



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-C2

CAF Metal Designation CF8MNMnMod

Material Spec CF8MNMnMOD

Ladle#1 Heat 29060

Cert Number S75920-1

Pour Date 4/15/2005

Revised 8/1/05

Element	Min	Actual	Max
C	0.04	0.06	0.07
MN	2.3	2.8	2.8
SI	0.0	0.5	0.5
CR	18.0	18.0	18.5
NI	13.0	13.2	13.5
MO	2.1	2.3	2.5
P*	0.0	----	0.015
S*	0.0	----	0.015
N	0.24	0.26	0.28

* Reported on weighted average MTR see Doc. #4.

Respectfully Submitted,
Charles A. Ruud
Quality Assurance Manager

Superior Quality Engineered Metal Products

www.MetalTekInt.Com



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Carondelet Division

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Material Test Report

ENERGY INDUSTRIES OF OHIO

Purchase Order Number PPPL-FP-LTS-2

Pattern Number MCWF-C2

CAF Metal Designation CF8MNMnMod

Material Spec CF8MNMnMOD

Ladle#2 Heat 29061

Cert Number S75920-1

Pour Date 4/15/2005

Revised 8/1/05

Element	Min	Actual	Max
C	0.04	0.05	0.07
MN	2.3	2.8	2.8
SI	0.0	0.5	0.5
CR	18.0	17.8	18.5
NI	13.0	13.1	13.5
MO	2.1	2.4	2.5
P*	0.0	-----	0.015
S*	0.0	-----	0.015
N	0.24	0.28	0.28

* Reported on weighted average MTR see Doc. #4.

Respectfully Submitted,
Charles A. Ruud
Quality Assurance Manager

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Material Test Report

ENERGY INDUSTRIES OF OHIO

Purchase Order Number PPPL-FP-LTS-2

Pattern Number MCWF-C2

CAF Metal Designation CF8MNMnMod

Material Spec CF8MNMnMOD

Ladle#3 Heat 29063

Cert Number S75920-1

Pour Date 4/15/2005

Revised 8/1/05

Element	Min	Actual	Max
C	0.04	0.06	0.07
MN	2.3	2.8	2.8
SI	0.0	0.5	0.5
CR	18.0	18.3	18.5
NI	13.0	13.3	13.5
MO	2.1	2.2	2.5
P*	0.0	----	0.015
S*	0.0	----	0.015
N	0.24	0.26	0.28

* Reported on weighted average MTR see Doc. #4.

Respectfully Submitted,
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Quality Assurance Manager

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Material Test Report

ENERGY INDUSTRIES OF OHIO

Purchase Order Number PPPL-FP-LTS-2

Cert Number S75920-1

Pattern Number MCWF-C2

Pour Date 4/15/2005

CAF Metal Designation CF8MNMnMod

Material Spec CF8MNMnMOD

Weighted average of 3 heats – 29060(46%),29061(25%),29063(29%) Total Weight 29107 lbs.

Revised 8/1/05

Element	Min	Actual	Max
C	0.04	0.06	0.07
MN	2.3	2.8	2.8
SI	0.0	0.5	0.5
CR	18.0	18.0	18.5
NI	13.0	13.2	13.5
MO	2.1	2.3	2.5
P*	0.0	0.023	0.015
S*	0.0	0.018	0.015
N	0.24	0.26	0.28

*P & S taken from cast on bar, zones 1,2,&3 and analyzed by wet chemistries, ASTM E1019-03 for sulfur and Colormetric for phosphorous.

*P & S are above the specification.

Averages reported, individuals listed below.

Sulfur:	Z1 .022	Phosphorous:	Z1 .024
	Z2 .018		Z2 .021
	Z3 .015		Z3 .025

Respectfully Submitted,
Charles A. Ruud
Quality Assurance Manager

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Material Test Report

ENERGY INDUSTRIES OF OHIO

Purchase Order Number PPPL-FP-LTS-2

Pattern Number MCWF-C1

Weld Material Batch 3012668/82743

Element	Actual
C	0.02
MN	7.3
SI	0.4
CR	19.5
NI	15.2
MO	3.0
P	0.03
S	0.03
N	0.17

Respectfully Submitted,

A handwritten signature in black ink, appearing to read "Charles A. Ruud".

Charles A. Ruud
Quality Assurance Manager

Superior Quality Engineered Metal Products

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Carondelet Division

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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-C1

Weld Material Batch WO 19711

Element	Actual
C	0.02
MN	3.4
SI	0.2
CR	17.7
NI	16.2
MO	2.8
P	0.02
S	0.002
N	0.15

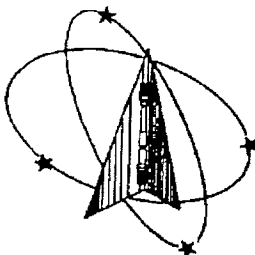
Respectfully Submitted,

A handwritten signature in black ink, appearing to read "CAR" or similar, with a long horizontal stroke extending to the right.

Charles A. Ruud
Quality Assurance Manager

Superior Quality Engineered Metal Products

www.MetalTekInt.Com



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.

June 17, 2005

CERTIFICATION

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
SOAK TIME: 5 Minutes
SPEED OF TESTING: 0.0030 in./in./min., 0.0500 in./in./in.
MATERIAL: Metaltek CF8NMnMOD

Sample	TestLog Number	Temp. °F	UTS ksi	0.2% YS ksi	Elong %	RA %	Modulus Msi	Codes	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	AUIR
A1 (Z1)	C03040	-320	155.1	95.5	51	37	25.9	—	33210	19210	0.5060	0.4002	2.00	3.02	0.20109020	M9	R
A1 (Z2)	C03041	-320	155.1	94.6	59	51	25.4	—	33120	18980	0.5054	0.3543	2.00	3.18	0.20061359	M9	R
A1 (Z3)	C03042	-320	168.7	101.8	58	57	25.2	—	33840	20420	0.5054	0.3305	2.00	3.18	0.20061359	M9	R
C2 (Z1)	C03043	-320	163.6	94.0	51	41	25.9	D	32840	18880	0.5056	0.3891	2.00	3.03	0.20077240	M9	R
C2 (Z2)	C03044	-320	162.4	91.7	61	61	25.0	—	32580	18390	0.5054	0.3163	2.00	3.21	0.20061359	M9	R
C2 (Z3)	C03045	-320	165.5	93.9	61	61	25.7	—	33230	18850	0.5056	0.3163	2.00	3.21	0.20077240	M9	R

D - Failed outside middle half of gage length.

KNOWLEDGE OR WILLFULLY FAULTS OR CONCEALS A MATERIAL FACT ON THIS FORM OR MAKING FALSE, FICTITIOUS OR MISLEADING STATEMENTS OR REPRESENTATIONS HEREIN COULD CONSTITUTE A VIOLATION OF FEDERAL, STATE AND LOCAL LAWS. THE CERTIFICATE OR REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN APPROVAL OF WMT&R, INC.

Testing Specialists for Aerospace, Automotive, and Material Testing Fields
Locations in Youngstown, PA U.S.A. ~ Tel: (724) 537-3131 and
Banbury U.K. ~ Tel: +44 (0) 1295 261211

Matthew Johnston
Roy E. Slatt Mail Worker
Technical Services Manager
6-17-05
June 17, 2005



Section 1 of 1
WMT&R Report No. 5-29323
Req. No. 5394



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

METALTEK INTERNATIONAL
8600 Commercial Blvd.
Pevely, MO 63070

May 17, 2005
Lab No. 05P-1488
P.O. No. 12516
Page 1 of 7

Attention: Chuck Ruud

REPORT OF MECHANICAL TESTS

SAMPLE ID: 3 Ea. C-2 COIL, #Z1, #Z2, & #Z3

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. %		Modulus of Elasticity Msi
#Z1	.1948	.0946	51.4	37,700	82,000	1.17	51.4	23.4
#Z2	.1948	.0887	54.5	35,900	81,000	1.03	51.5	23.2
#Z3	.1901	.0887	53.3	36,100	84,300	1.15	57.5	21.4

Round, reduced section tensiles

Yield taken at .2% offset

Tested in accordance with ASTM A 370

Identification of tested specimens provided by the client



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

Karl Schmitz, Director
Materials Testing

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METALTEK INTERNATIONAL
8600 Commercial Blvd.
Pevely, MO 63070

May 17, 2005
Lab No. 05P-1488
P.O. No. 12516
Page 2 of 7

Attention: Chuck Ruud

REPORT OF CHARPY IMPACT TEST

MATERIAL (SAMPLE ID): C-2 COIL, #Z1
SPECIFICATION: ASTM A 370-03a
SPECIMEN TYPE: "A" Vee Notch
SPECIMEN SIZE: 10 mm x 10 mm
TEMPERATURE OF TEST: 293°K

RESULTS:

BASE METAL	FOOT LBS.	LATERAL EXPANSION	% SHEAR
Z1-1	140	.106	100
Z1-2	128	.059	70
Z1-3	150	.126	100
<u>AVERAGE</u>	139	.097	90

Identification of tested specimen provided by client.



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Karl Schmitz
Karl Schmitz, Director
Materials Testing

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May 17, 2005
Lab No. 05P-1488
P.O. No. 12516
Page 3 of 7

Attention: Chuck Ruud

REPORT OF CHARPY IMPACT TEST

MATERIAL (SAMPLE ID): C-2 COIL, #Z1
SPECIFICATION: ASTM A 370-03a
SPECIMEN TYPE: "A" Vee Notch
SPECIMEN SIZE: 10 mm x 10 mm
TEMPERATURE OF TEST: 77°K

RESULTS:

BASE METAL	FOOT LBS.	LATERAL EXPANSION	% SHEAR
Z1-4	90	.045	60
Z1-5	80	.049	60
Z1-6	81	.055	60
<u>AVERAGE</u>	84	.050	60

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Pevely, MO 63070

May 17, 2005
Lab No. 05P-1488
P.O. No. 12516
Page 4 of 7

Attention: Chuck Ruud

REPORT OF CHARPY IMPACT TEST

MATERIAL (SAMPLE ID): C-2 COIL, #Z2
SPECIFICATION: ASTM A 370-03a
SPECIMEN TYPE: "A" Vee Notch
SPECIMEN SIZE: 10 mm x 10 mm
TEMPERATURE OF TEST: 293°K

RESULTS:

BASE METAL	FOOT LBS.	LATERAL EXPANSION	% SHEAR
Z2-1	140	.118	100
Z2-2	154	.090	90
Z2-3	150	.109	100
<u>AVERAGE</u>	148	.105	97

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May 17, 2005
Lab No. 05P-1488
P.O. No. 12516
Page 5 of 7

Attention: Chuck Ruud

REPORT OF CHARPY IMPACT TEST

MATERIAL (SAMPLE ID): C-2 COIL, #Z2
SPECIFICATION: ASTM A 370-03a
SPECIMEN TYPE: "A" Vee Notch
SPECIMEN SIZE: 10 mm x 10 mm
TEMPERATURE OF TEST: 77°K

RESULTS:

BASE METAL	FOOT LBS.	LATERAL EXPANSION	% SHEAR
Z2-4	88	.071	90
Z2-5	76	.037	60
Z2-6	86	.057	70
<u>AVERAGE</u>	83	.055	73

Identification of tested specimen provided by client.



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Pevely, MO 63070

May 17, 2005
Lab No. 05P-1488
P.O. No. 12516
Page 6 of 7

Attention: Chuck Ruud

REPORT OF CHARPY IMPACT TEST

MATERIAL (SAMPLE ID): C-2 COIL, #Z3
SPECIFICATION: ASTM A 370-03a
SPECIMEN TYPE: "A" Vee Notch
SPECIMEN SIZE: 10 mm x 10 mm
TEMPERATURE OF TEST: 293°K

RESULTS:

BASE METAL	FOOT LBS.	LATERAL EXPANSION	% SHEAR
Z3-1	154	.086	100
Z3-2	200	.061	100
Z3-3	142	.080	90
<u>AVERAGE</u>	165	.076	97

Identification of tested specimen provided by client.



Certificate No. 0397-01
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May 17, 2005
Lab No. 05P-1488
P.O. No. 12516
Page 7 of 7

Attention: Chuck Ruud

REPORT OF CHARPY IMPACT TEST

MATERIAL (SAMPLE ID): C-2 COIL, #Z3
SPECIFICATION: ASTM A 370-03a
SPECIMEN TYPE: "A" Vee Notch
SPECIMEN SIZE: 10 mm x 10 mm
TEMPERATURE OF TEST: 77°K


RESULTS:

BASE METAL	FOOT LBS.	LATERAL EXPANSION	% SHEAR
Z3-4	91	.052	80
Z3-5	86	.050	80
Z3-6	81	.061	80
<u>AVERAGE</u>	86	.054	80

Identification of tested specimen provided by client.

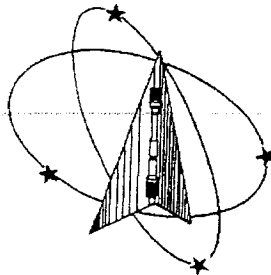


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Certificate No. 0397-02


Karl Schmitz, Director
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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

WMTR is a technical leader in the material testing industry.

April 28, 2005

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 95Max ---) 0.2% YS ksi (Min 72Max ---) 4D Elong. % (Min 32Max ---) Modulus Msi (Min 21Max ---)

SOAK TIME: 5 Minutes

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

MATERIAL: 316 S/S

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	AIUR
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

DISPOSITION: Acceptable

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

D. J. [Signature]

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[Signature]
Roy E. Starr, Manager
Technical Services Manager
4-2805
April 28, 2005

Testing Specialists for Aerospace, Automotive, and Material Testing Fields
Locations in Youngstown, PA U.S.A. ~ Tel. (724) 537-3131 and
Banbury U.K. ~ Tel. +44 (0) 1295 261211

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METALTEK INTERNATIONAL8600 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. %		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

KS/tw


Karl Schmitz, Director
Materials TestingCertificate No. 0597-01
Certificate No. 0597-02AN OFFICIAL COPY OF TEST REPORT WILL BE PROVIDED BY THIS LABORATORY ON REQUEST. DO NOT REPRODUCE.
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METALTEK INTERNATIONAL
8600 Commercial Blvd.
Pevely, MO 63070

Attention: **Chuck Ruud**

April 6, 2005
Lab No. 05P-1007
P.O. No. 12516
Page 1 of 2

REPORT OF CHARPY IMPACT TEST

MATERIAL (SAMPLE ID): 1 Ea., Material (1) LNM4455, Lot # 3012668/82743
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
LNM4455-1	52	0.027	40
LNM4455-2	50	0.022	40
LNM4455-3	50	0.016	20
Average	51	0.022	33

Identification of tested specimen provided by client.

KS/tw

Karl Schmitz
Karl Schmitz, Director
Materials Testing



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

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METALTEK INTERNATIONAL
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Pevely, MO 63070

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

Attention: Chuck Ruud


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.

KS/tw


Karl Schmitz, Director
Materials Testing



Certificate No. 0387-01
Certificate No. 0397-02

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St. Louis Testing Laboratories
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METALTEK INTERNATIONAL8600 Commercial Blvd.
Pevely, MO 63070February 28, 2005
Lab No. 05P-0554
P.O. No. 12516
Page 1 of 2
(Revised Report 3-2-05)

Attention: Rick Suria

REPORT OF CHARPY IMPACT TEST

MATERIAL (SAMPLE ID): Electrode LNM 4455 & B316NF *301 26682743*
SPECIFICATION: ASTM A 370-03a *L W01974*
SPECIMEN TYPE: "A" Vee Notch, All Weld *Chk 6/14/05*
SPECIMEN SIZE: 10 mm x 10 mm
TEMPERATURE OF TEST: +70°F
RESULTS:

ALL WELD	JOULES	FOOT LBS.	LATERAL EXPANSION	% SHEAR
LNM 4455-7	149	110	0.055	50
LNM 4455-8	130	96	0.050	50
LNM 4455-9	134	99	0.051	50
Average	138	102	0.052	50

ALL WELD	JOULES	FOOT LBS.	LATERAL EXPANSION	% SHEAR
B316NF-7	155	114	0.056	50
B316NF-8	151	111	0.053	50
B316NF-9	146	108	0.052	50
Average	151	111	0.054	50

Identification of tested specimen provided by client.

KS/clm

Karl Schmitz
Karl Schmitz, Director
Materials TestingCertificate No. 0397-01
Certificate No. 0397-02AN OFFICIAL COPY OF TEST REPORT WILL BE PROVIDED BY THIS LABORATORY ON REQUEST. DO NOT REPRODUCE.
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METALTEK INTERNATIONAL
8600 Commercial Blvd.
Pevely, MO 63070

February 28, 2005
Lab No. 05P-0554
P.O. No. 12516
Page 2 of 2
(Revised Report 3-2-05)

Attention: Rick Suria

PROCEDURE QUALIFICATION

WELDER: TERRY STANFIELD
MATERIAL: 1" CF8MnMn, Mod
SPECIFICATION: ASME IX
ELECTRODE: B316NF
PROCESS: SMAW

*This is unrelated
to report for C-2
Cfr*

REDUCED SECTION TENSILE

SAMPLE ID	WIDTH INCHES	THICKNESS INCHES	AREA SQ. INCHES	ACTUAL LBS.	TENSILE STRENGTH PSI	FRACTURE
TS-2	.750	1.000	.7500	70,000	93,300	Weld Metal
TS-5	.750	1.010	.7575	71,000	93,700	Weld Metal

GUIDED BEND TEST

SAMPLE ID	BEND	RESULTS
TS-1	Side	Acceptable, No Discontinuities
TS-3	Side	Acceptable, No Discontinuities
TS-4	Side	Acceptable, No Discontinuities
TS-6	Side	Acceptable, No Discontinuities

KS/clm

Karl Schmitz, Director
Materials Testing
CWI No. 92120161



Certificate No. 0387-01
Certificate No. 0397-02

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Carondelet Division

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

Final Inspection Report

Customer Name: ENERGY
INDUSTRIES OF
OHIO

Pattern: MCWF-C2

Order Number: PPPL-FP-LTS-2

Revised 7/26/05

ASTM Metal CF8MNMN MOD

Date 7/26/2005

Type Description	Cert Number	Procedure	Acceptance Criteria	Actual
Liquid Penetrant	S75920-1	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	S75920-1	SOP Mag Perm 100 Rev 1	<1.02	Acceptable
Radiographic	S75920-1	Technique # 12726	MSS SP 54	Acceptable
Visual	S75920-1	CQP - 500 REV 4	ASTM A802 LEVEL 2	Acceptable

Liquid Penetrant

Technician: Jason Rees
ASNT Level II

A handwritten signature in black ink, appearing to read 'CAR', is positioned above the printed name of the Quality Assurance Manager.

Respectfully Submitted,
Charles A. Ruud
Quality Assurance Manager

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