



8260 Parkhill Drive, Milton, Ontario L9T 5V7  
1-800-844-6790 | ht 905-542-1312 | Fax: 905-542-1318  
E-mail: info@cwbggroup.org | Web: www.cwbggroup.org



Registrar  
*[Signature]*

Scope: Custom and structural fabrication.

Company Code: HAIPRI

for the period September 29, 2011 to October 29, 2012

in DIVISION 2

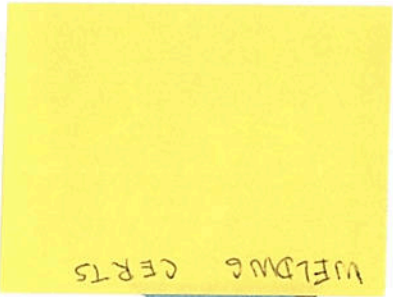
"Certification of Companies for Fusion Welding of Steel"

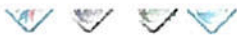
is certified to CSA Standard W47.1

160 Stanley Street , Trenton, ON K8V 4W1

HAI Precision Waterjets Inc.

The CWB acknowledges that





8260 Parkhill Drive, Milton, Ontario L9T 5V7  
1-800-844-6790 | Int 905-542-1312 | Fax: 905-542-1318  
Email: info@cwbggroup.org | Web: www.cwbggroup.org



Registrar  
*[Handwritten signature]*

Scope: Custom aluminum fabrication and mechanical

Company Code: HAIPR2

for the period September 29, 2011 to October 29, 2012

in DIVISION 2

"Certification of Companies for Fusion Welding of Aluminum"

is certified to CSA Standard W47.2

160 Stanley Street, Trenton, ON K8V 4W1

HAI Precision Waterjets Inc.

The CWB acknowledges that





8260 Parkhill Drive, Milton, Ontario L9T 5V7  
1-800-844-6790 | Tel: 905-542-1312 | Fax: 905-542-1318  
Email: info@cwbgroup.org | Web: www.cwbgroup.org



The product certification system operated by the Canadian Welding Bureau most closely resembles that described by ISO/IEC Guide 67, Conformity assessment — Fundamentals of product certification, System 5.



Registrar

Scope: Custom and structural fabrication.

Company Code: HAIR1

for the period September 30, 2012 to October 29, 2013

in DIVISION 2

"Certification of Companies for Fusion Welding of Steel"

is certified to CSA Standard W47.1

160 Stanley Street, Trenton, ON K8V 4W1 Canada

HAI Precision Waterjets Inc.

The CWB acknowledges that

LETTER OF VALIDATION






8250 Parkhill Drive, Milton, Ontario L9T 5V7  
1-800-844-6790 | Tel: 905-512-1312 | Fax: 905-642-1318  
Email: info@cwbgroup.org | Web: www.cwbgroup.org



The product certification system operated by the Canadian Welding Bureau most closely resembles that described by ISO/IEC Guide 67, Conformity assessment — Fundamentals of product certification, System 5.



Registrar  


Scope: Custom aluminum fabrication and mechanical

Company Code: HAIPR2

for the period September 30, 2012 to October 29, 2013

in DIVISION 2

"Certification of Companies for Fusion Welding of Aluminum"

is certified to CSA Standard W47.2

160 Stanley Street, Trenton, ON K8V 4W1 Canada

HAI Precision Waterjets Inc.

The CWB acknowledges that

LETTER OF VALIDATION





**BARBER HYMAC HYDRO INC.**  
**FINAL INSPECTION**

DATE JAN. 15/13

PAGE 1 OF 1

REV D

J.H.H.T WORK NO. A1192

DWG NO. N/A

CUSTOMER REF NO. UNIVERSITY OF ALBERTA

ITEM DESCRIPTION MAIN VESSEL ASSY

DIMENSIONAL CHECKS		REQUIRED	ACTUAL	TOLERANCE	ACCEPT	REJECT
	1700.3		1700.4			
	14.35/14.22		14.275			
	9.65/9.40		9.487			
	1828.8		1828.8			
	63.5		63.5			
	63.5		63.70			
	14.35/14.22		14.25			
	9.65/9.40		9.6			
	1828.8		1828.55			
	1171.4		1171.4			
	1700.3		1700.28			

VISUAL

SURFACE FINISH

ACCEPTABLE

YES

NO

VISIBLE

YES

NO

IDENTIFICATION MARKINGS

REQUIRED

YES

NO

CORRECT

YES

NO

QUANTITY

REQUIRED

IN BATCH

B.H.H.T FINAL RELEASE

INITIATE NCMR

NCMR NO.

REASON FOR REJECTION

CUSTOMER MANDATORY HOLD POINT

YES

NO

NO

CUSTOMER SIGNATURE

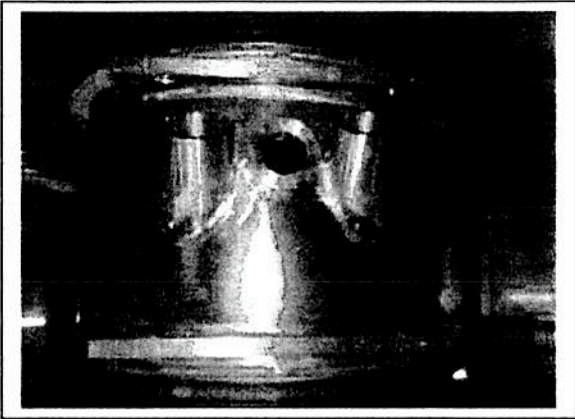
FINAL ACCEPTANCE

MACHINED BY FRED K. & GUY R.

DATE JAN. 15/2013

B.H.H.T INSPECTOR BILL CORNIES

DATE JAN. 16/2013


<p><b>Liquid Penetrant Inspection Report</b></p> <p>Date: 4 Jan 2013 Page: 1 of</p>		<p><b>Item inspected:</b> Cherenkov Vessel Assembly</p> <p><b>Material Type:</b> 6061-T6 Aluminum</p>		<p><b>Client:</b> HAI Precision Waterjet</p> <p><b>Job Number:</b> FGG011301B</p>		<p><b>Address:</b> 160 Stanley St. Trenton ON</p> <p><b>Client PO Number:</b> 6244-7</p>		<p><b>Client Representative:</b> Will Rinisma</p> <p><b>Code:</b> CSA W59.2-03-12</p>		<p><b>Surface Condition:</b> Mill</p>		<p><b>LIQUID PENETRANT INSPECTION INFORMATION</b></p>		<p><b>Equipment:</b></p> <ul style="list-style-type: none"> <li>&gt; Magnaflux-SKC-S Cleaner</li> <li>&gt; Magnaflux-SKL-WP2 Penetrant</li> <li>&gt; Magnaflux-SKD-S2 Developer</li> </ul> <p><b>Products:</b></p>		<p><b>Inspection Results:</b></p> <p>Visible Liquid penetrant inspection carried out on 100% of welds on Cherenkov Vessel, all welds acceptable at completion of inspection.</p>				<p><b>Technician Name:</b> Doug Wray</p> <p><b>Certification:</b> CGSB Level 2 PT Ser # 10171</p>		<p><b>Signature:</b></p>		<p><b>Assistant:</b></p>		<p><b>Welding Inspection Supervisor</b></p>		<p><b>(WIS) Approval:</b></p>	
		<p><b>FGG INSPECTIONS PARTNERSHIP</b></p> <p>15 LaJunesse Local 700 Kingsey Falls, Qc J0A 1B0 Tel: (819) 363-9344 Fax: (819) 363-2272 www.fgginsp.com</p>																											

CANADIAN WELDING BUREAU

The certification of the person named on this card includes  
endorsements for the code(s) and standard(s) identified  
below. Code and Standard examinations must be rewritten  
every six (6) years from the date shown beside each code.  
CSA W47.1: Certification of Companies for Fusion Welding of  
Steel/CSA W59: Welded Steel Construction..... 08/07

This card is the property of the Canadian Welding Bureau and can be recalled at any  
time. Fraudulent use may involve permanent cancellation.

CONDITIONS: Possession of this card does not imply that the holder represents an  
organization certified to CSA Standard W178.1, having personnel and procedures  
approved by the Canadian Welding Bureau.

REG. NO.	EXPIRY (MM/DD/YY)	AUTHORIZED SIGNATURE
3762	11/21/2013	

W178.2 LEVEL 3 CERTIFIED WELDING INSPECTOR

The Inspector named herein has complied with the requirements  
of CSA Standard W178.2 "Certification of Welding Inspectors".

DOUGLAS A. WRAY

CANADIAN WELDING BUREAU





DATE

2/1/13

SIGNATURE

*[Handwritten Signature]*

- PLATES - 6061-T6
- PLATES - 5083-H116
- PLATES CSA G40.21 300W
- FORGINGS - 6061-T6
- FORGINGS AISI 1022
- ORINGS - VITON
- BOLTS - 316L SST
- NUTS - SILICON BRONZE
- SHEETS 2024-T3 (FREE ISSUED TO HAI)

**MATERIALS SUPPLIED**

DATE

-2/1/13

PURCHASE ORDER

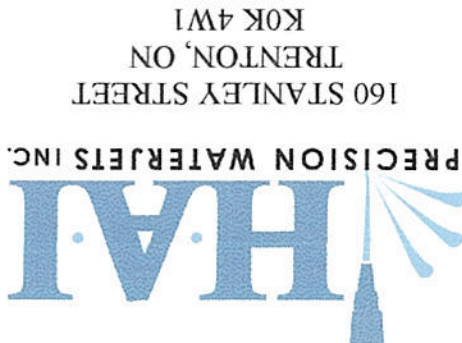
-P0054070

CUSTOMER

-UNIVERSITY OF REGINA

HAI Precision hereby certifies that the material supplied under the noted Purchase Order / Customer conforms to the specifications detailed as follows:

**CERTIFICATE OF COMPLIANCE**



HAI + STEEL COMPLIANCE REPORTS



Ship From: THYSSENKRUPP MATERIALS NA  
 2821 LANGSTAFF ROAD  
 CONCORD, ONTARIO L4K 5G6  
 Tel: 905 669 9444 Fax: 9057389033

Ship To: ( )  
 HAI PRECISION WATERJETS INC.  
 160 STANLEY STREET  
 TRENTON, ONT. K8V 4W1  
 Tel: 613-394-4589 Fax: 16133944295

Ship Date 10oct12 at 8:27 From PFW  
 No: PEG 789425

Probill T157818 16426915  
 Via MANITOULIN TRA  
 FOB CONCORD  
 Route 0 - 0 Manifest  
 Trailer

Slp WAYNE FLYNN (905-532-1382)  
 Sold To: ( 9042)  
 HAI PRECISION WATERJETS INC.  
 160 STANLEY STREET  
 TRENTON, ONT. K8V 4W1

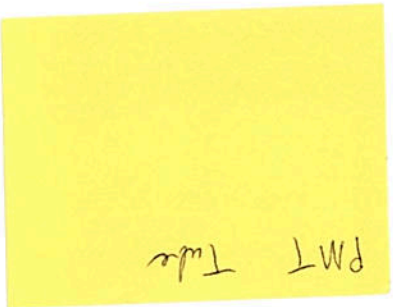
500 LBS OR MORE SHIP VIA DAVE'S DELIVERY  
 WEDNESDAY  
 or Standard common carrier deliveries please use  
 Meyers Transport"  
 TOTAL 1 SKID G.W 565 LBS

\*CUSTOMER PICK-UP HRS AT THYSSENKRUPP MATERIALS NA  
 CONCORD, ONT. \* \*\*\* 9:00 AM TO 4:00 PM \*\*\*  
 \*\*\* TEL. 800-926-2600 \*\*\*  
 \* WE STOCK STAINLESS STEEL  
 \* PLEASE LET US QUOTE YOUR NEXT REQUIREMENT  
 \*\*\*\*\*  
 \*\*\*PLEASE NOTE A \$25.00 ENERGY SURCHARGE WILL BE  
 ADDED TO EVERY ORDER.\*\*\*

TOUTES ERREURS ET/OU MARCHANDISES MANQUANTES DOIVENT ETRE  
 RAPORTEES IMMEDIATEMENT  
 ERRORS OR SHORTAGE MUST BE REPORTED IMMEDIATELY  
 POUR DE MARCHANDISES AVEC NOTRE NUMERO D'APPROBATION SEULEMENT.  
 MERCHANDISE MAY NOT BE RETURNED WITHOUT OUR APPROVAL NUMBER.

REÇU EN BONNE CONDITIONS / RECEIVED IN GOOD CONDITION  
 TR/0017 101202001 10001 TR/0017 10001 10001 10001

DATE



# THYSSENKRUPP MATERIALS NA

PART NO.

We certify that this is a true copy of the report furnished by the producer of the metal, or data resulting from tests made in approved labs.

Signed by: \_\_\_\_\_  
Title: \_\_\_\_\_

## Certificate of Mill Test Results

IV PEC-626033-001

Pg 1/2

# Sapa

Sapa Industrial Equations  
53 POTTSVILLE STREET  
CRISSCONA, PA  
17928-0187

Sapa Extrusions Inc., a Subsidiary of Sapa AB

Invoice To Customer

THYSSENKRUPP MATERIALS NA INC  
2821 LANGSTAFF ROAD  
ATTN: ACCOUNT PAYABLE

CONCORD, ON L4K 5G6

Sale To Customer

THYSSENKRUPP MATERIALS NA INC  
2821 LANGSTAFF ROAD

CONCORD, ON L4K5G6

### Certified Inspection Report

Sales Order Number: 1100507212  
Line No: 1  
Customer P/N: PEC-241543-001

Cert Number: SAP626760  
Cert Creation Date: 30-AUG-12  
Page: 1 of 2  
Cert Print Date: 30-AUG-12

Quantity Shipped	Unit	Date Shipped	Item Description	Spec/Revision
1388	LB	30-AUG-12	Extruded Regular Rod 9 000 F1A 1 1/4 IN LN FEN SEMILL. W/F 24.814 F 01 CS 9 6061/T6 Marking CONTRADUCTIONS	ASTM B221 REV 12 AMS-QQ-A-280W R1V ASME B221 REV 09 UNSWA95061 REV
			Item No.	
			Delivery Id	
			Customer P/N	

Applicable specifications, tolerances and descriptions  
Strengths will be 0.030 inch/oz maximum  
COMPOSITION NOTE: The values for 'Oxygen Each' and 'Oxygen Total' have met the limits as shown on this certified inspection report. Remainder is Aluminum.

Signature and Title

*William Martin III*  
William Martin III  
Tech/Quality Manager

30-AUG-12

#### Quantity per Lot / Package

Package Number	Lot Number	Quantity	UOM	Weight
G12-PKG1725504	21135827	2	PCS	1800
G12-PKG1725515	21135827	2	PCS	1800

#### Composition Limits

Alloy	Si		Fe		Cu		Mn		Mg		Cr		Zn
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Alur
6061	0.40	0.80	0.70	0.15	0.40	0.15	0.80	1.30	0.01	0.35	...	...	0.25

#### Original Statement

We hereby certify that, unless otherwise indicated, the material covered by this report has been unmanufactured, inspected, and tested in accordance with, and has been found to meet, the applicable requirements described herein, including any specifications forming a part of the description and that samples representative of the material met the composition and had the mechanical properties shown on the face of this certification. Also, note that mercury is not a normal contaminant in aluminum alloy and neither it nor any of its compounds are used in the manufacture of our product. This certification is not to be reproduced in partial form without prior written approval of our Quality Assurance Dept.



# THYSSENKRUPP MATERIALS NA

PART NO.

PO/RCl  
We certify that this is a true copy of the report furnished by the producer of the metal, or data resulting from tests made in approved labs.

Signed by: \_\_\_\_\_  
Title: \_\_\_\_\_  
IV PBC-626033-001

## Certificate of Mill Test Results



Sapa Industrial Extrusions  
33 POTTSVILLE STREET  
CHRISTONNA, PA  
17929-0187

### Certified Inspection Report

Order Number: 1100907212  
Line No. 1  
Customer PO: PBC-241543-001

Cert Number: SAPA626760  
Page: 2 of 2  
Cert Creation Date: 30-AUG-12  
Cert Print Date: 30-AUG-12

Alloy	Ti		Si		Pb		Others Each		Others Total	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
6061	0.15	0.15	0.05	0.05	0.05	0.05	0.05	0.05	0.15	0.15

#### Composition Results

Heat / Cast	Si	Fe	Cu	Mn	Mg	Cr	Zn	Ti	Bi	Pb	Others Each	Others Total
4028351	0.73	0.33	0.36	0.12	0.91	0.14	0.04	0.02			Others Each	Others Total
Heat / Cast	Si	Pb	Cu <td>Mn</td> <td>Mg</td> <td>Cr <td>Zn</td> <td>Ti</td> <td>Bi</td> <td>Pb</td> <td>Others Each</td> <td>Others Total</td> </td>	Mn	Mg	Cr <td>Zn</td> <td>Ti</td> <td>Bi</td> <td>Pb</td> <td>Others Each</td> <td>Others Total</td>	Zn	Ti	Bi	Pb	Others Each	Others Total
4028354	0.69	0.40	0.30	0.14	0.87	0.15	0.06	0.02			Others Each	Others Total
Heat / Cast	Si	Fe <td>Cu <td>Mn</td> <td>Mg</td> <td>Cr <td>Zn</td> <td>Ti</td> <td>Bi</td> <td>Pb</td> <td>Others Each</td> <td>Others Total</td> </td></td>	Cu <td>Mn</td> <td>Mg</td> <td>Cr <td>Zn</td> <td>Ti</td> <td>Bi</td> <td>Pb</td> <td>Others Each</td> <td>Others Total</td> </td>	Mn	Mg	Cr <td>Zn</td> <td>Ti</td> <td>Bi</td> <td>Pb</td> <td>Others Each</td> <td>Others Total</td>	Zn	Ti	Bi	Pb	Others Each	Others Total
4028367	0.74	0.41	0.34	0.13	0.88	0.14	0.06	0.02			Others Each	Others Total

#### Mechanical Properties - Test Limits

Test Type	UTS - T		TYS - T		Yl. Elong	
	MIN	MAX	MIN	MAX	MIN	MAX
UDX	51	51	48	48	11.3	11.3
Test Temp	213.587	213.587	213.587	213.587	213.587	213.587
Lot Number	1	1	1	1	1	1
# of Tests	8 of 719	8 of 719	8 of 719	8 of 719	8 of 719	8 of 719

#### Cert Note

Products manufactured with a T6511 temper also meet T6 temper requirements.  
Yield strength has been determined by the 0.2% offset method.  
All Mill Finish Alloys produced at Sapa Extrusions comply with 0.4% Maximum Lead per RoHS, with the exception of 5082 alloy.  
In accordance with EN 10204 Inspection Certificate Type A1  
Produced in the USA or Other Qualified Countries as Defined by DPAHS 225.872.1  
Made in USA



SAMUEL SPECIALTY METALS ONTARIO  
 DIV OF SAMUEL, SON & CO., LTD.  
 2360 DIXIE ROAD  
 MISSISSAUGA, ON L4Y 1Z7  
 (905) 279-5460 FAX (905) 279-9658

NO. 002461528



PAGE 1 OF 1

CARRIER NAME  
 K TAM

TRUCK 262

SALES BRANCH NAME  
 SAMUEL SPECIALTY METALS ONT.

DATE OF SHIPMENT  
 9/19/12

**SOLD TO**

HAI PRECISION WATERJETS INC.  
 160 STANLEY STREET

**SHIP TO**

HAI PRECISION WATERJETS INC.  
 160 STANLEY STREET  
 TRENTON ON  
 K8V4W1 (101407-00001)

WORK ORDER NO.

ITEM NO. 034532-01

Cust order#: 6244-2

171 LBS ALUM PLATE 6061-T6

2"x19"x45"

Part#: ALPPL2X19X45

Description

Pcs

Sq ft

Qty

Skid#

Tag#

Vendor Org

Mill tag#

Lift#

5.938

171

653105

7713051

017

US

Total: 1605841

1

5.938

171

D133242

602467A3

Total weight:  
 Total #bundles:

1

171 LBS

Quality  
 Widen  
 Holes

CHARGES  PERMANENTLY BY

PREPAID

COLLECT

DRIVER INSTRUCTIONS

AGENT/DISPATCHER

DRIVER

RECEIVED BY

VALUATION (Max \$ 2,000 unless otherwise stated)  
 DECLARED VALUE  
 OF SHIPMENT \$

2. DRIVER (This bill of lading is to be signed by shipper and driver)



SAMUEL SPECIALTY METALS ONTARIO  
 DIV OF SAMUEL, SON & CO., LTD.  
 2360 DIXIE ROAD  
 MISSISSAUGA, ON L4Y 1Z7  
 (905)279-5460 FAX (905)279-9658



## MTR Retrieval System

HAI PRECISION WATERJETS INC.

Your Purchase Order #: 6244-2

Our Work Order #: 034532

Bill of Lading #: 002461528

Print Date: 9/18/2012

The following table relates work-order line-items to heat numbers, grade and size used on the above Purchase Order/Work Order.

WO Line#	Grade	Size	Mill Name	Heat Number/s
1	T651 BR	2" X 19" X 45"	KAISER ALUMINUM, TRN	602467A3

**KAISER ALUMINUM**  
 Trentwood Works - Spokane, WA 99215  
 Phone: (800) 367-2586

**CERTIFIED TEST REPORT**

Serial Number  
 4270523

D094106

SHIP TO:  
 SAMUEL MISSISSAUGA  
 2360 DIXIE ROAD  
 MISSISSAUGA, ON, CA L4Y1Z7

SOLD TO:  
 SAMUEL MISSISSAUGA  
 2360 DIXIE ROAD  
 MISSISSAUGA, ON, CA L4Y1Z7

CUSTOMER PO NUMBER: A23555		WORK PACKAGE:		CUSTOMER PART NUMBER:		SHIP RUN/LOAD: 102374/11		GOVT CONTRACT NUMBER:	
KAISER ORDER NO: 1134651		LINE ITEM: 10		SHIP DATE: 24-JUL-2012		ALLOY: 6061		CLAD: BARE	
TEMPER: T651		PRODUCT DESCRIPTION: Kaiser Select® Precision Plate		TRUCK B/L #: 2038077		GAUGE: 2,000 IN		DIAMETER/MDTH: 48,500 IN	
WEIGHT SHIPPED: 4208 LB		QUANTITY: 3 PCS EST.		TRUCK B/L #: 2038077		GAUGE: 2,000 IN		DIAMETER/MDTH: 48,500 IN	
								LENGTH: 144,500 IN	
								(3670.3 MM)	

MHU 1605841: LOT 602467A3: 3 pieces:

**Certified Specifications**

AMS 4027/RevN EN 10204-3.1/Rev2004  
 ASME SB 209/Rev2004  
 ASTM B 209/Rev10

Test Code: 1511

**Test Results**

Lot: 602467A3 Cast 872 Drop 27 Ingot 2  
 Melted in USA

(ASTM E8/B557)

(EN 2002-1)

Tensile: T651

Dir / # Tests  
 LT / 2 (Min:Max)

Ultimate KSI (MPA) 49.2 : 50.1 (339 : 345)  
 Yield KSI (MPA) 44.3 : 44.5 (305 : 307)

Elongation %  
 14.3 : 15.2

(ASTM E1251)

Chemistry: Actual(wt%)

SI	0.69	FE	0.6	CU	0.31	MN	0.12	MG	1.0	CR	0.19	ZN	0.19	TI	0.02	V	0.01	ZR	0.00	OTHER	0.04
----	------	----	-----	----	------	----	------	----	-----	----	------	----	------	----	------	---	------	----	------	-------	------

**ALLOY LIMITS**

6061	SI	0.40	FE	0.0	CU	0.15	MN	0.00	MG	0.8	CR	0.04	ZN	0.00	TI	0.05	V	0.00	ZR	0.00	OTHER	0.05
------	----	------	----	-----	----	------	----	------	----	-----	----	------	----	------	----	------	---	------	----	------	-------	------

MIN(wt%)

MAX(wt%)

**Aluminum Remainder**

0.8	0.7	0.40	0.15	0.15	0.15	1.2	0.35	0.25	0.15	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
-----	-----	------	------	------	------	-----	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------

**KAISER**  
**ALUMINUM**

Trentwood Works - Spokane, WA 99215  
Phone: (800) 367-2586

**CERTIFIED TEST REPORT**

Serial Number  
4270523

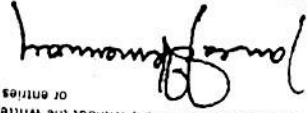
**TEST NOTES**

6061 sheet or plate certified to AMS 4025, AMS 4026, or AMS 4027 also meets applicable requirements of AMS-QQ-A-250/11 Rev. A.

DS94106

**CERTIFICATION**

Kaiser Aluminum Fabricated Products, LLC (Kaiser) hereby certifies that metal shipped under this order was melted in the United States of America or a qualifying country per DPAAS 225.872-1(a), was manufactured in the United States of America, and meets the requirements of DPAAS 252.225 for domestic content. This material has been inspected, tested and found in conformance with the requirements of the applicable specifications as indicated herein. For material which is solution heat treated outside specification limits, mechanical properties are as shown herein and chemical composition meets specifications of the applicable specifications as indicated herein. All metal which is solution heat treated complies with AMS 2772. Any warranty is limited to that shown on Kaiser's standard general terms and conditions of sale. Test reports are on file, subject to examination. Test reports shall not be reproduced except in full, without the written approval of Kaiser Aluminum Fabricated Products, LLC Laboratory. The recording of false, fictitious or fraudulent statements or entries on the certificate may be punished as a felony under federal law, ISO-9001:2000 certified.

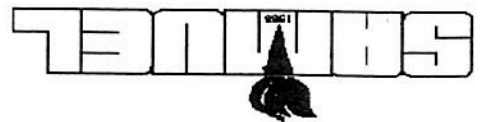


**JAMES HEMENWAY, LABORATORIES SUPERVISOR**





SAMUEL SPECIALTY METALS ONTARIO  
 DIV OF SAMUEL, SON & CO., LTD.  
 2360 DIXIE ROAD  
 MISSISSAUGA, ON L4Y 1Z7  
 (905)279-5460 FAX (905)279-9658



## MTR Retrieval System

HAI PRECISION WATERJETS INC. Your Purchase Order #: **VERBAL**

Our Work Order #: **035209**

Bill of Lading #: **002485032**

Print Date: **10/10/2012**

The following table relates work-order line-items to heat numbers, grade and size used on the above Purchase Order/Work Order.

WO Line#	Grade	Size	Mill Name	Heat Numbers
----------	-------	------	-----------	--------------

1	H116 MF	.5000" X60" X240"	UNKNOWN	527462
---	---------	-------------------	---------	--------

**CERTIFIED INSPECTION REPORT**

**Alcoa Inc.**

**DAVENPORT WORKS 4879 State Street Bettendorf, IA 52722**

Ship From: **RIVERDALE, IA.**

The Purchaser certifies that the material covered by this certificate has been inspected with, and has been found to meet the specified requirements, including any specifications forming a part of the description and that samples representative of the material meet the composition limits and that the mechanical properties shown on the face of this sheet. This test report shall not be reproduced except in full, without the written approval of the Quality Department. No alteration, addition or other change is authorized to be made to this certificate. The recording of false, fictitious, or otherwise fraudulent statements or entries on this certificate by any respondent may be punished as a felony under applicable law.

*Rob Woodard*

Rob Woodard  
Director of Manufacturing Development Works

*Terence Thom*  
Quality Assurance Manager

Page 1 of 2

1408162 Ship Date 0 P.I. No. Invoice No. Alcoa No. Item  
2012-07-23 7210233 00000 1000391464-3 DP-21464-3  
P.O. No./Govt Contract No. Customer Alcoa Item  
2265-V Lnh: 03 CHARLESTON ALUMINUM G041116671R02

Ship To: **CHARLESTON ALUMINUM  
480 FRONTAGE RD  
GASTON 29053 SC**

Item Description  
0.5 IN TK (.027 -.016) X 60.0 IN W (.3125 -  
0.000) X 240.0 IN LN (+.5 -0.0) (N) A/T 5083-  
H116 SHIPYARD PLATE MIL. FINISH, SAMPD.  
ABS-ALUM REV 2010 NT 10 ASTM666 REV 08  
ASTM928 REV 09 (MARKED) NOT INTERPRETABLE  
MAX GROSS SKID WGT: 4500 LB QUAN TOL +/-20  
\* COR 0228091 REV 02 CUST RFD 12-07-  
23 \*\*\* W/E 12-07-28 \*\*\*

Num	Package	Ticket	Lot	Weight	Quantity	UOM	Inspector	Clock	Numbers
1	428736		527462	3594	5	PC	47360		
2	428743		527462	3614	5	PC	47360		
3	430046		527461	3583	5	PC	47285		
4	430089		527461	3587	5	PC	47285		
				14376	20				

COR: 0228091.2 Specification Limits

Temp Dir UTS TYS ELAD  
H116 Longitudinal Max KSI KSI PCT  
Min 44.0 31.0 12

H116 Refoliation Corrosion ASTM NMR B928

**PRELIMINARY  
CERTIFICATION**

**CERTIFIED INSPECTION REPORT**

**Alcoa Inc.**

**DAVENPORT WORKS 4879 State Street Beltendorf, IA 52722**

Ship From: RIVERDALE, IA.

1408162 Ship Date 2012-07-23 R.L.No. 7210233 Invoice No. 00000 Alcoa No. Item 1000391464-3 DP-91464-3  
 P.O.No./Govt Contract No. 2265-V Lnh: 03 Customer Alcoa Item CHARLESTON ALUMINU 6041116671R02

We hereby certify that the material covered by this certificate has been inspected with and has been found to meet the applicable requirements described therein, including any specifications forming a part of the description and that samples representative of the material and the composition tests and that the mechanical properties shown on the face of this sheet. This test report shall not be reproduced except by us, without the written approval of the Quality Department. No alteration, addition or other change shall be made in this certificate. The recording of false, fictitious, or otherwise fraudulent statements or entries on this certificate by any recipient may be punished as a felony under applicable law.

*Bob L. Woodall*  
 Bob Woodall  
 Director of Manufacturing Davenport Works

*Terrence Thom*  
 Terrence Thom  
 Quality Assurance Manager

QCR: 0228091.2 -Specification Limits (cont.) ----- Other Other  
 Chemical Composition SI PY CU MN MG CR ZN TI Each Total Aluminum  
 Alloy 5083 Max 0.40 0.40 0.10 1.0 4.9 0.25 0.25 0.15 0.05 0.15  
 Min 0.40 4.0 0.05 REMAIN

Notes for Lot: 527461  
 \*\*\*\*\* ABS CERTIFICATION REQUIRED \*\*\*\*\*  
 Lot: 527461 - Mechanical, Physical, Metallurgy, Quantometer Results  
 Tapir Dir No-> TMS Flad  
 H116 Longitudinal 3 Test KSI KSI ECT  
 46.4 46.8 19.3 18.5 14.1  
 46.6 39.4 16.7

H116 Exfoliation Corrosion PASS  
 Cast Number Chemical - OBS SI PE CU MN MG CR ZN TI  
 H321701C Actuals 0.09 0.16 0.03 0.59 4.5 0.08 0.13 0.02

Notes for Lot: 527462  
 \*\*\*\*\* ABS CERTIFICATION REQUIRED \*\*\*\*\*  
 Lot: 527462 - Mechanical, Physical, Metallurgy, Quantometer Results  
 Tapir Dir No-> UTS TYS Flad  
 H116 Longitudinal 3 Test KSI KSI PCT  
 47.9 49.1 42.4 40.3 14.8  
 47.7 39 14.8

H116 Exfoliation Corrosion PASS  
 Cast Number Chemical - OBS SI FE CU MN MG CR ZN TI  
 H325501D Actuals 0.11 0.20 0.09 0.56 4.4 0.09 0.14 0.02

This material was melted in the United States or a Qualifying Country [REF DFARS 225.872.1(a)]; It was manufactured in the United States

**PRELIMINARY  
 CERTIFICATION**



**ESSAR Steel Algoma Inc.**

105 West St., Sault Ste. Marie, Ontario, Canada, P6A 7B4

*Account*

CUSTOMER PURCHASE ORDER NUMBER P005482-2	ENTRY DATE 2012/02/17	CREATE DATE 2012/05/02	INVOICE NUMBER 275745	SHIP TO CUSTOMER NAME & ADDRESS ACCUCCUT PROFILE AND GRINDING LTD., 300 CONNIE STREET CONCORD, ONTARIO.	CARRIER BEST	MILL ORDER 17441
CHANGE TO CUSTOMER NAME & ADDRESS			SHIP TO CUSTOMER NAME & ADDRESS		-2040 (TK1)	

ACCUCCUT PROFILE AND GRINDING LTD  
300 CONNIE STREET  
CONCORD, ONTARIO.  
L4K 5W6

CUSTOMER SPECIFICATION  
HR MULTIPLE CERTIFIED PLATE - HSLA - CSA G40.21 38W/44W/ASTM A36/ASME SA36  
(04) (04) (08) (11A) - FLATNESS 1/2 A-6

**SUPPLEMENTARY INSTRUCTIONS**

TEST CERT 1: RCR090@ACCUCCUT.CA TEST CERT 2: PLATE TEST COUPON

TEST REPORTS REQUIRED

INSP YR 2000223727 PP  
CUST USE RESALE 2012/05/02 17:56

MEETS EN 10204:2004 TYPE 3.1  
ISO QUALITY AND ENVIRONMENTAL CERTIFICATES AVAILABLE AT WWW.ESSARSTEELALGOMA.COM  
ALL HEATS FULLY KILLED  
HEATS INDICATED WITH (+) FINE GRAINED  
HEATS INDICATED WITH (\*) MADE IN CANADA WITH DOMESTIC AND NORTH AMERICAN MATERIALS  
\* \* \* \* \*  
CUSTOMER ITEM 00006 OUR ITEM 003 DIMENSIONS 1.000 X 96 X 240 "

PLATE NUMBER	HEAT-MS	NO. PIECES	WEIGHT	PLATE NUMBER	NO. PIECES	WEIGHT
70937	5099M-55	2	13068			

**TENSILE TESTS:**

HEAT	SRCE	GAGE	COND	TEST	YIELD	TENSILE	% ELONG
5099M	166"	1.0000	AR	.2	47.0	72.0	33(2")
	166"	1.0000	AR	.2	46.0	70.0	31(2")

**\*\*WARNING\*\***

THE TEST RESULTS AND VALUES REPORTED HEREIN INDICATE ONLY THAT (1) THE PARTICULAR STEEL FOR WHICH THIS CERTIFICATE IS ISSUED MEETS THE MINIMUM SPECIFIED YIELD STRENGTH AND (2) THE CHEMICAL ANALYSIS AND PHYSICAL PROPERTIES OF SUCH STEEL ARE IN CONFORMANCE WITH THE REQUIREMENTS OF THE SPECIFICATION INDICATED. THE RESULTS OR VALUES REPORTED HEREIN CAN NOT BE USED TO QUALIFY THE STEEL FOR ANY SPECIFICATION OTHER THAN THE ONE INDICATED AND CAN NOT BE RELIED UPON FOR ANY PURPOSE (INCLUDING DESIGN OR CALCULATIONS) AS REPRESENTING THE ACTUAL STRENGTH OF SUCH STEEL.

*HYDROFORMING & PLATE*

**K. UGHADPAGA**  
MANAGER METALLURGICAL SERVICES

THIS MILL TEST REPORT MAY NOT BE REPRODUCED EXCEPT IN FULL WITHOUT WRITTEN APPROVAL OF ESSAR STEEL ALGOMA INC. IF YOU RECEIVE THIS DOCUMENT AND ARE NOT THE INTENDED RECEIVER, PLEASE CALL (705) 945-2624 COLLECT FOR INSTRUCTIONS ON METHOD OF DISPOSAL OF DOCUMENT.

**MILL TEST REPORTS**

ESSAR STEEL ALGOMA INC. HEREBY CERTIFIES THAT THE MATERIAL HEREIN DESCRIBED WAS MADE AND TESTED IN ACCORDANCE WITH THE RULES OF THE SPECIFICATION SHOWN. ALL RESULTS ARE RETAINED IN ACCORDANCE WITH THE COMPANY'S STANDARD RECORD KEEPING PRACTICES.



Account

Page 510 1

# SSAB

## Test Certificate

Form TCI: Revision 1: Date 31 Oct 2000

1770 Bill Sharp Boulevard, Muscatine, IA 52761-9412

Mill Order No.: 41-316905-07

Shipping Manifest: MR159371

Customer:  
RUSSEL METALS INC  
1900 MINNESOTA COURT  
SUITE 210  
MISSISSAUGA  
ON L5N3C9

Customer P.O. No.: M46012088 & 41-31689  
Product Description: CSA G40.21(2004)44W/300W / ASTM A36(08)  
A709(01A)36/ASME SA36(01ED)

Ship Date: 22 Jun 12  
Cert Date: 22 Jun 12  
Cert No: 061305050  
(Page 1 of 1)

Size: 0.750 X 120.0 X 480.0 (IN)

Heat Id	Tested Pieces			Tensiles			Charpy Impact Tests			HDWTT Temp %Shr		
	Piece Id	Tested Thickness	Tst Loc (KSI)	YS (KSI)	UTS (KSI)	%RA	Elong % Tst	Abs. Energy (FTLB)	% Shear Avg		Tst Temp	Tst Dir
A11298	D22	0.749 (DISCRD)	L	51	74		25	1	2	3		
B1L813	D01	0.748 (DISCRD)	L	52	75		30	1	2	3		
Chemical Analysis C Mn P S Si Tot Al Cu Ni Cr Mo Nb Co V Ti B N A11298 .19 .87 .018 .003 .18 .029 .32 .14 .17 .04 .001 .006 .019 .0002 .0090 B1L813 .20 .88 .018 .001 .21 .037 .34 .14 .13 .03 .001 .007 .023 .0003 .0108												

MERCURY IS NOT A METALLURGICAL COMPONENT OF THE STEEL AND NO MERCURY WAS INTENTIONALLY ADDED DURING THE MANUFACTURE OF THIS PRODUCT  
MOR EN 10204:2004 INSPECTION CERTIFICATE 3.1 COMPLIANT  
PRODUCTS SHIPPED: D01 PCES: 6, WGT: 73643 A11298 D22 PCES: 1, WGT: 12277

STEEL  
BLANK  
OFF

TEST CERT. #  
A 2 4 5 4 3

WE HEREBY CERTIFY THAT THIS MATERIAL WAS TESTED IN ACCORDANCE WITH, AND MEETS THE REQUIREMENTS OF, THE APPROPRIATE SPECIFICATION

B. H. Wales  
SENIOR METALLURGIST - PRODUCT

Cust Part #:



Philadelphia Forgings  
 222 N. Keswick Ave., Glenside, PA 19038  
 P: 866 48FORGE F: 215 885-2166  
 www.philadelphiaforgings.com

**MATERIAL CERTIFICATION**

FORGED AL+STEEL RW  
 + FLANGES

Sold To:  
 HAI Precision Waterjets, Inc.  
 160 Stanley Street  
 Trenton, ON K8V 4W1

Date: 9/7/12  
 Our Order #: 12603P  
 Your Order #: 6244-1

Quantity	Description	Specification
1	Smooth forged with allowance to finish to: 72.00" OD x 64.929" ID x 2.00" Thick.	AISI 1022

Heat #: 13678	Condition: Normalized
---------------	-----------------------

We certify the results of our tests as follows:

Chemical Analysis											
C	Mn	P	S	Si	Ni	Cr	Mo	Cu	V	Cb	Sn
.220	.870	.013	.004	.200	.060	.110	.040	.110	.000	.001	.006

Mechanical Properties						
Diameter	Tensile PSI	Yield PSI	Elong 2" %	Reduction %	Hardness	Other

Notes:

Philadelphia Forgings

Ed Holden, President



Philadelphia Forgings  
 222 N. Keswick Ave., Glenside, PA 19038  
 P: 866-48FORGE F: 215-886-2166  
 www.philadelphiaforgings.com

# Packing Slip

Ship to:  
 Barber Hymac Hydro Inc  
 239 Barrick Road  
 Port Colborne, ON L3K 5Z5

Ship Date: 9/14/12  
 Purchase Order No: 6244  
 Our Order No: 12603P  
 Shipping Method: Truck

Description	Ship Qty	Order Qty
Smooth forged with allowance to finish to: 72.00" OD x 66.05" ID x 2.50" Thick. MATERIAL: 6061 T6. 677.67	4	4





Philadelphia Forgings  
 222 N. Keswick Ave., Glenside, PA 19038  
 P: 866.48FORAGE F: 215.886.2166  
 www.philadelphiaforgings.com

**MATERIAL CERTIFICATION**

Sold To: HAI Precision Waterjets, Inc.  
 160 Stanley Street  
 Trenton, ON K8V 4W1

Date: 9/7/12  
 Our Order #: 12603P  
 Your Order #: 6244-1

Quantity	2
Description	Smooth forged with allowance to finish to: 72.00" OD x 66.05" ID x 2.50" Thick.
Specification	AA6061-T6

Heat #: F70649	Condition: Solution Treated, Aged
----------------	-----------------------------------

We certify the results of our tests as follows:

Chemical Analysis											
Si	Fe	Cu	Mn	Mg	Zn	Cr	Ti				
.620	.400	.270	.050	1.020	.100	.150	.030				

Mechanical Properties					
Diameter	Tensile PSI	Yield PSI	Elong 2" %	Reduction %	Hardness
					Other

Notes:

Philadelphia Forgings

Ed Holden, President

**MATERIAL CERTIFICATION**

Sold To: HAI Precision Waterjets, Inc.  
 160 Stanley Street  
 Trenton, ON K8V 4W1

Date: 9/7/12  
 Our Order #: 12603P  
 Your Order #: 6244-1

Quantity	2
Description	Smooth forged with allowance to finish to: 72.00" OD x 66.05" ID x 2.50" Thick.
Specification	AA6061-T6

Heat #: F70651	Condition: Solution Treated, Aged
----------------	-----------------------------------

We certify the results of our tests as follows:

Chemical Analysis										
Si	Fe	Cu	Mn	Mg	Zn	Cr	Ti			
.590	.390	.250	.050	.970	.080	.150	.020			

Mechanical Properties						
Diameter	Tensile PSI	Yield PSI	Elong 2" %	Reduction %	Hardness	Other

Notes:

Philadelphia Forgings



Ed Holden, President

NORTH AMERICAN FREE TRADE AGREEMENT  
**CERTIFICATE OF ORIGIN**  
 (Instructions Attached)

1 Exporter's Name and Address:  
 Philadelphia Forgings  
 222 N. Keswick Avenue  
 Glenside, PA 19038

2 Blanket Period:  
 From 01 | 01 | 2012 | To 01 | 01 | 2013 |  
 DD MM YY DD MM YY

3 Producer's Name and Address:  
 Philadelphia Forgings  
 222 N. Keswick Avenue  
 Glenside, PA 19038

4 Importer's Name and Address:  
 Barber Hymac Hydro Inc.  
 239 Barrick Road  
 Port Colborne, Ontario, Canada L3K 5Z5  
 Attn: Karl Vankralingen

Tax Identification Number: 23-2631137

Tax Identification Number: 23-2631173

Tax Identification Number: 905-835-8112

6	7	8	9	10
HS Tariff Classification Number	Preference Criterion	Producer	Net Cost	Country of Origin
730799	B	YES	NO	USA
7616.99.90.030	B B	YES	NO	USA

5 Description of Good(s)  
 6061-T6 Aluminum Forgings 72.80" OD x 65.25" ID x 3.30" THK. 4 pieces  
 1022 Carbon Steel Forging 72" OD x 64.929" ID x 2.00" THK. 1 piece

6 I certify that:  
 - the information on this document is true and accurate and I assume the responsibility for proving such representations. I understand that I am liable for any false statements or material omissions made on or in connection with this document;  
 - I agree to maintain, and present upon request, documentation necessary to support this Certificate, and to inform, in writing, all persons to whom the Certificate was given of any changes that would affect the accuracy or validity of this Certificate;  
 - the goods originated in the territory of one or more of the Parties, and comply with the origin requirements specified for those goods in the North American Free Trade Agreement, and unless specifically exempted in Article 411 or Annex 401, there has been no further production or any other operation outside the territories of the Parties; and  
 - this Certificate consists of \_\_\_\_\_ pages, including all attachments.

Authorized Signatures: *Mark Sippel*  
 Name: awn Sippel  
 Title: Office Manager  
 Company: Philadelphia Forgings

Date: DD MM YYYY 14 9 2012  
 Telephone: 866-483-6743  
 Fax: 215-886-2166



**ORDER ACKNOWLEDGEMENT**

Order Number	2349583
Order Date	11/19/2012 11:41:06
Page	1 of 1

**Absolute Stainless Inc.**

2800 Argenta Road, Unit 1  
 Mississauga, Ontario L5N 8L2  
 Phone: 905-667-8182 Fax: 905-667-4664  
 www.absolast.com



**Bill To:**

HAI PRECISION WATERJETS INC  
 160 STANLEY STREET  
 TRENTON, ON K8V 4W1  
 CANADA

**Ship To:**

HAI PRECISION WATERJETS INC  
 160 STANLEY STREET  
 TRENTON, ON K8V 4W1  
 CANADA

1-800-749-0079

Customer ID: 115582

Job:

PO Number	Ship Route	Quantities			
		Ordered	Allocated	Remaining	UOM
6244	CMACDONALD				
	Taker				

Item ID	Item Description	Unit Size	UOM	Disp.	Remaining	Allocated	Ordered
HB0751060031	3/4-10 X 6 HEX HEAD CAP SCREWS 316 STAINLESS STEEL ASTM F593 H	1.0	EA	0.00	0.00	0.00	0.00
OHN07510000SI	3/4-10 HEX NUTS SILICON BRONZE	1.0	EA	0.00	0.00	0.00	0.00
FW075BS17510931	3/4 BS 1 3/4 OD (.813 ID X .109 THK +/- .007) 316 STAINLESS STEEL FLAT WASHERS COM	1.0	EA	0.00	0.00	0.00	0.00

Total Lines: 3

**CERTIFICATE OF COMPLIANCE**

We certify that the materials supplied on this P.O. are manufactured and conform to the specifications outlined.

*MacDonald*

NU TS, BOLTS, O-RINGS.

Please Note: In accordance with our industry standard, quantities of goods shipped may be within + or - 10 percent of the original order quantity, and will be billed accordingly.

Packing Slip

Net Amount		SHIPPING		Total Amount													
Qty. Ord	Qty. Ship	Description	Unit Price	U/M	Amount												
4	4	1700.3MM X 11.0MM VITON O.R. B/N:23463-2 C/D:1-12		EA													
6	6	169.3MM X 2.5MM VITON O.R. B/N:23124-1 C/D:9-11		EA													
1	1	164.8MM X 2.5MM VITON O.R. B/N:23124-1 C/D:9-11		EA													
PURO ACCOUNT #3683305																	
<table border="1" style="width: 100%;"> <tr> <td>Order Date</td> <td>Customer</td> <td>Customer P/O</td> <td>Terms</td> <td>Order No.</td> <td>Ship Via</td> </tr> <tr> <td>20-Nov-12</td> <td>CAV100</td> <td>6244</td> <td>CREDIT CARD</td> <td>0000091526</td> <td>PUROLATOR</td> </tr> </table>						Order Date	Customer	Customer P/O	Terms	Order No.	Ship Via	20-Nov-12	CAV100	6244	CREDIT CARD	0000091526	PUROLATOR
Order Date	Customer	Customer P/O	Terms	Order No.	Ship Via												
20-Nov-12	CAV100	6244	CREDIT CARD	0000091526	PUROLATOR												

Bill To: CASH/CREDIT CARD ON

Ship To: HAI PRECISION  
160 STANLEY ST.  
TRENTON ON K8V 4W1

53-A Cowansview Road  
Cambridge, Ontario N1R 7L2  
Tel: (519) 622-3868 Fax: (519) 622-3090

FLEXIBLE PRODUCTS INC.

**BUDLAR**

Packing Slip  
0000200157  
Date  
21-Nov-12



# ABS Quality Evaluations

## Certificate Of Conformance

This is to certify that the Quality Management System of:

**ASM Aerospace Specification Metals, Inc.**

2501 NW 34th Place  
Ste B28  
Pompano Beach, FL 33069  
U.S.A.

THIS AL WINDOWS

has been assessed by ABS Quality Evaluations, Inc. and found to be in conformance with the requirements set forth by:

**AS/EN/JISQ9120:2009 - Rev. A and ISO 9001:2008**

The Quality Management System is applicable to:

**DISTRIBUTION OF AIRCRAFT QUALITY RAW MATERIALS FOR AVIATION, SPACE AND DEFENSE**

The certification has been performed in accordance with the requirements of AS 9104 revision A and ABS QE is accredited under the Aerospace Registration Management Program.

Certificate No: 46149  
Effective Date: 04 April 2012  
Expiration Date: 03 April 2015  
Issue Date: 04 April 2012



Alex Weisselberg, President



Validity of this certificate is based on the periodic audits of the management system defined by the above scope and is contingent upon prompt, written notification to ABS Quality Evaluations, Inc. of significant changes to the management system or components thereof.

ABS Quality Evaluations, Inc. 16855 Northchase Drive, Houston, TX 77060, U.S.A.  
Validity of this certificate may be confirmed at [www.abs-qc.com/cert\\_validation](http://www.abs-qc.com/cert_validation).



**STATEMENT BY ULTIMATE CONSIGNEE AND PURCHASER**

1. ULTIMATE CONSIGNEE		UNIVERSITY OF REGINA	
ADDRESS		3737 WASCANA PARKWAY	
ADDRESS		3737 WASCANA PARKWAY	
CITY		REGINA, SASKATCHEWAN	
COUNTRY		CANADA	
POSTAL CODE		S4S 0A2	
LINE 2		TELEPHONE OR FAX 306-585-5392	

2. DISPOSITION OR USE OF ITEMS BY ULTIMATE CONSIGNEE NAMED IN BLOCK 1

We certify that the items: (left mouse click in the appropriate box below)

A. Will be used by us (as capital equipment) in the form in which received in a manufacturing process in the country named in Block 1 and will not be reexported or incorporated into an end product.  
 B. Will be processed or incorporated by us into the following product (s) apparation or a particie detector to be manufactured in the country named in Block 1 for distribution in CANADA  
 C. Will be resold by us in the form in which received in the country named in Block 1 for use or consumption therein.  
 D. Will be reexported by us in the form in which received to \_\_\_\_\_  
 E. Other (describe fully) \_\_\_\_\_

NOTE: If BOX (D) is checked, acceptance of this form by the Bureau of Industry and Security as a supporting document for license applications shall not be construed as an authorization to reexport the items to which the form applies unless specific approval has been obtained from the Bureau of Industry and Security for such export.

3. NATURE OF BUSINESS OF ULTIMATE CONSIGNEE NAMED IN BLOCK 1

A. The nature of our usual business is Education

B. Our business relationship with the U.S. exporter is \_\_\_\_\_

C. We have had this business relationship for \_\_\_\_\_ year(s).

4. ADDITIONAL INFORMATION


5. ASSISTANCE IN PREPARING STATEMENT

STATEMENT OF ULTIMATE CONSIGNEE AND PURCHASER

We certify that all of the facts contained in this statement are true and correct to the best of our knowledge and we do not know of any additional facts which are inconsistent with the above statement. We shall promptly send a supplemental statement to the U.S. Exporter, disclosing any change of facts or intentions set forth in this statement which occurs after the statement has been prepared and forwarded, except as specifically authorized by the U.S. Export Administration Regulations (15 CFR parts 730-774), or by prior written approval of the Bureau of Industry and Security, we will not reexport, resell, or otherwise dispose of any items approved on a license supported by this statement (1) to any country not approved for export as brought to our attention by means of a bill of lading, commercial invoice, or any other means, or (2) to any person if we know that it will result directly or indirectly, in disposition of the items contrary to the representations made in this statement or contrary to Export Administration Regulations.

6. SIGNATURE OF OFFICIAL OF ULTIMATE CONSIGNEE

PURCHASER University of Regina

SIGNATURE OF PURCHASER 

TITLE OF OFFICIAL

NAME OF OFFICIAL Don Landry

TITLE OF OFFICIAL

DATE (mmmm,dd,yyyy)

CERTIFICATION FOR USE OF U.S. EXPORTER - We certify that no corrections, additions, or alterations were made on this form by us after the form was signed by the (ultimate consignee)(purchaser).

8. NAME OF EXPORTER ASM Aerospace Specification Metals, Inc.

NAME OF PERSON SIGNING THIS DOCUMENT Rad Getten

TITLE OF PERSON SIGNING THIS DOCUMENT

QUALITY Assurance Manager

DATE (mmmm,dd,yyyy)

Public reporting burden for this collection of information is estimated to average 15 minutes per response plus one minute for recordkeeping, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Director of Administration, Room 3889, Bureau of Industry and Security, U.S. Department of Commerce.

Washington, DC 20230, and to the Office of Management and Budget Paperwork Reduction Project (0694-0021, 0694-0093), Washington, D.C. 20503. Notwithstanding any other provision of law, no person is obligated to respond to or shall a person be subject to a penalty for failure to comply with a collection of information if it does not display this information subject to the Paperwork Reduction Act unless that collection of information displays a currently valid OMB Control Number.

We acknowledge that the making of any false statements or concealment of any material fact in connection with this statement may result in imprisonment or both and denial, in whole or in part, of participation in U.S. exports and reexports.



Per our conversation, the material quoted below is available and the price is valid. In order to export this material to Canada we would need to add an export quality skid for \$150.00. Also, I have attached a copy of our credit application that we will need completed, signed, and returned if you would like to apply for terms N-30 days. We also

Jason Reilly wrote:  
Hello Garth,

Sincerely,  
Garth Huber

Please find our completed credit application. Please let us know if there are any problems. We will proceed with the Purchase Requisition for 4 sheets of the material.

Dear Jason:

-----Original Message-----  
From: Garth Huber [mailto:huberg@uregina.ca]  
Sent: Monday, June 25, 2012 12:01 PM  
To: jreilly@aerospacemetals.com  
Cc: Lorraine Horvath; Jeffery Raymond  
Subject: Re: FW: 2024-T3 Oversize Sheet Quote

Jason Reilly  
ASM Aerospace Specification Metals  
2501 NW 34th Place, #B-28  
Pompano Beach, FL 33069  
954-977-0666 x104  
954-977-3858 fax  
jreilly@aerospacemetals.com

We have been waiting for the laboratory test results and have finally received them. The sheets were pulled out for inspection and we have discovered that they were mill produced to T4 by Alcoa and not T3 as our description stated. The material test results show that this material will meet and exceed the properties of T3, but is mill stenciled as T4. I have attached a copy of the lab test results for this material. Please review and let us know if it will be acceptable to ship. I am sorry for the delay, and for the confusion on this order.

Hello Garth,

**Subject:** RE: FW: 2024-T3 Oversize Sheet Quote  
**From:** "Jason Reilly" <jreilly@aerospacemetals.com>  
**Date:** Wed, 18 Jul 2012 15:21:39 -0400  
**To:** <huberg@uregina.ca>  
**CC:** "Lorraine Horvath" <Lorraine.Horvath@uregina.ca>, "Jeffery Raymond" <Jeffery.Raymond@uregina.ca>, "Rad Getten" <rgetten@aerospacemetals.com>



ASM Aerospace Specification Metals, Inc.

2501 NW 34th Place, #B28

Pompano Beach, FL 33069

Phone: (954) 977-4285 Fax: (954) 977-6337

## Packing Slip

P/Slip#: 31739

### Customer:

THE UNIVERSITY OF REGINA

PO#: P0054103

Ship Date: 7/30/2012

Ship Via: THOMPSON AHERN & CO.

FOR: CA

### Item(s) Shipped:

Description

Spec/Rev: 2024-T4 BARE QQ-A-250/4

Line/Item#: ITEM: 1

Part#: JOB#6244

Size: .040" X .80" X 120"

Shipped Qty: 4 EA

Weight: 150 LBS

HT/Lot: 524-545

Mill: ALCOA

Cage Code:

### COMMENTS:

(LAB TEST REPORT & C OF C ONLY)  
SCH B#: 7606.12.3070  
NO EEI 30.36

Destination Control Statement: These commodities, technology, or software, if intended for export, are subject to United States Export Administration and U.S. State Department Regulations. Diversion Contrary to U.S. Law is Prohibited.

WWW.AEROSPACEMETALS.COM / WWW.TITANIUMDISTRIUTOR.COM

Rev. 3/11

SHIP TO ADDRESS:  
THE UNIVERSITY OF REGINA  
C/O HAI PRECISION WATERJET  
160 STANLEY STREET  
TRENTON ONTARIO, K8V4W1  
CANADA



# REMO PAYMENTS TO:

ASM Aerospace Specification Metals, Inc.  
 2501 NW 34<sup>th</sup> Place #B28  
 Pompano Beach, FL 33069



ASM AEROSPACE SPECIFICATION METALS, INC.  
 2501 N.W. 34<sup>TH</sup> Place #B28, Pompano Beach, FL 33069  
 Tel: 954-977-4285 • Fax: 954-977-6337  
 www.aerospacemetals.com

ISO & AS  
 Registered Company

## INVOICE

2823  
 CUST. # THE UNIVERSITY OF REGINA  
 CUSTOMER: 3737 WASCANA PARKWAY  
 REGINA, SK, S4S 0AZ  
 CANADA

SHIP TO: THE UNIVERSITY OF REGINA  
 C/O HAI PRECISION WATERJETTS  
 160 STANLEY ST.  
 TRENTON ONTARIO, K8V 4W1  
 CANADA

Page #: 1

DATE	SALESPERSON	BUYER	TERMS	CUSTOMER P.O.	INVOICE NO.
07/30/12	JASON REILLY		NET 30	P0054103	31739
ORDER DATE		SHIP VIA		FOB.	ASM ORDER NO.
06/29/12	THOMPSON AHERN & CO		CA		21783
QUANTITY	ITEM NUMBER	DESCRIPTION	UNIT PRICE	U	AMOUNT
SHIPPED	B.O.			M	
4	0 20244-.040	2024-T4 BARE QQ-A-250/4	1120.00	EA	4480.00
<p><b>DESTINATION CONTROL STATEMENT</b>                  THESE COMMODITIES, TECHNOLOGY, OR SOFTWARE WERE EXPORTED FROM THE UNITED STATES IN ACCORDANCE WITH THE EXPORT ADMINISTRATION REGULATIONS. DIVERSION CONTRARY TO U.S. LAW IS PROHIBITED.</p> <p>WEIGHT: 150                  HEAT #: 524-545                  # PIECES: 4                  MILL: ALCOA</p> <p>(LAB TEST REPORT &amp; C OF C ONLY)                  .040" X 80" X 120"                  JOB #62244                  ITEM: 1                  SCH B#: 7606.12.3070                  NO EEI 30.36</p>					
Total Lbs: 150			Freight: 0.00		
			Taxable Sales: 0.00		
			Tax: 0.00		
Total:			Total: 4480.00		

OVER/UNDER SHIPMENT POLICY:  
 INDUSTRY STANDARDS ALLOW A MINIMUM  
 10% SHIP TOLERANCE IN QUANTITY & WEIGHT

THIS ORDER IS ACCEPTED AND SHIPPED STRICTLY SUBJECT TO  
 THE TERMS AND CONDITIONS OF SALE PRINTED ON REVERSE SIDE  
 OR ATTACHED HERETO. TERMS & CONDITIONS PRINTED ON  
 CUSTOMERS PURCHASE ORDER OR OTHERWISE SHALL BE NULL &  
 VOID.

INVOICES ARE PAYABLE ACCORDING TO TERMS  
 OF SALE. AS PERMITTED BY LAW, CUSTOMER AGREES  
 TO PAY LEGAL FEES IF NECESSARY. PROPER VENUE  
 BROWARD COUNTY, FLORIDA.



ASM Aerospace Specification Metals, Inc  
Certificate of Conformance

THE UNIVERSITY OF REGINA

Aerospace Specification Metals hereby certifies that all items furnished in this shipment are in full compliance with all purchase order and specification requirements, and other applicable documents cited in the P.O. When test report is provided, it represents the actual attributes of the item(s) furnished and the test results are in full compliance with all applicable specifications and purchase order requirements. All records such as material certification, inspection, test reports, or any other data are on file and available upon request. Additionally, material is suitably packaged to help safeguard against shipping damage. (Note: Material does not come in contact with mercury during stores and processing at ASM.)

Item(s) Shipped:

Ship Date: 7/30/2012

P.O#: P0054103

P/Slip#: 31739

Item#: ITEM: 1

Spec/Rev: 2024-T4 BARE QQ-A-250/4

Part#: JOB#6244

Size: .040" X .80" X 120"

Qty: 4 EA

Hi/Lot: 524-545

Mill: ALCOA

Cage Code:

COMMENTS:

(LAB TEST REPORT & C OF C ONLY)  
SCH B#: 7606.12.3070  
NO EEI 30.36

Blue free in  
Quality Control  
ASM QC 8

**EXOVA**  
 10005 Freeman Avenue, Santa Fe Springs, CA. 90670  
 Tel: (562) 946-1721 Fax: (562) 944-8389 www.exova.com



CUSTOMER: PO/SO: Lab No: 564901 Date: 07/25/12

Material: 2024 Aluminum ✓ P/NI Heat Number: 524-545 ✓  
 Specification: QQ-A-250/4, Rev: B INT. AM 2 Size: 0.040" x 8" Corner  
 TEMPER: T4444 Other: BHEET ✓  
 NPL: ALCOA, Mfg. 1 SQ# 86065

METALLURGY	TENSILE TEST		CERTIFICATION OF TEST		TENSILE STRENGTH		ELONG (4D)		RED. OF AREA			
	LOC/ORIENTATION	TEMP/F	STRESSED DIM	STRESSED AREA	TYS @ 0.2% OFF LBS	KSI	LBS	KSI		IN	%	FIN. DIM.
LONG TRANS Min. Requirements		RT	.0401 T .503 W	.0202	892	✓ 44.2 40.0	1376	✓ 68.1 62.0	0.446 2.000G	✓ 22.3 15		

W7-27-12  
 ASM  
 OIG  
 8

Conforms to requirements.

\*\*\*Amended Certification: Long & Trans bend test added.

MEM PAGE: 1 of 3

Signed for and on behalf of Exova



Bob Groner, General Manager  
 EXOVA



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**EXOVA**  
 10005 Freeman Avenue, Santa Fe Springs, CA. 90670  
 Tel: (562) 946-1721 Fax: (562) 944-8389 www.exova.com



Customer:

PO/BO:

Lab No: 564901

Date: 07/25/12

Material: 2024 Aluminum  
 Specification: QQ-A-250/4, Rev: E INT. AM 2  
 TEMPER: T4  
 MILL: ALCOA, Misc.: 90# 86065

P/N: Size: 0.040" x 8" Corner

Heat Number: 524-545  
 Other: SHBBT

CHEMISTRY ELEMENT	CERTIFICATION OF TEST			COMMENTS
	MINIMUM REQ'S	MAXIMUM REQ'S	ACTUAL	
Unless otherwise indicated all units are in weight %				
Si		0.50	0.05 ✓	
Fe		0.50	0.06 ✓	
Cu	3.8	4.9	4.1 ✓	
Mn	0.30	0.9	0.5 ✓	
Mg	1.2	1.8	1.4 ✓	
Cr		0.10	0.01 ✓	Less than
Zn		0.25	0.01 ✓	
Ti		0.15	0.03 ✓	
OR		0.05	0.05 ✓	Less than
OBT		0.15	0.15 ✓	Less than
Al	BAL		BAL	
Ni	INFO		0.01	

07-27-12  
 ASM  
 QC  
 8

Conforms to requirements.

Comment: METHOD: XRF.

\*\*\*Amended Certification; Long & Trans bend test added.

MEM PAGE: 2 of 3

Signed for and on behalf of Exova

Accredited

Bob Groneir, General Manager

Materials Testing Laboratory



LABORATORY ACCREDITATION BUREAU  
 ACR/ISO/ASME/ASTM/CPA/7025  
 Certificate #2158 of Testing

**Nadcap**

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**EXOVA**  
10005 Freeman Avenue, Santa Fe Springs, CA. 90670  
Tel: (562) 946-1721 Fax: (562) 944-8389 www.exova.com



Customer:

PO/SO:

Heat Number: 524-545

Inh No: 564901 Date: 07/25/12

Material: 2024 Aluminum

P/N:

Size: 0.040" x 8" Corner

Other: SHEET

Specification: QQ-A-250/4, Rev: E INT. AM 2  
TEMPER: T4  
MILL: ALCOA, Misc. 1, 80# 86065

**CERTIFICATION OF TEST**

**BEND TESTS**

One transverse specimen was bent 180 Deg. over a 5T dia. mandrel. Visual inspection at 20X revealed no evidence of cracks. ✓

One long specimen was bent 180 Deg. over a 5T dia. mandrel. Visual inspection at 20X revealed no evidence of cracks. ✓

ASM Aerospace Specification Metals Inc., Pompano Beach, FL  
CERTIFIES THAT THIS IS A TRUE COPY OF THE MILL TEST REPORT  
AND REPRESENTS THE ACTUAL ATTRIBUTES OF THE ITEM(S)  
FURNISHED AND THE TEST RESULTS ARE IN FULL COMPLIANCE  
WITH ALL APPLICABLE SPECIFICATIONS AND PURCHASE  
ORDER REQUIREMENTS

07-27-12  
ASM  
OC  
8

Conforms to Requirements. ✓  
\*\*\*Amended Certification: Long & Trans bend test added. ✓

MEM Page: 3 of 3

Signed for and on behalf of Exova

Bob Groner, General Manager  
EXOVA



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16 Glendale Pl., Cambridge, ON, N1S 3J1

Telephone: (519) 240 3139  
Fax: (519) 623-5044  
E Mail: heliumleak@rogers.com

# TEST CERTIFICATE

Page 1 of 1

CLIENT: HAI PRECISION

PURCHASE ORDER:

ADDRESS: 160 STANLEY ST.  
TRENTON ON, K8V 4W1

DATE: JAN 21 - 23 2013

*This report refers to the HELIUM LEAK TEST of the following: Qty (1) PARTICLE DETECTOR ASSEMBLY*

REFERENCE SPECIFICATION:

HOOD-1 REV 0

ACCEPTANCE CRITERIA: NO LEAKS > 1X10<sup>-8</sup> STD. CC/SEC

EQUIPMENT REQUIRED:

Varian 959 MSLD, S/N L1F2144; Commercial grade helium; Calibrated Leak @ 5.3 X 10<sup>-8</sup> std cc/sec. S/N: L1G 2083, Edwards vacuum pump, Inficon digital vacuum gauge

TEST DESCRIPTION:

The vessel was evacuated to below 50 mtorr and maintained for the entire test. The mass spectrometer was warmed up, stabilized and calibrated to 5.3X 10<sup>-8</sup> std. cc/sec. The mass spectrometer leak detector was then connected directly to the center nozzle. Large leaks were found on two of the window sleeves, all were repaired and retested. After the large leaks were removed the mass spectrometer was able to function in the 10<sup>-9</sup> range. All welds and seals were then sprayed with helium. The leak rate began to rise within 10 minutes of testing. It was determined that the window sleeve o-rings were leaking. Attempts to isolate these areas proved impossible and therefore the integrity of other joints could not be verified. The leak rate from the sleeve o-rings rose to 1x10<sup>-6</sup> in 45 minutes after which the test was aborted. The hood technique could not be performed due to the leaks in the o-rings.

RESULTS OF TEST:

Leaks greater than 1x10<sup>-8</sup> remain, test incomplete.

Technician: Wayne Yetman

HELIUM TEST CERTS

Job I.D. #: 1165

Qualifications: SNT-TC-1A LTIII





16 Glendale Pl., Cambridge, ON, N1S 3J1

Telephone: (519) 240 3139  
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E Mail: [heliumleak@rogers.com](mailto:heliumleak@rogers.com)

# TEST CERTIFICATE

Page 1 of 1

CLIENT: HAI PRECISION

PURCHASE ORDER:

ADDRESS: 160 STANLEY ST.  
TRENTON ON, K8V 4W1

DATE: JAN 31 2013

*This report refers to the HELIUM LEAK TEST of the following: Qty (1) PARTICLE DETECTOR ASSEMBLY*

REFERENCE  
SPECIFICATION:

HOOD-1 REV 0

ACCEPTANCE  
CRITERIA: NO LEAKS > 1X10<sup>-8</sup> STD. CC/SEC

EQUIPMENT  
REQUIRED:

Varian 959 MSLD, S/N LLF2144; Commercial grade helium; Calibrated Leak @ 4.82 X 10<sup>-8</sup> std cc/sec.  
S/N: 6144, Edwards vacuum pump, Inficon digital vacuum gauge

TEST  
DESCRIPTION:

The vessel was evacuated to below 50 mtorr and maintained for the entire test. The mass spectrometer was warmed up, stabilized and calibrated to 4.8X 10<sup>-8</sup> std. cc/sec. The auxiliary pump was valved off allowing the mass spec to maintain the vacuum independently. A response and sensitivity test was performed by introducing helium from a known leak standard into the assembly at a distant point from the mass spec. A notable response was seen after 10 minutes. The helium source was valved off and pumped out. The entire assembly was then enshrouded in plastic and helium was introduced at the bottom. The helium atmosphere was maintained for the entire test period. Mass spectrometer background at the start was 8x10<sup>-9</sup> atm cc/sec and after 60 minutes of testing was 7x 10<sup>-9</sup> atm cc sec. No evidence of leaks were noted

RESULTS  
No Leaks greater than 1x10<sup>-8</sup> were noted.

Technician: Wayne Yetman

Job I.D. #: 1171

Qualifications: SNT-TC-1A LTIIII

DATE: AUGUST 2010  
REVISION NO: 0  
PROCEDURE NO: HOOD-01  
PREPARED BY: Wayne Yetman

## HELIUM LEAK TEST PROCEDURE HOOD TECHNIQUE

---

16 Glendale Pl., Cambridge, ON, N1S3J1  
Telephone: (519) 240-3139  
Home: (519) 623-5343  
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E Mail: [heliumleak@rogers.com](mailto:heliumleak@rogers.com)



<b>1.0</b>	<b>SUBJECT</b>	1.1 Helium Leak Detection using the hood technique
<b>2.0</b>	<b>SCOPE</b>	2.1 This procedure describes the use of the helium mass spectrometer for quantitatively leak testing welds and other joints.
<b>3.0</b>	<b>REFERENCES</b>	3.1 ASME 2010 Boiler and Pressure Vessel Code, Section V, Article 10, appendix IX. 3.2 ASTM E498 3.3 Customer Specifications
<b>4.0</b>	<b>EQUIPMENT</b>	4.1 Mass spectrometer leak detector - Varian 959 or equivalent. 4.2 Tracer Probe - This may be used to pinpoint leak location if required, following the hood test. 4.3 Hood: Plastic material large enough to enshroud the area under test and capable of maintaining a helium atmosphere. 4.4 Calibration Leak Standards - Calibration leak standards may be either permeation or capillary types. The mass spectrometer test equipment calibration leak shall have a leakage rate of no greater than $1 \times 10^{-7}$ std. c.c./sec. The system calibration leak shall have a leakage rate equal to or smaller than the required test sensitivity. 4.5 Tracer Gas - Bottled helium gas of commercial grade purity.
<b>5.0</b>	<b>EQUIPMENT CALIBRATION</b>	5.1 The mass spectrometer leak detector shall be turned on and allowed to warm up for 15 minutes (or as specified by the instrument manufacturer) prior to calibration. The mass spectrometer test equipment calibrated leak shall be attached directly on to the machine inlet using the vacuum method for equipment calibration. The sensitivity shall be checked before and after testing and at intervals of not more than 2 hours during continuous scanning. If the sensitivity of the unit falls below the above noted level the unit shall be re-calibrated and all areas tested after the previous calibrations shall be retested.
<b>6.0</b>	<b>TESTING CONDITIONS</b>	6.1 Items to be tested shall be cleaned and dried with hot air to achieve a moisture free atmosphere. The surface areas to be tested must be free of oil, grease, paint or other contaminants that might mask the test. All cleaning shall be performed in advance by the client prior to the arrival of the testing personnel in accordance with their procedure. Note: Cleaning agents used are to be in compliance with the test material specification and must be thoroughly rinsed or wiped clean to ensure no residue remains. 6.2 The area in which the test will be carried out should be room temperature and free from drafts and extreme temperature variations.



7.0	<p><b>QUALIFICATION OF PERSONNEL</b></p> <p>7.1 Personnel performing helium leak testing shall be certified in accordance with HLD's written practice WP-1, which meets the requirements stated in ASNT SNT-TC-1A.</p> <p>7.2 Personnel performing test evaluations shall be certified to Level II or III in Helium Mass Spectrometer Testing.</p> <p>7.3 Personnel qualification records shall be maintained and made available upon request.</p>
8.0	<p><b>TESTING PARAMETERS</b></p> <p>8.1 Customer to clearly inform technician as to which section or components are to be tested.</p> <p>8.2 Evacuate the component to an absolute pressure sufficient for connection of the helium mass spectrometer to the system. Note: An auxiliary vacuum pump may be required to achieve the initial vacuum.</p> <p>8.3 When a satisfactory vacuum and background level is achieved attach the system-calibrated leak to a distant point on the component in order to determine the system's ability to detect helium. Note the time required for an indication from the system-calibrated leak to appear on the mass spectrometer output meter. This time shall be considered the response time. Following this preliminary test repump the system to restore the background to the level achieved prior to the response test.</p> <p>8.4 The unit to be tested may be kept in a helium atmosphere for the test by enshrouding it with plastic, which will give an overall leak rate. To achieve an approximate 100% helium atmosphere, the shroud can be partially evacuated and backfilled with helium or purged with helium and then closed off.</p> <p>8.5 The unit shall be held under vacuum and enshrouded in a helium atmosphere for no less than the time noted in 8.3.</p> <p>8.6 If the background is zero prior to starting the test then this calculation does not apply otherwise the measured leak rate of the component shall be determined as follows:</p>
	<p>MLR = <math>ACL R (MR - BG)</math></p> <p>WHERE:</p> <p>ACL R = actual calibrated leak rate per full scale division</p> <p>MR = the increase in output of the mass spec. leak detector</p> <p>BG = mass spectrometer background</p> <p>MLR = measured leak rate of the component</p>
	<p>ALR = <math>MLR / \% HE \times 100</math></p> <p>WHERE:</p> <p>MLR = measured leak rate of the component</p> <p>% HE = helium concentration</p> <p>ALR = actual leak rate of the component</p>
8.7	<p>If the tracer gas concentration is approximately 100% as in 8.4 then this calculation does not apply, otherwise the calculation of actual leak rate (corrected for tracer gas concentration) shall be as follows:</p>

- (a) Customer name.
- (b) Product description.
- (c) Customer purchase order number.
- (d) Test instrument, standard leak – including serial numbers and calibration date.
- (e) Type of test.
- (f) Test sensitivity.
- (g) Temperature at time of test. Note: Temperature-measuring device not required if test performed at constant room temperature.
- (h) Technician's name/signature.
- (i) Witnessing inspector's name if applicable.
- (j) Date of test.
- (k) Procedure number.
- (l) Test results.
- (m) Test method.
- (n) Approximate hood gas concentration

10.1 Each leak test performed shall be documented by a report, which shall include as a minimum:

**REPORT OF EXAMINATION**

Areas that leak at a greater rate than the allowable rate must be repaired and retested as per the original test procedure. In order to pinpoint leaks the tracer probe method may be used.

9.2 Rejects: acceptable.

9.1 When the leak rate is equal to or less than the allowable rate the unit tested shall be

**ACCEPTANCE STANDARD**

10.0

9.0

ASME 2011 ADDENDA: NO CHANGES

REV LOG: HOOD-01 REV 0



*Certificate*  
Nondestructive Testing Personnel

*This Certifies That*  
**Wayne Yetman**  
of

**HELIUM LEAK DETECTION SERVICES INC.**

Has demonstrated his knowledge, proficiency and evidence of continued satisfactory performance in the following nondestructive test method and level in accordance with the provisions of the American Society for Nondestructive Testing Inc., recommended practice SNT-TC-1A and Helium Leak Detection Services general practice WP-1 rev1.  
This certificate is valid for the specific category or categories noted and is effective from the date shown.

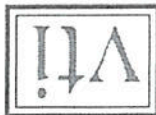


MASS SPECTROMETER LEAK Testing (Detector and Tracer Methods)  
LEVEL III

DATE ISSUED March 1 2012  
EXPIRY DATE March 1 2017

  
BRIAN WEAVER: EXAMINER

Vacuum Technology  
INCORPORATED



Calibration Laboratory  
Certificate No. 1707.01



## CERTIFICATE OF CALIBRATION

Calibration Report Number: 6144-ACAL-COMP-1-66921	Customer: HELIUM LEAK DETECTION SERVICES INC.
16 Glendale Place Cambridge, Ontario CANADA N1S3J1	Customer Purchase Order Number: CC-Yelman
	Order Number: 11833

MODEL NUMBER AND/OR DESCRIPTION  
GPP-8-He-118T-110CC  
SERIAL NUMBER  
6144

### CALIBRATION RESULTS

The unit specified was calibrated using the procedure defined below and conforms to the requirements of the customer's purchase order.

### METHODS AND EQUIPMENT

The unit was calibrated by a traceable comparison against a primary transfer standard on an Automated AERO VAC Mass Spectrometer System (AutoCal) using Calibration Procedure VTI-QAP-11-001, Rev E. Procedures used are in accordance with ISO/IEC 17025:2005, ISO/IEC Guide 25, Military Standard 45662A, and ANSI/NCSL Z540-1-1994, which supersedes Military Standard 45662A.

### MEASUREMENT TRACEABILITY

All measurement and test equipment (M&TE) as well as all primary transfer standards are calibrated traceable to NIST. The Calibrated Leak Lab maintains all relevant calibration records for the M&TE and primary transfer standards used. Spinning Rotor Gauges and Capacitance Manometers are calibrated traceable to NIST. Temperature measurement devices and reference volumes are traceable through accredited calibration sources. Time measurements are traceable through the U.S. Naval Observatory Master Clock.

### MEASUREMENT UNCERTAINTY

The total estimated measurement uncertainty for this calibration, as reported on Page 2 of this Certificate of Calibration, reflects a coverage factor of 2 (k=2). The reported estimated measurement uncertainty is calculated in accordance with NIST Technical Note 1297, 1994 Edition, *Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results*.

Calibration Lab Technician

Calibration Lab Approver

Date: 10-Jul-2012



# Vacuum Technology INCORPORATED

## CERTIFICATE OF CALIBRATION

### Vacuum Technology Inc.

1003 Alvin Weinberg Drive  
Oak Ridge, TN 37830  
Phone:(865)481-3342

Accu-Flow Calibrated Leak

Model #: GPP-8-He-118T-110CC  
Element : 7740 Pyrex  
Fill Gas: Helium

Serial #: 6144  
Fill Pressure: 65 psig  
Volume: 110cc

#### Calibration Data

LR =  $3.99 \times 10^{-4}$  atm-cc/s into vac. at 22.1°C  
n =  $1.60 \times 10^{-12}$  mol/s ( $\pm 6.73\%$ ) (k=2)  
Depletion Rate: 0.2% Per Year  
Calibration Date: Jul 10, 2012  
Temp Coeff: 4.0% per °C

#### Warning!!

Do not exceed 100°C during bakeout!

VTI Recalibration Service

Phone:(865)481-3342

Email:sales@vacuumtechnology.com

For permeation leaks, the Isolation valve

should be left open when not in use

to prevent saturation of the glass element.

Calibration Report Number	6144-ACAL-COMP-1-66921
---------------------------	------------------------

Customer	HELIUM LEAK DETECTION SERVICES INC.	Order ID	11833
----------	-------------------------------------	----------	-------

Purchase Order	CC - Yetman	Recalibration ID	
----------------	-------------	------------------	--

Pressure Measurement Equip.		Volume Standard	
Manufacturer	-	Manufacturer	-
Model#	-	Model#	-
Serial#	-	Serial#	-
Report # :	-	Report # :	-
Cal Date :	-	Cal Date :	-
Cal Due :	-	Cal Due :	-

Primary Transfer Flow Standard		Temperature Measurement Equip.	
Manufacturer	VTI	Manufacturer	Athens
Leak Model#	CLP-8-1P-He-4MVGR-110CC-IHS	Model#	16C-B-S-B-30-00
Leak Serial#	1495	Serial#	1133000139
Report # :	1495- Dec-2011	Report # :	1000311152
Cal Date :	December 16, 2011	Cal Date :	February 1, 2012
Cal Due :	December 16, 2012	Cal Due :	February 1, 2013
Cal Temp (°C):	24.7		
Coeff (%/°C) :	0.0%		
Gas Type	.He		
Q (atm-cc/s)	1.97E-08		

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