

## MATERIAL TRACEABILITY

SALES ORDER NO.

509.4-5

DRWG. NO.

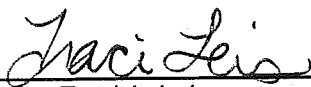
15775A

<b>Nozzles:</b>				
<b>Purpose</b>	<b>Dia. or Size</b>	<b>Material</b>	<b>Nozzle Thk. Nom.</b>	<b>Trace Code</b>
B OUT	2.375	SB-241-5083	0.154	T138C
A OUT	4.500	SB-241-5083	0.237	T172C
A IN & B IN	3.500	SB-241-5083	0.216	T187C
<b>Headers:</b>				
<b>Purpose</b>		<b>Material</b>	<b>Nom. Thk.</b>	<b>Trace Code</b>
A IN&OUT & B IN&OUT		SB-209-5083	0.250	S472C
<b>End Pieces:</b>				
<b>Purpose</b>	<b>End Type</b>	<b>Material</b>	<b>Nom. Thk.</b>	<b>Trace Code</b>
A IN&OUT	FLAT	SB-209-5083	0.625	S515C
B IN&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

07/16/04 13:41

86306900147

"TW Metals."

003/003

1183087482 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:

Anvil Alloys International Ltd.

Client:

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

Produkt:

Tubes seamless extruded

Product / Produit:

ASME SB 241

Spezifikation:

Specification:

Werkstoff:

5083

Alloy/Alliage:

Abmessung

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

Size / Dimension

2" NB Sched. 40

Kennzeichnung

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

Marking/Marquage:

Lieferung:

Delivered Material / Matériel délivré:

pcs. lbs  
35 855

Zeugnisnummer:

Cert No. / No. du certificat:

Bestellnummer:

Order No. / No. de commande

Auftrag:

Our Reference/Notre Reference

12832

7939/2

Zustand:

Temper/Etat

0

## 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		84,2

Reviewed

TÜV Süddeutschland Bau und Betrieb GmbH

Notified Body &amp; 16 acc. to Pressure

Equipment Directive 97/23/EC 2005

-Testing Laboratory der  
Prüfungen:

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

29.03.04

Sinde

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

T.M. METALS

JUL-16-2004 10:32

VIEWED

DEC 21 2004

PED OK

11/22/2004 10:52

6306900147

TUMETALS

PAGE 02/09

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

PAGE 9/8

SENT BY: ANVIL ALLOYS INT;

ALUMINA AG

Uetzerstr. 36 - 58225 Umm

## Abnahmeprüfbescheinigung 3.1 B - EN 10204

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

Supplier  
Client:

Anvil Alloys International Ltd.

Unit 12, Roberts Ind. Est  
Wiggenhall Rectwades, Herts WD1. Great Britain

Tubes seamless extruded

Product:

Product / Product:

Specification:

Specification:

Material:

Material:

Size / Dimension:

Material:

Material:

Material:

Material:

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ASME SB 241

5083

114,300 mm x 182,260 mm x 6,020 mm x 1800,00 mm

4" Sch. 40

ALLIANCE - Cast No. 2447-2 - 4" SCH 40 - 5083 - B - ASME SB 241

ALLIANCE - Cast No. 2447-2 - 4" SCH 40 - 5083 - B - ASME SB 241

ALLIANCE - Cast No. 2447-2 - 4" SCH 40 - 5083 - B - ASME SB 241

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ALLIANCE - Cast No. 2447-2 - 4" SCH 40 - 5083 - B - ASME SB 241

ALLIANCE - Cast No. 2447-2 - 4" SCH 40 - 5083 - B - ASME SB 241

## 1. Chemische Analyse

## Chemical Analysis / analyse chimique

	Si	Fe	Cu	Mn	Ni	C	Zn	P	S	Al	N
Charge/ min.											
Cast No. max.	0,40	0,40	0,10	1,0	1,0	0,25	0,25	0,25	0,25	0,008	0,008
2447-2/04	0,102	0,323	0,008	0,008	4,705	0,075	0,048	0,023	0,003	0,002	0,003
Hydrogen content:	0,12	conf 100 g Al									

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

## 2. Mechanische Eigenschaften

## Mechanical Properties / Valeurs Mécaniques

Amortissements Resonance	Impact (Joules) Char	Yield (kgf/cm²) min	Elongation Z %	Elongation A 5 %	Hardness HB
min.	20,0 SLD	16,0	14,0		
1	40,000	21,750	26,0		73,9
2	45,530	24,070	23,0		72,2

Reviewed

TÜV Süddeutschland Bau und Betrieb GmbH

Notified Body No. 3 acc. to Pressure

Equipment Directive 97/23/EC

Testing Laboratory

Ergebnis der  
Prüfung:Test results:  
Results:

13.08.2004

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

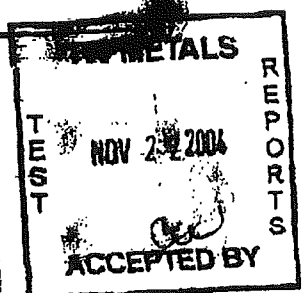
We confirm that the delivery has been tested and applies to the agreements made on receipt of the order.

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

Certified ACC. to EN 10204-2, valid until 2005-09-01  
Original No. 00000000

Der Werkstoffprüfer:

TT: 01.01.2004 - 01.01.2005



PED OK

01/05/04 11/22/04

07/30/04 07:49

86306900147

"TW Metals."

1003/006

M83087483

7-30-04



ALUTINA

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 Woburn, Herts WD1 Great Britain

Zeugnisnummer:

Cert No. / No. du certificat:

Bestellnummer:

Order No. / No. de commande:

Auftrag:

Our Reference/Notre Référence:

13003

8986/1

Produkt:

Product / Produit:

Spezifikation:  
Specification:Werkstoff:  
Alloy/Alliage:Abmessung:  
Size / Dimension:Kennzeichnung:  
Marking/Marquage:

Lieferung:

Delivered Material / Matériau délivré:

Tubes drawn seamless

ASME SB 241

5083

88,900 mm x 77,920 mm x 5,490 mm x 6000,00 mm  
3" NB SCH 40

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

pcs.

lbs

18

917

Zustand:  
Temper/État

0

A2499944

T-187-C

A22325

TW METALS

TEST

JUL 30 2004

ACCEPTED BY

## 1. Chemische Analyse

## Chemical Analysis / analyse chimique

	Si	Fe	Cu	Mn	Mg	Cr	Zn	Ti	Pb	Zr	Bi	Sn	Ni
Charge/ Cast No.	min. max.	0,40 0,40	0,10 0,10	0,40 1,0	4,0 4,9	0,05 0,25	0,25 0,25	0,15 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 &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. max.	39,0 53,0	16,0	14,0		
1	41,180	20,445	30,0		77,8
2	40,165	21,170	30,0		78,7

REVIEWED

FEB 23 2005

v. Süddeutsche Bau und Betrieb GmbH

Notion: ... Pressure

Equipment Greening 07/23/EC

Testing Laboratory-

AI  
Reviewed

FEB 23 2005

FEB 23 2005

PED 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.: 001939 QM

Der Werksachverständige

P.07/11 6124287669

T.W. METALS

JUL-16-2004 10:33

83087483

18/15/2004 13:40

6306900147

TWMETALS

PAGE 03/03

14/10 2004 15:05 FAX +30 22620 53683

ELVA S.A./V. GRIMANIS

001/001

m49107483 10-150


 ATHENS - LAMIA NATIONAL ROAD (57th Km), 32011 INORTA 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  
 Page: 1

## - MILL TEST CERTIFICATE -

 CTS No: 55717  
 DATE: 19/06/2004

 Customer : COMMONWEALTH - USA  
 Order No : 01883  
 Your Ref. : 6310-06

 INVOICE NR: 95005100  
 Notes : INTERNAL PRICING LIST NR: 80010662 PO: H4907483  
 ACCORDING TO AA, ASTM B809-04, AMS-QQA-250/6 AND ASME B209 SPECIFICATIONS.

TEST REPORT ACC TO EN 10204/3.1B

 P02491884  
 12/16/04

## PRODUCTS LIST

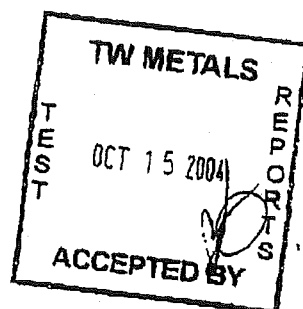
## A. CHEMICAL ANALYSIS (%)

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 No	Coil No	Test No	Posit	RPM 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. MOUTSOPOULOS


REVIEWED

PEN BK

12/15/04

 APR 29 2005  
 7.R

4907483

Corus Aluminium Walzprodukte GmbH  
Carl-Spaeter-Str. 10  
56070 Koblenz



## Inspection Certificate (EN 10204/3.1.B)

Page 1 from 1

Certificate No. : 1278986  
Purchaser : CORUS ALUMINIUM ROLLED PRODUCTS USA- A DIVISION  
475 N.MARTINGALE RD/S.400  
SCHAUMBURG, IL 60173  
Purchase Order No. : 3130M49118433/TW METALS  
Order number : 78293  
Order item : 3  
Lot No. : 874346  
Dimensions : 15,875x2,438,400x7,315,200 mm  
0,625x96,000x288,000 "  
Master standard : ASME SB-209 2001  
ASTM B 209 - 04  
AMS-QQ-A-250/6 AUG 1997

Material : 1024516  
Cust. part no. :  
Mat. Design. : Plate  
Alloy : 5083  
Temper : O  
Drawing number :  
Quantity : 4

PO# 2505009  
S-515-C  
J2805

## TECHNOLOGICAL PROPERTIES

### Mechanical properties

Temper: O  
ASTM B 209 - 04

	Pl-No.	Spec. No.	Rp1,0	Rp0,2 ksi	Rm ksi	AZ" %	Z	Rp/Rm
L Min:	-	-	-	18,0	40,0	16,0	-	-
Max:	-	-	-	29,0	51,0	-	-	-
Act.:	-	1	-	26,1	45,7	23,5	-	-
Act.:	-	2	-	23,5	45,2	27,2	-	-

### Chemical composition in %, remainder Al

Core Alloy : 5083 Cast No. : EL136210  
Alloy spec. : ASTM B 209 - 04

	Si	Fe	Cu	Mn	Mg	Cr	Zn	Ti	others each	others total
Min:	-	-	-	0,40	4,0	0,05	-	-	-	-
Max:	0,40	0,40	0,10	1,0	4,9	0,25	0,25	0,15	0,05	0,15
act.:	0,1300	0,2100	-	0,6300	4,7200	0,0810	-	0,0150	0,0050	0,0073

### Other tests

Dimensional control:

Surface control:

Quality Assurance, 20.12.2004

K. Betzing

Reviewed

IV Süddeutschland Bau- und Metall GmbH

Notified By: ... pressure

Ec ... Directive 97/23/EC

... 29 2005

ok

ok

FEB 08 2005

TW METALS

TEST

JAN 27 2005

ACCEPTED BY

PER OK

PITTSBURGH, PA. DAVENPORT V. KS  
Ship From: RIVERDALE, IA.

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

**Quality Assurance Manager**

DS-82366-1

M 49119837

TW METALS-ROGERS

ACCEPTED BY

Q5. 16001

# CERTIFICATION REPORT

Alcoa Inc.

PITTSBURGH, PA DAVENPORT WORKS

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

*Karl P. Young*

Karl 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

Ship From: RIVERVIEW, IA.

Alcoa No. Item DS-82366-1

Customer TW METALS-ROGERS

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  
O 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  
H2946033 Actuals .11 .24 .04 0.59 4.5 .09 .02 .02

*PO 2492035  
5546C  
PT 3-3-05*

MAR 04 2005

REVIEWED

MAR 03 2005

APR 29 2005

*T.R.*

TW METALS

REPORTS

TEST

FEB 21 2005

*VX*

ACCEPTED BY