

MATERIAL TRACEABILITY

SALES ORDER NO. 509.1-1 DRWG. NO. 15772A

Nozzies:				
Purpose	Dia. or Size	Material	Nozzle Thk. Nom.	Trace Code
A VENT	1.315	SB-241-5083	0.133	T006C
A OUT	10.750	SB-241-5083	0.365	T107C
A IN	14.000	SB-209-5083	0.375	S468C
Headers:				
Purpose		Material	Nom. Thk.	Trace Code
A IN&OUT & A VENT		SB-209-5083	0.375	S468C
End Pieces:				
Purpose	End Type	Material	Nom. Thk.	Trace Code
A IN	FLAT	SB-209-5083	1.000	S473C
A OUT & A VENT	FLAT	SB-209-5083	1.000	S474C
Permanent End Closures:				
Purpose	End Type	Material	Nom. Thk.	Trace Code
A IN	FLAT	SB-209-5083	1.000	S458C
A OUT	FLAT	SB-209-5083	0.750	S467C

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

MATERIAL TRACEABILITY

SALES ORDER NO.

509.1-2

DRWG. NO.

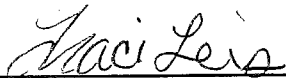
15772A

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Traci A. Leis
Documentation Coordinator

03/24/04 16:01

9011441752733301

TW METALS

0063/003

M83086851

ALLUNA 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.
Anvil House, Vale Industrial Park
Tolpits Lane Watford WD1 6QP
Great Britain

Zeugnisnummer:

Cert No. / No. du certificat:

Bestellnummer:

12105

Order No. / No. de commande

Auftrag:

1635/1

Our Reference/Notre Reference:

Produkt:

Tubes seamless extruded

Product / Produit:

Spezifikation:

ASME SB 241

Specification:

Werkstoff:

5083

Alloy/Alliage:

Abmessung

33,400 mm x 26,640 mm x 3,380 mm x 6000,00 mm

Size / Dimension

1" NB Sched. 40

Kennzeichnung

Cast No. 8146 - 3 - 1" NB SCHED. 40 - 5083 - 0 - ASME SB 241 - AWU

Marking/Marquage:

Lieferung:

pcs.

lbs

Delivered Material / Matériau livré:

61

677

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					
8146-3/02	0,233	0,286	0,060	0,552	4,710	0,082	0,080	0,025	0,005	0,0056	0,0002	0,0015	0,0030
Hydrogen content:	0,10 ccm/100 g Al												

Bemente 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	12,0	
max.	51,0				
1	41,325	17,980	24,0	28,3	69,8

Reviewed

TUV Süddeutschland Bau und Betrieb GmbH

Notified body No. 0101 acc. to Pressure

Equipment Directive 97/23/EC

Testing Laboratory

FEB

4 2005

AI-Reviewed

REVIEWED

6/11/04

PEP OK

JUN 11 2004

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

02.10.02

/ spors



Certified acc. to DIN EN ISO 9002, valid until 2003-02-03

P.19/21 6124267669

T.M. METALS

MAR-22-2004 12:55

SA TUBES LIMITED

Studley Road, Redditch, Worcester B98 7HN, England
Telephone (01527) 484500, Facsimile (01527) 484501



Inspection Certificate

18308741 0000120

Customer Copy No. 92085/1

Customer

ANVIL ALLOYS INTERNATIONAL LTD
UNIT 12, FISHERS INDUSTRIAL ESTATE
WIGGENTHALL ROAD
WATFORD
Herts
WD18 0PN

T-107C

Your Order No : 13060
Your Part No : 10" NB SCHED 40
Our Order No : 88104/K
Packing Note No : 8838660
Date : 17 Aug 2004
Packages : 3 BUNDLES

Specification

5083
ASME B31.3

ITEM DESCRIPTION
SEAMLESS DRAWN TUBE - 273.100MM OD X 9.27MM WT
Length - Random lengths

ASME CERTIFICATE OF CONFORMITY
THIS MATERIAL HAS BEEN MANUFACTURED, SAMPLED,
TESTED AND INSPECTED AND MEETS THE REQUIREMENTS
OF THE MATERIAL SPECIFICATION

No of Pieces	Net Weight	Tensile Test				Chemical Analysis %										TN
		Tens No.	0.2% Proof Stress KSI	Tensile Strength KSI	% Elongation 2in	Heat or Cast No.	S	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Pb	
2	534	272876	22.05	44.67	23	1K201	.15	.28	.02	.56	4.58	.12		.01	<0.0001	.02
1	262	272877	22.19	45.11	24	1K201	.15	.28	.02	.56	4.58	.12		.01	<0.0001	.02
1	247	272877	22.19	45.11	24	1K201	.15	.28	.02	.56	4.58	.12		.01	<0.0001	.02
1	179	272877	22.19	45.11	24	1K201	.15	.28	.02	.56	4.58	.12		.01	<0.0001	.02
1	88	272877	22.19	45.11	24	1K201	.15	.28	.02	.56	4.58	.12		.01	<0.0001	.02

Reviewed

TUV SÜDDEUTSCHLAND Bau und Betrieb GmbH

Notified Body No. 0100 acc. to Pressure

Equipment Directive 97/23/EC

Testing Laboratory - FEB 14 2005

TW METALS REPORTS
OCT 20 2004
ACCEPTED BY

REMARKS
TEST CERTS TO EN10284 3.1B. ASME CONFORMITY STATEMENT B31.3 WT + TOL GUIDANCE ONLY (MASS CONTROLLED). 5083/ALMCA.508

PEOK

Registered in England No. 3381335
Registered Office: Victoria House,
150-162 The Quays, Salford, M20 3AP, England
VAT Registration No. GB 858 8742 05

AI
Reviewed
NOV 20 2004

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

Form and content of SA Tubes Limited D11

10/20/2004 15:26

6306900147

TW METALS

PAGE

09/09

JUL. 1. 2004 7:16AM

COMMONWEALTH METAL

NO. 119

P. 3/3

commonwealth PO# M49103125

ELVALATHENS - LAMIA NATIONAL ROAD (57th Km), 32011 INOIKIA VOTIA, GREECE
TEL: +30 2620-32 269, 31503, 32 241

HELLENIC ALUMINIUM INDUSTRY S.A.

FAX: +30 2620-32 236, 32 237, TLX: +601-299327, 299324, 299325, 299326

Page 1

- MILL TEST CERTIFICATE -

C-17 No : 54989

DATE : 25/05/2004

Customer : COMMONWEALTH - USA
Order No : 0753
Your Ref. : 522-06INVOICE NO: 4308
Notes : INTERNAL PACKING LIST NR: 40009082 PO M49103125
ACCORDING TO AL ASTM B209, ALB-90A-250/6 AND A900 SPECIFICATIONS.

TEST REPORT ACC TO EN 10204/3.1B

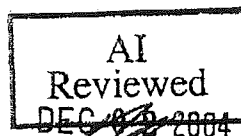
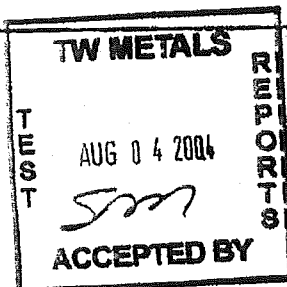
PRODUCTS LIST

A. CHEMICAL ANALYSIS (%)

Order Line Product Name	Alloy	Temper	Thickness / Step Width	Length	Coil No	Si	Fe	Mn	Mg	Cu	Ti	Zn	Cr
ALUMINIUM SHEETS													
0076301	5083	-0-	9.250	1524.00 3657.60	040267301	.11	.31	.43	4.20	.032	.006	.019	.180
		Inches :	.37500	60.000 144.000									
0076302	5083	-0-	12.7000	1524.00 3657.60	040453101	.12	.33	.25	4.54	.032	.013	.017	.118
		Inches :	.50000	60.000 144.000									

B. MECHANICAL PROPERTIES

Heat Nr	Coil No	Test No	Posit	RP _H N/mm ²	R ₀₂ N/mm ²	ELONG %
04203000	040267301	2989	RL	313.0	190.2	15.8
			Kel :	45.389	27.581	
04201610	040453101	3943	RL	313.0	173.0	18.0
			Kel :	45.389	25.087	



Quality Control Department

B. WILKINSON

REVIEWED

Reviewed

TUV SÜddeutschland Prüf und Betrieb GmbH

Norm : EN 10204-3.1B to Pressure

Equipment Directive 97/23/EC

-Testing Laboratory-

FEB 14 2005

49103125

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



Inspection Certificate (EN 10204/3.1.B)

Page 1 from 2

Certificate No. : 1079294
Purchaser : CORUS ALUMINIUM ROLLED PRODUCTS USA- A DIVISION
475 N.MARTINGALE RD/8.400
SCHAUMBURG, IL 60173
Material : 1022909
Cust. part no. : Plate
Mat. Design. : 5083
Alloy : 0
Temper : 0
Drawing number : 2
Quantity : 2
Purchase Order No. : 2229/M49111056/TW METALS
Order number : 76300
Order item : 1
Lot No. : 957160
Dimensions : 25,400x3,048,000x0,098,000 mm
1,000x120,00x240,00 "
Master standard : ASME SB-209 2001
ASTM B 209 2002a
AMS-QQ-A-250/8 AUG 1997

S-473-C

P# 2497394

12-19-04

TECHNOLOGICAL PROPERTIES

Mechanical properties

Temper: O
ASTM B 209 2002a

	Pl-No.	Spec. No.	Rp1,0	Rp0,2 ksi	Rm ksi	A2" %	Z	Rp/Rm
L Min:	-	-	-	18,0	40,0	18,0	-	-
Max:	-	-	-	29,0	51,0	-	-	-
Act.:	-	1	-	27,8	45,5	19,4	-	-
Act.:	-	2	-	25,1	45,1	19,1	-	-

Chemical composition in %, remainder Al

Core Alloy : 5083 Cast No. : 3-04-0184
Alloy spec. : ASTM B 209 2002a

	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.:	0,3150	0,2750	0,0750	0,6950	4,6070	0,1100	0,0680	0,0261	0,0123	0,0386

Other tests

Reviewed

TÜV Süddeutschland Bau und Betrieb GmbH

Dimensional control:

Surface control:

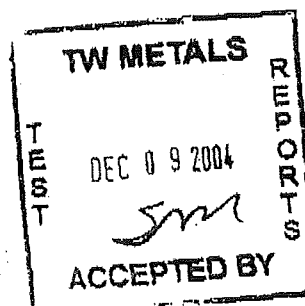
Quality Assurance, 25.10.2004

K. Betzing

Notified as per pressure
Equipment Directive 97/23/EC

Testing: FEB 14 2005

REVIEWED



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



Inspection Certificate (EN 10204/3.1.B)

Page 2 from 2

Certificate No. : 1079294
Purchaser : CORUS ALUMINIUM ROLLED PRODUCTS USA- A DIVISION
475 N.MARTINGALE RD/S.400
SCHAUMBURG, IL 60173
Purchase Order No. : 2229/M49111056/TW METALS
Order number : 76300
Order item : 1
Lot No. : 957161
Dimensions : 25,400x3,048,000x6,096,000 mm
1,000x120,00x240,00 "
Master standard : ASME SB-209 2001
ASTM B 209 2002a
AMS-QQ-A-250/6 AUG 1997

Material : 1022909
Cust. part no. : Plate
Mat. Design. : 5083
Alloy : 0
Temper : 0
Drawing number : 2
Quantity : 2

5-474-C

202497394

K1249-M

TECHNOLOGICAL PROPERTIES

Mechanical properties

Temper: O
ASTM B 209 2002a

	Pl-No.	Spec. No.	Rp1,0	Rp0,2 ksi	Rm ksi	A2" %	Z	Rp/Rm
L Min:	-	-	-	18,0	40,0	16,0	-	-
Max:	-	-	-	29,0	51,0	-	-	-
Act.:	-	1	-	26,7	45,1	18,9	-	-
Act.:	-	2	-	26,4	45,1	18,4	-	-

Chemical composition in %, remainder Al

Core Alloy : 5083 Cast No. : 3-04-0184
Alloy spec. : ASTM B 209 2002a

	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.:	0,3150	0,2750	0,0750	0,6950	4,6070	0,1100	0,0680	0,0261	0,0123	0,0386

Reviewed

Other tests

TÜV SÜddeutschland Bau und Betrieb GmbH

Normed Body No. 0118 acc. to Pressure

Dimensional control:

Equipment Directive 90/269/EC

Surface control:

-Testing Laboratory-

Quality Assurance, 25.10.2004

FEB 14 2005

K. Betzing

TW METALS	
TEST	REPORTS
DEC 09 2004	
ACCEPTED BY	

CERTIFIED PECTION REPORT

Alcoa Co.

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

Per

Mark J. Vrablic

Mark J. Vrablic
Director of Manufacturing Davenport Works

Karl P. Young

Karl P. Young
Quality Assurance Manager

293992

Ship Date

303022

B.L. No.

2004-10-30

62938

P.O. No./Govt Contract No.

Customer

M 49110533

TW METALS-ROGERS

Ship From: RIVERDALE, IA.

Alcoa No. Item

DS-79049-1

Page

Ship To: TW METALS
7640 REINHOLD DRIVE
CINCINNATI, OH 45237

Item Description

.750 IN TK (+.0370 -.0370) X 60.000 IN W (+.5/.5) -
O X 144.000 IN LN (+1/2 -0) (N) A/F 5083-
O STORAGE TANK & CRYOGENIC PLATE MILL FINISH, SAVED ITEM 11449. PER AMS-
SB-209 REV A99 & EXCEPT MARKING
AMS-QQ-A-250/6 & EXCEPT MARKING ASTM209 REV
04 & EXCEPT MARKING AMS4056 REV F
DIMENSIONAL TOLERANCES F ANS135.2 REV
2003 ((MARKED)) STADNARD INTERLEAVED
SKID WGT: 6000 LB QUAN TOL +/-
40 & CQR 0141846 REV 03 CUST REQ 04-09-
20 *** W/E 04-10-02 ***

Num	Package Ticket	Lot	Weight	Quantity	UOM	Pc Id/Serl
1	226752	649283	6073	10	PC	
2	226861	649283	4256	7	PC	
			10329	17		

Notes for CQR: 0141846.3

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: 0141846.3 -Specification Limits

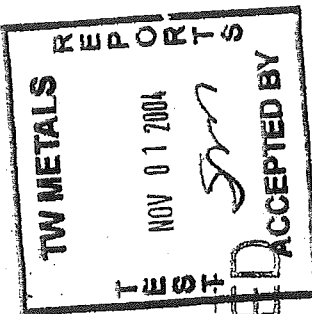
Temp	Dir	UTS	KSI	TYS	KSI	EL4D	PCT
0	Longitudinal	Max	51.0	29.0			
		Min	40.0	18.0			

Chemical Composition	SI	FE	CU	MN	MG	CR	ZN	TI	Each	Total	Aluminum
Alloy 5083	Max	.40	.40	.10	1.0	4.9	.25	.25	.15	.05	.15
	Min				.40	4.0	.05				REMAIN

Lot: 649283 -Mechanical, Physical, Metallographic, Spectrometer Results

Temp	Dir	No. Test	UTS	KSI	TYS	KSI	EL4D	PCT
0	Longitudinal	3	Max	44.7	23.1	28.4		
			Min	44.4	22.8	26.5		

Reviewed
TUV SÜddeutschland Rail und Betrieb GmbH
Notified Body No. 0000 acc. to Pressure
Equipment Directive 97/23/EC
Testing Laboratory 14 2005



2.1 OK

9-4671-0

port type 12/10/01

DEC 12 2004

Alcoa

PITTSBURGH, PA DAVENPORT, IA

Ship From: RIVERDALE, IA.

225

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 test samples representative of the material met the composition limits and had the mechanical properties shown on the face of this sheet.

Per: _____

Mary G. Kavan

Mark J. Vrabiec
Director of Manufacturing Development Works

John P. Young

Kendon P. Young
Quality Assurance Manager

Lot:	649283	- Mechanical, Physical, Metallurgy, Quantometer Results (cont.)									
Cast Number		Chemical	SI	FE	CU	MN	MG	CR	ZN	TI	
H2788045		Actuals	.07	.21	.03	0.64	4.5	.08	.01	.02	

Reviewed

Deutscher Verlag der Wissenschaften
Berlin Betrieb GmbH

THE UNIVERSITY OF CHICAGO

Equipe de Trabalho

[illegible]

GOVT 7-1 B3

AI
Reviewed
DEC 02 2000

REPORTS

TW METALS

NOV 01 2004

See

ACCEPTED BY

TEST

WELLS

