

# Westmoreland Mechanical Testing & Research, Inc.

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WMTR 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  
Pavey, MO 63070-1528

Attention: Rick Suria

Subject: All processes, performed upon the material as received, were conducted at WMTR, Inc. in accordance with the WMTR 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 CF8HMNM0D

Sample	Test Log Number	Temp. °F	UTS ksi	0.2% YS ksi	Elong %	RA %	Modulus ksi	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	DISPOSITION: Report
A1 (Z1)	C03040	-320	165.1	95.5	51	37	25.9	---	33210	19210	0.5060	0.4002	2.00	3.02	0.20109020	M9	R
A1 (Z2)	C03041	-320	165.1	94.6	59	51	25.4	---	33120	18980	0.5054	0.3543	2.00	3.18	0.20061359	M9	R
A1 (Z3)	C03042	-320	169.7	101.9	58	57	25.2	---	33840	20420	0.5054	0.3005	2.00	3.16	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	0.5058	0.3163	2.00	3.21	0.20077240	M9	R

D - Failed outside middle half of gage length.

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



Section 1 of 1

WMTR Report No. 5-29323

Req. No. 5394

*Matthew J. Weston*  
Roy E. Starnat  
Technical Services Manager / Tensile Supervisor  
6-17-05  
June 17, 2005

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

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**METALTEK INTERNATIONAL**  
8600 Commercial Blvd.  
Pevely, MO 63070

June 14, 2005  
Lab No. 05P-1741  
P.O. No. 12516  
Page 1 of 3

**Attention: Chuck Ruud**


**REPORT OF CHARPY IMPACT TEST**

**MATERIAL (SAMPLE ID):** Alloy CF8 MNMn-Mod, A-1 COIL  
**SPECIFICATION:** ASTM A 370-03a  
**SPECIMEN TYPE:** "A" Vee Notch  
**SPECIMEN SIZE:** 10 mm x 10 mm  
**TEMPERATURE OF TEST:** 293°K / 68° F

**RESULTS:**

BASE METAL	FOOT LBS.	LATERAL EXPANSION	% SHEAR
Z1-7	152	0.125	100
Z1-8	152	0.086	100
Z1-9	182	0.089	100
<b>Average</b>	162	0.100	100
BASE METAL	FOOT LBS.	LATERAL EXPANSION	% SHEAR
Z2-7	152	0.131	100
Z2-8	164	0.084	100
Z2-9	170	0.105	100
<b>Average</b>	162	0.107	100
BASE METAL	FOOT LBS.	LATERAL EXPANSION	% SHEAR
Z3-7	196	0.117	100
Z3-8	164	0.104	100
Z3-9	142	0.088	100
<b>Average</b>	167	0.103	100

*Identification of tested specimen provided by client.*

  
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. DO NOT REPRODUCE.  
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**Attention: Chuck Ruud**

**REPORT OF CHARPY IMPACT TEST**

**MATERIAL (SAMPLE ID):** Alloy CF8 MNMn-Mod, A-1 COIL  
**SPECIFICATION:** ASTM A 370-03a  
**SPECIMEN TYPE:** "A" Vee Notch  
**SPECIMEN SIZE:** 10 mm x 10 mm  
**TEMPERATURE OF TEST:** 77°K / -320°F

**RESULTS:**

BASE METAL	FOOT LBS.	LATERAL EXPANSION	% SHEAR
Z1-7	82	0.040	60
Z1-8	73	0.053	60
Z1-9	78	0.045	60
<b>Average</b>	78	0.046	60
BASE METAL	FOOT LBS.	LATERAL EXPANSION	% SHEAR
Z2-7	94	0.061	70
Z2-8	90	0.053	70
Z2-9	76	0.057	70
<b>Average</b>	87	0.057	70
BASE METAL	FOOT LBS.	LATERAL EXPANSION	% SHEAR
Z3-7	59	0.028	30
Z3-8	83	0.059	40
Z3-9	72	0.043	40
<b>Average</b>	71	0.043	37

*Identification of tested specimen provided by client.*

*Karl Schmitz*, Director  
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 Page 3 of 3

**Attention: CHUCK RUUD**

**REPORT OF MECHANICAL TESTS**

**SAMPLE ID:** 3 EA., A-1 COIL, Z1, Z2, Z3

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.	%
Z1	0.1886	.0716	62.0	21.8 Msi	37600	85700	1.06	53.0
Z2	0.1886	0.0707	62.5	21.5 Msi	35500	79300	1.11	55.5
Z3	0.1940	0.0855	55.9	21.7 Msi	36800	82100	1.02	51.0


Round, reduced section room temperature tensiles

Yield taken at .2% offset

Tested in accordance with ASTM A 370

*Identification of tested specimens provided by the client.*

KS/tlv

  
 Karl Schmitz, Director  
 Materials Testing



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