

## MATERIAL TRACEABILITY

SALES ORDER NO.

509.5-6

DRWG. NO.

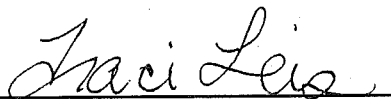
15774A

Nozzles:					
Purpose	Dia. or Size	Material	Nozzle Thk. Nom.	Trace Code	
B VENT	1.050	SB-241-5083	0.113	T062C	
A OUT	4.500	SB-241-5083	0.237	T129C	
B OUT	2.375	SB-241-5083	0.154	T138C	
A IN & B IN	3.500	SB-241-5083	0.216	T187C	
Headers:					
Purpose		Material	Nom. Thk.	Trace Code	
A IN&OUT		SB-209-5083	0.375	S466C	
B IN&OUT		SB-209-5083	0.250	S472C	
End Pieces:					
Purpose	End Type	Material	Nom. Thk.	Trace Code	
B IN	FLAT	SB-209-5083	0.375	S167C	
A IN&OUT	FLAT	SB-209-5083	1.000	S461C	
B OUT	FLAT	SB-209-5083	0.375	S546C	

THE MATERIAL CERTIFICATION USED IN THE FABRICATION OF THE CORE OF THE ABOVE ASSEMBLY CONTAINS RESTRICTED INFORMATION.

THEREFORE IT IS COMPANY CONFIDENTIAL, AND CANNOT BE DIVULGED TO THE CUSTOMER OR ANY THIRD PARTY.

ALL MATERIALS USED MEET THE SPECIFICATIONS AND THE MANUFACTURING CODE AS STATED ON THE DRAWING.



Traci A. Leis  
Documentation Coordinator

# BRITISH ALUMINIUM TUBES

A Division of British Aluminium Limited  
 Studley Road, Redditch, Worcester B98 7HN, England  
 Telephone (01527) 484500, Facsimile (01527) 484501

Consignee

ANVIL ALLOYS INTERNATIONAL LTD B/E  
 ANVIL HOUSE  
 VALE INDUSTRIAL PARK  
 TOEPITS LANE  
 WATFORD HERTS  
 WD1 8QP

Size / Description

SEAMLESS DRAWN TUBE - 26.700MM OD X 2.670MM WT

Your Order No : 10519  
 Our Order No : 76397  
 Packing Note No : 78286  
 Date : 10 May 2000  
 Packages : 1 BUNDLE

Specification

5083 0  
 ASMESB241

THE MATERIAL HAS BEEN  
 MANUFACTURED, SAMPLED,  
 TESTED AND INSPECTED AND  
 MEETS THE REQUIREMENTS OF  
 THE MATERIAL SPECIFICATION

Customer Copy No. 6843/1

Other Tests Passed

## Test Report

### Chemical Analysis %

Cast No.	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Na	Ti	H cc/ 100gm
IE054	.15	.30	.03	.68	4.53	.14		.03	.0010	.02	.11
IE054	.15	.30	.03	.68	4.53	.14		.03	.0010	.02	.11

### Tensile Test

No of Pieces	Net Weight	Lot or Test No.	0.2% Proof Stress KSI	Tensile Strength KSI	% Elongation 2in
9	68	17754	21.32	44.24	17
42	317	17753	21.32	40.32	16

TW METALS  
 TEST  
 MAR 15 2002  
 REPORTS  
 ACCEPTED BY

Reviewed  
 TÜV SÜDDEUTSCHLAND Bau und Betrieb GmbH  
 Notified Body  
 Equipment Directive 97/23/EC  
 Testing Laboratory

MAR 31 2005

Remarks: 5083/ALMG4-5M  
 TEST CERTS TO EN10204.3.1B. ASME CONFORMITY STATEMENT REQD

The Chemical and Mechanical properties of the material on this test certificate have been checked against the relevant standard and conform in every respect.

Signed:

Date: 11-5-00

ANVIL ALLOYS INT  
 verified true  
 copy of original

(THIS CERTIFICATE CONFORMS TO THE REQUIREMENTS OF EN 10204.3.1B AND DIN 50049.3.1B)

Registered Office: Harbour City, Salford Quays, Manchester M5 2SF, England.  
 Registered in England No. 3081702  
 VAT Registration No. GB 888 2142 28

REVIEWED

10/12/04

PEP OK

**BRITISH ALUMINIUM TUBES**

Sludley Road, Redditch, Worcestershire B98 7HN England  
Telephone 01527 484575 Fax 01527 484501

**FACSIMILE**

TO Rick Valentine FROM Carl Jackson  
COMPANY Anvil Alloys International Ltd  
FAX PAGES 1  
PHONE DATE 10 May 2000  
CC

T-062-C

SUBJECT Order 76397/1, 26.7 x 2.87 x 6000 mm 5083-0, Test Certificate 68743/1

If this message is not correctly received, or any pages are faulty, please telephone the above number immediately.

**Comments:**

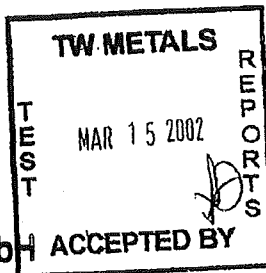
Dear Rick

Nine tubes were shipped on Invoice 15006 against the above order. However, it has come to my notice that there is an error on the line marking for these tubes. In particular, the lot number should be 177754 as stated on Test Certificate 68743/1. The line marking shows the lot number incorrectly as 177755, however, all the other details (including the cast number) in the line marking are correct.

We apologise for this error and the inconvenience that has resulted.

Yours sincerely

Dr C M Jackson  
Technical Manager



REVIEWED

OCT 01 2004 Re

Reviewed

TÜV Süddeutschland Bau und Betrieb GmbH

Notified body for acc. to Pressure

Equipment Directive 97/23/EC

-Testing Laboratory- MAR 31 2005

A Division of British Aluminium Speciality Extrusions and Tubes Ltd  
Registered in England No. 19811395  
Registered Office: The Victoria, Harbour City, Salford Quays, Manchester M5 2SP, England.  
VAT Registration No. GB 668 2147 26

M8308 8044

11/22/04

PAGE 8/8

SENT BY: ANVIL ALLOYS INT;

144 01028 800722

9-NOV-04 13:30;

T-129-C

ALUNNA AG

Uetzer Weg 36 - 59425 Unna

# Abnahmeprüfbescheinigung 3.1 B - EN 10204

## Inspection Certificate 3.1 B - EN 10204 / Certificat de Reception 3.1 B - EN 10204

Kunde /  
Client:

Anvil Alloys International Ltd.

Zugversuchnummer:

Cert No. / No. du certificat:

33098

Bestellnummer:

Order No. / No. de commande:

AUTUMN

Our Reference / Notre référence:

9925/1

Produkt:

Product / Produit:

Specification:

Specification:

Werkstoff:

Alloy/Alliage:

Abmessung:

Size / Dimension:

Konsistenznachweis:

Marking/Markage:

Lieferung:

Delivered Material / Matériau livré:

ASME SB 241

5083

114,300 mm x 102,260 mm x 6,020 mm x 8000,00 mm

1" Sched. 40

ALLUNNA - Cast No. 2447-2 - 4" NB SCH 40 - 5083 - 0 - ASME SB 241

Zustand:

Temper/État:

0

pcs.

lbs

13

935

## 1. Chemische Analyse

## Chemical Analysis / analyse chimique

	Si	Fe	Cu	Mn	Mg	C	Zn	Al	Pb	Zr	Bi	Sr	Ni
Charge/ min.				0,40	4,0	0,05							
Cast No. max.	0,40	0,40	0,10	1,0	4,9	0,25	0,25	0,15					
2447-2/04	0,192	0,323	0,030	0,589	4,705	0,075	0,048	0,022	0,003	0,025	0,0003	0,0017	0,0030
Hydrogen content:	0,12	max/250 g Al											

Elemente ohne Angabe &lt; 0,01 % / Elements without indication &lt; 0,01 %

## 2. Mechanische Eigenschaften

## Mechanical Properties / Valeurs Mécaniques

Anforderungen Requirements	tensile (min) Kst	yield (ReL, 2) Kst	elongation T %	elongation A 5 %	Hardness HB
min.	39,0	16,0	14,0		
max.	51,0				
1	40,890	21,750	26,0		73,9
2	45,530	24,070	22,0		72,2

Reviewed

TÜV Süddeutschland Bau und Betrieb GmbH

Notified Body No. 0053 acc. to Pressure

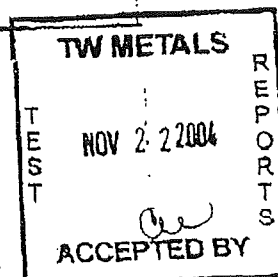
Equipment Directive 97/23/EC

-Testing Laboratory-

MAR 31 2005

12/15/04

REVIEWED

Ergebnis der  
Prüfungen:

Test results:

Résultats:

Es wird bestätigt, daß die Lieferung geprüft wurde und den Vereinbarungen bei der Bestellannahme entspricht.

We confirm that the delivery has been tested and applies to the agreements made on receipt of this order.

Nous confirmons que la livraison a été contrôlée et correspond avec les conventions faites à la réception de la commande.

13.09.2004

/ Seite

Certified acc. to DIN EN ISO 9001:2000, valid until 2005-03-09  
Certificate No.: 051973 QM

Der Werkstoffzustand:

TT:01 0007-60-000

07/16/04

13:41

86306900147

"TW Metals."

0903/003

1783087482 1-16-04

Uelzener Weg 36 - 59425 Unna

## Abnahmeprüfbescheinigung 3.1 B - EN 10204

Inspection Certificate 3.1 B - EN 10204 / Certificat de Reception 3.1 B - EN 10204

Kunde:

Client:

Anvil Alloys International Ltd.

Unit 17, Fishers Ind. Est  
Wiggenhall Rd Watford, Herts WD1 Great Britain

Produkt:

Product / Produit:

Spezifikation:

Specification:

Werkstoff:

Alloy / Alliage:

Abmessung

Size / Dimension

Kennzeichnung

Marking / Marquage:

Lieferung:

Delivered Material / Matériel délivré:

Tubes seamless extruded

ASME SB 241

5083

60,300 mm x 52,510 mm x 3,910 mm x 6000,00 mm

2" NB Sched. 40

Cast No. 1764-3-2" NB-Sch40/5083-0-Asme-SB241-AWU

Zeugnisnummer:

Cert No. / No. du certificat:

Bestellnummer:

Order No. / No. de commande

Auftrag:

Our Reference / Notre Référence

12832

7939/2

Zustand:

Temper / État

0

P02492366

T-138-C

Jenssen

## 1. Chemische Analyse

## Chemical Analysis / analyse chimique

	Si	Fe	Cu	Mn	Mg	Cr	Zn	Ti	Pb	Zr	Bi	Sn	Ni
Charge/ min.				0,40	4,0	0,05							
Cast No. max.	0,40	0,40	0,10	1,0	4,9	0,25	0,25	0,15					
1764-3/04	0,202	0,349	0,033	0,581	4,738	0,106	0,047	0,022	0,003	0,0022	0,0016	0,0015	0,0053
Hydrogen content:	0,12	ccm/100 g Al											

Elemente ohne Angabe &lt; 0,01 % / Elements without indication &lt; 0,01 %

## 2. Mechanische Eigenschaften

## Mechanical Properties / Valeurs Mécaniques

Anforderungen Requirements	tensile (Rm) Ksi	yield (Rp0,2) Ksi	elongation 2" %	elongation A S %	Hardness HB
min.	39,0	16,0	14,0		
max.	51,0				
1	43,645	22,040	20,0		88,1
2	45,095	22,910	20,5		88,2

Reviewed

TÜV Süddeutschland Bau und Betrieb GmbH

Notified Body No. 1001 acc. to Pressure

Equipment Directive 97/23/EC

-Testing Laboratory-

Ergebnisse der

Prüfungen:

Test results:

Résultats:

Es wird bestätigt, daß die Lieferung geprüft wurde und den Vereinbarungen bei der Bestellannahme entspricht

We confirm that the delivery has been tested and applies to the agreements made on receipt of the order  
Nous confirmons que la livraison a été contrôlée et correspond avec les conventions faites à la réception de la commande

29.03.04

/ Siede

Certified acc. to DIN EN ISO 9001:2000, valid until 2006-03-09  
Certificate No.: 001959 QM

T.W. METALS

JUL 16 2004

Der Werkstoffverständige

VIEWED  
DEC 21 2004

PED OK

07/30/04

07:49

6306900147

"TW Metals."

0003/006

M83087483

7-30-04



ALI Unna

Uelzener Weg 36 - 59425 Unna

# Abnahmeprüfbescheinigung 3.1 B - EN 10204

Inspection Certificate 3.1 B - EN 10204 / Certificat de Reception 3.1 B - EN 10204

**Kunde:** Anvil Alloys International Ltd.  
**Client:** Unit 17, Fishers Ind. Est  
 Wiggenshall Rd Wotton, Herts WD1 Great Britain

**Zeugnisnummer:** 13003  
**Order No. / No. de commande:** 8986/1  
**Our Reference/Notre Reference:** 22325

**Produkt:** Tubes drawn seamless

**Product / Produit:**

**Spezifikation:** ASME SB 241

**Specification:**

**Werkstoff:** 5083

**Alloy/Alliage:**

**Abmessung:** 98,900 mm x 77,920 mm x 5,490 mm x 6000,00 mm

**Size / Dimension:** 3" NB SCH 40

**Kennzeichnung:** Cast No. 2083-1 - 3" NB SCH 40 - 5083 - 0 - ASME SB 241 - AWU

**Marking/Markage:**

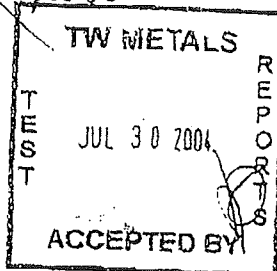
**Lieferung:**

**Delivered Material / Matériel délivré:**

pcs. lbs  
18 917

**Zustand:** 0

**Temper/État:**



## 1. Chemische Analyse

## Chemical Analysis / analyse chimique

	Si	Fe	Cu	Mn	Mg	Cr	Zn	Ti	Pb	Zr	Bi	Sn	Ni
Charge/ min.				0,10	4,0	0,05							
Cast No. max.	0,40	0,40	0,10	1,0	4,9	0,25	0,25	0,15					
2083-1/04	0,160	0,274	0,029	0,530	4,685	0,070	0,050	0,023	0,004	0,0018	0,0001	0,0014	0,0020
Hydrogen content:	0,12	ccm/100 g Al											

Elemente ohne Angabe < 0,01 % / Elements without indication < 0,01 %

## 2. Mechanische Eigenschaften

## Mechanical Properties / Valeurs Mécaniques

Anforderungen Requirements	tensile (Rm) Ksi	yield (Rp0,2) Ksi	elongation 2" %	elongation A 5 %	Hardness HB
min.	39,0	16,0	14,0		
max.	51,0				
1	41,180	20,445	30,0		77,8
2	40,165	21,170	30,0		78,7

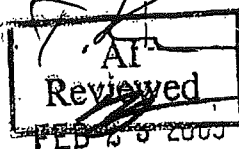
Reviewed

TW Metals International GmbH

Inspection Certificate 3.1 B - EN 10204

Wiggenshall Rd Wotton, Herts WD1 Great Britain

27.05.2004



REVIEWED

FEB 23 2005

PERD OIS

## Ergebnis der Prüfungen:

Es wird bestätigt, daß die Lieferung geprüft wurde und den Vereinbarungen bei der Bestellannahme entspricht

Test results:

We confirm that the delivery has been tested and applies to the agreements made on receipt of the order

Results:

Nous confirmons que la livraison a été contrôlée et correspond avec les conventions faites à la réception de la commande.

27.05.2004 / Since



Certified acc. to DIN EN ISO 9001:2000, valid until 2006-03-09  
 Certificate No.: 001959 QM

Der Werksachverständige

P.07/11 6124287669

T.W. METALS

JUL-16-2004 10:33

83087483

06/006

001/001

04-AUG-84 16:52

~~FROM Elval SA Plant Secur~~

+902262091347

T-259 P.001/001 F-098

**ELVAL**  
HELLENIC ALUMINIUM INDUSTRY S.A.

ATHENS - LAMIA NATIONAL ROAD (57th Km). 32011 NORTA VIOTIA, GREECE  
TEL: +30 2620-32 269, 31503, 32 241

HELLENIC ALUMINIUM INDUSTRY S.A.

FAXC+30 2020-32 236, 52 137, TLX+601-290327, 299324, 299325, 200326

Page : 1

**-MILL TEST CERTIFICATE-**

Q-#F-No : 53084

DATE : 05/04/2004

Customer : COMMONWEALTH - USA  
Order No : 0 0415  
Your Ref. : 5049-06

DOWIDE NR: \_\_\_\_\_  
 Notes: INTERNAL PACKING LIST NR: 00005715  
 ACCORDING TO ARASTA B209/02, ARNE B209/02 AND AMS00A-250/6 SPECIFICATION (MS).  
 TEST REPORT ACC. TO EN 10204/3.1B

## PRODUCTS LIST

A. CHEMICAL ANALYSIS (x)

PRODUCTS LIST															
Ordline	Product Name	Alloy	Temper	Thickn /Step	Width	Length	Coil No	SI	Fe	Mn	Mg	Cu	Ti	Zn	Cr
ALUMINUM SHEETS															
0041501		5083	-O-	9.5250 Inches = .37500	1524.00	3657.60 60.000 144.000	040180401	.12	.35	.49	4.24	.025	.014	.016	.208
0041502		5083	-O-	12.7000 Inches = .50000	1524.00	3657.60 60.000 144.000	040180501	.12	.35	.49	4.24	.025	.014	.016	.208

## 2. MECHANICAL PROPERTIES

Heat No	Coil No	Test No	Posit	RPM N/mm2	NO2 N/mm2	ELONG %
04201630	040160401	1630	AL	311.0	188.6	16.5
			Kai :	45.039	27.349	
04201630	040160501	2639	AL	308.4	159.6	17.7
			Ksi :	44.432	23.144	

Quality Control Department

**D. MEITSOPOLDS**

Art. SIREA Di BONO

B.R

K. MAZURKUS

AI  
Reviewed

~~DEC 02 2004~~

RED OK

Reviewed

Reviewed  
TÜV Süddeutschland Bau und Betrieb GmbH

Notified Body No. 0035 acc. to Pressure

Equipment Directive 97/23/EC

**-Testing Laboratory-**

MAR 31 2005

REVIEWED

02 25

TW METALS  
TEST  
AUG 04 2004  
REPORTS  
ACCEPTED BY

三、

10/15/2004 13:40

6306900147

TWMETALS

PAGE 03/03

14/10 2004 18:05 FAX +30 22620 53683

ELVA S.A./V. GRIMANIS

001/001

M49107483 10-150

ATHENS - LAMIA NATIONAL ROAD (57th Km), 32011 INORITA VIOTIA, GREECE  
TEL: +30 22620-32 269, 31503, 32 241

HELLENIC ALUMINIUM INDUSTRY S.A.

FAX: +30 22620-32 236, 32 237. TLX: +601-299327, 299324, 299325, 299326

## - MILL TEST CERTIFICATE -

Crtf No : 55717  
DATE : 19/06/2004Customer : COMMONWEALTH - USA  
Order No : 0 1883  
Your Ref : 6310-06INVOICE NR:95005100  
Notes : INTERNAL PACKING LIST NR:80010662 PD M4907483  
ACCORDING TO AA, ASTM B209-04, AMS-88A-250/6 AND AEME B209 SPECIFICATIONS.

TEST REPORT ACC TO EN 10204/3.1B

S-472-C

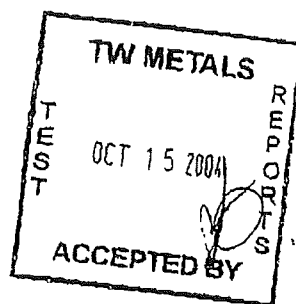
P02491884  
12/16/04

PRODUCTS LIST							A. CHEMICAL ANALYSIS (%)									
OrdLine	Product Name	Alloy	Temper	Thickn /Step	Width	Length	Coil	No	Si	Fe	Mn	Mg	Cu	Ti	Zn	Cr
0188301	ALUMINIUM SHEETS	5083	-0-	6.3500	1524.00	3657.60	040555201		.12	.33	.60	4.77	.029	.015	.016	.092
			Inches :	.25000	60.000	144.000										

## B. MECHANICAL PROPERTIES

Heat Nr	Coil	No	Test No	Posit	RPW N/mm2	R02 N/mm2	ELONG %
04201620	040555201		4563	AL	310.4	171.8	20.6
				Ksi :	45.012	24.913	

Quality Control Department

PIP  
D. PROTSOPOLLOS

REVIEWED

PEN BK

Reviewed

TWMETALS

MAR 31 2005

J. R.

MAR 31 2005

04/03/05



S-167-2



M4906878  
10-28-02  
28

AMENDED TEST CERT

CORUS

INSPECTION CERTIFICATE / TEST REPORT / CHIN 5049/3.1 (EN 10049.1B)

NO.: 0477723

PAGE: 1

PURCHASER: CORUS ALUMINIUM WÄLZPRODUKTE

ORDER NO. MAN.: 64625

SCHALMIDT

SPEC.: ASTM B 209

ORDER REF. PURCH. 19724024M 4906878/TW METALS

ALLOY/TEMPER: 5083 O

THICK: 0.100" 250005

PRODUCT: PLATE

QUANTITY: 49

DIMENSIONS: 7'10" x 121'9" x 3042'00" mm  
0.375" x 46'00" x 120'00" in

P62419096  
LINE 8905  
2/17/03

RESULTS:

Mechanical properties:

Pl. No.	Spec. No.	T.S.	U.T.S.	EL.	Reduction of area	Tensile strength
		N/mm <sup>2</sup>	N/mm <sup>2</sup>	%	%	(KMPa) 1/cm
Min. L <sub>0</sub>		122	276	16.0		
Max. L <sub>0</sub>		199	301			
1		196	308	24.9		
2		179	302	24.5		
3		197	310	34.7		

Chemical composition: In % , transducer Al

Cast No.: 1-02-20073

Si	Fe	Cu	Mn	Mg	Cr	Zn	Ti	B
0.280	0.230	0.057	0.664	4.350	0.024	0.080	0.0293	0.0011
Zr	Pb	Ni	Sn	Be	Na	Li	P	
0.0077	0.0028	0.0051	0.0024	0.0020	0.0002	0.0000	0.0057	
Al	Ti	Ti+Zr	Ca/Mg					
		0.037						

Reviewed

TÜV Süddeutschland Bau und Betrieb GmbH

REVIEWED

Remarks:

Equipment Directive 97/23/EC

Testing Laboratory

MAR 31 2005

FEB 14 2003

MATERIAL ALSO MEETS THE REQUIREMENTS OF AMS-QQ-A-250/3

AND ASTM B 209 - 2001

THIS MATERIAL HAS BEEN MANUFACTURED IN ACCORDANCE TO SPEC. ASTM B 209 - 2001

Koblenz, the 13.10.02 AL

Quality assurance

THIS TEST CERT HAS BEEN ISSUED AND TRANSMITTED BY EDP, IT IS VALID WITHOUT SIGNATURE. ORIGINAL TEST CERT WITH SIGNATURE ON FILE.

TW METALS  
TEST  
OCT 28 2002  
ACCEPTED BY  
REPORTS

2/14/03

49068783



# CERTIFIED INSPECTION REPORT

Alcoa inc.

PITTSBURGH, PA DAVENPORT WORKS  
Ship From RIVERDALE, IA.

Page 2

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 met the composition limits and had the mechanical properties shown on the face of this sheet.

*Mark J. Vrabec*  
Mark J. Vrabec  
Director of Manufacturing Davenport Works

*Kenton P. Young*  
Kenton P. Young  
Quality Assurance Manager

292305 Ship Date  
2004-10-20  
293014 B.L. No.  
62091  
P.O. No./Govt Contract No.  
M 49110679

Invoice No.  
55823  
Alcoa No. Item  
DS-79148-1

Customer

TW METALS-CINCINN

9-4610

Lot: 661993 - Mechanical, Physical, Metallography, Quantometer Results (cont.)  
Cast Number H258208B  
Chemical SI FE CU MN MG CR ZN TI  
Actuals .08 .15 .07 0.67 4.8 .08 .01 .02

Reviewed

TÜV SÜDDEUTSCHLAND BAU UND BETRIEB GmbH

Notified body No. 0106 acc. to Pressure

Equipment Directive 97/23/EC

-Testing Laboratory-

MAR 31 2005

*T.R.*

REVIEWED

NOV 10 2004

TW METALS	REPORTS
TEST	OCT 22 2004
ACCEPTED BY	<i>Bu</i>

# CERTIFIED INSPECTION REPORT

**Alcoa**

PITTSBURGH, PA DAVENPORT V

Ship From: RIVERDALE, IA.

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 met the composition limits and had the mechanical properties shown on the face of this sheet.

*Mark J. Viablos*  
Director of Manufacturing Davenport Works

*Karlton P. Young*  
Quality Assurance Manager

Page

353191 48023  
Ship Date B.L. No.  
2005-02-18 69926  
P.O. No./Govt Contract No. Customer  
M 49119837 TW METALS-ROGERS

Ship To: TW METALS  
14600 JAMES RD.  
ROGERS, MN 55374

Item Description  
.3750 IN TK X 60.000 IN W X 144.0000 IN LN (N) A/T 5083-  
O STORAGE TANK & CRYOGENIC PLATE MILL FINISH ITEM 11453. PER ASME-  
SB-209 REV A99 & EXCEPT MARKING AMS-QQ-A-  
25076 & EXCEPT MARKING ASTM209 REV 04 &  
EXCEPT MARKING AMS4056 REV F DIMENSIONAL  
TOLERANCES F ANS135.2 REV 2003  
((MARKED)) PAPER INTERLEAVED  
SKID WGT: 6000 LB QUAN TOL +/-30  
& CQR 0153045 REV 01 CUST REQ 05-02-  
14 \*\*\* W/E 05-02-26 \*\*\*

PO 2492035  
55460  
RS 3-3-05

Num	Package Ticket	Lot	Weight	Quantity	UOM	Pc Id/Serl
1	256683	733811	6680	21	PC	
2	256733	733811	2867	9	PC	
3	256733	733812	3823	12	PC	
4	256865	733812	4138	13	PC	
			17508	55		

MAR 01 2005

Notes for CQR: 0153045.1 . . .  
PRODUCT PRODUCED AND MARKED TO THE REQUIREMENTS OF AMS-QQ-A-250/6 ALSO MEETS THE REQUIREMENTS OF QQ-A-250/6G. PRODUCT  
PRODUCED AND MARKED TO THE REQUIREMENTS OF QQ-A-250/6G ALSO MEETS THE REQUIREMENTS OF AMS-QQ-A-250/6.

CQR: 0153045.1 -Specification Limits

Temp Dir	Longitudinal	Max	Min	UTS	KSI	EL4D	PCT
		51.0	40.0	18.0	29.0	16	

Chemical Composition

SI	FE	CU	MN	MG	CR	ZN	TI	Each	Total
Max	.40	.40	.10	1.0	4.9	.25	.15	.05	.15
Min				.40	4.0	.05			

Alloy 5083

Lot: (733811) -Mechanical, Physical, Metallography, Quantometer Results

Temp Dir	Longitudinal	6	Max	Min	UTS	KSI	EL4D	PCT
			44.3	20	29.9			
			43.2	19.3	28.4			

Reviewed  
TUV SÜDPRÜFUNG Gmbh und Betrieb GmbH

Notified under No. 010100010 Pressure

Equipment Directive 97/23/EC  
TUV SÜDPRÜFUNG LABORATORY  
MAR 31 2005

TW METALS  
REPORTS  
FEB 21 2005  
V

ACCEPTED BY

MAR 03 2005

RS 120 OK

# CERTIFICATE OF INSPECTION REPORT

Alcoa IC.

PITTSBURGH, PA DAVENPORT RKS  
Ship From: RIVERDALE, IA.

Page 2

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 met the composition limits and had the mechanical properties shown on the face of this sheet.

Per:

*Mark J. Vrabec*

Mark J. Vrabec  
Director of Manufacturing Davenport Works

*Kurtis P. Young*

Kurtis P. Young  
Quality Assurance Manager

353191  
Ship Date  
2005-02-18  
P.O. No./Govt Contract No.  
M 49119837

48023  
B.L. No.  
59926  
Customer  
TW METALS-ROGERS

Alcoa No. Item  
DS-82366-1

Lot: 733811 - Mechanical, Physical, Metallography, Quantometer Results (cont.)

Cast Number: H286702A  
Chemical SI FE CU MN MG CR ZN TI  
Actuals .09 .23 .04 0.58 4.5 .08 .02 .02

Lot: 733812 - Mechanical, Physical, Metallography, Quantometer Results

Temp Dir No. Test UTS KSI TYS KSI EL4D PCT  
Longitudinal 6 Max 43.5 20.4 30.8  
Min 42.9 18.9 27.2  
Cast Number Chemical SI FE CU MN MG CR ZN TI  
Actuals H2946033 .11 .24 .04 0.59 4.5 .09 .02 .02

Reviewed

*[Signature]*

MAR 31 2005

*[Signature]*

MAR 04 2005

REVIEWED

MAR 03 2005

TW METALS

REPORTS

TEST

FEB 21 2005

ACCEPTED BY

PO 2492035  
55460  
PT 3-3-05

## MATERIAL TRACEABILITY

SALES ORDER NO.

509.6-7

DRWG. NO. 15774Z

Interconnecting Piping:		
Description	Material	Trace Code
1.315" x .180" PIPE	SB-241-5083	T190C
3.5" x .216" NOZZLE	SB-241-5083	T194C
4" 40S 90LR .216W ELBOW	SB-241-5083	W810C
3" 40S 90LR .237W ELBOW	SB-241-5083	W834C

83086664

12304

Test Report

# BRITISH ALUMINIUM TUBES

Division of British Aluminium Specialty Extrusions and Tubes Ltd.  
 Sturley Road, Redditch, Worcester B98 7LN, England  
 Telephone (01527) 484600, Facsimile (01527) 484601

Customer Gally No. 734094

Order Reference

Your Order No : 10737  
 Our Order No : 77261  
 Packing Note No : 32332  
 Date : 14 Feb 2001  
 Packages : 1 BUNDLE

CUSTOMER  
 ANYAL ALLOYS INTERNATIONAL LTD B/E  
 ANVIL HOUSE  
 VALE INDUSTRIAL PARK  
 TOLPITS LANE  
 WATFORD HERTS  
 WD1 8QP

THE MANUFACTURER OF CONFORMITY  
 THE MANUFACTURER HAS BEEN INDEPENDENTLY  
 TESTED AND APPROVED AND MEETS THE REQUIREMENTS  
 OF THE NATIONAL CERTIFICATION

PO 2507127  
 T1900  
 P5 3 3-05

Specification  
 1012  
 ASME B36.10

Size / Description  
 SEAMLESS DRAWN TUBE - 13.400MM OD X 4.550MM WT

Chemical Analysis %

No of Pieces	Net Weight	Tensile Test			% Elongation 2in
		Last or Test No.	0.2% Proof Stress KSI	Tensile Strength KSI	
26	368	117285	20.51	45.98	21

Chemical Analysis %

Cst No.	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Na
3E264	.13	.28	.02	.69	4.50	.13		.02	<0.0001

Ti

.02

.13

TW METALS  
 JAN 23 2004  
 TEST REPORT  
 ACCEPTED BY

MAR 03 2005  
 P5 3-3-05  
 PEG

Reviewed TEST CERTS TO EN10607.10 ASME CONFORMITY STATEMENT REQ  
 WT + TOL GUIDANCE ONLY (MAGNIFIED) 5083/ALMGH-3M1

TUV Súddeutsches Bau und Betrieb GmbH

Notified Body No. 0005 acc. to Pressure

Equipment Directive 97/23/EC

Testing Laboratory  
 Registered Office: The Victoria, Harrogate, North Yorkshire, N.Y.S. 22 2005  
 VAT Registered No. GB 658 314255

The Chemical and Mechanical Properties of the material on which this certificate is based have been checked against the relevant standard and found to be in conformity.  
 Signed: [Signature]  
 Date: 15-2-01

For full details of the requirements of EN 10204 3.1B and 3.10.1

(THIS CERTIFICATE CONFORMS TO THE REQUIREMENTS OF EN 10204 3.1B AND 3.10.1)

IN 8308 8270

12/28/04 C

ALUMINA AG

Uelzener Weg 36 59425 Unna

**Abnahmeprüfbescheinigung 3.1 B - EN 10204****Inspection Certificate 3.1 B - EN 10204 / Certificat de Reception 3.1 B - EN 10204****Kunde:**  
Client:

Anvil Alloys International Ltd.

**Zeugnisnummer:**

second edition

Cert No. / No. du certificat:

**Bestellnummer:**

13145

Order No. / No. de commande

**Auftrag:**

10376/1

Our Reference/Notre Reference:

**Produkt:**

Product / Produit:

**Spezifikation:**

Specification:

ASME SB 241

**Werkstoff:**

Alloy/Alliage:

EN AW-5083

**Zustand:**

Temper/Etat

**Abmessung**

Size / Dimension

88,900 mm x 77,920 mm x 5,490 mm x 6000,00 mm

**Kennzeichnung**

Marking/Marquage:

Case No. 2492-1-3" NB-Sch40-5083-0-ASME-SB241-AWU

**Lieferung:**

Delivered Material / Matériel délivré:

pcs.

kg

24

547

**1. Chemische Analyse****Chemical Analysis / analyse chimique**

	Si	Fe	Cu	Mn	Mg	Cr	Zn	Ti	Pb	Zr	Bi	Sn	Ni
Charge/ min.				0,40	4,0	0,05							
Cast No. max.	0,40	0,40	0,10	1,0	4,9	0,25	0,25	0,15					
2492-1/04	0,280	0,288	0,043	0,557	4,625	0,077	0,047	0,023	0,003	0,0035	0,0005	0,0015	0,0030

Hydrogen content: 0,12

ccm/100 g Al

Elemente ohne Angabe &lt; 0,01 % / Elements without indication &lt; 0,01 %

**2. Mechanische Eigenschaften****Mechanical Properties / Valeurs Mécaniques**

Anforderungen Requirements	tensile (Rm) Ksi	yield (Rp0,2) Ksi	elongation 2" %	elongation A 5 %	Hardness HB
min.	39,0	16,0	14,0		
max.	51,0				
1	43,500	20,735	22,0		69,8
2	43,790	21,170	20,0		70,6

REVIEWED

MAR 11 2005

TÜV SÜDDEUTSCHLAND

GmbH

Notified Body No. 0036 acc. to Pressure

Equipment Directive 97/23/EC

APR 22 2005

**-Testing Laboratory-****Ergebnis der Prüfungen**

Es wird bestätigt, daß die Lieferung geprüft wurde und den Vereinbarungen bei der Bestellannahme entspricht

We confirm that the delivery has been tested and applies to the agreements made on receipt of the order

Nous confirmons que la livraison a été contrôlée et correspond avec les conventions faites à la réception de la commande

Test results:

Resultats:

Certified acc. to DIN EN ISO 9001:2000, valid until 2006-03-09

ST/0815

2005-03-09



CERTIFIED MATERIAL TEST REPORT  
AND CERTIFICATE OF COMPLIANCE  
FLOWLINE DIVISION - MARKOVITZ ENTERPRISES  
P.O. BOX 7027, NEW CASTLE, PA 16107  
(724) 658-3711 \*\* COMMERCIAL \*\*

PAGE

3/30/04

INCO FLANGE & FITTING, INC.  
5114 STEADMONT DRIVE  
HOUSTON, TX 77040

OUR ORDER NO. 11-8754-00  
CUST ORDER NO. 39277-8-0  
MARK LINE 1  
MARK LINE 2  
DATE 3/23/04  
Q.A. APPROVED BY Helinda Allen

W-810-C

PRODUCT NO. 88680 THIS NUMBER MARKED ON FITTINGS  
DESCRIPTION 4 408 5083-0 90 LR WPS  
ITEM SPEC B361-02 B16.9-01 MN .40-1.0 CR .05-.25 CU .10 TENSILE PSI 39,000 MIN  
YIELD PSI 16,000 MIN  
ELONG, % 14.00 MIN  
BASE MATL B241 TI .15  
ZH .25  
SPEC RANGE (MAX, UNLESS SHOWN) SI .40 FE .40  
MG 4.0-4.9

ORIG. HEAT NO. 218563

TYPICAL CHEMICAL AND MECHANICAL PROPERTIES ARE AS NOTED FOR THE ALLOY PURCHASED.

THIS CERTIFICATE COMPLIES WITH EN 10204 3.1.B.  
THE QUALITY SYSTEM UNDER WHICH THESE ITEMS WERE MANUFACTURED, INSPECTED AND TESTED COMPLIES  
WITH ISO 9001:2000 CERTIFICATE NO. CERT-3976-2002-AQ-HOU-KVA/RAB REV.2.

THIS TEST REPORT REPRESENTS THE ACTUAL ATTRIBUTES OF THE ITEMS FURNISHED AND ALL ITEMS WERE  
MANUFACTURED, SAMPLED, INSPECTED, AND TESTED IN FULL COMPLIANCE WITH APPLICABLE  
SPECIFICATIONS AND YOUR ORDER NUMBER.

Reviewed

TÜV Süddeutschland Bau und Betrieb GmbH

Notified Body No. 0036 acc. to Pressure

Equipment Directive 97/23/EC

-Testing Laboratory-

APR 22 2005

T.R.

REVIEWED

MAR 30 2004 R

102465011

me

4/13/04

TO: MCO FLANGE & FITTING, INC.  
5114 STEADHUNT DRIVE  
HOUSTON, TX 77040

OUR ORDER NO. 11-8937-00  
CUST ORDER NO. 394950  
MARK LINE 1 394950  
MARK LINE 2  
DATE 4/06/04  
Q.A. APPROVED BY Melinda Allen

PRODUCT NO. 88816 THIS NUMBER MARKED ON FITTINGS

DESCRIPTION 3 40S 5083-0 90 LR

ITEM SPEC B361-02 B16.9-01 MN .40-1.0

BASE MATL B241

SPEC RANGE (MAX, UNLESS SHOWN) SI .40 FE .40  
MG 4.0-4.9

TENSILE PSI 39,000 MIN  
YIELD PSI 16,000 MIN  
ELONG. % 14.00 MIN

W-834-C

ORIG. HEAT NO. 218563

TYPICAL CHEMICAL AND MECHANICAL PROPERTIES ARE AS NOTED FOR THE ALLOY PURCHASED.

THIS CERTIFICATE COMPLIES WITH EN 10204 3.1.B.

THE QUALITY SYSTEM UNDER WHICH THESE ITEMS WERE MANUFACTURED, INSPECTED AND TESTED COMPLIES WITH ISO 9001:2000 CERTIFICATE NO. CERT-3976-2002-AQ-HOU-RVA/RAB REV.2.

PRODUCT NO. 88817 THIS NUMBER MARKED ON FITTINGS

DESCRIPTION 3 40S 5083-0 45 LR

ITEM SPEC B361-02 B16.9-01 MN .40-1.0

BASE MATL B241

SPEC RANGE (MAX, UNLESS SHOWN) SI .40 FE .40  
MG 4.0-4.9

TENSILE PSI 39,000 MIN  
YIELD PSI 16,000 MIN  
ELONG. % 14.00 MIN

W-835-

ORIG. HEAT NO. 218563

TYPICAL CHEMICAL AND MECHANICAL PROPERTIES ARE AS NOTED FOR THE ALLOY PURCHASED.

THIS CERTIFICATE COMPLIES WITH EN 10204 3.1.B.

THE QUALITY SYSTEM UNDER WHICH THESE ITEMS WERE MANUFACTURED, INSPECTED AND TESTED COMPLIES WITH ISO 9001:2000 CERTIFICATE NO. CERT-3976-2002-AQ-HOU-RVA/RAB REV.2.

THIS TEST REPORT REPRESENTS THE ACTUAL ATTRIBUTES OF THE ITEMS FURNISHED AND ALL ITEMS WERE MANUFACTURED, SAMPLED, INSPECTED, AND TESTED IN FULL COMPLIANCE WITH APPLICABLE SPECIFICATIONS AND YOUR ORDER NUMBER.

Reviewed

TÜV Süddeutschland Bau und Betrieb GmbH

Notified Body No. 0005 for Pressure

Equipment Directive 97/23/EC

-Testing Laboratory-

APR 22 2005

T. R.

REVIEWED

me

## MATERIAL TRACEABILITY

SALES ORDER NO.

509.7-8

DRWG. NO. 15774Y

Tank Assembly:		
Description	Material	Trace Code
6.625" x .280" NOZZLE	SB-241-5083	T128C
4.500" x .237" NOZZLE	SB-241-5083	T172C
3.500" x .216" NOZZLE	SB-241-5083	T194C
1.500" PLATE	SB-209-5083	S498C
1.500" PLATE	SB-209-5083	S520C
.375" PLATE	SB-209-5083	S547C

SENT BY: ANVIL ALLOYS INT;

01929 800722 ; 8-NOV-04 13:28;

PAGE 4/8

P-128-C

ALUNDA AG

Uetziener Weg 36 - 59425 Unna

## Abnahmeprüfbescheinigung 3.1 B - EN 10204

Inspection Certificate 3.1 B - EN 10204 / Certificat de Reception 3.1 B - EN 10204

Kunde:  
Client:

Anvil Alloys International Ltd.

Zeugnisnummer:

Cert No. / No. du certificat:

Bestellnummer:

12910

Order No. / No. de commande:

Anfrage:

0658/1

Our Reference/Notre Référence:

Produkt:

Product / Produit:

Spezifikation:

Specification:

Werkstoff:

Alloy/Alliage:

Abmessung:

Size / Dimension:

Kennzeichnung:

Marking/Parage:

Lieferung:

Delivered Material / Matériel délivré:

Unit 17, Fishers Ind Est  
Wiggenhall Rd Walsford, Herts WD1 Great Britain

Tubes seamless extruded

ASME SB 241

5083

188,280 mm x 154,080 mm x 7,110 mm x 6000,00 mm

6" NB Sched 40

Cert No. 2114-1-6" NB Sched 40/5083-0-ASME-SB241-AWU

Zustand:

Temperatur:

0

pos.

lbs

10

1281

## 1. Chemische Analyse

## Chemical Analysis / analyse chimique

	Si	P	Cu	Mn	Mg	Cr	Zn	Ti	Pb	Zr	Bi	Sn	Ni
Charge min.				0,40	4,0	0,05							
Cert No. max.	0,40	0,48	0,18	1,0	4,9	0,25	0,25	0,15					
2114-1/04	0,163	0,281	0,023	0,534	4,695	0,077	0,006	0,022	0,002	0,0021	0,0003	0,0015	0,0030

Hydrogen content: 0,12 cm<sup>3</sup>/100 g Al

Elemente ohne Angabe &lt; 0,01 % / Elements without indication &lt; 0,01 %

## 2. Mechanische Eigenschaften

## Mechanical Properties / Valeurs Mécaniques

Anforderungen Requirements	tensile (Rm) Ksi	yield (R <sub>0.2</sub> ) Ksi	elongation Z <sup>1</sup> %	elongation A %	Hardness HB
min.	39,0	16,0	14,0		
max.	51,0				
1	45,965	26,825	20,5		75,2
2	43,935	26,825	22,0		75,3

TW METALS

NOV 22 2004

ACCEPTED BY

REPORTS

Reviewed

TÜV Süddeutschland Bau und Betrieb GmbH

Notified Body No. 0036 acc. to Pressure

Equipment Directive 97/23/EC

-Testing Laboratory- APR 22 2005

Ergebnis der  
Prüfung:

Test results:

Results:

Es wird bestätigt, daß die Lieferung geprüft wurde und den Vereinbarungen bei der Bestellannahme entspricht

We confirm that the delivery has been tested and applies to the agreements made on receipt of the order

Nous confirmons que la livraison a été contrôlée et correspond avec les conventions faites à la réception de la commande

24.05.2004

/ Stufe

Conform to: EN 10204-2003, valid until 2008-03-09  
Certificate No.: 091979 QM

Der Werkstoffverständige

ch/s 9  
h08808

M8308 8044 11/22/04

+44 01923 800722 ; 9-NOV-04 13:30;

PAGE 8/8

SENT BY: ANVIL ALLOYS INT;



Uelzener Weg 36 - 53425 Unna

# Abnahmeprüfbescheinigung 3.1 B - EN 10204

## Inspection Certificate 3.1 B - EN 10204 / Certificat de Reception 3.1 B - EN 10204

Kunde / Client:

Anvil Alloys International Ltd.

Unit 17, Rokers Ind. Est  
Wiggenhall Rd Walsley, Herts WD1. Great Britain

Zugnummer / No. du certificat:

2008

Bestellnummer / Order No. / No. de commande

9925/1

Anzahl / Our Reference / Notre référence

Produkt / Product:

Tubes seamless extruded

Spezifikation / Specification:

ASME SB 241

Werkstoff / Alloy/Alage:

5083

Zustand / Temperature

Abmessung / Size / Dimension

114,300 mm x 102,360 mm x 6,020 mm x 9900,00 mm  
4" Schrot. 40

Kennzeichnung / Marking/Markings:

ALLInna - Cast No. 2447-2 - 4" N6 SCH 40 - 5083 - 0 - ASME SB 241

Lieferung / Delivery:

Delivered Material / Matériel délivré:

pcs.  
13lbs  
935

## 1. Chemische Analyse

## Chemical Analysis / analyse chimique

	C	Fe	Cu	Mn	Mg	Si	Ni	Pb	S	Bi	M
Charge / min.				0,10	4,0	0,05					
Cast No. max.	0,40	0,40	0,10	1,0	4,0	0,25	0,25	0,15			
2447-2/04	0,102	0,323	0,038	0,089	4,705	0,076	0,018	0,023	0,003	0,0017	0,0030
Hydrogen content:	0,12	max/1000 g Al									

Elemente ohne Angabe &lt; 0,01 % / Elements without indication &lt; 0,01 %

## 2. Mechanische Eigenschaften

## Mechanical Properties / Valeurs Mécaniques

Anforderungen / Requirements	tensile (min) ksi	yield (Rp0.2) ksi	elongation 2" %	elongation 5" %	Hardness HB
min. mm.	29,0 51,0	16,0	14,0		
1	40,800	21,750	26,0		73,9
2	45,530	24,070	22,0		72,2

Reviewed

TÜV Süddeutschland Bau und Betrieb GmbH

Notified body No. 18 acc. to Pressure

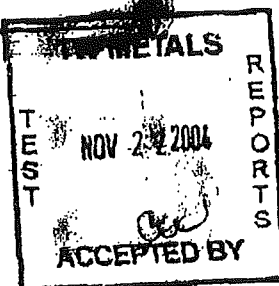
Equipment Directive 97/23/EC

Testing Laboratory

APR 22 2005

REVIEWED

JAN 25 2005



Ergebnis der Prüfung / Test results / Results:

Es wird bestätigt, daß die Lieferung geprüft wurde und den Vereinbarungen bei der Bestellannahme entspricht.  
We confirm that the delivery has been tested and applies to the agreements made on receipt of the order.  
Nous confirmons que la livraison a été contrôlée et correspond avec les conventions faites à la réception de la commande.

13.09.2004

/ Seite

Certified acc. to DIN EN ISO 9001:2000, valid until 2005-03-08  
Certification No. 000709 QM

Der Werkstoffverständliche

TT: 00010007 - 00111111

6306900147 11/22/04

1183088270

12/28/04 Cu



ALUMINA AG

Uelzener Weg 36 - 59425 Unna

## Abnahmeprüfbescheinigung 3.1 B - EN 10204

Inspection Certificate 3.1 B - EN 10204 / Certificat de Reception 3.1 B - EN 10204

**Kunde:** Anvil Alloys International Ltd.  
**Client:** Unit 17, Fishers Ind. Est  
 Wigganhall Rd Watford, Herts WD1 Great Britain  
**Produkt:** Tubes drawn seamless  
**Product / Produit:** Tubes drawn seamless

**Zeugnisnummer:** second edition  
**Cert No. / No. du certificat:**  
**Bestellnummer:** 13145  
**Order No. / No. de commande:**  
**Auftrag:** 10376/1  
**Our Reference/Notre Reference:**

**Spezifikation:**  
**Specification:**

ASME SB 241

**Werkstoff:**  
**Alloy/Alliage:**

EN AW-5083

**Zustand:** 0  
**Temper/Etat:**

**Abmessung:**  
**Size / Dimension:**

88,900 mm x 77,920 mm x 5,490 mm x 6000,00 mm

**Kennzeichnung:**  
**Marking/Marquage:**

Cast No. 2492-1-3" NB Sch 40-5083-0-ASME-SB241-AWU

**Lieferung:**

Delivered Material / Matériel délivré:

pcs. kg  
 24 547

## 1. Chemische Analyse

## Chemical Analysis / analyse chimique

	Si	Fe	Cu	Mn	Mg	Cr	Zn	Ti	Pb	Zr	Bi	Sn	Ni
Charge/ min.				0,40	4,0	0,05							
Cast No. max.	0,40	0,40	0,10	1,0	4,9	0,25	0,25	0,15					
2492-1/04	0,280	0,288	0,043	0,557	4,635	0,077	0,047	0,023	0,003	0,0035	0,0005	0,0015	0,0030

Hydrogen content: 0,12 ccn/100 g Al

Elemente ohne Angabe &lt; 0,01 % / Elements without indication &lt; 0,01 %

## 2. Mechanische Eigenschaften

## Mechanical Properties / Valeurs Mécaniques

Anforderungen Requirements	tensile (Rm) Ksi	yield (Rp0,2) Ksi	elongation 2" %	elongation 5" %	Hardness HB
min.	39,0	16,0	14,0		
max.	51,0				
1	43,500	20,735	22,0		69,8
2	43,790	21,170	20,0		70,6

REVIEWED

Reviewed

TÜV Süddeutschland Bau und Betrieb GmbH

Notified Body No 0036 acc. to Pressure

Equipment Directive 97/23/EC

-Testing Laboratory- APR 22 2005

PEO  
OIC

## Ergebnis der Prüfungen

Es wird bestätigt, daß die Lieferung geprüft wurde und den Vereinbarungen bei der Bestellannahme entspricht

Test results:

Results:

we confirm that the delivery has been tested and applies to the agreements made on receipt of the order  
 Nous confirmons que la livraison a été contrôlée et correspond avec les conventions faites à la réception de la commande

Certified acc. to DIN EN ISO 9001:2000, valid until 2006-03-09

ST/04/15

2005-03-23

Alcoa Inc.

PITTSBURGH, PA DAVENPORT WISCONSIN  
Ship From: RIVERDALE, IA.

228533	203087
<u>Ship Date</u>	<u>B.L. No.</u>
2003-07-24	35508

Invoice No.  
84892

Alcoa No. Item  
DS-63766-1

Page 1

Kenton R. Young

Mark J. Vrabec  
Director of Manufacturing Development Works

**Kenton P. Young**  
Quality Assurance Manager

Ship To: TW METALS  
14600 JAMES RD.  
ROGERS, MN 55374

Item Description

1.1500 IN TK (+.0470 -.0470) X 60.000 IN W (+5/16 -  
0) X 144.000 IN LN (+1/2 -0) (N) A/T 5083-  
O STORAGE TANK & CRYOGENIC PLATE WILL FINISH. SAVED ITEM 11  
SB-209 REV A99 & EXCEPT MARKING ASTM B209 REV  
AMS-QQ-A-250/6 & EXCEPT MARKING AMS4056 REV F  
02A & EXCEPT MARKING AMS4056 REV F  
DIMENSIONAL TOLERANCES F ANSI H35.2 REV  
2003 (MARKED) INTERLEAVED SKID WGT: 6000 LB QUAN TOL +/-  
40 & COR 0141837 REV 02 CUST REQ 03-07-  
24 \*\*\* W/E 03-07-26 \*\*\*

Num	Package Ticket	Lot	Weight	Quantity	UOM	Pc Id/Seri
1	691007	704033	6251	5	PC	
2	691009	704033	3736	3	PC	
			9987	8		

Notes for CQR: 0141837.2

CCQR: 0141837.2 -Specification Limits

Tmpr O	Dir Longitudinal	UTS		TYS		EL4D											
		KSI	PCT.	KSI		KSI											
		Max Min	51.0 40.0	29.0 18.0													
				SI	FE	CU	MN	MG	CR	ZN	TI	Other	Each	Total	Aluminum		
				.40	.40	.10	1.0	4.9	.25	.25	.15	.05	.15		REMAIN		
				Max			.40	4.0	.05								
				Min													
Chemical Composition																	
Alloy 5083																	

Lot: 704033 -Mechanical, Physical, Metallography, Quantometer Results

Temp	Dir	No. Test	UTS		TVS		EL4D
			Max	KSI	KSI	PCT	
0	Longitudinal	3	43.8	23.2	22.3	20.8	
			43	22.6	20.8		

**Reviewed**

**TÜV SÜD**  
TUV Süddeutsches Bau und Betrieb GmbH  
Notified body no. 0036 acc. to Pressure  
Equipment Directive 97/23/EC  
**Testing Laboratory-**

APR 22 2005 T.R.

APR 22 2005

REPORTS

TW METALS

AUG 01 2003

TEST

ACCEPTED BY

# CERTIFIED INSPECTION REPORT

Alcoa Inc.

PITTSBURGH, PA DAVENPORT WORKS  
Ship From: RIVERDALE, IA.

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 met the composition limits and had the mechanical properties shown on the face of this sheet.

*Mark J. Vrablic*  
Mark J. Vrablic  
Director of Manufacturing Davenport Works

*Kenton P. Young*  
Kenton P. Young  
Quality Assurance Manager

203087

228533

B.L. No.

Invoice No.

Alcoa No. Item

2003-07-24

35508

84892

DS-63766-1

P.O. No./Govt Contract No.

CUSTOMER

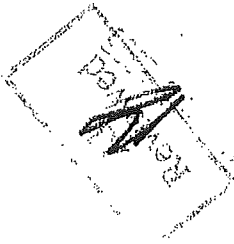
M 49086674

TW METALS-ROGERS

Lot: 704033 - Mechanical, Physical, Metallurgy, Quantometer Results (cont.)

Cast Number	Chemical	SI	FE	CU	MN	MG	CR	ZN	TI
H2497051	Actuals	.10	.26	.06	0.65	4.5	.09	.01	.02

5498C



TW METALS	REPORTS
TEST	AUG 01 2003
ACCEPTED BY	

JAN 28 2005

Reviewed

TÜV SÜDDEUTSCHLAND Bau und Betrieb GmbH

Notified Body acc. to Pressure

Equipment Directive 97/23/EC

-Testing Laboratory-

*T.R.*

APR 22 2005



# SOUTHWEST ALUMINIUM (GROUP) CO. LTD., IMPORT AND EXPORT DIVISION

## MILL CERTIFICATE

Buyer: COMMONWEALTH METAL CORPORATION

Product: ALUMINUM PLATES Alloy: 5083-O Size: SEE BELOWS

BUYERS CONTRACT NUMBER 7482-14837-06

PO# 49113702

PO# 2488597

S-520-C

PC-29-05

### I CHEMICAL COMPOSITION

Sizes (INCHES)	Lot No.	Si	Cu	Mg	Mn	Fe	Zn	Ti	Ni	Cr	Zr	Others		Al
												Each	Total	
1.25" x 60" x 144"	875010	0.15	0.07	4.30	0.70	0.23	≤0.20	≤0.10	≤0.05	0.11	-	≤0.05	≤0.15	REM
1.50" x 60" x 144"	875011	0.15	0.07	4.30	0.70	0.23	≤0.20	≤0.10	≤0.05	0.11	-	≤0.05	≤0.15	

### II MECHANICAL PROPERTIES

Sizes (INCHES)	Lot No.	UTS(MPa)	UYS(MPa)	Elongation %	Bending
1.25" x 60" x 144"	875010	295-295	156-162	23-23	--
1.50" x 60" x 144"	875011	290-295	164-172	23-24	--

We certify that the present supply above mentioned has been manufactured to the technical specifications of customer contract or order, and completed all relative inspections and tests.

Inspector: TANG CU LI

Date: 2004-10-22

Marked 98209

MAR 18 2005

MATERIAL CONFORMS TO ASTM, AA,  
QQA STANDARDS IN ALL RESPECTS

REVIEWED

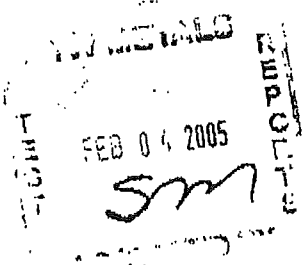
Reviewed

TÜV Süddeutschland Bau und Betrieb GmbH

Notified body No. 1001 acc. to Pressure

Equipment Directive 97/23/EC

-Testing Laboratory- APR 22 2005



PER

MR KEN RUPP  
CHART HEAT EXCHANGERS  
2191 WARD AVENUE  
LA CROSSE WI 54601

2345 S. 170th Street  
New Berlin, Wisconsin 53151-2701 USA  
Telephone : (262) 782-6344  
Toll Free : (800) 726-6385  
Telefax : (262) 782-3653  
E-Mail : stork.technimet@stork.com  
Website : www.storktechnimet.com

Report No. : 0503-12303-2  
Date : 3/14/2005  
Subject : Chemical Analysis and Tensile Testing of an Aluminum Sample identified as:  
Trace Code S520C

Your Ref : 2508289  
Received : 3/4/2005

### Chemical Analysis Results (Weight Percent)

Sample ID	S520C
Silicon	0.21
Iron	0.06
Copper	0.04
Manganese	0.59
Magnesium	4.27
Chromium	0.11
Nickel	0.003
Zinc	0.009
Titanium	0.009
Aluminum	Remainder
Specification	AA 5083

LOT 875011

Analysis completed using ICP-AES (CS-3, 08-04).

### Tensile Test Results

Sample ID	S520C
Diameter, in.	0.501
Original area, in. <sup>2</sup>	0.1971
Diameter after fracture, in.	0.424
Area after fracture, in. <sup>2</sup>	0.1412
Yield load, 0.2% offset, lbs.	4,380
Tensile load, lbs.	8,800
Pretest gage length, in.	2.0
Post test gage length, in.	2.41
Yield strength, 0.2% offset, psi	22,200
Tensile strength, psi	44,600
Elongation, %	21
Reduction in area, %	28

MAR 28 2005

Reviewed

TÜV SÜDDEUTSCHLAND Bau und Betrieb GmbH

Notified Body acc. to Pressure

Equipment Directive 97/23/EC

-Testing Laboratory- APR 22 2005

It is our policy to retain components and sample remnants for a minimum of 30 days from the report date, after which time they may be discarded. The data herein represents only the item(s) tested. This report shall not be reproduced, except in full, without prior permission of Stork Technimet, Inc.

Signed:

Patrice D. Gwinn  
Chemical Laboratory Manager



ISO/IEC 17025 (ISO 9002 Compliance)

Chemical 0088-01  
Mechanics 0088-02

Stork Technimet, Inc. is an operating unit of Stork Materials Technology B.V., Amsterdam, The Netherlands, which is a member of the Stork group.

# CERTIFIED INSPECTION REPORT

Alcoa Inc.

PITTSBURGH, PA DAVENPORT WORKS  
Ship From: RIVERDALE, IA.

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 met the composition limits and had the mechanical properties shown on the face of this sheet.

*Mark J. Viablick*  
Director of Manufacturing Davenport Works

Mark J. Viablick

Director of Manufacturing Davenport Works

*Kenton P. Young*  
Kenton P. Young  
Quality Assurance Manager

Kenton P. Young  
Quality Assurance Manager

353191

Ship Date

2005-02-18

P.O. No./Govt Contract No.

M 49119837

Invoice No.

86494

Alcoa No. Item

DS-82366-1

CUSTOMER

TW METALS-ROGERS

Ship To: TW METALS  
14600 JAMES RD.  
ROGERS, MN 55374

## Item Description

3750 IN TK X 60.000 IN W X 144.0000 IN LN (N) A/T 5083-  
STORAGE TANK & CRYOGENIC PLATE MILL FINISH ITEM 11453. PER ASME-  
SB-209 REV A99 & EXCEPT MARKING AMS-QQ-A-  
25076 & EXCEPT MARKING ASTM B209 REV 04 &  
EXCEPT MARKING AMS4056 REV F DIMENSIONAL  
TOLERANCES F ANS H35.2 REV 2003  
((MARKED)) PAPER INTERLEAVED  
SKID WGT: 6000 LB QUAN TOL +/-30  
& CQR 0153045 REV 01 CUST REQ 05-02-  
14 \*\*\* W/E 05-02-26 \*\*\*

Num	Package Ticket	Lot	Weight	Quantity	UOM	Pc Id/Serl
1	256683	733811	6680	21	PC	
2	256733	733811	2867	9	PC	
3	256733	733812	3823	12	PC	
4	256865	733812	4138	13	PC	
			17508	55		

Notes for CQR: 0153045.1  
PRODUCT PRODUCED AND MARKED TO THE REQUIREMENTS OF AMS-QQ-A-250/6 ALSO MEETS THE REQUIREMENTS OF QQ-A-250/6G. PRODUCT  
PRODUCED AND MARKED TO THE REQUIREMENTS OF QQ-A-250/6G ALSO MEETS THE REQUIREMENTS OF AMS-QQ-A-250/6.

Reviewed

TUV Sueddeutsches Bau und Betrieb GmbH

CQR: 0153045.1 -Specification Limits

Notified body No. 0001 acc to Pressure

Equipment Directive 97/23/EC

Other-Testing Laboratory-

Total Aluminum

SI	FE	CU	MN	MG	CR	ZN	TI	Each	Total
.40	.40	.10	1.0	4.9	.25	.25	.15	.15	.15
Max									
Min									

REMAIN

Lot: 733811 -Mechanical, Physical, Metallography, Quantometer Results

Temp Dir	Longitudinal	No. Test	Max	Min	UTS	TYS	EL4D
					KSI	KSI	PCT
O	Longitudinal	6	Max	Min	44.3	20	29.9
					43.2	19.3	28.4

TW METALS

REPORTS

FEB 21 2005

ACCEPTED BY

PEO  
o/c

# CERTIFIED SECTION REPORT

Alcoa

PITTSBURGH, PA

DAVENPORT, KS

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 met the composition limits and had the mechanical properties shown on the face of this sheet.

*Mary G. Kuhn*

Mark J. Vrabec  
Director of Manufacturing Davenport Works

*Karen P. Young*

Karen P. Young  
Quality Assurance Manager

353191

Ship Date

2005-02-18

P.O. No./Govt Contract No.

M 49119837

48023

B.L. No.

69926

Invoice No.

86494

CUSTOMER

TW METALS-ROGERS

PITTSBURGH, PA

DAVENPORT, KS

Ship From: RIVERDALE, IA.

Page

Alcoa No. Item

DS-82366-1

Lot: 733811 - Mechanical, Physical, Metallurgy, Quantometer Results (cont.)

Cast Number H286702A Chemical SI FE CU MN MG CR ZN TI  
Actuals .09 .23 .04 0.58 4.5 .08 .02 .02

Lot: 733812 - Mechanical, Physical, Metallurgy, Quantometer Results

Temp Dir	No. Test	UTS KSI	TYS KSI	ELAD PCT				
					Max	43.5	20.4	30.8
0 Longitudinal	6	Min	42.9	18.9	27.2			
Cast Number H2946033	Chemical SI	FE	CU	MN	MG	CR	ZN	TI
		Actuals	.11	.24	.04	0.59	4.5	.09

*PO 24990245  
55476  
153-3-05*

Reviewed

TÜV SÜDDEUTSCHLAND Bau und Betrieb GmbH

Notified Body No. 0408 acc. to Pressure

Equipment Directive 97/23/EC

Testing Laboratory

APR 22 2005

*T.E.*

REVIEWED

MAR 03 2005

*RS*

TW METALS

REPORTS

TEST

FEB 21 2005

*W*

ACCEPTED BY