

Abnahmeprüfzeugnis EN 10204-3.1B  
Inspection Certificate  
Certificat de Réception

**HÜLSEN**  
Nahtlose Rohrbogen aus NE-Metallen  
Apparatebau · Heiz- und Kühlwalzen



Besteller:  
Customer  
Acheteur  
Böhling Rohrleitungs- und  
Apparatebau GmbH  
Großmannstr. 118  
20539 Hamburg

Bestell Nr.: 0691/2-881-2  
Order No.  
N° de la commande

vom dated date: 25.05.05

Hersteller:  
Manufacturer  
Fabricant  
Jakob Hülsen GmbH & Co. KG  
Maysweg 14  
D-47918 Tönisvorst

Werks Nr.: 251570  
Works No.  
N° usine

Blatt Nr.: 1  
Sheet No.  
Page N°

Certificate No.:

Prüfgegenstand: concentric reducers  
Article  
Produit

Prüfgrundlagen: ASTM B361  
Technical requirements  
Spécifications techniques

Werkstoff: 5083  
Material  
Matière

entsprechend: ASME SB241  
according to  
suivant

Ausgabe:  
Edition  
Editione

Lieferzustand: 0 condition  
State of delivery  
Etat de livraison

Herstellerzeichen  
Brand of manufacturer  
Marque du fabricant



Kennzeichnung: 5083-0  
Marking  
Marquage  
Dimensions  
Cast No.

Werkssachverständiger  
Works Inspector  
L'expert de l'usine

Umfang der Lieferung-Extent of material delivery-Liste descriptive:

Pos. Nr. Item No Poste N°	Stückzahl Number of pce. Numero de pce.	Gegenstand-Article-Designation de produit	Schmelze Nr. Heat No. N° Coulee	Probe Nr. Test No. N° d'éprouvette
20	2	114,3 x 6,0 / 88,9 x 5,5	9754	204/04
21	2	168,3 x 12,0/114,3 x 12,0	1956-2	112/04
22	6	168,3 x 6,0/114,3 x 6,0	1494-1	104/05
23	2	219 x 6,0/168 x 6,0	1J140	174/03

Zusätzliche Angaben-Additional remarks-Remarques:

Seamless drawn pipes in accordance with the enclosed inspection certificate(s) were used.

Die gestellten Anforderungen sind laut Anlagen erfüllt.  
The requirements are fulfilled as per annex.  
Les conditions imposees sont satisfaites suivant annexes.

Werkssachverständiger  
Works-Inspector  
L'expert de l'usine  
HÜLSEN

D-47918 Tönisvorst, den 12.Juli 2005

Anlagen: 1) Ergebnis der Prüfungen – Test results – Résultats des essais  
Annexes 2) Inspection Certificates 3.1B  
Allegati

Jakob Hülsen GmbH & Co. KG  
Maysweg 14 · D-47918 Tönisvorst  
Postfach 10 10 31 · D-47710 Krefeld  
Telefon (0 21 51) 9 93 28-0  
Telefax (0 21 51) 9 93 28-99  
E-mail: info@huelsen.de

Amtsgericht Krefeld HRA 4710  
pHG Hülsen Kupferschmiede  
und Apparatebau GmbH  
Amtsgericht Krefeld HRB 8969  
Geschäftsführer: Ulrike Thallner, Ralf Hülsen  
Internet: www.huelsen.de

USt.Id-Nr. DE 120 003 549

Bankverbindungen:  
Deutsche Bank Krefeld, BLZ 320 700 80, Kto.-Nr. 34/4705  
Sparkasse Krefeld, BLZ 320 500 00, Kto.-Nr. 67 107 011  
Postbank Essen, BLZ 360 100 43, Kto.-Nr. 227 15-432

## Ergebnis der Prüfungen

Test Results  
Resultats des Essais  
Anlage-Annex-Annexe 1



Bestell-Nr.: 0691/2-881.2  
Order No.  
N° de la commande:

Blatt Nr. 2  
Sheet No.  
Page N°

Werks Nr.: 251570  
Works No.  
No. de usine

Certificate No.:

## Mechanische Prüfungen-Mechanical Tests- Essais mecaniques

Probe Nr. Test No. N° d'éprouvette	Probenabmessung Dim. of Specimen Dim. de l'éprouvette		T  °C	R <sub>F0,2%</sub>  N/mm²	R <sub>m</sub>  N/mm²	A <sub>5</sub>  L <sub>0</sub> = 5,65x S <sub>0</sub> <sup>1/2</sup> %  %	L <sub>0</sub> =2"	1= [J]      Schlagarbeit-Energy of impact- Energy de rupture 2= [J/cm²]      Kerbschlag zähigkeit-Impact- strength-Resilience					Bemerkungen Remarks Remarques
	Dicke Thickness Epaisseur	Breite, Ø Width, Ø Largeur, Ø						Werte-Values-Valeurs					
	mm	mm						1	2	3	Σ/n		
1	2	3	4	5	6	7	8	9	10	11	12	13	14
Anforderungen Requirements Exigences  ASME SB 241			20	110	270- 350		14						
204/04	7,1	10,3	20	259	293	18,0	18,0						
112/04	13,5	9,7	20	221	319	19,5	22,5						
104/05	11,5	9,3	20	223	305	17,0	16,0						
174/03	13,5	9,1	20	205	288	15,5	19,0						

Besichtigung und Maßkontrolle ohne Beanstandung.  
Visual inspection and control of dimensions without complaints.

D-47918 Tönisvorst, den 12.Juli 2005

Werkssachverständiger  
Works-Inspector  
L'expert de l'usine  
HÜLSEN

Jakob Hülsen GmbH & Co. KG  
Maysweg 14 · D-47918 Tönisvorst  
Postfach 10 10 31 · D-47710 Krefeld  
Telefon (0 21 51) 9 93 28-0  
Telefax (0 21 51) 9 93 28-99  
E-mail: info@huelsen.de

Amtsgericht Krefeld HRA 4710  
pHG Hülsen Kupferschmiede  
und Apparatebau GmbH  
Amtsgericht Krefeld HRB 8969  
Geschäftsführer: Ulrike Thallner, Ralf Hülsen  
Internet: www.huelsen.de

UST d.Nr. DE 120 003 549

Bankverbindungen:  
Deutsche Bank Krefeld, BLZ 320 700 80, Kto.-Nr. 34/4705  
Sparkasse Krefeld, BLZ 320 500 00, Kto.-Nr. 67 107 011  
Postbank Essen, BLZ 360 100 43, Kto.-Nr. 227 15-432



# Abnahmeprüfzeugnis

Inspection Certificate DIN 50 049-3.1.C  
Certificat de Réception EN 10204-3.1.C  
Certificato Collaudo Materiali

Prüf-Nr. - Inspection No.: 9167-17-SW R1  
Certificat No. - No di collaudo:

Teil - Part - Partie - Parte:  
Blatt-Nr - Sheet No. - Page No. - Pag No.: 1 of 2

Besteller - Customer - Acheteur - Committente:  
Linde AG  
Verfahrenstechnik und Anlagenbau  
Werk Schalchen, Carl Von Linde-strasse 15  
83342 Tacherting, Germany

Bestell-Nr. - Order No.: L-5RL007 25.3  
No de la commande - No dell'ordine:

Vom - dated - - 06.05.03  
date - in data :

38

Hersteller - Manufacturer - Fabricant - Produttore:  
British Aluminium Tubes  
Studley Road, Redditch  
Worcestershire, B98 7HN, England

Werks-Nr - Works No. - No usine - Commessa No.:  
84835/1

Prüfgegenstand - Article - Produit - Prodotto: Seamless Aluminium Tube

Prüfgrundlagen/Anforderungen - Technical requirements/Demand - Spécifications techniques/Exigences - Norma di controllo/Requisiti:

AD 2000 - Merkblatt W6/1 (Einzelgutachten)

Werkstoff - Material - Matière - Materiale

entsprechend - according to suivant- secondo

Ausgabe Edition - Edizione:

AlMg 4,5 Mn F27  
EN AW-5083 -H112  
SB 241 5083

DIN 1725 / 1746  
EN573-3/754-2  
ASME

Feb 1983  
1994/1997  
1996

Lieferzustand - State of delivery - Etat de livraison - Stato di fornitura: Soft Annealed

Erschmelzungsart - Melting process - Procédé d'élaboration - Procedimento di elaborazione: Electric.

Kennzeichnung - Marking - Marquage - Punzonatura:

Material: - ASME SB241 5083 - H112

AlMg 4,5 Mn F27 AD W6/1

Tube Nrs : (2 Tubes per Nr.): 245133, 245135, 245131,  
245139, (1 Tube Nr.): 245129, 245137,

Herstellerzeichen - Brand of the manufacturer - BAT

Marque du fabricant - Marchio del produttore:

Stempel des Sachverständigen - Inspectors stamp

Poinçon de l'expert - Punzone dell'ispettore.

T4Ü

Pos.- Nr./Item No. Poste-No No.pos	Stückzahl Number of Quote Numero pezzi	Gegenstand - Article Désignation du produit - Tipo di prodotto	Schmelze-Nr. Heat No. No Coulée No Colata	Probe-Nr. Test No. No d'éprouvette No di prova
01	01	219,0mm O/D. x 12,0mm WT x 5,600 mtrs	1J140	245294/295 (245129)
01	02	219,0mm O/D. x 12,0mm WT x 5,600 mtrs	1J140	245296/297 (245133)
01	02	219,0mm O/D. x 12,0mm WT x 5,600 mtrs	1J140	245298/299 (245135)
01	01	219,0mm O/D. x 12,0mm WT x 5,600 mtrs	1J140	245300/301 (245137)
01	02	219,0mm O/D. x 12,0mm WT x 5,600 mtrs	1J140	245302/303 (245131)
01	02	219,0mm O/D. x 12,0mm WT x 5,600 mtrs	1J140	245310/305 (245139)

Zusätzliche Angaben - Additional remarks - Autres remarques - Osservazione:

Die gestellten Anforderungen sind lt. Anlagen erfüllt.

The requirements are fulfilled as per annex.  
Les conditions imposées sont satisfaites suivant annexes -  
I risultati sono conformi ai requisiti richiesti come da allegati.

(Ort - Location - Lieu - Località)

(Datum - Date - Data)

LONDON

14/08/2003

Prüfstelle für Druckgeräte  
der RWTÜV Systems GmbH  
H. Eggenstein

8435

Anlagen - Annexes - Annexes Allegati: 2

1) Ergebnis der Prüfungen - Test results - Risultati dei test  
Weitere Anlagen in 1 - Other annexes in 1 - Autres annexes en 1 - Altri allegati in 1

**Abnahmeprüfzeugnis**

Inspection Certificate DIN 50 049-3.1.C

Certificat de Réception EN 10204-3.1.C

Certificato Collaudo Materiali

Besteller - Customer - Acheteur - Committente:

Linde AG

Verfahrenstechnik und Anlagenbau

Werk Schalchen, Carl Von Linde-strasse 15

83342 Tacherting, Germany

Hersteller - Manufacturer - Fabricant - Produttore:

British Aluminium Tubes

Studley Road, Redditch

Worcestershire, B98 7HN, England

Prüf-Nr. - Inspection No.: 9167-17-SW R1

Certificat No. - No di collaudo:

Teil - Part - Partie - Parte:

Blatt-Nr - Sheet No. - Page No. - Pag No.: 2 of 2

38

Bestell-Nr. - Order No.: 001-5RL007

No de la commande - No dell'ordine:

Vom - dated - 06.05.03

date - in data:

Werks-Nr - Works No. - No usine - Commessa No.:

84835/1

Prüfgegenstand - Article - Produit - Prodotto: Seamless Aluminium Tube

Prüfgrundlagen/Anforderungen - Technical requirements/Demand - Spécifications techniques/Exigences - Norma di controllo/Requisiti:

AD 2000 - Merkblatt W6/1 (Einzelgutachten)

Werkstoff - Material - Matière - Materiale

entsprechend - according to suivant - secondo

Ausgabe Edition - Edizione:

AlMg 4,5 Mn F27

DIN 1725 / 1746

Feb 1983

EN AW-5083 -H112

EN573-3/754-2

1994/1997

SB 241 5083

ASME

1996

Lieferzustand - State of delivery - Etat de livraison - Stato di fornitura: Soft Annealed

Erschmelzungsart - Melting process - Procédé d'élaboration - Procedimento di elaborazione: Electric.

Kennzeichnung - Marking - Marquage - Punzonatura:

Material: - ASME SB241 5083 - H112

AlMg 4,5 Mn F27 AD W6/1

Tube Nrs: (2 Tubes per Nr.): ,245141

(1 Tube Nr:),245143,

Herstellerzeichen - Brand of the manufacturer - BAT

Marque du fabricant - Marchio del produttore:

Stempel des Sachverständigen - Inspectors stamp  
Poinçon de l'expert - Punzone dell'ispettore.

T4Ü

Pos.- Nr./Item No. Poste-No No.pos	Stückzahl Number of Quote Numero pezzi	Gegenstand - Article Désignation du produit - Tipo di prodotto	Schmelze-Nr. Heat No. No Coulée No Colata	Probe-Nr. Test No. No d'éprouvette No di prova
01	02	219,0mm O/D. x 12,0mm WT x 5,600 mtrs	1J140	245306/307 (245141)
01	01	219,0mm O/D. x 12,0mm WT x 5,600 mtrs	1J140	245308/309 (245143)

Zusätzliche Angaben - Additional remarks - Autres remarques - Osservazione:

Die gestellten Anforderungen sind lt. Anlagen erfüllt.

The requirements are fulfilled as per annex  
Les conditions imposées sont satisfaites suivant annexes -  
I risultati sono conformi ai requisiti richiesti come da allegati.

(Ort - Location - Lieu - Località)

LONDON

(Datum - Date - Data)

14/08/2003

Prüfstelle für Druckgeräte  
der RWTÜV Systems GmbH

H. Eggenstein

8436

Anlagen - Annexes - Annexes Allegati: 2

1) Ergebnis der Prüfungen - Test results - Résultats des essais - Risultati delle prove

Weitere Anlagen in 1 - Other annexes in 1 - Autres annexes en 1 - Altri allegati in 1



Prüf-Nr.: 9167-17 SW R1

Teil

Inspection No.

Part

Certificat N°.

Partie

N° di collaudo

Parte

Sheet-No.

Page N°.

Pag N°

## Mechanische Prüfungen - Mechanical tests - Essais mécaniques - Prova meccaniche

Prüfart - Test type - Type d'essai - Tipo di prova: Probenart - Specimen size Type de l'éprouvette Tipo di provetta: Probenzustand - Specimen condition - Etat d'éprouvette - Stato della provetta:			ZUGVERSUCH / TENSILE TEST								HARDNESS HB					
Probe-Nr. Test No. N°. d'éprouvette N° di prova.	Probenabmessung Dim. of specimen Dim. de l'éprouvette Dim. della provetta		Probenentnahme Specimen Prélevement Prelevamento			Prüftemperatur Test temperature Température d'essai Temperatura di prova °C	Streck-/Dehnstrecke Yieldpoint/Proof Stress Limite d'élasticité Lim. di snervamento	Zugfestigkeit Tensile strength Résistance à la traction Carico di rottura	Bruchdehnung Elongation Allongement Allungamento	Bruchreduktion Reduction of area Striction/Strizione	1 = [J] Schlagarbeit - Energy of impact Energie de rupture - Energia di rottura 2 = [J/cm²] Kerbschlagzähigkeit-Impact Strength Résilience - Resilienza 3 = [%] Krist.Bruchanteil - Cryst. proportion Partie cristalline - Proporzione cristallina 4 = [mm10-³] Breitung - Expansion 5 = [%] Elargissement - Espansione 6 = Härte (Einheiten) - Hardness - Dureté - Durezza					
Schmelze-Nr. Heat No. N° Coulée Colata N°	Dicke Thickness Epaisseur Spessore	Breite, Ø Width, Ø Largeur, Ø Largh, Ø	Ort - Location Lieu - Zona	Richtung Direction - Senso	Lage - Position Posizione				A Lo = 5.65 √so	Z	Werte - Values - Valeurs - Valori 1 2 3 Σ/n Bemerkung Remarks Remarques Osservazioni					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Anforderungen Analysis % Max unless Stated S.i.0,40 Fe.0,40 Cu.0,10 Mn.0,40 to 1,00 Mg.4,0 to 4,9 Cr.0,05 to 0,25 Zn.0,25 Ti.0,15.			1	2	3	20	min 130	min 270	min 14		6 2	≈ 65			20	DVM J/cm² (10 x 10mm)
245294 (1J140)	12,10	12,01	1	2L	3	20	151	299	26		6	77	HB			
245295	12,05	12,18	1	2T	3	20	202	302	22		2	35	34	35	34	
245296 (1J140)	11,95	11,97	1	2L	3	20	140	297	24		6	76	HB			
245297	12,11	11,97	1	2T	3	20	202	308	27		2	32	32	32	32	
245298 (1J140)	12,44	11,97	1	2L	3	20	142	298	26		6	78	HB			
245299	12,11	12,02	1	2T	3	20	201	308	25							
245300 (1J140)	12,50	11,99	1	2L	3	20	133	293	22		6	73	HB			
245301	12,61	11,83	1	2T	3	20	178	297	28							
245302 (1J140)	11,90	11,99	1	2L	3	20	136	297	24		6	75	HB			
245303	12,68	12,20	1	2T	3	20	201	303	22							
245310 (1J140)	12,66	11,92	1	2L	3	20	132	298	23		6	75	HB			
245305	12,63	12,05	1	2T	3	20	193	305	24							
Notes			1) From tube end 2) L = Longitudinal / T = Transverse 3) Full Thickness 3* Mid Wall 4) Besichtigung / Maßkontrolle / Visual and Dimensional check - ohne Beanstandung / Satisfactory 5) Chemische / Chemical Analysis: siehe Anlage 2 / See annex 2 6) Wärmebehandlung / Heat Treatment: Annealed at 400°C 7) Technological tests (ring tensile & macro) - ohne Beanstandung / Satisfactory 8) UST To SEP 1915/1918 - siehe Anlage 2 / See annex 2: 9) Manufacturers 3.1.B certificate shows in house tests only.													

((Ort - Location - Lieu - Località)

(Datum Date - Data)

LONDON

14-08-2003

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der RWTÜV Systems GmbH  
H. Eggenstein

## Mechanische Prüfungen - Mechanical tests - Essais mécaniques - Prove meccaniche

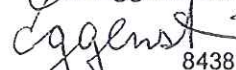
Prüfart - Test type - Type d'essai - Tipo di prova: Probenart - Specimen size Type de l'éprouvette Tipo di provetta: Probenzustand - Specimen condition - Etat d'éprouvette - Stato della provetta:			ZUGVERSUCH / TENSILE TEST								HARDNESS HB					
Probe-Nr. Test No. N°. d'éprouvette N° di prova.	Probenabmessung Dim. of specimen Dim. de l'éprouvette Dim. della provetta		Probenentnahme Specimen Prélevement Prelevamento			Prüftemperatur Test Temperature Température d'essai Temperatura di prova °C	Streck-/Dehngrenze Yield point/Proof Stress Limite d'élasticité Limite di snervamento	Zugfestigkeit Tensile strength Résistance à la traction Carico di rottura	Bruchdehnung Elongation Allongement Allungamento	Bruchmechanisierung Reduction of area Striction/Strizione	1 = [J] Schlagarbeit - Energy of impact Energie de rupture - Energia di rottura 2 = [J/cm²] Kerbschlagzähigkeit-Impact Strength Résilience - Resilienza 3 = [%] Krist.Bruchanteil - Cryst. proportion Partie cristalline - Proporzione cristallina 4 = [mm10-1] Breitung - Expansion 5 = [%] Elargissement - Espansione 6 = Härte (Einheiten) - Hardness - Dureté - Durezza					
Schmelze-Nr. Heat No. N° Coulée Colata N°	Dicke Thickness Epaisseur Spessore	Breite, Ø Width, Ø Largeur Ø Largh, Ø	Ort - Location Lieu - Zona	Richtung Direction - Senso	Lage - Position Posizione		0.2 N/mm²	RM N/mm²	A Lo = 5.65 √so %	Z %	Werte - Values - Valeurs - Valori 1 2 3 Σ/n Bemerkung Remarks Remarques Osservazioni					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Zugs / Anforderungen			1	2	3	20	min 130	min 270	min 14		6 2	≈ 65			20	DVM J/cm² (10 x 10mm)
% Max unless Stated S.i 0,40 Fe, 0,40 Cu, 0,10 Mn, 0,40 to 1,00 Mg, 4,0 to 4,9 Cr, 0,05 to 0,25 Zn, 0,25 Ti, 0,15.																
245306 (1J140)	12,280	12,02	1	2L	3	20	139	309	24		6	75	HB			
245307	12,36	12,00	1	2T	3	20	208	313	26							
245308 (1J140)	12,40	11,97	1	2L	3	20	139	302	26		6	75	HB			
245309	12,02	11,50	1	2T	3	20	239	335	21							
Notes			1) From tube end 2) L = Longitudinal / T = Transverse 3) Full Thickness 3* Mid Wall 4) Besichtigung / Maßkontrolle / Visual and Dimensional check - ohne Beanstandung / Satisfactory 5) Chemische / Chemical Analysis: siehe Anlage 2 / See annex 2 6) Wärmebehandlung / Heat Treatment: Annealed at 400°C 7) Technological tests (ring tensile & macro) - ohne Beanstandung / Satisfactory 8) UST To SEP 1915/1918 - siehe Anlage 2 / See annex 2: 9) Manufacturers 3.1.B certificate shows in house tests only.													

((Ort - Location - Lieu - Località)

LONDON

(Datum Date - Data)

14-08-2003

Prüfstelle für Druckgeräte  
der RWTÜV Systems GmbH  
H. Eggenstein


8438



# BA TUBES LIMITED

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



## Inspection Certificate

### Customer

LINDE AG  
WERKSGRUPPE VERFAHRENSTECHNIK UND  
ANLAGENBAU, WERK SCHALCHEN  
CARL VON LINDE-STRASSE 15  
83342 TACHERTING, GERMANY

Customer Copy No. 88776/1

Your Order No : 001 5RL007  
Our Order No : 84835/1  
Packing Note No : 117944  
Date : 20 Jun 2003  
Packages : 1 CASE

Other Tests Passed  
NOTCH IMPACT TEST  
RING TENSILE TEST  
ULTRASONIC TEST

### Size / Description

SEAMLESS EXT TUBE 219.000MM O/D 12.000MM W/T 5083 Alloy  
Length - 5600.00 mm

### Specification

5083 H112  
BS EN 573-3/755-2 ADW6/1

No of Pieces	Nett Weight	Tensile Test					Brinell Hardness	Chemical Analysis %										H cc/ 100gm
		Lot or Test No.	0.2% Proof Stress N/mm2	Tensile Strength N/mm2	% Elongation 5.65v SO			Cast No.	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Na	
1	121	245129 L T	149 209	300 300	23 18	77	1J140	.16	.34	.03	.54	4.41	.11		.01	<0.0001	.02	.08
2	242	245133 L T	143 196	299 306	23 18	76	1J140	.16	.34	.03	.54	4.41	.11		.01	<0.0001	.02	.08
2	242	245135 L T	143 193	300 304	22 23	78	1J140	.16	.34	.03	.54	4.41	.11		.01	<0.0001	.02	.08
2	242	245139 L T	126 203	292 304	22 21	72	1J140	.16	.34	.03	.54	4.41	.11		.01	<0.0001	.02	.08
1	121	245143 L T	144 195	300 307	23 25	75	1J140	.16	.34	.03	.54	4.41	.11		.01	<0.0001	.02	.08
Remarks		TUV TEST CERT TO EN 10088-2																

### Remarks

TUV TEST CERTS TO EN 10204 3.1C. CUT TO MAX LENGTHS  
SODIUM LESS THAN 10PPM. HYDROGEN LESS THAN 0.2ML/100GMMMS.  
8 X 5600MM

TÜV UK Ltd

Witnessed  
Reviewed  
Signature

Date 20/6/03

Anlage 2 Page 1 of 3  
Prüf Nr. 9167-17 (Sw)

*Jackson*

Registered in England No. 3981395  
Registered Office: Victoria House,  
150-182 The Quay, Salford, M50 3SP, England.  
VAT Registration No. GB 668 2142 26

( THIS CERTIFICATE CONFORMS TO THE REQUIREMENTS OF EN 10204 3.1b )

For and on behalf of BA Tubes Limited

# BA TUBES LIMITED

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



## Inspection Certificate

### Customer

LINDE AG  
WERKSGRUPPE VERFAHRENSTECHNIK UND  
ANLAGENBAU, WERK SCHALCHEN  
CARL VON LINDE-STRASSE 15  
83342 TACHERTING, GERMANY

Your Order No : 001 5RL007  
Our Order No : 84835/1  
Packing Note No : 117938  
Date : 20 Jun 2003  
Packages : 1 CASE

Customer Copy No. 88775/1

Other Tests Passed  
NOTCH IMPACT TEST  
RING TENSILE TEST  
ULTRASONIC TEST

### Size / Description

SEAMLESS EXT TUBE 219.000MM O/D 12.000MM W/T 5083 Alloy  
Length - 5600.00 mm

### Specification

5083 H112  
BSEN573-3/755-2 ADW6/1

### Tensile Test

No of Pieces	Nett Weight	Lot or Test No.	0.2% Proof Stress N/mm2	Tensile Strength N/mm2	% Elongation 5.65v SO	Brinell Hardness	Cast No.	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Na	Ti	H cc/100gm
2	242	245141 L T	141 195	305 306	22 23	75	1J140	.16	.34	.03	.54	4.41	.11		.01	<0.0001	.02	.08
2	242	245131 L T	138 145	300 311	22 23	75	1J140	.16	.34	.03	.54	4.41	.11		.01	<0.0001	.02	.08
1	121	245137 T T	128 193	293 306	24 21	73	1J140	.16	.34	.03	.54	4.41	.11		.01	<0.0001	.02	.08

### Chemical Analysis %

No of Pieces	Nett Weight	Lot or Test No.	0.2% Proof Stress N/mm2	Tensile Strength N/mm2	% Elongation 5.65v SO	Brinell Hardness	Cast No.	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Na	Ti	H cc/100gm
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1	121	245137 T T	128 193	293 306	24 21	73	1J140	.16	.34	.03	.54	4.41	.11		.01	<0.0001	.02	.08

### Remarks

TUV TEST CERTS TO EN 10204 3.1C. CUT TO MAX LENGTHS  
SODIUM LESS THAN 10PPM. HYDROGEN LESS THAN 0.2ML/100GMMMS.  
5 X 5600MM

TÜV UK Ltd

Witnessed

Date

Reviewed Date 20/6/03

Signature

Attachment Page 2 of 3  
Prüf Nr. 9167-17 (S)

*[Signature]*

Registered in England No. 3981395

Registered Office: Victoria House,

150-182 The Quays, Salford, M30 3SP, England.

VAT Registration No. GB 658 2142 26

For and on behalf of BA-Tubes Limited

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





# Morgan-Ward

(NON-DESTRUCTIVE TESTING) LTD  
DALE ROAD - NEW MILLS - HIGH PEAK - DERBYSHIRE - SK22 4NW  
Tel: 01663 747061 Fax: 01663 746837 E-mail: mwn@talk21.com

APPROVALS

Certification Authority  
Joint Aviation Authority  
FAA (Cert. No. 1450100000)  
UKAS  
British Aerospace  
Eurostar Design  
MCD  
NAFLIC



## ULTRASONIC TEST REPORT

Page 1 of 1

### CLIENT

B A Tubes Ltd  
Studley Road  
Redditch  
Worcs

REPORT No: 47423/ULT

DATE OF TEST: 12.6.03

JOB No: 84835-1

ORDER No: RS983061

### COMPONENT / AREA TESTED

15 off 219mm O/D x 12mm W/T x 5.6M long tubes  
Batch Nos: 84835-1-1, 2 off 84835-1-6, 2 off  
84835-1-2, 2 off 84835-1-7, 2 off  
84835-1-3, 2 off 84835-1-8, 1 off  
84835-1-4, 2 off  
84835-1-5, 2 off

MATERIAL  
S083

SURFACE CONDITION  
As Drawn

PROCEDURE / STANDARD  
SEP1915/1918

Issue No. / Date  
1989/1997

### EQUIPMENT

K.K. USIP 12

ACCEPTANCE CRITERIA  
9.6.04

Issue No. / Date  
1989/1997

SERIAL No.  
UT101

CALIBRATION DATE  
9.6.04

TEST SENSITIVITY (COMP'N)

COUPLANT  
Water

TEST / REFERENCE BLOCKS  
SEP1915/1918A

SCANNING PATTERN  
10% probe overlap

PROBES USED

0°

45°

60°

70°

45°

MAKE & TYPE

Phoenix SC

Phoenix  
SC

FREQUENCY

4MHz

4MHz

SIZE

10mm dia

10mm dia

PROBE SERIAL No.

S736

S737

SENSITIVITY SETTING

28dB

28dB

ATTENUATION /  
TRANSFER LOSS

0dB

0dB

### TEST DETAILS & RESULTS:

The tubes were found to be acceptable to specification.

Anlage 2 Page.....3.....of.....3.....

Prüf Nr.....91.6.7.....17.....(S...)

TEST LOCATION

Morgan Ward (NDT) Ltd

OPERATOR

J. Francomb/G. Notman

QUALIFICATION

PCN LII

CERTIFICATE No.

113163/204926

SIGNED

AUTHORISED SIGNATORY FOR MORGAN WARD NDT LIMITED  
NAME: J. FRANCOMB  
DATE: 12.6.03