**P. van Etteger**	**QS Manager**	**10/02/2005**	**3018926/7830**

Registered Office
Nieuwe Dukenburgseweg 20
6534 AD NIJMEGEN

Post address:
P.O. Box 253
6500 AG Nijmegen
NETHERLANDS

Telephone: 31 24 3522911
Fax: 31 24 3522200

QA32(Incl)
3301013 rev. 00

PRODUCT CONFORMANCE REPORT

LINCOLN® ELECTRIC

Product	LNM 4455	Size(s) mm	1,2
Class.	EN 12072-99: G 20 16 3 Mn L	Lot/Batch	3018513/78308
		Item No.	692129
Customer	EUROWELD MOORESVILLE N.C. 28117 UNITED STATES	Quantity	105,0 KG
		Customer ref.	P.O.: 05 - 46
		LSW Order No.	SD427896

Chemical analysis (%) EN10204 2.2

C	Si	Mn	P	S	Cr	Ni	Mo	Cu	N
0,01	**0,5**	**7,3**	**0,015**	**0,001**	**20,3**	**15,4**	**2,9**	**0,1**	**0,19**

Mechanical tests, all weld metal EN10204 2.2

Tensile testing

Cond.	Temp. °C	Rp0.2 N/mm2	Rm N/mm2	A5 %
AW	**RT**	**407**	**623**	**41**

Impact testing

Cond.	Temp.1 °C	Av1 J
AW	**-196**	**67**

Additional information EN10204 2.2

Other tests

Remarks

Impact testing (individual values): 70J - 65J - 67J.

The product identified above has been manufactured, tested and supplied in compliance with a Quality Assurance Programme that fulfils the requirements of EN 29000/ ISO 9000/BS 5750 or similar standard.
We herewith certify that the product complies with the above-mentioned standards.
Certified ISO 9001:2000.

Company	Issued by	Function	Date	Cert.No.
Lincoln Smitweld B.V.	**P. Nagels**	**QA Administrator**	**22/03/2005**	**3018513/7830**

Registered Office
Nieuwe Dukenburgseweg 20
6534 AD NIJMEGEN

Post address
P.O. Box 253
6500 AG Nijmegen

Telephone: 31 24 3522911
Fax: 31 24 3522200

V22Urev3

METRODE PRODUCTS LIMITED
HANWORTH LANE, CHERTSEY
SURREY, UK, KT16 9LL
Tel: +44 (0) 1932 566721
Fax: +44 (0) 1932 565168
Email: info@metrode.com
Website: www.metrode.com

CERTIFIED MATERIAL TEST REPORT

THIS PRODUCT HAS BEEN MANUFACTURED AND SUPPLIED THROUGH A SYSTEM APPROVED TO ISO 9001 & 2 OR EQUIVALENT

TEST CERTIFICATE NUMBER

175185

INVOICE TO
Euroweld Ltd
255 Rolling Hills Road
Mooresville
NC 28117
USA

DESPATCHED TO
Euroweld Ltd
255 Rolling Hills Road
Mooresville
NC 28117
USA

CUSTOMER ORDER NUMBER	N 03-134
DELIVERY NOTE DOCUMENT NUMBER	DN0096436
QUANTITY (KG)	40.5000
OUR ORDER REFERENCE	SO1777956 / 1
DATE	07/01/04

METRODE WELDING CONSUMABLE	ULTRAMET B316NF 4.0MM
FORM	MMA ELECTRODE
BATCH NUMBER	WO19711
SPECIFICATION	BS EN 1600:1997 E 18 15 3 L B 4 2

Chemical Analysis (Weight %) — Type: BS EN 10204: 3.1.B / ASME SFA-5.01: Sch. H

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	N		
0.02	3.28	0.24	0.009	0.023	18.0	15.4	2.80	0.07	0.11		

Mechanical Tests — Type: BS EN 10204: 2.2

Tensile Tests / Impact Energies

Condition	Test Temperature	$Rp_{0.2\%}$ (MPa)	Rm (MPa)	A4 (%)	Z (%)	Impact Temperature (°C)	Impact Energy (J)	Lateral Expansion (mm)
AS-WELDED	ROOM	>420	>600	38	54	-196	>40	

Metrode Products Limited certifies that the above material conforms to the indicated specifications

This document is produced electronically and is valid without signature.

IMPORTANT. Any liability arising from either reliance on this certificate, or use of our products, is strictly limited and governed by our conditions of business

Barrie Kylet – Q.A.Manager

ASME SFA-5.01: Lot classification: C4

Notes:
% Ni includes incidental Co unless otherwise specified
% Nb (Cb) includes incidental Ta unless otherwise specified
Ferrite is given as FN (Ferrite number) and measured on all-weld pad using instrument calibrated against NBS-related secondary standards (See AWS A4.2-97) unless otherwise specified

Founded 1929 St. Louis Testing Laboratories INCORPORATED

2810 Clark Avenue • St. Louis, MO 63103-2574 • (314) 531-8080 • FAX (314) 531-8085

Chemical, Metallurgical, Mechanical, Nondestructive, Environmental Testing, Analyses and Field Service.

METALTEK INTERNATIONAL
8600 Commercial Blvd.
Pevely, MO 63070

August 8, 2005
Lab No. 05P-2334
P.O. No. 21324

Attention: CHUCK RUUD

REPORT OF MECHANICAL TESTS

SAMPLE ID:
1) STOCK# LNM 4455, LINCOLN LOT 3018926/78309
2) STOCK# LNM 4455, LINCOLN LOT 3017006/72262
3) STOCK# LNM 4455, LINCOLN LOT 3012668/82743
4) STOCK# B316NF METRODE, W021735

Sample ID	Original Area Sq. Inches	Reduced Area Sq. Inches	Reduction in Area %	Modules of Elasticity	Yield Strength PSI	Tensile Strength PSI	Elongation (2.0" Gage Length) in.	Elongation (2.0" Gage Length) %
1	0.1385	0.0897	54.3	24.5 Msi	56900	93900	0.84	42.0
2	0.1886	0.0935	50.4	24.9 Msi	54900	92100	0.85	42.5
3	0.1909	0.0951	50.2	22.6 Msi	57400	93700	0.83	41.5
4	0.1901	0.0962	49.4	23.0 Msi	54800	88200	0.75	37.5

Round, reduced section all weld tensiles

Yield taken at .2% offset

Tested in accordance with ASTM A 370-03a

Identification of tested specimens provided by the client.

Karl Schmitz, Director
Materials Testing

KS/tlv

Founded 1929 St. Louis Testing Laboratories INCORPORATED

2810 Clark Avenue • St. Louis, MO 63103-2574 • (314) 531-8080 • FAX (314) 531-8085

Chemical, Metallurgical, Mechanical, Nondestructive, Environmental Testing, Analyses and Field Service.

METALTEK INTERNATIONAL
8600 Commercial Blvd.
Pevely, MO 63070

August 8, 2005
Lab No. 05P-2334
P.O. No. 21324

Attention: Chuck Ruud

REPORT OF CHARPY IMPACT TEST

MATERIAL (SAMPLE ID): STOCK# LNM 4455, LINCOLN LOT 3018926/78309
STOCK# LNM 4455, LINCOLN LOT 3017006/72262

SPECIFICATION: ASTM A 370-03a

SPECIMEN TYPE: "A" Vee Notch

SPECIMEN SIZE: 10 mm x 10 mm (All Weld)

TEMPERATURE OF TEST: 293°K

REQUIREMENTS:

ALL WELD	FOOT LBS.	LATERAL EXPANSION	% SHEAR
78309-7	97	0.074	50
78309-8	96	0.076	50
78309-9	108	0.075	50
Average	100	0.075	50
ALL WELD	**FOOT LBS.**	**LATERAL EXPANSION**	**% SHEAR**
72262-7	126	0.098	50
72262-8	102	0.080	50
72262-9	123	0.087	50
Average	117	0.088	50

Identification of tested specimen provided by client.

Karl Schmitz, Director
Materials Testing

KS/tlv

ACCREDITED
Certificate No. 0397-01
Certificate No. 0397-02

MEMBER ACIL

11 B

Westmoreland Mechanical Testing & Research, Inc.
P.O. Box 388
Westmoreland Drive
Youngstown, Pa. 15696-0388 U.S.A.
Telephone: 724-537-3131 Fax: 724-537-3151
Website: www.wmtr.com
WMT&R is a technical leader in the material testing industry.

ACCREDITED
621-01 & 621-02

Accredited Nadcap Materials Testing Laboratory

April 28, 2005

CERTIFICATION

Section 1 of 1

WMT&R Report No. 5-26097
P.O. No. 19386R9
WMT&R Quote No. QN250563
Req. No. 4315

MetalTek International
The Carondelet Division
8600 Commercial Blvd.
I-55 Industrial Park
Pevely, MO 63070-1528

Attention: Rick Suria

Subject: All processes, performed upon the material as received, were conducted at WMT&R, Inc. in accordance with the WMT&R Quality Assurance Manual, Rev. 9, dated 4/1/2000.
The following tests were performed on this order: TENSILE

TENSILE RESULTS: ASTM E21-03a
Requirements: UTS ksi (Min 95\Max ---) 0.2% YS ksi (Min 72\Max ---) 4D Elong. % (Min 32\Max ---) Modulus Msi (Min 21\Max ---)
SOAK TIME: 5 Minutes
SPEED OF TESTING: 0.0050 in./in./min., 0.0500 In./min./in.
MATERIAL: 316 S/S
DISPOSITION: Acceptable

Sample	TestLog Number	Temp. °F	UTS ksi	0.2% YS ksi	Elong %	RA %	Modulus Msi	Ult. Load lbf	0.2% YLD. lbf	Orig. Dia. (in.)	Final Dia. (in.)	4D Orig GL (in.)	4D Final GL (in.)	Orig. Area (sq. in.)	Machine Number	A\U\R
Bar#1 (Lot#3012668/82743)	B75123	-320	187.7	126.3	33	22	27.1	37740	25394	0.5060	0.4471	2.00	2.65	0.20109020	M9	A
Bar#2 (Batch#W019711)	B75124	-320	166.9	109.5	34	27	26.4	33500	21990	0.5056	0.4315	2.00	2.67	0.20077240	M9	A

A\U\R: A=ACCEPTABLE, U=UNACCEPTABLE, R=REPORT

Roy E. Starr\Matt Wojton
Technical Services Manager\Tensile Supervisor

4-28-05
April 28, 2005

10 B

Founded 1929 St. Louis Testing Laboratories INCORPORATED

2810 Clark Avenue • St. Louis, MO 63103-2574 • (314) 531-8080 • FAX (314) 531-8085

METALTEK INTERNATIONAL
8600 Commercial Blvd.
Pevely, MO 63070

Attention: Chuck Ruud

April 22, 2005
Lab No. 05P-1170
P.O. No. 12516
Page 1 of 1
(revised 6/15/05)

REPORT OF MECHANICAL TESTS

SAMPLE ID: 1 Ea., Sample Bar #1, Lot 3012668/82743
1 Ea., Sample Bar #2, Batch # WO19711

Sample ID	Original Area Sq. Inches	Reduced Area Sq. Inches	Reduction In Area %	Yield Strength PSI	Tensile Strength PSI	Elongation (2.0" Gage Length) in.	Elongation (2.0" Gage Length) %	Elastic Modulus
#1	.1901	.0855	55.0	56,500	85,000	0.80	55.0	25.5 MSI
#2	.1917	.0881	54.0	63,900	98,100	0.88	54.0	23.1 MSI

Round, reduced section all weld room temperature tensiles

Yield taken at .2% offset

Tested in accordance with ASTM A 370
Identification of tested specimens provided by the client

Karl Schmitz, Director
Materials Testing

KS/tw

ACCREDITED
Certificate No. 0397-01
Certificate No. 0397-02

MEMBER ACIL

Founded 1929 St. Louis Testing Laboratories INCORPORATED

2810 Clark Avenue • St. Louis, MO 63103-2574 • (314) 531-8080 • FAX (314) 531-8085

Chemical, Metallurgical, Mechanical, Nondestructive, Environmental Testing, Analyses and Field Service.

METALTEK INTERNATIONAL
8600 Commercial Blvd.
Pevely, MO 63070

August 16, 2005
Lab No. 05P-2532
P.O. No. 21324

Attention: Chuck Ruud

REPORT OF CHARPY IMPACT TEST

MATERIAL (SAMPLE ID): LNM 4455, LINCOLN LOT 3018513/78308

SPECIFICATION: ASTM A 370-03a

SPECIMEN TYPE: "A" Vee Notch

SPECIMEN SIZE: 10 mm x 10 mm

TEMPERATURE OF TEST: 293°K

BASE METAL	FOOT LBS.	LATERAL EXPANSION	% SHEAR
LNM4455-7	104	0.085	100
LNM4455-8	106	0.093	100
LNM4455-9	99	0.084	100
Average	103	0.087	100

Identification of tested specimen provided by client.

Karl Schmitz, Director
Materials Testing

KS/tlv

Founded 1929 St. Louis Testing Laboratories INCORPORATED

2810 Clark Avenue • St. Louis, MO 63103-2574 • (314) 531-8080 • FAX (314) 531-8085

Chemical, Metallurgical, Mechanical, Nondestructive, Environmental Testing, Analyses and Field Service.

METALTEK INTERNATIONAL
8600 Commercial Blvd.
Pevely, MO 63070

August 16, 2005
Lab No. 05P-2532
P.O. No. 21324

Attention: CHUCK RUUD

REPORT OF MECHANICAL TESTS

SAMPLE ID: LNM 4455, LINCOLN LOT 3018513/78308

Sample ID	Original Area Sq. Inches	Reduced Area Sq. Inches	Reduction in Area %	Yield Strength PSI	Tensile Strength PSI	Elongation (2.0" Gage Length) in.	Elongation (2.0" Gage Length) %	Modules of Elasticity
LNM4455	0.1932	0.0866	55.2	65200	95200	0.76	38.0	23.4

Round, reduced section tensiles

Yield taken at .2% offset

Tested in accordance with ASTM A 370-03a

Identification of tested specimens provided by the client.

Karl Schmitz, Director
Materials Testing

KS/tlv

Westmoreland Mechanical Testing & Research, Inc.
P.O. Box 388
Westmoreland Drive
Youngstown, Pa. 15696-0388 U.S.A.
Telephone: 724-537-3131 Fax: 724-537-3151
Website: www.wmtr.com
WMT&R is a technical leader in the material testing industry.

ACCREDITED
621-01 & 621-02

Accredited Nadcap Materials Testing Laboratory

October 18, 2005

CERTIFICATION

Section 1 of 1
WMT&R Report No. 5-35979
Requisition No. 4972

MetalTek International
The Carondelet Division
8600 Commercial Blvd.
I-55 Industrial Park
Pevely, MO 63070-1528

Attention: Jim Galaske

Subject: All processes, performed upon the material as received, were conducted at WMT&R, Inc. in accordance with the WMT&R Quality Assurance Manual, Rev. 9, dated 4/1/2000.
The following tests were performed on this order: TENSILE

TENSILE RESULTS: ASTM E21-03a
SOAK TIME: 5 Minutes
SPEED OF TESTING: 0.0030 in./in./min., 0.0500 in./min./in.
MATERIAL: METALTEK CF8MNMNMOD
DISPOSITION: Report

Specimen ID	TestLog Number	Temp. °F	UTS ksi	0.2% YS ksi	Elong %	RA %	Modulus Msi	Ult. Load lbf	0.2% YLD. lbf	Orig. Dia. (in.)	Final Dia. (in.)	4D Orig GL (in.)	4D Final GL (in.)	Orig. Area (sq. in.)	Machine Number	A\U\R
3018513/78308	C54936	-320	184.9	123.7	33	33	32.8	18470	12350	0.3566	0.2926	1.40	1.86	0.09987403	M9	R

A\U\R: A=ACCEPTABLE, U=UNACCEPTABLE, R=REPORT

Roy E. Stan\Matt Wojton
Technical Services Manager___ Tensile Supervisor

10-18-05
October 18, 2005

Founded 1929 St. Louis Testing Laboratories INCORPORATED

2810 Clark Avenue • St. Louis, MO 63103-2574 • (314) 531-8080 • FAX (314) 531-8085

Chemical, Metallurgical, Mechanical, Nondestructive, Environmental Testing, Analyses and Field Service.

METALTEK INTERNATIONAL
8600 Commercial Blvd.
Pevely, MO 63070

October 5, 2005
Lab No. 05P-3096
P.O. No. 21324
Page 1 of 1

Attention: Chuck Ruud

REPORT OF CHARPY IMPACT TEST

MATERIAL (SAMPLE ID): WELD PLATE- 3018513 / 78308

SPECIFICATION: ASTM A 370-03a

SPECIMEN TYPE: "A" Vee Notch

SPECIMEN SIZE: 10 mm x 10 mm

TEMPERATURE OF TEST: -320°F

REQUIREMENTS: minimum 35 ft / lbs.

BASE METAL	FOOT LBS.	LATERAL EXPANSION	% SHEAR
3018513/78308-1	48	0.033	50
3018513/78308-2	65	0.045	50
3018513/78308-3	48	0.033	50
Average	54	0.037	50

Identification of tested specimen provided by client.

Karl Schmitz, Director
Materials Testing

KS/tlv

ACCREDITED
Certificate No. 0397-01
Certificate No. 0397-02

Westmoreland Mechanical Testing & Research, Inc.
P.O. Box 388
Westmoreland Drive
Youngstown, Pa. 15696-0388 U.S.A.
Telephone: 724-537-3131 Fax: 724-537-3151
Website: www.wmtr.com
WMT&R is a technical leader in the material testing industry.

ACCREDITED
621-01 & 621-02

Accredited Nadcap Materials Testing Laboratory

September 13, 2005

CERTIFICATION

WMT&R Report No. 5-34328
P.O. No. 19386 Rel No.18
Requisition No. 4934

MetalTek International
The Carondelet Division
8600 Commercial Blvd.
I-55 Industrial Park
Pevely, MO 63070-1528

Attention: Jim Galaske

Subject: All processes, performed upon the material as received, were conducted at WMT&R, Inc. in accordance with the WMT&R Quality Assurance Manual, Rev. 9, dated 4/1/2000.
The following tests were performed on this order: IMPACT and TENSILE

TENSILE RESULTS: ASTM E21-03a
Requirements: UTS ksi (Min 95\Max ---) 0.2% YS ksi (Min 72\Max ---) 4D Elong. % (Min 32\Max ---) Modulus Msi (Min 21\Max ---)
SOAK TIME: 5 Minutes
SPEED OF TESTING: 0.0030 in./in./min., 0.0500 in./min./in.
MATERIAL: 316 S/S

DISPOSITION: Acceptable

Reference	Lot No. | Batch No. | Specimen ID	TestLog Number	Temp. °F	UTS ksi	0.2% YS ksi	Elong %	RA %	Modulus Msi	Ult. Load lbf	0.2% YLD. lbf
Lincoln LNM4455	3018926 | 78309 | Tensile	C43938	-320	182.1	128.2	34	24	27.0	17560	12360

A\U\R: A=ACCEPTABLE, U=UNACCEPTABLE, R=REPORT

DISPOSITION: Acceptable

Reference	Lot No. | Batch No. | Specimen ID	TestLog Number	Orig. Dia. (in.)	Final Dia. (in.)	4D Orig GL (in.)	4D Final GL (in.)	Orig. Area (sq. in.)	Machine Number	A\U\R
Lincoln LNM4455	3018926 | 78309 | Tensile	C43938	0.3504	0.3048	1.40	1.87	0.09643131	M9	A

A\U\R: A=ACCEPTABLE, U=UNACCEPTABLE, R=REPORT

Requirements supplied by MetalTek International.

Roy E. Starr/Matt Wojton
Technical Services Manager / Tensile Supervisor — September 13, 2005

Westmoreland Mechanical Testing & Research, Inc.
P.O. Box 388
Westmoreland Drive
Youngstown, Pa. 15696-0388 U.S.A.
Telephone: 724-537-3131 Fax: 724-537-3151
Website: www.wmtr.com
WMT&R is a technical leader in the material testing industry.

ACCREDITED
621-01 & 621-02

Accredited Nadcap Materials Testing Laboratory

11

September 13, 2005

CERTIFICATION

WMT&R Report No. 5-34328
P.O. No. 19386 Rel No.18
Requisition No. 4934

MetalTek International
The Carondelet Division
8600 Commercial Blvd.
I-55 Industrial Park
Pevely, MO 63070-1528

Attention: Jim Galaske

Subject: All processes, performed upon the material as received, were conducted at WMT&R, Inc. in accordance with the WMT&R Quality Assurance Manual, Rev. 9, dated 4/1/2000.
The following tests were performed on this order: IMPACT and TENSILE

IMPACT RESULTS: ASTM E23-02
REQUIREMENTS: Energy (Min 35\Max ---)
MATERIAL: Lincoln LNM4455
SAMPLE TYPE: Charpy V-Notch
DISPOSITION: Acceptable

Reference	Lot No. | Batch No. | Specimen ID	TestLog Number	Sample Size	Temp. °F	Energy ft-lbs	Mils Lat Exp	% Shear Fracture	A\U\R
Lincoln LNM4455	3018926 | 78309 | Cvn-1	C43939	Standard	-320	56	18	40	Acceptable
Lincoln LNM4455	3018926 | 78309 | Cvn-2	C43940	Standard	-320	52	18	40	Acceptable
Lincoln LNM4455	3018926 | 78309 | Cvn-3	C43941	Standard	-320	53	12	40	Acceptable

Requirements supplied by MetalTek International.

Roy E. Starr\Matt Wolton
Technical Services Manager\ Tensile Supervisor

9-13-05
September 13, 2005

11 B

Founded 1929 St. Louis Testing Laboratories INCORPORATED

2810 Clark Avenue • St. Louis, MO 63103-2574 • (314) 531-8080 • FAX (314) 531-8085

METALTEK INTERNATIONAL
8600 Commercial Blvd.
Pevely, MO 63070

Attention: Chuck Ruud

April 6, 2005
Lab No. 05P-1007
P.O. No. 12516
Page 2 of 2

REPORT OF CHARPY IMPACT TEST

MATERIAL (SAMPLE ID): (2) Metrode B316NF, Batch # WO19711

SPECIFICATION: ASTM A 370-03a

SPECIMEN TYPE: "A" Vee Notch

SPECIMEN SIZE: 10 mm x 10 mm

TEMPERATURE OF TEST: -320°F

ALL WELD METAL	FOOT LBS.	LATERAL EXPANSION	% SHEAR
B316NF-1	48	0.030	30
B316NF-2	52	0.027	30
B316NF-3	44	0.027	30
Average	48	0.028	30

Identification of tested specimen provided by client.

Karl Schmitz, Director
Materials Testing

KS/tw

ACCREDITED

Certificate No. 0397-01
Certificate No. 0397-02

MEMBER ACIL

Westmoreland Mechanical Testing & Research, Inc.
P.O. Box 388
Westmoreland Drive
Youngstown, Pa. 15696-0388 U.S.A.
Telephone: 724-537-3131 Fax: 724-537-3151
Website: www.wmtr.com
WMT&R is a technical leader in the material testing industry.

ACCREDITED
621-01 & 621-02

Accredited Nadcap Materials Testing Laboratory

September 9, 2005

CERTIFICATION

Section 1 of 1

WMT&R Report No. 5-33240
P.O. No. 19386
Requisition No. 5813

MetalTek International
The Carondelet Division
8600 Commercial Blvd.
I-55 Industrial Park
Pevely, MO 63070-1528

Attention: Jim Galaske

Subject: All processes, performed upon the material as received, were conducted at WMT&R, Inc. in accordance with the WMT&R Quality Assurance Manual, Rev. 9, dated 4/1/2000.
The following tests were performed on this order: TENSILE

TENSILE RESULTS: ASTM E21-03a
SOAK TIME: 5 Minutes
SPEED OF TESTING: 0.0030 in./in./min., 0.0500 in./min./in.
MATERIAL: METALTEK CF8MNMNMOD

DISPOSITION: Report

Coil No.	Specimen	TestLog Number	Temp. °F	UTS ksi	0.2% YS ksi	Elong %	RA %	Modulus Msi	Ult. Load lbf	0.2% YLD. lbf	Orig. Dia. (in.)	Final Dia. (in.)	4D Orig GL (in.)	4D Final GL (in.)	Orig. Area (sq. in.)	Machine Number	A\U\R
C4	Z1	C35777	-320	166.5	100.2	58	50	26.8	33500	20150	0.5061	0.3584	2.00	3.16	0.20116969	M9	R
C4	Z2	C35778	-320	161.7	97.9	44	35	26.1	32550	19700	0.5062	0.4071	2.00	2.87	0.20124920	M9	R
C4	Z3	C35779	-320	166.2	95.4	60	56	26.5	33440	19200	0.5061	0.3354	2.00	3.20	0.20116969	M9	R

A\U\R: A=ACCEPTABLE, U=UNACCEPTABLE, R=REPORT

Roy E. Starr Matt Wojton
Technical Services Manager / Tensile Supervisor

9-9-05
September 9, 2005

Founded 1929 St. Louis Testing Laboratories INCORPORATED

2810 Clark Avenue • St. Louis, MO 63103-2574 • (314) 531-8080 • FAX (314) 531-8085

Chemical, Metallurgical, Mechanical, Nondestructive, Environmental Testing, Analyses and Field Service.

METALTEK INTERNATIONAL
8600 Commercial Blvd.
Pevely, MO 63070

August 10, 2005
Lab No. 05P-2373
P.O. No. 21324

Attention: **CHUCK RUUD**

REPORT OF CHARPY IMPACT TEST

MATERIAL (SAMPLE ID): Z1, Z2, Z3-C4 COIL- ALLOY CF8MNMnMod

SPECIFICATION: ASTM A 370-03a

SPECIMEN TYPE: "A" Vee Notch

SPECIMEN SIZE: 10 mm x 10 mm

TEMPERATURE OF TEST: +73°F

REQUIREMENTS: 50 ~~60~~ ft / lbs CAR 10/24/05

RESULTS:

BASE METAL	FOOT LBS.	LATERAL EXPANSION	% SHEAR
Z1-7	164	0.086	80
Z1-8	170	0.084	80
Z1-9	160	0.081	80
Average	165	0.084	80

BASE METAL	FOOT LBS.	LATERAL EXPANSION	% SHEAR
Z2-7	168	0.091	90
Z2-8	146	0.084	80
Z2-9	164	0.111	90
Average	159	0.095	87

BASE METAL	FOOT LBS.	LATERAL EXPANSION	% SHEAR
Z3-7	180	0.091	90
Z3-8	204	0.100	90
Z3-9	224	0.106	90
Average	203	0.099	90

Identification of tested specimens provided by client.

C S 0802 8/9/05

Karl Schmitz, Director
Materials Testing

ACCREDITED
Certificate No. 0397-01
Certificate No. 0397-02

MEMBER ACIL

Founded 1929 St. Louis Testing Laboratories INCORPORATED

2810 Clark Avenue • St. Louis, MO 63103-2574 • (314) 531-8080 • FAX (314) 531-8085

Chemical, Metallurgical, Mechanical, Nondestructive, Environmental Testing, Analyses and Field Service.

METALTEK INTERNATIONAL
8600 Commercial Blvd.
Pevely, MO 63070

August 10, 2005
Lab No. 05P-2373
P.O. No. 21324

Attention: **CHUCK RUUD**

REPORT OF CHARPY IMPACT TEST

MATERIAL (SAMPLE ID): Z1, Z2, Z3-C4 COIL- ALLOY CF8MNMnMod

SPECIFICATION: ASTM A 370-03a

SPECIMEN TYPE: "A" Vee Notch

SPECIMEN SIZE: 10 mm x 10 mm

TEMPERATURE OF TEST: 77°K

REQUIREMENTS: 35 ft / lbs

RESULTS:

BASE METAL	FOOT LBS.	LATERAL EXPANSION	% SHEAR
Z1-7	78	0.044	40
Z1-8	91	0.049	40
Z1-9	90	0.054	50
Average	86	0.049	43
BASE METAL	**FOOT LBS.**	**LATERAL EXPANSION**	**% SHEAR**
Z2-7	73	0.044	40
Z2-8	80	0.041	40
Z2-9	77	0.061	50
Average	77	0.049	43
BASE METAL	**FOOT LBS.**	**LATERAL EXPANSION**	**% SHEAR**
Z3-7	92	0.041	40
Z3-8	81	0.052	40
Z3-9	118	0.091	80
Average	97	0.061	53

Identification of tested specimens provided by client.

0802 8/10/05

Karl Schmitz, Director
Materials Testing

ACCREDITED
Certificate No. 0397-01
Certificate No. 0397-02

MEMBER ACIL

Founded 1929 St. Louis Testing Laboratories INCORPORATED

2810 Clark Avenue • St. Louis, MO 63103-2574 • (314) 531-8080 • FAX (314) 531-8085

Chemical, Metallurgical, Mechanical, Nondestructive, Environmental Testing, Analyses and Field Service.

METALTEK INTERNATIONAL
8600 Commercial Blvd.
Pevely, MO 63070

Attention: CHUCK RUUD

August 10, 2005
Lab No. 05P-2373
P.O. No. 21324

(Corrected Report 8/12/05)

REPORT OF MECHANICAL TESTS

SAMPLE ID: Z1, Z2, Z3-C4 COIL- ALLOY CF8MNMnMod

Sample ID	Original Area Sq. Inches	Reduced Area Sq. Inches	Reduction in Area %	Yield Strength PSI	Tensile Strength PSI	Elongation (2.0" Gage Length) in.	Elongation (2.0" Gage Length) %	Modules of Elasticity
Z1	0.1893	0.0779	58.8	37400	82000	0.10	55.0	22.5 Msi
Z2	0.1893	0.0897	52.6	38400	83500	0.11	55.5	25.3 Msi
Z3	0.1893	0.0908	52.0	36500	83800	0.13	56.5	21.4 Msi

Round, reduced section tensiles

Yield taken at .2% offset

Tested in accordance with ASTM A 370-03a

Identification of tested specimens provided by the client.

Room temperature CBR 10/20/05

Karl Schmitz, Director
Materials Testing

KS/tlv

Coil C-4 Weld Map – Metal Tek

Map of all major welds exceeding 20% of wall, over 1 inch or over 10^2 inches

Defect Number	Drawing View	Length (inches)	Width (inches)	Depth (inches)
1	Left	4 ¾	4 ½	1 ½
2	Left	6 ½	6	1
3	Left	4 ¾	4 ½	1
4	Left	20	10 ½	1 ¼
5	Left	8	3	½
6	Left	13	2	½
7	Left	6 ½	4 ¾	¼
8	Left	9	3	¼
9	Left	19	2	¼
10	Left	8 ½	4	¼
11	Left	15	2	½
12	Left	18	10	¾
13	Left	3	2	2
14	Left	4 ½	1 ¾	1 ½
15	Left	5	4	¼
16	Left	10	5	¼
17	Left	9	1 ½	¼
18	Left	10 ¾	1	½
19	Left	8	3	¼
20	Left	12	6	Thru
21	Top	5	5	½
22	Bottom	10 ½	6	¾
23	Bottom	13	5	Thru
24	Bottom	7	2 ½	Thru
25	Bottom	6	3 ¼	¾
26	Bottom	12	8	¾
27	Bottom	14	7	1
28	Back	10	4	1 ½
29	Back	11	2	2
30	Back	4	2 ½	Thru
31	Back	23	5 ½	1
32	Back	10	6	1
33	Back	12	2 ½	Thru
34	Back	2	2	1
35	Back	13	2	1 ¾

Coil C-4 Weld Map – Metal Tek

Map of all major welds exceeding 20% of wall, over 1 inch or over 10^2 inches

Defect Number	Drawing View	Length (inches)	Width (inches)	Depth (inches)
36	Back	16	1	¼
37	Back	9	5	Thru
38	Back	3	3	1
39	Back	8	4 ½	¾
40	Back	7	2	2
41	Back	3	2	1 ½
42	Top	10	2	1 ¾
43	Top	5	2	1 ½
44	Top	7	1 ½	1
45	Top	8	2	1
46	Front	7 ½	7	3
47	Front	22 ½	10	2
48	Front	15	6	4
49	Front	8 ½	4	3
50	Front	9	4	1 ½
51	Front	6 ½	5	¾
52	Front	6	3	1
53	Front	14	6	1 ½
54	Front	10	4	Thru
55	Front	5	3 ½	Thru
56	Front	7 ½	4 ½	1
57	Front	3 ½	3 ½	2
58	Front	6	4	¾
59	Front	13	5	¾
60	Front	3 ½	3 ½	2
61	Front	9	7 ½	½
62	Front	12	1	3/4
63	Front	8	4	1 ½
64	Front	3	2	Thru
65	Front	6	3 ½	Thru
66	Front	13	3	Thru
67	Front	31	12	1
68	Front	6	3 ½	2
69	Bottom	8	2 ¾	1 ½
70	Right	7	4	1
71	Right	3	2	1
72	Right	9	6	3

Coil C-4 Weld Map – Metal Tek

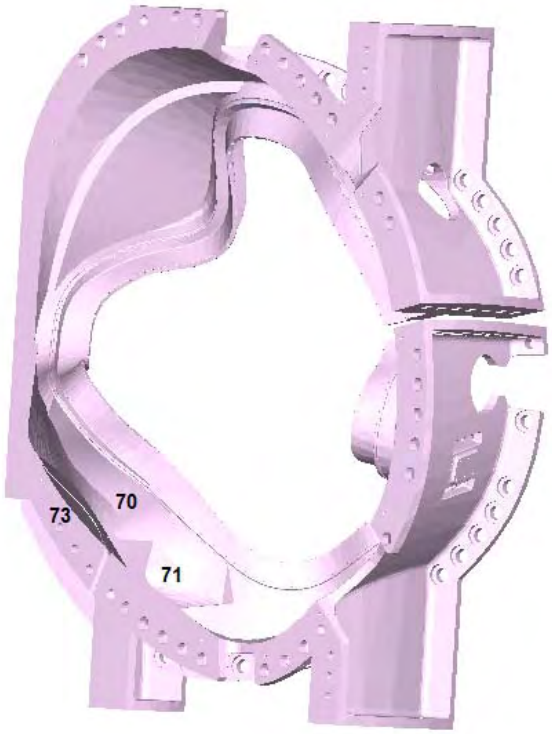
Map of all major welds exceeding 20% of wall, over 1 inch or over 10^2 inches

Defect Number	Drawing View	Length (inches)	Width (inches)	Depth (inches)
73	Top	7	3 ½	2
4aR1	Left	7 ½	4	¾
4bR1	Left	4 ½	2 ½	2 ¼
23R1	Bottom	6	4	2
19R1	Left	6 ¼	3	1 ½
74	Left	3 ½	3	1 ¼
75	Left	3	2 ½	1
76	Left	4	2	1
77	Left	6	3	7/8
78	Left	3	2	1 ¼

Coil C-4 Weld Map – Metal Tek

Map of all major welds exceeding 20% of wall, over 1 inch or over 10^2 inches

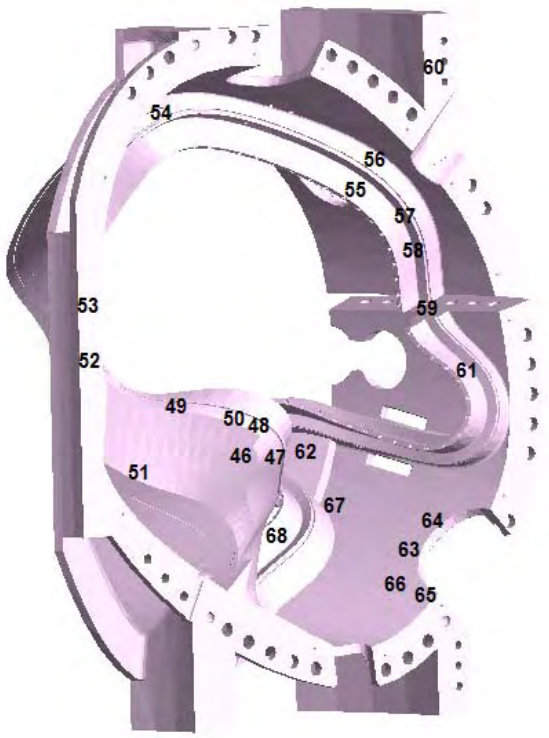
Right View



Coil C-4 Weld Map – Metal Tek

Map of all major welds exceeding 20% of wall, over 1 inch or over 10^2 inches

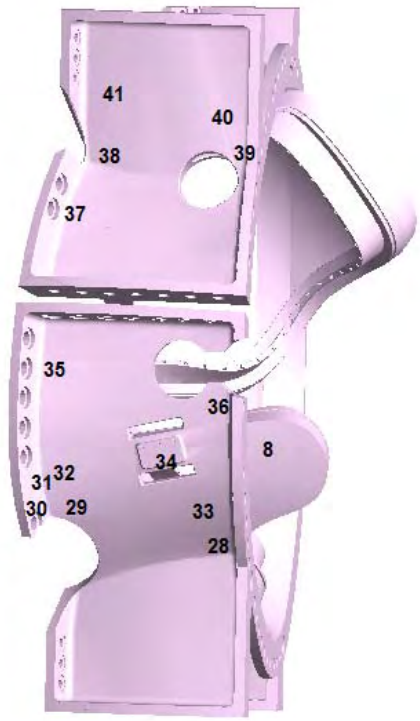
Front View



Coil C-4 Weld Map – Metal Tek

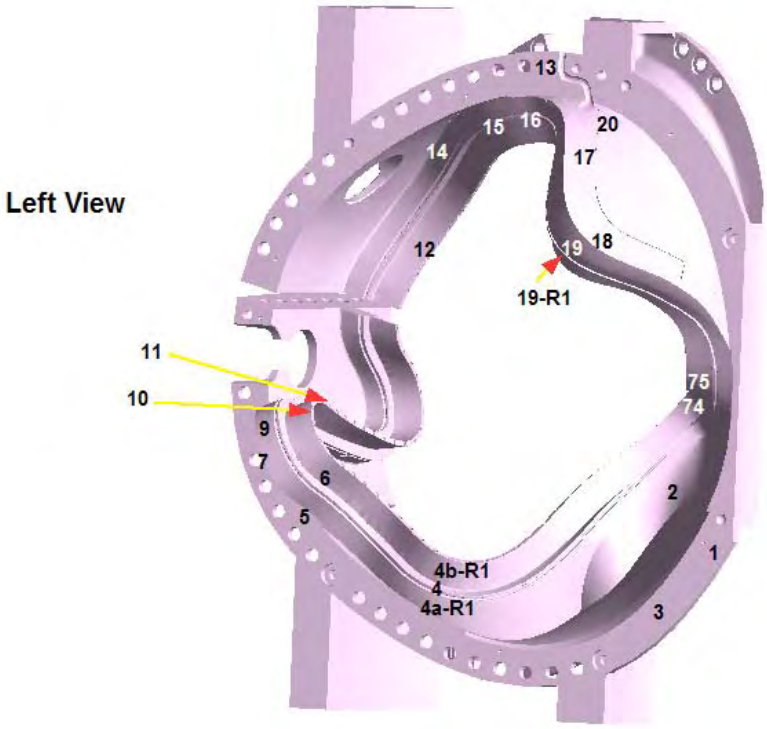
Map of all major welds exceeding 20% of wall, over 1 inch or over 10^2 inches

Back View



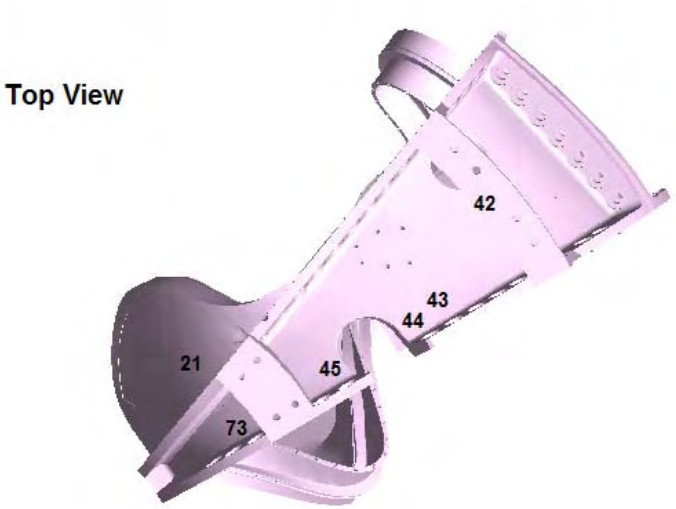
Coil C-4 Weld Map – Metal Tek

Map of all major welds exceeding 20% of wall, over 1 inch or over 10^2 inches



Coil C-4 Weld Map – Metal Tek

Map of all major welds exceeding 20% of wall, over 1 inch or over 10^2 inches



Coil C-4 Weld Map – Metal Tek

Map of all major welds exceeding 20% of wall, over 1 inch or over 10^2 inches

Bottom View

Metal Tek INTERNATIONAL

RADIOGRAPHIC STANDARD SHOOTING SKETCH

Customer EIO	Pattern Number MCWF-C-4
Material CF8MNM	Traceability Number
Film Manufactuer Fuji	Source Number 23 Ci 6060
IQI LEVEL 2-2T From CQP 401 X Other (Specify, E.G. 2-4T, 2-1T) N/A	

Exposures (views)	75-76	92-93	116-117	B-C	C-D	E-F	F-G	G-H	H-I	I-J		
Thickness (IN.)	1½"x2"	1½"x2"	2 ¾"	3"-6"	3"-8"	3"-8"	3"-6"	3"-6"	3"-6"	3"-6"		
S/F Distance (IN.)	20"	→	18"	20"	→							
Penetrameter	30/40	→	50x2	60x2 120x2	60x2 120x2 140	→	60x2 120x2	60x2 80 120x2	60x2 120x2	→		
Time (MIN.)	7m	6m30s	10m	1hr45m	→		1hr45m	→				
Focal Spot (IN.)	.1	→										
Film Size (IN.)	14x17	→										
Screen Size (Pb) Front/Back	.01	→										
S.W.E./D.W.E.	SWE	→										
S.W.V/D.W.V.	SWV	→										
Film Type	59/80	→	80/80	29 59 2X 80	29 Fuji →							
Acceptance Standard	E446	→	E186	E186 E280	→							
Severity Level	See	spec		SP 54	→							

Shooting Sketch (Use Additional Pages as Needed)

See original Tech. Drawing

Technique Prepared By: [signature] Level: II Date: 10-24-05

Technique Approved By: [signature] Level: III Date: 10-24-05

TEAM COOPERHEAT-MQS, INC.

CERTIFIED RADIOGRAPHIC INSPECTION REPORT

FORM 6061-RT- 002 Rev.2

5512 W. State St. Milwaukee, WI 53208 Tel:(414)771-3060 Fax:(414)771-9481 (800)818-6403 www.cooperheat-mqs.com

CUSTOMER

NAME METAL TEK INTERNATIONAL

ADDRESS 8600 COMMERCIAL BLVD

CITY PEVELY STATE MO ZIP 63070

DATE 8/13/2005

WORK ORDER NO. 361-02454-2

P.O. NUMBER 21678

XRAY X

GAMMA

PROCEDURE SPECIFICATION ASTM E94-93

ACCEPTANCE CRITERIA MSS-SP-54-1999

SHEET 1 OF 6

PART NUMBER	Serial No	View	No Apparent Indications: Acceptable	Rejected	Inclusion	Dross or Slag	Porosity	Incomplete Penetration: Lack of Fusion	Gas	Shrinkage: Cracks	Hot Tears	Undercut	Surface	Film Artifacts	REMARKS
MCWF-C-4		1-2		R						3-4					
		2-3	✓							1					
E.I.O. C040851		3-4	✓							2					
		4-5	✓							2			✓		
MS75920-4		5-6	✓							2					
		7-8	✓										✓		
		8-9	✓										✓		
		9-10		R						3-4					See A150 V 39-40
		11-12	✓												
		12-13	✓										✓		
		13-14	✓										✓		*
		15-16		R						4					
		16-17	✓							1-2			✓		
		18-19	✓										✓		
		19-20	✓										✓	✓	
		20-21	✓										✓		
		21-22	✓							2		1	✓		
		23-24	✓									0-1			
		24-25	✓										✓		
		26-27	✓										✓		
		27-28	✓							2-3					
		29-30	✓									2	✓	✓	
		30-31	✓							1			✓		
		32-33	✓							1		1	✓		
		33-34	✓										✓		

NO. ACCEPTED 0 NO. REJECTED 1

MQS TECH. NO. 12970 SHT. REV. 1

CUST. RSS NO. SHT. REV.

COMMENTS * added Film + 60 Pene for surface feture

REVIEWER John Petroske

CERTIFIED NDT LEVEL (RT) RT-II

TEAM COOPERHEAT-MQS, INC.

CERTIFIED RADIOGRAPHIC INSPECTION REPORT

FORM 6061-RT- 002 Rev.2

5512 W. State St. Milwaukee, WI 53208 Tel:(414)771-3060 Fax:(414)771-9481 (800)818-6403 www.cooperheat-mqs.com

CUSTOMER

NAME METAL TEK INTERNATIONAL

ADDRESS 8600 COMMERCIAL BLVD

CITY PEVELY STATE MO ZIP 63070

DATE 8/13/2005

P.O. NUMBER 21678

WORK ORDER NO. 361-02454-2

XRAY X

GAMMA

PROCEDURE SPECIFICATION ASTM E94-93

ACCEPTANCE CRITERIA MSS-SP-54-1999

SHEET 2 OF 6

PART NUMBER	Serial No	View	No Apparent Indications: Acceptable	No Apparent Indications: Rejected	Inclusion	Dross or Slag	Incomplete Penetration: Porosity	Lack of Fusion	Shrinkage: Gas Cracks	Shrinkage: Hot Tears	Under cut	Film Artifacts: Surface		REMARKS
MCWF-C-4		35-36	✓									✓	✓	
	36	36-37		R					3-4			✓	✓	
E.I.O. C040851		38-39		R						R		✓		
		39-40		R					4					See Also V9-10
MS75920-4		41-42		R					3			✓		
RBK		42-43		R						4-5		✓		
		44-45	✓	OK						10*		✓		
Re Test RBK		45-46	RBK	R						4		✓		
		47-48		R							R	✓		
		48-49		R							R	✓		
	49	50-51	✓									✓		
		52-53	✓									✓		
		53-54	✓											
	*	54-55	✓											
		55-56		R						2-3				
		56-57	✓											
		57-58	✓									✓		
		58-59	✓									✓		
		59-60	✓									✓		
		60-61	✓									✓		
		62-63	✓									✓		
		63-64		R							R			
		65-66		R						3-4				
		67-68		R							R			
		68-69	✓									✓		

NO. ACCEPTED 0

NO. REJECTED 1

MQS TECH. NO. 12970 SHT. REV. 1

CUST. RSS NO. SHT. REV.

COMMENTS * R.S. when returned for upgrade 40 Penc not present.

REVIEWER John Petunke

CERTIFIED NDT LEVEL (RT) RT II

TEAM COOPERHEAT-MQS, INC.

CERTIFIED RADIOGRAPHIC INSPECTION REPORT

FORM 6061-RT- 002 Rev.2

5512 W. State St. Milwaukee, WI 53208 Tel:(414)771-3060 Fax:(414)771-9481 (800)818-6403 www.cooperheat-mqs.com

CUSTOMER

NAME METAL TEK INTERNATIONAL

ADDRESS 8600 COMMERCIAL BLVD

CITY PEVELY STATE MO ZIP 63070

DATE 8/13/2005

WORK ORDER NO. 361-02454-2

P.O. NUMBER 21678

XRAY X

GAMMA

PROCEDURE SPECIFICATION ASTM E94-93

ACCEPTANCE CRITERIA MSS-SP-54-1999

SHEET 3 OF 6

PART NUMBER	Serial No	View	No Apparent Indications: Acceptable	Rejected	Dross Inclusion	Dross or Slag Inclusion	Incomplete Penetration: Porosity	Lack of Fusion	Shrinkage: Gas Cracks	Hot Tears	Under cut	Film Artifacts: Surface		REMARKS
MCWF-C-4		69-70	✓							1-2		✓		
		*												
E.I.O. C040851		71-72	✓							1-2		✓		
		72-73	✓											
MS75920-4		73-74		R					3					
		74-75	✓									✓		
		75-76	✓	R					2-3			✓		
		76-77	✓									✓	✓	
		78-79		R					4-5					
		79-80		R					(					
		80-81	✓						1-2			✓		
		81-82	✓						0-1	1-2		!		
		83-84		R						4-5		✓		
		85-86		R							R	✓		
		86-87	✓							0-1		✓		**
		87-88	✓									✓		
		90-91	✓									✓		
		92-93		R							R	✓		
		8889	✓											
		V94	✓						2				✓	
		V95	✓		1							✓		
		96-97		R					5 — Visible To			Surface		
		97-98		R							R	✓	✓	
		9899	✓									✓		
	100	101	✓							1				

NO. ACCEPTED 0 NO. REJECTED 1

MQS TECH. NO. 12970 SHT. REV. 1

CUST. RSS NO. SHT. REV.

COMMENTS * No V64 — Not needed. Dig out view from previous pc.

** Three additional Film used for density.

REVIEWER [signature]

CERTIFIED NDT LEVEL (RT) RT-II

TEAM COOPERHEAT-MQS, INC.

CERTIFIED RADIOGRAPHIC INSPECTION REPORT

FORM 6061-RT- 002 Rev.2

5512 W. State St. Milwaukee, WI 53208 Tel:(414)771-3060 Fax:(414)771-9481 (800)818-6403 www.cooperheat-mqs.com

CUSTOMER

NAME METAL TEK INTERNATIONAL

ADDRESS 8600 COMMERCIAL BLVD

CITY PEVELY STATE MO ZIP 63070

DATE 8/13/2005

WORK ORDER NO. 361-02454-2

P.O. NUMBER 21678

XRAY X

GAMMA

PROCEDURE SPECIFICATION ASTM E94-93

ACCEPTANCE CRITERIA MSS-SP-54-1999

SHEET 4 OF 6

PART NUMBER	Serial No	View	No Apparent Indications: Acceptable	Rejected	Dross Inclusion	Dross or Slag	Incomplete Penetration: Porosity	Lack of Fusion	Shrinkage: Gas Cracks	Hot Tears	Under cut	Film Artifacts: Surface		REMARKS
MCWF-C-4	101-102			R					4-5	4-5				
	102-103			R						R		✓		
E.I.O. C040851	103-104			R						R		✓		
	104-105			R						R			✓	
MS75920-4	106-107			R					3-4	R		✓		
	107-108			R						3-4		✓		
	108-109													
	109-110	✓								1				
	111-112	✓												
	112-113	✓										✓		
	114-115			R						4-5				
	115-116	✓												
	116-117			R						4-5	R			

NO. ACCEPTED 8

NO. REJECTED 1

MQS TECH. NO. 12970 SHT. REV. 1

CUST. RSS NO. SHT. REV.

COMMENTS

REVIEWER [signature]

CERTIFIED NDT LEVEL (RT) RT II

TEAM COOPERHEAT-MQS, INC.

CERTIFIED RADIOGRAPHIC INSPECTION REPORT

FORM 6061-RT- 002 Rev.2

5512 W. State St. Milwaukee, WI 53208 Tel:(414)771-3060 Fax:(414)771-9481 (800)818-6403 www.cooperheat-mqs.com

CUSTOMER

NAME METAL TEK INTERNATIONAL

ADDRESS 8600 COMMERCIAL BLVD

CITY PEVELY STATE MO ZIP 63070

DATE 8/13/2005

P.O. NUMBER 21678

WORK ORDER NO. 361-02454-2

XRAY X

GAMMA

PROCEDURE SPECIFICATION ASTM E94-93

ACCEPTANCE CRITERIA MSS-SP-54-1999

SHEET 5 OF 6

PART NUMBER	Serial No	View	No Apparent Indications: Acceptable	Rejected	Incomplete Penetration: Inclusion	Dross or Slag	Porosity	Lack of Fusion	Shrinkage: Gas	Cracks	Hot Tears	Under cut	Film Artifacts: Surface		REMARKS
MCWF-C-4		A-B		R					4-5						
RAIL		B-C		R					4-5				✓		
E.I.O. C040851		C-D		R					4-5				✓		
		D-E	✓										✓		
MS75920-4		E-F	X on	R					3-4				✓		
		F-G		R					3-4						
		G-H		R					4-5						
		H-I		R					5						
		I-J		R					5						
		J-K		R					4				✓		
		K-L	✓										✓		
		L-M	✓										✓		
		M-N	✓						0-1				✓		
		N-O	✓										✓		
		O-P	✓						0-1		Z				
		P-Q	✓												
		Q-R	✓						0-1				✓		
		R-S		R					4-5						
		S-T		R								R			
		T-U	✓						0-1				✓		
		U-V	✓						2				✓	✓	
		V-W	✓						1				✓		
		W-X	✓						2-3				✓		
		X-Y	✓						1				✓		
		Y-Z		R					4				✓		

NO. ACCEPTED 9 NO. REJECTED 1

COMMENTS

MQS TECH. NO. 12970 SHT. REV. 1

CUST. RSS NO. SHT. REV.

REVIEWER [signature]

CERTIFIED NDT LEVEL (RT) RT II

TEAM COOPERHEAT-MQS, INC.

CERTIFIED RADIOGRAPHIC INSPECTION REPORT

FORM 6061-RT- 002 Rev.2

5512 W. State St. Milwaukee, WI 53208 Tel:(414)771-3060 Fax:(414)771-9481 (800)818-6403 www.cooperheat-mqs.com

CUSTOMER

NAME METAL TEK INTERNATIONAL

ADDRESS 8600 COMMERCIAL BLVD

CITY PEVELY STATE MO ZIP 63070

DATE 8/13/2005

WORK ORDER NO. 361-02454-2

P.O. NUMBER 21678

XRAY X

GAMMA

PROCEDURE SPECIFICATION ASTM E94-93

ACCEPTANCE CRITERIA MSS-SP-54-1999

SHEET 6 OF 6

PART NUMBER	Serial No	View	No Apparent Indications: Acceptable	No Apparent Indications: Rejected	Inclusion	Dross or Slag	Incomplete Penetration: Porosity	Lack of Fusion	Shrinkage: Gas Cracks	Shrinkage: Hot Tears	Under cut	Surface	Film Artifacts	REMARKS
MCWF-C-4	~~Z~~	~~AA~~		R					3-4			✓		~~XZ~~-~~YZ~~-~~AA~~
		BB	✓						Z-3					
E.I.O. C040851	~~CC~~	DD		R					3-4			✓		
	DD	A		R					3-4			✓		
MS75920-4														

NO. ACCEPTED Ø NO. REJECTED 4

COMMENTS

MQS TECH. NO. 12970 SHT. REV. 1

CUST. RSS NO. SHT. REV.

REVIEWER Joel Petruska

CERTIFIED NDT LEVEL (RT) RT-II

TEAM COOPERHEAT-MQS, INC.

CERTIFIED RADIOGRAPHIC INSPECTION REPORT

FORM 6061-RT- 002 Rev.2

5512 W. State St. Milwaukee, WI 53208 Tel:(414)771-3060 Fax:(414)771-9481 (800)818-6403 www.cooperheat-mqs.com

CUSTOMER

NAME METAL TEK INTERNATIONAL

ADDRESS 8600 COMMERCIAL BLVD

CITY PEVELY STATE MO ZIP 63070

DATE 10/09/2005

WORK ORDER NO. 361-02596

P.O. NUMBER 22184

XRAY X

GAMMA

PROCEDURE SPECIFICATION ASTM E94-93

ACCEPTANCE CRITERIA MSS-SP-54-1999*

SHEET ____ OF ____

*NCSX-CSPEC-141-03-08 Ref. Para. 3.1.1.7

PART NUMBER	Serial No	View	No Apparent Indications: Acceptable	Rejected	Incomplete Penetration: Inclusion	Dross or Slag	Porosity	Lack of Fusion	Shrinkage: Gas	Cracks	Hot Tears	Under cut	Film Artifacts: Surface		REMARKS
MCWF-C-4	4 (R!)	1-2	✓												
	*	4-5	✓												
E.I.O. C040851	*	5-6	✓											✓	
		9-10	✓								1-2				
MS75920-4		15-16	✓								1			✓	
		36-37	✓											✓	
		38-39	✓												
		39-40	✓												
		41-42	✓												
		42-43	✓											✓	
		45-46	✓										✓		
		47-48	✓												
		48-49	✓		✓										
		53-56	✓												
		63-64	✓						1-2						
		65-66	✓											✓	
		67-68	✓												
		73-74	✓												
		75-76		R					3						
		78-79	✓												
		79-80	✓												
		83-84	✓		2-3										
		85-86	✓												
		92-93		R				R							
		96-97	✓											✓	

NO. ACCEPTED 4 NO. REJECTED 1

COMMENTS

MQS TECH. NO. 12970 SHT. REV.

CUST. RSS NO. SHT. REV.

REVIEWER John Petroske

CERTIFIED NDT LEVEL (RT)

John Petroske RT II Exp. 01/08

TEAM COOPERHEAT-MQS, INC.

CERTIFIED RADIOGRAPHIC INSPECTION REPORT

FORM 6061-RT- 002 Rev.2

5512 W. State St. Milwaukee, WI 53208 Tel:(414)771-3060 Fax:(414)771-9481 (800)818-6403 www.cooperheat-mqs.com

CUSTOMER

NAME METAL TEK INTERNATIONAL

ADDRESS 8600 COMMERCIAL BLVD

CITY PEVELY STATE MO ZIP 63070

DATE 10/09/2005

WORK ORDER NO. 361-02596

P.O. NUMBER 22184

XRAY X

GAMMA

PROCEDURE SPECIFICATION ASTM E94-93

ACCEPTANCE CRITERIA MSS-SP-54-1999 *

SHEET ____ OF ____

*NCSX-CSPEC-141-03-08 Ref Para. 3.1.1.7

PART NUMBER	Serial No	View	No Apparent Indications: Acceptable	Rejected	Inclusion	Dross or Slag	Incomplete Penetration: Porosity	Lack of Fusion	Shrinkage: Gas Cracks	Hot Tears	Under cut	Surface Film Artifacts	REMARKS
MCWF-C-4	4 (R!)	97-98	✓										
	101-102		✓									✓	
E.I.O. C040851	102-103		✓										
	103-104		✓									✓	
MS75920-4	104-105		✓										
	106-107		✓										
	107-108		✓										
	114-115		✓										
	116-117			R						4			
	A-B		✓						1				
*	B-C			R						2			
*	C-D			R					1				
*	F-G			R					2				
*	G-H			R					2				
*	H-I			R					5				
	I-J			R					45				
	J-K		✓						1				
	R-S		✓							1			
	S-T		✓							1			
	Y-Z		✓						2				
	Z-AA		✓										
	CC-DD		✓						1				
	DD-A		✓						1				

NO. ACCEPTED Ø NO. REJECTED 1

MQS TECH. NO. 12970 SHT. REV.

CUST. RSS NO. SHT. REV.

COMMENTS

REVIEWER John Petroske

CERTIFIED NDT LEVEL (RT)

John Petroske RT II Exp. 01/08

MetalTek INTERNATIONAL

RADIOGRAPHIC INTERPRETATION REPORT

CUSTOMER	PURCHASE ORDER NUMBER	DATE	CONTROL NO.	PAGE
E.I.O	PPPL-FP-LTS-2	10-24-05	40851	1 of 1

PART NO.	SPECIFICATION	CLASS	TOTAL PIECES	PIECES ACCEPTED
MCWF-C-4	E446/E186/E280	See Spec.	1	

RADIOGRAPHED BY:	INTERPRETED BY:	ASNT LEVEL
Midgett/Kelley	Midgett/Kelley	II

FILM TYPE	MATERIAL	ISOTOPE	CODE
29/59/80	CFBMNMN	IRIDIUM 192 COBALT 60 ✓	ASTM E94 ✓ ASME MIL-STD-453

MS75920-4

	VIEW	PENE	ACCEPT	REJECT	SHRINK	INCLUSION	POROSITY	LINEAR	SURFACE	LOF/LOP	COMMENTS
MCWF-C-4	75-76	30/40	✓				2		✓		
R2	92-93	↓	✓				1		✓		
	116-117	50	✓				2		✓		
	B-C	60/120		X			X				
	F-G	↓	✓				1		✓		
	G-H	60 80 120		X		UBK	X				
	H-I	60/120		X		X	X				
	I-J	↓	✓				2		✓		
	C-D	60 120 140	✓				1				
	E										
R1	E-F	60 120 140	✓			1	2				

MetalTek INTERNATIONAL

RADIOGRAPHIC INTERPRETATION REPORT

CUSTOMER	PURCHASE ORDER NUMBER	DATE	CONTROL NO.	PAGE
EIO,	PPPL - FP - LTS - 2	10-26-05	40851	1 of 1

PART NO.	SPECIFICATION	CLASS	TOTAL PIECES	PIECES ACCEPTED
MCWF-C-4	E446/E186 E280	seespec	1	1

RADIOGRAPHED BY:	INTERPRETED BY:	ASNT LEVEL
Midgett / Kelley	Midgett / Kelley	II

FILM TYPE	MATERIAL	ISOTOPE	CODE
29 59/80	CF8M NMN	IRIDIUM 192 COBALT 60 V	ASTM E94 ASME MIL-STD-453

MS75920-4	VIEW	PENE	ACCEPT	REJECT	SHRINK	INCLUSION	POROSITY	LINEAR	SURFACE	LOF/LOP	COMMENTS
MCWF-C-4	B-C	60/120	/				1		/		
R3	G-H	60/120 80	/				1				
	H-I	60/120	/				1				

MetalTek INTERNATIONAL

RADIOGRAPHIC INTERPRETATION REPORT

CUSTOMER	PURCHASE ORDER NUMBER	DATE	CONTROL NO.	PAGE
Ohio Energy Industries of	PPPL-FP-273-2	6-28-05	40551	1 of 1

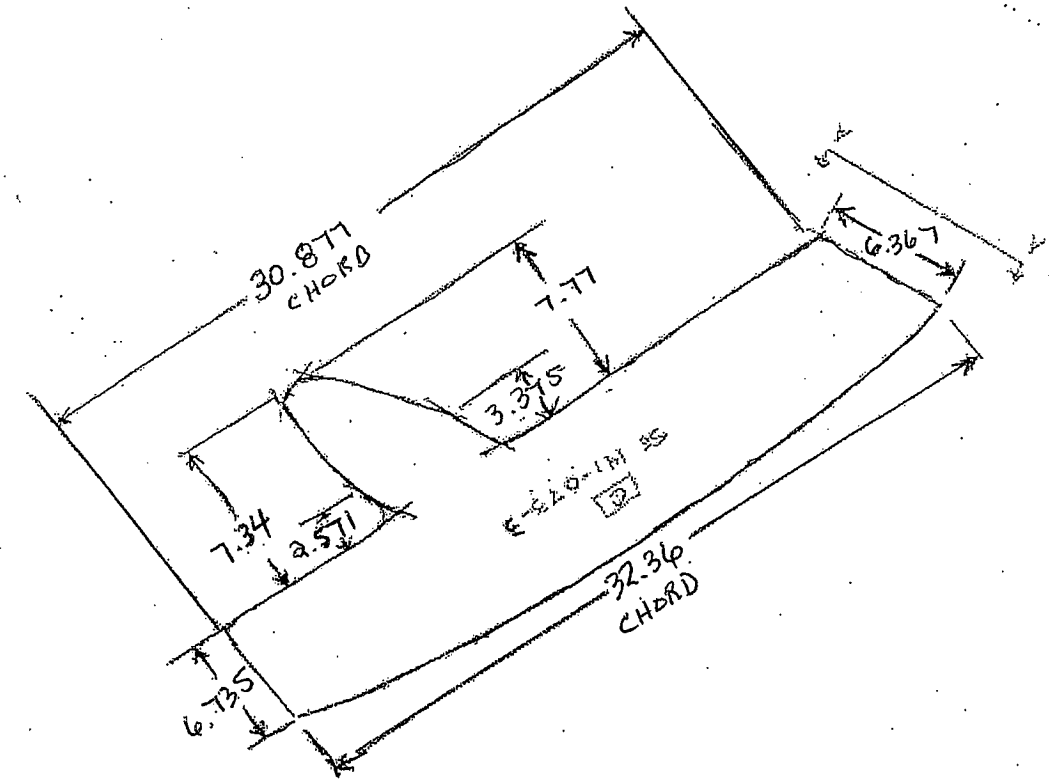
PART NO.	SPECIFICATION	CLASS	TOTAL PIECES	PIECES ACCEPTED
SE-141-073 coil shim	E 186	see spec	1	1

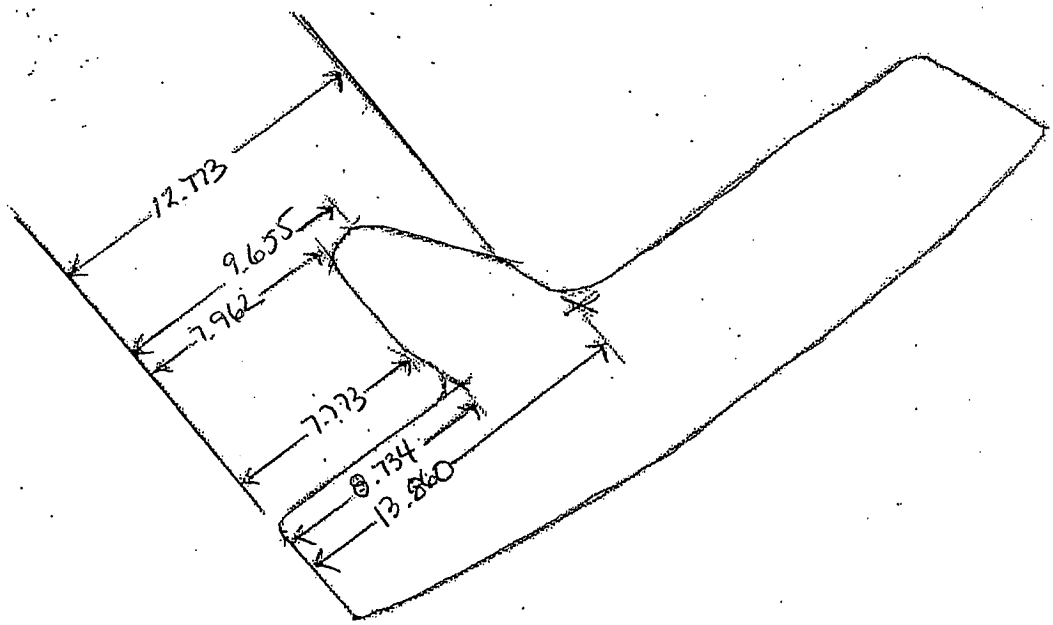
RADIOGRAPHED BY:	INTERPRETED BY:	ASNT LEVEL
[illegible]	[illegible]	II

FILM TYPE	MATERIAL	ISOTOPE	CODE
50	CF8M NM Mod	IRIDIUM 192 COBALT 60 ✓	ASTM E94 ASME ✓ MIL-STD-453

	VIEW	PENE	ACCEPT	REJECT	SHRINK	INCLUSION	POROSITY	LINEAR	SURFACE	LOF/LOP	COMMENTS
MS73220-2 SN ~~AF~~-3	A	50	✓								
	B	↓	✓						✓		
	C		✓						✓		
	D		✓						✓		
	E	6	✓								

Metal INTERNATIONAL





.33/.38 TYP THK

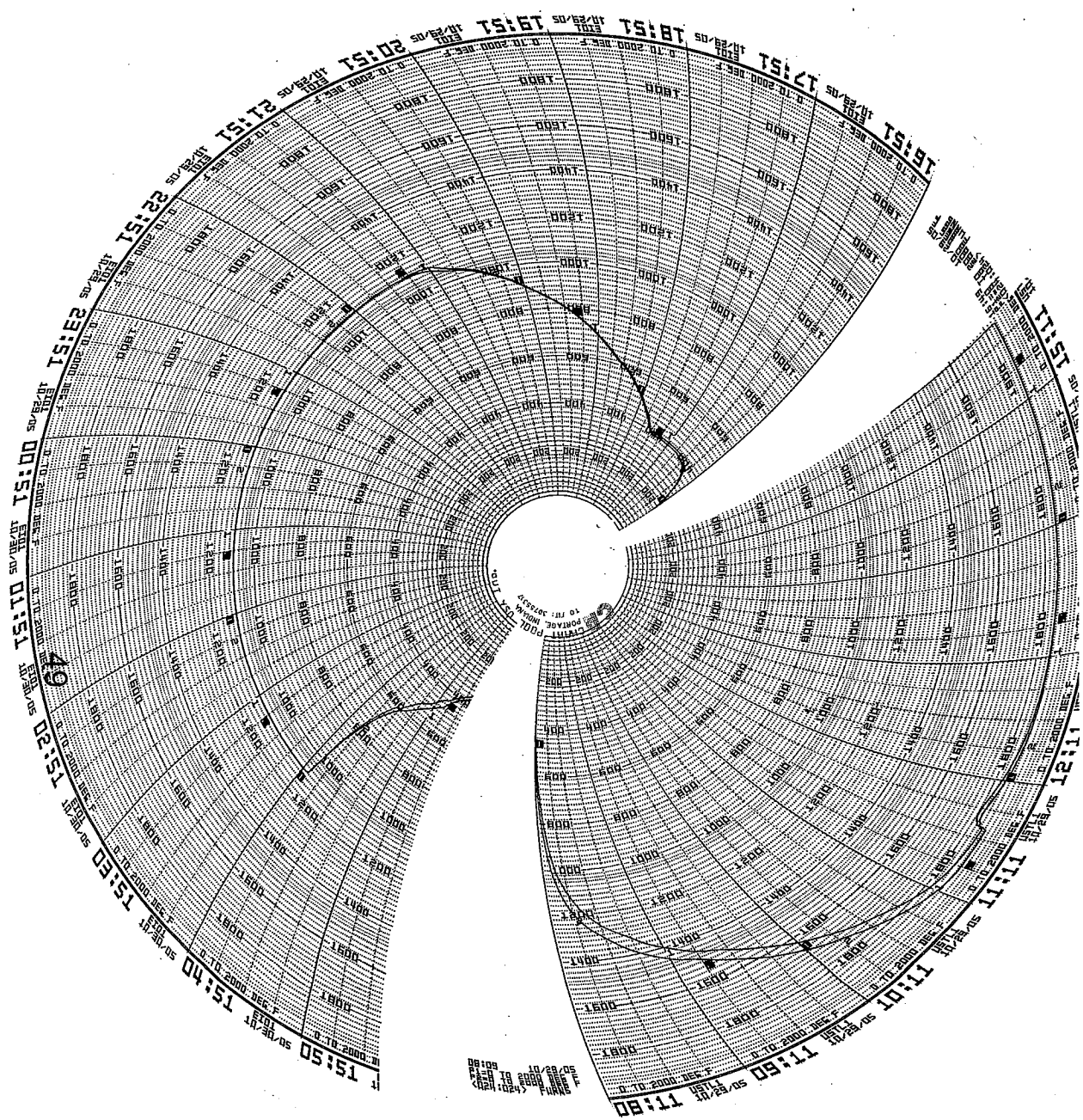
SEE A-A

Shim SE-141-073-3 / Sketch 10-28-05 / S73220-2 / Jody Johnson

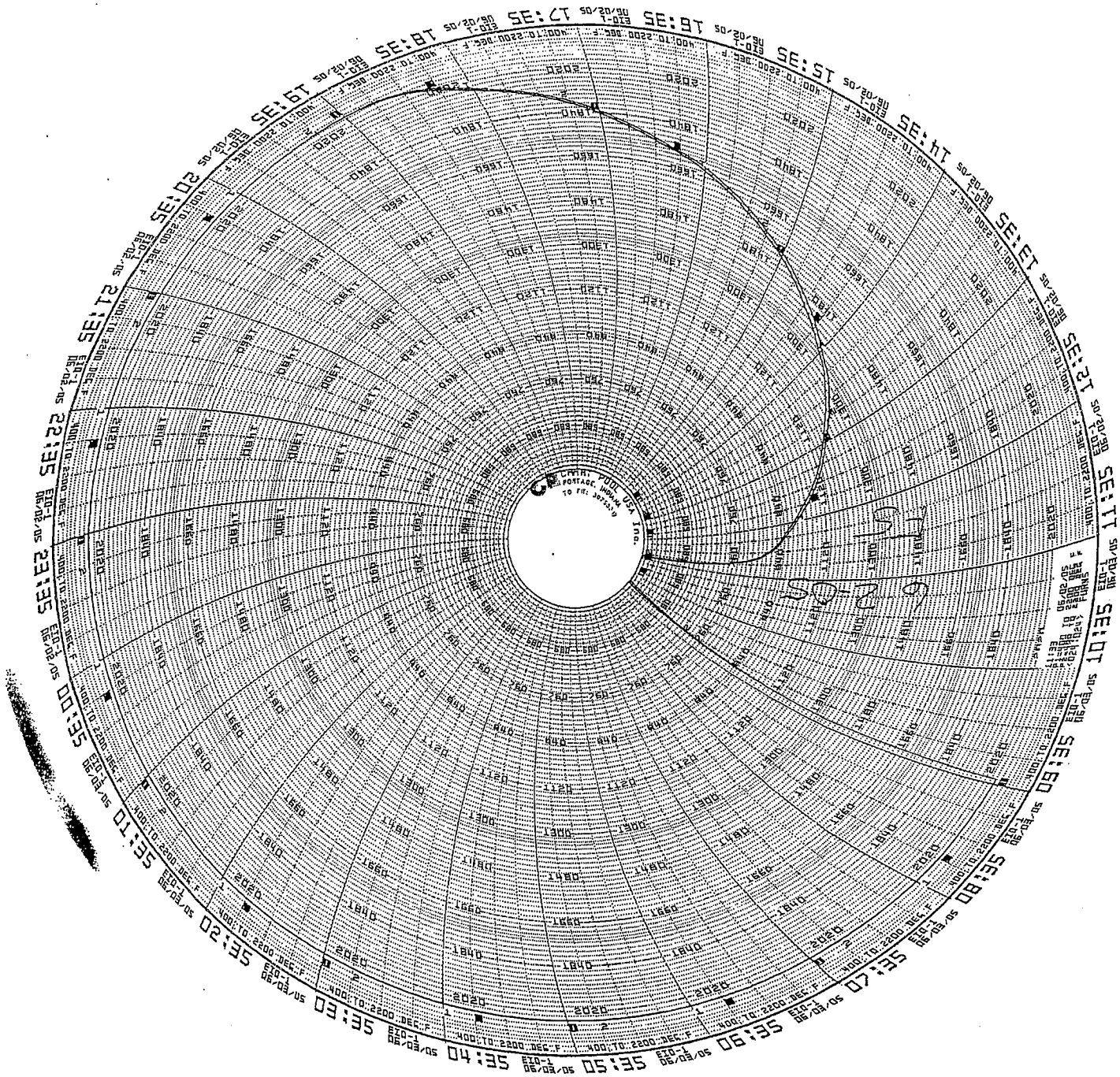
7-26-05
7-27-05 E5
EIO 7-26-05
MCWF-C4
MS75920-3
1Pc

E10 10-29-05

C-4 Coil



A + C Shims CAL



OPER. #	STATION	DESCRIPTION OF PROCESS	Name	Date
10	QUALITY RELEASE	REVIEW AND APPROVE MTS. RECEIVED APPROVAL FROM EIO ON 6/14/05 FROM Pete SIGNED QUALITY MANAGER	CAR	6/14
15	PATTERN NPAT SOP 0100REV2	APPLY APPROPRIATE PART NUMBER, SERIAL NUMBER, AND FOUNDRY MARK, TO THE PATTERN. CAST ON BARS REQUIRED. Place numbers on the bars as to their location.		
20	COREMAKE CORE SOP 0100 REV 6 CALIBRATION PER CORE SOP 0200R4/0300R6	MAKE CORES IN SAND MIXTURES AS DESCRIBED BY METALTEK ENGINEERING AND VERIFIED IN MODELING TRIALS. METALTEK CORE SOP 0100 REV 6) CORE WASH WITH ZIRCONIUM CORE WASH. (CALIBRATION OF EQUIPMENT REQUIRED PER CORE SOP 0200,R4 / 0300,R6) VERIFY COUNT AND INSPECT.	BWC	7-8-05
30	MOLD MOLD SOP 0400 REV 8 CALIBRATION PER MOLD SOP 0900 REV 5 PREPARATION PER MOLD SOP 1100R2/1200R2/1300R1 SAND TESTING PER MOLD SOP 1400R2/1500R3/1600R2	MOLD PER WORK INSTRUCTIONS IN MAPICS ROUTING AND SOPS REFERENCED. ENGINEER OF RECORD – ROGER BROMAN, CONSULT ON MOLD-RELATED CONCERNS. MOLD MATERIALS REQUIRED PER MAPICS BOM. NOTIFY ENGINEER OF ANY SUBSTITUTIONS.	BWC	7-8-05
40	POUR MELT SOP 0100R5 MELT SOP 0700R2 MELT SOP 0600R2	METAL MUST BE AOD REFINED OR AOD INGOT. VIRGIN METAL ADDITIONS ALLOWED. RECORD POURING TEMPERATURE: 2750 CASTING POURED AT: NBF 7-13-05 6:30 AM DATE: 7-13-05 HEAT #"s: 30108, 30109, 30110, 30111, 30112, 30 ELAPSED POUR TIME 10 min KEEL BLOCKS POURED: yes - 8 Sample from ladle to be analyzed for final chemical analysis and reported on material certifications. Sample Taken by: J.W. Analyzed: G.Hurt Date: 7-13-05	JWG	7-13-05
50	MELT SOP 0800R2	SHAKEOUT	CAR	7-16-05

60	ARC RISE SOP 0100R1	REMOVE RISERS AS DIRECTED BY SUPERVISOR.		7/25
70	HEAT TREAT HEAT SOP 0103R5	SOLUTION ANNEAL. MAKE SURE TO BLOCK ALL FLANGES OF FORM AND RACETRACK TO MINIMIZE CREEP DISTORTION. Soak Temp: 2050F, Soak Time: 4HR + 1/2 HR/IN, Quench Type: Air Cool	F5-1 KmR	7/26
75	PHYSICAL TESTING	OBTAIN TEST SPECIMENS AND SUBMIT FOR PHYSICAL TESTING. REPORT RESULTS AS PART OF STEP 510.	WH	7/26
NOTE		**THE ORDER OF CLEANING PROCESSES MAY BE ALTERED DUE TO CAPACITY CONSTRAINTS. HOLD POINTS AND COMPLIANCE WILL NOT BE COMPROMISED. EIO WILL BE ADVISED OF ALL CHANGES THAT MAY RESULT IN A REQUEST FOR DEVIATION FROM REQUIREMENTS.**		
80	GRIND GSWA SOP 0100R3	SWING GRIND TO REMOVE RISER REMAINS AND FLASH IF REQUIRED.	MTW	7/26
85	GRIND GCHI SOP 0100R2	CHIP AND HAD GRIND SURFACE OF PART AS REQUIRED FOR CONTOUR.		
90	SAND BLAST BLAS SOP 0100R6	SANDBLAST (REMOVE ALL BLAST MATERIAL FROM CASTING) SANDBLASTING WILL BE DONE USING RECYCLED SHARP ANGULAR AGGREGATE.		
NOTICE	WITNESS NOTIFICATION **HOLD FOR EIO APPROVAL**	PROVIDE NOTICE TO EIO AND DCMA AT LEAST FIVE DAYS IN ADVANCE OF LAYOUT. EIO NOTIFIED ON 7/26/05 DCMA NOTIFIED ON 7/28/05 APPROVAL RECEIVED ON _____	Q ENG OR QA MGR	
100	**LAYOUT SOP LAYOUT 0100**	INSPECT CASTING TO VERIFY DIMENSIONS. THIS STEP MAY BE DELAYED. DIMENSIONED _____ DATE _____ RELEASED _____(ENGINEER ONLY) NOTE: THE FIRST PART PRODUCED OF EACH TYPE A, B AND C WILL BE DIMENSIONED BY LAWTON PATTERN. IF DIMENSIONED BY LAWTON IT WILL BE DOCUMENTED HERE. Subsequent casting done internally per Romer Arm.		
110	VISUAL INSPECTION CQP-500 REV 4	VISUALLY INSPECT 100% of COMPONENT ACCORDING TO ASTM **A802 LEVEL 3 ALL CONDITIONS.** IF OK CHECK HERE _____ . IF REJECTED CHECK HERE ____ . MARK AND REPAIR AT STEP 120.	VT - LEVEL II	

start Rev 8

60	ARC RISE SOP 0100R1	REMOVE RISERS AS DIRECTED BY SUPERVISOR.	~~MW~~	
70	HEAT TREAT HEAT SOP 0103R5	SOLUTION ANNEAL. MAKE SURE TO BLOCK ALL FLANGES OF FORM AND RACETRACK TO MINIMIZE CREEP DISTORTION. Soak Temp: 2050F, Soak Time: 4HR + 1/2 HR/IN, Quench Type: Air Cool MAKE SURE TEST MATERIAL IS PLACED IN THE CORRECT ZONE.	~~DES~~ ~~JWG~~	~~7/26/05~~
75	PHYSICAL TESTING	OBTAIN TEST SPECIMENS AND SUBMIT FOR PHYSICAL TESTING. REPORT RESULTS AS PART OF STEP 510.		
NOTE		**THE ORDER OF CLEANING PROCESSES MAY BE ALTERED DUE TO CAPACITY CONSTRAINTS. HOLD POINTS AND COMPLIANCE WILL NOT BE COMPROMISED. EIO WILL BE ADVISED OF ALL CHANGES THAT MAY RESULT IN A REQUEST FOR DEVIATION FROM REQUIREMENTS.**		
80	GRIND GSWA SOP 0100R3	SWING GRIND TO REMOVE RISER REMAINS AND FLASH IF REQUIRED.	8-1-05 RTG	Start Rev 8
85	GRIND GCHI SOP 0100R2	CHIP AND HAD GRIND SURFACE OF PART AS REQUIRED FOR CONTOUR.	CSS 8-4-05	
90	SAND BLAST BLAS SOP 0100R6	SANDBLAST (REMOVE ALL BLAST MATERIAL FROM CASTING) SANDBLASTING WILL BE DONE USING RECYCLED SHARP ANGULAR AGGREGATE.	RJG 8-4-05	TO RT 8/4/05
NOTICE	WITNESS NOTIFICATION	PROVIDE NOTICE TO EIO AND DCMA AT LEAST FIVE DAYS IN ADVANCE OF LAYOUT. EIO NOTIFIED ON 8/23/05 DCMA NOTIFIED ON 8/23/05 APPROVAL RECEIVED ON NA	Q ENG OR QA MGR	
100	INTERIM LAYOUT SOP LAYOUT 0100	INSPECT CASTING TO VERIFY DIMENSIONS. THIS STEP MAY BE DELAYED UNTIL ALL REPAIRS ARE COMPLETE. NOTE: THE FIRST PART PRODUCED OF EACH TYPE A, B AND C WILL BE DIMENSIONED BY LAWTON PATTERN. IF DIMENSIONED BY LAWTON IT WILL BE DOCUMENTED HERE. Subsequent casting done internally per Romer Arm.	TRS	10/28/05
110	INTERIM VISUAL INSPECTION CQP-500 REV 4	VISUALLY INSPECT 100% of COMPONENT ACCORDING TO ASTM A802 LEVEL 3 IN NON MACHINED AREAS AND LEVEL 2 IN MACHINED AREAS. IF OK CHECK HERE _____. IF REJECTED CHECK HERE ✓. MARK AND REPAIR AT STEP 120.	VT - LEVEL II KLA	
NOTICE	WITNESS NOTIFICATION	PROVIDE NOTICE TO EIO AND DCMA AT LEAST FIVE DAYS IN ADVANCE OF LP STEP. EIO NOTIFIED ON 9/1 DCMA NOTIFIED ON 9/1	Q ENG OR QA MGR	RTS

115	INTERIM 100% L.P. CQP 0300 REV 10	L.P. 100% OF COMPONENT. ACCEPTANCE PER ASTM A903. ACCEPTANCE CRITERIA-LEVEL 1 FOR HIGH STRESSED AREAS, LEVEL 2 FOR ALL OTHER AREAS. SEE LP DRAWING. IF OK CHECK HERE _____ IF REJECTED CHECK HERE ___✓___ MARK AND REPAIR AT STEP 120.	LP - LEVEL II T.R.C.	9-7-05
120	WELD SOP 0100 REV 7	EXCAVATE ANY DEFECTS FOUND DURING 100% VISUAL AND LP INSPECTION.	TLS	9-6-05
125	GRIND GCHI SOP 0100R2	CHIP AND HAND GRIND EXCAVATION AS REQUIRED.	CA	9/6
130	L.P. EXCAVATION CQP-300 REV 10	L.P. ALL EXCAVATIONS PRIOR TO WELDING TO ENSURE REMOVAL OF DEFECT. ACCEPTANCE PER A903. ACCEPTANCE CRITERIA-LEVEL 1 FOR HIGH STRESSED AREAS, LEVEL 2 FOR ALL OTHER AREAS. SEE LP DRAWING. IF OK CHECK HERE _____ IF REJECTED SEND BACK TO STEP 125.	LP - LEVEL II	JDK 9-8-05
165	SAND BLAST BLAS SOP 0100R6	SANDBLAST (REMOVE ALL BLAST MATERIAL FROM CASTING) SANDBLASTING WILL BE DONE USING RECYCLED SHARP ANGULAR AGGREGATE.	BSD	9-7 05
170	WELD MAP	MAP ALL MAJOR WELDS WITH DIGITAL PHOTO/MAPS INDICATING LOCATION. SERIALIZE DEFECTS ON CASTING, USE SCALE IN PHOTOS AND DOCUMENT SIZE. THIS IS TO BE PERFORMED BY SUPERVISOR, INSPECTION LEAD MAN OR THEIR DESIGNEE, FILE WITH QA. USE YELLOW MARKER. MUST INDICATE ON MAP ALL MAJOR WELDS, DEFINED AS GREATER THAN 20% OF THE WALL OR 1 INCH WHICHEVER IS LESS OR 10 SQUARE INCHES APPROXIMATLY 3.3"X3.3".	JRB	9-12
NOTICE	WITNESS NOTIFICATION	PROVIDE NOTICE TO EIO AND DCMA AT LEAST FIVE DAYS IN ADVANCE OF X-RAY AND DIMENSIONAL STEPS. EIO NOTIFIED ON 8/1 DCMA NOTIFIED ON 8/4	Q ENG OR QA MGR	RMS
190	X-RAY AT MQS MQS PROCEDURE 20.H.010 REV 0	X-RAY PER TECHNIQUE # 12726 USE CALIBRATED DENSITOMETER FOR DENSITY VERIFICATION. WHEN MARKING USE BLACK MARKERS. ATTACH TECHNIQUE, READER SHEET FOR ALL RADIOGRAPHS. MUST INDICATE RADIOGRAPHER AND ASNT CERTIFICATION LEVEL ON READER SHEET.	RT – LEVEL II MQS	8-13-05
210	X-RAY CQP 401 REV 5	X-RAY INTERPRETATION. ACCEPTANCE MSS SP 54. ATTACH TECHNIQUE, READER SHEET FOR ALL RADIOGRAPHS. MUST INDICATE RADIOGRAPHER AND ASNT CERTIFICATION LEVEL ON READER SHEET. IF OK CHECK HERE _____ AND SEND TO STEP 260. REJECTED CHECK HERE ___✓___ MARK UP DEFECTS AND SEND THE CASTING TO STEP 220.	RT – LEVEL II RBK	8-19-05

220	WELD SOP 0100 REV 7	EXCAVATE ANY DEFECTS FOUND DURING RADIOGRAPHY.	TD 8/20	
225	GRIND GCHI SOP 0100R2	CHIP AND HAND GRIND EXCAVATION AS REQUIRED.	LSG ~~8/22~~ 9/6/05	
230	L.P. EXCAVATION CQP-300 REV 10	L.P. ALL EXCAVATIONS PRIOR TO WELDING TO ENSURE REMOVAL OF DEFECT. ACCEPTANCE PER A903. ACCEPTANCE CRITERIA-LEVEL 1 FOR HIGH STRESSED AREAS, LEVEL 2 FOR ALL OTHER AREAS. SEE LP DRAWING. IF OK CHECK HERE ✓ IF REJECTED SEND BACK TO STEP 225.	LP - LEVEL II JDR ~~8/24/05~~	9/8/05
240	WELD MAP	MAP ALL WELDS WITH DIGITAL PHOTO/MAPS INDICATING LOCATION. SERIALIZE DEFECTS ON CASTING, USE SCALE IN PHOTOS AND DOCUMENT SIZE. THIS IS TO BE PERFORMED BY SUPERVISOR, INSPECTION LEAD MAN OR THEIR DESIGNEE, FILE WITH QA. USE YELLOW MARKER. MUST INDICATE ON MAP ALL MAJOR WELDS, DEFINED AS GREATER THAN 20% OF THE WALL OR 1 INCH WHICHEVER IS LESS OR 10 SQUARE INCHES APPROXIMATLY 3.3"X3.3".	JB	
NOTICE	WITNESS NOTIFICATION	PROVIDE NOTICE TO EIO AND DCMA AT LEAST FIVE DAYS IN ADVANCE OF WELD STEP. EIO NOTIFIED ON 8/23/05 DCMA NOTIFIED ON 8/23/05	Q ENG OR QA MGR	KM
260	QA APPROVAL HOLD POINT	QA TO APPROVE ELECTRODE PRIOR TO USE. PROCEDURE USED: 15-GMAW-CF8MnMn MOD MATERIAL/LOT USED: 3018926-78309 QUALITY ENG. Name: [signature] Date: 9/14/05		9/14/05
270	WELD SOP 0100 REV 7	WELD REPAIR DEFECTS AS MARKED. FOR WELDS <2" - WPS 10-SMAW-CF8MNMN MOD REV 1(Flat) or 25 SMAW-CF8MNMN MOD REV 0 (Vertical) LOT # 3018926-78309 W019711 S01786582 FOR WELDS <8" - WPS 15-GMAW-CF8MNMN MOD REV 2 3018515/78308	JK 92905 TD 9/28	
280	GRIND GCHI SOP 0100R2	HAND GRIND WELDS.	QB / MG 9/30	
290	L.P. WELD CQP 0300 REV 10	L.P. WELD REPAIRS ACCEPTANCE PER ASTM A903. ACCEPTANCE CRITERIA-LEVEL 1 FOR HIGH STRESSED AREAS, LEVEL 2 FOR ALL OTHER AREAS. SEE LP DRAWING. IF OK CHECK HERE ___ WASH AND SEND TO STEP 300. IF REJECTED CHECK HERE X	LP - LEVEL II JPS 9/30	10/5/05
	REPEAT	REPEAT STEPS 220 TO 290 AS REQUIRED TILL CLEAR THROUGH VISUAL INSPECTION & PENETRANT INSPECTION. DOCUMENT REWORK ON STEPS S220 TO S290. IF OK CHECK HERE ___ AND PROCEED TO STEP 295.		
	REPEAT STEPS	SUPPLEMENTAL REPAIR STEPS — 1ST: ABK 10/14 XRAY Reject; 2ND: Reject DWM 10-24-05; 3RD: XRAY DWM 10-27-05; 4TH; 5TH		10/27/05
S220	WELD SOP 0100 REV 7	EXCAVATE ANY DEFECTS FOUND DURING RADIOGRAPHY.		

RT OK 10/25

S230	L.P. EXCAVATION CQP-300 REV 10	L.P. ALL EXCAVATIONS PRIOR TO WELDING TO ENSURE REMOVAL OF DEFECT. ACCEPTANCE PER A903. ACCEPTANCE CRITERIA-LEVEL 1 FOR HIGH STRESSED AREAS, LEVEL 2 FOR ALL OTHER AREAS. SEE LP DRAWING.	LP - LEVEL II				
S240	WELD MAP	MAP ALL MAJOR WELDS WITH DIGITAL PHOTO/MAPS INDICATING LOCATION. SERIALIZE DEFECTS ON CASTING, USE SCALE IN PHOTOS AND DOCUMENT SIZE. THIS IS TO BE PERFORMED BY SUPERVISOR, INSPECTION LEAD MAN OR THEIR DESIGNEE, FILE WITH QA. USE YELLOW MARKER. MUST INDICATE ON MAP ALL MAJOR WELDS, DEFINED AS GREATER THAN 20% OF THE WALL OR 1 INCH WHICHEVER IS LESS OR 10 SQUARE INCHES APPROXIMATLY 3.3"X3.3".					
NOTICE	WITNESS NOTIFICATION	PROVIDE NOTICE TO EIO AND DCMA AT LEAST FIVE DAYS IN ADVANCE OF WELD STEP. EIO NOTIFIED ON _____ DCMA NOTIFIED ON _____	Q ENG OR QA MGR				
S260	QA APPROVAL HOLD POINT	QA TO APPROVE ELECTRODE PRIOR TO USE. PROCEDURE USED: GMAW MATERIAL /LOT USED : 30185I3-78308 QUALITY ENG. Name: RMS Date: _____					
S270	WELD SOP 0100 REV 7	WELD REPAIR DEFECTS AS MARKED. FOR WELDS <2" - WPS 10-SMAW-CF8MNMN MOD REV 1(Flat) or 25 SMAW-CF8MNMN MOD REV 0 (Vertical) FOR WELDS <8" - WPS 15-GMAW-CF8MNMN MOD REV 2	TAD 10/28				
S280	GRIND GCHI SOP 0100R2	HAND GRIND WELDS.	KLB 10/28				
S290	L.P. WELD CQP 0300 REV 10	L.P. WELD REPAIRS ACCEPTANCE PER ASTM A903. ACCEPTANCE CRITERIA-LEVEL 1 FOR HIGH STRESSED AREAS, LEVEL 2 FOR ALL OTHER AREAS. SEE LP DRAWING. IF OK CHECK HERE _____ WASH AND SEND TO STEP 300. IF REJECTED CHECK HERE _____AND RETURN TO STEP S220.	LP - LEVEL II	OK REJ	OK REJ	OK REJ	OK REJ
	REPEAT	REPEAT STEPS S220 TO S290 AS REQUIRED TILL CLEAR THROUGH VISUAL INSPECTION & PENETRANT INSPECTION.	QA ENG.	RMS			
295	TEST MAG PERM SOP MAG PERM 100, REV 1	TEST MAG PERMEABILITY REPAIR AREAS TEST AT LEAST 5 POINTS PER WELD. ACCEPTANCE 1.02. IF OK CHECK HERE ✓ AND GO TO STEP 300. IF REJECTED CHECK HERE _____.			CA		10/28
296	GRIND GCHI SOP 0100R2	GRIND AREAS OF NON COMPLIANCE AND RETURN TO STEP 295. REPEAT UNTIL COMPLIANCE IS ACHIEVED.			NA		
300	X-RAY (NOTE)	IF RADIO GRAPHED AREAS ARE GREATER THAN FOUR TO FIVE INCHES THE CASTING WILL BE SENT TO MQS. SEND TO MQS CHECK HERE _____. RADIOGRAPH AT CAF CHECK HERE ✓.			QA ENGINEER		RMS

N/A

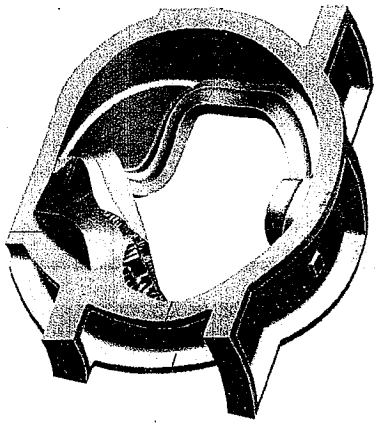
310 A	MQS X-RAY DEFECTS REPAIRED BY WELDING	X-RAY PER TECHNIQUE # 12726 USE CALIBRATED DENSITOMETER FOR DENSITY VERIFICATION. ATTACH TECHNIQUE, READER SHEET FOR ALL RADIOGRAPHS. MUST INDICATE RADIOGRAPHER AND ASNT CERTIFICATION LEVEL ON READER SHEET.				LEVEL II		
310 B	CAF X-RAY DEFECTS REPAIRED BY WELDING CQP 401 REV 5	X-RAY PER TECHNIQUE # 12726 USE CALIBRATED DENSITOMETER FOR DENSITY VERIFICATION. ATTACH TECHNIQUE, READER SHEET FOR ALL RADIOGRAPHS. MUST INDICATE RADIOGRAPHER AND ASNT CERTIFICATION LEVEL ON READER SHEET.				RT - LEVEL II		
320	X-RAY CQP 401 REV 5	X-RAY INTERPRETATION. ACCEPTANCE MSS SP 54. ATTACH TECHNIQUE, READER SHEET FOR ALL RADIOGRAPHS. MUST INDICATE RADIOGRAPHER AND ASNT CERTIFICATION LEVEL ON READER SHEET. IF OK CHECK HERE _____ AND SEND TO STEP 340. REJECTED CHECK HERE _____ MARK UP DEFECTS AND SEND THE CASTING TO STEP 220.				RT - LEVEL II all accepted 10/23/05		
	REPEAT STEPS	SUPPLEMENTAL REPAIR STEPS	1ST	2ND	3RD	4TH	5TH	
S321	WELD SOP 0100 REV 7	EXCAVATE ANY DEFECTS FOUND DURING RADIOGRAPHY.						
S322	L.P. EXCAVATION CQP-300 REV 10	L.P. ALL EXCAVATIONS PRIOR TO WELDING TO ENSURE REMOVAL OF DEFECT. ACCEPTANCE PER A903. ACCEPTANCE CRITERIA-LEVEL 1 FOR HIGH STRESSED AREAS, LEVEL 2 FOR ALL OTHER AREAS. SEE LP DRAWING.	LP - LEVEL II					
S323	WELD MAP	MAP ALL MAJOR WELDS WITH DIGITAL PHOTO/MAPS INDICATING LOCATION. SERIALIZE DEFECTS ON CASTING, USE SCALE IN PHOTOS AND DOCUMENT SIZE. THIS IS TO BE PERFORMED BY SUPERVISOR, INSPECTION LEAD MAN OR THEIR DESIGNEE, FILE WITH QA. USE YELLOW MARKER. MUST INDICATE ON MAP ALL MAJOR WELDS, DEFINED AS GREATER THAN 20% OF THE WALL OR 1 INCH WHICHEVER IS LESS OR 10 SQUARE INCHES APPROXIMATLY 3.3"X3.3".						
NOTICE	WITNESS NOTIFICATION	PROVIDE NOTICE TO EIO AND DCMA AT LEAST FIVE DAYS IN ADVANCE OF WELD STEP. EIO NOTIFIED ON _____ DCMA NOTIFIED ON _____	Q ENG OR QA MGR					
S324	QA APPROVAL HOLD POINT	QA TO APPROVE ELECTRODE PRIOR TO USE. PROCEDURE USED: _____ MATERIAL /LOT USED :_____ QUALITY ENG. Name: _____ Date: _____						
S325	WELD SOP 0100 REV 7	WELD REPAIR DEFECTS AS MARKED. FOR WELDS <2" - WPS 10-SMAW-CF8MNMN MOD REV 1(Flat) or 25 SMAW-						

N/A

		CF8MNMN MOD REV 0 (Vertical) FOR WELDS <8" - WPS 15-GMAW-CF8MNMN MOD REV 2					
S326	GRIND GCHI SOP 0100R2	HAND GRIND WELDS.					
S327	L.P. WELD CQP 0300 REV 10	L.P. WELD REPAIRS ACCEPTANCE PER ASTM A903. ACCEPTANCE CRITERIA-LEVEL 1 FOR HIGH STRESSED AREAS, LEVEL 2 FOR ALL OTHER AREAS. SEE LP DRAWING. IF OK CHECK HERE _____ WASH AND SEND TO STEP 300. IF REJECTED CHECK HERE _____AND RETURN TO STEP S321.	LP - LEVEL II	OK REJ	OK REJ	OK REJ	OK REJ
	REPEAT	REPEAT STEPS S321 TO S327 AS REQUIRED TILL CLEAR THROUGH VISUAL INSPECTION & PENETRANT INSPECTION.	QA ENG.				
340	SAND BLAST BLAS SOP 0100R6	SANDBLAST (REMOVE ALL BLAST MATERIAL FROM CASTING) SANDBLASTING WILL BE DONE USING RECYCLED SHARP ANGULAR AGGREGATE.			CA		10/31
NOTICE	WITNESS NOTIFICATION	PROVIDE NOTICE TO EIO AND DCMA AT LEAST FIVE DAYS IN ADVANCE OF VISUAL AND LP STEPS. EIO NOTIFIED ON 10/24 DCMA NOTIFIED ON 10/24			Q ENG OR QA MGR		RMS
350	FINAL VISUAL INSPECTION CQP-500 REV 4	VISUALLY INSPECT 100% of COMPONENT ACCORDING TO ASTM A802 LEVEL 3 IN NON MACHINED AREAS AND LEVEL 2 IN MACHINED AREAS. IF OK CHECK HERE ✓. IF REJECTED CHECK HERE _____. MARK AND REPAIR AT STEP 385. MUST BE PERFORMED BY LEVEL II in VT.			VT - LEVEL II KRA 10.31.05		
360	FINAL L.P. CQP 0300 REV 10	FINAL L.P. 100% OF COMPONENT. ACCEPTANCE PER ASTM A903. ACCEPTANCE CRITERIA-LEVEL 1 FOR HIGH STRESSED AREAS, LEVEL 2 FOR ALL OTHER AREAS. SEE LP DRAWING. IF OK CHECK HERE _____ WASH AND SEND TO STEP 455. IF REJECTED CHECK HERE ✓			LP - LEVEL II JR		10/31
380	WELD SOP 0100 REV 7	EXCAVATE ANY DEFECTS FOUND DURING FINAL PENETRANT INSPECTION.			RG		10/30
385	GRIND GCHI SOP 0100R2	CHIP AND HAD GRIND EXCAVATION AS REQUIRED.			Grinded only		
390	L.P. EXCAVATION CQP-300 REV 10	L.P. ALL EXCAVATIONS PRIOR TO WELDING TO ENSURE REMOVAL OF DEFECT. ACCEPTANCE PER A903. IF OK CHECK HERE _____ IF REJECTED SEND BACK TO STEP 385.			LP - LEVEL II		NO welds.

400	WELD MAP	MAP ALL MAJOR WELDS WITH DIGITAL PHOTO/MAPS INDICATING LOCATION. SERIALIZE DEFECTS ON CASTING, USE SCALE IN PHOTOS AND DOCUMENT SIZE. THIS IS TO BE PERFORMED BY SUPERVISOR, INSPECTION LEAD MAN OR THEIR DESIGNEE, FILE WITH QA. USE YELLOW MARKER. MUST INDICATE ON MAP ALL MAJOR WELDS, DEFINED AS GREATER THAN 20% OF THE WALL OR 1 INCH WHICHEVER IS LESS OR 10 SQUARE INCHES APPROXIMATLY 3.3"X3.3".	N/A	
420	QA APPROVAL HOLD POINT	QA TO APPROVE ELECTRODE PRIOR TO USE. PROCEDURE USED: _____ MATERIAL/LOT USED:_____ QUALITY ENG. Name: _____ Date: _____		
430	WELD SOP 0100 REV 7	WELD REPAIR DEFECTS AS MARKED. FOR WELDS <2" - WPS 10-SMAW-CF8MNMN MOD REV 1(Flat) or 25 SMAW-CF8MNMN MOD REV 0 (Vertical) FOR WELDS <8" - WPS 15-GMAW-CF8MNMN MOD REV 2		
440	GRIND GCHI SOP 0100 REV 2	HAND GRIND WELDS.		
450	L.P. WELDS CQP 0300 REV 10	L.P. WELD REPAIRS ACCEPTANCE PER ASTM A903. IF OK CHECK HERE _____ WASH AND SEND TO STEP 460. IF REJECTED CHECK HERE _____AND RETURN TO STEP 440.	LP - LEVEL II	
	REPEAT	REPEAT STEPS ___350 TO 450_____AS REQUIRED TILL WELDS CLEAR FINAL LIQUID PENETRANT INSPECTION. DOCUMENT REWORK ON A SUPPLEMENTAL MTS	QA ENG. CAR	10/31
451	TEST MAG PERM SOP MAG PERM 100, REV 1	TEST MAG PERMEABILITY REPAIR AREAS. RECORD ON WELD MAP LIST. TEST AT LEAST 5 POINTS PER WELD. ACCEPTANCE 1.02. IF OK CHECK HERE ✓ AND GO TO STEP 430. IF REJECTED CHECK HERE _____.	KLA	10/31
452	GRIND GCHI SOP 0100R2	GRIND AREAS OF NON COMPLIANCE AND RETURN TO STEP 451. REPEAT UNTIL COMPLIANCE IS ACHIEVED.	N/A	
455	HEAT TREAT	STRESS RELIEF. Load casting into cold furnace. Ramp up to 1100 F at rate of 200 F per hour. Hold at temp 4 hours. Furnace cool to 500 F at 50 F per hour. Air cool. Submit furnace charts to QA.		
NOTICE	WITNESS NOTIFICATION	PROVIDE NOTICE TO EIO AND DCMA AT LEAST FIVE DAYS IN ADVANCE OF VISUAL AND LP STEPS. EIO NOTIFIED ON 10/24 DCMA NOTIFIED ON 10/24	Q ENG OR QA MGR	

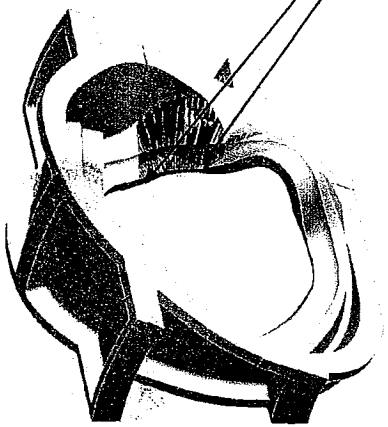
460	FINAL VISUAL INSPECTION CQP-500 REV 4	VISUALLY INSPECT 100% of COMPONENT ACCORDING TO ASTM A802 LEVEL 3 ALL CONDITIONS. IF OK CHECK HERE _____. IF REJECTED CHECK HERE _____. MARK AND REPAIR AT STEP 390. MUST BE PERFORMED BY LEVEL II in VT.	VT - LEVEL II KLA	10/31
470	FINAL L.P. CQP 0300 REV 10	FINAL L.P. 100% OF COMPONENT. ACCEPTANCE PER ASTM A903. ACCEPTANCE CRITERIA-LEVEL 1 FOR HIGH STRESSED AREAS, LEVEL 2 FOR ALL OTHER AREAS. SEE LP DRAWING. IF OK CHECK HERE ___√___ WASH AND SEND TO STEP 455. IF REJECTED CHECK HERE _____. DOCUMENT REPAIRS USING S321 THROUGH S327.	LP - LEVEL II 10/31	JDL
NOTICE	WITNESS NOTIFICATION	PROVIDE NOTICE TO EIO AND DCMA AT LEAST FIVE DAYS IN ADVANCE OF MAG PERM STEPS. EIO NOTIFIED ON 10/24 DCMA NOTIFIED ON 10/24	Q ENG OR QA MGR	RMS
500	FINAL MAG PERM INSPECTION SOP MAG PERM 100, REV 1	PERFORM MAG PERM TESTING WITH SEVRIN GAUGE. ACCEPTANCE 1.02. CHECK THE ENTIRE SURFACE ON A 6"BY6" GRID. REPORT RESULTS. USE A 6" SQUARE BLOCK TO INDICATE TEST LOCATIONS AND RECORD RESULTS. COMPLIANT AREAS WILL NOT BE MARKED. MARK NONCOMPLIANT AREAS WITH AN "X" FOR REPAIR. OK CHECK HERE ___√___ AND GO TO STEP 530. IF REJECTED CHECK HERE _____.	KLA	10/31
510	GRIND GCHI SOP 0100 REV 2	HAND GRIND WITH SUITABLE CONE OR OTHER SIMILAR GRINDER AS REQUIRED TO ENSURE REMOVAL OF MATERIAL TO ACHIEVE MAG PERM REQUIREMENT. CIRCLE AREA REMEDIATE FOR RETEST.	N/A	
520	RETEST MAG PERM SOP MAG PERM 100, REV 1	RETEST MAG PERMEABILITY AT FAILED TEST POINTS. MARK NONCOMPLIANT AREAS WITH AN "X" FOR REPAIR. ACCEPTANCE 1.02. IF OK CHECK HERE _____. IF REJECTED CHECK HERE _____RETURN TO STEP 510.	√	
530	DOC. REVIEW	REVIEW DOCUMENTS AS REQUIRED IN CAF CHECKLIST, ALL DOCUMENTS NOTED TO BE ACCESSIBLE FOR AUDITING. (SHIPPER, C OF C, M.T.R., M.T.S., INSPECTION REPORT, X-RAY READER SHEETS AND HEAT TREAT CHARTS)		10/31
NOTICE	RELEASE FROM EIO	PROVIDE DOCUMENTS TO EIO. SENT ON 10/27 + 10/28 BY _____. RECEIVED RELEASE FROM EIO ON Date 10/31	Q ENG OR QA MGR	
540	PACK AND SHIP	PACKAGE AND SHIP TO MAJOR TOOL.		
1000	REVISION HISTORY	ORIGINAL 12-14-04. Approved 12-14-04. Revision level 1- Revised 1-26-05 new page 8, correct High stress areas, Revision level 2 3-16-05, delete LO step 455. Revision 3 3-28-05 Added note regarding hold point at weld step 400. Revision level 4 written for C-2 casting 4-18-05. Rev 5 added Layout SOP# and note regarding first casting layout responsibility. 5-10-05. Rev 6 added word LOT to weld material steps. 5-29-05. Rev 7 6-14-05 added "LOT" to weld step on supplement page. Rev. 8 7-29-05 added stress relief , deleted weld hold points, added vertical weld procedure, and several editorial changes.	CARUUD	



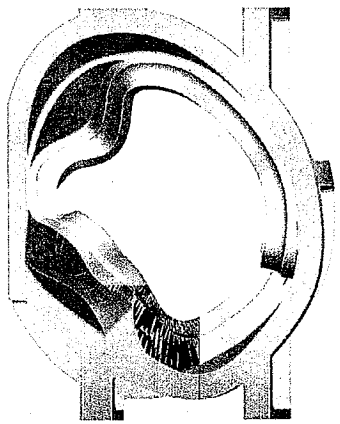
GENERAL ISOMETRIC
VIEW FROM TOP SIDE

TABS DESIGNATE CRITICAL AREA

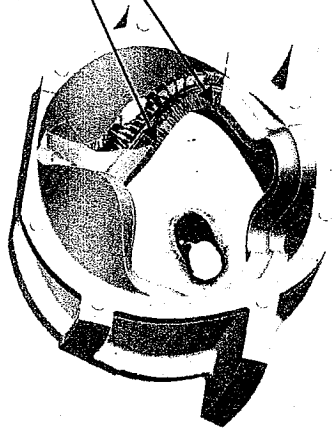
RED AREA INDICATES HIGH STRESSED AREA



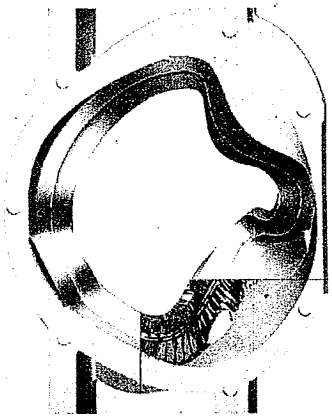
TOP SIDE ISOMETRIC



TOP SIDE VIEW



BOTTOM SIDE ISOMETRIC



BOTTOM SIDE VIEW

Energy Industries of Ohio

FIVE PARTS KEEP TOGETHER **Manufacturing and Test Sequence (MTS) Coill C Shim**

CO# 40851, Pattern SE 141-073 -3 MS73220-2 Dated December 14, 2004 Revision:Original **Dated Issued:4-27-05**

OPER. #	STATION	DESCRIPTION OF PROCESS Keep all parts together. Sign and date each step when all 5 parts have been completed.	Name	Date
10	QUALITY RELEASE	REVIEW AND APPROVE MTS. RECEIVED APPROVAL FROM EIO ON Pete FROM 12/15/04 SIGNED QUALITY MANAGER	Gtr	4/21/05
20	PATTERN NPAT SOP 0100REV2	APPLY APPROPRIATE PART NUMBER, SERIAL NUMBER, FOUNDRY MARK, TO THE PATTERN.	TB	4/22/05
30	MOLD MOLD SOP 0400 REV 8 CALIBRATION PER MOLD SOP 0900 REV 5 PREPARATION PER MOLD SOP 1100R2/1200R2/1300R1 SAND TESTING PER MOLD SOP 1400R2/1500R3/1600R2	MOLD PER WORK INSTRUCTIONS IN MAPICS ROUTING AND SOPS REFERENCED. ENGINEER OF RECORD – ROGER BROMAN, CONSULT ON MOLD-RELATED CONCERNS. MOLD MATERIALS REQUIRED PER MAPICS BOM. NOTIFY ENGINEER OF ANY SUBSTITUTIONS.	CR	4/22/05
40	POUR MELT SOP 0100R5 MELT SOP 0700R2 MELT SOP 0600R2	METAL MUST BE AOD REFINED OR AOD INGOT. VIRGIN METAL ADDITIONS ALLOWED. RECORD POURING TEMPERATURE: 2825 CASTING POURED AT: 1245 Am DATE: 4/20 HEAT #"s: ~~NA~~ 29198 ELAPSED POUR TIME NA KEEL BLOCKS POURED: yes Sample from ladle to be analyzed for final chemical analysis and reported on material certifications. Sample Taken by: SR Analyzed: G Hunt Date: 4/20 **Note: Make 15 additional test bars for mechanical testing.**	JG	4/20/05
50	MELT SOP 0800R2	SHAKEOUT	CA	4/29
60	ARC RISE SOP 0100R1	REMOVE RISERS AS DIRECTED BY SUPERVISOR.	BNVH	6/16/05
70	HEAT TREAT HEAT SOP 0103R5	SOLUTION ANNEAL. With C-1 Coil.	DLS	6/2/05

80	PHYSICAL TESTING	OBTAIN TEST SPECIMENS AND SUBMIT FOR PHYSICAL TESTING. REPORT RESULTS AS PART OF *STEP 480.* Bars returned to HT w/	W+	6/29
90	GRIND GSWA SOP 0100R3 GCHI SOP 0100R2	SWING GRIND TO REMOVE RISER REMAINS AND FLASH IF REQUIRED. CHIP AND HAD GRIND SURFACE OF PART AS REQUIRED.	CEG	6/16/05
100	SAND BLAST BLAS SOP 0100R6	SANDBLAST (REMOVE ALL BLAST MATERIAL FROM CASTING) SANDBLASTING WILL BE DONE USING RECYCLED SHARP ANGULAR AGGREGATE.		MTW 6/16/05
110	VISUAL INSPECTION CQP-500 REV 4	VISUALLY INSPECT 100% of COMPONENT ACCORDING TO ASTM A802 LEVEL 3 ALL CONDITIONS. IF OK CHECK HERE ✓ . IF REJECTED CHECK HERE ___ . MARK AND REPAIR AT STEP 130.	VT - LEVEL II	SSB 6-16-05
NOTICE	WITNESS NOTIFICATION	PROVIDE NOTICE TO EIOAND DCMA AT LEAST FIVE DAYS IN ADVANCE OF LP STEP. EIO NOTIFIED ON 6/13 DCMA NOTIFIED ON 6/13	Q ENG OR QA MGR	CAR 6/16/05
120	100% L.P. CQP 0300 REV 10	L.P. 100% OF COMPONENT. ACCEPTANCE PER ASTM A903. ACCEPTANCE CRITERIA- LEVEL 2. IF OK CHECK HERE ___ IF REJECTED CHECK HERE ✓ MARK AND REPAIR AT STEP ~~120~~ 280 Ctr	LP - LEVEL II	SSB 6-16-05
130	WELD SOP 0100 REV 7	EXCAVATE ANY DEFECTS FOUND DURING 100% VISUAL AND LP INSPECTION.		M/P #56
140	L.P. EXCAVATION CQP-300 REV 10	L.P. ALL EXCAVATIONS PRIOR TO WELDING TO ENSURE REMOVAL OF DEFECT. ACCEPTANCE PER A903. ACCEPTANCE CRITERIA- LEVEL 2.	LP - LEVEL II	
150	SAND BLAST BLAS SOP 0100R6	SANDBLAST (REMOVE ALL BLAST MATERIAL FROM CASTING) SANDBLASTING WILL BE DONE USING RECYCLED SHARP ANGULAR AGGREGATE.		
160	WELD MAP	MAP ALL WELDS WITH DIGITAL PHOTO/MAPS. SERIALIZE DEFECTS ON CASTING, USE SCALE IN PHOTOS AND DOCUMENT SIZE. THIS IS TO BE PERFORMED BY SUPERVISOR, INSPECTION LEAD MAN OR THEIR DESIGNEE, FILE WITH QA.. USE YELLOW MARKER. MUST SEND REPORT ON ALL WELDS OVER 10% OF NOMINAL WALL THICKNESS TO CUSTOMER. DEFECTS>10% YES _____, REPORT SENT BY _____ DATE_____ DEFECTS < 10 % _____SIGN BY QA ENG.		
NOTICE	WITNESS NOTIFICATION	PROVIDE NOTICE TO EIOAND DCMA AT LEAST FIVE DAYS IN ADVANCE OF XRAY AND LAYOUT STEPS. EIO NOTIFIED ON 6/13 DCMA NOTIFIED ON 6/13	Q ENG OR QA MGR	RMS

170	CAF X-RAY CQP 401 REV 5	X-RAY PER TECHNIQUE: To be determined. USE CALIBRATED DENSITOMETER FOR DENSITY VERIFICATION. ATTACH TECHNIQUE, READER SHEET FOR ALL RADIOGRAPHS. MUST INDICATE RADIOGRAPHER AND ASNT CERTIFICATION LEVEL ON READER SHEET.	RT - LEVEL II ok D	Dwm 6-28-05
180	X-RAY CQP 401 REV 5	X-RAY INTERPRETATION. ACCEPTANCE MSS SP 54. ATTACH TECHNIQUE, READER SHEET FOR ALL RADIOGRAPHS. MUST INDICATE RADIOGRAPHER AND ASNT CERTIFICATION LEVEL ON READER SHEET. IF OK CHECK HERE __V__ AND SEND TO STEP 310. REJECTED CHECK HERE _____ MARK UP DEFECTS AND SEND THE CASTING TO STEP 200.	RT – LEVEL II	Dwm 6-28-05
190	LAYOUT	INSPECT CASTING TO VERIFY DIMENSIONS. THIS MAY BE PERFORMED BEFORE OR AFTER STEP 180. DIMENSIONED _____ DATE 10/28/05 RELEASED _____(ENGINEER ONLY)	JAJ	10/28/05
200	WELD SOP 0100 REV 7	EXCAVATE ANY DEFECTS FOUND DURING RADIOGRAPHY.	NA	
210	L.P. EXCAVATION CQP-300 REV 10	L.P. ALL EXCAVATIONS PRIOR TO WELDING TO ENSURE REMOVAL OF DEFECT. ACCEPTANCE PER A903. ACCEPTANCE CRITERIA- LEVEL 2.	LP - LEVEL II	
220	WELD MAP	MAP ALL WELDS WITH DIGITAL PHOTO/MAPS. SERIALIZE DEFECTS ON CASTING, USE SCALE IN PHOTOS AND DOCUMENT SIZE. THIS IS TO BE PERFORMED BY SUPERVISOR, INSPECTION LEAD MAN OR THEIR DESIGNEE, FILE WITH QA.. MUST SEND REPORT ON ALL WELDS OVER 10% OF NOMINAL WALL THICKNESS TO CUSTOMER. DEFECTS>10% YES _____, REPORT SENT BY _____ DATE_____ DEFECTS < 10 % _____ SIGN BY QA ENG.		
NOTICE	WITNESS NOTIFICATION	PROVIDE NOTICE TO EIOAND DCMA AT LEAST FIVE DAYS IN ADVANCE OF WELD STEP: EIO NOTIFIED ON _____ DCMA NOTIFIED ON _____	Q ENG OR QA MGR	
230	QA APPROVAL HOLD POINT	QA TO APPROVE ELECTRODE PRIOR TO USE. PROCEDURE USED: _____ MATERIAL USED:_____ QUALITY ENG. Name: _____ Date: _____		
240	WELD SOP 0100 REV 7	WELD REPAIR DEFECTS AS MARKED. FOR WELDS <2" - WPS 10-SMAW-CF8MNMN MOD REV 1 FOR WELDS <8" - WPS 15-GMAW-CF8MNMN MOD REV 2		
250	GRIND GCHI SOP 0100R2	HAND GRIND WELDS.		

260	L.P. WELD CQP 0300 REV 10	L.P. WELD REPAIRS ACCEPTANCE PER ASTM A903. ACCEPTANCE CRITERIA-LEVEL 2. IF OK CHECK HERE _____ WASH AND SEND TO STEP 300. IF REJECTED CHECK HERE _____AND RETURN TO STEP 220.	LP - LEVEL II	
	REPEAT	REPEAT STEPS __220 TO 260___AS REQUIRED TILL CLEAR THROUGH VISUAL INSPECTION & PENETRANT INSPECTION. DOCUMENT REWORK ON A SUPPLEMENTAL MTS	QA ENG.	
270	TEST MAG PERM SOP MAG PERM 100, REV 1	TEST MAG PERMEABILITY REPAIR AREAS RECORD ON WELD MAP LIST. TEST AT LEAST 5 POINTS PER WELD. ACCEPTANCE 1.02. IF OK CHECK HERE _____AND GO TO STEP 290. IF REJECTED CHECK HERE _____.		
280	GRIND GCHI SOP 0100R2	GRIND AREAS OF NON COMPLIANCE AND RETURN TO STEP 270. REPEAT UNTILL COMPLIANCE IS ACHIEVED. Grind all LP indications	CA	10/30
290	CAF X-RAY DEFECTS REPAIRED BY WELDING CQP 401 REV 5	X-RAY PER TECHNIQUE: To be determined. USE CALIBRATED DENSITOMETER FOR DENSITY VERIFICATION. ATTACH TECHNIQUE, READER SHEET FOR ALL RADIOGRAPHS. MUST INDICATE RADIOGRAPHER AND ASNT CERTIFICATION LEVEL ON READER SHEET.	RT - LEVEL II	NA
300	X-RAY CQP 401 REV 5	X-RAY INTERPRETATION. ACCEPTANCE MSS SP 54. ATTACH TECHNIQUE, READER SHEET FOR ALL RADIOGRAPHS. MUST INDICATE RADIOGRAPHER AND ASNT CERTIFICATION LEVEL ON READER SHEET. IF OK CHECK HERE _____ AND SEND TO STEP 310. REJECTED CHECK HERE _____ MARK UP DEFECTS AND SEND THE CASTING TO STEP 200.	RT - LEVEL II	
	REPEAT	REPEAT STEPS __200 TO 300___AS REQUIRED TILL WELDS CLEAR X-RAY. DOCUMENT REWORK ON A SUPPLEMENTAL MTS	QA ENG.	
310	SAND BLAST BLAS SOP 0100R6	SANDBLAST (REMOVE ALL BLAST MATERIAL FROM CASTING) SANDBLASTING WILL BE DONE USING RECYCLED SHARP ANGULAR AGGREGATE.	MW 10/31/05	
NOTICE	WITNESS NOTIFICATION	PROVIDE NOTICE TO EIOAND DCMA AT LEAST FIVE DAYS IN ADVANCE OF VISUAL AND LP STEPS. EIO NOTIFIED ON 10/23 DCMA NOTIFIED ON 10/23	Q ENG OR QA MGR	RMS
320	FINAL VISUAL INSPECTION CQP-500 REV 4	VISUALLY INSPECT 100% of COMPONENT ACCORDING TO ASTM A802 LEVEL 2 ALL CONDITIONS. IF OK CHECK HERE ✓. IF REJECTED CHECK HERE _____. MARK AND REPAIR AT STEP 340.	VT - LEVEL II KA 10-31-05	

		MUST BE PERFORMED BY LEVEL II in VT.		
330	FINAL L.P. CQP 0300 REV 10	FINAL L.P. 100% OF COMPONENT. ACCEPTANCE PER ASTM A903. ACCEPTANCE CRITERIA-LEVEL 1 FOR HIGH STRESSED AREAS, LEVEL 2 FOR ALL OTHER AREAS. SEE LP DRAWING. IF OK CHECK HERE ___✓___ WASH AND SEND TO STEP 410. IF REJECTED CHECK HERE _____	LP - LEVEL II KLA 10-31-05	
340	WELD SOP 0100 REV 7	EXCAVATE ANY DEFECTS FOUND DURING FINAL PENETRANT INSPECTION.	N/A	
350	L.P. EXCAVATION CQP-300 REV 10	L.P. ALL EXCAVATIONS PRIOR TO WELDING TO ENSURE REMOVAL OF DEFECT. ACCEPTANCE PER A903.	LP - LEVEL II	
370	WELD MAP	MAP ALL WELDS WITH DIGITAL PHOTO/MAPS. SERIALIZE DEFECTS ON CASTING, USE SCALE IN PHOTOS AND DOCUMENT SIZE. THIS IS TO BE PERFORMED BY SUPERVISOR, INSPECTION LEAD MAN OR THEIR DESIGNEE. FILE WITH QA. MUST SEND REPORT ON ALL WELDS OVER 10% OF NOMINAL WALL THICKNESS TO CUSTOMER. NOMINAL WALL THICKNESS TO CUSTOMER. DEFECTS.>10% YES _____, REPORT SENT BY _____ DATE_____ DEFECTS < 10 % _____SIGN BY QA ENG.		
380	WELD SOP 0100 REV 7	WELD REPAIR DEFECTS AS MARKED. FOR WELDS <2" - WPS 10-SMAW-CF8MNMN MOD REV 1 FOR WELDS <8" - WPS 15-GMAW-CF8MNMN MOD REV 2		
390	GRIND GCHI SOP 0100 REV 2	HAND GRIND WELDS.		
400	L.P. WELDS CQP 0300 REV 10	L.P. WELD REPAIRS ACCEPTANCE PER ASTM A903. IF OK CHECK HERE _____ WASH AND SEND TO STEP 460. IF REJECTED CHECK HERE _____AND RETURN TO STEP 390.	LP - LEVEL II	
	REPEAT	REPEAT STEPS ___390 TO 410____AS REQUIRED TILL WELDS CLEAR FINAL LIQUID PENETRANT INSPECTION. DOCUMENT REWORK ON A SUPPLEMENTAL MTS	QA ENG.	
410	TEST MAG PERM SOP MAG PERM 100, REV 1	TEST MAG PERMEABILITY REPAIR AREAS. RECORD ON WELD MAP LIST. TEST AT LEAST 5 POINTS PER WELD. ACCEPTANCE 1.02. IF OK CHECK HERE _____AND GO TO STEP 430.		

420	GRIND GCHI SOP 0100R2	GRIND AREAS OF NON COMPLIANCE AND RETURN TO STEP 420. REPEAT UNTILL COMPLIANCE IS ACHIEVED.	NA	
NOTICE	WITNESS NOTIFICATION	PROVIDE NOTICE TO EIOAND DCMA AT LEAST FIVE DAYS IN ADVANCE OF MAG PERM STEP. EIO NOTIFIED ON 10/23 DCMA NOTIFIED ON 10/23	Q ENG OR QA MGR	RMS
430	FINAL MAG PERM INSPECTION SOP MAG PERM 100, REV 1	PERFORM MAG PERM TESTING WITH SEVRIN GAUGE. ACCEPTANCE 1.02. CHECK THE ENTIRE SURFACE ON A 6"BY6" GRID. REPORT RESULTS. USE A 6" SQUARE BLOCK TO INDICATE TEST LOCATIONS AND RECORD RESULTS. COMPLIANT AREAS WILL NOT BE MARKED. MARK NONCOMPLIANT AREAS WITH AN "X" FOR REPAIR. OK CHECK HERE ✓ AND GO TO STEP 470. IF REJECTED CHECK HERE _____.	CAR	10/28
440	GRIND GCHI SOP 0100 REV 2	HAND GRIND WITH SUITABLE CONE OR OTHER SIMILAR GRINDER AS REQUIRED TO ENSURE REMOVAL OF MATERIAL TO ACHIEVE MAG PERM REQUIREMENT. CIRCLE AREA REMEDIATE FOR RETEST.	NA	
450	RETEST MAG PERM SOP MAG PERM 100, REV 1	RETEST MAG PERMEABILITY AT FAILED TEST POINTS. MARK NONCOMPLIANT AREAS WITH AN "X" FOR REPAIR. ACCEPTANCE 1.02. IF OK CHECK HERE _____. IF REJECTED CHECK HERE _____ RETURN TO STEP 450		
460	PHOTOGRAPH	TAKE DIGITAL PICTURES.	JCS	10/31/05
470	AUDIT REVIEW	PROCESS DOCUMENT TO PROGRAM MANAGER FOR COMPLIANCE AUDIT.	CAR	10/31/05
480	DOC. REVIEW	REVIEW DOCUMENTS AS REQUIRED IN CAF CHECKLIST, ALL DOCUMENTS NOTED TO BE ACCESSIBLE FOR AUDITING. (SHIPPER, C OF C, M.T.R., M.T.S., INSPECTION REPORT, X-RAY READER SHEETS AND HEAT TREAT CHARTS)	CAR	10/31/05
NOTICE	RELEASE FROM EIO	PROVIDE DOCUMENTS TO EIO. SENT ON 11/1 BY CAR. RECEIVED RELEASE FROM EIO ON _____.	Q ENG OR QA MGR	
490	PACK AND SHIP	PACKAGE AND SHIP TO MAJOR TOOL.		
1000	REVISION HISTORY	ORIGINAL 12-14-04.	CARUUD	

Corrective Action 1308
Carondelet Division - CA / PA / RGA Database
Corrective Action Type NCR
Date 6/13/2005
CA Originator C. Ruud
Pattern Number: C and A Coil Shims 11 Pieces

Description of Defect / Non-Conformance
Chemistry for 11 shim castings is out of specification.

Root Cause
Chemistry specification was not changed in system and not communicated to Lab personnel.

Corrective Action
Specification was corrected in system and Lab personnel trained. Mag permeability was checked on the parts and are less than 1.02u.

Verification of Corrective Action
Chemistries were checked on subsequent parts and are within specification.

Preventive Action
Create Inspection and Test Plan summarizing all requirements.

Estimated Completion Date
6/15/05

Actual Completion Date
Complete.

Signed: C. Ruud

CC: Roger Broman, Barry Craig, Joe Edwards, E.J. Kubick

Nonconformance Report: MetalTek CA 1308

Project Disposition: Use as is.

Approvals

Procurement Technical Representative _____
Wayne Reiersen for Phil Heitzenroeder

Responsible Line Manager _____
Mike Cole for Brad Nelson

Nonconformance Report: CA 1323 (phosphorus levels exceeds specification limits for castings C1- C4 and A1 and C1 shim and four Type C and six A coil shims)

Project Disposition:

The erroneous levels were due to calibration errors with the spectrometer. As reported in MTK's attached report, preventive maintenance has since been performed on the spectrometer. The reported chemistry will be accepted for the castings and shims noted above. The specification chemistry will not be changed at this time.

Approvals:

Phil Heitzenroeder

Digitally signed by Phil Heitzenroeder
DN: CN = Phil Heitzenroeder, C = US, O = PPPL, OU = Mech. Eng. Division
Reason: I egree to 'specified' portions of this document
Date: 2006.02.21 11:49:56 -05'00'

Procurement Technical Representative

Brad Nelson

Digitally signed by Brad Nelson
DN: cn=Brad Nelson, c=US, o=ORNL, ou=FED, email=nelsonbe@ornl.gov
Date: 2006.02.21 14:16:12 -05'00'

Responsible Line Manager:

Corrective Action 1323
Carondelet Division - CA / PA / RGA Database
Corrective Action Type NCR
Date 7/27/2005
CA Originator C. Ruud
Applies to: Coil castings C-1, C-2, C-3, C-4 and A-1 and C 1 shim and four C coil and six A coil shims

Description of Defect / Non-Conformance
Phosphorus levels in material produced to date exceed specification limits. Both phosphorus and sulfur readings reported erroneously in certifications.

Certification reports have shown phosphorus and sulfur levels in the <.01% range. Independent laboratory data confirmed phosphorus in the .018 to .033% range and sulfur in the .005 to .022% range. Actual levels of some tests are above those in PPPL Specification NCSX-CSPEC-141-03-07 Rev 7.

Nonconformance was first suspected as a result of analysis of zoned attached test specimens volunteered by MetalTek International as response to PPPL questions on weighted average chemical analysis and quality of blending in the gating system. Nonconformance was verified on the bars used in the study and has been extended to evaluation of previously poured products.

Root Cause
Specification limits were set below the levels achievable through use of available raw materials. Spectrometer did not properly calibrate for phosphorus and sulfur at levels of specification due to equipment malfunction.
The chemical specification of EIO heats uses alloy CF8MNMn-Mod which incorporates a type standard calibration with a certified reference material (CRM) BS180. This enables the operator of the spectrometer to match the elemental concentrations of this alloy with corrective factors. These factors are determined by analyzing the CRM and having them compared with the calibration curves for each element. The phosphorus and sulfur content have very low measured intensities due to low concentrations. Intermittent failure of the spectrometer intensity measuring card caused higher intensity readings for phosphorus and sulfur. Subsequent checks with the CRM resulted in low corrective factors that were not detected. This in turn resulted in low reported concentrations for the EIO samples. All the major elements, which are measured on other intensity cards, have been closely monitored and matched very well with the CRM and thus were reported correctly.

Corrective Action
Modification to specification for phosphorus and sulfur will be requested. Limits will be set based on process capability and consistent with other stainless steel grades.
Replacement of deficient card in spectrometer will be made upon delivery.

Subsequent immediate analysis of chemistry results, obtained by wet analysis, is attached and demonstrate top of specification for sulfur and over specification for phosphorus. The spectrometer manufacturer has performed an analysis to determine the cause of the malfunction and verified that the intensity card has an intermittent fault and must be replaced. The card has been ordered and scheduled for replacement on August 15, 2005.
Until the card is replaced we will be performing additional type standardizations to ensure accurate sulfur and phosphorus analysis. Additionally, for coils made until the card is replaced, an independent laboratory will perform a verification of the chemical analysis.

Verification of Corrective Action
Will be determined at a later date.

Preventive Action
In addition to spectrometer faults, we have identified that the specification ranges for sulfur and phosphorus is unattainable. Analysis and specifications for virgin charge materials predict sulfur at 0.040% maximum and phosphorus at 0.040% maximum. We have no way to remove phosphorus from the melt and do not intentionally add phosphorus. So, the confirmed coil analyses, along with analyses of virgin material heats, demonstrate sulfur in the range of 0.010% to 0.022% and phosphorus in the range of 0.018% to 0.033%. These results are consistent with our charge material analysis. We will request a deviation for phosphorus in the subject parts and also request a permanent specification change to 0.040% maximum for both phosphorus and sulfur, to allow us to provide non-discrepant material. This change will not affect, in any way, the physical properties or material performance because all coils and test material exhibited sulfur and phosphorus within the new ranges despite inaccurate reporting.
Other actions: Specifications have been added to the BS 180 standard and the type standard will be measured against the criteria.

Estimated Completion Date
August 15, 2005

Actual Completion Date TBD

Signed: C. Ruud 

CC: Jim Galaske, Barry Craig, Joe Edwards, E.J. Kubick

Guide to St Louis Testing Report Dated 7-26-05

Sample name	Sample origin
A1Z1	Cast on bar A-1 coil, zone 1
A1Z2	Cast on bar A-1 coil, zone 2
A1Z3	Cast on bar A-1 coil, zone 3
C1	Cast on bar C-1 coil
C2Z1	Cast on bar C-2 coil, zone 1
C2Z2	Cast on bar C-2 coil, zone 2
C2Z3	Cast on bar C-2 coil, zone 3
C3Z1	Cast on bar C-3 coil, zone 1
C3Z2	Cast on bar C-3 coil, zone 2
C3Z3	Cast on bar C-3 coil, zone 3
F1	Final analysis button from ladle for C-4 coil
F2	Final analysis button from ladle for C-4 coil
F3	Final analysis button from ladle for C-4 coil
P1	Preliminary analysis button from ladle for C-4 coil

Testing is underway of the heat used to pour the four C coil and six A coil shims.

Attachment 40
CA 1323

Founded 1929 St. Louis Testing Laboratories INCORPORATED

Chemical, Metallurgical, Mechanical, Nondestructive, Environmental Testing, Analyses and Field Service.

July 26, 2005
Lab No. 05C-0608
Invoice No. 59891
P.O. No. 21324
Page 1 of 1

METALTEK INTERNATIONAL
8600 Commercial Blvd.
Pevely, MO 63070

Attention: Chuck Ruud

REPORT OF CHEMICAL ANALYSIS

SAMPLE ID: A1 Z1, A1 Z2, A1 Z3, C1, C2 Z1, C2 Z2, C2 Z3, C3 Z1, C3 Z2, C3 Z3, F1, F2, F3, P1

RESULTS: %

ANALYTE	A1Z1	A1Z2	A1Z3
Sulfur	.013	.005	.010
Phosphorus	.025	.023	.018

ANALYTE	C1	C2Z1	C2Z2	C2Z3
Sulfur	.014	.022	.018	.015
Phosphorus	.018	.024	.021	.025

ANALYTE	C3Z1	C3Z2	C3Z3
Sulfur	.013	.014	.012
Phosphorus	.024	.025	.021

ANALYTE	F1	F2	F3	P1
Sulfur	.014	.015	.012	.010
Phosphorus	.029	.033	.028	.030

Sulfur Test Method: ASTM E1019-03

Phosphorous Test Method: Colormetric

Identification of tested specimen provided by the client.

Robin E. Sinn
Laboratory Director

RES/nmc

Corrective Action 1379
Carondelet Division - CA / PA / RGA Database
Corrective Action Type NCR
Date 8/31/2005
CA Originator C. Ruud
Applies to: Weld Material Lincoln 3018926-78309

Description of Defect / Non-Conformance
Material failed elongation and one of three charpy impact tests at -320 F. The average of the specimens exceeds the minimum. See S8 of ASTM A 703/A 703M.

Root Cause
The sample of the weld contained defects not detected.

Corrective Action
Retest material already at Lab.
If needed, make a new weld plate after reviewing process with welder and weld another sample.

Verification of Corrective Action
Retest results. If new plates are needed, the new plate will be x-rayed prior to testing.

Estimated Completion Date
9-2-05

Actual Completion Date TBD

Signed: C. Ruud

CC: R. Suria, Barry Craig, Joe Edwards, E.J. Kubick

Nonconformance Report: CA1379

Project Disposition:
Since the re-test meets requirements, this NCR can now be considered closed.

Approvals: Phil Heitzenroeder

Digitally signed by Phil Heitzenroeder
DN: CN = Phil Heitzenroeder, C = US, O = PPPL, OU = Mech. Eng. Division
Reason: I am approving this document
Date: 2005.11.07 10:09:58 -05'00'

Procurement Technical Representative

11/7/05

Responsible Line Manager:

Corrective Action 1423
Carondelet Division - CA / PA / RGA Database
Corrective Action Type NCR
Date 10/20/2005 **Revised 10-25-05**
CA Originator C. Ruud

Applies to: Weld Material Metrode Lot WO21735 and Lot WO19711 **used on C-2 and C-4 coils**.

Description of Defect / Non-Conformance
Material does not meet the requirements of NCSX CSPEC – 141-03-09.

Root Cause
The specification was to have included chemical ranges to accommodate the different kinds of weld material used and accepted for the weld procedure qualifications.

Corrective Action
Revise specification.

Estimated Completion Date

Actual Completion Date TBD

Signed: C. Ruud

CC: R. Suria, Barry Craig, Joe Edwards, E.J. Kubick

Nonconformance Report: 1423

Project Disposition:
Rev. 10 of NCSX-CSPEC-141-03 now includes two tables for weld wire chemistry (3-1 and 3-2) to permit the use of both bare weld wire and coated wire electrodes.

Approvals:

_____
Procurement Technical Representative

_____
Responsible Line Manager:

Corrective Action 1433
Carondelet Division - CA / PA / RGA Database
Corrective Action Type NCR
Date 10-27-05
CA Originator R. Suria
Applies to: C-4 Coil

Description of Defect / Non-Conformance
R-2 weld repairs. >.060" requirement not achieved on the inner rail.

Root Cause
Original casting defect that meet Level II requirements.

Corrective Action
Weld upgrade to meet the <.060 requirement.

Verification of Corrective Action
Re x-ray the defective welds.

Estimated Completion Date
10/27/05 for repairs.

Actual Completion Date
10/27/05

R Suria ok

Signed: R. Suria

CC: C Ruud, B. Craig, J. Edwards, E.J. Kubick

MetalTek INTERNATIONAL

Carondelet Division

8600 Commericial Blvd. - Pevely, MO 63070 USA
Phone: 636-479-4499 - Fax: 636-479-3399

Final Inspection Report

Customer Name: ENERGY INDUSTRIES OF OHIO

Pattern: MCWF-C 4 COIL

Order Number: PPPL-FP-LTS-2

ASTM Metal CF8MNMN MOD

Date 10/26/2005

Type Description	Cert Number	Procedure	Acceptance Criteria	Actual
Liquid Penetrant	S75920-3	CQP - 300 Rev 9	SEE NOTE	Acceptable
Notes Acceptance per ASTM A903. Acceptance criteria - level 1 for high stressed areas, level 2 for all other areas.				
Mag Perm	S75920-3	SOP Mag Perm 100 Rev 1	<1.02	Acceptable
Radiographic	S75920-3	Technique # 12726	MSS SP 54	Acceptable
Visual	S75920-3	CQP - 500 REV 4	ASTM A802 LEVEL 2	Acceptable

Liquid Penetrant

Technician: Jason Rees
ASNT Level II

Visual

Technician: Kevin Anderson
ASNT Level II

Respectfully Submitted,
Charles A. Ruud
Quality Assurance Manager

MetalTek INTERNATIONAL

Carondelet Division

8600 Commercial Blvd. - Pevely, MO 63070 USA
Phone: 636-479-4499 - Fax: 636-479-3399

Certificate of Conformance

ENERGY INDUSTRIES OF OHIO

Order Number PPPL-FP-LTS-2
Pattern MCWF-C 4 COIL
ASTM CF8MNMN MOD

Date 10/26/2005

Cert Number
S75920-3

We certify that we have complied in accordance with the drawings(s) and specifications(s) listed on the above purchase order. The articles furnished were made and/or processed from parts and/or materials in accordance with all applicable drawings(s) and specifications(s) pursuant to the afore mention purchase order.

Respectfully Submitted,
Charles A. Ruud
Quality Assurance Manager

MetalTek INTERNATIONAL

Carondelet Division
8600 Commericial Blvd. - Pevely, MO 63070 USA
Phone: 636-479-4499 - Fax: 636-479-3399

Final Inspection Report

Customer ENERGY INDUSTRIES OF OHIO

Pattern: SE-141-073 COIL C SHIM

S/N 3

Order PPPL-FP-LTS-2

ASTM Metal CF8MNMN MOD

Date 10/28/2005

Type Description	Cert Number	Procedure	Acceptance Criteria	Actual
Liquid Penetrant	S73220-2	CQP - 300 Rev 9	ASTM A903 Level II	Acceptable
Mag Perm	S73220-2	SOP Mag Perm 100 Rev 1	<1.02	Acceptable
Radiographic	S73220-2	Technique # 12726	MSS SP 54	Acceptable
Visual	S73220-2	CQP - 500 REV 4	ASTM A802 LEVEL 2	Acceptable

Liquid Penetrant
Technician: Kevin Anderson
ASNT Level II

Visual
Technician: Kevin Anderson
ASNT Level II

Respectfully Submitted,
Charles A. Ruud
Quality Assurance Manager

3

MetalTek INTERNATIONAL

Carondelet Division

8600 Commercial Blvd. - Pevely, MO 63070 USA
Phone: 636-479-4499 - Fax: 636-479-3399

Certificate of Conformance

ENERGY INDUSTRIES OF OHIO

Order Number	PPPL-FP-LTS-2	
Pattern	SE-141-073 COIL C SHIM	S/N 3
ASTM	CF8MNMN MOD	Date 10/28/2005

Cert Number

S73220-2

C shim for C-4 coil was poured from heat number 29198. No weld repairs were necessary.

We certify that we have complied in accordance with the drawings(s) and specifications(s) listed on the above purchase order. The articles furnished were made and/or processed from parts and/or materials in accordance with all applicable drawings(s) and specifications(s) pursuant to the afore mention purchase order.

Respectfully Submitted,
Charles A. Ruud
Quality Assurance Manager

11/26/04
Rev. 01

EIO
Energy Industries of Ohio
SUPPLIER QUALITY RELEASE

		Date: 10-31-05

I. General Information:			
Project Name:	Modular Coil Winding Form C4		
PO No:	NCSX-SOW-141-02-01	Rev.:	
Supplier:	MetalTek		
Procurement Agent:	EIO		
Shipment:	☒ Partial ☐ Final		

II. Material Description
Casting C4 Coil

III. Release Checklist		
Plan Requirements Complete?	☒ Yes ☐ No ☐ N/A	(If identified "No" provide explanation in comments section below)
Variances?	☒ Yes ☐ No ☐ N/A	(If identified "No" provide explanation in comments section below)
Princeton Notified of Shipment?	☒ Yes ☐ No ☐ N/A	(If identified "No" provide explanation in comments section below)
DCMA Notified of Shipment?	☒ Yes ☐ No ☐ N/A	(If identified "No" provide explanation in comments section below)
☒ Conditional ☐ Unconditional	Explain conditional releases in comments section.	

IV. Comments
Variances – See attached package for CA's and deviations Pending stress relief chart & final reports

By signing below you acknowledge that the casting has met all applicable standards and contractual requirements

V. Supplier Quality Representative Sign Off		
Charles Ruud	X	10-31-05
Supplier Quality Representative (SQR) Print/Type Name	Supplier Quality Representative (SQR) Signature	Date

VI. Supplier Approval For Shipment		
Procurement Agent Notified of Shipment	Date: 10-31-05	
Required Vendor Data Ready for Shipment	Date: 10-31-05	
Peter A Djordjevich	X	10-31-05

EIO
Energy Industries of Ohio
SUPPLIER QUALITY RELEASE

		Date: 10-31-05

I. General Information:			
Project Name:	Modular Coil Winding Form C4		
PO No:	NCSX-SOW-141-02-01	Rev.:	
Supplier:	MetalTek		
Procurement Agent:	EIO		
Shipment:	☒ Partial ☐ Final		
Supplier's Representative Print/Type Name	Supplier's Signature	Date	

1. Enter:
   Project Name
   PO Number
   Supplier
   Procurement Agent

2. Enter a brief description of items being released, including applicable drawing number(s), dash or item number(s), drawing revision letter, specification(s), and serial number(s).

3. Self-Explanatory

4. Record any unusual circumstance, such as a conditional release.

5. The Supplier's representative shall sign and date.

7. Signature and date of the Supplier's authorized representative indicating shipping date.

8. In case of partial release, the supplier shall maintain copies of each sequential "Supplier Quality Release" and establish complete accountability of material release on final shipment.

9. Supplier shall include a copy of the completed form with each shipment.

Energy Industries of Ohio

Contract # S005242-F

Modular Coil Winding Form

C-4 Documentation Package

Part 2

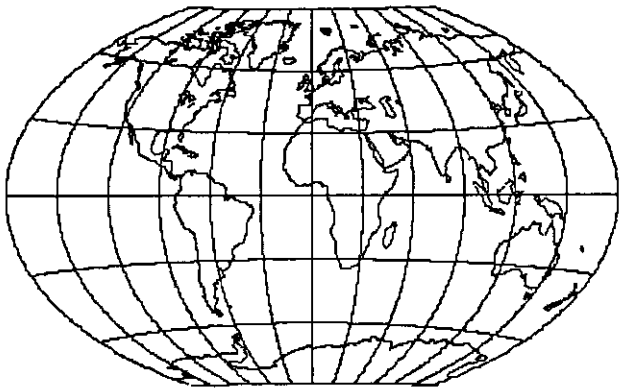
Major Tool & Machine

Revised 7/17/2006

****Note – The table of contents that follows a supplemental EIO TOC as an aide to locating documents. Documents may be duplicated in this package; 1st as an attachment to a NC (not listed) & the 2nd time in the order noted in the MTM TOC.**

C-4 Documentation Package

List of Documents 7-17-06



ENERGY INDUSTRIES OF OH

Purchase Order Number:

S005242-F

Part Number:

SE141-116

Part Name:

MCWF C-4

MTM Work Order Number:

65707/4.0

MTM Major Tool & Machine, Inc.

Customer: 8909 - ENERGY INDUSTRIES OF OHIO
Customer P.O.: S005242-F
Customer Part ID: SE141-116 - MCWF C-4

DS141-036 - STUD

Item#	Sub	Op	Pc	Document Description / Material Description / File Name / Heat Lot
11	4	10	30	Material Certification: THIS HARDWARE TO BE REPLACED / DS141-036 - STUD - MC108260.TIF / 8969595

DS141-060 - NUT

Item#	Sub	Op	Pc	Document Description / Material Description / File Name / Heat Lot
12	4	10	50	Material Certification: THIS HARDWARE TO BE REPLACED / DS141-060 - NUT - MC108258.TIF / 8977349

SE141-078 - POLOIDAL BREAK SHIM ASSEMBLY

Item#	Sub	Op	Pc	Document Description / Material Description / File Name / Heat Lot
13	2	30	20	Certificate of Conformance: MILL TEST REPORT / LOCTITE 411 - LOCKING COMPOUND - mc106229.tif / CERTIFIED

SE141-078-03 - INSULATING SLEEVE

Item#	Sub	Op	Pc	Document Description / Material Description / File Name / Heat Lot
14	3	10	10	Certificate of Conformance: / G11CR_1 - ROUND, BAR, 1.75 DIA - mc108545.tif / CERTIFIED

SE141-103

Item#	Sub	Op	Pc	Document Description / Material Description / File Name / Heat Lot
15	1	140		Inspection Data Checklist: 2 steps

SE141-103-1 - MOD COIL WINDING FORM ASSEMBLY TYPE-C

Item#	Sub	Op	Pc	Document Description / Material Description / File Name / Heat Lot
16	0	10	10	Material Certification: Trace ID: 113686 / ER316MNNF_093_GTAW - WELD WIRE,GTAW .093 DIA - mc106164.pdf / W020132 / WO20132
17	0	10	10	Material Certification: Trace ID: 116252 / ER316MNNF_093_GTAW - WELD WIRE,GTAW .093 DIA - mc106579.tif / W020132 / WO20132

SE141-103-4 - INSULATING SHEET

Item#	Sub	Op	Pc	Document Description / Material Description / File Name / Heat Lot
18	7	10	10	Certificate of Conformance: G11CR / G11CR_3 - SHEET, FLAT - mc107081.tif / CERTIFIED

SE141-103-5 - INSULATING SLEEVE

Customer: 8909 - ENERGY INDUSTRIES OF OHIO
Customer P.O.: S005242-F
Customer Part ID: SE141-116 - MCWF C-4

Item#	Sub	Op	Pc	Document Description / Material Description / File Name / Heat Lot
19	5	10	10	Certificate of Conformance: / G11CR_1 - ROUND, BAR, 1.75 DIA - Same as Item #14 / CERTIFIED

SE141-116 - WINDING FORM TYPE-C Qty: 1

Item#	Sub	Op	Pc	Document Description / Material Description / File Name / Heat Lot
20	1	15		Certification: PRELIMINARY RT INSPECTION - MC113899.TIF
21	1	85		Inspection Data Checklist: 6 steps
22	1	100		Nondestructive Liquid Penetrant Test Certification #16067
23	1	110		Map(s): RT MAP AND READER SHEET - MC119083.PDF
24	1	130		Inspection Data Checklist: 4 steps
25	1	132		Inspection Data Checklist: 83 steps
26	1	160		Inspection Data Checklist: 2 steps
27	11	20		Nondestructive Liquid Penetrant Test Certification #15604
28	12	30		Nondestructive Liquid Penetrant Test Certification #16147

SE141-137 - BEARING PLATE DETAIL

Item#	Sub	Op	Pc	Document Description / Material Description / File Name / Heat Lot
29	9	10	10	Material Certification: TO BE REPLACED - SEE NC19233 / 316_17 - BAR, FLAT, 1"X3", 316 SST - MC115096.TIF / M11443
30	9	40		Inspection Data Checklist: 1 steps

SE141-138 - BEARING PLATE DETAIL

Item#	Sub	Op	Pc	Document Description / Material Description / File Name / Heat Lot
31	10	10	10	Material Certification: TO BE REPLACED - SEE NC19234 / 316_17 - BAR, FLAT, 1"X3", 316 SST - Same as Item #29 / M11443
32	10	40		Inspection Data Checklist: 1 steps

CERTIFICATE OF CONFORMANCE

TO: ENERGY INDUSTRIES OF OHIO **DATE: 03/30/2006**

ATTENTION: Receiving Department

Seller certifies that:

Part Number: **SE141-116** Purchase Order: **S005242-F**

Part Name: **MCWF C-4** Workorder: **65707/4.0**

Part Serial Number: **C4** Quantity: **1**

1. These materials and/or parts were produced in conformance with all contractually applicable Government and/or Customer specifications referred in, or furnished with, the above Purchase Order.
2. The materials and/or parts furnished under the above Purchase Order were produced:

   [X] From materials furnished by Customer for the production of such parts.

   [X] From materials for which the seller has available for examination chemical and/or physical test reports or other evidence of conformance to applicable specifications.
3. All processes required in the production of these part and/or materials are listed below and were performed by a facility or personnel approved or certified by the Seller and the customer when such approval or certification is required by contract.

Certifications are on file at this plant.

Other Requirements:

MANUFACTURED PER B.P. SE141-103 REV. 3 AND P.O. REQUIREMENTS.

Signature: _____ Title: Quality Mgr. Date: 3/24/06

Activity	Visual Mfg Ref.	Op Status	Close Date	Emp ID
Manufacturing Planning- QA planning- Production Support	65707/4.0 -Sub:0 Op#:10	Closed	3/24/2006	339-E.Root
Final Inspection----Prepare part for source inspection.----Review and complete QA data package per QAP and the requirements of the product specification NCSX-CSPEC-141-03-05 September 23- 2004.--Contact CFT to review data package prior to notifying source inspection.	65707/4.0 -Sub:0 Op#:20	Closed	3/24/2006	339-E.Root
Source Inspection	65707/4.0 -Sub:0 Op#:30	Closed	3/24/2006	840-G.Masood
Package and Ship----Build a box/crate suitable for protecting the part from the environment.----Weigh the finished part and metal stamp the value in pounds on the casting in the area marked on the customer drawing.----Part must be protected and wrapped in plastic prior to inserting into the crate. Refer to PS583.----Part is to be shipped to PPPL in Princeton- NJ per QAP shipping address.----Crate must be marked/stenciled per the MTM drawing.	65707/4.0 -Sub:0 Op#:40	Closed	3/27/2006	406-P.Caito
RECEIVE CUSTOMER-SUPPIED CASTING----Part Number: SE141-116 Rev: 6--Part Description: PRODUCTION WINDING FORM TYPE-C	65707/4.0 -Sub:1 Op#:10	Closed	11/11/2005	437-J.Hiatt
THE -T- AREAS DEFINED AS -HIGH STRESS- ARE TO BE RT 100%. SEE PS581 FOR PROCESS INSTRUCTIONS.----HAND SKETCH A LAYOUT OF ALL FILM LOCATIONS ON SHEET (1) OF THE CUSTOMER DRAWING SE141-116 TO MAINTAIN SHOT AND FILM TRACEABILITY.----ALL FILM IS TO BE DOUBLED UP IN ORDER TO SUPPLY THE CUSTOMER WITH A COMPLETE SET OF FILM.----SPECIFICATIONS: ASTM A703/A703M SUPPLEMENTARY REQUIREMENT S5---- PROCEDURE/METHOD: ASTM E94 AND ASTM E142 (USE OF A WIRE PENETRAMETER MAY BE NECESSARY INSTEAD OF THE HOLE TYPE TO ENSURE OBJECTIVE 2% OF THICKNESS RESOLUTION/SENSITIVITY)----ACCEPTANCE CRITERIA: LESS THAN OR EQUAL TO .080- MAJOR DIMENSION IN THE WEB REGION OF THE TEE IS ACCEPTABLE.----SCAN RT CERTIFICATION- AND HAND SKETCHED MAP AND LINK IN QAP TO THIS OPERATION.---- Certification: RADIOGRAPHIC INSPECTION--Map(s): CUSTOMER DRAWING Rev: --Part Number: SE141-116 Rev: 6--Part Description: WINDING FORM TYPE-C--Material Type: 316 SST--Material Thickness: VARIES--Serial Number: C-4	65707/4.0 -Sub:1 Op#:15	Closed	11/10/2005	010-M.Contractor

Activity	Visual Mfg Ref.	Op Status	Close Date	Emp ID
SETUP AND MACHINE THE FLANGE FACES AND FLANGE PERIPHERY TO WITHIN .100- STOCK.	65707/4.0 -Sub:1 Op#:18	Closed	12/14/2005	806-R.Vannoy
SET CASTING ON RISERS WITH DATUM -E- FLANGE DOWN. ROUGH MACHINE OUTSIDE POLOIDAL BREAK FLANGES TO WITHIN .030- OF FINISH. MACHINE POLOIDAL BREAK THROUGH THE FLANGES AND CASTING WALL TO 2.050- LEAVING THE T SECTION TO BE CUT AT A LATER TIME.	65707/4.0 -Sub:1 Op#:20	Closed	1/22/2006	345-D.Sauser
USING TABS CUT FROM CUSTOMER SUPPLIED MATERIAL- WELD TEMPORARY SHIM IN PLACE. WELD TABS TO SHIM AND TABS TO CASTING. (DO NOT WELD SHIM DIRECTLY TO CASTING)--USE MACHINED QUALIFIERS TO HELP POSITION THE SHIM.	65707/4.0 -Sub:1 Op#:25	Closed	12/28/2005	465-J.Bever
SET UP FIXTURE PLATE MTMFX-3099 AND MACHINE LOCATING PADS AS NECESSARY.--SET UP CASTING WITH DATUM -E- AGAINST THE FIXTURE.--- MACHINE THE REMAINING PORTION OF THE POLOIDAL BREAK TO 2.050-.--- FINISH MACHINE DATUM -D- WING SURFACES AND ALL AREAS BELOW THE T SECTION.--- MACHINE T SECTION TO WITHIN .030-.--- FINISH MACHINE DATUM -D- FLANGE.--	65707/4.0 -Sub:1 Op#:30	Closed	1/23/2006	345-D.Sauser
SET UP FIXTURE PLATE MTMFX-3100 AND MACHINE LOCATING PADS AS NECESSARY.--SET UP CASTING WITH DATUM -D- AGAINST THE FIXTURE.--- FINISH MACHINE DATUM -E- WING SURFACES AND ALL AREAS BELOW THE T SECTION.--- MACHINE T SECTION TO WITHIN .030-.--- FINISH MACHINE DATUM -E- FLANGE.--	65707/4.0 -Sub:1 Op#:35	Closed	2/9/2006	345-D.Sauser
CD-1 (SETUP 1)--SET UP MTMFX-3099 ON ANGLE PLATE.--LOAD PART WITH DATUM -D- FLANGE UP.--VERIFY FLATNESS OF DATUM -D- FACE AND RECORD RESULTS IN IDC (SEE LINKED DATUM -D- MAP)--RECORD TOOLING BALL LOCATIONS IN IDC.--COMPLETE ALL PROGRAMS FOR SETUP 1.	65707/4.0 -Sub:1 Op#:50	Closed	2/20/2006	445-J.Purkhiser
CD-2 (SETUP 2)--SET CASTING ON RISERS WITH DATUM -D- FLANGE UP. --RECORD TOOLING BALL LOCATIONS IN IDC. COMPLETE ALL PROGRAMS FOR SETUP 2.	65707/4.0 -Sub:1 Op#:55	Closed	2/24/2006	315-C.Land
CE-2 (SETUP 4)--SET CASTING ON RISERS WITH DATUM -E- FLANGE UP. --RECORD TOOLING BALL LOCATIONS IN IDC. --COMPLETE ALL PROGRAMS FOR SETUP 4.	65707/4.0 -Sub:1 Op#:60	Closed	3/2/2006	744-P.Schumacher

Activity	Visual Mfg Ref.	Op Status	Close Date	Emp ID
CE-1 (SETUP 3)--SET UP MTMFX-3100 ON ANGLE PLATE.--LOAD PART WITH DATUM -E- FLANGE UP.--VERIFY FLATNESS OF DATUM -E- FACE AND RECORD RESULTS ON IDC (SEE LINKED DATUM -E- MAP)--RECORD TOOLING BALL LOCATIONS IN IDC.--COMPLETE ALL PROGRAMS FOR SETUP 3.--	65707/4.0 -Sub:1 Op#:70	Closed	3/8/2006	744-P.Schumacher
PROTECT PART FROM METAL CONTAMINATION DUE TO CONTACT WITH IRON- SPECIFICALLY WHEN RIGGING PART FOR MOVEMENT.--ALL GRINDING WHEELS AND DISKS MUST BE VIRGIN MATERIAL NOT PREVIOUSLY USED ON ANY OTHER MATERIAL TO AVOID MATERIAL CONTAMINATION.----- FINISH HAND TAPPING OF 3/8-16 HOLES USING TAP GUIDE (IF REQUIRED)--- START BLENDING T-SECTION---HAND GRIND 1/16 CHAMFER ON ALL SPLIT LINE EDGES OF POLOIDAL BREAK AND ON ALL THRU HOLES AT POLOIDAL BREAK.---HAND GRIND VPI GROOVE WHERE REQUIRED.--- DEBURR WING AREAS TO REMOVE ANY SHARPNESS FROM MACHINING (SCALLOPS DO NOT NEED TO BE REMOVED).--- CHECK ALL ACCESSIBLE T CLEARANCES USING MTMFX-3473 CHECKING FIXTURE--- HAND GRIND 1/16 TO 3/32 CHAMFER ON OUTER EDGE OF T IN ALL ACCESSIBLE AREAS.--	65707/4.0 -Sub:1 Op#:75	Closed	3/26/2006	219-T.Laird

Activity	Visual Mfg Ref.	Op Status	Close Date	Emp ID
POLOIDAL BREAK OPERATION (SETUP 5)--- INSTALL MTMFX-3099 ON RISERS. --- TACK WELD FIXTURE TO RISER BLOCKS TO PREVENT MOVEMENT.--- LOAD PART ON FIXTURE WITH DATUM -D- FLANGE UP. --- TACK WELD DATUM -E- FLANGE TO THE FIXTURE ON EITHER SIDE OF THE POLOIDAL BREAK.--- TACK WELD BRACING TO PREVENT MOVEMENT OF THE POLOIDAL BREAK WHEN THE TEMPORARY SHIM IS REMOVED. TABS MADE FROM THE CASTING MATERIAL ARE TO BE WELDED TO THE BRACING AND THEN THE TABS WELDED TO THE CASTING.--- RECORD TOOLING BALL LOCATIONS IN IDC. --- REMOVE SHIM AND FINISH MACHINE POLOIDAL BREAK.--- INSTALL DRILL FIXTURE AND COMPLETE GUN DRILLING OPERATION.--- COMPLETE ALL REMAINING PROGRAMS FOR SETUP 5.--- REMOVE THE DRILL FIXTURE AND INSTALL THE TWO TAPERED PINS. PLACE ALUMINUM BLOCKS IN THE POLOIDAL BREAK AND CLAMP OVER THE BLOCKS TO MINIMIZE ANY MOVEMENT DURING HANDLING. --- VERIFY THAT QUALIFIERS HAVE BEEN CUT ON THE OUTER DIAMETERS OF THE -D- AND -E- FLANGES ACROSS THE POLOIDAL BREAK. THIS WILL BE USED FOR ALIGNMENT DURING THE ASSEMBLY OPERATION.--- CUT THE TACKS AND BRACING LOOSE AND REMOVE THE PART FROM THE FI	65707/4.0 -Sub:1 Op#:80	Closed	3/17/2006	631-J.Pond
PROTECT PART FROM METAL CONTAMINATION DUE TO CONTACT WITH IRON- SPECIFICALLY WHEN RIGGING PART FOR MOVEMENT.--- ALL GRINDING WHEELS AND DISKS MUST BE VIRGIN MATERIAL NOT PREVIOUSLY USED ON ANY OTHER MATERIAL TO AVOID MATERIAL CONTAMINATION.----- FLIP PART AND SET UP ON DATUM -D-.--- START BLENDING T SECTION--- DEBURR WING AREAS TO REMOVE ANY SHARPNESS FROM MACHINING (SCALLOPS DO NOT NEED TO BE REMOVED).--- CHECK ALL ACCESSIBLE T CLEARANCES USING MTMFX-3473 CHECKING FIXTURE--- HAND GRIND 1/16 TO 3/32 CHAMFER ON OUTER EDGE OF T IN ALL ACCESSIBLE AREAS.--- USING 1/4- NUMBERS- STAMP NUMBERS ON FACE OF T PER DRAWING. USE DRAWING SE141-116-2MTM REV 6A FOR STAMPING NUMBERS.----	65707/4.0 -Sub:1 Op#:85	Closed	3/26/2006	219-T.Laird

Activity	Visual Mfg Ref.	Op Status	Close Date	Emp ID
HAND GRIND VPI GROOVE AND AREAS OF CAST STOCK THAT WERE NOT REMOVED BY MACHINING. SEE ROB BACKEK FOR DETAILS.	65707/4.0 -Sub:1 Op#:88	Closed	3/19/2006	837-J.Deverter
PROTECT PART FROM METAL CONTAMINATION DUE TO CONTACT WITH IRON- SPECIFICALLY WHEN RIGGING PART FOR MOVEMENT.--MOVE PART INTO WASH BOOTH. --THOROUGHLY CLEAN AND DRY ALL SURFACES AND HOLES PER SECTION 9 OF PS583. --PARTS TO BE WASHED USING HEATED- DE-MINERALIZED WATER- AND IF NECESSARY- A MILD NON-CHLORINATED CLEANING SOLUTION (E.G. SIMPLE GREEN®- OR AUTHORIZED EQUIVALENT)- USING MTM'S HIGH PRESSURE WASHER. THE SPRAY PRESSURE AT THE NOZZLE WILL BE APPROXIMATELY 1-000 TO 1-500 PSI AND THE CLEANING SOLUTION TEMPERATURE WILL BE APPROXIMATELY 150°F.--HAVE INSPECTION VERIFY THE CLEANLINESS OF THE CASTING PRIOR TO REMOVING FROM THE WASH BOOTH.--	65707/4.0 -Sub:1 Op#:90	Closed	3/18/2006	524-G.Davis
PT 100% OF FINISHED MACHINED SURFACES ONLY. SEE PS582 FOR PROCESSING INSTRUCTIONS. ----ANY REJECTABLE INDICATIONS IN THE MACHINED SURFACES MUST BE NUMBERED AND A DIGITAL PHOTO TAKEN OF THE DEFECT. THE SIZE OF EACH REJETABLE INDICATION MUST BE RECORDED AND THE LOCATION IS TO BE DESCRIBED ON THE NONCONFORMANCE USING THE HOLE NUMBERS FROM THE T SECTION. EMAIL PHOTOS TO MIKE GRIFFITH AND KEVIN BOWLING.----IF THERE ARE REJECTABLE INDICATIONS; TAKE THE PHOTOS- COMPLETE THE NONCONFORMANCE AND CLOSE OUT THE OPERATION FOR CONTINUED PROCESSING OF THE PART TO THE NEXT OPERATION.----MTM CERTIFICATION TO INCLUDE THE INFORMATION PER SUPPLEMENTARY REQUIREMENTS S1 OF ASTM A903/A903M----MTM NDT Cert: LPI CERTIFICATION--Specification: ASTM A903/A903M--Method: E165--Acceptance: ASTM A903/A903M LEVEL 1	65707/4.0 -Sub:1 Op#:100	Closed	3/19/2006	674-S.Williams
GOVERNMENT SOURCE INSPECTOR TO WITNESS PT RESULTS.	65707/4.0 -Sub:1 Op#:101	Closed	3/24/2006	840-G.Masood

Activity	Visual Mfg Ref.	Op Status	Close Date	Emp ID
THE -T- AREAS DEFINED AS -HIGH STRESS- ARE TO BE RT 100%. SEE PS581 FOR PROCESS INSTRUCTIONS.----HAND SKETCH A LAYOUT OF ALL FILM LOCATIONS ON ATTACHED RT MAP. ----ALL FILM IS TO BE DOUBLED UP IN ORDER TO SUPPLY THE CUSTOMER WITH A COMPLETE SET OF FILM.----SPECIFICATIONS: ASTM A703/A703M SUPPLEMENTARY REQUIREMENT S5---- PROCEDURE/METHOD: ASTM E94 AND ASTM E142 (USE OF A WIRE PENETRAMETER MAY BE NECESSARY INSTEAD OF THE HOLE TYPE TO ENSURE OBJECTIVE 2% OF THICKNESS RESOLUTION/SENSITIVITY)----ACCEPTANCE CRITERIA: NO DEFECT LARGER THAN .080- MAJOR DIMENSION IS ALLOWED.----SCAN RT CERTIFICATION- AND HAND SKETCHED MAP AND LINK IN QAP TO THIS OPERATION.----Certification: RADIOGRAPHIC INSPECTION--Map(s): RT MAP Rev: --Part Number: SE141-116 Rev: 8--Part Description: WINDING FORM TYPE-C--Material Type: 316 SST--Material Thickness: VARIES	65707/4.0 -Sub:1 Op#:110	Closed	3/22/2006	010-M.Contractor
GOVERNMENT SOURCE INSPECTOR TO WITNESS RT RESULTS.	65707/4.0 -Sub:1 Op#:111	Closed	3/24/2006	840-G.Masood
SET PART ON RISERS WITH DATUM -D- FLANGE DOWN. PLACE A RISER ON EITHER SIDE OF THE POLOIDAL BREAK TO ENABLE CLAMPING TO ENSURE THAT THE DATUMS ARE COPLANER. LAY A STRAIGHT EDGE ACROSS THE DATUM -D- FLANGE TO VERIFY ALIGNMENT. ENSURE RADIAL ALIGNMENT BY LAYING A STRAIGHT EDGE ACROSS THE QUALIFIERS CUT ON THE OD OF EACH FLANGE. USE CLAMPS AS NECESSARY TO FORCE THE CASTING INTO POSITION.--ONCE THE ALIGNMENT IS SET- INSTALL THE POLOIDAL BREAK SHIM ASSEMBLY AND ACCOMPANYING HARDWARE AND INSULATION PER THE ASSEMBLY DRAWING.--VERIFY CLEARANCE OF Ø.001- - Ø.002 BETWEEN BUSHING AND BOLT PER DRAWING NOTE 13. RECORD RESULTS IN IDC.--APPLY THRED-GARD ANTI-SEIZE TO HARDWARE PER DRAWING NOTE 10.--TORQUE THE ASSEBMLY TO 1500 FT-LBS.--VERIFY GAP AT POLOIDAL BREAK PER IDC.--Part Number: SE141-116 Rev: 8--Part Description: WINDING FORM TYPE-C	65707/4.0 -Sub:1 Op#:130	Closed	3/19/2006	825-B.Jarrett

Activity	Visual Mfg Ref.	Op Status	Close Date	Emp ID
CMM INSPECT AND COMPLETE IDC. OUTPUT INSPECTION RESULTS FOR VERIFICATION USING VERISURF SOFTWARE.----Part Number: SE141-116 Rev: 8--Part Description: WINDING FORM TYPE-C	65707/4.0 -Sub:1 Op#:132	Closed	3/24/2006	339-E.Root
SOURCE FOR DIMENSIONAL	65707/4.0 -Sub:1 Op#:133	Closed	3/24/2006	840-G.Masood
THE RESISTANCE OF THE MID-PLANE ELECTRICAL INSULATION SHALL BE GREATER THAN 500 KOHMS WHEN TESTED AT 100 VDC.----TEST 1:--THE INSULATION RESISTANCE BETWEEN THE MID-PLANE POLOIDAL BREAK SHIM AND WINDING FORM SHALL BE MEASURED. DURING THIS TEST- THE BOLTS SHOULD BE IN THEIR NORMAL STATE (I.E.- ELECTRICALLY -FLOATING-). THE MID-PLANE SHIM SHALL BE CONNECTED TO ONE SIDE OF THE MEGGER- AND THE CASTING SHALL BE CONNECTED TO THE OTHER. RECORD RESULTS IN IDC.----TEST 2:--ALL OF THE BOLTS SHALL BE ELECTRICALLY CONNECTED (JUMPERED) TOGETHER IN ONE GROUP. THE MID-PLANE CASTING (SHIM) AND THE WINDING FORM SHALL BE ELECTRICALLY CONNECTED TOGETHER IN A SECOND GROUP. THE INSULATION RESISTANCE BETWEEN THE JUMPERED BOLTS (GROUP 1) AND THE JUMPERED WINDING FORM AND MID-PLANE (GROUP 2) SHALL BE MEASURED FOR COMPLIANCE. RECORD RESULTS IN IDC.----Part Number: SE141-103--Part Description: MCWF ASSEMBLY TYPE-C	65707/4.0 -Sub:1 Op#:140	Closed	3/23/2006	503-B.Houk
SOURCE FOR ELECTRICAL TEST	65707/4.0 -Sub:1 Op#:150	Closed	3/24/2006	840-G.Masood

Activity	Visual Mfg Ref.	Op Status	Close Date	Emp ID
PERFORM A MAG PERMEABILITY CHECK OF THE MACHINED SURFACES USING A SEVERN PERMEABILITY INDICATOR GAGE. PERMEABILITY SHOULD BE NO GREATER THAN 1.02µ.----CHECK THE PERMEABILITY IN 3 PLACES ON EACH SIDE OF THE T SECTION AT LOCATIONS ADJACENT TO EVERY 5TH HOLE STARTING WITH HOLE 5 AND ENDING WITH HOLE 95. INSPECT ONE POINT ON THE T SECTON- ANOTHER BELOW THE VPI GROOVE AND THE LAST POINT ON THE FLANGE. REPEAT THIS PROCESS ON BOTH SIDES OF THE PART. THERE WILL BE A TOTAL OF 57 POINTS INSPECTED PER SIDE. ----COMPLETE THE IDC INDICATING THE PERMEABILITY RANGE.--Part Number: SE141-116 Rev: 8--Part Description: PRODUCTION WINDING FORM TYPE-C	65707/4.0 -Sub:1 Op#:160	Closed	3/23/2006	503-B.Houk
SOURCE FOR MAG PERMEABILITY	65707/4.0 -Sub:1 Op#:170	Closed	3/24/2006	840-G.Masood
WELD REPAIR TOOL GOUGE AND GRIND ANY EXCESS WELD BACK FLUSH TO THE SURROUNDING FINISH MACHINED SURFACES (ALL MACHINED SURFACES SHOULD HAVE A MINIMUM OF .030- STOCK).	65707/4.0 -Sub:11 Op#:10	Closed	2/9/2006	854-R.Upchurch
PENETRANT INSPECT WELD REPAIR.--Specification: ASTM A903/A903M LEVEL 1--MTM NDT Cert: REPAIR OF DEFECT NC19209	65707/4.0 -Sub:11 Op#:20	Closed	2/10/2006	674-S.Williams
PERFORM A RELATIVE MAGNETIC PERMEABILITY CHECK OF THE REPAIRED AREA. VERIFY PERMEABILITY IS LESS THAN 1.02. PERMEABILITY TO BE CHECKED AT A MINIMUM OF 1 POINT EVERY 2 SQR. INCHES IN THE REPAIRED REGION.--Test Certification: PERMEABILITY CHECK - NC19209 Rev: --Specification: ASTM A703/A703M	65707/4.0 -Sub:11 Op#:30	Closed	2/9/2006	854-R.Upchurch
WELD REPAIR CASTING NON-CLEANUP AREA AND GRIND FLUSH WITH ADJACENT SURFACES.	65707/4.0 -Sub:11 Op#:40	Closed	2/10/2006	352-J.Spencer

Activity	Visual Mfg Ref.	Op Status	Close Date	Emp ID
PLACE INDICATORS ON AND AROUND THE T SECTION OF THE PART TO MONITOR ANY MOVEMENT DURING THE WELDING PROCESS.----WELD THE TOOLING GOUGE AND WATCH FOR ANY MOVEMENT OF THE -T-. IF THE INDICATORS SHOW MORE THAN .005- MOVEMENT AFTER THE PART HAS COOLED THEN WELD ON THE BASE OPPOSITE THE -T- TO DRAW THE PART BACK INTO POSITION.--REPEAT THIS PROCESS AS REQUIRED UNTIL THE ENTIRE GOUGE HAS BEEN REPAIRED.----FINISHING GRINDING OF THE REPAIRED AREA WILL BE PERFORMED BY THE DEBURR PERSONNEL.	65707/4.0 -Sub:12 Op#:10	Closed	3/24/2006	233-G.Stupples
GRIND THE WELD REPAIRED AREAS FLUSH TO THE SURROUNDING FINISHED MACHINED SURFACES. USE A STRAIGHT EDGE TO VERIFY THAT THE PROFILE OF THE REPAIRED AREAS IS WITHIN .010- OF THE EXISTING MACHINED AREAS.	65707/4.0 -Sub:12 Op#:20	Closed	3/8/2006	578-S.Martinez
PENETRANT INSPECT WELD REPAIR.--Specification: ASTM A903/A903M LEVEL 1--MTM NDT Cert: REPAIR OF DEFECT NC19321	65707/4.0 -Sub:12 Op#:30	Closed	3/24/2006	840-G.Masood
PERFORM A RELATIVE MAGNETIC PERMEABILITY CHECK OF THE REPAIRED AREA. VERIFY PERMEABILITY IS LESS THAN 1.02. PERMEABILITY TO BE CHECKED AT A MINIMUM OF 1 POINT EVERY 2 SQR. INCHES IN THE REPAIRED REGION.--Test Certification: PERMEABILITY CHECK - NC19321 Rev: --Specification: ASTM A703/A703M	65707/4.0 -Sub:12 Op#:40	Closed	3/24/2006	503-B.Houk
RECEIVE CUSTOMER SUPPLIED CASTING	65707/4.0 -Sub:2 Op#:10	Closed	1/14/2006	854-R.Upchurch
MACHINE THE SHIM COMPLETE PER THE DRAWING AND CNC PROGRAMS.	65707/4.0 -Sub:2 Op#:20	Closed	2/3/2006	506-R.Liston
ASSEMBLE (5) OF THE INSULATING SLEEVES INTO THE SHIM AND BOND USING LOCTITE 411. DO NOT INSTALL THE BUSHINGS IN THE OUTSIDE HOLES. THEY WILL BE INSTALLED LATER.	65707/4.0 -Sub:2 Op#:30	Closed	3/17/2006	821-J.Leggins
SAW OFF 16- AND MOVE TO NEXT WORK CENTER.	65707/4.0 -Sub:3 Op#:10	Closed	6/4/2005	227-D.Bockover
MACHINE PER THE DRAWING FOR A SLIP FIT WITH MATING DETAIL. OBTAIN FINISHED MACHINED CASTING SHIM BEFORE FINAL SIZING THE O.D. OF THE SLEEVE.	65707/4.0 -Sub:3 Op#:20	Closed	3/17/2006	821-J.Leggins

Activity	Visual Mfg Ref.	Op Status	Close Date	Emp ID
RECEIVE MATERIAL--NOTIFY CFT AND FORWARD MATERIAL STORES.	65707/4.0 -Sub:4 Op#:10	Closed	5/19/2005	825-B.Jarrett
SAW OFF 30- LENGTH AND MOVE TO NEXT WORK CENTER.	65707/4.0 -Sub:5 Op#:10	Closed	6/4/2005	227-D.Bockover
MACHINE PER THE DRAWING FOR A SLIP FIT WITH MATING DETAIL. CHECK FINISHED MACHINED CASTING BEFORE FINAL SIZING THE O.D. OF THE SLEEVE.	65707/4.0 -Sub:5 Op#:20	Closed	3/17/2006	821-J.Leggins
RECEIVE MATERIAL	65707/4.0 -Sub:7 Op#:10	Closed	4/5/2005	131-W.Allen
MACHINE THE PROFILE LEAVING STOCK PER PROGRAM.----ALSO MACHINE OUT FLAT STOCK PIECES FOR SHIMS BEHIND THE OUTSIDE OF POLOIDAL BREAK FLANGE PER CNC PROGRAM.	65707/4.0 -Sub:7 Op#:20	Closed	9/14/2005	129-E.Taina
VERIFICATION OF THE PERMEABILITY OF THE RAW MATERIAL TO BE DONE UNDER SUB 10 OPERATION 10.--SAW TO A LENGTH OF 6.75-.	65707/4.0 -Sub:9 Op#:10	Closed	1/10/2006	227-D.Bockover
MACHINE BEARING PLATES COMPLETE FROM MATERIAL SUPPLIED BY MAJOR TOOL.--VENDOR TO SUPPLY DIMENSIONAL INSPECTION REPORT.--MTM TO DO ALL NDT TESTING PER NOTE 5.--Part Number: SE141-137 Rev: 1--Part Description: BEARING PLATE--Dimensional Report: VENDOR SUPPLIED--Dimensional Report: VENDOR SUPPLIED	65707/4.0 -Sub:9 Op#:30	Closed	2/7/2006	Subcontract
PERFORM A MAGNETIC PERMEABILITY CHECK USING A SEVERN PERMEABILITY INDICATOR GAGE. PERMEABILITY SHOULD BE NO GREATER THAN 1.03µ.--Part Number: SE141-137 Rev: 1--Part Description: BEARING PLATE DETAIL	65707/4.0 -Sub:9 Op#:40	Closed	2/8/2006	503-B.Houk
PRIOR TO SAWING- HAVE QUALITY VERIFY THE MAG PERMEABILITY OF THE RAW MATERIAL. PERMEABILITY IS NOT TO EXCEED 1.03µ. PERFORM THE MAGNETIC PERMEABILITY CHECK ON THE RAW MATERIAL USING A SEVERN PERMEABILITY INDICATOR GAGE. TIME HAS BEEN ADDED TO THE SAW SEQUENCE TO ALLOW QUALITY TO CLOCK IN TO PERFORM THE CHECK.----IF THE PERMEABILITY DOES NOT EXCEED 1.03µ.- SAW TO A LENGTH OF 10.5-.	65707/4.0 -Sub:10 Op#:10	Closed	1/10/2006	227-D.Bockover

Activity	Visual Mfg Ref.	Op Status	Close Date	Emp ID
MACHINE BEARING PLATES COMPLETE FROM MATERIAL SUPPLIED BY MAJOR TOOL.--VENDOR TO SUPPLY DIMENSIONAL INSPECTION REPORT.--MTM TO DO ALL NDT TESTING PER NOTE 5.--Part Number: SE141-138 Rev: 1--Part Description: BEARING PLATE--Dimensional Report: VENDOR SUPPLIED--Dimensional Report: VENDOR SUPPLIED	65707/4.0 -Sub:10 Op#:30	Closed	2/7/2006	Subcontract
PERFORM A MAGNETIC PERMEABILITY CHECK USING A SEVERN PERMEABILITY INDICATOR GAGE. PERMEABILITY SHOULD BE NO GREATER THAN 1.03µ.--Part Number: SE141-138 Rev: 1--Part Description: BEARING PLATE DETAIL	65707/4.0 -Sub:10 Op#:40	Closed	2/8/2006	503-B.Houk
GRIND AS-CAST AREA PER DIRECTION FROM MIKE GRIFFITH.	65707/4.0 -Sub:13 Op#:10	Closed	3/25/2006	524-G.Davis

Major Tool & Machine, Inc.
1458 East 19th Street
Indianapolis, IN 46218-4289

MTM N/C: 19209

Date: 02/09/06
User ID: GRIFFITH

Customer: ENERGY INDUSTRIES OF OHIO
Contact: NANCY HORTON — Telephone: 216-496-2314
E-Mail: NKHFlowen@aol.com — Fax: 216-328-2001

Part: SE141-116 / MODULAR COIL WINDING FORM TYPE — Customer P.O.: S005242-F/Ln:4
Drawing ID: SE141-116 — Revision: 7 — Serial No./Qty: C4
Links: I-Type:W: 65707/4.0 Sub: I Op: 35

Reported By: MIKE GRIFFITH — Telephone: 317-636-6433
E-Mail: mGriffith@MajorTool.com — Fax: 317-634-9420

Problem: TOOL GOUGE APPROXIMATELY 1.5" LONG X .5" WIDE AND .250" DEEP ON THE CORNER OF THE T. GOUGE IS LOCATED ON THE DATUM -D- SIDE (SEE PICTURES).

Proposed Disposition:
RECOMMEND WELD REPAIR OF DEFECTIVE AREA PRIOR TO FINISH MACHINING.
ALSO RECOMMEND REPAIR TO BE INSPECTED USING PT AND MAG PERMEABILITY CHECK WITH WAIVER OF THE X-RAY REQUIREMENT.

Number of additional pages: 2 attached pictures

Customer Disposition: **[ ] Use As Is** **[ ] Rework** **[ ] Repair** **[ ] Scrap** **[ ] Replace**

PPPL concurs with Major Tools recommended disposition.

Technical Contact Approval: Phil Heitzenroeder — Digitally signed by Phil Heitzenroeder DN: CN = Phil Heitzenroeder, C = US, O = PPPL, OU = Mech. Eng. Division Reason: I am approving this document Date: 2006.02.10 16:31:49 -05'00' — **Title:** _____ **Date:** _____

RLM: Brad Nelson — Digitally signed by Brad Nelson DN: cn=Brad Nelson, c=US, o=ORNL, ou=FED, email=nelsonbe@ornl.gov Date: 2006.02.10 17:50:02 -05'00' — **Title:** _____ **Date:** _____

Major Tool Implemented By: Mike Griffith Title: QFT. ENGINEER Date: 2-10-06

Root Cause1: 803-INEFFECTIVE TRAINING

Resource: CAD/CAM – LARGE MILLING Equipment:
Description: THE TOOL-GOUGE OCCURRED AS A RESULT OF A PROGRAMMING ERROR. PROGRAMS HAD BEEN MODIFIED TO HELP REDUCE MACHINING CYCLE. THE NEW PROGRAM WAS VERIFIED USING VERICUT PRIOR TO RELEASING TO THE MACHINE. THE PROGRAMMER AGAIN VERIFIED THE PROGRAM AFTER THE GOUGE OCCURRED AND DISCOVERED THAT THE ERROR HAD BEEN DETECTED BY VERICUT. THE PROGRAMMER WAS NOT CORRECTLY INTERPRETING THE RESULTS FROM THE VERIFICATION PROCESS.

Corrective Action 1: Action: 02/09/06 By: 242-M.GRIFFITH

Description: THE PROGRAMMER HAS BEEN GIVEN ADDITIONAL TRAINING ON THE USE OF VERICUT AND FULLY UNDERSTANDS HOW THE ERROR WAS MISSED.

Major Tool & Machine, Inc.
1458 E. 19th Street, Indianapolis, In 4621
TEL:(317)636-6433 FAX:(317)634-9420

Nondestructive Test
Certification for Liquid Penetrant Examination

Date of Inspection: 02/10/2006 **Type of Material:** 316_17 **NDT#:** 15604

Stage of Inspection:	Manufacturing Process:	Surface Condition:	Test Being Run to:	Heat Treated:
[ ] Incoming Inspection	[x] Weldment [ ] Casting	[ ] Machined	[x] Router Instructions	[ ] Yes
[x] In-Process Inspection	[ ] Bar Stock [ ] Plate	[x] Rough	[ ] Drawing	[x] No
[ ] After Repair	[ ] Forging [ ] Other	[ ] Other	[ ] Test Plan	
[ ] Final Inspection			[ ] Technique Card	

Part Information:
- **MTM Job Number:** 65707/4.0 -Sub:11 -Op:20
- **Resource ID:** 810-LIQUID PENETRANT INSPECTI
- **Part ID:** SE141-103-1
- **Part Name:** MOD COIL WINDING FORM ASSE
- **Serial Number:**
- **Customer P.O.:** S005242-F
- **Customer Unit/Plant:**

Test Results:
- **Quantity Inspected:** 1
- **Quantity Accepted:** 1
- **Quantity Rejected:** 0
- **Run Hours:**

Customer Inspection Pl
- **Test Step:**
- **Revision:**
- **Material Test Number:**

Inspection Criteria:
- **Customer Specification:** ASTM A903/903M LEVEL1
- **MTM Spec Number:** NDT-WI-009
- **Acceptance Standard:** NO DEFECTS

Inspection Materials Used:
- **Manufacturer:** SHERWIN CORP.
- **Type of Penetrant:** DP-51
- **Batch Number:** 41-E47
- **Developer:** D-100
- **Batch Number:** 520-H6

Penetrant Examination Processes:
- **Type:** II (Visible) / Dwell Time: 30 Minutes
- **Method:** A (Water Wash)
- **Method of Drying:** Normal Evaporation
- **Form:** e (nonaqueous for Type II visible dye) / Dwell Time: 30 Min

Inspection Requirements:

% of all accessible surfaces [ ] Joint Preps [x] Root Pass [x] Back Gouge [x] Cover Pass [ ] Other

Notes:
INSPECT WELD REPAIR.

NO REJECTABLE INDICATIONS AT TIME OF INSPECTION.

This is a LPI check in reference to NC 19209.

This is to certify that the pieces specified have been inspected in accordance with the specifications shown.

Inspector: 674-S.WILLIAMS **Date:** 02/10/2006 Sylvester Williams Level II PT

Workorder: 65707/4-0 Sub:11 Op:30

Revision: 03/06/06 7:44

Part: REWORK - REWORK / REPAIR PER N/C - N/C #

Drawing ID: SE141-116 Rev: 8			INSPECTION INSTRUCTIONS			RESULTS		INSPECTED BY			
SHEET	ZONE	CHARACTERISTIC	GAGE/EQUIP	BY	SAMPLE	SER#	DATA/REMARKS	INSP	VERFD	AUDIT	
(10)		N C 19209 RECORD PERMEABILITY READINGS OF THE REPAIRED AREA. MAG PERMEABILITY TO BE NO GREATER THAN 1.02μ.	MASTER GAGE	QA		J-1165	<1.02	854-R.UP 03-08-06			A

Employees: 854-R.Upchurch

* To Far Right Indicates Data Package Requirement

NOTE: the recording of false, fictitious, or fraudulent statements or entries on this document may be punished as a felony under federal statutes including federal law, title 18, chapter 47.

Major Tool & Machine, Inc.
1458 East 19th Street
Indianapolis, IN 46218-4289

MTM N/C: 19233

Date: 02/17/06
User ID: GRIFFITH

Customer: ENERGY INDUSTRIES OF OHIO
Contact: NANCY HORTON
E-Mail: NKHFlowen@aol.com
Telephone: 216-496-2314
Fax: 216-328-2001

Part: SE141-137 /
Drawing ID: SE141-137
Revision: 1
Customer P.O.: S005242-F/Ln:4
Serial No./Qty: 12 PCS.

Reported By: MIKE GRIFFITH
E-Mail: mGriffith@MajorTool.com
Telephone: 317-636-6433
Fax: 317-634-9420

Problem: PER RFD 14-011 MAGNETIC PERMEABILITY TO BE NO GREATER THAN 1.03.
BEARING PLATES FOR C4, C5 AND C6 CHECK BETWEEN 1.03 AND 1.05.

Proposed Disposition:
PROPOSE TO USE AS IS.

Number of additional pages: _____

Customer Disposition: [ ] Use As Is [x] Rework [ ] Repair [ ] Scrap [ ] Replace

The material specified for the bearing plates will be changed to Stellalloy. The bearing plates for all MCWFs except C1, C2, C3 (already been accepted by NCSX) shall be made of Stellalloy.

Major Tool Implemented By: [signature] Title: QT ENGINEER Date: 3/23/06
PER ATTACHED EMAIL, PARTS WILL BE SHIPPED WITH HIGH PERMEABILITY BEARING PLATES UNTIL NEW PLATES ARE AVAILABLE.

Approved by:

Phil Heitzenroeder
Digitally signed by Phil Heitzenroeder
DN: CN = Phil Heitzenroeder, C = US, O = PPPL, OU = Mech. Eng. Division
Reason: I agree to the terms defined by the placement of my signature on this document
Date: 2006.03.20 17:27:05 -05'00'

Brad Nelson
Digitally signed by Brad Nelson
DN: cn=Brad Nelson, c=US, o=ORNL, ou=FED, email=nelsonbe@ornl.gov
Date: 2006.03.21 00:59:03 -05'00'

Tech. Rep,. RLM

e:\mtmapps\Mtnonc14.qrp

Griffith, Mike

From: Larry L. Sutton [lsutton@pppl.gov]
Sent: Wednesday, March 22, 2006 5:58 PM
To: NKHFlowen@aol.com
Cc: Phil Heitzenroeder; royjratc-aol-com-offsite; Frank A. Malinowski
Subject: Subcontract S005242-F - Use of Stellalloy Bearing Plates

Nancy:

Phil directed I dispatch to you the following information.

"This is to confirm the telephone conversation between Nancy Horton, Phil Heitzenroeder, and Larry Sutton on 3/17 and a phone conversation with Phil on 3/22. NCSX is changing the material for the bearing plates to Stellalloy for modular coil winding forms C4-C5, A1-A6, and B1-B6. We realize that implementing this change will not be possible for the next 2-3 winding forms.
For those winding forms where the Stellalloy bearing plates are not available at shipment, we would ask that they be shipped with the 316 stainless steel bearing plates currently on hand which have high magnetic permeability.
NCR's should be issued to document those shipped with the high permeability bearing plates. These will be replaced with Stellalloy bearing plates when the studs and nuts are replaced with the A286 versions at PPPL. MTM kindly agreed in a telephone conversation this morning which involved Roy to put paint dots on the hardware and bearing plates which will need to be replaced at PPPL."

Regards,

Larry

Major Tool & Machine, Inc.
1458 East 19th Street
Indianapolis, IN 46218-4289

MTM N/C: 19234

Date: 02/17/06
User ID: GRIFFITH

Customer: ENERGY INDUSTRIES OF OHIO
Contact: NANCY HORTON
E-Mail: NKHFlowen@aol.com
Telephone: 216-496-2314
Fax: 216-328-2001

Part: SE141-138 /
Drawing ID: SE141-138
Revision: 1
Customer P.O.: S005242-F/Ln:4
Serial No./Qty: 6

Reported By: MIKE GRIFFITH
E-Mail: mGriffith@MajorTool.com
Telephone: 317-636-6433
Fax: 317-634-9420

Problem: PER RFD 14-011 MAGNETIC PERMEABILITY TO BE NO GREATER THAN 1.03.
BEARING PLATES FOR C4, C5 AND C6 CHECK BETWEEN 1.03 AND 1.05.

Proposed Disposition:
PROPOSE TO USE AS IS.

Number of additional pages:_____

Customer Disposition: [ ] Use As Is x Rework [ ] Repair [ ] Scrap [ ] Replace

Refer also to N/C19233. The material specified for the bearing plates will be changed to Stellalloy. The bearing plates for all MCWFs except C1, C2, C3 (already been accepted by NCSX) shall be made of Stellalloy.

Major Tool Implemented By: [signature] **Title:** QFT ENGINEER **Date:** 3/23/06

Approved by: PER ATTACHED EMAIL, PARTS WILL BE SHIPPED WITH HIGH PERMEABILITY BEARING PLATES UNTIL NEW PLATES ARE AVAILABLE.

Phil Heitzenroeder

Digitally signed by Phil Heitzenroeder
DN: CN = Phil Heitzenroeder, C = US, O = PPPL, OU = Mech. Eng. Division
Reason: I agree to 'specified' portions of this document
Date: 2006.03.20 17:37:02 -05'00'

Brad Nelson

Digitally signed by Brad Nelson
DN: cn=Brad Nelson, c=US, o=ORNL, ou=FED, email=nelsonbe@ornl.gov
Date: 2006.03.21 00:59:46 -05'00'

Tech. Rep. **RLM**

n:\mmapps\Minonc14.qrp

Griffith, Mike

From: Larry L. Sutton [lsutton@pppl.gov]
Sent: Wednesday, March 22, 2006 5:58 PM
To: NKHFlowen@aol.com
Cc: Phil Heitzenroeder; royjratc-aol-com-offsite; Frank A. Malinowski
Subject: Subcontract S005242-F - Use of Stellalloy Bearing Plates

Nancy:

Phil directed I dispatch to you the following information.

"This is to confirm the telephone conversation between Nancy Horton, Phil Heitzenroeder, and Larry Sutton on 3/17 and a phone conversation with Phil on 3/22. NCSX is changing the material for the bearing plates to Stellalloy for modular coil winding forms C4-C5, A1-A6, and B1-B6. We realize that implementing this change will not be possible for the next 2-3 winding forms.
For those winding forms where the Stellalloy bearing plates are not available at shipment, we would ask that they be shipped with the 316 stainless steel bearing plates currently on hand which have high magnetic permeability.
NCR's should be issued to document those shipped with the high permeability bearing plates. These will be replaced with Stellalloy bearing plates when the studs and nuts are replaced with the A286 versions at PPPL. MTM kindly agreed in a telephone conversation this morning which involved Roy to put paint dots on the hardware and bearing plates which will need to be replaced at PPPL."

Regards,

Larry

Major Tool & Machine, Inc.
1458 East 19th Street
Indianapolis, IN 46218-4289

MTM N/C: 19321

Page: 1
Date: 03/03/06
User ID: GRIFFITH

Customer: ENERGY INDUSTRIES OF OHIO
Contact: NANCY HORTON Telephone: 216-496-2314
E-Mail: NKHFlowen@aol.com Fax: 216-328-2001

Part: SE141-116 / MODULAR COIL WINDING FORM TYPE Customer P.O.: S005242-F/Ln:4
Drawing ID: SE141-116 Revision: 8 Serial No./Qty: C4

Reported By: MIKE GRIFFITH Telephone: 317-636-6433
E-Mail: mGriffith@MajorTool.com Fax: 317-634-9420

Problem: There is a tool gouge in the T-section of the Datum E side. The gouge is along the short leg of the L in the location where the .5" VPI bleed hole intersects the T-section (zone F3 on sheet 9 of the drawing).
The gouge is approximately 12" in length and approximately .05" in depth. The width and location of the gouge varies along the surface. See attached pictures for further details.

Proposed Disposition:

Major Tool Proposes to weld the defective area after the completion of all machining operations. Indicators would be placed on and around the T section to monitor any movement that may occur during welding. If required, welds will be performed on the opposite side of the T to counteract any movement that occurs. The welded areas will be blended to the adjacent machined surfaces to maintain the correct profile. Both a PT inspection and permeability check will be performed on any welded areas. Major Tool also proposes a waiver of RT for this repair. Due to the thickness of the casting in this area, it is highly unlikely that an x-ray would produce any evidence of a defect introduced by the welding process.

Number of additional pages: 4

Customer Disposition: [ ] **Use As Is** [X] **Rework** [ ] **Repair** [ ] **Scrap** [ ] **Replace**

- This tool gouge is located on the base of the"T" between bolt locations 25 and 30. Please see the attached photos also.
- The size and location of this gouge **requires this defect to be weld repaired.**
- Major Tool's proposal to waive the RT for this repair and perform PT and permeability checks is accepted

EIO verification of completion: Mike Griffith Digitally signed by Mike Griffith DN: CN = Mike Griffith, C = US, O = Major Tool and Machine, OU = CFT White Date: 2006.03.24 17:26:48 -05'00' **Title:** EIO Program Mgr for NCSY **Date:** 3/24/06

Major Tool Implemented By: _____ **Title:** _____ **Date:** _____

Approved by:

Phil Heitzenroeder — Digitally signed by Phil Heitzenroeder DN: CN = Phil Heitzenroeder, C = US, O = PPPL, OU = Mech. Eng. DMslon Reason: I agree to 'specified' portions of this document Date: 2006.03.22 09:48:12 -05'00'

Tech. Rep.

Brad Nelson — Digitally signed by Brad Nelson DN: cn=Brad Nelson, c=US, o=ORNL, ou=FED, email=nelsonbe@ornl.gov Date: 2006.03.21 21:08:57 -05'00'

RLM

n:\rtmapps\Mmonc14.qrp

Major Tool & Machine, Inc.
1458 E. 19th Street, Indianapolis, In 4621
TEL:(317)636-6433 FAX:(317)634-9420

Nondestructive Test
Certification for Liquid Penetrant Examination

Date of Inspection:03/24/2006 **Type of Material:**CAST STAINLESS **NDT#:16147**

Stage of Inspection:	Manufacturing Process:	Surface Condition:	Test Being Run to:	Heat Treated:
[ ] Incoming Inspection	[ ] Weldment [x] Casting	[x] Machined	[x] Router Instructions	[ ] Yes
[ ] In-Process Inspection	[ ] Bar Stock [ ] Plate	[ ] Rough	[x] Drawing	[x] No
[x] After Repair	[ ] Forging [ ] Other	[x] Other	[ ] Test Plan	
[ ] Final Inspection		FINAL MACHINED & AS CAST	[ ] Technique Card	
			SEE NOTES	

Part Information:
MTM Job Number: 65707/4.0 -Sub:12 -Op:30
Resource ID: 810-LIQUID PENETRANT INSPECTI
Part ID: SE141-116
Part Name: MODULAR COIL WINDING FORM
Serial Number:
Customer P.O.: S005242-F
Customer Unit/Plant:

Test Results:
Quantity Inspected: 1
Quantity Accepted: 1
Quantity Rejected: 0

Run Hours:

Inspection Results:
Customer N/C #:
[x] Accepted
[ ] Rejected
[ ] N/C-Report
[ ] Rework
MTM N/C #: 19321

Customer Inspection Pl SEE NOTES
Test Step:
Revision:
Material Test Number:

Inspection Criteria:
Customer Specification: ASTM A903/A903M
MTM Spec Number: PS582 (REF NDT-WI-09)
Acceptance Standard: ASTM A903 (SEE NOTES)

Inspection Materials Used:
Manufacturer: SHERWIN
Type of Penetrant: DP-51
Batch Number: 41-E47
Developer: D-100
Batch Number: 520-H6

Penetrant Examination Processes:
Type: II (Visible) / Dwell Time: 15 Minutes
Method: A (Water Wash)
Method of Drying: Forced Air Fan
Form: e (nonaqueous for Type II visible dye) / Dwell Time: 15 Min

Inspection Requirements:

100 % of all accessible surfaces [ ] Joint Preps [ ] Root Pass [ ] Back Gouge [ ] Cover Pass [ ] Other

Notes:

PENETRANT INSPECT WELD REPAIR.
Specification: ASTM A903/A903M LEVEL 1
MTM NDT Cert: REPAIR OF DEFECT NC19321

No defects noted.

This is to certify that the pieces specified have been inspected in accordance with the specifications shown.

Inspector: 674-S.WILLIAMS **Date:** 03/24/2006 Sylvester Williams Level II PT

Workorder: 65707/4-0 Sub:12 Op:40

Revision: 03/06/06 7:42

Part: REWORK - REWORK / REPAIR PER N/C - N/C #_____

Drawing ID: SE141-116 Rev: 8			INSPECTION INSTRUCTIONS			RESULTS		INSPECTED BY			
SHEET	ZONE	CHARACTERISTIC	GAGE/EQUIP	BY	SAMPLE	SER#	DATA/REMARKS	INSP	VERFD	AUDIT	
(10)		N C 19321 RECORD PERMEABILITY READINGS OF THE REPAIRED AREA. MAG PERMEABILITY TO BE NO GREATER THAN 1.02μ.	MASTER GAGE	QA		J-1165	LESS THAN 1.02	503-B.HO 03-24-06			A

Employees: 503-B Houk

* To Far Right Indicates Data Package Requirement

NOTE: the recording of false, fictitious, or fraudulent statements or entries on this document may be punished as a felony under federal statutes including federal law, title 18, chapter 47.

Major Tool & Machine, Inc.
1458 East 19th Street
Indianapolis, IN 46218-4289

MTM N/C: 19455

Date: 03/23/06
User ID: GRIFFITH

Customer: ENERGY INDUSTRIES OF OHIO
Contact: NANCY HORTON — Telephone: 216-496-2314
E-Mail: NKHFlowen@aol.com — Fax: 216-328-2001

Part: SE141-116 / MODULAR COIL WINDING FORM TYPE — Customer P.O.: S005242-F/Ln:4
Drawing ID: SE141-116 — Revision: 8 — Serial No./Qty: C4

Reported By: MIKE GRIFFITH — Telephone: 317-636-6433
E-Mail: mGriffith@MajorTool.com — Fax: 317-634-9420

Problem: PART IS REJECTED PER ASTM A903/A903M LEVEL 1. SEE ATTACHED MAP FOR SIZES AND LOCATIONS.

Proposed Disposition:
PROPOSE TO USE AS IS.

Number of additional pages: 15

Customer Disposition: **X Use As Is** **[ ] Rework** **[ ] Repair** **[ ] Scrap** **[ ] Replace**

All of the indications were reviewed. Only one raise serious concern, the one near hole location number 21. The stresses in this area were determined to be low, and based on this, we agree with the disposition to use as is. Please see the attached.

Phil Heitzenroeder

Digitally signed by Phil Heitzenroeder
DN: CN = Phil Heitzenroeder, C = US, O = PPPL, OU = Mech. Eng. Division
Reason: I agree to the terms defined by the placement of my signature on this document
Date: 2006.03.24 15:48:55 -05'00'

Brad Nelson

Digitally signed by Brad Nelson
DN: cn=Brad Nelson, c=US, o=ORNL, ou=FED, email=nelsonbe@ornl.gov
Date: 2006.03.31 14:45:20 -05'00'

Major Tool Implemented By: Mike Griffith

Digitally signed by Mike Griffith
DN: cn=Mike Griffith, c=US, o=Major Tool and Machine, ou=CFT - White, email=mgriffith@majortool.com
Reason: I agree to the terms defined by the placement of my signature on this document
Date: 2006.04.03 08:07:22 -04'00'

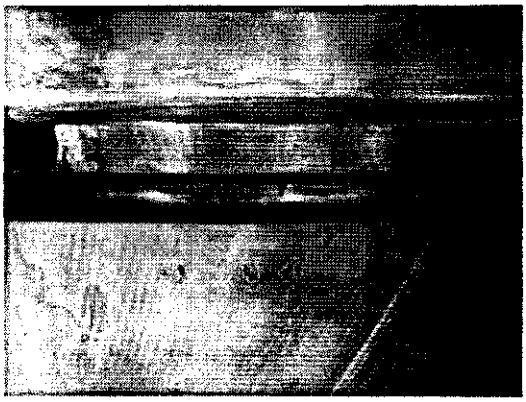
Title: _____ **Date:** _____

n:\mtmapps\Mtnonc14.qrp

/Open /WO:65707-4

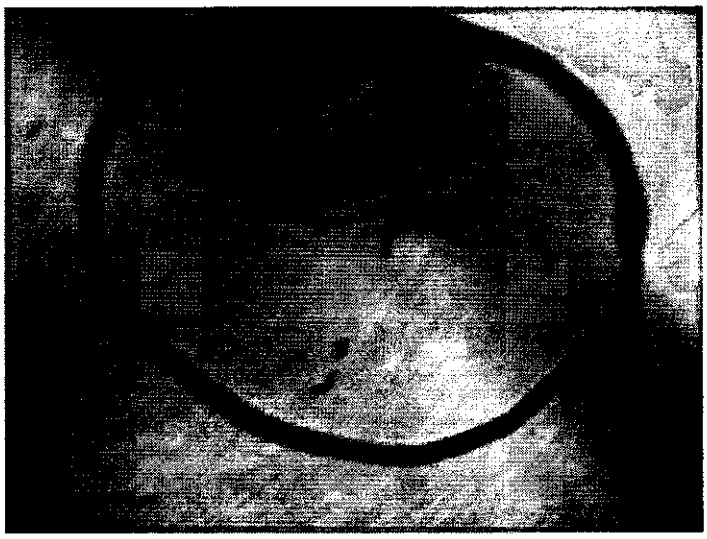
PT Rejection Photos and Dimensions

PT1 is located on the D side near hole 63. There are several linear indications scattered in this area ranging from .08" to .35" and approximately .002" to .008" wide.
One indication is rounded and is approximately .08" in diameter.



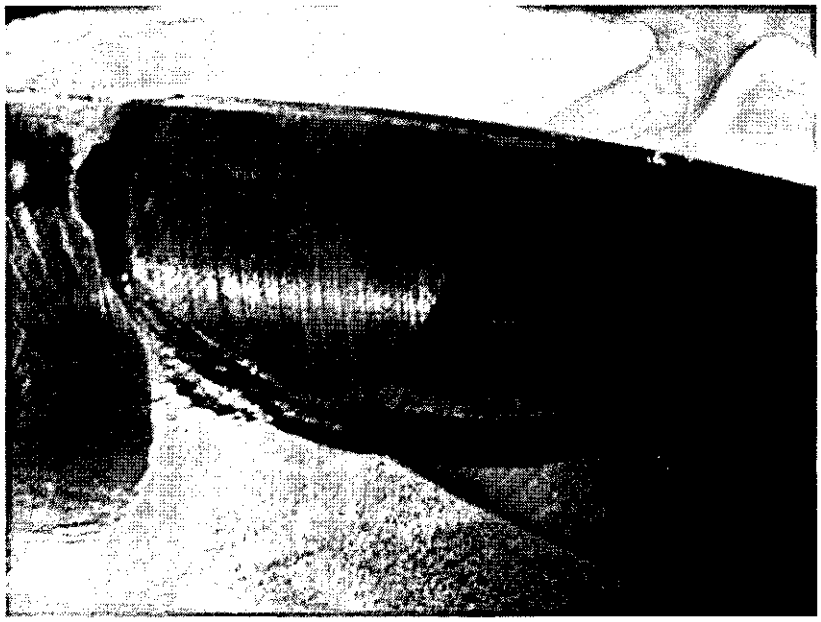
PT Rejection Photos and Dimensions

PT2 is located on the D side near hole 64. There are two linear indications approx. .15" in length each and approx. .005" wide.

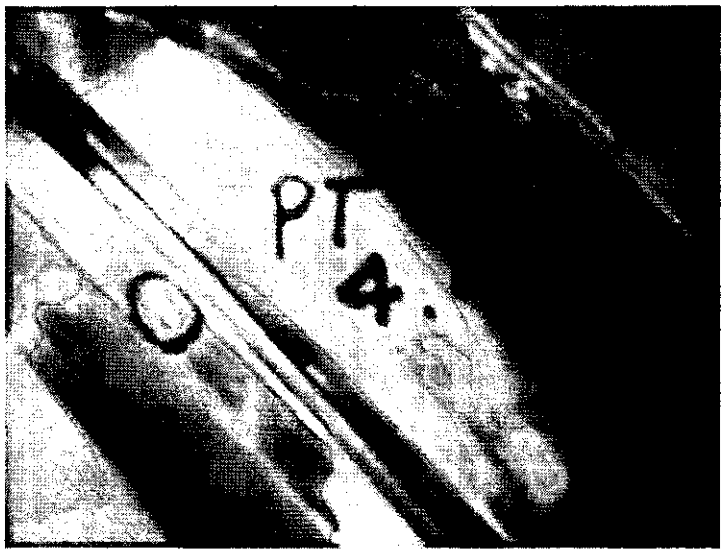


PT Rejection Photos and Dimensions

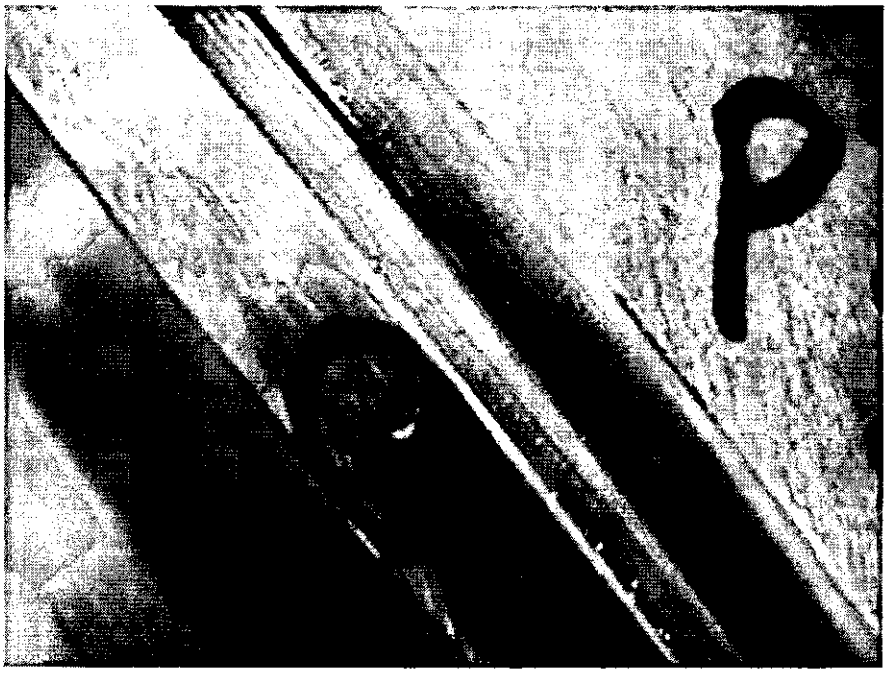
PT3 is located on the D side near hole 83. The indication is .06 - .08 rounded.



PT Rejection Photos and Dimensions



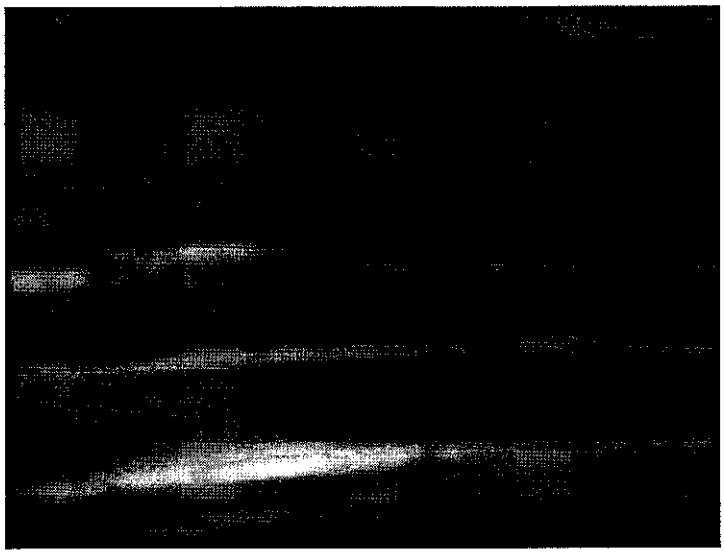
PT4 is located on the D side near hole 20. Indication is approximately .125 linear.



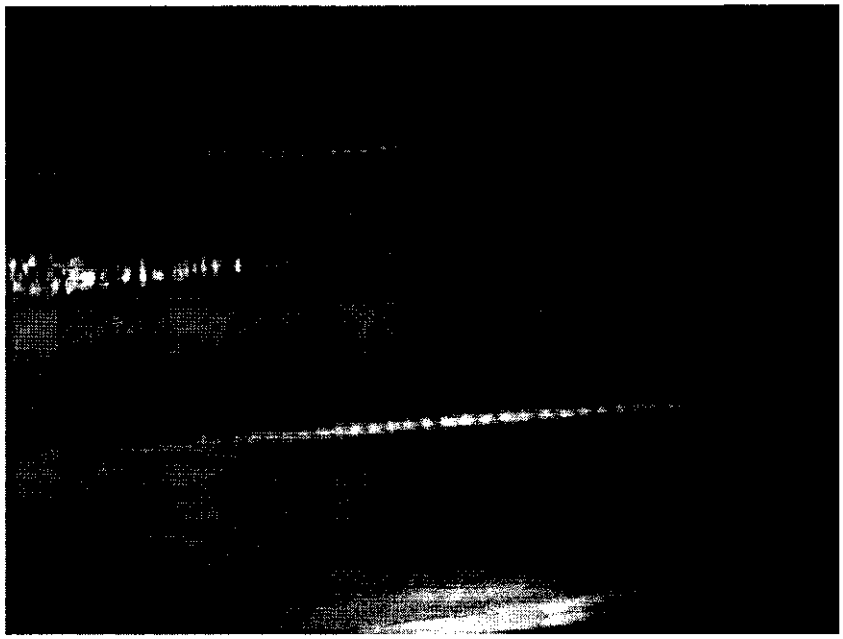
PT Rejection Photos and Dimensions

PT5 is located on the D side near hole 23. Indication is approx. .100 linear.

PT Rejection Photos and Dimensions



PT6 is located on the D side near hole 45. The indication is approx. .25" linear.

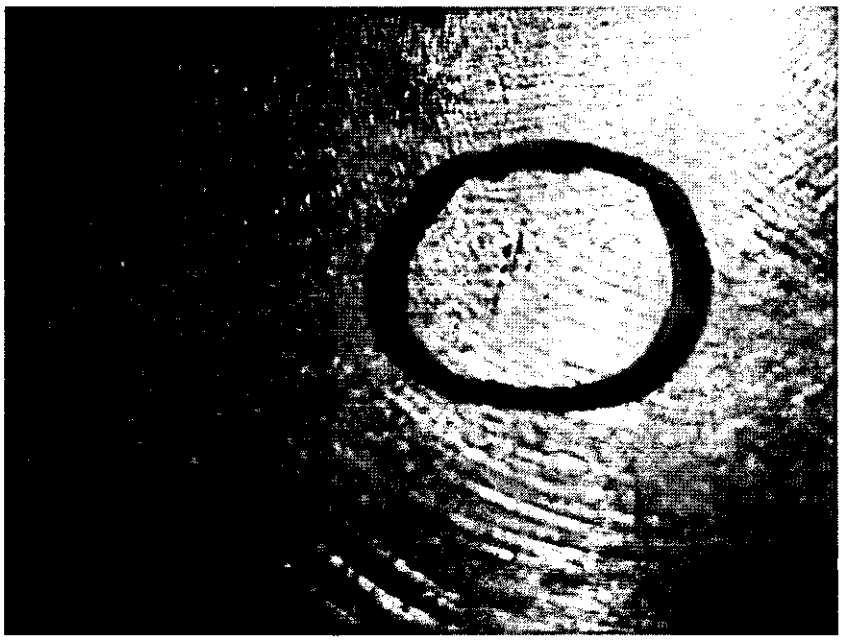


PT Rejection Photos and Dimensions

PT7 is located on the D side near hole 46. The indication is approx. .300" linear.

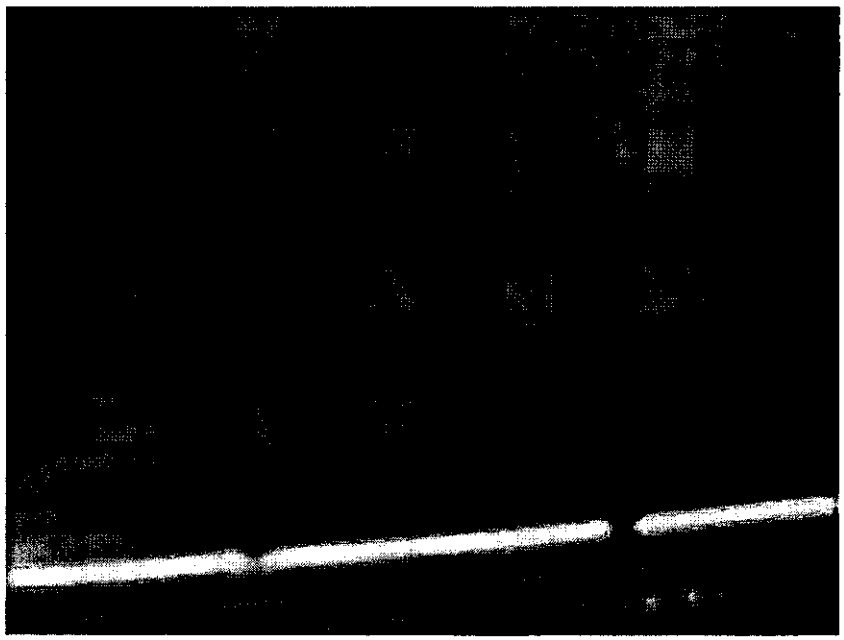
PT Rejection Photos and Dimensions

PT8 is located on the D side near hole 85. The indication is approx. .175" linear.



PT Rejection Photos and Dimensions

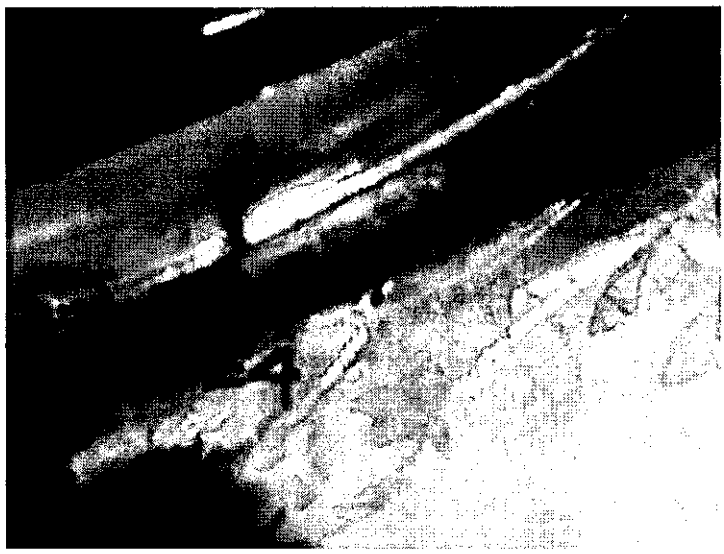
PT9 is located on the E side near hole 21. The indication is approx. .200" linear.



PT Rejection Photos and Dimensions

PT10 is located on the E side near hole 21. The indication is approx. .200" linear.

PT Rejection Photos and Dimensions

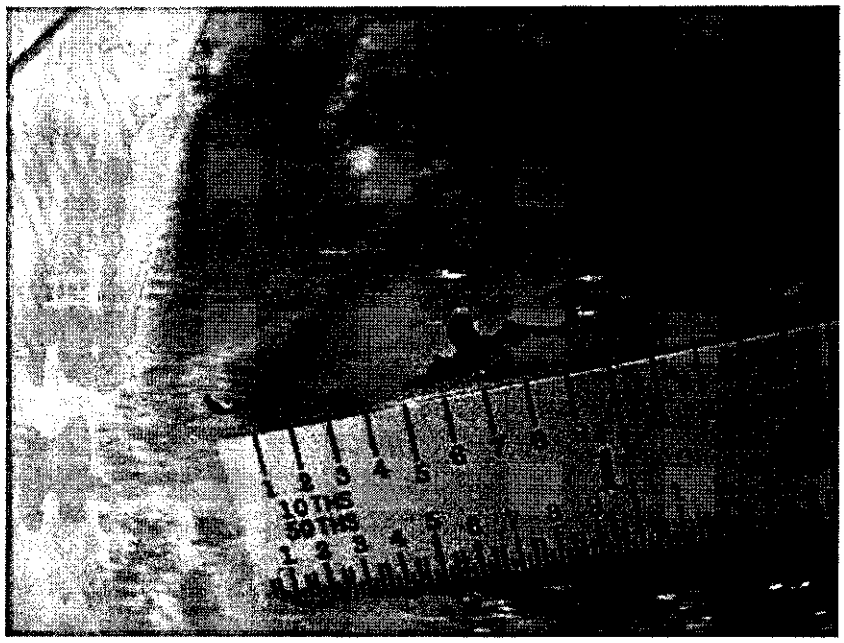


PT11 is located on the E side near hole 4. The indication is approx. .100" linear.

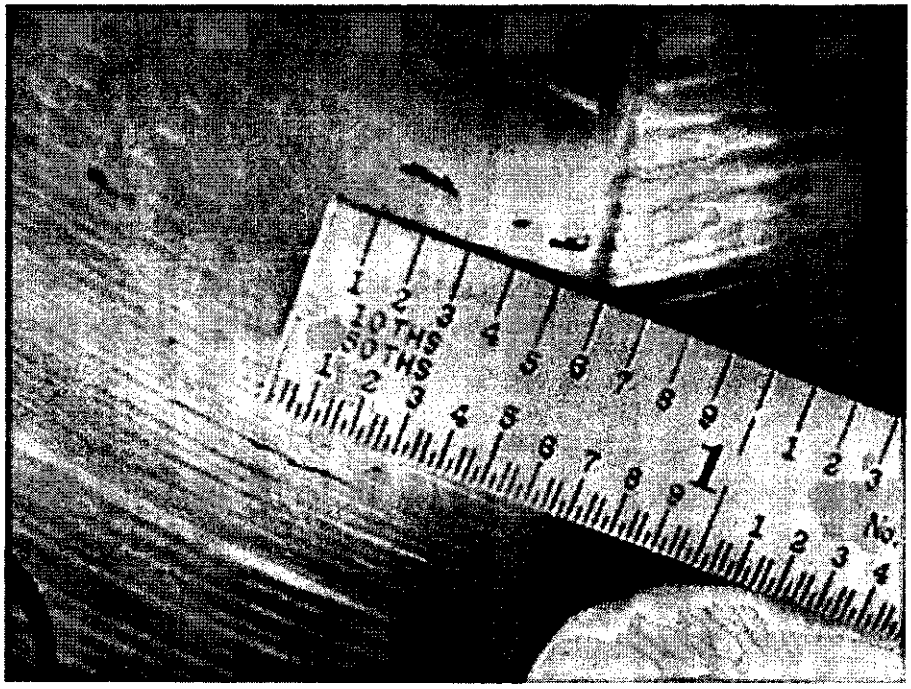
PT Rejection Photos and Dimensions

PT12 is located on the E side near hole 60. The indication is approx. .120" linear.

PT Rejection Photos and Dimensions

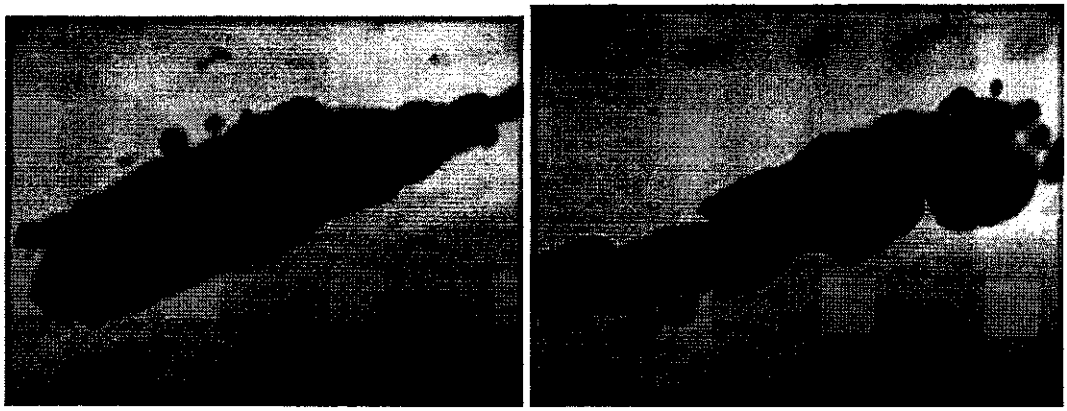


Indications on D Flange large wing. There are also several smaller indications scattered around the wing area.



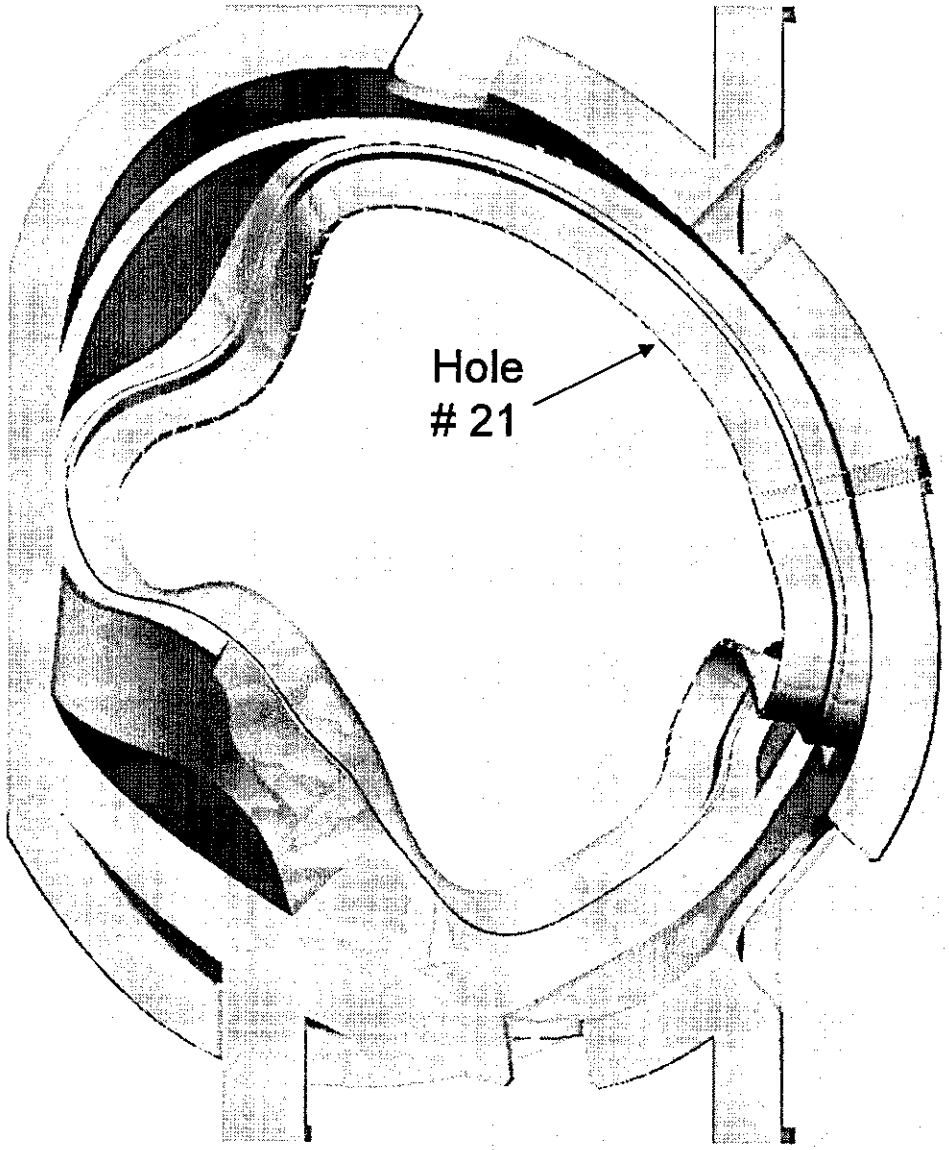
PT Rejection Photos and Dimensions

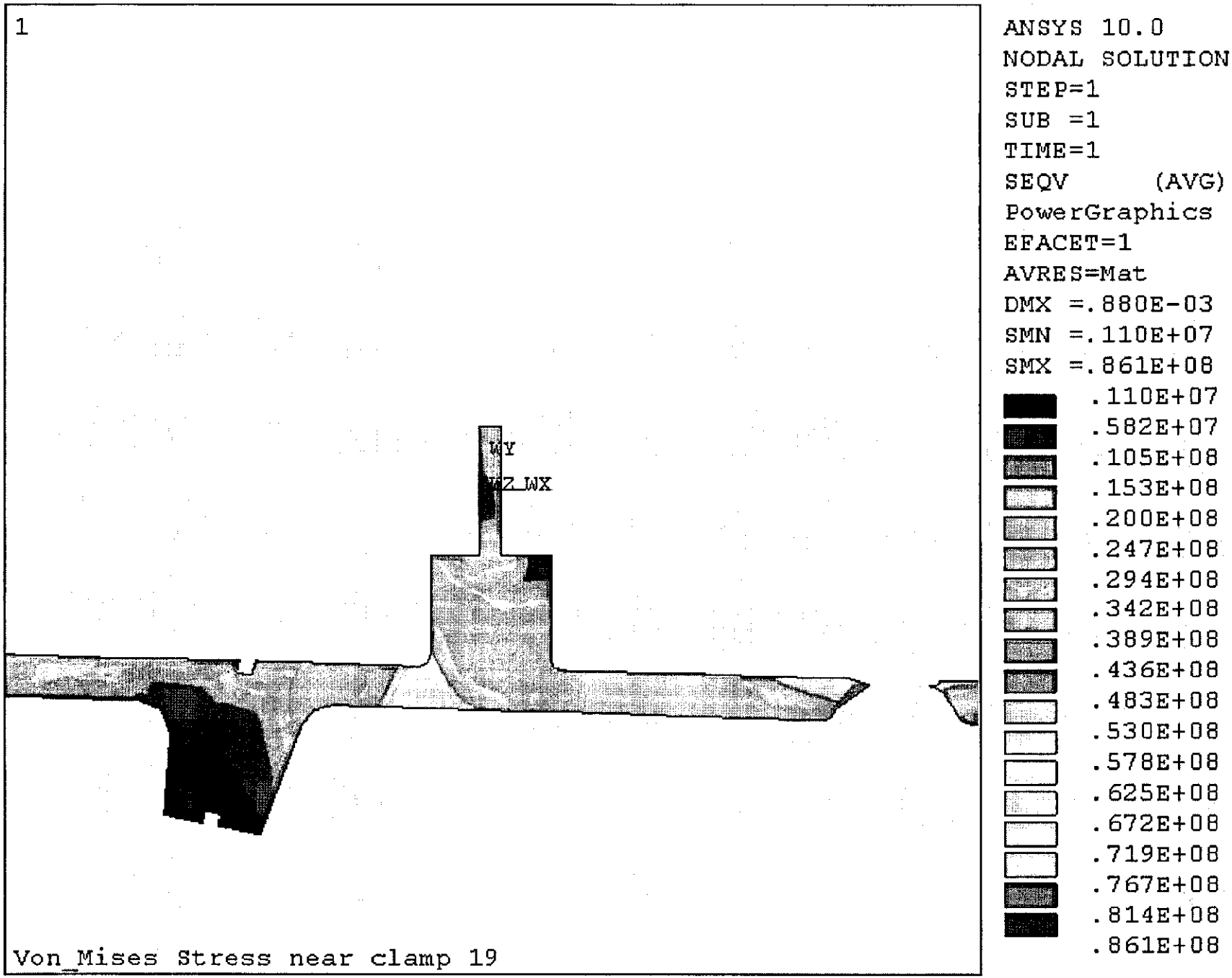
These pictures show a string of indications in an area in which we ground for clearance below the VPI groove. The photo on the bottom left is about 6" in length and the one on the right is about 3.5" in length. This appears to be area that was weld upgraded at the MTK.
Indications are located on the D side from hole 44 to 49.

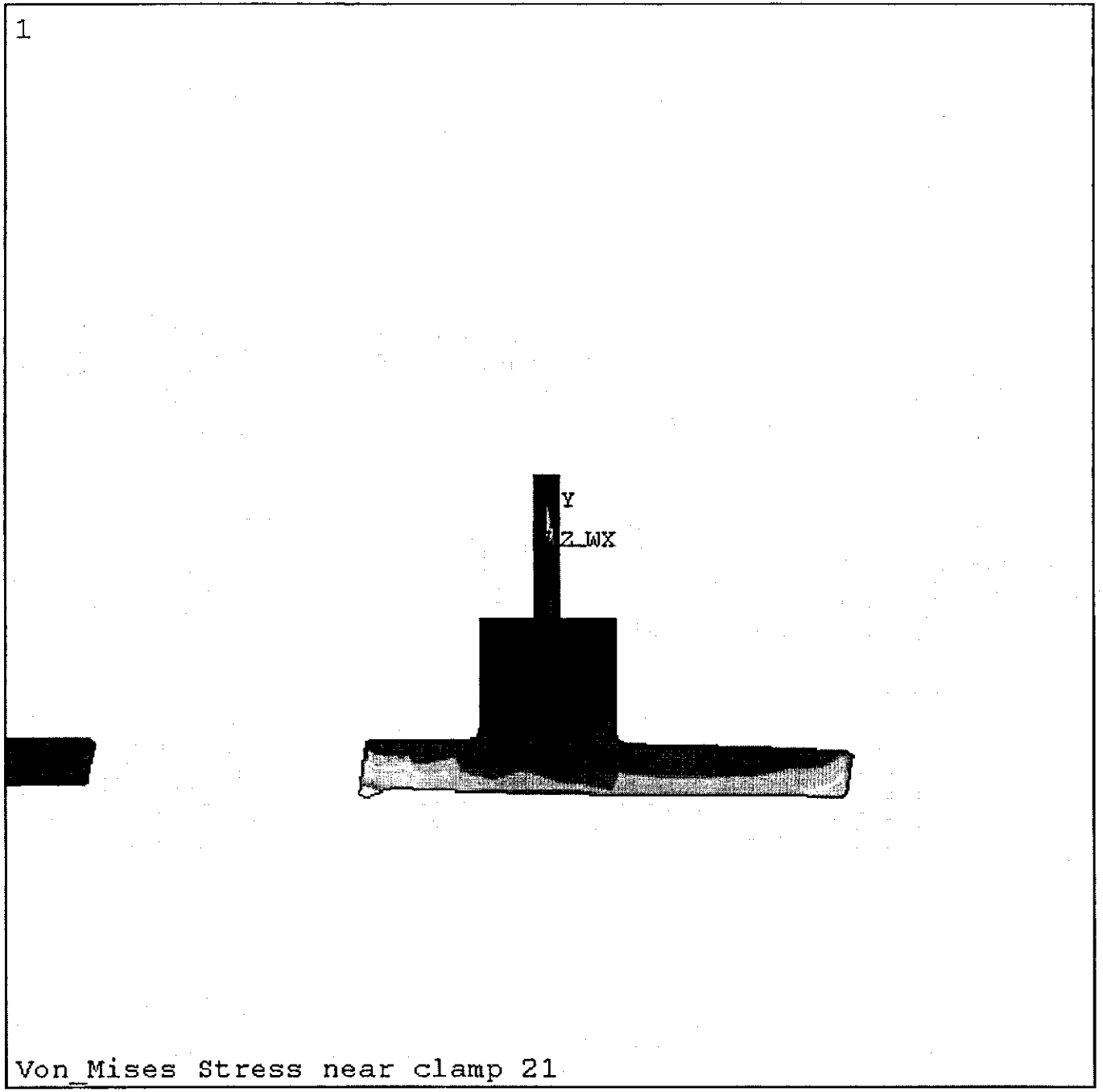


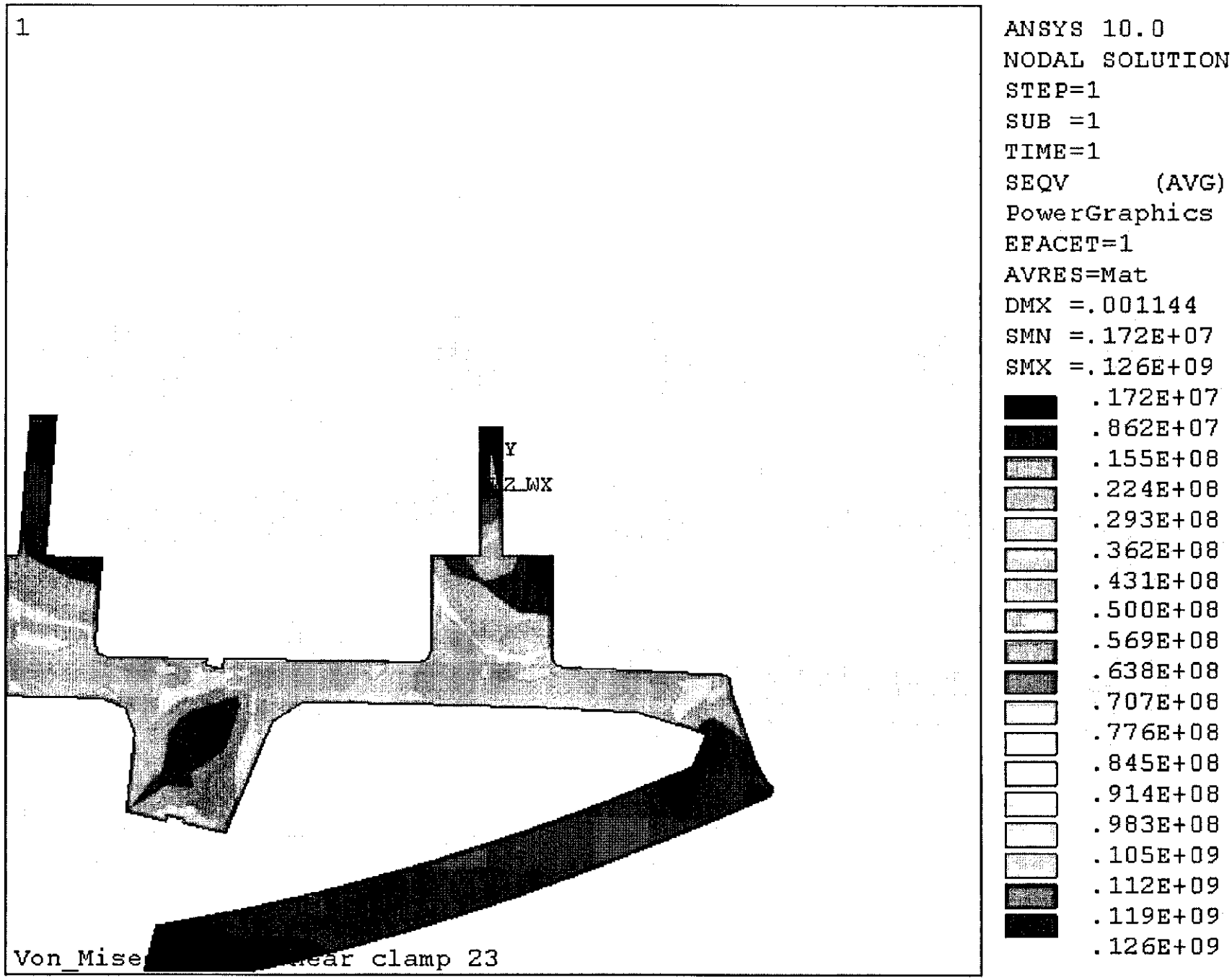
PT Rejection Photos and Dimensions

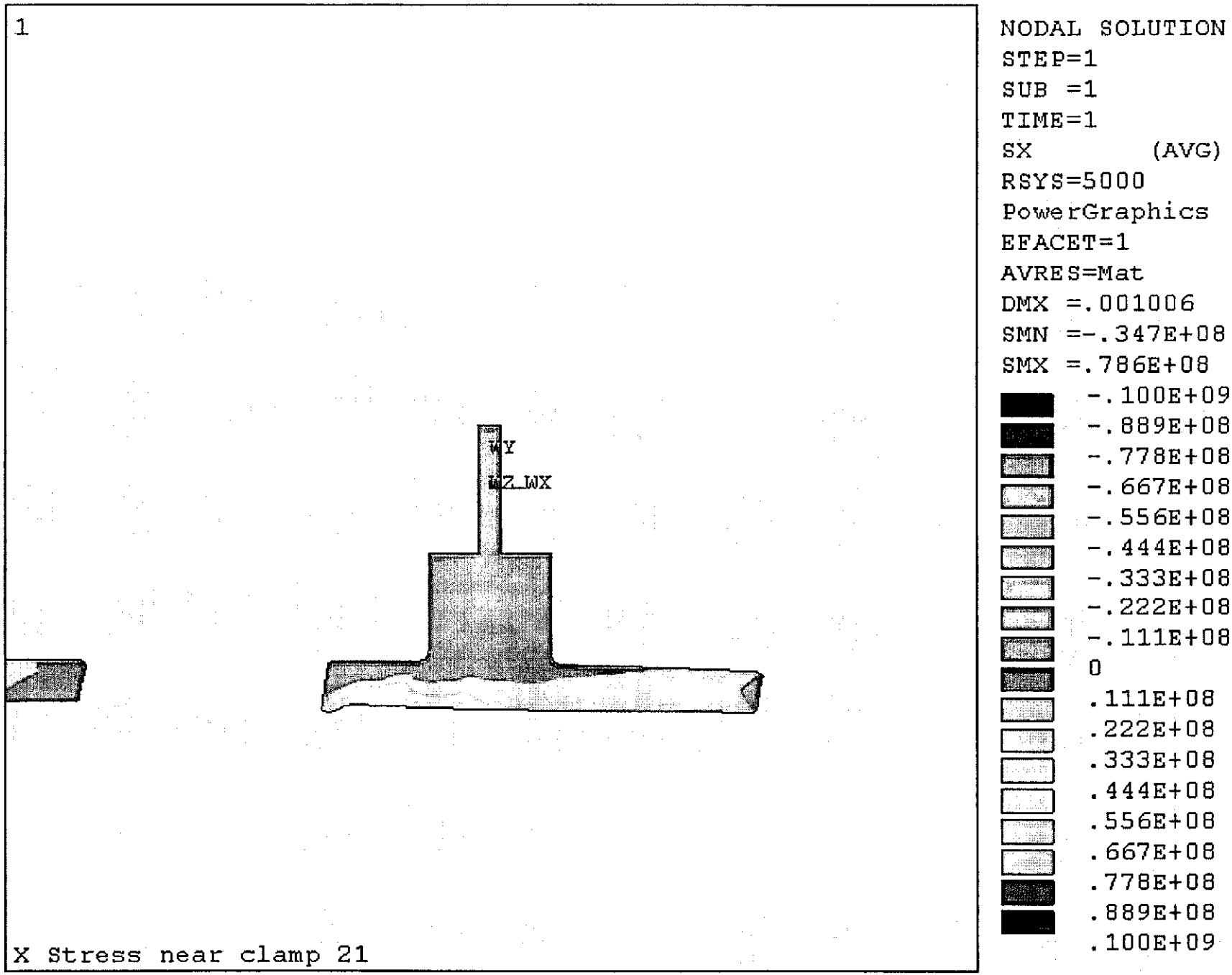
The above indication is a 1.885 diameter hole located at zone C5 of sheet 4. This is the hole that is closest to the intersection point of the flange to leg. The largest indication is approximately .100" x .03".

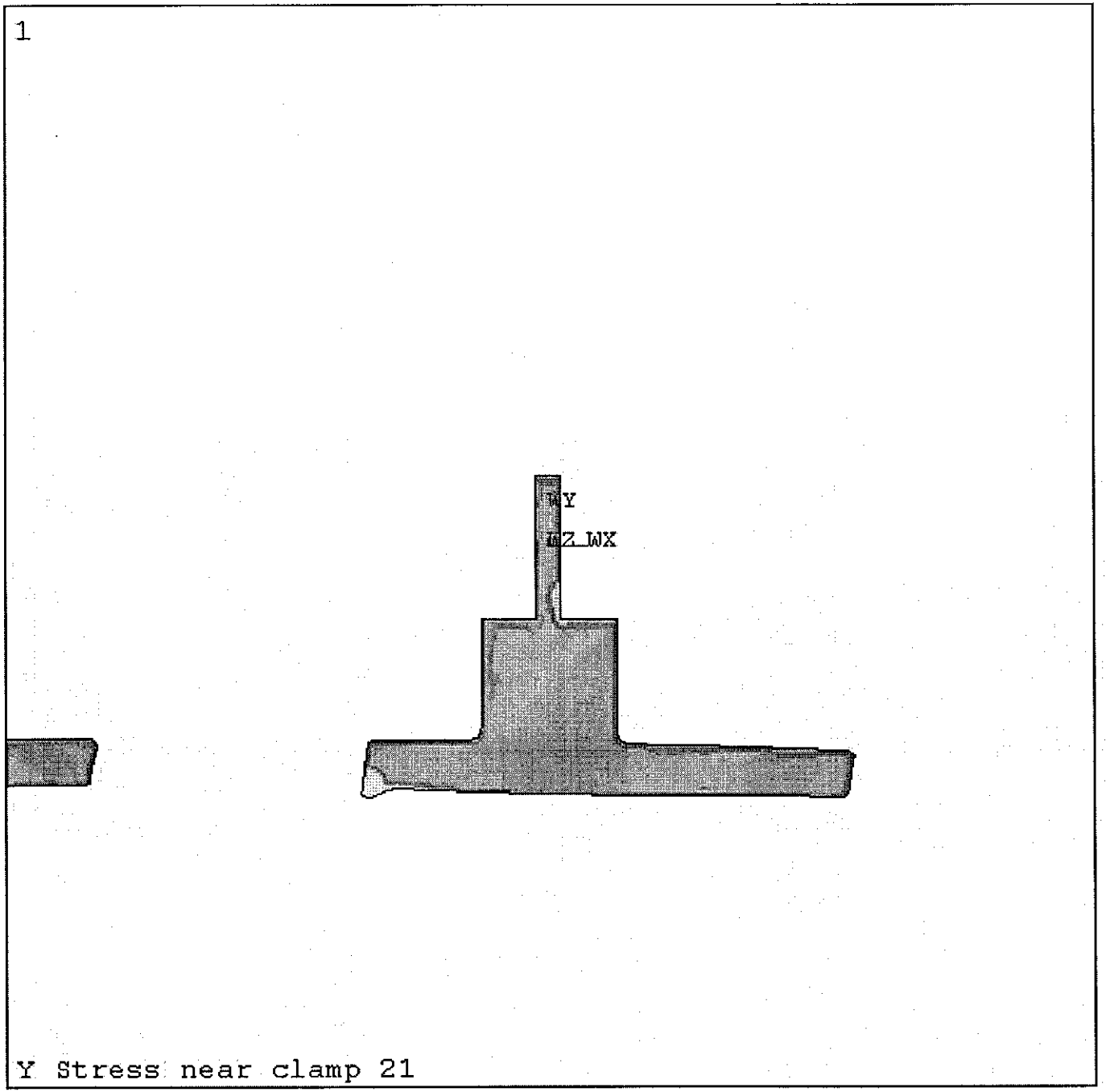

Hole
21


1
WY
WZ WX
ANSYS 10.0
NODAL SOLUTION
STEP=1
SUB =1
TIME=1
SEQV (AVG)
PowerGraphics
EFACET=1
AVRES=Mat
DMX =.880E-03
SMN =.110E+07
SMX =.861E+08
.110E+07
.582E+07
.105E+08
.153E+08
.200E+08
.247E+08
.294E+08
.342E+08
.389E+08
.436E+08
.483E+08
.530E+08
.578E+08
.625E+08
.672E+08
.719E+08
.767E+08
.814E+08
.861E+08
Von Mises Stress near clamp 19


1
Y
Z
WX
Von Mises Stress near clamp 21
ANSYS 10.0
NODAL SOLUTION
STEP=1
SUB =1
TIME=1
SEQV (AVG)
PowerGraphics
EFACET=1
AVRES=Mat
DMX =.001006
SMN =.305E+07
SMX =.357E+09
.305E+07
.227E+08
.423E+08
.620E+08
.816E+08
.101E+09
.121E+09
.141E+09
.160E+09
.180E+09
.199E+09
.219E+09
.239E+09
.258E+09
.278E+09
.298E+09
.317E+09
.337E+09
.357E+09

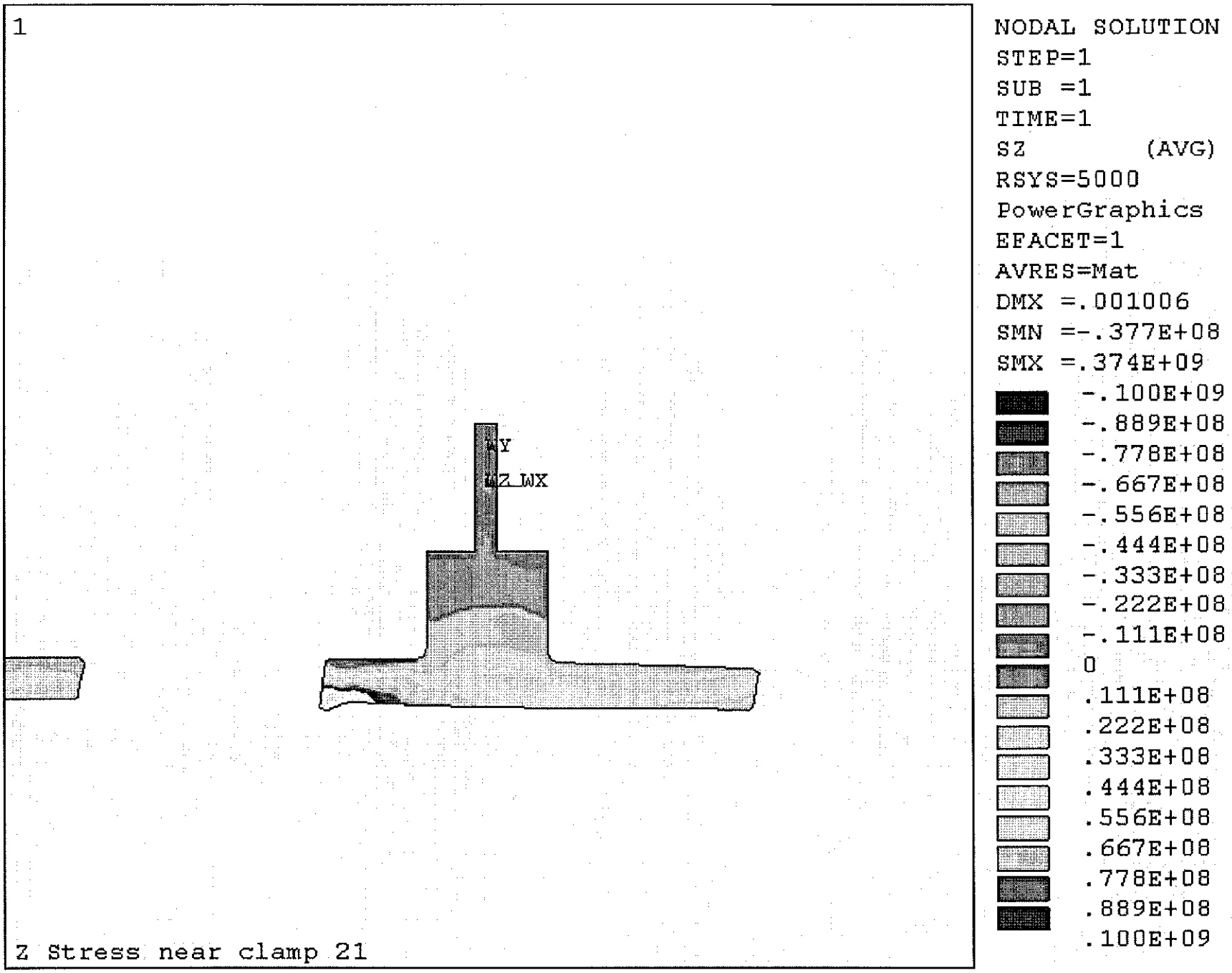

1
Y
Z
WX
Von_Mise
ear clamp 23
ANSYS 10.0
NODAL SOLUTION
STEP=1
SUB =1
TIME=1
SEQV (AVG)
PowerGraphics
EFACET=1
AVRES=Mat
DMX =.001144
SMN =.172E+07
SMX =.126E+09
.172E+07
.862E+07
.155E+08
.224E+08
.293E+08
.362E+08
.431E+08
.500E+08
.569E+08
.638E+08
.707E+08
.776E+08
.845E+08
.914E+08
.983E+08
.105E+09
.112E+09
.119E+09
.126E+09

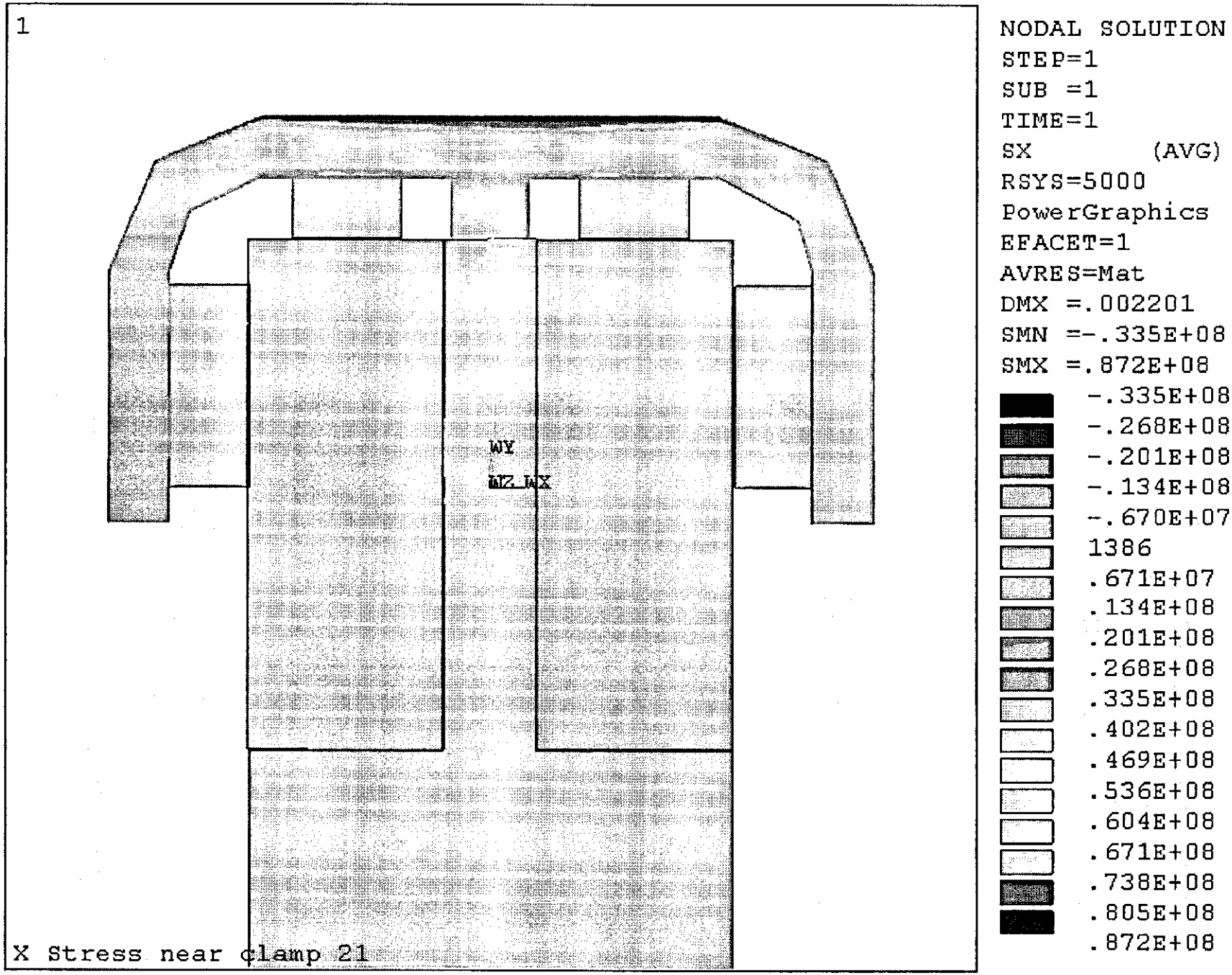

1
WY
WZ WX
X Stress near clamp 21
NODAL SOLUTION
STEP=1
SUB =1
TIME=1
SX (AVG)
RSYS=5000
PowerGraphics
EFACET=1
AVRES=Mat
DMX =.001006
SMN =-.347E+08
SMX =.786E+08
-.100E+09
-.889E+08
-.778E+08
-.667E+08
-.556E+08
-.444E+08
-.333E+08
-.222E+08
-.111E+08
0
.111E+08
.222E+08
.333E+08
.444E+08
.556E+08
.667E+08
.778E+08
.889E+08
.100E+09

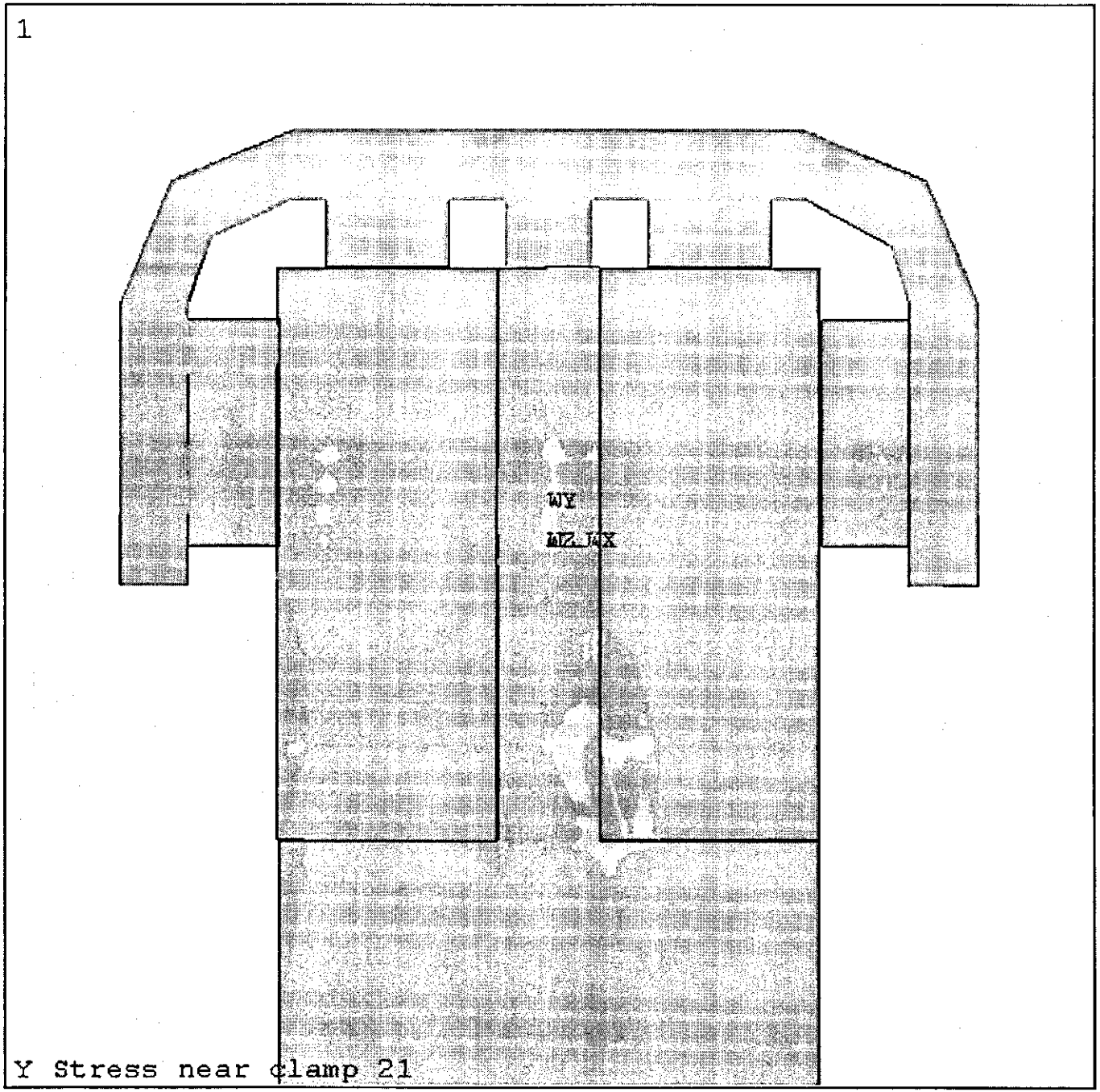


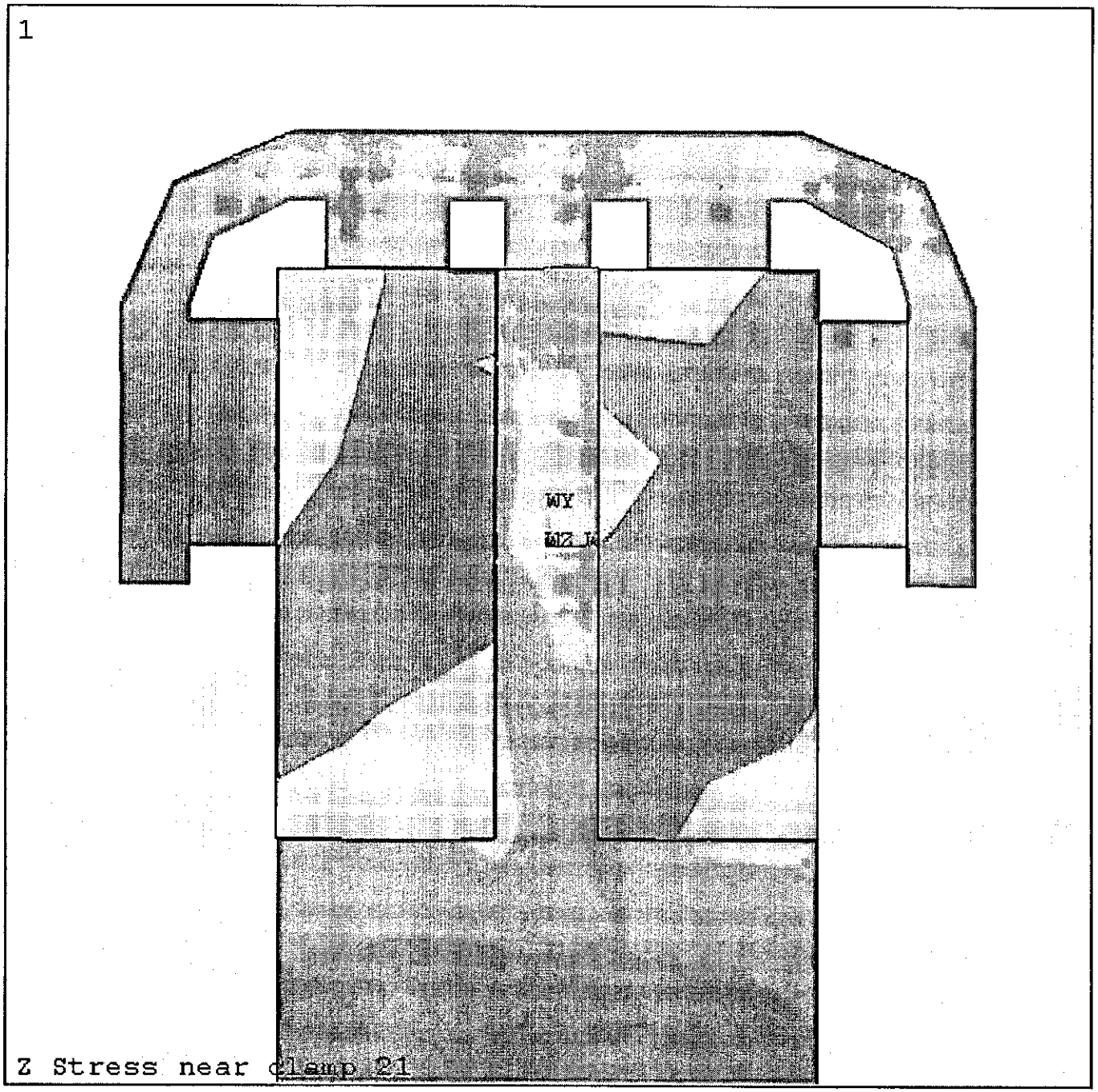
NODAL SOLUTION
STEP=1
SUB =1
TIME=1
SY (AVG)
RSYS=5000
PowerGraphics
EFACET=1
AVRES=Mat
DMX =.001006
SMN =-.528E+08
SMX =.754E+08

-.100E+09
-.889E+08
-.778E+08
-.667E+08
-.556E+08
-.444E+08
-.333E+08
-.222E+08
-.111E+08
0
.111E+08
.222E+08
.333E+08
.444E+08
.556E+08
.667E+08
.778E+08
.889E+08
.100E+09


1
Y
Z
WX
NODAL SOLUTION
STEP=1
SUB =1
TIME=1
SZ (AVG)
RSYS=5000
PowerGraphics
EFACET=1
AVRES=Mat
DMX =.001006
SMN =-.377E+08
SMX =.374E+09
-.100E+09
-.889E+08
-.778E+08
-.667E+08
-.556E+08
-.444E+08
-.333E+08
-.222E+08
-.111E+08
0
.111E+08
.222E+08
.333E+08
.444E+08
.556E+08
.667E+08
.778E+08
.889E+08
.100E+09
Z Stress near clamp 21


1
WY
WZ WX
X Stress near clamp 21
NODAL SOLUTION
STEP=1
SUB =1
TIME=1
SX (AVG)
RSYS=5000
PowerGraphics
EFACET=1
AVRES=Mat
DMX =.002201
SMN =-.335E+08
SMX =.872E+08
-.335E+08
-.268E+08
-.201E+08
-.134E+08
-.670E+07
1386
.671E+07
.134E+08
.201E+08
.268E+08
.335E+08
.402E+08
.469E+08
.536E+08
.604E+08
.671E+08
.738E+08
.805E+08
.872E+08


1
WY
WZ_WX
Y Stress near clamp 21
NODAL SOLUTION
STEP=1
SUB =1
TIME=1
SY (AVG)
RSYS=5000
PowerGraphics
EFACET=1
AVRES=Mat
DMX =.002201
SMN =-.440E+08
SMX =.955E+08
-.440E+08
-.363E+08
-.285E+08
-.208E+08
-.130E+08
-.525E+07
.251E+07
.103E+08
.180E+08
.258E+08
.335E+08
.413E+08
.490E+08
.568E+08
.645E+08
.723E+08
.800E+08
.878E+08
.955E+08


1
WY
Z Stress near clamp 21
NODAL SOLUTION
STEP=1
SUB =1
TIME=1
SZ (AVG)
RSYS=5000
PowerGraphics
EFACET=1
AVRES=Mat
DMX =.002201
SMN =-.687E+08
SMX =.763E+08
-.687E+08
-.607E+08
-.526E+08
-.446E+08
-.365E+08
-.284E+08
-.204E+08
-.123E+08
-.427E+07
.379E+07
.118E+08
.199E+08
.280E+08
.360E+08
.441E+08
.521E+08
.602E+08
.683E+08
.763E+08

Major Tool & Machine, Inc.
1458 East 19th Street
Indianapolis, IN 46218-4289

MTM N/C: 19474

Date: 03/23/06
User ID: GRIFFITH

Customer: ENERGY INDUSTRIES OF OHIO
Contact: NANCY HORTON — Telephone: 216-496-2314
E-Mail: NKHFlowen@aol.com — Fax: 216-328-2001

Part: SE141-116 / MODULAR COIL WINDING FORM TYPE — Customer P.O.: S005242-F/Ln:4
Drawing ID: MCWF TYPE-C XRAY MA Revision: — Serial No./Qty: C4

Reported By: MIKE GRIFFITH — Telephone: 317-636-6433
E-Mail: mGriffith@MajorTool.com — Fax: 317-634-9420

Problem: Radiographically identified casting discontinuities (non-metallic and gas porosity) noted.
There are 3 rejections in shot 2-3.

.08" x .14"
.10" x .25"
.10" x .125"

Proposed Disposition:
PROPOSE TO USE AS IS.

Number of additional pages: 2

Customer Disposition: **X] Use As Is** **[ ] Rework** **[ ] Repair** **[ ] Scrap** **[ ] Replace**

Refer to the attached photos and reader sheets. These indications are inner regions of bolts 52 through 56. The stress in the areas of these defects are low enough that they can be accepted as is.

Approved by:

Phil Heitzenroeder

Digitally signed by Phil Heitzenroeder
DN: CN = Phil Heitzenroeder, C = US, O = PPPL, OU = Mech. Eng. Division
Reason: I agree to 'specified' portions of this document
Date: 2006.03.24 16:59:08 -05'00'

Technical representative

Brad Nelson

Digitally signed by Brad Nelson
DN: cn=Brad Nelson, c=US, o=ORNL, ou=FED, email=nelsonbe@ornl.gov
Date: 2006.03.24 18:32:42 -05'00'

RLM

n:\mtmapps\Mtnonc14.qrp

4959

COOPERHEAT MQS

10520 Chester Road
Woodlawn, Ohio 45215

CLIENT	INTERPRETER/LEVEL	RADIOGRAPHER	JOB NO	P.O. NO	DATE
Major Tool & Machine	John Ballard II	John Ballard	13860001	NA	3/22/06

ISOTOPE/X-RAY	DIA. X LENGTH	CURIES/MA	FOCAL SPOT SIZE	SFD	SOD	TIME	FILM PROCESSING	FILM TYPE	FILM TECHNIQUE	PB SCREENS
IR-192	.118"X.089	56.3	.148"	16"	15.44"	2:15	Auto	Kodak AA	Double	.010

WELD PROCESS	MATERIAL SPEC.	MATERIAL DIAMETER	MATERIAL THICKNESS	PENETRAMETER	SHIM	ACCEPTANCE STANDARD
NIA	316 SST	NIA	varies	ASTM 1B	NIA	No Defects Larger Than .080"

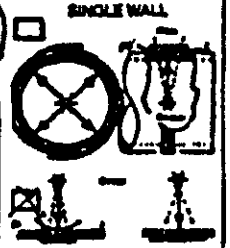
DESCRIPTION
65707/4.0/1/110/1818
CA SE141-116 Rev-8
Pg 1 of 2

REMARKS
Densitometer 012105 NC19474
Cal. due. 5/2/06
3 rejectable indications (one (.080"x .140") + one (.100"x .250") + one (.100"x .125"))

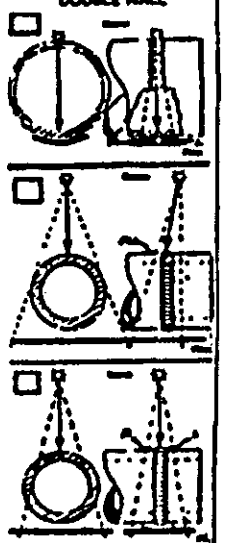
PIPING, SEAM OR FITTING	FILM INTERVAL RANGE	WELDER IDENTIFICATION	PENETRAMETER SIZE	PENETRAMETER QUALITY LEVEL	SLAG	POROSITY	POROSITY WITH TAIL	CRACK	LACK OF FUSION	LACK FUSION	INTERNAL CONCAVITY	INTERNAL CONCAVITY	TUNGSTEN	MELT THROUGH	BURN THROUGH	CRATER-PIT	OXIDATION	INTERNAL UNDERCUT	EXTERNAL UNDERCUT	ALIGNED INDICATIONS	WELD CONTOUR	MIS-MATCH	FILM ARTIFACT	VISUAL CONCERNS	FILM DENSITY	SEE REMARKS	ACCEPT	REJECT
T	0-1	NIA	1B	.016		✓																					✓	
↓	1-2	↓	↓	↓																							✓	
	2-3					X																				✓		X
	3-4																										✓	
↓	4-5	↓	↓	↓																							✓	

End View | Side View

SINGLE WALL



DOUBLE WALL



P Penetrameter
S Shim
L Location Marker
( ) OTHER

John Ballard
Cooperheat-MQS Signature

3/22/06
Customer Representative Signature

3/22/06
Date

MCWF Type C
RT Map of High Stress Region

MTM Workorder Number: 65707/4.0/1/110/818

3/22/06

pg 2 of 2

C4

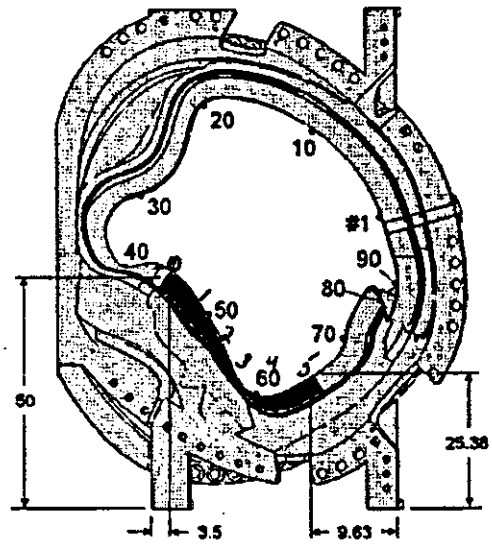
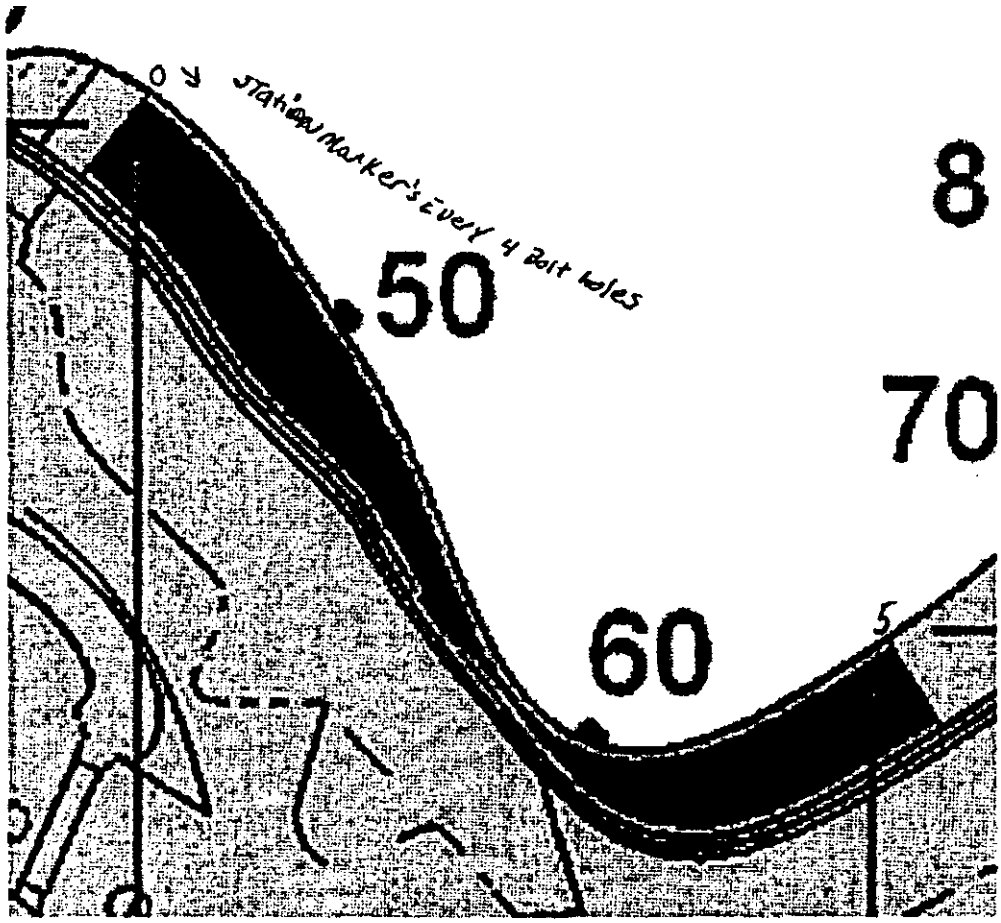


Figure 7-2 – High Stress Region Identification for Type-C MCWF



Major Tool & Machine, Inc.
1458 East 19th Street
Indianapolis, IN 46218-4289

MTM N/C: 19475

Date: 03/28/06
User ID: GRIFFITH

Customer: ENERGY INDUSTRIES OF OHIO
Contact: NANCY HORTON
E-Mail: NKHFlowen@aol.com
Telephone: 216-496-2314
Fax: 216-328-2001

Part: SE141-116 / WINDING FORM TYPE-C
Drawing ID: SE141-103 Revision: 3
Links: 1-Type:W: 65707/4.0 Sub: 0 Op: 20
Customer P.O.: S005242-F/Ln:4
Serial No./Qty: C4

Reported By: MIKE GRIFFITH
E-Mail: mGriffith@MajorTool.com
Telephone: 317-636-6433
Fax: 317-634-9420

Problem: There are several miscellaneous machining defects in various locations on the castings. The attached summary shows the sizes and locations of the defects.

3/27/06 - revision to original NC
The tool gouge reported on page 5 of the attachment was mistakenly blended out after the initial report was sent.

Proposed Disposition:
Customer to advise disposition of each of the reported items.

Number of additional pages: 9 pages

Customer Disposition: **[x] Use As Is** **[ ] Rework** **[ ] Repair** **[ ] Scrap** **[ ] Replace**

The list of indications were reviewed during a joint NCSX and EIO conference call on 3/24/06. Based on that review, all were accepted as is.

On 3/27, MTM reported that the tool gauge on pg. 5 was mistakenly blended out. This is acceptable.

Root Cause 1:

Resource: WHITE TEAM, ENGINEERING

Description: At the end of the manufacturing process the casting is marked up to identify the location of PT failures and miscellaneous gouges for reporting to our customer. There are also several items identified that require additional hand working that do not need to be submitted for approval. Due to the number of marked up areas, it becomes very difficult to clearly communicate which areas need additional blending and which areas are to be left as is.

Corr Actn: 1: Action: 03/28/06 By: 242-M.GRIFFITH

Description: In order to clearly identify areas that are not to be hand worked, florescent labels have been printed with the words "DO NOT BLEND". These labels will be applied to the casting during the visual inspection process as required.

Approved by:

Phil Heitzenroeder

Digitally signed by Phil Heitzenroeder
DN: cn=Phil Heitzenroeder, c=US, o=PPPL, ou=Mech. Eng. Division
Reason: I agree to specified portions of this document
Date: 2006.05.08 17:16:31 -04'00'

Tech. Rep.

Brad Nelson

Digitally signed by Brad Nelson
DN: cn=Brad Nelson, c=US, o=ORNL, ou=FED, email=nelsonbe@ornl.gov
Date: 2006.05.08 18:25:15 -04'00'

RLM

n:\mtmapps\Mtnonc17.qrp

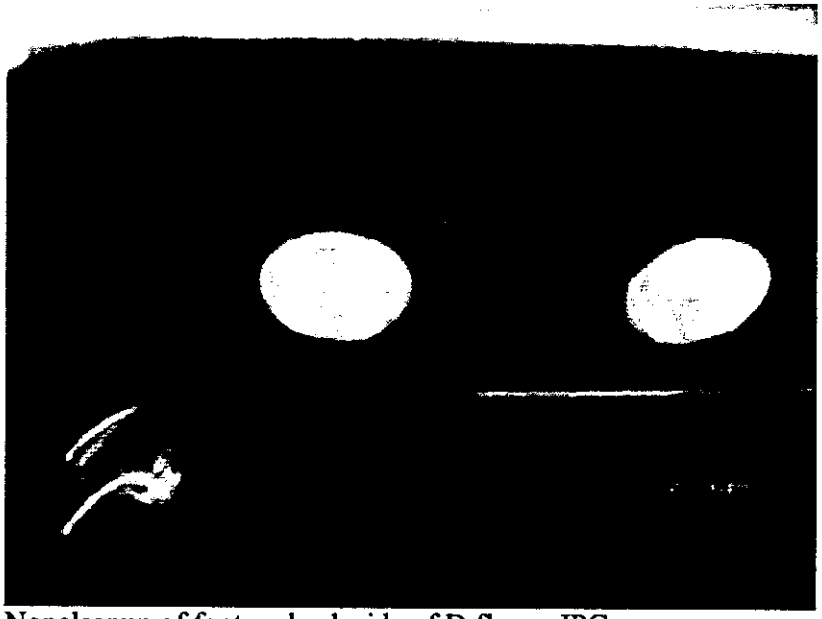
65707/4 (C4)

Miscellaneous Machining and Casting Issues

Counterbore adjacent to Poloidal Break on E Flange.JPG

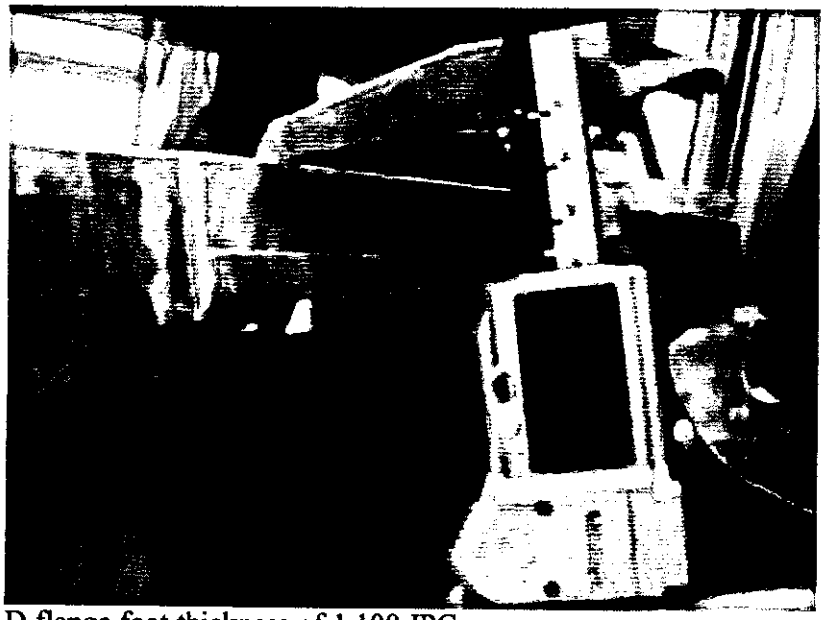
Counterbore is next to Poloidal Break on the E flange. Approximately 60% of counterbore cleaned up 100%. The area of non cleanup has tooling gouges and is approximately .050" in depth.

Miscellaneous Machining and Casting Issues



Noncleanup of foot on back side of D flange.JPG

This area is beneath the leg shown on sheet 4, zone C5. Instead of the 2.38" spot face on the back side, we typically machine this entire surface to a full clean up. The two holes in this view do not have a 100% cleanup. The photo below shows that the flange thickness in this area is approximately 1.100" in the thinnest cross section.

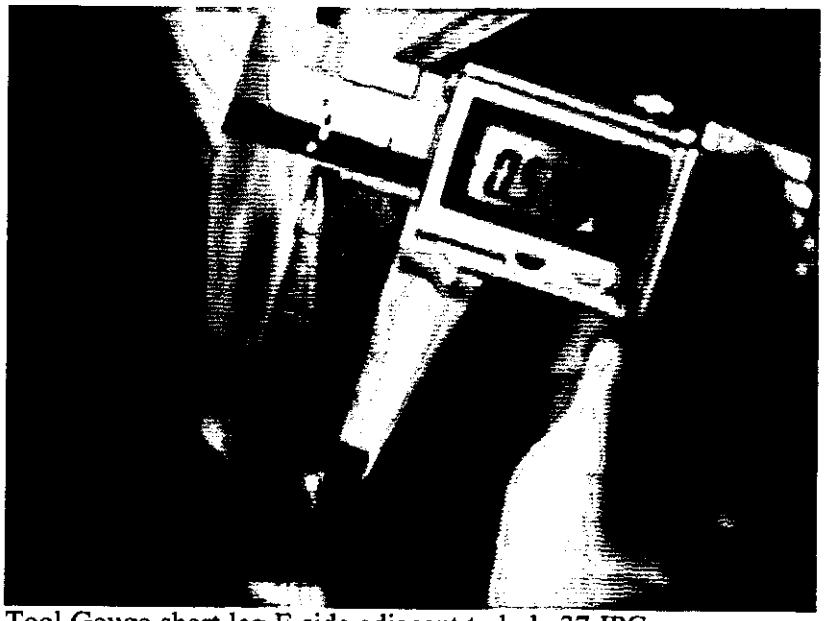


D flange foot thickness of 1.100.JPG

Miscellaneous Machining and Casting Issues

Tool Gouge short leg E37 wide view.JPG

This is a tooling gouge on the short leg of the "T" on the E flange side located close to hole 37. The gouge is approximately .590" in length by .200" wide and .005" in depth.

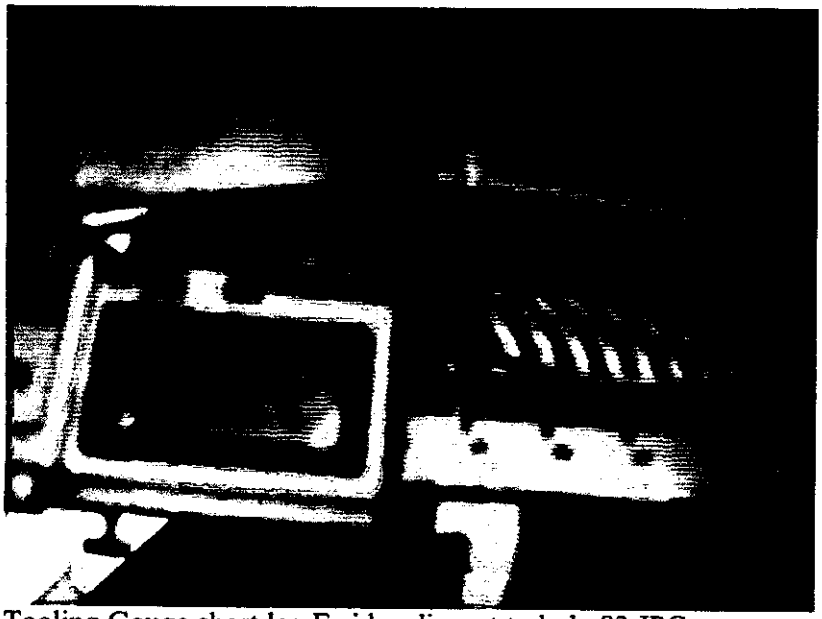


Tool Gouge short leg E side adjacent to hole 37.JPG

Miscellaneous Machining and Casting Issues

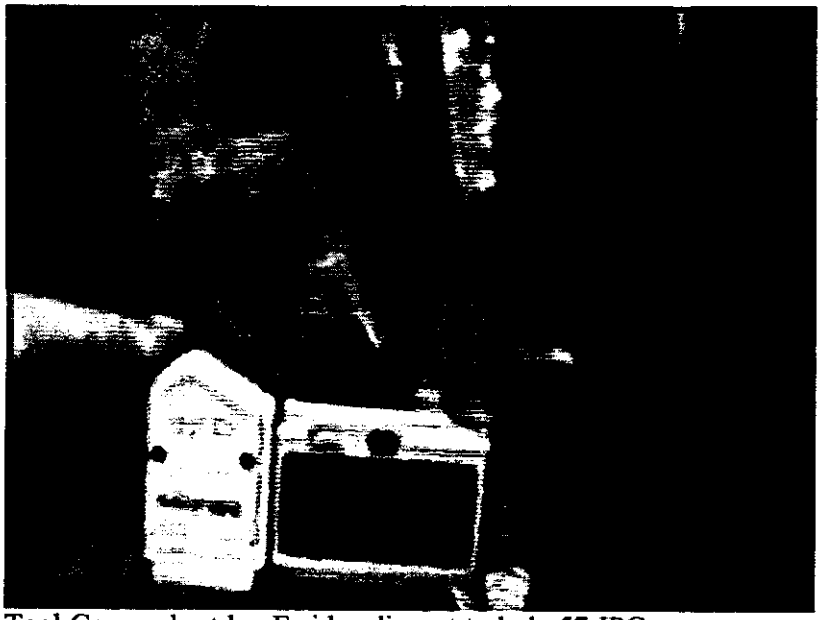
Tooling Gouge short leg E83 wide veiw.JPG

This is a tooling gouge on the short leg of the "T" on the E flange side located close to hole 83. The gouge is approximately 2.200" in length by .200" wide and .008" in depth.



Tooling Gouge short leg E side adjacnet to hole 83.JPG

Miscellaneous Machining and Casting Issues

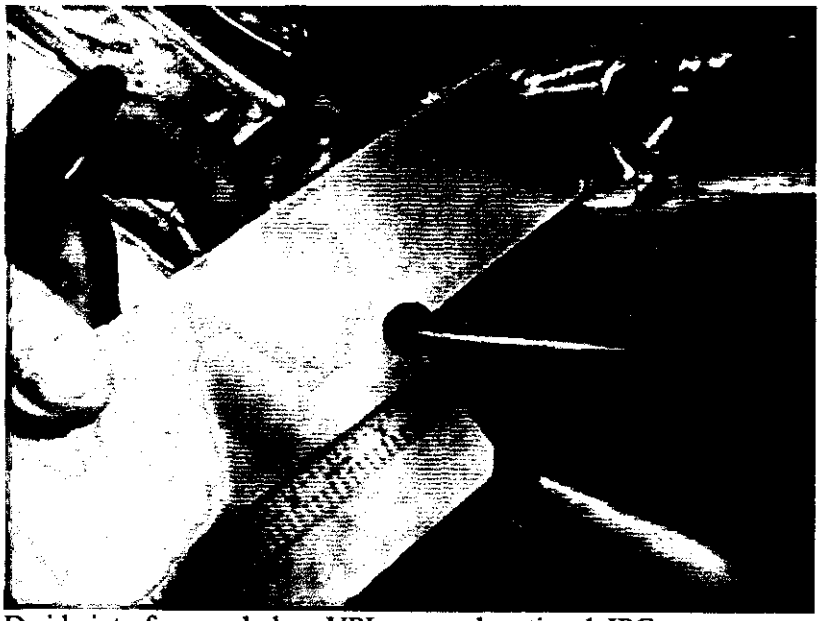


Tool Gouge short leg E side adjacent to hole 57.JPG

This is a tooling gouge on the short leg of the "T" on the E flange side located close to hole 57. The gouge is approximately .800" in length by .200" wide and .010" in depth.

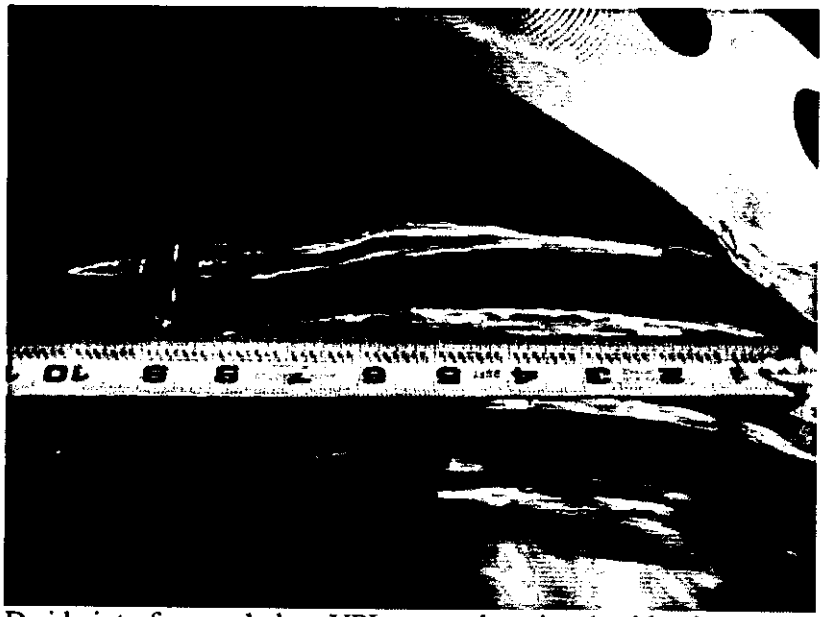
Tool Gouge short leg E57 wide view.JPG

Miscellaneous Machining and Casting Issues



D side interference below VPI groove location 1.JPG

These pictures show the interference below the VPI groove located adjacent to poloidal break on the D side from hole 11 to 13. The interference to the gage is approximately .100" - .200" over a length of about 10".

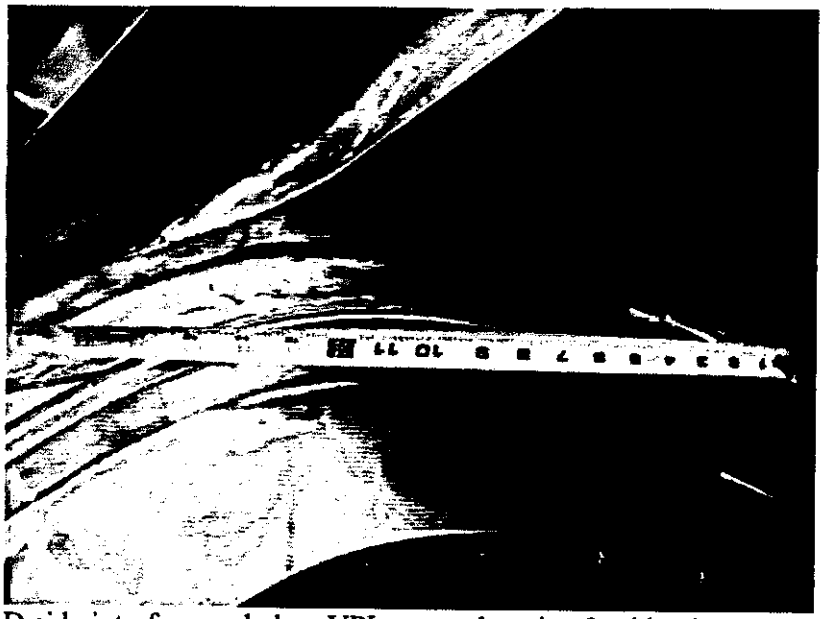


D side interference below VPI groove location 1 wide view.JPG

Miscellaneous Machining and Casting Issues

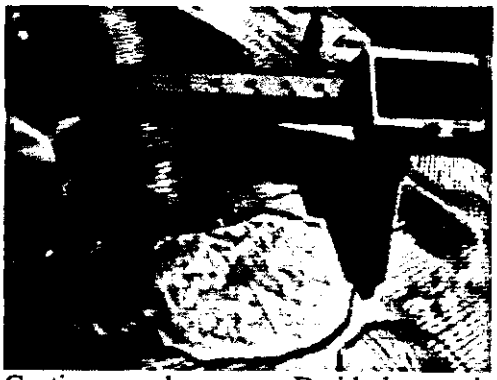
D side interference below VPI groove location 2.JPG

These pictures show the interference below the VPI groove located on the D side from hole 45 to 50. The interference to the gage is approximately .200" - .300" over a length of about 15".

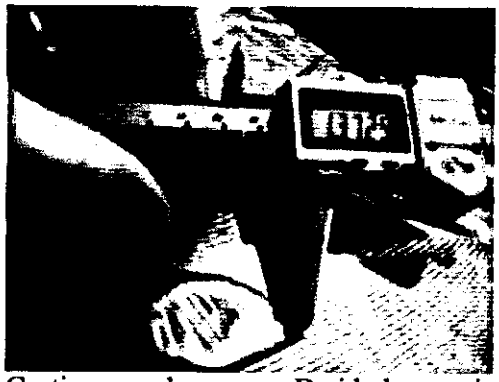


D side interference below VPI groove location 2 wide view.JPG

Miscellaneous Machining and Casting Issues



Casting noncleanup on D side large wing.JPG



Casting noncleanup on D side large wing 2.JPG

Casting noncleanup D side large wing wide view.JPG

The above pictures show noncleanup after final machining on the large flange of the D side. The depths are approximately .02 - .04".

Miscellaneous Machining and Casting Issues

Tool Gouge in cast wall D side section PT11 sheet 7.JPG

This photo shows a tooling gouge in the cast wall located below the 6.5" opening shown on sheet 7 section view PT11. Gouge is approximately 1.470" x .800. The casting wall in this area measures 1.3". The gouge is approximately .25" in depth.

Customer: ENERGY INDUSTRIES OF OHIO
Contact: NANCY HORTON — Telephone: 216-496-2314
E-Mail: NKHFlowen@aol.com — Fax: 216-328-2001

Part: /
Drawing ID: SE141-116 — Revision: 8 — Customer P.O.: S005242-F/Ln:4 — Serial No./Qty: C4

Reported By: MIKE GRIFFITH — Telephone: 317-636-6433
E-Mail: mGriffith@MajorTool.com — Fax: 317-634-9420

Problem: Inspection Test #: 200 rejected: : 2X .06-.09 X 45`: CHAMFER NOT PRESENT - RADIUS
Inspection Test #: 230 rejected: DATUM -E- FLANGE: {f|.01}: .020
Inspection Test #: 250 rejected: DATUM -D- FLANGE: {f|.01}: .025
Inspection Test #: 280 rejected: 8X Ø1.13 THRU/
BACK SPOT FACE Ø2.38 / MIN DEPTH FOR C'UP: {#|.01|A|B|C}: .005 TO .067 / ACCEPT SPOT / 1.125 - 1.129
Inspection Test #: 320 rejected: 3X Ø1.13
: {#|d.060|D|A|N}: .029 TO .067
Inspection Test #: 376 rejected: 12X .25-20 UNC -2B
SUMMARY OF HOLE POSITIONS.
ACTUAL FEATURE CONTROL FRAME
IS NOT ON DRAWING.: {#|d,06|D|A|N}: .004 - .067
Inspection Test #: 650 rejected: : 4.00 ~ .010: 3.918
Inspection Test #: 750 rejected: : 6X d.375-16 UNC TO .75 DEEP
.03 X 45` CHAMFER: ACCEPT / 2 AT .700 DEEP / CHAMFER ACCEPTED
Inspection Test #: 980 rejected: : {g|.125|A|B|C}: .017 TO .53
Inspection Test #: 990 rejected: DATUM -D- SIDE INNER CAST: {g|.5|A|B|C}: -.98 TO .24
Inspection Test #: 1030 rejected: DATUM -E- SIDE INNER CAST: {g|.5|A|B|C}: -.33 TO .59
Inspection Test #: 1035 rejected: MACHINE / GRIND THIS AREA
TO PROFILE OF +.05/.10: : .062 to .075

Proposed Disposition:
Propose to use as is.

Number of additional pages: 3 IDC attachments

Customer Disposition: [] **Use As Is** [x] **Rework** [ ] **Repair** [ ] **Scrap** [ ] **Replace**
These were jointly reviewed by NCSX and MTM during a teleconference on 3/24. All can be accepted as is the exception of the wing area which needs to be ground to provide adequate assembly clearance. Please see the attached slides prepared by Tom Brown. (Some of the grinding is to remove excess overcast; some of it is to increase assembly clearances beyond those currently specified).

Phil Heitzenroeder
Digitally signed by Phil Heitzenroeder
DN: CN = Phil Heitzenroeder, C = US, O = PPPL, OU = Mech. Eng. Division
Reason: I agree to the terms defined by the placement of my signature on this document
Date: 2006.03.24 17:20:08 -05'00'

Tech. Rep

Brad Nelson
Digitally signed by Brad Nelson
DN: cn=Brad Nelson, c=US, o=ORNL, ou=FED, email=nelsonbe@ornl.gov
Date: 2006.03.24 18:33:55 -05'00'

RLM.

Major Tool Implemented By:_____ **Title:**_____ **Date:**_____

n:\mtmapps\Mtnonc14.qrp

C4

Workorder: 65707/4-0 Sub:1 Op:130

Revision: 03/17/06 14:47

Part: SE141-116 - MODULAR COIL WINDING FORM TYPE-C - PRODUCTION MODULAR COIL WINDING FORM TYPE-C

Drawing ID: SE141-103 Rev: 3			INSPECTION INSTRUCTIONS			RESULTS		INSPECTED BY			
SHEET	ZONE	CHARACTERISTIC	GAGE/EQUIP	BY	SAMPLE	SER#	DATA/REMARKS	INSP	VERFD	AUDIT	
2* (10)	D3	Ø.001 - Ø.002 CHECK CLEARANCE OF ITEM 5 TO ITEM 6.	FEELER GAGES	QA		J-1144	ACCEPT	242-M.G 03-22-06			A *
* (15)		THE GAP BETWEEN THE POLOIDAL BREAK BUSHINGS AND FLANGE SHALL BE LESS THAN .002"	FEELER GAGES	QA		J-1144	LESS THAN .002"	242-M.G 03-22-06			A *
2* (20)	F2	ENSURE THAT THE CUMULATIVE GAPS AT ANY SINGLE CROSS SECTION OF THE POLOIDAL FLANGE ELEMENTS IS LESS THAN .005".	FEELER GAGES	QA		J-1144	LESS THAN .002"	242-M.G 03-22-06			A *
* (30)		THE MAX. GAP AT THE POLOIDAL BREAK PERIMITER IS .015" AND CANNOT EXCEED 1/8" FROM THE EDGE.	FEELER GAGES	QA		J-1144	LESS THAN .002"	242-M.G 03-22-06			A *

Employees: 242-M.Griffith

* To Far Right Indicates Data Package Requirement

NOTE: the recording of false, fictitious, or fraudulent statements or entries on this document may be punished as a felony under federal statutes including federal law, title 18, chapter 47.

C4

Workorder: 65707/4-0 Sub:1 Op:85

Revision: 03/16/06 9:14

Part: SE141-116 - MODULAR COIL WINDING FORM TYPE-C - PRODUCTION MODULAR COIL WINDING FORM TYPE-C

Drawing ID: SE141-116 Rev: 8			INSPECTION INSTRUCTIONS			RESULTS		INSPECTED BY			
SHEET	ZONE	CHARACTERISTIC	GAGE/EQUIP	BY	SAMPLE	SER#	DATA/REMARKS	INSP	VERFD	AUDIT	
* (10)		VERIFY CLEARANCE BELOW VPI GROOVE ON BOTH SIDES OF THE T SECTION USING MTMFX-3473		MFG		MTMFX-3473	ACCEPT TO SUPPLIED GAGE	313-R.BA 03-20-06			A *
* (20)		22 PLACES DATUM E FLANGE VERIFY 2" CLEARANCE ABOVE 3" COUNTERBORE SURFACE USING MTMFX-3564.		MFG		MTMFX-3564	ACCEPT TO SUPPLIED GAGE	313-R.BA 03-20-06			A *
* (30)		26 PLACES DATUM D FLANGE VERIFY 2" CLEARANCE ABOVE 3" COUNTERBORE SURFACE USING MTMFX-3564.		MFG		MTMFX-3564	ACCEPT TO SUPPLIED GAGE	313-R.BA 03-20-06			A *
6* (40)	F3	VERIFY THAT 1" DIAMETER COOLING HOLES PASS COMPLETELY THROUGH CASTING WITH NO INTERFERENCE FROM CASTING STOCK.		MFG	4	VISUAL	ACCEPT	313-R.BA 03-20-06			A *
9* (50)	D7	VERIFY THAT 1" DIAMETER COOLING HOLES PASS COMPLETELY THROUGH CASTING WITH NO INTERFERENCE FROM CASTING STOCK.		MFG	4	VISUAL	ACCPET	313-R.BA 03-20-06			A *
9* (60)	F3	VERIFY THAT 1" DIAMETER COOLING HOLES PASS COMPLETELY THROUGH CASTING WITH NO INTERFERENCE FROM CASTING STOCK.		MFG	4	VISUAL	ACCEPT	313-R.BA 03-20-06			A *

Employees: 313-R.Bachek

* To Far Right Indicates Data Package Requirement

C4

Workorder: 65707/4-0 Sub:1 Op:132

Revision: 03/24/06 14:27

Part: SE141-116 - MODULAR COIL WINDING FORM TYPE-C - PRODUCTION MODULAR COIL WINDING FORM TYPE-C

Drawing ID: SE141-116 Rev: 8			INSPECTION INSTRUCTIONS			RESULTS		INSPECTED BY			
SHEET	ZONE	CHARACTERISTIC	GAGE/EQUIP	BY	SAMPLE	SER#	DATA/REMARKS	INSP	VERFD	AUDIT	
1* (10)	E8	47.19 ± .03	CMM	QA		00064	47.169	339-E.RO 03-24-06			A *
1* (20)	B8	47.19 ± .03	CMM	QA		00064	47.169	339-E.RO 03-24-06			A *
1* (30)	D6	47.19 ± .03	CMM	QA		00064	47.169	339-E.RO 03-24-06			A *
1* (40)	C6	47.19 ± .03	CMM	QA		00064	47.169	339-E.RO 03-24-06			A *
1* (50)	E6	// .02 A	CMM	QA		00064	ACCEPT	339-E.RO 03-24-06			A *
1* (60)	B6	// .02 A	CMM	QA		00064	ACCEPT	339-E.RO 03-24-06			A *
2* (80)	H6	2X R.187 +.025 -.005	PIN GAGE	QA		J-652	ACCEPT	339-E.RO 03-24-06			A *
2* (90)	G8	2X .03 X 45°		QA		VISUAL	ACCEPT	339-E.RO 03-24-06			A *
2* (100)	G8	.40 ± .010	CALIPER	QA		J-707	.39 TO .41	339-E.RO 03-24-06			A *
2* (110)	G8	2X .030 X 45°		QA		VISUAL	ACCEPT	339-E.RO 03-24-06			A *
2* (120)	F7	2X .32	CALIPER	QA		J-707	.315 TO .330	339-E.RO 03-24-06			A *
2* (130)	F7	2X R.11	RADIUS GAGE	QA		R-21	0.10	339-E.RO 03-24-06			A *
2* (140)	G6	⌓ .2 R S T P TO M	CMM	QA		00064	-0.062 TO .079	339-E.RO 03-24-06			A *
2*	G6	4.790 OR SHELL INTERSECT.		QA		MTMFX-3473	ACCEPT (AREAS OF CONCERN REPORTED)	242-M.G			A

* To Far Right Indicates Data Package Requirement

NOTE: the recording of false, fictitious, or fraudulent statements or entries on this document may be punished as a felony under federal statutes including federal law, title 18, chapter 47.

C4

(150)		VERIFY USING TEMPLATE PER DRAWING NOTE 16 (MTMFX-3473)						03-24-06			*
2* (160)	G3	⌓ .2 R S T Q TO N	CMM	QA		00064	-.009 TO .097	339-E.RO 03-24-06			A *
2* (170)	G3	4.790 OR SHELL INTERSECT. VERIFY USING TEMPLATE PER DRAWING NOTE 16 (MTMFX-3473)		QA		MTMFX-3473	ACCEPT	339-E.RO 03-24-06			A *
2* (180)	E6	⌓ .02 R S T M TO MI	CMM	QA		00064	-.022 TO .029	339-E.RO 03-24-06			A *
2* (182)	F3	⌓ .02 R S T N TO NI	CMM	QA		00064	-.019 TO .023	339-E.RO 03-24-06			A *
2* (185)	E5	⌓ .1 R S T MI TO NI	CMM	QA		00064	-.019 TO .028	339-E.RO 03-24-06			A *
Drawing ID: NCSX-CSPEC-141-03 Rev: 11			**INSPECTION INSTRUCTIONS**			**RESULTS**		**INSPECTED BY**			
SHEET	**ZONE**	**CHARACTERISTIC**	**GAGE/EQUIP**	**BY**	**SAMPLE**	**SER#**	**DATA/REMARKS**	**INSP**	**VERFD**	**AUDIT**	
4* (188)	3.1.1.4	√125 THE TWO "L" MACHINED SURFACES OF TEE.	PROFILOMETER	QA		J-1152	ACCEPT	339-E.RO 03-24-06			A *
Drawing ID: SE141-116 Rev: 8			**INSPECTION INSTRUCTIONS**			**RESULTS**		**INSPECTED BY**			
SHEET	**ZONE**	**CHARACTERISTIC**	**GAGE/EQUIP**	**BY**	**SAMPLE**	**SER#**	**DATA/REMARKS**	**INSP**	**VERFD**	**AUDIT**	
2* (190)	B5	⌖ .06 R S T 96X .375-16 UNC .750 DEEP .625 CBORE .188 DEEP	CMM CALIPER	QA	50%	00064 J-707	.005 TO .040 / .75 / .625 / .187 TO .188	339-E.RO 03-24-06			A *
2* (195)	B5	.375-16 UNC .750 DEEP GAGE 100% OF THE HOLES AND VERIFY CLEANLINESS.	THREAD PLUG GAGE	QA	100%	A-443	ACCEPT	339-E.RO 03-24-06			A *
2* (200)	B4	2X .06-.09 X 45°		QA		VISUAL	CHAMFER NOT PRESEN - RADIUS	339-E.RO 03-24-06			R *
3* (210)	G7	⌖ .01 A B C 8X Ø1-8 UNC THRU	CMM THREAD PLUG GAGE	QA		00064 A-347	ACCEPT	242-M.G 03-24-06			A *
3*	H3	▱ .01	CMM	QA		00064	.020	339-E.RO			R

* To Far Right Indicates Data Package Requirement

NOTE: the recording of false, fictitious, or fraudulent statements or entries on this document may be punished as a felony under federal statutes including federal law, title 18, chapter 47.

C4

(230)		DATUM -E- FLANGE						03-24-06			*
3* (240)	H4	√125 DATUM -E- FLANGE	PROFILOMETER	QA		J-1152	41 TO 70	339-E.RO 03-24-06			A *
3* (250)	F3	▱ .01 DATUM -D- FLANGE	CMM	QA		00064	.025	339-E.RO 03-24-06			R *
3* (260)	F3	√125 DATUM -D- FLANGE	PROFILOMETER	QA		J-1152	44 TO 76	339-E.RO 03-24-06			A *
3* (280)	E4	⌖ .01 A B C 8X Ø1.13 THRU BACK SPOT FACE Ø2.38 MIN DEPTH FOR C'UP	CMM	QA		00064 MTMFX-3564	.005 TO .067 / ACCE PT SPOT / 1.125 - 1 .129	339-E.RO 03-24-06			R *
4* (290)	H8	⌖ .060 D A N 3X Ø1.885 THRU	CMM	QA		00064	.026 - .033	339-E.RO 03-24-06			A *
4* (291)	H8	3X Ø1.885 +/- .003 Ø3.00 BACK SPOTFACE VERIFY MIN CLEANUP	CMM	QA		00064 MTMFX-3564	ACCEPT SPOT / 1.884 - 1.888	339-E.RO 03-24-06			A *
4* (300)	H7	⌖ Ø.06 D A N 3X 2.000" COUNTERBORE 1.00 DP	CMM CALIPER	QA		00064 J-707	.010 TO .014 / .99 DEEP	339-E.RO 03-24-06			A *
4* (305)	H7	Ø⌊⌋ 2.000 - 2.001	MICROMETER - INTE	QA		J-999	2.000 TO 2.001	339-E.RO 03-24-06			A *
4* (310)	H6	⌖ Ø.060 D A N 17X Ø1.885 THRU	CMM	QA		00064	1.882 - 1.887	339-E.RO 03-24-06			A *
4* (311)	H6	3X Ø1.885 +/- .003 THRU Ø3.00 BACK SPOTFACE VERIFY MIN CLEANUP	CMM	QA		00064 MTMFX-3564	SEE 290 / ACCEPT SP OT	339-E.RO 03-24-06			A *
4* (320)	H5	⌖ Ø.060 D A N 3X Ø1.13	CMM	QA		00064	.029 TO .067	339-E.RO 03-24-06			R *
4* (321)	H5	3X Ø1.13 +/- .010 Ø2.38 BACK SPOTFACE VERIFY MIN CLEANUP	CMM CALIPER	QA		00064 J-707	SEE 280 / ACCEPT SP OT	339-E.RO 03-24-06			A *

* To Far Right Indicates Data Package Requirement

NOTE: the recording of false, fictitious, or fraudulent statements or entries on this document may be punished as a felony under federal statutes including federal law, title 18, chapter 47.

C4

4* (340)	E6	⌖ Ø.060 D A N 3X Ø1.375-6 UNC THRU	CMM	QA		00064	.0068 TO .027	339-E.RO 03-24-06			A *
4* (350)	E6	⌖ Ø.060 D A N 5X Ø1.885 THRU	CMM	QA		00064	.0036 TO .017	339-E.RO 03-24-06			A *
4* (351)	E6	5X Ø1.885 +/- .003 THRU Ø3.00 BACK SPOTFACE VERIFY MIN CLEANUP	CMM	QA		00064 MTMFX-3564	SEE 290 / ACCEPT SP OT	339-E.RO 03-24-06			A *
4* (360)	D4	⌖ Ø.060 D A N Ø1.885 THRU	CMM	QA		00064	.021	339-E.RO 03-24-06			A *
4* (361)	D4	Ø1.885 +/- .003 THRU Ø3.00 BACK SPOTFACE VERIFY MIN CLEANUP	CMM	QA		00064 MTMFX-3564	SEE 290 / ACCEPT SP OT	339-E.RO 03-24-06			A *
4* (370)	B5	⌖ Ø.060 D A N 3X Ø1.13	CMM	QA		00064	.0054 TO .017	339-E.RO 03-24-06			A *
4* (371)	B5	3X Ø1.13 +/- .010 Ø2.38 BACK SPOTFACE VERIFY MIN CLEANUP	CMM CALIPER	QA		00064 J-707	SEE 280 / ACCEPT SP OT	339-E.RO 03-24-06			A *
4* (375)	D1	12X .25-20 UNC -2B	THREAD PLUG GAGE	QA		A-234	ACCEPT	339-E.RO 03-24-06			A *
4* (376)	G8	⌖ Ø.06 D A N 12X .25-20 UNC -2B SUMMARY OF HOLE POSITIONS. ACTUAL FEATURE CONTROL FRAME IS NOT ON DRAWING.	CMM	QA		00064	.004 - .067	339-E.RO 03-24-06			R *
5* (380)	E8	⌖ Ø.060 E A J Ø1.885 THRU	CMM	QA		00064	.020	339-E.RO 03-24-06			A *
5* (381)	E8	Ø1.885 +/- .003 THRU Ø3.00 BACK SPOTFACE VERIFY MIN CLEANUP	CMM	QA		00064 MTMFX-3564	SEE 380 / ACCEPT SP OT	339-E.RO 03-24-06			A *
5* (400)	F6	⌖ Ø.060 E A J 3X Ø1.375-6 UNC THRU	CMM	QA		00064	.0094 TO .026	339-E.RO 03-24-06			A *

* To Far Right Indicates Data Package Requirement

C4

5* (410)	F6	⌖ Ø.06 E A J 3X 2.000" COUNTERBORE 1.00 DP	CMM CALIPER	QA		00064 J-707	.013 TO .028 / .99 DP	339-ERO 03-24-06			A *
5* (412)	F6	ØL 2.000 - 2.001	MICROMETER - INTE	QA		J-999	2.0000 - 2.0001	339-ERO 03-24-06			A *
5* (415)	F7	7X 1/4-20 UNC -2B	THREAD PLUG GAGE	QA		A-234	ACCEPT	339-ERO 03-24-06			A *
5* (420)	F7	⌖ Ø.06 E A J 7X 1/4-20 UNC -2B SUMMARY OF HOLE POSITIONS. ACTUAL FEATURE CONTROL FRAME IS NOT ON DRAWING.	CMM	QA		00064	.010 - .039	339-ERO 03-24-06			A *
5* (430)	E7	⌖ Ø.060 E A J 24X Ø1.885 THRU	CMM	QA		00064	.013 TO .028	339-ERO 03-24-06			A *
5* (431)	E7	24X Ø1.885 +/- .003 THRU Ø3.00 BACK SPOTFACE VERIFY MIN CLEANUP	CMM	QA		00064 MTMFX-3564	1.884 - 1.888 / ACC EPT SPOT	339-ERO 03-24-06			A *
5* (440)	E7	⌖ Ø.060 E A J 3X Ø1.5 TO 2.00 DEEP Ø3.00 TO 1.00 DEEP	CMM	QA		00064	.008 - .012 / 1.5 / 1.99 DP	339-ERO 03-24-06			A *
5* (450)	D7	3X Ø1.885 +/- .003 THRU Ø3.00 BACK SPOTFACE VERIFY MIN CLEANUP	CMM	QA		00064 MTMFX-3564	1.887 - 1.888 / ACC EPT	339-ERO 03-24-06			A *
6* (470)	E3	4X Ø1.00 THRU	CMM	QA		00064	1.00 - 1.002 THRU	339-ERO 03-24-06			A *
8* (650)	G7	4.00 ± .010	CALIPER	QA		J-707	3.918	339-ERO 03-24-06			R *
8* (750)	D7	6X Ø.375-16 UNC TO .75 DEEP .03 X 45° CHAMFER	THREAD PLUG GAGE	QA		A-442 VISUAL	ACCEPT / 2 AT .700 DEEP / CHAMFER ACCE PTED	339-ERO 03-24-06			R *
8* (760)	D7	13.6 °		QA		VISUAL	SEE IGES	339-ERO 03-24-06			A *
8*	D7	5.88		QA		VISUAL	ACCEPT	339-ERO			A

* To Far Right Indicates Data Package Requirement

C4

(770)		VERIFY THAT PAD MEETS THE MINIMUM OF 5.88						03-24-06			*
8* (780)	D7	2.19 ± .010		QA		VISUAL	SEE IGES	339-E.RO 03-24-06			A *
8* (790)	D7	2.19 ± .010		QA		VISUAL	SEE IGES	339-E.RO 03-24-06			A *
8* (830)	C8	2X 1.56 ± .010 THRU	CALIPER	QA		J-707	1.565	339-E.RO 03-24-06			A *
8* (850)	C8	2X 7.50 ± .010 THRU	CALIPER	QA		J-707	7.506	339-E.RO 03-24-06			A *
8* (860)	C8	8X R.25	RADIUS GAGE	QA		R-21	.25	339-E.RO 03-24-06			A *
8* (870)	C8	2X 2.52 ± .010		QA		VISUAL	SEE IGES	339-E.RO 03-24-06			A *
9* (900)	E7	2.54 ± .010		QA		VISUAL	SEE IGES	339-E.RO 03-24-06			A *
9* (910)	E7	5.08 ± .010		QA		VISUAL	SEE IGES	339-E.RO 03-24-06			A *
9* (920)	F3	4X Ø1.0 THRU VERIFY THAT HOLES BREAK COMPLETELY THROUGH INSIDE OF CASTING	CALIPER	QA		J-707	1.00 THRU	339-E.RO 03-24-06			A *
9* (930)	F3	2X Ø .50 ± .010 THRU	CALIPER	QA		J-707	.50	339-E.RO 03-24-06			A *
9* (940)	E3	2.44 ± .010	CALIPER	QA		J-707	2.46	339-E.RO 03-24-06			A *
9* (950)	E3	1.22 ± .010		QA		VISUAL	SEE IGES	339-E.RO 03-24-06			A *
9* (960)	C7	4X Ø1.0 THRU VERIFY THAT HOLES BREAK COMPLETELY THROUGH INSIDE OF CASTING	CALIPER	QA		J-707	1.000 - 1.004	339-E.RO 03-24-06			A *
9*	C6	2X Ø.25 T.C. HOLE		QA			.25 / THRU	339-E.RO			

* To Far Right Indicates Data Package Requirement

NOTE: the recording of false, fictitious, or fraudulent statements or entries on this document may be punished as a felony under federal statutes including federal law, title 18, chapter 47.

C4

(970)								03-24-06			*
Drawing ID: SE141-116 Rev: 7			INSPECTION INSTRUCTIONS			RESULTS		INSPECTED BY			
SHEET	ZONE	CHARACTERISTIC	GAGE/EQUIP	BY	SAMPLE	SER#	DATA/REMARKS	INSP	VERFD	AUDIT	
10* (980)	C8	⌓ .125 A B C	CMM	QA		00064	.017 TO .53	339-E.RO 03-24-06			R *
Drawing ID: SE141-116 Rev: 8			INSPECTION INSTRUCTIONS			RESULTS		INSPECTED BY			
SHEET	ZONE	CHARACTERISTIC	GAGE/EQUIP	BY	SAMPLE	SER#	DATA/REMARKS	INSP	VERFD	AUDIT	
10* (990)	D5	⌓ .5 A B C DATUM -D- SIDE INNER CAST	CMM	QA		00064	-.98 TO .24	339-E.RO 03-24-06			R *
Drawing ID: SE141-116 Rev: 7			INSPECTION INSTRUCTIONS			RESULTS		INSPECTED BY			
SHEET	ZONE	CHARACTERISTIC	GAGE/EQUIP	BY	SAMPLE	SER#	DATA/REMARKS	INSP	VERFD	AUDIT	
10* (1010)	C4	⌓ .125 A B C DATUM -E- SIDE LARGE WING	CMM	QA		00064	.011 TO .026	339-E.RO 03-24-06			A *
Drawing ID: SE141-116 Rev: 8			INSPECTION INSTRUCTIONS			RESULTS		INSPECTED BY			
SHEET	ZONE	CHARACTERISTIC	GAGE/EQUIP	BY	SAMPLE	SER#	DATA/REMARKS	INSP	VERFD	AUDIT	
10* (1030)	D1	⌓ .5 A B C DATUM -E- SIDE INNER CAST	CMM	QA		00064	-.33 TO .59	339-E.RO 03-24-06			R *
Drawing ID: SE141-116 Rev: 7			INSPECTION INSTRUCTIONS			RESULTS		INSPECTED BY			
SHEET	ZONE	CHARACTERISTIC	GAGE/EQUIP	BY	SAMPLE	SER#	DATA/REMARKS	INSP	VERFD	AUDIT	
10* (1035)	E1	MACHINE / GRIND THIS AREA TO PROFILE OF +.05/-.10	CMM	QA		00064	.062 - .075	242-M.G 03-24-06			R *
Drawing ID: NCSX-CSPEC-141-03 Rev: 10			INSPECTION INSTRUCTIONS			RESULTS		INSPECTED BY			
SHEET	ZONE	CHARACTERISTIC	GAGE/EQUIP	BY	SAMPLE	SER#	DATA/REMARKS	INSP	VERFD	AUDIT	
4* (1040)	3.1.1.4	UOS ALL MACHINED SURFACES TO BE 250 RMS SURFACE FINISH RECORD RANGE	PROFILOMETER	QA		J-1152 VISUAL	41 - 75	339-E.RO 03-24-06			A *
Drawing ID: SE141-116 Rev: 8			INSPECTION INSTRUCTIONS			RESULTS		INSPECTED BY			
SHEET	ZONE	CHARACTERISTIC	GAGE/EQUIP	BY	SAMPLE	SER#	DATA/REMARKS	INSP	VERFD	AUDIT	
1*		NOTE 9 RECORD THE WEIGHT OF THE PART	SCALE	QA		2270	5,640	339-E.RO			A

* To Far Right Indicates Data Package Requirement

NOTE: the recording of false, fictitious, or fraudulent statements or entries on this document may be punished as a felony under federal statutes including federal law, title 18, chapter 47.

C4

(1050)		6000LBS MAX						03-24-06			*

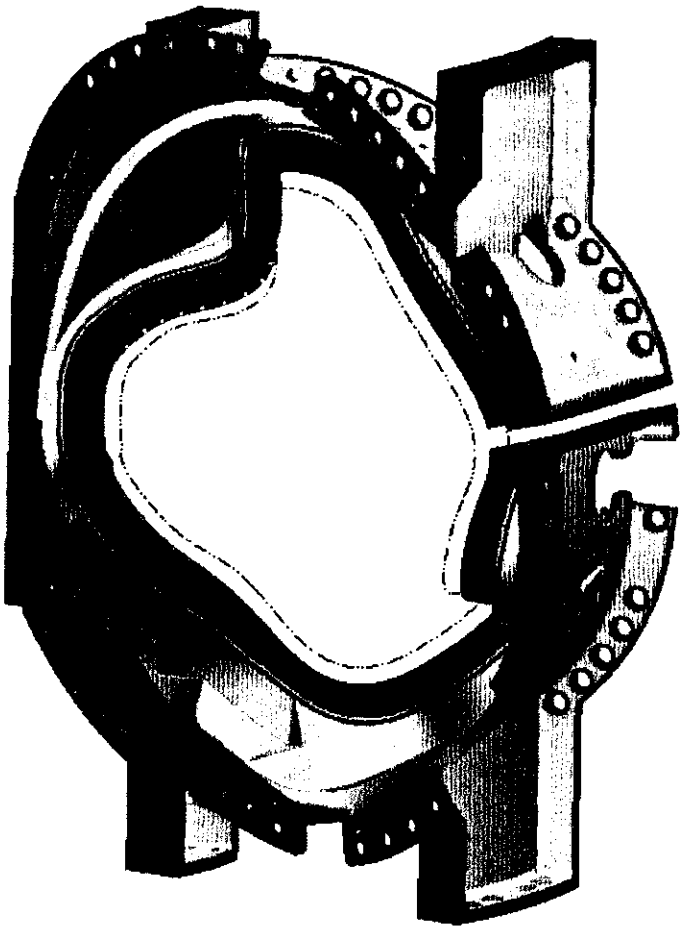
Employees: 242-M.Griffith / 339-E.Root

* To Far Right Indicates Data Package Requirement

MC C4 Wing Inspection

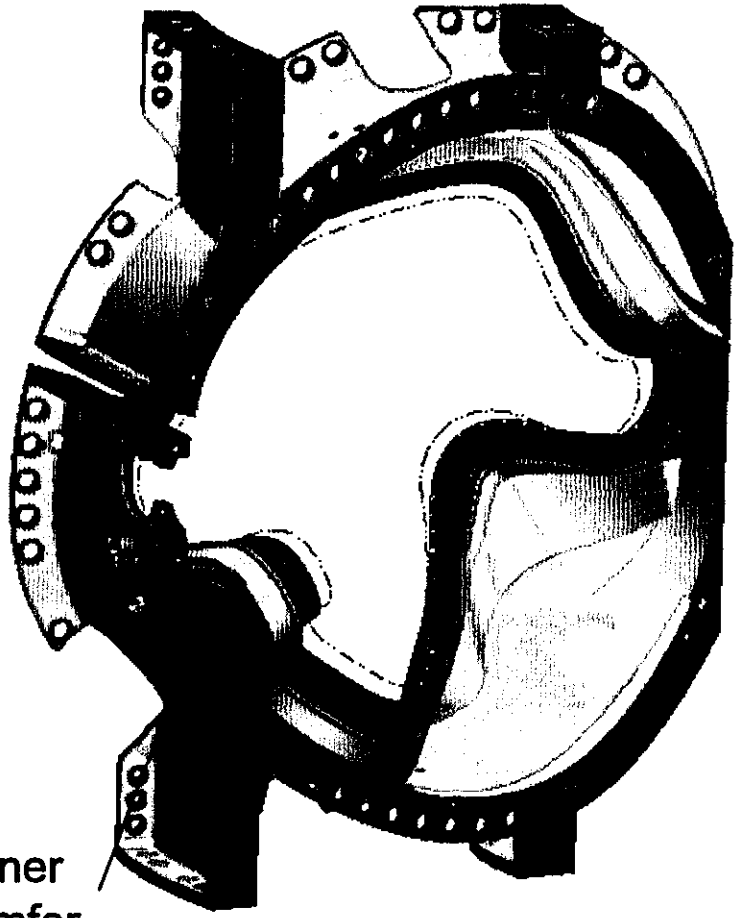
T. Brown

2/28/06

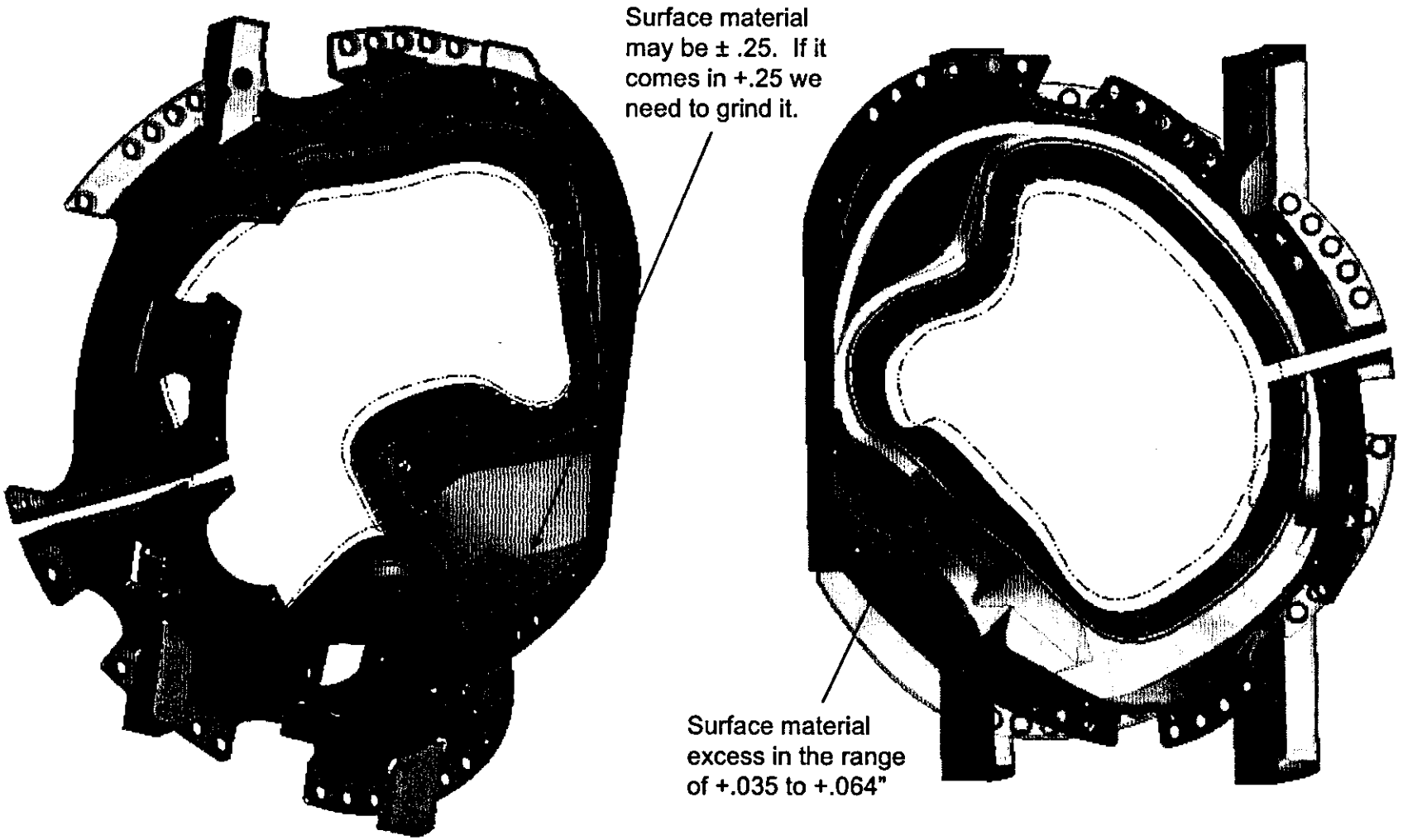


C to B Side

Corner
Chamfer
Reqd

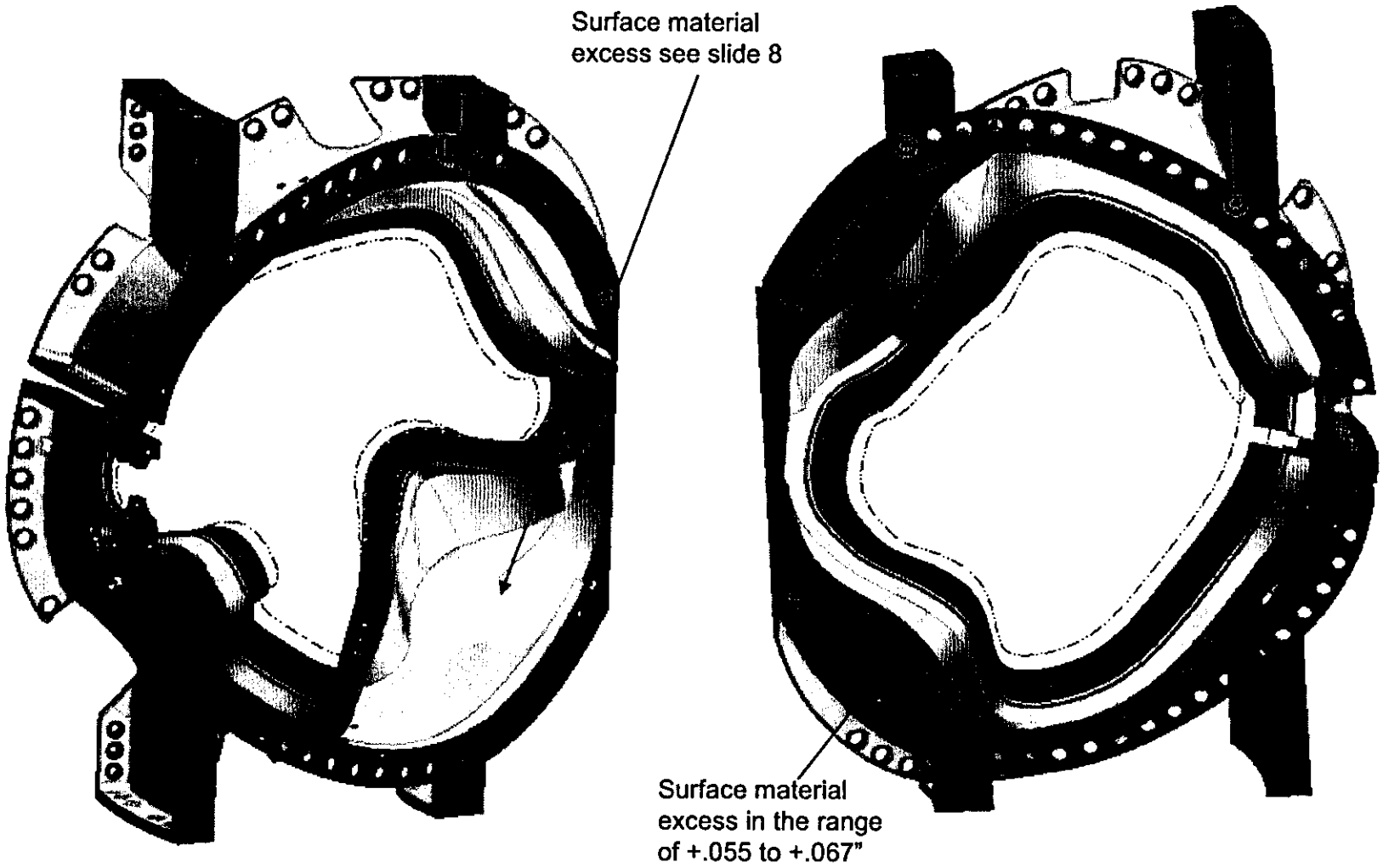


C to C Side



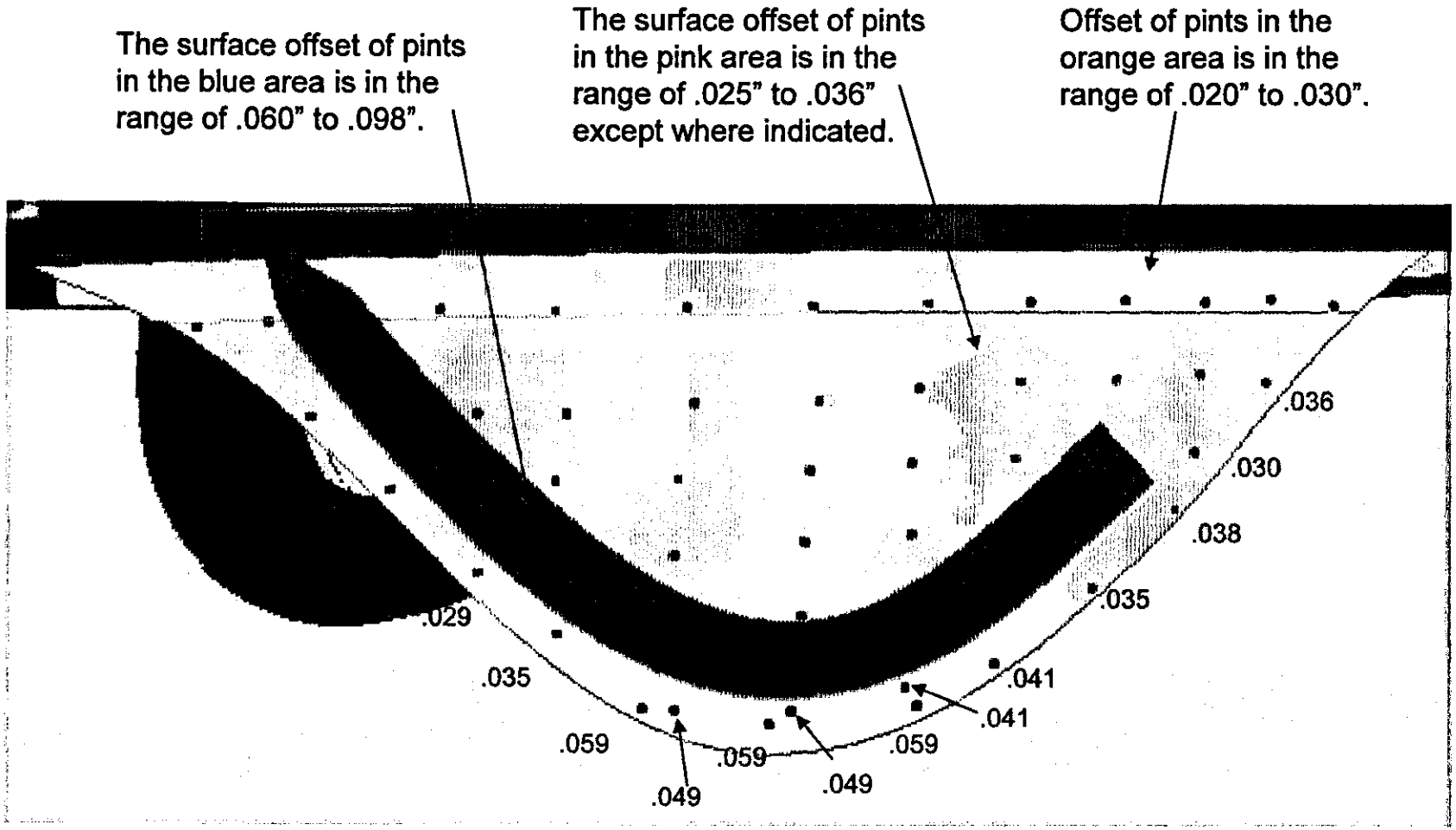
B to C Side

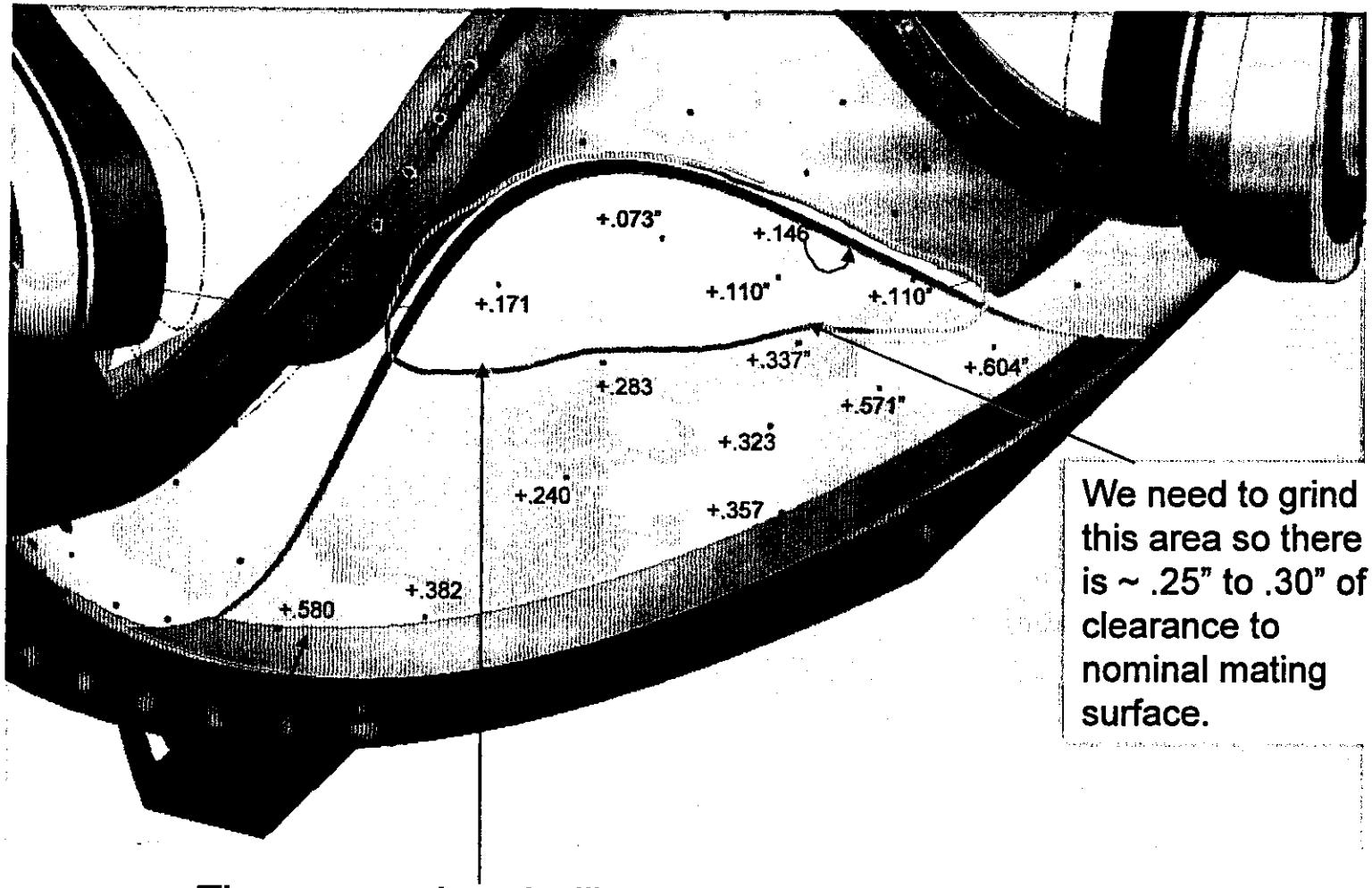
C to B Side



C Side

C Side - Flipped


The surface offset of pints in the blue area is in the range of .060" to .098".
The surface offset of pints in the pink area is in the range of .025" to .036" except where indicated.
Offset of pints in the orange area is in the range of .020" to .030".
.029
.035
.059
.049
.059
.049
.059
.041
.041
.035
.038
.030
.036

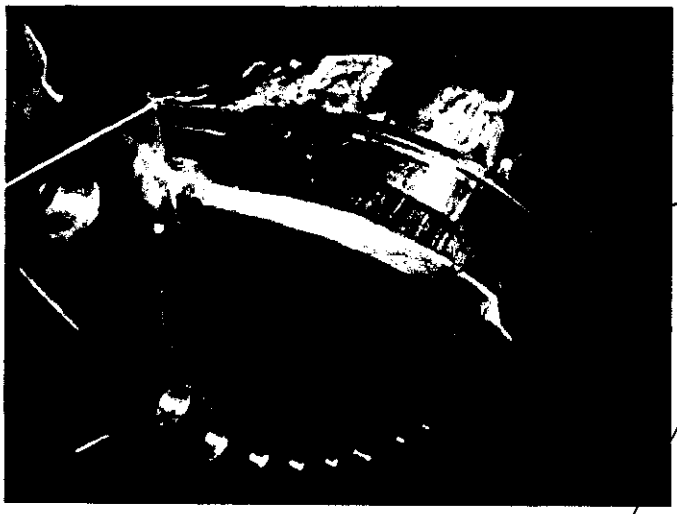


We need to grind this area so there is ~ .25" to .30" of clearance to nominal mating surface.

The area enclosed will need to be ground as it is too close to the nominal mating wing surface and even closer to the final machined surface shown in previous view graph.

65707/4 (C4)

Grinding Photos



Ground chamfer and hand blending of C4

When performing the grinding of the Wing Interference area, the shop personnel mistakenly interpreted the marked tool gouge (E57) as also needing blended out.
In order to prevent future occurrences I am making up stickers labeled "Do not blend" to apply to or cover up these types of areas.

Mike Griffith

Major Tool & Machine, Inc.
1458 East 19th Street
Indianapolis, IN 46218-4289

MTM N/C: 19483

Date: 03/24/06
User ID: GRIFFITH

Customer: ENERGY INDUSTRIES OF OHIO
Contact: NANCY HORTON — Telephone: 216-496-2314
E-Mail: NKHFlowen@aol.com — Fax: 216-328-2001

Part: / — Customer P.O.: S005242-F/Ln:4
Drawing ID: SE141-116 — Revision: 8 — Serial No./Qty: C4

Reported By: MIKE GRIFFITH — Telephone: 317-636-6433
E-Mail: mGriffith@MajorTool.com — Fax: 317-634-9420

Problem: Inspection Test #: 200 rejected: : 2X .06-.09 X 45`: CHAMFER NOT PRESENT - RADIUS
Inspection Test #: 230 rejected: DATUM -E- FLANGE: {f|.01}: .020
Inspection Test #: 250 rejected: DATUM -D- FLANGE: {f|.01}: .025
Inspection Test #: 280 rejected: 8X Ø1.13 THRU/
BACK SPOT FACE Ø2.38 / MIN DEPTH FOR C'UP: {#|.01|A|B|C}: .005 TO .067 / ACCEPT SPOT / 1.125 - 1.129
Inspection Test #: 320 rejected: 3X Ø1.13
: {#|d.060|D|A|N}: .029 TO .067
Inspection Test #: 376 rejected: 12X .25-20 UNC -2B
SUMMARY OF HOLE POSITIONS.
ACTUAL FEATURE CONTROL FRAME
IS NOT ON DRAWING.: {#|d,06|D|A|N}: .004 - .067
Inspection Test #: 650 rejected: : 4.00 ~ .010: 3.918
Inspection Test #: 750 rejected: : 6X d.375-16 UNC TO .75 DEEP
.03 X 45` CHAMFER: ACCEPT / 2 AT .700 DEEP / CHAMFER ACCEPTED
Inspection Test #: 980 rejected: : {g|.125|A|B|C}: .017 TO .53
Inspection Test #: 990 rejected: DATUM -D- SIDE INNER CAST: {g|.5|A|B|C}: -.98 TO .24
Inspection Test #: 1030 rejected: DATUM -E- SIDE INNER CAST: {g|.5|A|B|C}: -.33 TO .59
Inspection Test #: 1035 rejected: MACHINE / GRIND THIS AREA
TO PROFILE OF +.05/.10: : .062 to .075

Proposed Disposition:
Propose to use as is.

Number of additional pages: 3 IDC attachments

Customer Disposition: [] Use As Is [x] Rework [ ] Repair [ ] Scrap [ ] Replace
These were jointly reviewed by NCSX and MTM during a teleconference on 3/24. All can be accepted as is the exception of the wing area which needs to be ground to provide adequate assembly clearance. Please see the attached slides prepared by Tom Brown. (Some of the grinding is to remove excess overcast; some of it is to increase assembly clearances beyond those currently specified).

Phil Heitzenroeder — Digitally signed by Phil Heitzenroeder DN: CN = Phil Heitzenroeder, C = US, O = PPPL, OU = Mech. Eng. Division Reason: I agree to the terms defined by the placement of my signature on this document Date: 2006.03.24 17:20:08 -05'00'

Brad Nelson — Digitally signed by Brad Nelson DN: cn=Brad Nelson, c=US, o=ORNL, ou=FED, email=nelsonbe@ornl.gov Date: 2006.03.24 18:33:55 -05'00'

Tech. Rep — **RLM.**

Major Tool Implemented By: _____ **Title:** CFT ENGINEER **Date:** 3/27/2006

n:\mtmapps\Mtmonc14.qrp

EASTWOOD MANUFACTURING
CERTIFICATION OF COMPLIANCE

CUSTOMER : MAJOR TOOL AND MACHINE
ORDER # : P05-01160

DATE : 5-16-05
OUR NUMBER 32984

WE CERTIFY THAT THE MATERIALS SUPPLIED ON YOUR ORDER LISTED ABOVE COMPLIES WITH THE REQUIREMENTS OF YOUR ORDER AND OF THE SPECIFICATIONS LISTED BELOW

DESCRIPTION .

Lot No..		Part .		
32984-1	28 PIECES	DS141-036 ASTM A286 Silver plated Per AMS2410	Heat No.. 8969595	1 7/16 Round, machined to size Heat Treat. 36891 Silver plate. IMF 00132563 Post plate bake. SEI 37905 Tensile test. WH 05-0420-01

TENSILE KSI	YIELD KSI	ELONGATION	REDUCTION	HARDNESS
150	120	14	35	
PASS	PASS	PASS	PASS	PASS

DALE STARK
EASTWOOD MANUFACTURING

MAY 19 2005

96326

1-4
B-1

studs

MTM 09 5/19/05

Republic
401 ROSE AVE S E
MASSILLON, OH 44646
FAX 330-837-7017

CERTIFICATE OF TESTS REPUBLIC ENGINEERED PRODUCTS JANUARY 26, 2005
PAGE: 1 OF 3

PURCHASE ORDER: 42904-3
PART NUMBER : S# 47670
ORDER NUMBER: 12-52585-06 821
HEAT : 8969595
PURCHASE ORDER DATE: 05/24/04
ACCOUNT NUMBER . . : 27759001
SCHEDULE . . . . . : 30628-

CHARGE ADDRESS

FRY STEEL COMPANY
BUNNIE ISAKA
13325 MOLETTE ST
SANTA FE SPRINGS CA 90670

SHIP TO

FRY STEEL COMPANY
BUNNIE ISAKA
C/O CMI
4201 W 36TH ST
CHICAGO IL 60623

MATERIAL DESCRIPTION

COLD FINISHED STEEL BARS ALLOY DOUGLAS SPEC DMS-1553H GRADE B DTD 07/02/91 EXC MARK & PARA 3.4 OIL TEMP & 3.5 BOEING SPEC BMS 7-260 ASTM A 331-95 ASTM A 108-03 LEVEL 1 MIL S 5000E COND E-4 EXC MARK AMS 6415R EXC RHN AMS 6409B AMS 2310E AMS 2301J AMS 2304A AMS 6484B AMS -9- 5000 ISS 3/99 COND E-4 EXC MARK & PARA 4.3 EF-AISI-E-4340 , AIRCRAFT Q DBL TRANSV MECH PROP COLD DRAWN NOR M & SUBCRITICAL ANN BEFORE CD REST CHEM

SIZE: RDS 1.4375 X 11 /13FT

LADLE CHEMISTRY %

C	MN	P	S	SI	CU	NI	CR	MO	AL
0.42	00.75	.007	.002	0.22	0.10	01.70	00.84	0.21	00.028

V	N	CB	SN
0.005	.0064	0.002	.007

SEMI-FINISH RESULTS

AUSTENITIC GRAIN SIZE
AUST GRAIN SZ 7.

DEVELOPED TENS TRANS
NORMALIZE DEG F: 1650.
ASTM E8 AUSTENITIZE DEG F: 1550.
ASTM A370 QUENCHANT: OIL
TEMPER 1 DEG F: 900.
TEMP 1 TIME HOURS: 2.0

		TENSILE PSI	REDUCTION AREA PERCENT
PCE H	10102	185010.	45.5
PCE H	10302	180280.	55.6
PCE T	10503	185540.	55.7
PCE H	30102	180570.	51.4
PCE H	30302	193790.	53.0
PCE T	30504	185240.	46.3

DEVELOPED TRANS TENSILE
NORMALIZE DEG F: 1650.
ASTM E8 AUSTENITIZE DEG F: 1500.
ASTM A370 QUENCHANT: OIL
TEMPER 1 DEG F: 475.
TEMPER 2/SR DEG F: 475.
TEMP 1 TIME HOURS: 2.0
TEMP 2 TIME HOURS: 2.0

		TENSILE PSI	YIELD (.2%) PSI	REDUCTION AREA PERCENT	ELONGATION PERCENT
PCE H	10102	262320.	223600.	47.0	10.4
PCE H	10302	264250.	222910.	44.6	11.4
PCE T	10503	262170.	225100.	44.6	11.3
PCE H	30102	261840.	218860.	43.8	11.4
PCE H	30302	261260.	222160.	49.3	11.4
PCE T	30504	261050.	225230.	48.2	12.9

AMAN BHATIA
GEN MGR COLD FINISH OPERATIONS
Aman Bhatia

MTM 09 5/19/05

Republic
401 ROSE AVE S E
MASSILLON, OH 44646 FAX 330-837-7017

CERTIFICATE OF TESTS REPUBLIC ENGINEERED PRODUCTS JANUARY 26, 2005
PAGE: 2 OF 3

PURCHASE ORDER: 42904-3 PURCHASE ORDER DATE: 05/24/04
PART NUMBER : S# 47670 ACCOUNT NUMBER . . : 2775901
ORDER NUMBER: 12-52585-06 821 SCHEDULE . . . . . : 58828-
HEAT . . . . : 8969595

SEMI-FINISH RESULTS (CONTINUED)

DEVELOPED TRANS TENSILE — ASTM E8 — ASTM A370

	NORMALIZE DEG F	AUSTENITIZE DEG F	QUENCHANT	TEMPER 1 DEG F
	1650.	1500.	OIL	475.

	TEMPER 2/SR DEG F	TEMP 1 TIME HOURS	TEMP 2 TIME HOURS
	475.	2.0	2.0

		TENSILE PSI	YIELD (.2%) PSI	REDUCTION AREA PERCENT	ELONGATION PERCENT
PCE	H 10102	256220.	218900.	15.8	9.7
PCE	H 10302	260560.	223410.	46.3	10.6
PCE	T 10503	254270.	220610.	14.6	7.6
PCE	H 30102	263550.	222210.	35.4	11.0
PCE	H 30302	261190.	223640.	46.8	12.3
PCE	T 30504	258710.	221100.	44.3	11.8

JOMINY STD — SAE J406 — ASTM A255

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	18	20	22	24	26	28	30	32
58	58	57	57	57	57	56	56	56	56	56	56	55	55	55	55	54	53	52	51	51	50	49	49

MACROETCH SRC — ASTM E381 — MIL STD 430
AVG SURFACE 1. RANDOM .1. CENTER 1.

MAG PARTICLE 2301 — AMS 2301
AVG AVG FREQ 0.00 AVG SEV 0.00

MAG PARTICLE 2304 — AMS 2304
AVG AVG FREQ 0.00 AVG SEV 0.00

FINISH SIZE RESULTS SCHEDULE: 58828

DECARBURIZATION — SAE J419 — ASTM E1077

	TOTAL DEPTH INCHES
PCE 01	.015

HBW SURFACE (LAB) — ASTM E10 — ASTM A370

PCE 01	HBW 217.
PCE 02	HBW 217.
PCE 03	HBW 217.
PCE 04	HBW 217.
PCE 05	HBW 221.

MATERIAL SOURCES

	RED. RATIO TO 1
	73.6

TENSILE HT TRTD — ASTM E8 — ASTM A370

	NORMALIZE DEG F
PCE 01	1625.

NOTES

THE MATERIAL WAS NOT EXPOSED TO MERCURY OR ANY METAL ALLOY THAT IS LIQUID AT AMBIENT TEMPERATURE DURING PROCESSING OR WHILE IN OUR POSSESSION.

CHEMICAL ANALYSIS CONFORMS TO APPLICABLE SPECS: ASTM E415, ASTM E1019, AND ASTM E1085.

AMAN BHATIA
GEN MGR COLD FINISH OPERATIONS

Aman Bhatia

MTM 09 5/19/05

32984

mc108260.tif (1804x2276x2 tiff) [4]

Republic Engineered Products

401 ROSE AVE S E
MASSILLON, OH 44646 FAX 330-837-7017

CERTIFICATE OF TESTS REPUBLIC ENGINEERED PRODUCTS JANUARY 26, 2005
PAGE: 3 OF 3

PURCHASE ORDER: 42904-3
PART NUMBER : S# 47670
ORDER NUMBER: 12-52585-06 821
HEAT . . . . : 8969595

PURCHASE ORDER DATE: 05/24/04
ACCOUNT NUMBER . . : 27759001
SCHEDULE . . . . . : 50820-

NOTES (CONTINUED)

NO WELDING OR WELD REPAIR WAS PERFORMED ON THIS MATERIAL.

RECORDING OF FALSE, FICTITIOUS OR FRAUDULENT STATEMENT OR ENTRIES ON THIS DOCUMENT MAY BE PUNISHED AS A FELONY UNDER FED STATUES TITLE 18 CHAPTER 47.

I HEREBY CERTIFY THAT THE MATERIAL LISTED HEREIN HAS BEEN INSPECTED AND TESTED IN ACCORDANCE WITH THE METHODS PRESCRIBED IN THE GOVERNING SPECIFICATIONS AND BASED UPON THE RESULTS OF SUCH INSPECTION AND TESTING HAS BEEN APPROVED FOR CONFORMANCE TO THE SPECIFICATIONS.

CERTIFICATE OF TESTS SHALL NOT BE REPRODUCED EXCEPT IN FULL.

WHEN EVALUATED, MACRO ETCHES WERE VISUALLY RATED ON SAMPLES ETCHED USING HYDROCHLORIC ACID AT A TEMPERATURE 170 DEGREES(F) (+/- 10 DEGREES F)

ALL TESTING HAS BEEN PERFORMED USING THE CURRENT REVISION OF THE TESTING SPECIFICATIONS.

MFG IN THE U.S.A.

ALISON J. BLONDHEIM
NOTARY PUBLIC, STATE OF OHIO
MY COMMISSION EXPIRES MARCH 10, 2009

----- END OF DATA ----- CC ----- END OF DATA -----

FAX SHIP TO 1 COPY ATTENTION BUNNIE ISAKA 562-802-7481
MAIL SOLD TO 1 COPY ATTENTION BUNNIE ISAKA
FILE 1 COPY
WITH SHIPMENT 1 COPY

SHIPPING AREA:

32964

FRY STEEL CO. CERTIFIES THAT THIS IS A TRUE COPY OF THE ORIGINAL MILL TEST REPORT NOW ON FILE.
RECEIVED AND INSPECTED
FEB 1 4 2005
BY: BUNNIE ISAKA QC ENGINEER

AMAN BHATIA
GEN MGR COLD FINISH OPERATIONS

Aman Bhatia

MTM 09 5/14/05

mc108260.tif (1756x2228x2 tiff) [5]

Tensile Test Report

Company: Eastwood Mfg. Date: 4/22/2005
Lab Report #: 05-0420-01
Attention: Dale Stark P.O. #: 32984
Identification: AISI 4340
Procedure: 1-3/8" O.D.
Process:
Filler: Heat#8969595
Qualification:
Welder:

32984

32984

TENSILE TEST

Lab ID	Dimensions	Area	Yield Lbs	Ultimate Load Lbs	Yield P.S.I.	Tensile P.S.I.
C	.504 round	.1995	31,680	34,700	159,700	174,000

Elongation	Reduction of Area	Fracture	Comments
18.2%	52.3%	Ductile	

Tests performed in accordance with ASTM A370, E8, and WH Laboratories, LLC Quality Assurance Manual.
.2% Offset Yield – Gage Length 2.800" for .500", and 1.400" for .350" tensile per ASTM A370.
Test specimens retained for one (1) week maximum; unused material is retained for one (1) month.

Approved by: Robert Franch
Robert Franch

MTM 09 5/19/05

SEI HEAT TREAT

PO BOX 16338 HOUSTON, TX 77222
PHONE (713) 699-3892 FAX (713) 694-0891

CUSTOMER: EASTWOOD MANUFACTURING	CERTIFICATION DATE: MAY 11, 2005
CERTIFICATION/SO NUMBER: 27905	CUSTOMER ORDER NUMBER: 32984

MATERIAL: 4340	NUMBER OF PIECES: 28
DESCRIPTION: 1-3/8" X 6" STUDS SILVER PLATED	PART NUMBER(S): N/A
SPECIFICATION NUMBER: EASTWOOD MANUFACTURING	REFERENCE: N/A

HEAT TREAT PROCESS	TIME AT HEAT	COOLANT
Bake 950°	45 min	AIR

32934

32934

HARDNESS TEST:	NUMBER OF PIECES TESTED:

WE HEREBY CERTIFY THAT THE SERVICE FURNISHED ON THE ABOVE PURCHASE ORDER IS PROVIDED IN ACCORDANCE WITH OUR QUALITY CONTROL MANUAL, REVISION B, DATED JANUARY 21, 2001	QUALITY CONTROL:

MTM 09 5/18/05

Eastwood Manufacturing
8825 Breen Rd.
Houston, Texas 77088
(281) 447-0081 fax (281) 447-0098

P.O. P05-01160

INSPECTION DATA
CHECK LIST
FOR
Major Tool & Machine Inc.

Part Number (Detail / Sub-Assy/ Assy)	Rev.	Page
DS141-036		1 of 1
Part Name (Detail / Sub-Assy / Assy)		
Stud, 1.375-6 2A x 9 lg		
MATERIAL:	WORK ORDER # 329B4	Quantity 126

P.O. – DRAWING – SPECIFICATION DESCRIPTION			INSPECTION INSTRUCTIONS			INSPECTION RESULTS	INSPECTED BY		
SHT	ZONE	CHARACTERISTIC	GAGE/EQUIP.	BY	SAMPLE	DATA, CAR NO., REMARKS	MFG	QA	DATE
		Length 9.00 $^{+.25}_{-.00}$	Caliper #201	ns	25	9.025 - 9.017		NS	5-5-05
		4.50	Caliper #200	ns	25	4.50		NS	5-5-05
		Pitch Dia. 1.2643 - 1.2563	Mic 1-2	ns	25	1.261 - 1.257		NS	5-505
		Body Dia. 1.375 $^{+.0000}_{-.0002}$	#207 Mic 1-2	ns	25	1.3748 - 1.3749		NS	5-5-05
		Thread GO - NOGO	Gage #G017 #G017N	ns	25	ok		NS	5-5-05

COMMENTS: RECORD ALL DIMENSIONS THAT CARRIES A TOLERANCE OF (+-) .25mm OR LESS

MTM 09 5/19/05

INDUSTRIAL METAL FINISHING

CERTIFICATE OF COMPLIANCE

TO: EASTWOOD MFG. 5/86
P.O. BOX 41447
HOUSTON, TX 77241

THIS IS TO CERTIFY THAT THE METAL FINISHING SERVICE RENDERED ON ITEM(S)

126 EA. - 1.375 X 9 DE STUDS
252 EA. - 2.75 OD WASHERS
252 EA. - 1.375 12PT NUTS

ON PURCHASE ORDER 12984 LISTED ON OUR INVOICE #00132583

MEETS OR EXCEEDS THE REQUIREMENTS OF SPECIFICATION NUMBER

CERT: SILVER PLATE PER AMS 2410
NO BAKE REQUIRED

12984

QUALITY PROGRAM DATED: 05/01/93 REVISION: 1 DATED: 04/01/94

Terri McElhaney
NAME:

QC Manager 5/6/05
TITLE DATE

MTM 05 5/19/05

EASTWOOD MANUFACTURING
CERTIFICATION OF COMPLIANCE

CUSTOMER · MAJOR TOOL AND MACHINE
ORDER # · P05-01162

DATE · 5-16-05
OUR NUMBER 32982

WE CERTIFY THAT THE MATERIALS SUPPLIED ON YOUR ORDER LISTED ABOVE COMPLIES WITH THE REQUIREMENTS OF YOUR ORDER AND OF THE SPECIFICATIONS LISTED BELOW

DESCRIPTION .

Lot No..		Part .		
32982-1	56 PIECES	DS141-060 ASTM A286 Silver plated Per AMS2410	Heat No.. 8977349	1 5/8 Round, forged and machined to size Heat Treat. 36891 Silver plate. IMF 00132583 Post plate bake. none Tensile test. WH 05-0426-20

TENSILE KSI	YIELD KSI	ELONGATION	REDUCTION	HARDNESS
150	120	14	35	
PASS	PASS	PASS	PASS	PASS

DALE STARK
EASTWOOD MANUFACTURING

MAY 19 2005
96329
1-4
B.7

5/19/05
MTM 09

~~washers~~ WDS

Republic ENGINEERED PRODUCTS

GARY COLD FINISHED BAR PLANTS
PHONE: 219-886-8129 FAX: 219-886-8123

CERTIFICATE OF TESTS REPUBLIC ENGINEERED PRODUCTS SEPTEMBER 27, 2004
PAGE: 1 OF 2

PURCHASE ORDER : 427145
PART NUMBER . : S# 51250
ORDER NUMBER : 12-51689-04 823
HEAT . . . : 8977349
PURCHASE ORDER DATE: 03/11/04
ACCOUNT NUMBER . . : 27759001
SCHEDULE . . . . . : 54199-

CHARGE ADDRESS

FRY STEEL COMPANY
BUNNIE ISAKA
13325 MOLETTE ST
SANTA FE SPRINGS CA 90670

SHIP TO

FRY STEEL COMPANY
BUNNIE ISAKA
C/O CMI
4201 W 36TH ST
CHICAGO IL 60623

MATERIAL DESCRIPTION

COLD FINISHED STEEL BARS ALLOY ASTM A 331-95 ASTM A 108-03 LEVEL 2 MIL S 5626C & AMD 1 COND C-4 EXC MARK & PARA 4.3.1 & 4.12.1 WAIVED AMS 6382M AMS 2304A AMS 6349C EXC THERMAL TREATMENT AMS 2301J AMS - S - 5626 ISS 12/98 EXC PARA 4.3.1 & 4.12.1 EF-AISI-4140 . AIRCRAFT Q TURNED & POLISHED ANN BEFORE TURN

SIZE: RDS 1.6250 X 11 1/13FT

LADLE CHEMISTRY

C	MN	P	S	SI	CU	NI	CR	MO	AL
0.42	00.90	.011	.020	0.24	0.18	00.16	00.97	0.21	00.027

V	N	CB	SN
0.004	.0067	0.002	.009

SEMI-FINISH RESULTS

AUSTENITIC GRAIN SIZE:
AUST GRAIN SZ 7.

JOMINY STD SAE J406 ASTM A255

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	18	20	22	24	26	28	30	32
58	57	57	56	56	56	55	55	53	52	50	48	47	45	44	43	40	39	38	38	38	37	38	37

MACROETCH SRC ASTM E381 MIL STD 430
AVG SURFACE 1. RANDOM 1. CENTER 1.

MAG PARTICLE 2301 AMS 2301
AVG AVG FREQ 0.00 AVG SEV 0.00

MAG PARTICLE 2304 AMS 2304
AVG AVG FREQ 0.00 AVG SEV 0.00

FINISH SIZE RESULTS SCHEDULE: 54199

BHN HT TRTD (LAB) ASTM E10 ASTM A370
PCE 01 SURFACE 187
PCE 02 SURFACE 187
PCE 03 SURFACE 187
PCE 04 SURFACE 187
PCE 05 SURFACE 187

MATERIAL SOURCES
RED. RATIO
TO 1
58.2

NOTES

DECARB NIL

THE MATERIAL WAS NOT EXPOSED TO MERCURY OR ANY METAL ALLOY THAT IS LIQUID AT AMBIENT TEMPERATURE DURING PROCESSING OR WHILE IN OUR POSSESSION.

CHEMICAL ANALYSIS CONFORMS TO APPLICABLE SPECS:
ASTM E 327 ASTM E 1086 ASTM E 415 ASTM E 1019 ASTM E 1085 ASTM E572.

NO WELDING OR WELD REPAIR WAS PERFORMED ON THIS MATERIAL

5/15/05

MTM 09

AMAN BHATIA
GEN MGR COLD FINISH OPERATIONS

Aman Bhatia

mc108258.tif (1664x2194x2 tiff) [3]

Republic ENGINEERED PRODUCTS

GARY COLD FINISHED BAR PLANTS
PHONE: 219-886-8129 FAX: 219-886-8123

CERTIFICATE OF TESTS REPUBLIC ENGINEERED PRODUCTS SEPTEMBER 27, 2004
PAGE: 2 OF 2

PURCHASE ORDER: 42714-5 PURCHASE ORDER DATE: 03/11/04
PART NUMBER : SH 51250 ACCOUNT NUMBER . . : 27759001
ORDER NUMBER: 12-51689-04 823 SCHEDULE . . . . . : 54199-
HEAT . . . . : 8977349

NOTES (CONTINUED)

I HEREBY CERTIFY THAT THE MATERIAL HEREIN HAS BEEN INSPECTED AND TESTED IN ACCORDANCE WITH THE METHODS PRESCRIBED IN THE GOVERNING SPECIFICATIONS AND BASED UPON THE INSPECTION AND TESTING HAS BEEN APPROVED FOR CONFORMANCE TO THE SPECIFICATIONS

CERTIFICATE OF TESTS SHALL NOT BE REPRODUCED EXCEPT IN FULL.

ALL TESTING HAS BEEN PERFORMED USING THE CURRENT REVISION OF THE TESTING SPECIFICATION.

MFG IN THE U.S.A.

EVELYN GREENE
NOTARY PUBLIC, STATE OF INDIANA
MY COMMISSION EXPIRES OCTOBER 10, 2009

----- END OF DATA ----- CC ----- END OF DATA -----

FAX BY FAX PC 1 COPY ATTENTION BUNNIE ISAKA 562-802-7481
MAIL SOLD TO 1 COPY ATTENTION BUNNIE ISAKA
FILE 1 COPY
WITH SHIPMENT 1 COPY PRINTED AT SHIPPING AREA

REPUBLIC CC CERTIFIES THAT THIS IS A TRUE COPY OF THE ORIGINAL MILL TEST REPORT NOW ON FILE

OCT 0 5 2004

AMAN BHATIA
GEN MGR COLD FINISH OPERATIONS

5/16/05

MTM 09

Tensile Test Report

Company: Eastwood Mfg.
Date: 4/27/2005
Lab Report #: 05-0426-20
Attention: Dale Stark
P.O. #: 32982
Identification: AISI 4140
Procedure: 1-5/8" Diameter Bar
Process:
Filler:
Qualification:
Welder:

TENSILE TEST

Lab ID	Dimensions	Area	Yield Lbs	Ultimate Load Lbs	Yield P.S.I.	Tensile P.S.I.
E	.252 round	.0499	7,140	8,000	143,100	160,400

Elongation	Reduction of Area	Fracture	Comments
16.9%	61.2%	Ductile	

Tests performed in accordance with ASTM A370, E8, and WH Laboratories, LLC Quality Assurance Manual.
.2% Offset Yield – Gage Length 2.000" for .500", and 1.400" for .350" tensile per ASTM A370.
Test specimens retained for one (1) week maximum; unused material is retained for one (1) month.

Approved by: Robert French

5/19/05

MTM 09

Eastwood Manufacturing
9825 Breen Rd.
Houston, Texas 77086
(281) 4[illegible]-0081 fax (281) 447-0098

INSPECTION DATA CHECK LIST FOR Major Tool & Machine Inc.

Part Number (Detail / Sub-Assy/ Assy)	Rev.	Page of
DS141-060		1 1

Part Name (Detail / Sub-Assy / Assy)

Nut, 12 pt 1.375-6 UNC-2B

MATERIAL:	WORK ORDER #	Quantity
	32982	252

P.O. # P05-01161

P.O. # / DRAWING - SPECIFICATION DESCRIPTION			INSPECTION INSTRUCTIONS			INSPECTION RESULTS	INSPECTED BY		
SHT	ZONE	CHARACTERISTIC	GAGE/EQUIP.	BY	SAMPLE	DATA, CAR NO., REMARKS	MFG	QA	DATE
		1.375 Maximum	Caliper #200	ns	25	1.375 - 1.370		NS	5-5-05
		2.216 Maximum	Caliper #200	ns	25	2.210 - 2.205		NS	5-5-05
		1.00	Caliper #200	ns	25	1.010 - 1.000		NS	5-5-05
		1.225 Minor Dia.1.195	Caliper #200	ns ns	25	1.210 - 1.205		NS	5-5-05
		Thread GO - NOGO	gage 243 244	ns	25	ok		NS	5-5-05
		Acorss Flat 1.62	Caliper #200	ns	25	1.62		Ns	5-5-05

COMMENTS: RECORD ALL DIMENSIONS THAT CARRIES A TOLERANCE OF (+-) .25mm OR LESS

MTM 09 5/19/05

INDUSTRIAL METAL FINISHING

CERTIFICATE OF COMPLIANCE

TO: EASTWOOD MFG. 5/86
P.O. BOX 41447
HOUSTON, TX 77241

THIS IS TO CERTIFY THAT THE METAL FINISHING SERVICE RENDERED ON ITEM(S)

126 EA. - 1.375 X 9 DE STUDS
252 EA. - 2.75 OD WASHERS
252 EA. - 1.375 12PT NUTS

ON PURCHASE ORDER 12984 LISTED ON OUR INVOICE #00132581

MEETS OR EXCEEDS THE REQUIREMENTS OF SPECIFICATION NUMBER

CERT: SILVER PLATE PER AMS 2410
NO BAKE REQUIRED

QUALITY PROGRAM DATED: 05/01/93 REVISION: 1 DATED: 04/01/94

Tori McGlothlin
NAME:

QC Manager 5/10/05
TITLE DATE

12984

5/19/05

MTM 09

mc106229.tif (1909x2376x2 tiff)

MAJOR TOOL & MACHINE INC
1458 E 19TH ST
INDIANAPOLIS IN 46218

YOUR PURCHASE ORDER NUMBER
P05-01260
Today's Date:

McMASTER-CARR
600 COUNTY LINE ROAD
ELMHURST IL 60126-2081
IF THERE ARE ANY QUESTIONS ABOUT THIS SHIPMENT CONTACT OUR SALES DEPARTMENT
(630)833-0300

PAGE 1
MCM NUMBER 6148181-02

EXTRA PACKING LIST

Warehouse Location	McMaster-Carr Part Number	Fill Quantity	Item Description	Your Line	Your Order	This Shipment
	74765 A86	1 EA	LOCTITE PRISM SUPER GLUE MZ-N TOUGHENED,NUMBER 411,1-POUND BOTTLE,CLEAR 1	3	1 EA	1
	74765 A86	1 EA	LOCTITE PRISM SUPER GLUE MZ-N TOUGHENED,NUMBER 411,1-POUND BOTTLE,CLEAR 1	4	1 EA	1
	74765 A86	1 EA	LOCTITE PRISM SUPER GLUE MZ-N TOUGHENED,NUMBER 411,1-POUND BOTTLE,CLEAR 1	5	1 EA	1
	74765 A86	1 EA	LOCTITE PRISM SUPER GLUE MZ-N TOUGHENED,NUMBER 411,1-POUND BOTTLE,CLEAR 1	6	1 EA	1

3/9/05
94076
Lines 3-6
BJ
3/9/05

REFER TO: 6148181-02
MAJOR TOOL & MACHINE INC

TAG
CCP

PACKER	NUMBER OF CARTONS	FILLER

LNS: 4

CYCLE

CERTIFICATION OF COMPLIANCE

This is to certify that, according to our records, the above item(s) furnished on your purchase order was supplied in accordance with the description and as illustrated in our catalog.

Sincerely,

Brian Hedstrom
Quality Manager

MCM NO. 6148181-02 04

PURCHASE ORDER
P05-01260

FROM:
McMASTER-CARR
600 COUNTY LINE ROAD
ELMHURST IL 60126-2081 USA

SHIP TO:

MAJOR TOOL & MACHINE INC
1458 E 19TH ST
INDIANAPOLIS IN
46218

CCP

H

mc108545.tif (1628x2145x2 tiff)

Spaulding COMPOSITES
55 Nadeau Drive
Rochester, NH 03867
Ph: (603) 332-8555 Fax: (603) 332-5357
www.spauldingcom.com

Shipping List 072435
Customer No 101193
Sales Order Shipper

Sold to : STANDARD GRINDING & MFG CO
3721 W. CHASE AVENUE
SKOKIE, IL 60076
United States

Ship to : STANDARD GRINDING & MFG CO
3721 W. CHASE AVENUE
SKOKIE, IL 60076
United States

Ship Date	Customer PO	Sales Order	# of Boxes	Weight	Ship VIA	Bill of Lading	FOB
05/17/2005	80624	065171-00	1	0	YELLOW	072435	DE

Item	Part / Description / Details	Order Quantity	Ship Qty
000001	39G1CNT73125NMWLF U/M SHT SO Item 4 G-11-CR 46" +untrimmed X 36"+untrimmed Thickness: 3.125" +/-.110" PLEASE NOTE THAT THERE IS NO NEMA STANDARD FOR G-11 CR SHEET SPAULDING C OF C TO G -11 CR SHEET NO TESTING REQUIRED AT TIME OF ORDER Sheet tested 3.550 TK	1.00000	1.00000

RECEIVED MAY 19 2005 By [signature]

MAY 31 2005
96507
Lines 1,2
B.J.
MTM 09 5/31/05

CERTIFICATE of CONFORMANCE

WE HEREBY CERTIFY THAT THE MATERIAL SUPPLIED ON THIS ORDER WAS MADE IN ACCORDANCE WITH THE STANDARDS AND PROCESSES ESTABLISHED BY SPAULDING COMPOSITES COMPANY FOR THE REQUIREMENTS OF MATERIAL DESCIBED ABOVE.

LOT # DOM.

Authorized By: Mark L. Caudillo Date: 05/17/2005

Customer Copy Page # 1 Form: SCSHIP Rev: 8/99

05/26/05 13:00 603 674 1723 ATLAS FIBRE CO. 002/003

mc108545.tif (1644x2177x2 tiff) [2]

Spaulding COMPOSITES
55 Nadeau Drive
Rochester, NH 03867
Ph: (603) 332-0555 Fax: (603) 332-5357
www.spauldingcom.com

Shipping List 072434
Customer No 101193
Sales Order Shipper

Sold to : STANDARD GRINDING & MFG CO
3721 W. CHASE AVENUE
SKOKIE, IL 60076
United States

Ship to : STANDARD GRINDING & MFG CO
3721 W. CHASE AVENUE
SKOKIE, IL 60076
United States

Ship Date	Customer PO	Sales Order	# of Boxes	Weight	Ship VIA	Bill of Lading	F O B
05/17/2005	60624	065169-00	1	715	YELLOW	072434	DE

Item	Part / Description / Details	Order Quantity	Ship Qty
000001	39G1CNT71950NMWLF UM SHT SO Item 5 G-11-CR 48" +UNTRIMMED X 36"+UNTRIMMED THK: 1.950" +/-.070" PLEASE NOTE THAT THERE IS NO NEMA STANDARD FOR G-11 CR SHEET SPAULDING C OF C TO G -11 CR SHEET NO TESTING REQUIRED AT TIME OF ORDER	1.00000	1.00000

RECEIVED
MAY 19 2005
By

5/31/05
MTN 09

CERTIFICATE of CONFORMANCE

WE HEREBY CERTIFY THAT THE MATERIAL SUPPLIED ON THIS ORDER WAS MADE IN ACCORDANCE WITH THE STANDARDS AND PROCESSES ESTABLISHED BY SPAULDING COMPOSITES COMPANY FOR THE REQUIREMENTS OF MATERIAL DESCIBED ABOVE.

LOT # DOM.

Authorized By: Mark F Cardillo Date: 05/17/2005

Customer Copy

Page # 1

Form: SCSHIP Rev: 8/99

05/26/05 13:00 ATLAS FIBRE CO. 8047 674 1723 003/003

INSPECTION DATA CHECKLIST

Quality Assurance Documentation for Part ID: SE141-103 - Item: 15

Workorder: 65707/4-0 Sub:1 Op:140

Part: SE141-103 - MODULAR COIL WINDING FORM TYPE-C - PRODUCTION MODULAR COIL WINDING FORM TYPE-C

Drawing ID: SE141-103 Rev: 3			INSPECTION INSTRUCTIONS			RESULTS		INSPECTED BY			
SHEET	ZONE	CHARACTERISTIC	GAGE/EQUIP	BY	SAMPLE	SER#	DATA/REMARKS	INSP	VERFD	AUDIT	
*		TEST 1 RESISTANCE TO BE >500 kohms CHECK RESISTANCE BETWEEN THE MID-PLANE POLOIDAL BREAK SHIM AND THE WINDING FORM.	MULTIMETER	QA		J-1358	2.1G	503-B.HO 03-23-06			A
(10)											
*		TEST 2 RESISTANCE TO BE >500 kohms CHECK RESISTANCE BETWEEN THE JUMPERED BOLTS AND JUMPERED MID-PLANE CASTING AND WINDING FORM.	MULTIMETER	QA		J-1358	1.4G / 2.2G	503-B.HO 03-23-06			A
(20)											

METRODE PRODUCTS LTD
HANWORTH LANE
CHERTSEY SURREY
ENGLAND KT16 9LL
Tel +44 (0)1932 566721
Fax. +44 (0)1932 565168
Email mfo@metrode.com
Internet http/www.metrode.com

TEST CERTIFICATE

THIS PRODUCT HAS BEEN MANUFACTURED AND SUPPLIED THROUGH A SYSTEM APPROVED TO ISO 9001 & 2 OR EQUIVALENT

TEST CERTIFICATE NUMBER 194277

METRODE WELDING CONSUMABLES

BATCH No.	
OUR ORDER REF.	W020132
DATE	S01708013 / 1
PRODUCT	09/03/05
FORM	ER316MNNF TIG 2.4MM
SPECIFICATION	TIG WIRE

BS EN 12072:2000 W 20 16 3 Mn L

INVOICE TO	DESPATCHED TO
EUROWELD LTD 255 ROLLING HILLS ROAD MOORESVILLE NC 28117 USA	EUROWELD LTD 255 ROLLING HILLS ROAD MOORESVILLE NC 28117 USA

IMPORTANT: Any liability arising from either reliance on this certificate, or use of our products, is strictly limited and governed by our conditions of business.

CUSTOMER ORDER No.	DELIVERY NOTE DOCUMENT No.	QUANTITY (Kg)
N. 05-39	DN0106163	17.5000

CHEMICAL ANALYSIS (WEIGHT %) TYPE CERTIFIED MATERIAL TEST REPORT: BS EN 10204: 3.1.B

C	Mn	Si	S	P	Cr	Ni	Mo	N	Cu			
0.015	7.43	0.42	0.006	0.014	19.9	15.4	2.62	0.14	0.20			

TYPICAL ALL-WELD METAL MECH. PROPERTIES, AS WELDED:-
TS: >600 N/mm2; 0.2%PS: >400 N/mm2; EL. ON 4D: 40 %;
CVN @ -196 DEG.C: 70 J.

3/23/05 44534 3/23/05 MTM 09

Line 1 B-2

Metrode Products Ltd. certifies that the above material conforms to the indicated specifications

B. KYIET
Q A MANAGER

NOTES *Je includes incidental Co unless otherwise specified
*Nb (Cb) includes incidental Ta unless otherwise specified
Ferrite is given as FN (Ferrite Number) and measured on all-weld pad using instrument calibrated against NBS related secondary standards (See AWS A4 2-97) unless otherwise specified

All Test certificates issued by METRODE will contain this embossed seal
Any recipient of a copy of METRODE Test Certificate without the seal should ensure from the supplier that it is a true and accurate reproduction of the original

mc106579.tif (1652x2103x2 tiff)

mc106164.pdf

METRODE PRODUCTS LIMITED
HANWORTH LANE, CHERTSEY
SURREY, UK, KT16 9LL
Tel: +44 (0) 1932 566721
Fax +44 (0) 1932 565168
Email: info@metrode.com
Website: www.metrode.com

CERTIFIED MATERIAL TEST REPORT

THIS PRODUCT HAS BEEN MANUFACTURED AND SUPPLIED THROUGH A SYSTEM APPROVED TO ISO 9001 & 2 OR EQUIVALENT

TEST CERTIFICATE NUMBER

193695

INVOICE TO
EUROWELD LTD
255 ROLLING HILLS ROAD
MOORESVILLE
NC 28117
USA

DESPATCHED TO
EUROWELD LTD
255 ROLLING HILLS ROAD
MOORESVILLE
NC 28117
USA

CUSTOMER ORDER NUMBER	N.05-34
DELIVERY NOTE DOCUMENT NUMBER	DN0105859
QUANTITY (KG)	15.0000
OUR ORDER REFERENCE	SO1787730 / 1
DATE	02/03/05

METRODE WELDING CONSUMABLE	ER316MNNF TIG 2.4mm
FORM	TIG WIRE
BATCH NUMBER	WO20132
SPECIFICATION	BS EN 12072:2000 W 20 16 3 Mn L

Chemical Analysis (Weight %)					Type: BS EN 10204: 3.1.B / ASME SFA-5.01: Sch. H						
C	Mn	Si	S	P	Cr	Ni	Mo	N	Cu		
0.015	7.43	0.42	0.008	0.014	19.9	15.4	2.62	0.14	0.20		

Mechanical Tests						Type: BS EN 10204: 2.2 / ASME SFA-5.01: Sch. G		
Tensile Tests						Impact Energies		
Condition	Test Temperature	$Rp_{0.2\%}$ (MPa)	Rm (MPa)	A4 (%)	Z (%)	Temperature (°C)	Impact Energy (J)	Lateral Expansion (mm)
AS-WELDED	ROOM	>400	>600	40	-	-196	70	-

Metrode Products Limited certifies that the above material conforms to the indicated specifications

This document is produced electronically and is valid without signature.

IMPORTANT Any liability arising from either reliance on this certificate, or use of our products, is strictly limited and governed by our conditions of business.

Barrie Kyfet – Q.A.Manager

ASME SFA-5.01; Lot classification S4

3/3/05
93911
Linc 1 B.1

Notes:
% Ni includes incidental Co unless otherwise specified.
% Nb (Cb) includes incidental Ta unless otherwise specified
Ferrite is given as FN (Ferrite Number) and measured on all-weld pad using instrument calibrated against NBS-related secondary standards (See AWS A4.2-97) unless otherwise specified

MTH 09
3/7/05

FROM : EUROWELD-LTD FAX NO. : 704 662 9820 Mar. 02 2005 09:52AM P2

Westmoreland Mechanical Testing & Research, Inc.
P.O. Box 388
Westmoreland Drive
Youngstown, Pa. 15696-0388 U.S.A.
Telephone: 724-537-3131 Fax: 724-537-3151
Website: www.wmtr.com
WMT&R is a technical leader in the material testing industry.

ACCREDITED
621-01 & 621-02

Accredited Nadcap Materials Testing Laboratory

April 22, 2005

CERTIFICATION

WMT&R Report No. 5-25008
P.O. No. P05-01764
PQR No. 434
Welder Jason Bever #465

Major Tool & Machine Inc.
1458 East 19th Street
Indianapolis, IN 46218

Corrected Date
May 4, 2005

Attention: Josh Mayne

Subject: All processes, performed upon the material as received, were conducted at WMT&R, Inc. in accordance with the WMT&R Quality Assurance Manual, Rev. 9, dated 4/1/2000.
The following tests were performed on this order: IMPACT and TENSILE

IMPACT RESULTS: ASME Section IX and AWS B2.1, ASTM E23-02
No Requirements
MATERIAL: Metaltek CF8MNMN MOD
SAMPLE TYPE: Charpy V-Notch **DISPOSITION: Report**

Specimen ID	TestLog Number	Sample Size	Temp. °F\°C	Energy ft-lbs	Energy joules	Mils Lat Exp	A\U\R
Weld-1	B65835	Standard	68\20	173	234.6	84	Report
Weld-2	B65836	Standard	68\20	160	216.9	68	Report
Weld-3	B65837	Standard	68\20	157	212.9	81	Report

A\U\R: A=ACCEPTABLE, U=UNACCEPTABLE, R=REPORT

Richard G. Parks
Project Manager/Industrial Technology Engineer

5/4/05
May 4, 2005

Westmoreland Mechanical Testing & Research, Inc.
P.O. Box 388
Westmoreland Drive
Youngstown, Pa. 15696-0388 U.S.A.
Telephone: 724-537-3131 Fax: 724-537-3151
Website: www.wmtr.com
WMT&R is a technical leader in the material testing industry.

ACCREDITED
621-01 & 621-02

Accredited Nadcap Materials Testing Laboratory

April 20, 2005

CERTIFICATION

WMT&R Report No. 5-25008
P.O. No. P05-01764
PQR No. 434
Welder Jason Bever #465

Major Tool & Machine Inc.
1458 East 19th Street
Indianapolis, IN 46218

Attention: Josh Mayne

Subject: All processes, performed upon the material as received, were conducted at WMT&R, Inc. in accordance with the WMT&R Quality Assurance Manual, Rev. 9, dated 4/1/2000.
The following tests were performed on this order: IMPACT and TENSILE

TENSILE RESULTS: ASME Section IX and AWS B2.1, ASTM E21-03a
SOAK TIME: 5 Minutes
SPEED OF TESTING: 0.0050 in./in./min., 0.0500 in./min./in.
MATERIAL: Metrode ER316Mnnf **DISPOSITION: Report**

Specimen ID	TestLog Number	Temp. °F/°C	UTS KSI/MPA	0.2% YS KSI/MPA	Elong %	RA %	Modulus MSI/GPA	Ult. Load LBS/NEWTONS	0.2% YLD. LBS/NEWTONS
T1	B65833	-320/-196	191.8/1320	148.7/1030	27	39	28.7/198	2630/11699	2039/9071

A/U/R: A=ACCEPTABLE, U=UNACCEPTABLE, R=REPORT

DISPOSITION: Report

Specimen ID	TestLog Number	Orig. Width (in./mm)	Final Width (in./mm)	Orig. Thick (in./mm)	Final Thick (in./mm)	Orig. Dia. (in./mm)	4D Orig GL (in./mm)	4D Final GL (in./mm)	Orig. Area (Sq. In./Sq. mm)	Failure Location/Type	Machine Number	A/U/R
T1	B65833	0.1802/4.57708	0.1437/3.650	0.0761/1.933	0.0582/1.478	0.2511/6.378	0.70/17.78	0.89/22.61	0.04183816/26.992307	WELD/DUCTILE	M9	R

A/U/R: A=ACCEPTABLE, U=UNACCEPTABLE, R=REPORT

Roy E. Starr/Matt Wojton
____ Technical Services Manager/____ Tensile Supervisor April 20, 2005

Westmoreland Mechanical Testing & Research, Inc.
P.O. Box 388
Westmoreland Drive
Youngstown, Pa. 15696-0388 U.S.A.
Telephone: 724-537-3131 Fax: 724-537-3151
Website: www.wmtr.com
WMT&R is a technical leader in the material testing industry.

ACCREDITED
621-01 & 621-02

Accredited Nadcap Materials Testing Laboratory

April 20, 2005

CERTIFICATION

Section 2 of 2

WMT&R Report No. 5-25008
P.O. No. P05-01764

Major Tool & Machine Inc.

TENSILE RESULTS: ASME Section IX and AWS B2.1, ASTM E21-03a

SOAK TIME: 5 Minutes

SPEED OF TESTING: 0.0050 In./in./min., 0.0500 In./min./in.

MATERIAL: Metrode ER316Mnnf **DISPOSITION: Report**

Specimen ID	TestLog Number	Temp. °F/°C	UTS KSI/MPA	0.2% YS KSI/MPA	Elong %	RA %	Modulus MSI/GPA	Ult. Load LBS/NEWTONS	0.2% YLD. LBS/NEWTONS
T2	B65834	-320/-196	204.7/1410	156.5/1080	29	34	29.9/206	5095/22664	3894/17323

A/U/R: A=ACCEPTABLE, U=UNACCEPTABLE, R=REPORT

DISPOSITION: Report

Specimen ID	TestLog Number	Orig. Dia. (in./mm)	Final Dia. (in./mm)	4D Orig GL (in./mm)	4D Final GL (in./mm)	Orig. Area (Sq. In./Sq. mm)	Failure Location/Type	Machine Number	A/U/R
T2	B65834	0.1780/4.521	0.1444/3.668	0.70/17.78	0.90/22.86	0.02488456/16.054520	WELD/DUCTILE	M9	R

A/U/R: A=ACCEPTABLE, U=UNACCEPTABLE, R=REPORT

Roy E. Starr/Matt Wojton
Technical Services Manager/Tensile Supervisor

4-20-05
April 20, 2005

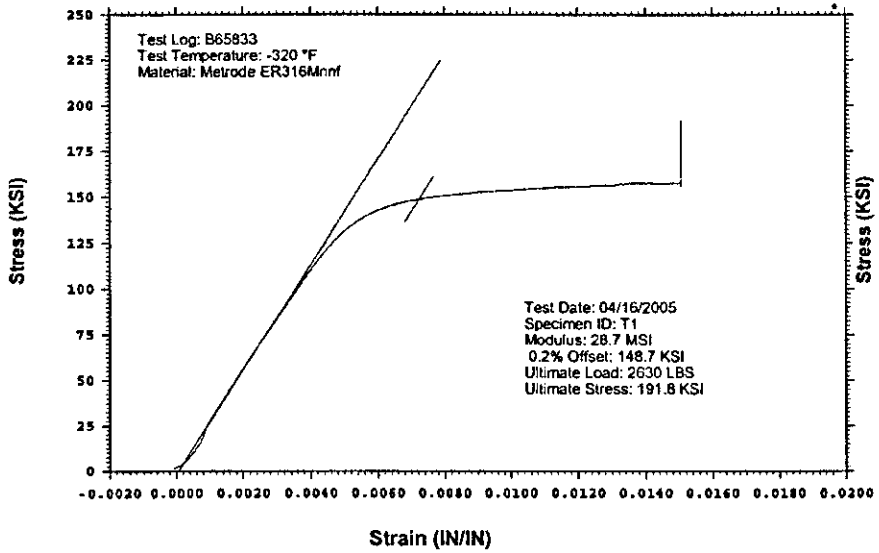
WESTMORELAND MECHANICAL TESTING & RESEARCH, Inc

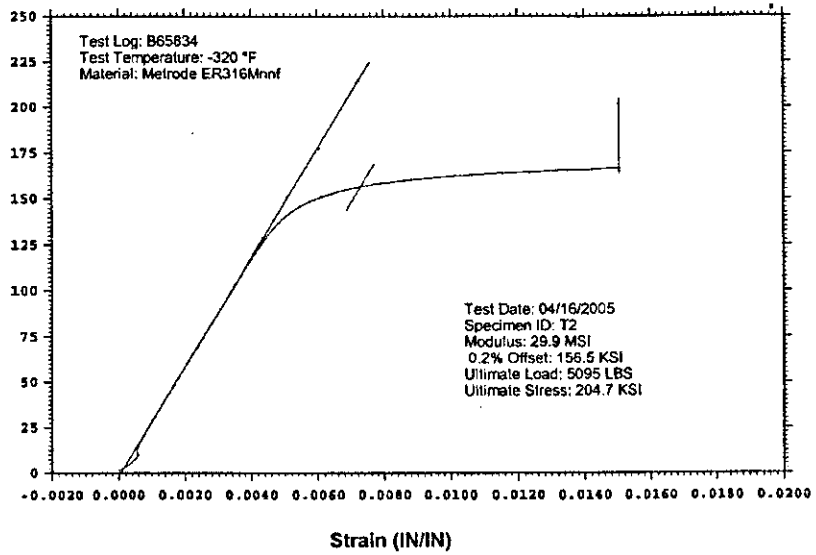
Stress vs. Strain

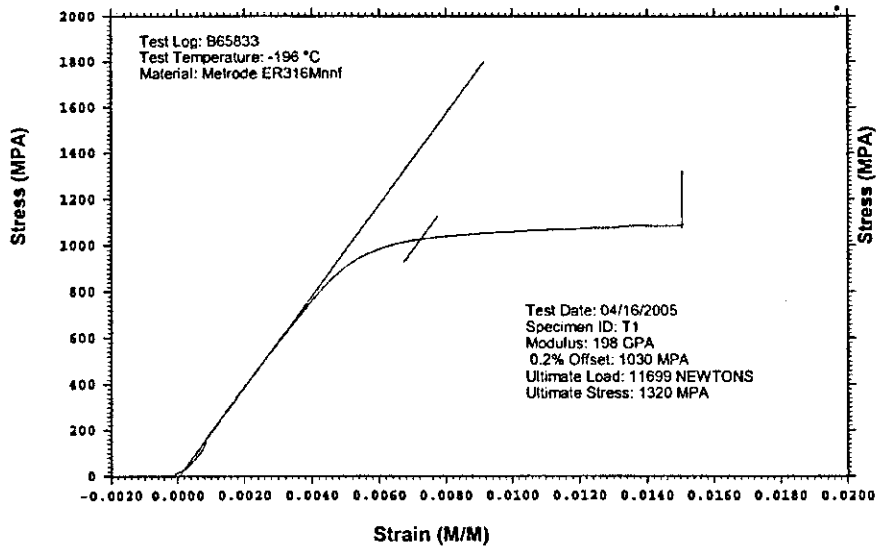
Phone: (724)537-3131

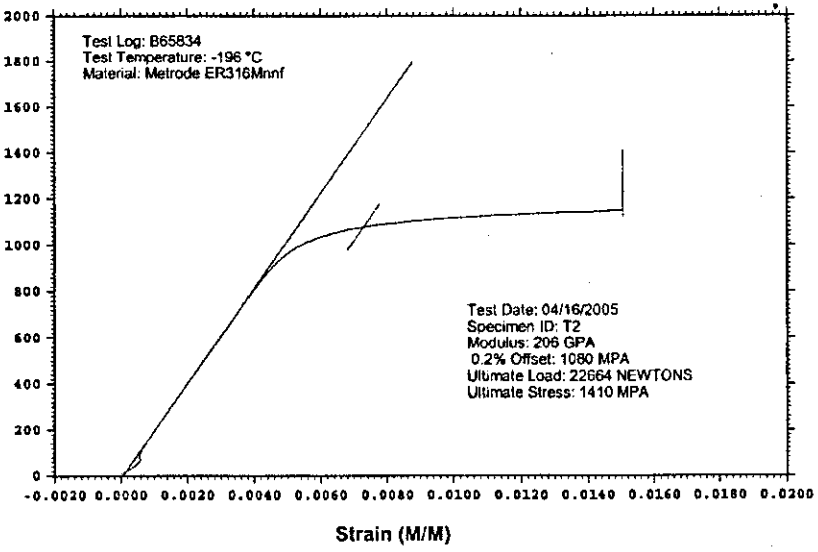
Customer: Major Tool & Machine Inc.
WMT&R Report: 5-25008

P.O. No.: P05-01764
PQR No.: 434
Welder: Jason Bever #465









GE Advanced Materials, Polymershapes

Certificate of Conformance

Date:

Attn: Receiving Inspection
To: Major Tool + Machine
Address: 1458 E. 19th St.
Indianapolis IN 46218

Customer P.O. Number: P05-01288
Sales Order No: 27908834

It is hereby certified that the product information provided below conforms to the corresponding information in the possession of GE Advanced Materials, Polymershapes with respect to such products. This certification and the sale of products are subject to GE Advanced Materials, Polymershapes' standard conditions of sale. This document shall not be reproduced, except in full, without prior written approval.

Quantity	Description	Lot/Specification/Standard Number
36	G11CR Plendic Sheet .062"THK X 16"X38"	No Spec / N38.009023

MTM 09
4/5/05

APR - 5 2005
94942
1-18

GE Advanced Materials, Polymershapes

By: Ernest Evans

Title: Warehouse Worker

COOPERHEAT MQS MQS Inspection

4959
10620 Chester Road
Woodlawn, Ohio 45215

CLIENT	INTERPRETER/LEVEL	RADIOGRAPHER	JOB NO	P.O. NO	DATE
Major Tool & Machine	Robert Weaver/II	Robert Weaver	13850291	N/A	11/4/05

ISOTOPE/X-RAY	DIA. X LENKV	CURIES/mA	FOCAL SPOT SIZE	SFD	SOD	TIME	FILM PROCESSING	FILM TYPE	FILM TECHNIQUE	PB SCREENS
IR192	.118"x.079"	74	.142"	17.75"	15"	26-30min	Auto	Kodak AA	Double	.010"

WELD PROCESS	MATERIAL SPEC.	MATERIAL DIAMETER	MATERIAL THICKNESS	PENETRAMETER	SHIM	ACCEPTANCE STANDARD
N/A	316 SST	N/A	2.75"	ASTM 1C	N/A	NO indications over .080"

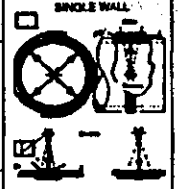
DESCRIPTION
65707/410/1/15/818
SE141-116 rev.6
page 1 of 2

REMARKS
Surface indications

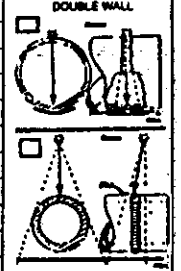
	FITTING, BEAM OR FITTING	FILM INTERVAL NUMBER	WELDER IDENTIFICATION	PENETRAMETER SIZE	PENETRAMETER QUALITY LEVEL	SLAG	POROSITY	POROSITY WITH TAIL	CRACK	LACK OF PEN	LACK FUSION	INTERNAL CONCAVITY	INTERNAL CONCAVITY	TUNGSTEN	MELT-THROUGH	BURN-THROUGH	CRATER-PIT	OXIDATION	INTERNAL UNDERCUT	EXTERNAL UNDERCUT	ALIGNED INDICATIONS	WELD CONTOUR	MIS-MATCH	FILM ARTIFACT	VISUAL CONCERNS	FILM DENSITY	SEE REMARKS	ACCEPT	REJECT
90°	web	0-1	N/A	1C	.050"		✓																					✓	
		1-2					✓																					✓	
		2-3					✓																					✓	
		3-4					✓																					✓	
	↓	4-5	↓	↓	↓		✓																					✓	
		*																											
45°	web	0-1																										✓	
		1-2																										✓	
		2-3																										✓	
		3-4																										✓	
	↓	4-5	↓	↓	↓																					✓		✓	

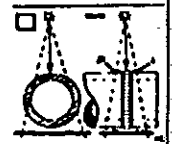
End View | Side View

SINGLE WALL



DOUBLE WALL





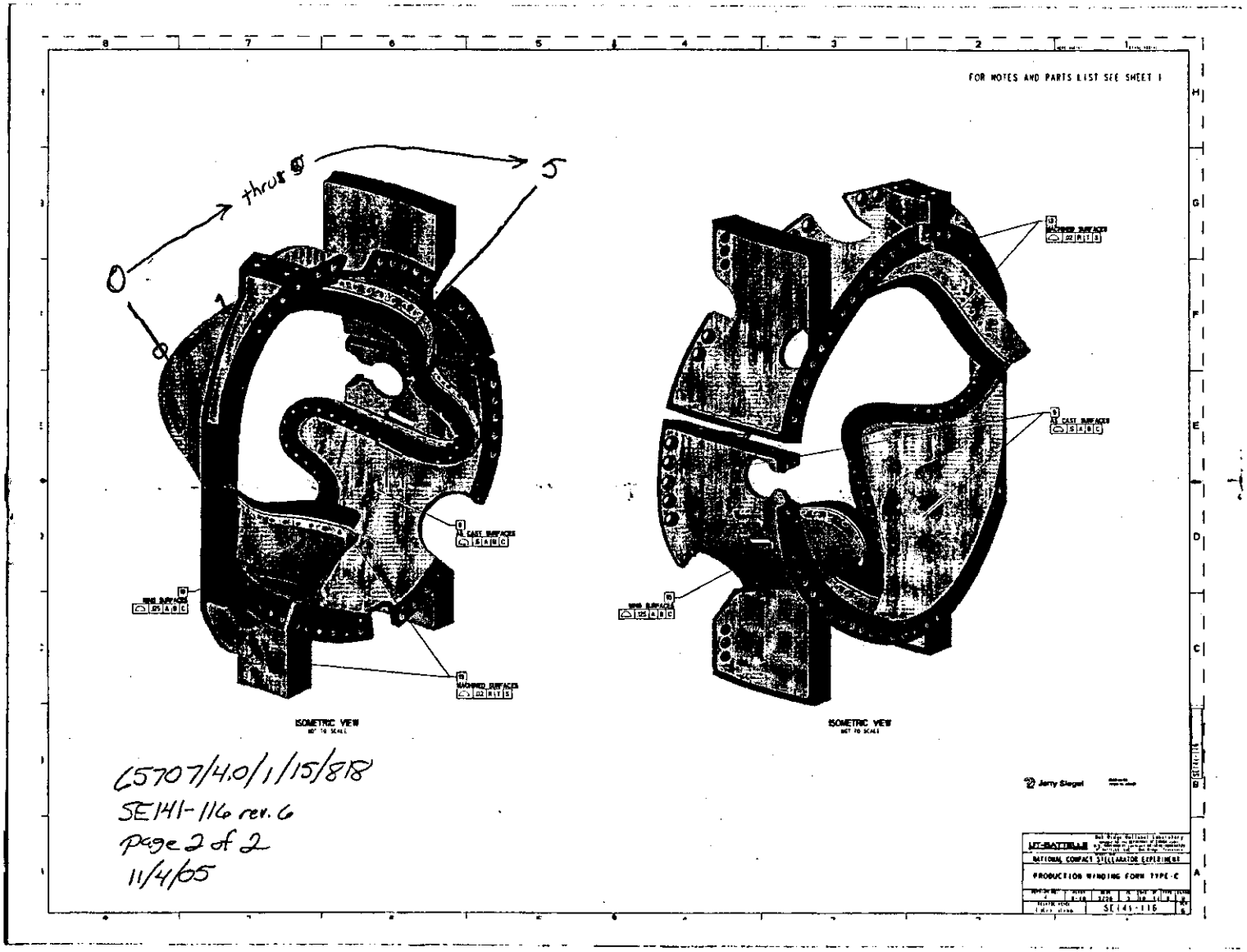
P Penetrameter
S Shim
L Location Marker
( ) OTHER

Robert Weaver 65514/II
Cooperheat-MQS Signature

Customer Representative Signature

11/4/05
Date

mc113899.tif (2547x3324x2 tiff)



mc113899.tif (2545x3324x2 tiff) [2]

Quality Assurance Documentation for Part ID: SE141-116 - Item: 21

Workorder: 65707/4-0 Sub:1 Op:85

Part: SE141-116 - MODULAR COIL WINDING FORM TYPE-C - PRODUCTION MODULAR COIL WINDING FORM TYPE-C

Drawing ID: SE141-116 Rev: 8			INSPECTION INSTRUCTIONS			RESULTS		INSPECTED BY			
SHEET	ZONE	CHARACTERISTIC	GAGE/EQUIP	BY	SAMPLE	SER#	DATA/REMARKS	INSP	VERFD	AUDIT	
* (10)		VERIFY CLEARANCE BELOW VPI GROOVE ON BOTH SIDES OF THE T SECTION USING MTMFX-3473		MFG		MTMFX-3473	ACCEPT TO SUPPLIED GAGE	313-R.BA 03-20-06			A
* (20)		22 PLACES DATUM E FLANGE VERIFY 2" CLEARANCE ABOVE 3" COUNTERBORE SURFACE USING MTMFX-3564.		MFG		MTMFX-3564	ACCEPT TO SUPPLIED GAGE	313-R.BA 03-20-06			A
* (30)		26 PLACES DATUM D FLANGE VERIFY 2" CLEARANCE ABOVE 3" COUNTERBORE SURFACE USING MTMFX-3564.		MFG		MTMFX-3564	ACCEPT TO SUPPLIED GAGE	313-R.BA 03-20-06			A
6* (40)	F3	VERIFY THAT 1" DIAMETER COOLING HOLES PASS COMPLETELY THROUGH CASTING WITH NO INTERFERENCE FROM CASTING STOCK.		MFG	4	VISUAL	ACCEPT	313-R.BA 03-20-06			A
9* (50)	D7	VERIFY THAT 1" DIAMETER COOLING HOLES PASS COMPLETELY THROUGH CASTING WITH NO INTERFERENCE FROM CASTING STOCK.		MFG	4	VISUAL	ACCPET	313-R.BA 03-20-06			A
9* (60)	F3	VERIFY THAT 1" DIAMETER COOLING HOLES PASS COMPLETELY THROUGH CASTING WITH NO INTERFERENCE FROM CASTING STOCK.		MFG	4	VISUAL	ACCEPT	313-R.BA 03-20-06			A

Nondestructive Test
Certification for Liquid Penetrant Examination

1458 E. 19th Street, Indianapolis, In 46218
TEL:(317)636-6433 FAX:(317)634-9420

Quality Assurance Documentation for Part ID: SE141-116 - Item: 22

Date of Inspection:03/19/2006 **Type of Material:**CAST STAINLESS **NDT#:16067**

Stage of Inspection:	Manufacturing Process:	Surface Condition:	Test Being Run to:	Heat Treated:
[ ] Incoming Inspection	[ ] Weldment [x] Casting	[x] Machined	[x] Router Instructions	[ ] Yes
[ ] In-Process Inspection	[ ] Bar Stock [ ] Plate	[ ] Rough	[x] Drawing	[x] No
[ ] After Repair	[ ] Forging [ ] Other	[x] Other	[ ] Test Plan	
[x] Final Inspection		FINAL MACHINED & AS CAS	[ ] Technique Card	
			SEE NOTES	

Part Information:
MTM Job Number: 65707/4.0 -Sub:1 -Op:100
Resource ID: 810-LIQUID PENETRANT INSPE
Part ID: SE141-116
Part Name: MODULAR COIL WINDING FOR
Serial Number:
Customer P.O.: S005242-F
Customer Unit/Plant:

Test Results:
Quantity Inspected: 1
Quantity Accepted: 0
Quantity Rejected: 1
Run Hours: 0.0

Inspection Results:
Customer N/C #:
[ ] Accepted
[x] Rejected
[ ] N/C-Report
[ ] Rework
MTM N/C #: 19455

Customer Inspection Plan: SEE NOTES
Test Step:
Revision:
Material Test Number:

Inspection Criteria:
Customer Specification: ASTM A903/A903M
MTM Spec Number: PS582 (REF NDT-WI-09)
Acceptance Standard: ASTM A903 (SEE NOTES)

Inspection Materials Used:
Manufacturer: SHERWIN
Type of Penetrant: DP-51
Batch Number: 41-E47
Developer: D-100
Batch Number: 520-H6

Penetrant Examination Processes:
Type: II (Visible) / Dwell Time: 15 Minutes
Method: A (Water Wash)
Method of Drying: Forced Air Fan
Form: e (nonaqueous for Type II visible dye) / Dwell Time: 15 Min

Inspection Requirements:

100 % of all accessible surfaces [ ] Joint Preps [ ] Root Pass [ ] Back Gouge [ ] Cover Pass [ ] Other

Notes:
PT 100% OF SURFACES ON PRODUCTION MODULAR COIL WINDING FORM TYPE-C.
SPECIFICATION: ASTM A903/A903M
METHOD: ASTM E165

ACCEPTANCE CRITERIA: ASTM A903/A903M LEVEL II FOR AS CAST SURFACES

ACCEPTANCE CRITERIA: ASTM A903/A903M LEVEL I FOR MACHINED SURFACES INCLUDING THE ENTIRE "T" SECTION (HIGH STRESS AREAS)

PART IS REJECTED PER ASTM A903/A903M LEVEL 1. 21 REJECTIONS WERE FOUND AT TIME OF INSPECTION. SEE MAP FOR SIZE AND LOCATION.

This is to certify that the pieces specified have been inspected in accordance with the specifications shown.

Inspector: 674-S.WILLIAMS **Date:** 03/19/2006 Sylvester Williams Level II MTM P-1

4959

10520 Chester Road
Woodlawn, Ohio 45215

COOPERHEAT MQS

CLIENT	INTERPRETER/LEVEL	RADIOGRAPHER	JOB NO	P.O. NO	DATE
Major Tool & Machine	John Ballard II	John Ballard	13860001	NA	3/22/06

ISOTOPE/X-RAY	DIA. X LENGTH	CURIES/KMA	FOCAL SPOT SIZE	SFD	SOD	TIME	FILM PROCESSING	FILM TYPE	FILM TECHNIQUE	PB SCREENS
IR-192	.118" X .089	56.3	.148"	16"	15.44"	2:15	Auto	Kodak AA	Double	.010

WELD PROCESS	MATERIAL SPEC.	MATERIAL DIAMETER	MATERIAL THICKNESS	PENETRAMETER	SHIM	ACCEPTANCE STANDARD
N/A	316 SST	N/A	varies	ASTM 1B	N/A	No Defects Larger Than .080"

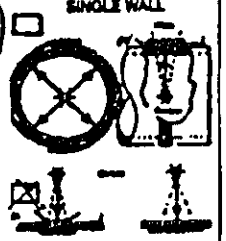
DESCRIPTION: C4 65707/4.0/1/110/818 SE141-116 Rev-8 Pg 1 of 2

REMARKS: Densitometer 012105 NC19474 Cal. due. 5/2/06 3 rejectable indications (one (.080"x .140") + one (.100"x .250") + one (.100"x .125"))

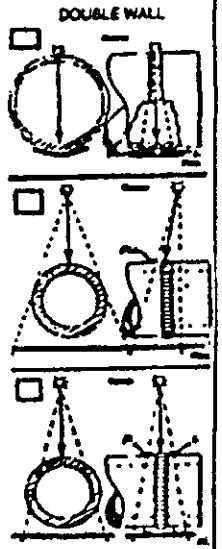
FITTING, SEAM OR FITTING	FILM INTERVAL NUMBER	WELDER IDENTIFICATION	PENETRAMETER SIZE	PENETRAMETER QUALITY LEVEL	SLAG	POROSITY	POROSITY WITH TAIL	CRACK	LACK OF PEN	LACK FUSION	INTERNAL CONVEXITY	INTERNAL CONCAVITY	TUNGSTEN	MELT-THROUGH	BURN-THROUGH	CRATER PIT	OXIDATION	INTERNAL UNDERCUT	EXTERNAL UNDERCUT	ALIGNED INDICATIONS	WELD CONTOUR	MIS-MATCH	FILM ARTIFACT	VISUAL CONCERNS	FILM DENSITY	SEE REMARKS	ACCEPT	REJECT
T	0-1	N/A	1B	.016		✓																					✓	
↓	1-2	↓	↓	↓																							✓	
	2-3					X																				✓		X
	3-4																										✓	
↓	4-5	↓	↓	↓																							✓	

End View | Side View

SINGLE WALL



DOUBLE WALL



P Penetrameter
S Shim
L Location Marker
( ) OTHER

John L Ballard
Cooperheat-MQS Signature

3/22/06
Customer Representative Signature

3/22/06
Date

MCWF Type C
RT Map of High Stress Region

MTM Workorder Number: 6570/4.0/1/110/818

3/22/06

pg 2 of 2

C4

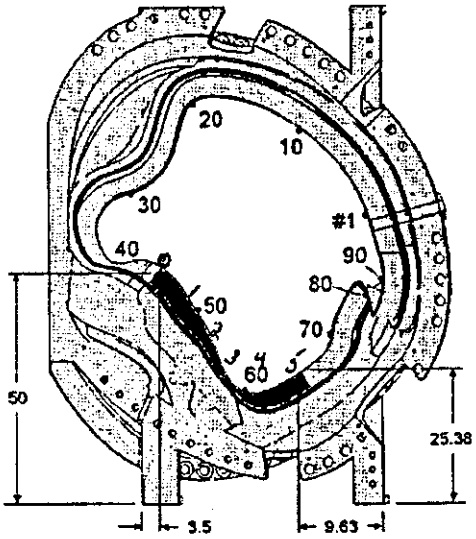
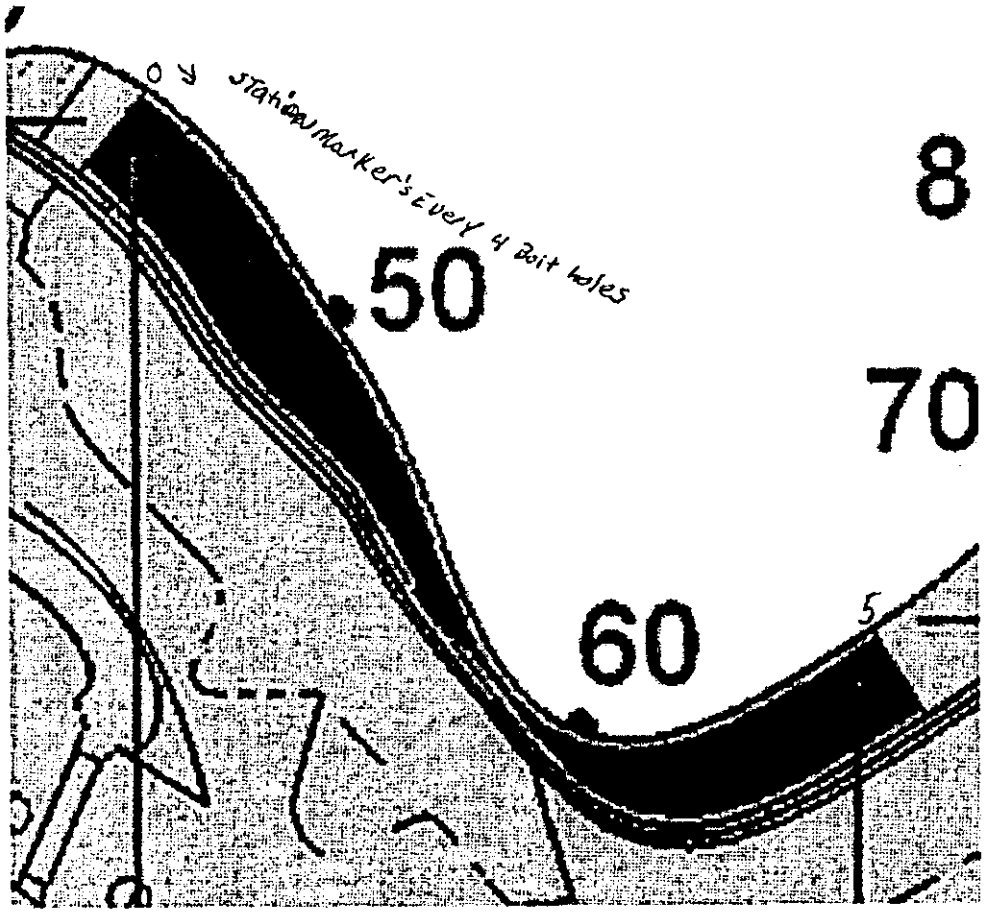


Figure 7-2 – High Stress Region Identification for Type-C MCWF



Quality Assurance Documentation for Part ID: SE141-116 - Item: 24

Workorder: 65707/4-0 Sub:1 Op:130

Part: SE141-116 - MODULAR COIL WINDING FORM TYPE-C - PRODUCTION MODULAR COIL WINDING FORM TYPE-C

Drawing ID: SE141-103 Rev: 3			INSPECTION INSTRUCTIONS			RESULTS		INSPECTED BY			
SHEET	ZONE	CHARACTERISTIC	GAGE/EQUIP	BY	SAMPLE	SER#	DATA/REMARKS	INSP	VERFD	AUDIT	
2* (10)	D3	Ø.001 - Ø.002 CHECK CLEARANCE OF ITEM 5 TO ITEM 6.	FEELER GAGES	QA		J-1144	ACCEPT	242-M.G 03-22-06			A
* (15)		THE GAP BETWEEN THE POLOIDAL BREAK BUSHINGS AND FLANGE SHAL BE LESS THAN .002"	FEELER GAGES	QA		J-1144	LESS THAN .002"	242-M.G 03-22-06			A
2* (20)	F2	ENSURE THAT THE CUMULATIVE GAP AT ANY SINGLE CROSS SECTION OF THE POLOIDAL FLANGE ELEMENTS IS LESS THAN .005".	FEELER GAGES	QA		J-1144	LESS THAN .002"	242-M.G 03-22-06			A
* (30)		THE MAX. GAP AT THE POLOIDAL BREAK PERIMITER IS .015" AND CANNOT EXCEED 1/8" FROM THE EDGE	FEELER GAGES	QA		J-1144	LESS THAN .002"	242-M.G 03-22-06			A

Quality Assurance Documentation for Part ID: SE141-116 - Item: 25

Workorder: 65707/4-0 Sub:1 Op:132

Part: SE141-116 - MODULAR COIL WINDING FORM TYPE-C - PRODUCTION MODULAR COIL WINDING FORM TYPE-C

Drawing ID: SE141-116 Rev: 8			INSPECTION INSTRUCTIONS			RESULTS		INSPECTED BY			
SHEET	ZONE	CHARACTERISTIC	GAGE/EQUIP	BY	SAMPLE	SER#	DATA/REMARKS	INSP	VERFD	AUDIT	
1* (10)	E8	47.19 ± .03	CMM	QA		00064	47.169	339-E.R 03-24-06			A
1* (20)	B8	47.19 ± .03	CMM	QA		00064	47.169	339-E.R 03-24-06			A
1* (30)	D6	47.19 ± .03	CMM	QA		00064	47.169	339-E.R 03-24-06			A
1* (40)	C6	47.19 ± .03	CMM	QA		00064	47.169	339-E.R 03-24-06			A
1* (50)	E6	// .02 A	CMM	QA		00064	ACCEPT	339-E.R 03-24-06			A
1* (60)	B6	// .02 A	CMM	QA		00064	ACCEPT	339-E.R 03-24-06			A
2* (80)	H6	2X R.187 +.025 -.005	PIN GAGE	QA		J-652	ACCEPT	339-E.R 03-24-06			A
2* (90)	G8	2X .03 X 45°		QA		VISUAL	ACCEPT	339-E.R 03-24-06			A
2* (100)	G8	.40 ± .010	CALIPER	QA		J-707	.39 TO .41	339-E.R 03-24-06			A
2* (110)	G8	2X .030 X 45°		QA		VISUAL	ACCEPT	339-E.R 03-24-06			A
2* (120)	F7	2X .32	CALIPER	QA		J-707	.315 TO .330	339-E.R 03-24-06			A
2* (130)	F7	2X R.11	RADIUS GAGE	QA		R-21	0.10	339-E.R 03-24-06			A
2* (140)	G6	⌓ .2 R S T P TO M	CMM	QA		00064	-0.062 TO .079	339-E.R 03-24-06			A
2* (150)	G6	4.790 OR SHELL INTERSECT. VERIFY USING TEMPLATE PER DRAWING NOTE 16 (MTMFX-3473)		QA		MTMFX-3473	ACCEPT (AREAS OF C NCERN REPORTED)	242-M.G 03-24-06			A
2*	G3	⌓ .2 R S T	CMM	QA		00064	-.009 TO .097	339-E.R			A

(160)		Q TO N						03-24-06			
2*	G3			QA		MTMFX-3473	ACCEPT	339-E.R			A
		4.790 OR SHELL INTERSECT. VERIFY USING TEMPLATE PER									
(170)		DRAWING NOTE 16 (MTMFX-3473)						03-24-06			
2*	E6	⌓ .02 R S T	CMM	QA		00064	-.022 TO .029	339-E.R			A
(180)		M TO MI						03-24-06			
2*	F3	⌓ .02 R S T	CMM	QA		00064	-.019 TO .023	339-E.R			A
(182)		N TO NI						03-24-06			
2*	E5	⌓ .1 R S T	CMM	QA		00064	-.019 TO .028	339-E.R			A
(185)		MI TO NI						03-24-06			
Drawing ID: NCSX-CSPEC-141-03 Rev: 11			**INSPECTION INSTRUCTIONS**			**RESULTS**		**INSPECTED BY**			
SHEET	**ZONE**	**CHARACTERISTIC**	**GAGE/EQUIP**	**BY**	**SAMPLE**	**SER#**	**DATA/REMARKS**	**INSP**	**VERFD**	**AUDIT**	
4*	3.1.1.	√125	PROFILOMETER	QA		J-1152	ACCEPT	339-E.R			A
		THE TWO "L" MACHINED SURFACES									
(188)		OF TEE.						03-24-06			
Drawing ID: SE141-116 Rev: 8			**INSPECTION INSTRUCTIONS**			**RESULTS**		**INSPECTED BY**			
SHEET	**ZONE**	**CHARACTERISTIC**	**GAGE/EQUIP**	**BY**	**SAMPLE**	**SER#**	**DATA/REMARKS**	**INSP**	**VERFD**	**AUDIT**	
2*	B5	⌖ .06 R S T	CMM	QA	50%	00064	.005 TO .040 / .75 / .625 / .187 TO .1	339-E.R			A
		96X .375-16 UNC .750 DEEP					88				
(190)		.625 C'BORE .188 DEEP	CALIPER			J-707		03-24-06			
2*	B5		THREAD PLUG GA	QA	100%	A-443	ACCEPT	339-E.R			A
		.375-16 UNC .750 DEEP GAGE 100% OF THE HOLES AND									
(195)		VERIFY CLEANLINESS.						03-24-06			
2*	B4	2X .06-.09 X 45°		QA		VISUAL	CHAMFER NOT PRESE - RADIUS [N/C:1948	339-E.R			R
(200)							3]	03-24-06			
3*	G7	⌖ .01 A B C	CMM	QA		00064	ACCEPT [N/C:19483]	242-M.G			A
(210)		8X Ø1-8 UNC THRU	THREAD PLUG GA			A-347		03-24-06			
3*	H3	▱ .01	CMM	QA		00064	.020 [N/C:19483]	339-E.R			R
(230)		DATUM -E- FLANGE						03-24-06			
3*	H4	√125	PROFILOMETER	QA		J-1152	41 TO 70	339-E.R			A
(240)		DATUM -E- FLANGE						03-24-06			
3*	F3	▱ .01	CMM	QA		00064	.025 [N/C:19483]	339-E.R			R

(250)		DATUM -D- FLANGE						03-24-06			
3* (260)	F3	√125 DATUM -D- FLANGE	PROFILOMETER	QA		J-1152	44 TO 76	339-E.R 03-24-06			A
3* (280)	E4	⌖ .01 A B C 8X Ø1.13 THRU BACK SPOT FACE Ø2.38 MIN DEPTH FOR C'UP	CMM	QA		00064 MTMFX-3564	.005 TO .067 / ACCEPT SPOT / 1.125 - 1.129 [N/C:19483]	339-E.R 03-24-06			R
4* (290)	H8	⌖ .060 D A N 3X Ø1.885 THRU	CMM	QA		00064	.026 - .033	339-E.R 03-24-06			A
4* (291)	H8	3X Ø1.885 +/- .003 Ø3.00 BACK SPOTFACE VERIFY MIN CLEANUP	CMM	QA		00064 MTMFX-3564	ACCEPT SPOT / 1.884 - 1.888	339-E.R 03-24-06			A
4* (300)	H7	⌖ Ø.06 D A N 3X 2.000" COUNTERBORE 1.00 DP	CMM CALIPER	QA		00064 J-707	.010 TO .014 / .99 DEEP	339-E.R 03-24-06			A
4* (305)	H7	Ø⌴ 2.000 - 2.001	MICROMETER - INT	QA		J-999	2.000 TO 2.001	339-E.R 03-24-06			A
4* (310)	H6	⌖ Ø.060 D A N 17X Ø1.885 THRU	CMM	QA		00064	1.882 - 1.887	339-E.R 03-24-06			A
4* (311)	H6	3X Ø1.885 +/- .003 THRU Ø3.00 BACK SPOTFACE VERIFY MIN CLEANUP	CMM	QA		00064 MTMFX-3564	SEE 290 / ACCEPT SPOT	339-E.R 03-24-06			A
4* (320)	H5	⌖ Ø.060 D A N 3X Ø1.13	CMM	QA		00064	.029 TO .067 [N/C:19483]	339-E.R 03-24-06			R
4* (321)	H5	3X Ø1.13 +/- .010 Ø2.38 BACK SPOTFACE VERIFY MIN CLEANUP	CMM CALIPER	QA		00064 J-707	SEE 280 / ACCEPT SPOT	339-E.R 03-24-06			A
4* (340)	E6	⌖ Ø.060 D A N 3X Ø1.375-6 UNC THRU	CMM	QA		00064	.0068 TO .027	339-E.R 03-24-06			A
4* (350)	E6	⌖ Ø.060 D A N 5X Ø1.885 THRU	CMM	QA		00064	.0036 TO .017	339-E.R 03-24-06			A
4*	E6	5X Ø1.885 +/- .003 THRU Ø3.00 BACK SPOTFACE	CMM	QA		00064	SEE 290 / ACCEPT SPOT	339-E.R			A

(351)		VERIFY MIN CLEANUP				MTMFX-3564		03-24-06			
4*	D4	⌖ Ø.060 D A N	CMM	QA		00064	.021	339-E.R			A
(360)		Ø1.885 THRU						03-24-06			
4*	D4		CMM	QA		00064	SEE 290 / ACCEPT SP	339-E.R			A
		Ø1.885 +/- .003 THRU					OT				
		Ø3.00 BACK SPOTFACE									
(361)		VERIFY MIN CLEANUP				MTMFX-3564		03-24-06			
4*	B5	⌖ Ø.060 D A N	CMM	QA		00064	.0054 TO .017	339-E.R			A
(370)		3X Ø1.13						03-24-06			
4*	B5		CMM	QA		00064	SEE 280 / ACCEPT SP	339-E.R			A
		3X Ø1.13 +/- .010					OT				
		Ø2.38 BACK SPOTFACE									
(371)		VERIFY MIN CLEANUP	CALIPER			J-707		03-24-06			
4*	D1		THREAD PLUG GA	QA		A-234	ACCEPT	339-E.R			A
(375)		12X .25-20 UNC -2B						03-24-06			
4*	G8	⌖ Ø.06 D A N	CMM	QA		00064	.004 - .067 [N/C:19	339-E.R			R
		12X .25-20 UNC -2B					483]				
		SUMMARY OF HOLE POSITIONS.									
		ACTUAL FEATURE CONTROL FRAME									
(376)		IS NOT ON DRAWING.						03-24-06			
5*	E8	⌖ Ø.060 E A J	CMM	QA		00064	.020	339-E.R			A
(380)		Ø1.885 THRU						03-24-06			
5*	E8		CMM	QA		00064	SEE 380 / ACCEPT SP	339-E.R			A
		Ø1.885 +/- .003 THRU					OT				
		Ø3.00 BACK SPOTFACE									
(381)		VERIFY MIN CLEANUP				MTMFX-3564		03-24-06			
5*	F6	⌖ Ø.060 E A J	CMM	QA		00064	.0094 TO .026	339-E.R			A
(400)		3X Ø1.375-6 UNC THRU						03-24-06			
5*	F6	⌖ Ø.06 E A J	CMM	QA		00064	.013 TO .028 / .99	339-E.R			A
(410)		3X 2.000" COUNTERBORE 1.00 DP	CALIPER			J-707	DP	03-24-06			
5*	F6	ØL 2.000 - 2.001	MICROMETER - INT	QA		J-999	2.0000 - 2.0001	339-E.R			A
(412)								03-24-06			
5*	F7		THREAD PLUG GA	QA		A-234	ACCEPT	339-E.R			A
(415)		7X 1/4-20 UNC -2B						03-24-06			
5*	F7	⌖ Ø.06 E A J	CMM	QA		00064	.010 - .039	339-E.R			A
		7X 1/4-20 UNC -2B									
		SUMMARY OF HOLE POSITIONS.									
		ACTUAL FEATURE CONTROL FRAME									

(420)		IS NOT ON DRAWING.						03-24-06			
5* (430)	E7	⌖ Ø.060 E A J 24X Ø1.885 THRU	CMM	QA		00064	.013 TO .028	339-E.R 03-24-06			A
5* (431)	E7	24X Ø1.885 +/- .003 THRU Ø3.00 BACK SPOTFACE VERIFY MIN CLEANUP	CMM	QA		00064 MTMFX-3564	1.884 - 1.888 / ACC EPT SPOT	339-E.R 03-24-06			A
5* (440)	E7	⌖ Ø.060 E A J 3X Ø1.5 TO 2.00 DEEP Ø3.00 TO 1.00 DEEP	CMM	QA		00064	.008 - .012 / 1.5 / 1.99 DP	339-E.R 03-24-06			A
5* (450)	D7	3X Ø1.885 +/- .003 THRU Ø3.00 BACK SPOTFACE VERIFY MIN CLEANUP	CMM	QA		00064 MTMFX-3564	1.887 - 1.888 / ACC EPT	339-E.R 03-24-06			A
6* (470)	E3	4X Ø1.00 THRU	CMM	QA		00064	1.00 - 1.002 THRU	339-E.R 03-24-06			A
8* (650)	G7	4.00 ± .010	CALIPER	QA		J-707	3.918 [N/C:19483]	339-E.R 03-24-06			R
8* (750)	D7	6X Ø.375-16 UNC TO .75 DEEP .03 X 45° CHAMFER	THREAD PLUG GA	QA		A-442 VISUAL	ACCEPT / 2 AT .700 DEEP / CHAMFER ACCEPTED [N/C:19483]	339-E.R 03-24-06			R
8* (760)	D7	13.6 °		QA		VISUAL	SEE IGES	339-E.R 03-24-06			A
8* (770)	D7	5.88 VERIFY THAT PAD MEETS THE MINIMUM OF 5.88		QA		VISUAL	ACCEPT	339-E.R 03-24-06			A
8* (780)	D7	2.19 ± .010		QA		VISUAL	SEE IGES	339-E.R 03-24-06			A
8* (790)	D7	2.19 ± .010		QA		VISUAL	SEE IGES	339-E.R 03-24-06			A
8* (830)	C8	2X 1.56 ± .010 THRU	CALIPER	QA		J-707	1.565	339-E.R 03-24-06			A
8* (850)	C8	2X 7.50 ± .010 THRU	CALIPER	QA		J-707	7.506	339-E.R 03-24-06			A
8* (860)	C8	8X R.25	RADIUS GAGE	QA		R-21	.25	339-E.R 03-24-06			A

8* (870)	C8	2X 2.52 ± .010		QA		VISUAL	SEE IGES	339-E.R 03-24-06			A
9* (900)	E7	2.54 ± .010		QA		VISUAL	SEE IGES	339-E.R 03-24-06			A
9* (910)	E7	5.08 ± .010		QA		VISUAL	SEE IGES	339-E.R 03-24-06			A
9* (920)	F3	4X Ø1.0 THRU VERIFY THAT HOLES BREAK COMPLETELY THROUGH INSIDE OF CASTING	CALIPER	QA		J-707	1.00 THRU	339-E.R 03-24-06			A
9* (930)	F3	2X Ø .50 ± .010 THRU	CALIPER	QA		J-707	.50	339-E.R 03-24-06			A
9* (940)	E3	2.44 ± .010	CALIPER	QA		J-707	2.46	339-E.R 03-24-06			A
9* (950)	E3	1.22 ± .010		QA		VISUAL	SEE IGES	339-E.R 03-24-06			A
9* (960)	C7	4X Ø1.0 THRU VERIFY THAT HOLES BREAK COMPLETELY THROUGH INSIDE OF CASTING	CALIPER	QA		J-707	1.000 - 1.004	339-E.R 03-24-06			A
9* (970)	C6	2X Ø.25 T.C. HOLE		QA			.25 / THRU	339-E.R 03-24-06			
Drawing ID: SE141-116 Rev: 7			**INSPECTION INSTRUCTIONS**			**RESULTS**		**INSPECTED BY**			
SHEET	**ZONE**	**CHARACTERISTIC**	**GAGE/EQUIP**	**BY**	**SAMPLE**	**SER#**	**DATA/REMARKS**	**INSP**	**VERFD**	**AUDIT**	
10* (980)	C8	⌓ .125 A B C	CMM	QA		00064	.017 TO .53 [N/C:19 483]	339-E.R 03-24-06			R
Drawing ID: SE141-116 Rev: 8			**INSPECTION INSTRUCTIONS**			**RESULTS**		**INSPECTED BY**			
SHEET	**ZONE**	**CHARACTERISTIC**	**GAGE/EQUIP**	**BY**	**SAMPLE**	**SER#**	**DATA/REMARKS**	**INSP**	**VERFD**	**AUDIT**	
10* (990)	D5	⌓ .5 A B C DATUM -D- SIDE INNER CAST	CMM	QA		00064	-.98 TO .24 [N/C:19 483]	339-E.R 03-24-06			R
Drawing ID: SE141-116 Rev: 7			**INSPECTION INSTRUCTIONS**			**RESULTS**		**INSPECTED BY**			
SHEET	**ZONE**	**CHARACTERISTIC**	**GAGE/EQUIP**	**BY**	**SAMPLE**	**SER#**	**DATA/REMARKS**	**INSP**	**VERFD**	**AUDIT**	
10* (1010)	C4	⌓ .125 A B C DATUM -E- SIDE LARGE WING	CMM	QA		00064	.011 TO .026	339-E.R 03-24-06			A
Drawing ID: SE141-116 Rev: 8			**INSPECTION INSTRUCTIONS**			**RESULTS**		**INSPECTED BY**			

SHEET	ZONE	CHARACTERISTIC	GAGE/EQUIP	BY	SAMPLE	SER#	DATA/REMARKS	INSP	VERFD	AUDIT	
10* (1030)	D1	⌓ .5 A B C DATUM -E- SIDE INNER CAST	CMM	QA		00064	-.33 TO .59 [N/C:19 483]	339-E.R 03-24-06			R
Drawing ID: SE141-116 Rev: 7			**INSPECTION INSTRUCTIONS**			**RESULTS**		**INSPECTED BY**			
SHEET	**ZONE**	**CHARACTERISTIC**	**GAGE/EQUIP**	**BY**	**SAMPLE**	**SER#**	**DATA/REMARKS**	**INSP**	**VERFD**	**AUDIT**	
10* (1035)	E1	MACHINE / GRIND THIS AREA TO PROFILE OF +.05/-.10	CMM	QA		00064	.062 - .075 [N/C:19 483]	242-M.G 03-24-06			R
Drawing ID: NCSX-CSPEC-141-03 Rev: 10			**INSPECTION INSTRUCTIONS**			**RESULTS**		**INSPECTED BY**			
SHEET	**ZONE**	**CHARACTERISTIC**	**GAGE/EQUIP**	**BY**	**SAMPLE**	**SER#**	**DATA/REMARKS**	**INSP**	**VERFD**	**AUDIT**	
4* (1040)	3.1.1.	UOS ALL MACHINED SURFACES TO BE 250 RMS SURFACE FINISH RECORD RANGE	PROFILOMETER	QA		J-1152 VISUAL	41 - 75	339-E.R 03-24-06			A
Drawing ID: SE141-116 Rev: 8			**INSPECTION INSTRUCTIONS**			**RESULTS**		**INSPECTED BY**			
SHEET	**ZONE**	**CHARACTERISTIC**	**GAGE/EQUIP**	**BY**	**SAMPLE**	**SER#**	**DATA/REMARKS**	**INSP**	**VERFD**	**AUDIT**	
1* (1050)		NOTE 9 RECORD THE WEIGHT OF THE PART 6000LBS MAX	SCALE	QA		2270	5,640	339-E.R 03-24-06			A

Quality Assurance Documentation for Part ID: SE141-116 - Item: 26

Workorder: 65707/4-0 Sub:1 Op:160

Part: SE141-116 - MODULAR COIL WINDING FORM TYPE-C - PRODUCTION MODULAR COIL WINDING FORM TYPE-C

Drawing ID: SE141-116 Rev: 8			INSPECTION INSTRUCTIONS			RESULTS		INSPECTED BY			
SHEET	ZONE	CHARACTERISTIC	GAGE/EQUIP	BY	SAMPLE	SER#	DATA/REMARKS	INSP	VERFD	AUDIT	
*		DATUM -E- SIDE MAG PERMEABILITY TO BE NO GREATER THAN 1.02μ. CHECK 3 PLACES ADJACENT TO EVERY 5TH HOLE IN T SECTION.	MASTER GAGE	QA		J-1165	LESS THAN 1.02	503-B.H 03-23-06			A
(10)											
*		DATUM -D- SIDE MAG PERMEABILITY TO BE NO GREATER THAN 1.02μ. CHECK 3 PLACES ADJACENT TO EVERY 5TH HOLE IN T SECTION.	MASTER GAGE	QA		J-1165	LESS THAN 1.02	503-B.H 03-23-06			A
(20)											

Major
Tool & Machine, Inc.
1458 E. 19th Street, Indianapolis, In 46218
TEL:(317)636-6433 FAX:(317)634-9420

Nondestructive Test
Certification for Liquid Penetrant Examination
Quality Assurance Documentation for Part ID: SE141-116 - Item: 27

Date of Inspection:02/10/2006 **Type of Material:**316-17 **NDT#:15604**

Stage of Inspection:	Manufacturing Process:	Surface Condition:	Test Being Run to:	Heat Treated:
[ ] Incoming Inspection	[x] Weldment [ ] Casting	[ ] Machined	[x] Router Instructions	[ ] Yes
[x] In-Process Inspection	[ ] Bar Stock [ ] Plate	[x] Rough	[ ] Drawing	[x] No
[ ] After Repair	[ ] Forging [ ] Other	[ ] Other	[ ] Test Plan	
[ ] Final Inspection			[ ] Technique Card	

Part Information:
MTM Job Number: 65707/4.0 -Sub:11 -Op:20
Resource ID: 810-LIQUID PENETRANT INSPE
Part ID: SE141-116
Part Name: MODULAR COIL WINDING FOR
Serial Number:
Customer P.O.: S005242-F
Customer Unit/Plant:

Test Results:
Quantity Inspected: 1
Quantity Accepted: 1
Quantity Rejected: 0
Run Hours: 0.0

Customer Inspection Plan:
Test Step:
Revision:
Material Test Number:

Inspection Criteria:
Customer Specification: ASTM A903/903M LEVEL1
MTM Spec Number: NDT-WI-009
Acceptance Standard: NO DEFECTS

Inspection Materials Used:
Manufacturer: SHERWIN CORP.
Type of Penetrant: DP-51
Batch Number: 41-E47
Developer: D-100
Batch Number: 520-H6

Penetrant Examination Processes:
Type: II (Visible) / Dwell Time: 30 Minutes
Method: A (Water Wash)
Method of Drying: Normal Evaporation
Form: e (nonaqueous for Type II visible dye) / Dwell Time: 30 Min

Inspection Requirements:

% of all accessible surfaces [ ] Joint Preps [x] Root Pass [x] Back Gouge [x] Cover Pass [ ] Other

Notes:
INSPECT WELD REPAIR.

NO REJECTABLE INDICATIONS AT TIME OF INSPECTION.

This is a LPI check in reference to NC 19209.

This is to certify that the pieces specified have been inspected in accordance with the specifications shown.

Inspector: 674-S.WILLIAMS **Date:** 02/10/2006 Sylvester Williams Level II MTM P-1

Major Tool & Machine, Inc.
1458 E. 19th Street, Indianapolis, In 46218
TEL:(317)636-6433 FAX:(317)634-9420

Nondestructive Test
Certification for Liquid Penetrant Examination
Quality Assurance Documentation for Part ID: SE141-116 - Item: 28

Date of Inspection:03/24/2006 **Type of Material:**CAST STAINLESS **NDT#:16147**

Stage of Inspection:	Manufacturing Process:	Surface Condition:	Test Being Run to:	Heat Treated:
[ ] Incoming Inspection	[ ] Weldment [x] Casting	[x] Machined	[x] Router Instructions	[ ] Yes
[ ] In-Process Inspection	[ ] Bar Stock [ ] Plate	[ ] Rough	[x] Drawing	[x] No
[x] After Repair	[ ] Forging [ ] Other	[x] Other	[ ] Test Plan	
[ ] Final Inspection		FINAL MACHINED & AS CAS	[ ] Technique Card	
			SEE NOTES	

Part Information:
MTM Job Number: 65707/4.0 -Sub:12 -Op:30
Resource ID: 810-LIQUID PENETRANT INSPE
Part ID: SE141-116
Part Name: MODULAR COIL WINDING FOR
Serial Number:
Customer P.O.: S005242-F
Customer Unit/Plant:

Test Results:
Quantity Inspected: 1
Quantity Accepted: 1
Quantity Rejected: 0
Run Hours: 0.0

Inspection Results:
Customer N/C #:
[x] Accepted
[ ] Rejected
[ ] N/C-Report
[ ] Rework
MTM N/C #: 19321

Customer Inspection Plan: SEE NOTES
Test Step:
Revision:
Material Test Number:

Inspection Criteria:
Customer Specification: ASTM A903/A903M
MTM Spec Number: PS582 (REF NDT-WI-09)
Acceptance Standard: ASTM A903 (SEE NOTES)

Inspection Materials Used:
Manufacturer: SHERWIN
Type of Penetrant: DP-51
Batch Number: 41-E47
Developer: D-100
Batch Number: 520-H6

Penetrant Examination Processes:
Type: II (Visible) / Dwell Time: 15 Minutes
Method: A (Water Wash)
Method of Drying: Forced Air Fan
Form: e (nonaqueous for Type II visible dye) / Dwell Time: 15 Min

Inspection Requirements:

100 % of all accessible surfaces [ ] Joint Preps [ ] Root Pass [ ] Back Gouge [ ] Cover Pass [ ] Other

Notes:

PENETRANT INSPECT WELD REPAIR.
Specification: ASTM A903/A903M LEVEL 1
MTM NDT Cert: REPAIR OF DEFECT NC19321

No defects noted.

This is to certify that the pieces specified have been inspected in accordance with the specifications shown.

Inspector: 674-S.WILLIAMS **Date:** 03/24/2006 Sylvester Williams Level II MTM P-1

mc115096.tif (1688x2156x2 tiff)

CERTIFICATE OF TEST

Certification Date
9-JAN-2006

CUSTOMER ORDER NUMBER
PO6-00025

CUSTOMER PART NUMBER

2301 AIRWEST BLVD
PLAINFIELD IN 46168

Invoice Number
T479315

Ship# T731400

SOLD TO: MAJOR TOOL & MACHINE INC
1458 E 19TH ST
INDIANAPOLIS IN 46218

SHIP TO: MAJOR TOOL & MACHINE INC
29267
1458 EAST 19TH STREET
INDIANAPOLIS IN 46218

Description: 316/316L HRAP BAR ASTM A479
1 X 3 X 12' R/L Line Total: 259 LB
HEAT: M11443 ITEM: 522335

Specifications:

ASTM A479 03	ASTM A276 03	ASME SA479 01
QQ S 763 98	AMS 5648 K02	AMS 5653 F02
AS TM A4	AMS QQ S 763 98	ASTM A182 03
ASTM A193 03	SATM A322 03	ASME SB182 00B

CHEMICAL ANALYSIS

C	SI	MN	P	S	CR	MO	NI
0.03	0.57	1.25	0.037	0.024	16.84	2.0	10.63

V	W	CO	TI	AL	NB	N	CU
0.03	0.07	0.057	3.05	0.059	0.01	0.04	0.27

RCPT: R534135
MILL : AMS SPECIALTY STEEL COUNTRY OF ORIGIN : AUSTRIA

MECHANICAL PROPERTIES

DESCRIPTION	YLD STR KSI	ULT TEN KSI	%ELONG IN 02 IN	%RED IN AREA	HARDNESS BHN
	58.0	91.0	44.0	71.0	194

GRAIN SIZE :10 -

RECEIVED
JAN 9 2006
104093 JH
Line 1

MTM 016 JAN 09 2006

The above data were transcribed from the manufacturer's Certificate of Test after verification for completeness and specification requirements of the information on the certificate. All test results remain on file subject to examination.

We hereby certify that the material covered by this report will meet the applicable requirements described herein, including any specification forming a part of the description.

The willful recording of false, fictitious, or fraudulent statements in connection with test results may be punishable as a felony under federal statutes.

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

DAMIAN GURRI

MANAGER, QUALITY ASSURANCE

mc115096.tif (1676x2146x2 tiff) [2]

CERTIFICATE OF TEST

Certification Date
9-JAN-2006

CUSTOMER ORDER NUMBER
PO6-00025

CUSTOMER PART NUMBER

2301 AIRWEST BLVD
PLAINFIELD IN 46168

Invoice Number
T479315

Ship# T731400

SOLD TO: MAJOR TOOL & MACHINE INC
1458 E 19TH ST
INDIANAPOLIS IN 46218

SHIP TO: MAJOR TOOL & MACHINE INC
29267
1458 EAST 19TH STREET
INDIANAPOLIS IN 46218

Description: 316/316L HRAP BAR
1 X 3 X 12' R/L
HEAT: M11443 ITEM: 522335

ASTM A479
Line Total: 259 LB

THERMAL TREATMENT: OK
HT TRT QUENCHED 1040 DEG C 30 MIN WATER
CORROSION: OK
MACRO: OK
MICRO1: OK

MTM 016

JAN 09 2006

The above data were transcribed from the manufacturer's Certificate of Test after verification for completeness and specification requirements of the information on the certificate. All test results remain on file subject to examination.

We hereby certify that the material covered by this report will meet the applicable requirements described herein, including any specification forming a part of the description.

The willful recording of false, fictitious, or fraudulent statements in connection with test results may be punishable as a felony under federal statutes.

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

DAMIAN GURRI

MANAGER, QUALITY ASSURANCE

mc115096.tif (1686x1990x2 tiff) [3]

ABNAHMEPRUEFZEUGNIS B
INSPECTION CERTIFICATE B
CERTIFICAT DE RECEPTION B
nach/according to/selon EN 10204-3.1
Blatt/Sheet/Feuille 1 Von/Of/De 2

ISO 9001
BSI Registration
No. FM00777

BÖHLER
EDELSTAHL

Nr./No./No.: 010.350 05.06.23
Seite/Page/Page: 01/01 16/ACK

Besteller/Purchaser/Commenant
AMS SPECIALITY STEEL, INC.

3304 COLLINS RD, PO BOX 1021
28173 WAXHAW, NC 28173-
USA

RS34135
522335

Bestell-Nr./Purchaser's Order No/No. de commande
2698/P791235

Unsere Auftrags-Nr./Works Order No /No. de commande d'usine
354.175/USA vom 05.02.23/01/

Lieferschein/Dispatch note/Avis d'expedition
20/511.846/K vom 05.06.20

Anforderungen/Requirements/Exigence
+:

Pruefgegenstand/Object of tests/Objet d'examen
AISI 316/316L, UNS-S-31600, UNS-S-31603, DIN 1017
STAINLESS STEEL FLAT BARS,
HOT ROLLED, QUENCHED/SOLUTION ANNEALED AND PICKLED

Umfang der Lieferung/Volume of delivery/Liste descriptive

		Gewicht kg Weight kgs Poids kg	Schmelze Heat No No. de coulee	Pruef-Nr Test No Eprouvette
03 FL 76,200MM X 25,400MM		2415.00	M11443	I067
1" X 3"	11,33 - 12,97 FT	5324,1	LBS	

"MATERIAL IS FREE OF MERCURY CONTAMINATION"
"NO WELD REPAIR"

+:
ASTM A484/A484M-03, ASTM A276-03, AMS-QQ-S-763-98, AMS 5653F-02,
AMS 5648K-02, ASTM A479/A479M-03, ASTM A182/A182M-03, ASTM A193/A193M-03,
ASTM A320/A320M-03, ASME SA479-01, ASME SA 182-00b,

COUNTRY OF ORIGIN: AUSTRIA

Erschmelzungsart/Steelmaking Process/Procede d'acieration: EAF

Kennzeichnung/Marking/Marquage
Markenbezeichnung/Grade of Material/nuance du materiel:
Werkstoff Nr./Material No./Materiaux No. X
Schmelze/Heat No./No de coulee: X

Besichtigung und Nachmessung: Kein Anstand
Inspection and Checking of Dimensions: satisfactory
Inspection et Control des dimensions: satisfaisant

Ergebnis der Pruefungen/Test Results/Resultat des essais
Die gestellten Anforderungen sind erfuellt.
The material has been furnished in accordance with the requirements.
Le material a ete trouve conforme aux exigences.

Zeichen des Lieferwerks
Brand of Manufacturer
Marques de l'usine

Zeichen des Pruefers
Symbol of Inspector
Symbole de l'inspecteur

BOEHLER
Edelstahl GmbH

MTM 016

JAN 09 2006

mc115096.tif (1556x2060x2 tiff) [4]

ABNAHMEPRUEFZEUGNIS B
INSPECTION CERTIFICATE B
CERTIFICAT DE RECEPTION B

ISO 9001
BSI Registration
No. FM00777

BÖHLER EDELSTAHL

Ergebnis der Pruefungen/Test results/Resultat des essais

Blatt/Sheet/Feuille 2 Von/Of/De 2

Nr./No./No.: 010.350 05.06.23

Seite/Page/Page: 01/01

Chemische Zusammensetzung/Chemical Composition/Composition chimique (%)

Schmelze
Heat No.
No. de coulee

	C	SI	MN	P	S	CR	MO	NI	V	W
M11443	0,03	0,57	1,25	0,037	0,024	16,84	2,00	10,63	0,03	0,07

CO=0,057 TI= 0,05 AL=0,059 NB=0,010 N = 0,04 CU=0,27

Mechanische Eigenschaften/Mechanical Properties/Characteristiques mecaniques

Pruef-Nr Test No Eprouvette	TEMP ° C	YIELD ST. KSI	TENS.ST KSI	ELONG. A4 %	R/A %
		>030	075-115	>40	>50
I067	0020	058	091	44	71

BRINELLHARDNESS : 194 BHN

MACRO AND MICRO TESTS : SATISFACTORY

CONFUSION-TEST : SATISFACTORY

GRAIN SIZE ACC. TO ASTM E112 : 10

INTERCRYSTALLINE CORROSION TEST ACC. TO ASTM A262 PR.E : SATISFACTORY

HEAT-TREATMENT:
QUENCHED: 1040 ° C - 30 MIN - WATER

Anlagen:
Enclosures:
Annexe:

BOEHLER
Edelstahl GmbH

DER ABNAHMEBEAUFTRAGTE
INSPECTOR'S REPRESENTATIVE

MTM 016 JAN 09 2006

Quality Assurance Documentation for Part ID: SE141-137 - Item: 30

Workorder: 65707/4-0 Sub:9 Op:40

Part: SE141-137 - -

Drawing ID: SE141-137 Rev: 1			INSPECTION INSTRUCTIONS			RESULTS		INSPECTED BY			
SHEET	ZONE	CHARACTERISTIC	GAGE/EQUIP	BY	SAMPLE	SER#	DATA/REMARKS	INSP	VERFD	AUDIT	
1* (10)	G2	RECORD MAGNETIC PERMEABILITY. RESULTS TO BE NO GREATER THAN 1.03µ PER RFD 14-011.	MASTER GAGE	QA		J-1165	BETWEEN 1.03 AND 1.05 [N/C:19233]	503-B.H 02-08-06			R

Quality Assurance Documentation for Part ID: SE141-138 - Item: 32

Workorder: 65707/4-0 Sub:10 Op:40

Part: SE141-138 - -

Drawing ID: SE141-138 Rev: 1			INSPECTION INSTRUCTIONS			RESULTS		INSPECTED BY			
SHEET	ZONE	CHARACTERISTIC	GAGE/EQUIP	BY	SAMPLE	SER#	DATA/REMARKS	INSP	VERFD	AUDIT	
1* (10)	G2	RECORD MAGNETIC PERMEABILITY. RESULTS TO BE NO GREATER THAN 1.03µ PER RFD 14-011.	MASTER GAGE	QA		J-1165	BETWEEN 1.03 AND 1.05 [N/C:19234]	503-B.H 02-08-06			R

Employees: 242-M.Griffith / 313-R.Bachek / 339-E.Root / 503-B.Houk