

1045

ER316 MNN

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	Telephone:	Fax:		
Nieuwe Dukenburgseweg 20	31 24 3522911	31 24 3522200		
6534 AD NIJMEGEN				





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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  
Page 1 of 3

**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.	%
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.*

KS/tlv

  
Karl Schmitz, Director  
Materials Testing



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

AN OFFICIAL COPY OF TEST REPORT WILL BE PROVIDED BY THIS LABORATORY ON REQUEST.  
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Pevely, MO 63070

August 8, 2005  
Lab No. 05P-2334  
P.O. No. 21324  
Page 2 of 3

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.

KS/tlv

  
Karl Schmitz, Director  
Materials Testing



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

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August 8, 2005  
Lab No. 05P-2334  
P.O. No. 21324  
Page 3 of 3

Attention: Chuck Ruud

**REPORT OF CHARPY IMPACT TEST**

**MATERIAL (SAMPLE ID):** STOCK# LNM 4455, LINCOLN LOT 3012668/82743  
STOCK# B316NF METRODE, W021735

**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
82743-7	100	0.082	50
82743-8	99	0.076	50
82743-9	94	0.072	50
Average	98	0.077	50
ALL WELD	FOOT LBS.	LATERAL EXPANSION	% SHEAR
W021735-7	102	0.101	50
W021735-8	88	0.073	50
W021735-9	88	0.080	50
Average	93	0.085	50

Identification of tested specimen provided by client.

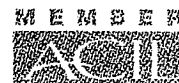
KS/tlv

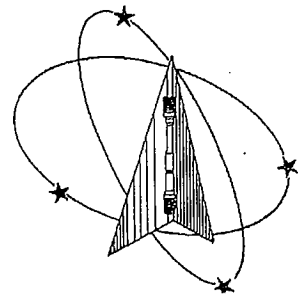
  
Karl Schmitz, Director  
Materials Testing



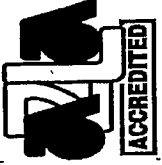
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**Westmoreland Mechanical Testing & Research, Inc.**  
P.O. Box 388  
Westmoreland Drive  
Youngstown, Pa. 15696-0388 U.S.A.  
Telephone: 724-537-3131 Fax: 724-537-3151  
Website: [www.wmtr.com](http://www.wmtr.com)  
WMTR is a technical leader in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



621-01 & 621-02

# CERTIFICATION

September 13, 2005

MetalTek International  
The Carondelet Division  
8600 Commercial Blvd.  
I-55 Industrial Park  
Pevety, 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 951Max ---) 0.2% YS ksi (Min 721Max ---) 4D Elong. % (Min 321Max ---) Modulus Msi (Min 211Max ---)

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	Test Log 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

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

DISPOSITION: Acceptable

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

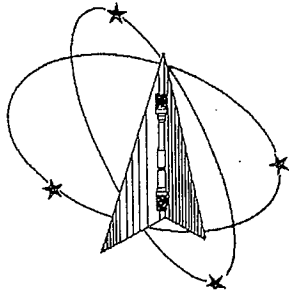
AIUR: A=ACCEPTABLE, U=UNACCEPTABLE, R=REPORT

Requirements supplied by MetalTek International.

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*Matt Wojton*  
Roy E. Starr  
Technical Services Manager  
September 13, 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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WMT&R is a technical leader in the material testing industry.

September 13, 2005

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 35Max ---)

MATERIAL: Lincoln LNM4455

SAMPLE TYPE: Charpy V-Notch

Reference	Lot No.   Batch No.   Specimen ID	Test Log Number	Sample Size	Temp. °F	Energy ft-lbs	Mils Lat Exp	DISPOSITION: Acceptable	
							% Shear Fracture	AIJR
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.

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



621-01 & 621-02



*[Signature]*  
Roy E. Start Watt Worger  
Technical Services Manager

*[Signature]*  
September 13, 2005

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9A

# PRODUCT CONFORMANCE REPORT



Product	LN M 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

### Impact testing

Cond.	Temp. °C	Rp0.2 N/mm2	Rm N/mm2	A5 %	Cond.	Temp.1 °C	Av1 J
AW	RT	407	623	41	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

Lincoln Smitweld B.V.

Registered Office

Nieuwe Dukenburgseweg 20  
6534 AD NIJMEGEN

Post address

P.O. Box 253  
6500 AG Nijmegen

Issued by

P. Nagels

Telephone

31 24 3522911

Function

QA Administrator

Fax:

31 24 3522200

Date

22/03/2005

Cert.No.

3018513/7830

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8600 Commercial Blvd.  
Pevely, MO 63070

August 16, 2005  
Lab No. 05P-2532  
P.O. No. 21324  
Page 1 of 2

**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
<b>Average</b>	103	0.087	100

*Identification of tested specimen provided by client.*

KS/tlv

  
Karl Schmitz, Director  
Materials Testing



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

AN OFFICIAL COPY OF TEST REPORT WILL BE PROVIDED BY THIS LABORATORY ON REQUEST.  
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Pevely, MO 63070

August 16, 2005  
Lab No. 05P-2532  
P.O. No. 21324  
Page 2 of 2

**Attention: CHUCK RUUD**

**REPORT OF MECHANICAL TESTS**

**SAMPLE ID:** LNM 4455, LINCOLN LOT 3018513/78308

Sample ID	Original Area	Reduced Area	Reduction in Area %	Yield Strength PSI	Tensile Strength PSI	Elongation (2.0" Gage Length)		Modules of Elasticity
	Sq. Inches	Sq. Inches				in.	%	
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.*

KS/tlv

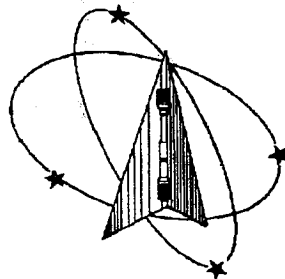
*Karl Schmitz*  
Karl Schmitz, Director  
Materials Testing



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

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WMT&R is a technical leader in the material testing industry.

October 18, 2005

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

## CERTIFICATION

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

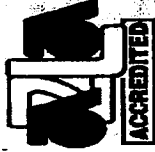
SPEED OF TESTING: 0.0030 in./in./min., 0.0500 in./in./in.

MATERIAL: METALTEK CF8MNMNMOD

Specimen ID	Test Log 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	AUUR
301851378308	C54936	-320	184.9	123.7	33	33	32.8	18470	12350	0.3566	0.2926	1.40	1.86	0.09987403	M9	R

AUUR: A=ACCEPTABLE; U=UNACCEPTABLE; R=REPORT

DISPOSITION: Report



621-01 & 621-02

Section 1 of 1

WMT&R Report No. 5-35979

Requisition No. 4972

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Baltimore, U.S.A. ~ Tel +44 (0) 1295 261211

Roy E. Starnik Wojton  
Technical Services Manager

Tensile Supervisor

October 18, 2005

10-18-05

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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
<b>Average</b>	54	0.037	50

*Identification of tested specimen provided by client.*

KS/tlv

  
Karl Schmitz, Director  
Materials Testing



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

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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	Rp0.2% (MPa)	Rm (MPa)	A4 (%)	Z (%)	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 Kyle - Q.A. Manager

ASME SFA-5.01: Lot classification: C4

Notes:  
1. Notwithstanding to the extent of compliance otherwise specified.  
2. WNB (CS) and incidental, unless otherwise specified.  
3. Fatigue is given as PR (Fatigue number) and measured on all-weld pad using instrument calibrated against NBS-related secondary standards (See AWS A4.2-97) unless otherwise specified.

10 B



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**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. %		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 Testing



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

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February 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 &amp; B316NF

**SPECIFICATION:**

ASTM A 370-03a

**SPECIMEN TYPE:**

"A" Vee Notch, All Weld

**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 Testing



Certificate No. 0557-01  
Certificate No. 0557-02

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10B



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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

**REDUCED SECTION TENSILE**

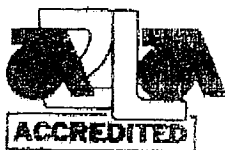
SAMPLE ID	WIDTH INCHES	THICKNESS INCHES	AREA SQ. INCHES	ACTUAL LBS.	TENSILE STRENGTH PSI	FRACTURE
TS-2	.750	1.000	.7500	70,000	93,300	Weld Metal
TS-5	.750	1.010	.7575	71,000	93,700	Weld Metal

**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

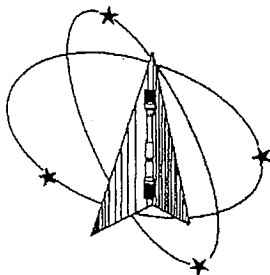
Karl Schmitz, Director  
Materials Testing  
CWI No. 92120161



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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

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## CERTIFICATION

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	AUIR
Bat#1 (Lot#3012688/82743)	B75123	-320	187.7	126.3	33	22	27.1	37740	25394	0.5060	0.4471	2.00	2.65	0.20109020	M9	A
Bat#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

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

*D. J. [Signature]*

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Testing Specialists for Aerospace, Automotive, and Material Testing Fields

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





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

Attention: Chuck Ruud

**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



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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*  
Karl Schmitz, Director  
Materials Testing



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