Zambetti & Lumina	SISTEMA QUALITA' *QUALITY SYSTEM* DOCUMENTAZIONE DI CO LLAUDO *DATA BOOK*	DATA 30/06/97 *Date* COMM. 7033 *job* FOGLIO 1 DI 1 *Sheet of*

CLIENTE : ANSALDO ENERGIA S.p.A.
Customer

COMMESSA : F10004EM
Job

ORDINE N° : BC 192126 Del 11/03/97
Order n°

DENOMINAZIONE : CAMINO CRIOGENICO
Denomination

SEZIONE *Section*	DESCRIZIONE *Description*	PAGINA N° *Page n°*
A	PIANO CONTROLLO QUALITA' *Quality control plan*	001 ÷ 003
B	ATTESTATI DI CONFORMITA' *Manufactoring inspection standard*	004 ÷ 009
C	CERTIFICATI MATERIALI *Material certificates*	010 ÷ 022
D	SPECIFICHE DI SALDATURA E SALDATORI QUALIFICATI *Welding procedures and qualified welding operatives*	023 ÷ 030
E	CERTIFICATI CND *NDT reports*	031 ÷ 033
F	CERTIFICATI PROVE DI TENUTA *Pressure test report*	034

Enti collaudatori *Inspect. officials*	Ispettore cliente *Customer inspect.*	Capo collaudo *Inspect. Director*
		Zambetti & Lumina s.r.l. Cont. Qualità II° Livello SNT-TC-1A Walter Spelgatti

Zambetti & Lumina

SEZIONE

SECTION

A

Zambetti & Lumina	SISTEMA QUALITA' *QUALITY SYSTEM*	PCQ N° 09/97 *Qcp N°*
	PIANO CONTROLLO QUALITA' **QUALITY CONTROL PLAN**	COMM. 7033 *Job*
		DATA 21/04/97 *Date*

CLENTE *Customer* ANSALDO ENERGIA S.p.A.	ORDINE *Order* BC 192126 Del 11/03/97	COMM. CLIENTE *Customer's job* F10004EM	
OGGETTO *Subject* CAMINO CRIOGENICO	UNITA' *Unit* \	QUANTITA' *Quantity* 1	FOGLIO 1 DI 3 *Sheet 1 of 3*

DOCUMENTI DI RIFERIMENTO
Reference documents

1- SPECIFICA ANSALDO N° 700RM07442 Rev.0

ENTI ISPETTIVI
Inspections bodies

A - Z & L C -

B - ANSALDO D -

APPROVAZIONE CLIENTE
Customer approval

LEGENDA
Legend

H = FASE VINCOLANTE
Hold point

N = FASE DA SEGNALARE
Notofication point

R = ESAME DEL CERTIFICATO
Test report rewiev

1 = ATTESTATO DI CONFORMITA'
Certificate of compliance

2 = CERTIFICATO DI ORIGINE
Origin certificate

3 = CERTIFICATO PROVA E/O COLLAUDO
Test / testing certificate

4 =

5 =

Rev. *Rev.*	Data *Date*	Descrizione *Description*	Preparato *Prepared*	Verificato *Checked*	Approvato *Approved*
0	21-04- 97	PRIMA EMISSIONE			

MODULO - MD023 FG.1 Rev.00

Zambetti & Lumina	PIANO DI CONTROLLO QUALITA' QUALITY CONTROL PLAN	CLIENTE *Customer* ANSALDO ENERGIA	OGGETTO *Subject* CAMINO CRIOGENIC	PCQ N° *Qcp N° 09/97* FOGLIO DI *Sheet 2 OF 3*	COMM. *Job* 7033 DATA *Date* 21/04/97

Fase *Item*	Fase di lavoro da ispezionare *Inspection stage*	Norme applicabili *Applicable standard*	Criterio di Accettazione *Acceptance standard*	Tipo Certif. *Certif. type*	Ente e tipo di controllo *Inspection and type test* A	B	C	D	Luogo di ispezione *Inspection location*	Data prevista di ispezione *Espected inspection date*	Data effettiva di ispezione *Actual inpection date*	N° certificato di prova *Test certificate number*	Note *Comments*
1.0	CONTROLLO CERTIFICAZIONE D'ORIGINE DEI MATERIALI	ASTM A240	ASTM A240 TYPE 304	2	R	R			Stab. Z&L *Z&L Shop*		06-05-97	VEDI SEZIONE C	
2.0	CONTROLLO QUALIFICHE DI SALDATURA E SALDATORI (WPS/PQR/WPQ)	ASME IX	ASME IX	3	H	R			Stab. Z&L *Z&L Shop*		24-04-97	VEDI SEZIONE D	
3.0	CONTROLLI IN FABBRICAZIONE												
3.1	CONTROLLO ASSIEMAGGIO DEI PARTICOLARI PRIMA DELLA SALDATURA	DISEGNI APPLICABILI	DISEGNI APPLICABILI		H				Stab. Z&L *Z&L Shop*		14-05-97	/	
3.2	CONTROLLO DIMENSIONALE DOPO SALDATURA	DISEGNI APPLICABILI	DISEGNI APPLICABILI	3	H				Stab. Z&L *Z&L Shop*		03-06-97	VEDI SEZIONE B	
3.3	CONTROLLI RX AL 100% DELLE SALDATURE TESTA-TESTA DELL' INVOLUCRO A DIS.620RM07428	ASME V Art.2	ASME VIII	3	H	R			Stab. Z&L *Z&L Shop*		18-06-97	VEDI SEZIONE E	
3.4	CONTROLLO LP AL 100% DELLE SALDATURE A TENUTA	ASME V Art.6	ASME VIII	3	H	N			Stab. Z&L *Z&L Shop*		18-06-97	" "	
3.5	CONTROLLO VISIVO AL 100% DI TUTTE LE SALDATURE	ASME V Art.9	ASME VIII	3	H	N			Stab. Z&L *Z&L Shop*		18-06-97	VEDI SEZIONE B	
3.6	CONTROLLO DIMENSIONALE FINALE DOPO LAVORAZIONI MECCANICHE	DISEGNI APPLICABILI	DISEGNI APPLICABILI	3	H				Stab. Z&L *Z&L Shop*		25-06-97	" "	
3.7	PROVA DI TENUTA A VUOTO	700RM07442 P.to 6	700RM07442 P.to 6	3	H	H			Stab. Z&L *Z&L Shop*		26-06-97	VEDI SEZIONE F	

A	B	C	D	
Timbro e firma *Stamp and signature* Zambetti & Lumina S.r.l. Cont. Qualità II° Livello SNT-TC-IA *Walter Spelgatti*	Timbro e firma *Stamp and signature*	Timbro e firma *Stamp and signature*	Timbro e firma *Stamp and signature*	

Revisione *Revision*	
0	21/04/97
1	
2	
3	
4	

Zambetti & Lumina	PIANO DI CONTROLLO QUALITA' QUALITY CONTROL PLAN	CLIENTE *Customer* ANSALDO ENERGIA	OGGETTO *Subject* CAMINO CRIOGENIC	PCQ N° *Qcp N° 09/97* FOGLIO DI *Sheet 3 OF 3*	COMM. *Job* 7033 DATA *Date* 21/04/97

Fase *Item*	Fase di lavoro da ispezionare Inspection stage	Norme applicabili *Applicable standard*	Criterio di Accettazione *Acceptance standard*	Tipo Certif. *Certif. type*	Ente e tipo di controllo *Inspection and type test* A	B	C	D	Luogo di ispezione *Inspection location*	Data prevista di ispezione *Espected inspection date*	Data effettiva di ispezione *Actual inpection date*	N° certificato di prova *Test certificate number*	Note *Comments*
3.8	CONTROLLO VISIVO DIMENSIONALE DEL CAMINO E DELLO SCHERMO PREMONTATI	DISEGNI APPLICABILI	DISEGNI APPLICABILI	3	H	H			Stab. Z&L *Z&L Shop*		02-07-97	VEDI SEZIONE B	
4.0	CONTROLLO DOCUMENTAZIONE FINALE	COME DA PCQ	COME DA PCQ		H	H			Stab. Z&L *Z&L Shop*		02-07-97	—	

A	Timbro e firma *Stamp and signature* Zambetti & Lumina s.r.l. Cont. Qualità II° Livello SNT-TC-IA *Walter Spelgatti*	B	Timbro e firma *Stamp and signature*	C	Timbro e firma *Stamp and signature*	D	Timbro e firma *Stamp and signature*	Revisione *Revision* 0 21/04/97 1 2 3 4

MODULO - MD023 FG.2 Rev.00

003

Zambetti & Lumina

SEZIONE

SECTION

B

Zambetti & Lumina	SISTEMA QUALITA' *QUALITY SYSTEM* ATTESTATO DI CONFORMITA' *Certificate of compliance*	ATC N° 087/97 A COMM. *job* 7033 DATA *Date* 03-06-97

CLIENTE *Customer* ANSALDO ENERGIA S.P.A.	ORDINE *Order* BC192126 DEL 11-03-97	COMM. CLIENTE *Customer's job* F10004EM
OGGETTO *Subject*		FOGLIO *Sheet* 1 DI *of* 1

POS. *Item*	RIFERIMENTO ORDINE *Order reference* DISEGNO *Drawing*	DENOMINAZIONE *Item description*	Quantita' *Quantity*	Documentazione rilasciata *Delivered documentation*
1	620RM07428	SCATOLA VALVOLE	1	
	620RM07431	FLANGIA INFERIORE	1	
	620RM07432	SERBATOIO	1	

SI CERTIFICA CHE I PARTICOLARI SOPRACITATI SONO STATI COSTRUITI IN CONFORMITA' AI DISEGNI E ALLE SPECIFICHE RICHIAMATE IN ORDINE

WE CERTIFY THAT THE ABOVEMENTIONED PARTS HAVE BEEN BUILD AND TESTED IN CONFORMITY WITH SPECIFICATIONS AND DRAWINGS AS PER ORDER

Note
Remarks

1- CONTROLLO DIMENSIONALE, DOPO SALDATURA, CON ESITO POSITIVO

2- RIF. NS. PCQ N° 09/97 FASE 3.2

Operatore *Operator*	Enti Collaudatori *Inspect. officials*	Ispettore cliente *Customer inspect.*	Capo collaudo *Inspect. Dept. manager*
			Zambetti & Lumina s.r.l Cont. Qualità II° Livello SNDTC IA Walter Speriatti

MODULO - MD002 Rev.00

Zambetti & Lumina	SISTEMA QUALITA' *QUALITY SYSTEM* ATTESTATO DI CONFORMITA' *Certificate of compliance*	ATC N° 092/97 COMM. *job* 7033 DATA *Date* 18-06-97

CLIENTE *Customer* ANSALDO ENERGIA S.P.A.	ORDINE *Order* BC 132126 DEL 11-03-97	COMM. CLIENTE *Customer's job* F10004EM
OGGETTO *Subject*		FOGLIO *Sheet* 1 DI *of* 1

POS. *Item*	RIFERIMENTO ORDINE *Order reference* DISEGNO *Drawing*	DENOMINAZIONE *Item description*	Quantita' *Quantity*	Documentazione rilasciata *Delivered documentation*
1	620RM07428	SCATOLA VALVOLE	1	
	620RM07431	FLANGIA INFERIORE	1	
	620RM07432	SERBATOIO	1	

SI CERTIFICA CHE I PARTICOLARI SOPRACITATI SONO STATI COSTRUITI IN CONFORMITA' AI DISEGNI E ALLE SPECIFICHE RICHIAMATE IN ORDINE

WE CERTIFY THAT THE ABOVEMENTIONED PARTS HAVE BEEN BUILD AND TESTED IN CONFORMITY WITH SPECIFICATIONS AND DRAWINGS AS PER ORDER

Note
Remarks

1- CONTROLLO VISIVO AL 100% DI TUTTE LE SALDATURE, CON ESITO POSITIVO

2- RIF. NS. PCQ N° 09/97 FASE 3.5

Operatore *Operator*	Enti Collaudatori *Inspect. officials*	Ispettore cliente *Customer inspect.*	Capo collaudo *Inspect. Responsible*
			Zambetti & Lumina s.r.l. Cont. Qualità II° Livello SNT-TC-IA Walter Speldatti

MODULO - MD002 Rev.00

Zambetti & Lumina	SISTEMA QUALITA' *QUALITY SYSTEM* ATTESTATO DI CONFORMITA' *Certificate of compliance*	ATC N° 093/97 COMM. *job* 7033 DATA *Date* 25-06-97

CLIENTE *Customer*	ORDINE *Order*	COMM. CLIENTE *Customer's job*
ANSALDO ENERGIA S.P.A.	BC 132126 DEL 11-03-97	F10004EM
OGGETTO *Subject*		FOGLIO *Sheet* 1 DI *of* 1

RIFERIMENTO ORDINE *Order reference* POS. *Item*	DISEGNO *Drawing*	DENOMINAZIONE *Item description*	Quantita' *Quantity*	Documentazione rilasciata *Delivered documentation*
1	VEDI S.T.	PARTICOLARI VARI	1	
	700RM07442	PER CAMINO CRIOGENICO		

SI CERTIFICA CHE I PARTICOLARI SOPRACITATI SONO STATI COSTRUITI IN CONFORMITA' AI DISEGNI E ALLE SPECIFICHE RICHIAMATE IN ORDINE

WE CERTIFY THAT THE ABOVEMENTIONED PARTS HAVE BEEN BUILD AND TESTED IN CONFORMITY WITH SPECIFICATIONS AND DRAWINGS AS PER ORDER

Note
Remarks

1- CONTROLLO DIMENSIONALE FINALE, DOPO LAVORAZIONE MECCANICA, CON ESITO POSITIVO

2- R.F. NS. PCQ N°09/97 FASE 3.6

Operatore *Operator*	Enti Collaudatori *Inspect. officials*	Ispettore cliente *Customer inspect.*	Capo collaudo *Inspect. Dept. manager*
			Zambetti & Lumina s.r.l. Cont. Qualità II° Livello 8NT-TC-IA Walter Spelgatti

MODULO - MD002 Rev.00

Zambetti & Lumina	SISTEMA QUALITA' *QUALITY SYSTEM* ATTESTATO DI CONFORMITA' *Certificate of compliance*	ATC N° 096/97 COMM. *job* 7033 DATA *Date* 02-07-97

CLIENTE *Customer* ANSALDO ENERGIA S.P.A.	ORDINE *Order* BC 192126 DEL 11-03-97	COMM. CLIENTE *Customer's job* F 10004 EM
OGGETTO *Subject*		FOGLIO *Sheet* 1 DI *of* 1

POS. *Item*	RIFERIMENTO ORDINE *Order reference* / DISEGNO *Drawing*	DENOMINAZIONE *Item description*	Quantita' *Quantity*	Documentazione rilasciata *Delivered documentation*
1	VEDI S.T.	ASSIEME CAMINO	1	
	700RM07442			

SI CERTIFICA CHE I PARTICOLARI SOPRACITATI SONO STATI COSTRUITI IN CONFORMITA' AI DISEGNI E ALLE SPECIFICHE RICHIAMATE IN ORDINE

WE CERTIFY THAT THE ABOVEMENTIONED PARTS HAVE BEEN BUILD AND TESTED IN CONFORMITY WITH SPECIFICATIONS AND DRAWINGS AS PER ORDER

Note
Remarks

1- CONTROLLO VISIVO E DIMENSIONALE DEL CAMINO E DELLO SCHERMO PREMONTATI, CON ESITO POSITIVO

2- RIF. NS. PCQ N° 03/97 FASE 3.8

Operatore *Operator*	Enti Collaudatori *Inspect. officials*	Ispettore cliente *Customer inspect.*	Capo collaudo *Inspect. Dept manager*
			Zambetti & Lumina s.r.l. Cont. Qualità II° Livello SNT-TC-IA Walter Speltri

MODULO - MD002 Rev.00

CARBONE LORRAINE GRUPPO PECHINEY

IL CARBONIO

Viale Lucania, 6
I-20139 MILANO, ITALIA
Tel. (39) (2) 57 49 31
Fax (39) (2) 57 30 21 03
Telex 320553 CARBO-I

DIVISIONE CHIMICO-MECCANICA

SPETT.LE
ZAMBETTI E LUMINA SRL
LOC. PERGEGALLI
24060 - ENDINE GAIANAO (BG)

C.A. VS. SIG. GUIZZETTI

Pratica seguita da: SIG.RA A. FERRARI
Tel. interno: 02/57493.1
Ns/rif.: SMA/MC/AF-N. 1124/L
Vs/rif.:

Milano, 30.05.1997

Oggetto: **CERTIFICATO DI CONFORMITA'**

In allegato Vi preghiamo di voler trovare il certificato di conformità del materiale relativo al Vs. ordine N. 281/97 del 16.05.97.

Con l'occasione, porgiamo i ns. più distinti saluti.

IL CARBONIO S.P.A.
me

1 All./

008

Groupe CARBONE LORRAINE

CEFILAC
Z.I. de Survaure
F-42607 MONTBRISON

N° PV/*PV nr* : 205645/21/97/000

CERTIFICAT DE CONFORMITE MATIERE ET DIMENSIONNELLE
CERTIFICATE OF MATERIAL AND DIMENSIONAL COMPLIANCE
(Type 2.1 selon NF EN 10204)

Nous soussignés CEFILAC, certifions que les joints objet de la commande :
CEFILAC certify that the seals of this purchase order :

Client/*Customer* : IL CARBONIO SPA

Adresse/*Address* : 20139 MILANO ITALIE

N° commande/*Order nr.* : P0918 **du/***of* 19/05/97

Références articles client :
Customer article reference

N° Client : *8945* **N° A.R.** : 205645 **Postes n°** : *01*
Customer nr *Ack. nr* *Item nr.*

ont été exécutés en :
were manufactured in :
INOX + COUPELLE JOINT ALU

et sont conformes aux dimensions demandées
and are in compliance with the required dimensions

et aux prescriptions de la commande.
and with the specifications of the order.

LOT: 61391/1/3

Date : 21/05/97

Nom/*Name* : P.PERRIER

Visa :

Zambetti
& Lumina

SEZIONE

SECTION

C

Zambetti & Lumina	SISTEMA QUALITA' *QUALITY SYSTEM* ELENCO CERTIFICATI DI ORIGINE *Origin certificates list*	ACM N° 44/97 COMM. *job* 7033 DATA *Date* 06-05-97

CLIENTE *Customer* ANSALDO ENERGIA S.P.A.	ORDINE *Order* BC 192126 DEL 11-3-97	COMM. CLIENTE *Customer's job* F 10004 EM
OGGETTO *Subject* ASSIEME CAMINO CRIOGENICO	DISEGNO *Drawing* VARI	FOGLIO *Sheet* 1 DI *of* 1

CERTIFICATO N° *Certificate n°*	FORNITORE *Supplier*	MATERIALE *Material*	PROFILO *Profile*	DIMENSIONI *Dimension*
47400/385/07	ALZ	AISI 304	LAMIERA	SP. 10
64617/201/43	"	"	"	"
232348	ACERINOX	"	"	SP. 25
232282	"	"	"	SP. 30
96/02631	DMV STAINLESS	"	TUBO	Ø x 42,4 x 2
14195	" "	"	"	Ø 141,3 x 3,4
30413/54	SANDVIK	"	"	Ø 159 x 4,5
9652861	DMV STAINLESS	"	"	Ø 219,1 x 8,18
/	METALMA	RAME	LAMIERA	SP. 1-2
1235	SILMET	"	TUBO	Ø 18 x 1

Note
Remarks

Enti Collaudatori *Inspect. Officials*	Ispettore cliente *Customer inspect.*	Capo collaudo *Inspect. Manager*
		Zambetti & Lumina s.r.l. Cont. Qualità II° Livello SNT-TC-IA Walter Spelgatti

MODULO - MD073 Rev.00

ALZ naamloze vennootschap
Maatschappelijke zetel
Gent-Zuid : Zone 6A, B 3600 Gent
Tel. (089) 30 21 11 - Telefax (089) 30 23 80
Telex 39058 aldorg b
H.R. Tongeren nr 41 051 B T W nr BE 401.277.914

Der TÜV Rheinland hat mit Schreiben vom 21. März 1972 auf die Gegenzeichnung verzichtet

SURVEYOR'S MARK
CACHET DE L'EXPERT
STEMPEL DES WERKSSACHVERSTÄNDIGEN

Certificat de Réception C.C.P.U. Nr
Abnahmeprüfzeugnis B
nach DIN 50049/3.1.B - NFA 00001/3.1.B - EN 10204/3.1.B

Approved as supplier according to AD/WO - TRD 100 statement W E 603
Überprüfung als Hersteller nach AD/WO - TRD 100 Rarichi W E 603

PROD.PROCES: Electric Arc Furnace - VOD - Continuous Casting.
PROC. FABRIC.: Four à Arc - VOD - Coulée Continue.
FERTIGUNGSABL.: Elektro-Lichtbogen Ofen - VOD - Stranggusz.

your order n° - votre n° de cde - Bestell.Nr: LAC/OIK/FEB97-

our order n° - notre n° de cde - Werkauf: 47400/385/07

ACIER INOXYDABLE, COILS, LAMINES A CHAUD, RECUITS ET DECAPES

heat n°-n° coulée Schmelze Nr: K650026

coil n°-n° bobine Band Nr: 65002620

Specifications - Spécifications - Vorschriften	Type - Nuance - Quality	Finish	Corrosion test - Corr. inter - Int.krist.Korr.
ASTM A240/A240 M-94A	TYPE 304	NO 1	ASTM A262 E - 93A :OK
ASME SA 240-95 ADD.95	TYPE 304	NO 1	
AFNOR NFA 36209-05/90	Z7 CN 18-09	LAC	AFNOR NFA 05-159 T1 :OK

dimensions - Abmessungen mm: 10.00 1500.00 0.0

Material (Code Designation) Matière Werkstoff (Nummer)

Quenching Hypertrempe Abschreckung: ASTM A240 1050°c forced air air poussé kompaktor Luft

Particular requirements - Prescr. particul. - Sondervorschriften: TERIAL MERCURY FREE

CHEMICAL ANALYSIS
COMPOSITION CHIMIQUE
CHEMISCHE ZUSAMMENSETZUNG

ELEMENTS	LADLE ACIERIE SCHMELZE	PRODUCT PRODUIT STUCKANAL.
C	0.050	0.050
Mn	1.32	1.33
P	0.032	0.031
S	0.006	0.005
Si	0.38	0.37
Cr	18.16	18.15
Ni	8.55	8.52
Mo		
Cu		
Ti		
Co		
N	0.026	
α - ferrite		
δ - ferrite		

MECHANICAL PROPERTIES - PROPRIETES MEC. - MECH. WERTE

TENSILE TEST ESSAI DE TRACTION ZUG VERSUCH	ROOM TEMP. - TEMP. AMB. - RAUMTEMP. REQ.-EXIGE ANFORDERUNG N/MM2 min.	max.	OBTAINED - OBTENU - ERGEBNISSE TEST N° - N° TEST - PROBE 65002620		TEMP. °C REQ.-EXIGE ANFORDER. min	OBTAIN.-OBTENU ERGEBNISSE
ASTM A240			A (T)	E		
Section-Q Schnitt mm²			12.53X10.10			
Yield 0.2% Limite él. Str.grenze 1.0%	205		321	325		
			358	357		
tensile strength rupture Zugfestigkeit	515		610	616		
elong. % A50 allong. Br.Dehn. A5	40		57	59		
			57	59		
F ø 2 /R max %			52	52		
hardness dureté Härte HRB		92	86.5	88.5		

grain size astm grain astm Korngrösse: 7.0

bend pliage Biegeversuch: 180° OK

impact strength test essai de résilience Kerbschlagbiegeversuch: °C OK

TESTS TO VERIFY BATCH AND QUALITY HAVE BEEN CARRIED OUT
TESTS DE VERIFICATION DE LA CONFORMITE DE LA NUANCE FOURNIE
VERWECHSLUNGSPRÜFUNG WURDE DURCHGEFÜHRT

VISUAL INSPECTION AND DIMENSIONAL CHECK
EXAMEN VISUEL ET DIMENSIONNEL DE SURFACE
BESICHTIGUNGEN UND ABMESSUNGEN

EXAMEN VISUEL D'ASPECT DE SURFACE ET DIMENSIONS OK

QUANTITY / WEIGHT MEMO / QUANTITÉ MÉMO POIDS LIVRÉ
ÜBERSICHT GELIEFERTER GEWICHTE

PACKAGE Nr N° DE CAISSE PAKET NR	QTY. QTÉ. ANZ.	NET WEIGHT POIDS NET NETTO GEW.	PACKAGE Nr N° DE CAISSE PAKET NR	QTY. QTÉ. ANZ.	NET WEIGHT POIDS NET NETTO GEW.
70069095	1	16840			
TOTAL/GESAMT:	QTY. QTÉ. ANZ	1	NET WEIGHT POIDS NET NETTO GEW.	16840	

OIKOS COM S.p.A.

The delivery is in accordance with the order.
La fourniture est conforme aux exigences de la commande.
Die Lieferung entspricht den Bestellbedingungen.

IL PRESENTE CERTIFICATO È VALIDO PER:
CLIENTE .....
ORDINE N° 35 DEL 07.5.97
BOLLA° 6635 DEL 04.6.97
POSIZIONE ..... N° PEZZI 1
VALVOROBICA INDUSTRIALE

ALZ naamloze-vennootschap
THE SURVEYOR - L'EXPERT - DER WERKSSACHVERSTÄNDIGE

Gent the le den 29.01.1997

H. JANSSEN

ZAMBETTI & LUMINASI S.r.l. ENDINE N. ..... Controllo Qualità
COPIA CONFORME ALL'ORIGINALE

PACKING LIST 703647 - I - 9701773

Maatschappelijke zetel
Genk-Zuid : Zone 6A, B 3600 Genk
Tel. (089) 30 21 11 - Telefax (089) 30 23 80
Telex 39058 aldozg b
H.R. Tongeren nr 41.051 - B.T.W. nr BE 401.277.914

Der TÜV Rheinland hat mit Schreiben vom 21. Märtz 1972 auf die Gegenzeichnung verzichtet

SURVEYOR'S MARK
CACHET DE L'EXPERT
STEMPEL DES WERKSSACHVERSTÄNDIGEN

Certificat de Réception C.C.P.U. Nr
Abnahmeprüfzeugnis B
nach DIN 50049/3.1.B - NFA 00001/3.1.B - EN 10204/3.1.B

Approved as supplier according to AD/WO - TRD 100 statement W E 603
Überprüfung als Hersteller nach AD/WO - TRD 100 Bericht W E 603

PROD.PROCES: Electric Arc Furnace - VOD - Continuous Casting.
PROC. FABRIC.: Four à Arc - VOD - Coulée Continue.
FERTIGUNGSABL.: Elektro-Lichtbogen Ofen - VOD - Stranggguss.

your order n° - votre n° de cde - Bestell.Nr	our order n° - notre n° de cde - Werksnr
LOT 483684/96 ALZ4596	64617/201/43

ACIER INOXYDABLE, COILS, LAMINES A CHAUD, RECUITS ET DECAPES

heat n°-n° coulée Schmelze Nr: K649077
coil n°-n° bobine Band Nr: 64907748

Specifications - Spécifications - Vorschriften	Type - Nuance - Quality	Finish	Corrosion test - Corr. inter - Int.krist.Korr.
ASTM A240/A240 M-94A	TYPE 304	NO 1	ASTM A262 E - 93A :OK
ASME SA 240-95 ADD.95	TYPE 304	NO 1	
AFNOR NFA 36209-05/90	Z7 CN 18-09	LAC	AFNOR NFA 05-159 T1 :OK

dimensions - Abmessungen
mm 10.00 1500.00 0.0
inches

Material (Code Designation) Matière Werkstoff (Normbez.)

Quenching Hypertrempe Abschreckung ASTM A240 1050°c forced air air poussé bewegter Luft

P lar requirem. - Prescr. particul. - Sondervorschriften :

CHEMICAL ANALYSIS
COMPOSITION CHIMIQUE
CHEMISCHE ZUSAMMENSETZUNG

ELEMENTS	LADLE ACIERIE SCHMELZE	PRODUCT PRODUIT STUCKANAL.
C	0.051	0.050
Mn	1.27	1.29
P	0.033	0.032
S	0.012	0.012
Si	0.40	0.39
Cr	18.08	18.12
Ni	8.63	8.65
Mo		
Cu		
Ti		
N	0.026	
α - ferrite		
δ - ferrite		

MECHANICAL PROPERTIES - PROPRIETES MEC. - MECH. WERTE

TENSILE TEST ESSAI DE TRACTION ZUG VERSUCH	ROOM TEMP. - TEMP. AMB. - RAUMTEMP. REQ.-EXIGÉ ANFORDERUNG min.	max.	OBTAINED - OBTENU - ERGEBNISSE TEST N° - N° TEST - PROBE		TEMP. °C REQ.-EXIGÉ ANFORDER. min.	OBTAIN.-OBTENU ERGEBNISSE
ASTM A240	N/MM2		64907748 A (T)	E		
Section-Q.Schnitt mm²			12.66X10.12			
yield 0.2% limite él. Str.grenze 1.0%	205		324	321		
			362	360		
tensile strength rupture Zugfestigkeit	515		615	613		
elong. % A50 allong. Br.Dehn. A5	40		56	57		
			56	57		
E 0.2 /R max %			52	52		
hardness dureté Härte HRB		92	87.0	86.5		

TRUE COPY
C.S.A.I. s.p.a.
li, ____
VS. ord. Fax pos. ____
Ns. comm. ____ n° lamiera 6307
Inspection Department

grain size astm grain astm Korngrösse

bend pilage Biegeversuch 180° OK

impact strength test °C essai de résilience Kerbschlagbiegeversuch

TESTS TO VERIFY BATCH AND QUALITY HAVE BEEN CARRIED OUT
TESTS DE VERIFICATION DE LA CONFORMITE DE LA NUANCE FOURNIE
VERWECHSLUNGSPRÜFUNG WURDE DURCHGEFÜHRT OK

VISUAL INSPECTION AND DIMENSIONAL CHECK
EXAMEN VISUEL ET DIMENSIONEL DE SURFACE
BESICHTIGUNGEN UND ABMESSUNGEN
EXAMEN VISUEL D'ASPECT DE SURFACE ET DIMENSIONS OK

QUANTITY / WEIGHT MEMO / QUANTITÉ MÉMO POIDS LIVRÉ
ÜBERSICHT GELIEFERTER GEWICHTE

PACKAGE Nr N° DE CAISSE PAKET NR	QTY. QTÉ. ANZ.	NET WEIGHT POIDS NET NETTO GEW.	PACKAGE Nr N° DE CAISSE PAKET NR	QTY. QTÉ. ANZ.	NET WEIGHT POIDS NET NETTO GEW.
70068857	1	17880			
TOTAL/GESAMT:	QTY. QTÉ. ANZ. 1		NET WEIGHT POIDS NET NETTO GEW.	17880	

CSAI 409-97 b

The delivery is in accordance with the order.
La fourniture est conforme aux exigences de la commande.
Die Lieferung entspricht den Bestellbedingungen.

NICHELCROM S.P.A.
VIA TRENTO, 96
20099 SESTO S. GIOVANNI
ITALIE

ZAMBETTI & LUMINA S.r.l. ENDINE GAIANO (BG) N. ____ Controllo Qualità

ALZ naamloze vennootschap
THE SURVEYOR - L'EXPERT - DER WERKSSACHVERSTÄNDIGE

Genk the le den 23.01.1997

PACKING LIST 703029 - I - 9701468

CERINOX, S.A.
FABRICA DEL CAMPO
GIBRALTAR
LAMONES (LOS BARRIOS)
TNO. (34) - 56 - 62 93 00
FAX (34) - 56 - 62 93 01
P.O. BOX. 83
11370 LOS BARRIOS (CADIZ)

INSPECTION CERTIFICATE

CERTIFICADO DE INSPECCION 3.1.B

ACCORDING TO SEGUN EN 10204

CERTIFICATE No. CERTIFICADO NR 232348 1 / 1

CUSTOMER CLIENTE

C.S.A.I. SPA
VIA FOSSE ARDEATINE, 69
20099 S.S.GIOVANNI MILANO ITALIA

Our order no. N/PEDIDO AE32561

Your order no. S/PEDIDO 005927/96

REQUIREMENTS NORMAS APLICABLES
ASTM-A-240/93;A-480/93;ASME-SA-240/95 + Add95

GRADE MATERIAL: Acx 160, TP-304
FINISH ACABADO: Nro.1

TRADE MARK SELLO DEL FABRICANTE

INSPECTOR'S STAMP SELLO DEL INSPECTOR

STEELMAKING PROCESS PROCESO DE ACERIA A.O.D.

COIL / BOX BOBINA/CAJA	CONTENT CONTENIDO	DIMENSIONES THICKNESS ESPESOR	WIDTH ANCHO	LENGTH LARGO	MARKS MARCA	QUANTITY Nº PIEZAS	PROBETA
4061	02PR91 ACA	25,00	1.500,00	6.000,00	40	1	02PR91 AC C
4061	02PR91 ACB	25,00	1.500,00	6.000,00	40	1	02PR91 AC C

CHEMICAL ANALYSIS — COMPOSICION QUIMICA (%)

HEAT NO. COLADA	C	CR	MN	N	NI	P	S	SI
REQUIREMENTS REQUISITOS	0,080	18,000 20,000	2,000	0,100	8,500 10,500	0,045	0,030	0,750
91	0,049	18,318	1,632	0,050	8,596	0,024	0,008	0,318

MECHANICAL PROPERTIES — CARACTERISTICAS MECANICAS

ALL PROBETA	HT	Rm. N/MM2	Rp 0.2 N/MM2	HRB	A200 %
REQUIREMENTS REQUISITOS	ST	515,00 700,00	205,00	92,00	40,00
PR91 AC	CT	591,9	278,0	89,0	54,4

TRUE COPY
C.S.A.I. s.p.a.
li, ...
VS. ord. Fax pos. .....
Ns. comm. ..... n° Istmiera 3623
Inspection Department

INTERGRANULAR CORROSION
CORROSION INTERGRANULAR
ASTM-A-262 PRACTICA E

SURFACE AND DIMENSIONAL CONTROL
INSPECCION SUPERFICIAL Y DIMENSIONAL

SATISFACTORY
Satisfactoria

REMARKS OBSERVACIONES

Temperatura de hipertemple entre 1050 y 1100 º C

ZAMBETTI & LUMINASI N..... Controllo Qualità ENDINE GAIANO (BG)

WORK INSPECTOR
INSPECTOR

013

J.A. Simón

PALMONES, 28 FEBRERO 1997

5.020.011

ACERINOX, S.A.
FABRICA DEL CAMPO
DE GIBRALTAR
PALMONES (LOS BARRIOS)
TFNO. (34) - 56 - 62 93 00
FAX (34) - 56 - 62 93 01
P.O. BOX. 83
11370 LOS BARRIOS (CADIZ)

INSPECTION CERTIFICATE

CERTIFICADO DE INSPECCION 3.1.B

ACCORDING TO / SEGUN EN 10204

CERTIFICATE No. / CERTIFICADO NR 232282 3 / 1

CUSTOMER / CLIENTE

C.S.A.I. SPA
VIA FOSSE ARDEATINE, 69
20099 S.S.GIOVANNI MILANO ITALIA

Our order no. / N/PEDIDO AE32561

Your order no. / S/PEDIDO 005927/96

REQUIREMENTS / NORMAS APLICABLES
ASTM-A-240/93;A-480/93;ASME-SA-240/95 + Add95

GRADE / MATERIAL: Acx 160 TP-304

FINISH / ACABADO: Nro.1

TRADE MARK / SELLO DEL FABRICANTE

INSPECTOR'S STAMP / SELLO DEL INSPECTOR

STEELMAKING PROCESS / PROCESO DE ACERIA A.O.D.

COIL / BOX BOBINA/CAJA	CONTENT CONTENIDO	DIMENSIONS DIMENSIONES THICKNESS ESPESOR	WIDTH ANCHO	LENGTH LARGO	MARKS MARCA	QUANTITY Nº PIEZAS	PROBETA	
Z3976	04PR91 CA	30,00	1.500,00	6.000,00	30	1	04PR91 C	C
Z3976	04PR91 CB	30,00	1.500,00	6.000,00	30	1	04PR91 C	C
Z8668	04PR91 DA	30,00	1.500,00	6.000,00	31	1	04PR91 D	C
Z8668	04PR91 DB	30,00	1.500,00	6.000,00	31	1	04PR91 D	C

CHEMICAL ANALYSIS — COMPOSICION QUIMICA (%)

HEAT NO. COLADA	C	CR	MN	N	NI	P	S	SI						
REQUIREMENTS REQUISITOS	0,080	18,000 20,000	2,000	0,100	8,500 10,500	0,045	0,030	0,750						
R91	0,049	18,318	1,632	0,050	8,596	0,024	0,008	0,318						

MECHANICAL PROPERTIES — CARACTERISTICAS MECANICAS

COIL PROBETA	MOD	Rm. N/MM2	Rp 0.2 N/MM2	HRB	A200 %						
REQUIREMENTS REQUISITOS	FT ST	515,00 700,00	205,00	92,00	40,00						
4PR C	CT	602,0	318,4	90,0	57,8						
4P D	CT	597,4	286,7	89,0	62,4						

TRUE COPY
C.S.A.I. s.p.a.
li, ...
VS. ord. Fax pos. .....
Ns. comm. ..... nº lamiera 4152
Inspection Department

INTERGRANULAR CORROSION / CORROSION INTERGRANULAR
ASTM-A-262 PRACTICA E

SURFACE AND DIMENSIONAL CONTROL / INSPECCION SUPERFICIAL Y DIMENSIONAL
SATISFACTORY / Satisfactoria

REMARKS / OBSERVACIONES

Temperatura de hipertemple entre 1050 y 1100 º C

ZAMBETTI & LUMINASTI S.p.A. ENDINE GAIANO (BG) N..... Controllo Qualità

WORK INSPECTOR / INSPECTOR

014

J.A. Simón

PALMONES, 28 FEBRERO 1997

D. 65.320.011

DMV STAINLESS ITALIA s.r.l.
24062 COSTA VOLPINO (BG)

(UNI EN 10204 3.1.B)

N° 76702631
Page 1

CUSTOMER'S ORDER 95/1405

MILL ORDER / ITEM 4711364/004

PRODUCT SEAMLESS STAINLESS STEEL PIPES-COLD DRAWN-ACC. TO ASTM A 312 /ASME SA 312 SEC. II IN TP 304L AND TP 304 - ANNEALED AND PICKLED - PLAIN ENDS -

DIMENSIONS:

Lg. From	Lg. To	O.D. mm	W.T. mm
4000	8000	42,400	2,000

QUANTITY : Nr 36 Mt 239 Kg 490 Ft 784' 1" Lbs 1080,2

TEST N. 59275 HEAT N. 74559

TENSION TEST + 20,0^C
TEST SPEC. : LONGITUDINAL

YIELD POINT 0,2% (MPA):	requir min	205	SECTION	37,6 mm2
TENSILE STRENGTH (MPA):	requir min	515	result	422,9
ELONGATION :	CALIBRATED ON 2"	50,8 mm	result	643,6
(%):	requir.min	35,0	result	42,3

TECNOLOGICAL TESTS PERFORMED WITH SATISFACTORY RESULTS:
FLATTENING TEST

HEAT N. 74559

HEAT ANALYSIS %

C	0,017	Mn	1,93	Si	0,32	P	0,025	S	0,003	Ni	10,35
Cr	18,20										

LEAK-TIGHTNESS TEST PERFORMED WITH SATISFACTORY RESULTS BY:
HYDRAULIC TEST PRESSURE 79,8 MPA

VISUAL AND DIMENSIONAL CONTROL OF THE TUBES HAS BEEN CARRIED OUT WITH SATISFACTORY RESULT

REMARKS:

THE STEEL IS PRODUCED BY ELECTRIC FURNACE

THE TUBES HAVE BEEN SOLUTION TREATED AT 1070°C

ALL TUBES HAVE BEEN SUBJECTED TO P.M.I. (FERRITE CHECKER) WITH SATISFACTORY RESULT.

ZAMBONELLI & LUMINASI S.r.l. ENDINE GAIANO (BG) N..... Controllo Qualità

IL PRESENTE CERTIFICATO E' VALIDO PER:
CUSTOMER ITALY INC. CHECKER
ORDINE N. 12 NS. COMMESSA N. 0.5.1.3
ORDER N. OUR WORK ORDER N.
POS. COMM. 03 QUANTITÀ 784
ITEM QUANTITY
FERRINOX
FOTOCOPIA CONFORME ALL'ORIGINALE

Questo certificato è emesso da un sistema computerizzato e è valido senza firma. Il certificato originale riporta il marchio DMV in colore blu lungo la diagonale. Il possessore dell'originale, qualora rilasci copie, deve attestarne a sua nome la conformità, assumendosi ogni responsabilità per usi illeciti o espressamente non consentiti dalla DMV Stainless Italia s.r.l.
Alterazioni e/o falsificazioni saranno perseguite a termini di legge.

This certificate is issued by a computerized system and it is valid without signature. On the original certificate the trade-mark DMV blu coloured along the diagonal is stamped. In case the owner of the original certificate would release a copy of it, he must attest its conformity to the original one taking upon himself the responsability for any unlawful or not allowed use.
Any alteration and/or falsification will be subject to the law.

Ce certificat est émis par un système informatisé et il est valable sans signature. Le certificat original reproduit la marque DMV de couleur bleu en diagonale. Dans le cas où le possesseur de l'original délivrera une copie, il devra attester la conformité en son nom, en s'endossant toute la responsabilité pour des usages illicites ou, tout simplement, pas permis par DMV Stainless Italia s.r.l.
Toute altération ou contrefaçon seront susceptibles d'entraîner des poursuites légales.

015

DATE 6/05/1996

D.M.V. STAINLESS ITALIA S.R.L.

CHIEF OF INSPECTION DPT
Ivan NEMBRINI

MANNESMANN
STAINLESS VALLOUREC

INSPECTION CERTIFICATE 3.1.B ACC. TO
EN 10204: 1991 + ...:1995

14195 1/

MW STAINLESS Deutschland GmbH
Postfach 16 01 20 · D-42830 Remscheid

To delivery note no 42/ / Delivery date . .

MW-order no 820/0537 4 Destination ITALY

Purchaser order no 4711609

Date of order 96.10.04 User-order no 2404/96
User

Supply plant MHP/REMSCHEID

Date of order 96.10.04 User-order no 2404/96

HIGH ALLOY STEEL TUBES # SEAMLESS, COLD FINISHED #
TECHNICAL TERMS OF DELIVERY DIN 17458, EDIT. 07.85,
PRUEFKLASSE 2 #
ASTM A 312 M - 94 B AND SA 312 M, EDITION 1995 / ASME BOILER
PRESSURE VESSEL CODE, SECTION II, EDITION 1995 #
IN CONNECTION WITH NF A 49-117, EDIT. 09.85 # TP 304 L
/ TP 304 / 1.4306 / 1.4301 / Z 2 CN 18.10 / Z 6 CN 18.09 #
FINISH: SOLUTION ANNEALED, FREE FROM SCALE #
ENDS PLAIN, SQUARE-CUT TO TUBE AXIS, DEBURRED #
TUBE TOLERANCE CLASS D 3 / T 3 ACC. TO DIN EN ISO 1127-05.96
IN RANDOM MILL LENGTH 4000 - 7000 MM

Interim Certificate
for information only
dated 25.3.97 signed

Item	Deliv.	Dimension/Item text	Quty/pcs	kg/lbs	Length m/ft
1	Part	OUT.DIAM. W.THICKN. 141,3 X 3,4 MM P.O.-NO. 2404/96 PACKED IN CASES	16	1.142 2.518	96,84 317,72

Results of ladle analysis (S) %

HEAT NO	STEELMAK.PROCESS	C	SI	MN	P	S	CR	NI
MINIMUM							18,000	10,000
MAXIMUM		0,030	1,000	2,00	0,045	0,0300	20,000	12,500
190220	S	0,024	0,380	1,88	0,019	0,0070	18,470	10,380

ZAMBETTI & LUMINA S.r.l. ENDINE GAVARNO (BG)
N. ....
Controllo Qualità

016

STAINLESS VALLOUREC DMV-Order no 62070657 4

Purchaser order no 4711609 14195 2

Tensile test results

Sample no.	Heat no	Test piece dimension mm	Test piece type	Test piece direction	Test piece loc. orient.	Test piece	Test temperature Grad C	Yield/proof strength Rp0,2 N/qmm	Rpl N/qmm	Tensile strength Rm N/qmm	Elongation (%) Lo=5.65VS0(A5)	Y/T Ratio %
MINIMUM								180	215	460	40,0	
MAXIMUM										680		
161	190220			longit			RT	256	291	583	58,2	

Hardness test results

Sample no	Heat no	HRB Value 1	Value 2	Value 3	Value 4
MAXIMUM		90,0	90,0	90,0	90,0
161	190220	73,0	73,0	73,0	
161	190220	74,0	74,0		

Other test results

-HEAT TREATMENT: 1040 DEGREES C AIR
-ULTRASONIC TEST ACC. TO SEP 1915: SATISFACTORY
-HYDROSTATIC TEST, 80 BAR: SATISFACTORY
-FLATTENING TEST: SATISFACTORY.
-RING EXPANDING TEST OF 100 % AT ONE END: SATISFACTORY
-VISUAL AND DIMENSIONAL INSPECTION SATISFACTORY
-INTERCRYSTALLINE CORROSION TEST AS PER DIN 50914 SATISFACTORY
-MATERIAL IDENTIFICATION TEST OF ALL TUBES BY SPECTROGRAPHIC ANALYSIS: SATISFACTORY
-INTERCRISTAL CORROSION TEST ACC. TO NF A 05-159: SATISFACTORY

Marking of the products

DMV-D -MATERIAL-DIMENSION-HEAT-NO-WA
H-S-2-US-ASTM A 312M/ASME SA 312M-SMLS-49-117-
TP 304/TP 304 L-1.4301/1.4306-
Z2 CN 18-10/Z6 CN 18-09

IL PRESENTE CERTIFICATO E' VALIDO PER
CLIENTE CUSTOMER FERRINOX
ORDINE N. ORDER N. 120 NS. COMMESSA N° OUR WORK TICKET N° A 998
POS. COMM. ITEM QUANTITÀ QUANTITY 1 PCS
FERRINOX ACCIAI INOSSIDABILI
FOTOCOPIA CONFORME ALL'ORIGINALE

THE PRODUCTS HAVE BEEN TESTED IN ACCORDANCE WITH THE PURCHASE SPECIFICATION AND ARE FOUND TO BE SATISFACTORY.

MHP MANNESMANN HOESCH PRAZISROHR GMBH
WERK REMSCHEID, ABNAHME
42831 REMSCHEID, POSTFACH 160210
SIGNED STOPKA, INSPECTION REPRESENTATIVE
REMSCHEID, THE 97.03.24, TELEPHONE: (02191) 366-205
TELEFAX: (02191) 366-220

This testimonial and certification respectively is recorded by computer system and is valid without signature. Alteration or use for other products are regarded as falsification of documents and will be subject to criminal jurisdiction.

ZAMBETTI & LUMINA S.r.l. ENDINE GAIANO (BG) N. ..... Controllo Qualità

017

[redacted]

INSPECTION
CERTIFICATE
ACC TO
EN 10 204 3.1.B

Customer order No: 970307-A1-000227
Cust No/Exp (Cons: 250-099
Date of order: 123913
Our order No: 300-36609 50127
Cust No/Exp (Buye: 250-700

MATERIAL DESCRIPTION:
SEAMLESS STAINLESS STEEL TUBES

STEEL GRADE:
SANDVIK 3R60

INSPECTOR'S S
QA-TUBE

MELTING PROCESS:
E

TECHNICAL REQUIREMENTS:
DIN 17458, TESTING CLASS 1

MATERIAL (STANDARD):
X2CRNIMO18143

MATERIAL NO
1.4435

EXTENT OF DELIVERY:

IT DIMENSIONS (MM) ETC.	PIECES	QUANTITY	HEAT NO	LOT NO
05 TST-3R60-159-4.5	8	890.0	439793	47178
TOTAL	8	890.0 KG		

HEAT ANALYSIS (%):

HEAT NO	C	SI	MN	P	S	CR	NI	M
439793	.017	.39	1.61	.031	.006	17.42	12.91	2.

RESULT OF TESTING:

LOT NO	RP0.2 N/MM2	RP1.0	RM N/MM2	A5 %	HARDNESS	HYDR.T MPA
47178	267	308	603	49		8.

SPECTROSCOPIC IDENTIFICATION: SATISFACTORY.
VISUAL INSPECTION AND DIMENSIONAL CONTROL: SATISFACTORY.
MARKING :
SANDVIK 3R60 W.NR 1.4435 H S PK 1 159.00 X 4.50 HT 439793

HEAT TREATMENT: SOLUTION ANNEALED AND QUENCHED.

THE MATERIAL IS MANUFACTURED ACCORDING TO A QUALITY SYSTEM, APPROVED AND REGISTERED TO ISO 9001

ZAMBETTI & LUMINASI
N.....
Controllo Qualità
ENDINE GAIANO (BG)

IL PRESENTE CERTIFICATO E' VALIDO PER:
CLIENTE / CUSTOMER: TERRINOX
ORDINE N. / ORDER N.: 1EL
NS. COMMESSA N° / OUR WORK TICKET N°: 139913
POS. COMM. / ITEM: 02
QUANTITÀ / QUANTITY: 1508
FOTOCOPIA CONFORME ALL'ORIGINALE

AB SANDVIK STEEL
Quality Assurance Department
ANITA RUNSTEN / CERTIFICATES

Beteckningar enligt ISO, v g vänd
Symbole according to ISO, PTO
Kurzzeichen laut ISO b.w.
Symboles selon ISO, t.s.v.p.

Postal address	Telephone	Division	Telefax	MEMO	Bankers	Postal giro accou
AB SANDVIK STEEL S-811 81 SANDVIKEN SWEDEN	Nat 026-26 00 00 Int +46 26-26 00 00 Telex 47000 sandvik s	Strip Wire Tube Semif.Prod. Special Metals	+46 26 27 23 07 +46 26 27 47 20 +46 26 25 27 70 +46 26 26 40 30	SESTLXST SESTLXWI SESTLXTU SESTLXSO	Svenska Handelsbanken S-E Banken	

DMV STAINLESS France SERVICE QUALITE B.P. 10 - 21501 Montbard cedex	ZERNAHLTPROTOKOLL EN 10204 - 3.1.B	9652861	Blatt/Seite 1 / 1

CLIENT
Purchaser / Besteller
COMMANDE No 95/1314/
Order Nr / Besteller Nr (Identification Fourniture/Certificat)
No COMMANDE USINE GZ3804030
SUBORDER / ITEM 4711330

TYPE DE PRODUIT

Tubes sans soudure	Finis à chaud	Série pipe	Hypertrempé Décapé
Seamless Pipes/Tubes	Hot finished	Pipe series	Annealed Pickled
Nathlose Stahlrohre	Warmgefertig	Série pipe	Abgeschreckt Gebeitz

NUANCES ET SPECIFICATIONS / Grade and Specifications / Stahlsorte und Liefervorschriften
TP304L/TP304
ASTM A 312/ASME SA 312
MARQUAGE/MARKING/MARKIERUNG : DMV -F- ASTM A312 / ASME SA312
TP304L/TP304 - HEAT : 386060 - 8" NPS.SCH 40S - 219.10 X 8.18 -
SEAMLESS - GZ3804030 -

QUANTITE / Quantity / Liefermenge			DIMENSIONS (Diam. X Ep. X Lg(mm)) / Size / Abmessung
ore	M 67.02	Kg 2910	219.10 x 8.18 SIZE 8" SCH 40S 5840 / 6400

ACTERISTIQUES CHIMIQUES / Chemical Analysis / Chemische Zusammenseltzung
boration / Melting Process / Erschmelzungsart ACIER ELECTRIQUE / ELECTRIC STEEL / ELECTROSTAHL

	C	Mn	P	S	Si	Ni	Cr				
MINI MAXI	0.035	2.00	0.040	0.030	0.75	8.00 11.00	18.00 20.00				
Coulée / Heat 386060	0.021	1.84	0.029	.0010	0.27	10.23	18.36				

ACTERISTIQUES MECANIQUES ET METALLURGIQUES / Mechanical and Metallurgical Properties / Mechanische und Metallurgische Kennwerte

	Re. à 0.2% Is 0.2% STRECKGRENZE MPA	Rm TENSILE TEST ENGFESTIGUNG MPA	A % ELONGATION DEHNUNG 50.8 mm	APLATISSEMENT FLATTENING RINGFALTV		
CONDITIONS IMPOSEES	MINI 205	MINI 515	MINI 35			
272 M273	297	584	50.9	BON-OK-OB BON-OK-OB		

COPIA CONFORME ALL'ORIGINALE
FERROTOX SRL

ZAMBETTI & LUMINASI S.r.l. ENDINE GAIANO (BG)
N. ...
Controllo Qualità

METALMA spa

RAME: ESTRATTO TABELLE UNI 5649 / 3310

SEMILAVORATI	COMPOSIZIONE CHIMICA					STATO FISICO	CARATTERISTICHE MECCANICHE		
	Cu	Bi	Pb	O_2	P		R	A	HB
Piatto/Barra Cu ETP									
UNI 5649-71	99,90	0,001	0,005	0,04	-	-	-	-	-
UNI 3310	-	-	-	-	-	Crudo H20	30+37	5	75+90
Lastra/Nastro Tubo Cu DHP									
UNI 5649-71	99,85	0,001	0,01	-	0,013 + 0,050	-	-	-	-
UNI 3310	-	-	-	-	-	Cotto R	20+25	40	40+60
UNI 3310	-	-	-	-	-	Crudo H10	25+29	10	60+75
UNI 3310	-	-	-	-	-	Crudo H20	30+37	5	75+90

APPLICAZIONI:

* Cu ETP Per semilavorati destinati a conduttori elettrici o per leghe pregiate.-
* Cu DHP Per semilavorati per i quali non vi sono esigenze di conduttività elettrica, ma aventi buone caratteristiche di plasticità ed esenti da fenomeni di fragilità in ambiente riducente.-

ZAMBETTI & LUMINA S.r.l. ENDINE GAIANO (BG) N..... Controllo Qualità

silmet

ATTESTATO DI ANALISI SU PRODOTTO FINITO N° 1295

DATA	17/11/95
DIMENSIONI TUBO	18 X 1
STATO FISICO	COTTO
PRODOTTO IL	16/11/95
RIFERIMENTO PCCL	945

COMPOSIZIONE CHIMICA

Cu	99,955
Zn	0,0000
Pb	0,0018
Fe	0,0000
Sn	0,0000
Ni	0,0052
P	0,0345
Mn	0,0018
Al	0,0011
Si	0,0000

NOTE

ZAMBETTI & LUMINA S.r.l. N..... Controllo Qualità ENDINE GAIANO (BG)

VISTO COLLAUDO

Tel. 030/2650275 - Fax 030/2651061 - Via Martiri della Libertà, 21 - Trebelle Gussago (BS) Italia

GHIDINI TRAFILERIE S.p.A.

Fonderie Estrusioni Laminazioni Trafilerie Corderie

ERTIFICATO DI COLLAUDO N° 1801 DEL 17.11.95

OVE ESEGUITE SU Tubo W DHP 18x1 rotoli

ENTE

NFERMA ORD. CLIENTE Pcl 945 16.11.95

N.	PROVINI Dimensioni mm.	PROVINI Sezione iniziale S_0 mm²	PROVE MECCANICHE trazione: Limite deformazione permanente 0,2% Totale Fs N.	Limite deformazione permanente 0,2% Unitario Rs N./mm²	Resistenza a trazione carico massimo Totale Fm N.	Resistenza a trazione carico massimo Unitario Rm N./mm²	Allungam. dopo rottura $L_0 = 40$ A %	durezza H	PROVE ELETTRICHE resistenza elettrica: Lettura al ponte ..... °C	Specifica a 20 °C Ω mm²/m	Condutt. % I.A.C.S.
	Dati richiesti secondo tabella UNI 6507					7,220	7,45				
6	18,01x0,90	48,35			11510	238,05	54,6				
7	18,01x0,90	48,35			11120	229,98	49,8				

ZAMBETTI & LUMINA S.r.l. N. ... Controllo Qualità ENDINE GAIANO (BG)

sto collaudo Cliente | Visto collaudo | Visto responsabile

Sede Amm.: Via Armieri, 8 - 25066 Lumezzane (Brescia) Italy
telefono (030) 871461 - telefax (030) 871998 - telegrammi GHIDINITRAFILERIE

Zambetti & Lumina

SEZIONE

SECTION

D

Zambetti & Lumina srl

PROCEDURE QUALIFICATION RECORD

Doc. N. PQR 0107

Emesso il 20.06.91

Foglio 1 di 2

PQR N. 0107 according to ASME

WPS N. 0107 Rev. 0

WELDING PROCESS

SMAW a	[X]	OFW f	[ ]
SAW b	[ ]	ESW g	[ ]
GTAW c	[X]	EGW h	[ ]
GMAW d	[ ]	EBW i	[ ]
PAW e	[ ]	SW l	[ ]

TYPE

Manual	1	[X]
Automatic	2	[ ]
Semiautomatic	3	[ ]
Machine	4	[ ]
Other	5	[ ]

SEQUENCE

from one side [X] c1 + a1

from both side [ ]

BEVEL PREPARATION

Workmachined	[X]
Grinded	[ ]
Cutted	[ ]
Oxycutted	[ ]
Other	[ ]

BACKING

Yes [ ] No [X]

Back.Mater. ____

Welding Joint Type SEE JOINT

WELD METAL DEPOSIT GTAW 1 = 3 mm
WELD METAL DEPOSIT SMAW 2÷N: OTHER

MATERIAL

Group N. P 8.1 to P 8.1

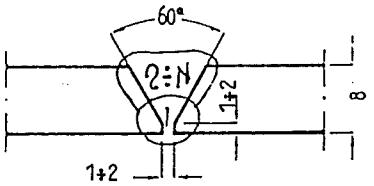
Material A240 316L to A240 316L

VALIDITY

Base Metal 1,58 to 16 mm

Weld Metal 1,58 to 16 mm

Diameter over 2"



WITH BACK GAS RATE 18/19 LT/1'

Layer	Proc.	FN.	AN.	SFA	AWS	Dia.	+/-	Amps.	Volts	Weld Metal	Flux or Gas	Gas rate	Speed
1	c1	5	8	5.9	ER 316 L	2.4	+	75÷80	-	FILOGASTIG 316L	ARGON	9/10 LT/1'	
2÷N	a1	5	8	5.4	E 316 L	3.25	-	90÷110	-	RS 316 L			

PREHEAT

Temp. ≥20 C

Interpass T. ≤200 C

Preheat Maint. ____ h

TECHNIQUE 1

Bead	String	[X]	Weave [ ]
Pass	Multiple	[X]	Single [ ]
Electrode	Multiple	[ ]	Single [X]

CLEANING

Initial Cleaning BRUSHING

Interpass Clean. BRUSHING

Back Gouging NO

Peening NO

POSITION

		G	F	S
Flat	1	[X]	[ ]	[ ]
Rotated	1R	[ ]	[ ]	
Horizontal	2	[ ]	[ ]	[ ]
Rotated	2R		[ ]	
Vertical	3	[ ]	[ ]	
Overhead	4	[ ]	[ ]	[ ]
All position	5	[ ]	[ ]	
All pos. 45deg	6	[ ]		

Weld Progress Up [ ] Down [ ]

HEAT TREATMENT

	1st	2nd	1st H.T.
Annealing	[ ]	[ ]	T. ____ C
Normalizing	[ ]	[ ]	H.T. ____ C/h
Tempering	[ ]	[ ]	C.T. ____ C/h
Solubilizing	[ ]	[ ]	Maint. ____ h
Quenching	[ ]	[ ]	2nd H.T.
Interm.PWHT	[ ]		T. ____ C
Stress Relief.	[ ]	[ ]	H.T. ____ C/h
P.W.H.T.		[ ]	C.T. ____ C/h
			Maint. ____ h

NON DESTRUCTIVE TEST

	VI	PT	MT	RT	UT
Bevel	[X]	[ ]	[ ]	[ ]	[ ]
Root pass	[X]	[ ]	[ ]	[ ]	[ ]
Interpass	[ ]	[ ]	[ ]	[ ]	[ ]
Final pass	[ ]	[ ]	[ ]	[ ]	[ ]
After goug.	[ ]	[ ]	[ ]	[ ]	[ ]
On all weld	[X]	[X]	[ ]	[X]	[ ]

Revisionato da SERTEG ZAMBETTI & LUMINA

Revisionato il 20.06.91

Revisione N. 0

& LUMINA srl

BUREAU VERITAS MILAN ITALY WITNESSED SURVEYOR DATE

BUREAU VERITAS SURVEYORS PARIS 1828 MILAN INTERNATIONAL REGISTER

023

Zambetti & Lumina srl

PROCEDURE QUALIFICATION RECORD

Doc. N. PQR 0107

Emesso il 20.06.91

Foglio 2 di 2

Results of PQR N. 0107

TENSILE TESTS

Specimen N.	Width	Thk	Area	T.S. N/mm2	Y.P. N/mm2	E %	Type of failure
01-07	19.1	8.5	162.3	564			DUCTILE - IN THE WELD
01-07	19.1	8.4	160.4	562			DUCTILE - OUT OF WELD

BEND TESTS

Face	Root	Side
GOOD	GOOD	
GOOD	GOOD	

HARDNESS AND MACRO

Hardness Type _____

B.M.	W.M.	H.A.Z.

TOUGHNESS TESTS

Specimen N.	Notch Loc.	Notch Type	Test Temp	Impact Value	Remarks

CH.ANAL.

C =	Mn=	Si=	S =	P =
Cr=	Ni=	Mo=	Ti=	Co=
Cu=	Nb=	Va=		

FILLET

Visual Insp. SATISFACTORY Yes ☐ No ☐

Penetrat.into Parent Metal Yes ☐ No ☐

Heat Treatment Chart N. / performed by /

Certificate of Radiographic Test N. 1501/91/ND performed by QUALITY CONTROL

Mechanical Test Certificate N. 2581/91/PM performed by QUALITY CONTROL

Other Test / performed by /

We certify that the statement in this record are correct and that the test weld were prepared, welded and tested in accordance with: ASME IX

WELDERS

Welder Name	Process	Stamp N.
PRIORE GIUSEPPE	GTAW	S3
PRIORE GIUSEPPE	SMAW	S3

Date	Manufacturer
15/07/91	ZAMBETTI & LUMINA

ZAMBETTI & LUMINA S.r.l.

Test conducted by: QUALITY CONTROL

Date	Agency Inspection
15/07/91	BUREAU VERITAS

BUREAU VERITAS MILAN ITALY WITNESSED APPROVED SURVEYOR A. NICOLINI DATE

Revisionato da			
Revisionato il			
Revisione N.			

BUREAU VERITAS SURVEYORS AT PARIS 1828 MILAN INTERNATIONAL REGISTER

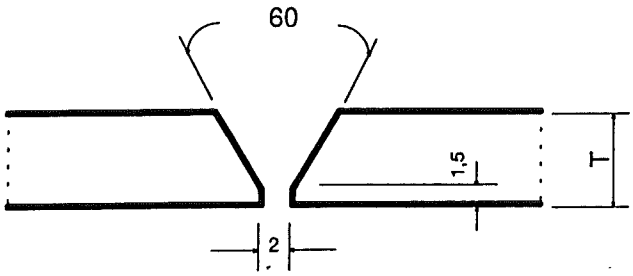
Zambetti & Lumina srl	PROCEDURE QUALIFICATION RECORD According to ASME Code Sect. IX	PQR 12-96 Page 1 of 2 Date

WPS Nr. 12-96

Welding Process GMAW

Types (Manual , Automatic ,Machine , Semi-autom.) SEMI-AUTOMATIC

JOINT (QW-402)



BUREAU VERITAS SURVEYORS PARIS 1828 MILAN INTERNATIONAL REGISTER

BASE METALS (QW-403)

Material Specification	ASTM A 240 TP. 304L
P-No. to P-No.	8 to 8
Test Thickness (m m)	20
Test Diameter (mm)	/
Other	/

PWHT (QW-407)

Temperature (° C)	/
Time (h)	/
Heating Rate (°C / h)	/
Cooling Rate (°C / h)	/
Other	/

FILLER METALS (QW-404)

Process (es)	GMAW
SFA Specification	5.9
AWS Classification	ER 308L
Filler Metal F-No.	6
Weld Metal A-No.	8
Chemical Analysis	/
Size of Filler Metal (mm)	1,0
Brand Name Wire/Electrode	OK AUTROD 16.12
Manufacturer	ESAB
Brand Name Flux	/
Manufacturer	/
Deposit. Weld Metal (mm)	20
Other	/

GAS (QW-408)

	Shielding	Trailing	Backing
Composition (%)	98%Ar + 2%CO2	/	98%Ar + 2%CO2
Flow Rate (l / l')	20 -24	/	28 - 30

Other /

ELECTRICAL CHARACTERISTICS (QW-409)

Process (es)	GMAW
Current	DC
Polarity	REVERSE
Amps.	140 - 170
Volts	27 - 34
Tungsten Size (mm)	/
Other	METHOD OF ARC TRANSFER : GLOBULAR

POSITION (QW-405)

Position	1G
Progression (Uphill-Downhill)	/
Other	/

PREHEAT (QW-406)

Preheat temperature (°C)	20
Interpass Temperature (°C)	150
Other	/

TECHNIQUE (QW-410)

Travel Speed (cm / l')	45
String or Weave Bead	STRING
Oscillation (mm)	/
Multipass or Single Pass	MULTIPASS
Single or Multiple Electrodes	/
Welding Sequencies	ALL PASSES : GMAW
Other	BACK GOUGING : GRINDING

Zambetti & Lumina srl	PROCEDURE QUALIFICATION RECORD According to ASME Code Sect. IX	PQR 12-96 Page 2 of 2 Date

TENSILE TEST - (QW-150)

Test Nr.	Width (mm)	Thickness (mm)	Area (mm^2)	Ultimate Total Load (N)	Ultimate Unit Stress (N/mm^2)	Type of Failure & Location
1	20,0	19,8	396,0	210.000	530	DUCTILE - OUTSIDE WELD
2	20,0	19,7	394,0	213.000	540	DUCTILE - OUTSIDE WELD

ALL WELD METALTENSILE TEST

Test Nr.	Diameter (mm)	Area (mm^2)	Length (mm)	Yeld		Tensile		Elongation	
				Total (N)	Unit (N/mm^2)	Total (N)	Unit (N/mm^2)	Total (mm)	Unit (%)

GUIDED BEND TEST - (QW-160)

Type and Figure No.	Results	Type and Figure No.	Results
Transversal Side - QW 462.2	Good	Transversal Side - QW 462.2	Good
Transversal Side - QW 462.2	Good	Transversal Side - QW 462.2	Good

TOUGHNESS TEST - (QW-170)

Test Nr.	Notch Location	Notch Type	Test Temp. (°C)	Impact Value (J)	Lateral Expansion		Drop Weight	
					(% Shear)	(Mils)	Break	No Break

FILLET-WELD TEST - (QW-180)

Result : Satisfactory ☐ Yes ☐ No Penetration into Parent Metal ☐ Yes ☐ No

Macro Result

OTHER TESTS

Macro Examination SATISFACTORY

Hardness Test /

Chemical Analysis /

Non Destructive Examination RADIOGRAPHIC : SATISFACTORY

BUREAU VERITAS SURVEYORS PARIS 1828 MILAN INTERNATIONAL REGISTER

Welder' s Name and Stamp ZANNI GIANFRANCO - S18

Test Conducted By BUREAU VERITAS Laboratory Test Nr.

We certify that the statement in this record are correct and that the test weld were prepared , welded and tested in accordance with the requirements of Section IX of the ASME Code.

MANUFACTURER	DATE	TESTING AGENCY
Zambetti & Lumina s.r.l. Cont. Qualità II° Livello SNT-TC-IA Walter Spelgatti	18 MAR. 1996	BUREAU VERITAS ITALY WITNESSED REVIEWED SURVEYOR A. NICOLINI

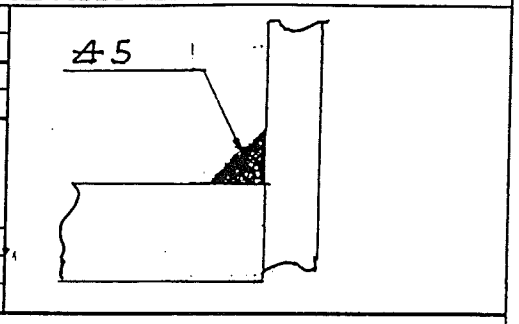
Zambetti & Lumina

WELDING PROCEDURE SPECIFICATION

According to ASME CODE Sect.IX

WPS Nr. 0107/C — Pag. 1 / 1

PQR Nr. 0107



QW 402	Joint preparation	Grinding or Machining
	Back Gouging	Grinding
QW 403	Materials Specification	ASTM A240 TP.304L
	P No. to P No.	8,1 to 8,1
	Thickness (mm)	5
	Diameter (mm)	/
	Welding Process	GTAW - MANUAL
	Weld Passes	ALL
	Backing Support	NONE
QW 404	Deposited Weld Thickness (mm)	5
	Size of Weld Pass (mm)	<5
	Size of Filler Metal (mm)	2,4
	Filler Metal Brand Name	FILOGASTIG
	Flux Brand Name	/
	A No.	8
	F No.	5
	SFA Specification	5,9
	AWS Classification	ER 316L
	Other	/
QW 405	Welding Position	1G
	Welding Progression	/
QW 406	Preheating Temperature (° C) min.	20
	Interpass Temperature (° C) max.	<200
	Post-heating Tem. & Time (° C& hr)	/
	Method of Heating	/
	Method of Control	/
QW 408	Shielding Gas	99,99 % ARGON
	Flow Rate (L / 1')	9/10 LT/1'
	Backing Gas	/
	Flow Rate (L / 1')	/
	Trailing Gas	/
	Flow Rate (L / 1')	/
QW 409	Current	DIRECT
	Polarity	STRAIGHT
	Amps	75 ÷ 80
	Volts	/
	Heat Imput (KJ/ cm)	/
QW 410	Travel Speed (cm / 1')	/
	Wire Feed Speed (cm / 1')	/
	Contact to Work Distance (mm)	/
	Method of Arc Transfer	GLOBULAR
	Bead Type (Weave or String)	STRING
	Oscillation (mm)	5
	Gas Cup Size (mm)	/
	Tungsten Electrode Size (mm)	/
	Multipass or Single Pass	SINGLE
	Single or Multiple Electrode	SINGLE
	Cleaning (Initial & Interpass)	BRUSHING AND GRINDING
	Peening	/
	Other	/
QW 407	PWHT Temperature (° C)	/
	PWHT Holding Time (hr)	/

Rev.	Date	Descr.	Prep.	Appr.
0	17/06/ 96			

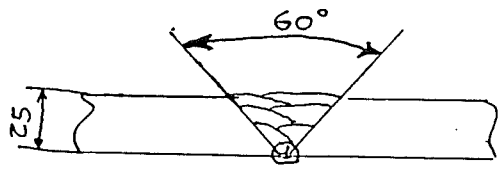
Zambetti & Lumina

WELDING PROCEDURE SPECIFICATION

According to ASME CODE Sect.IX

WPS Nr. 7033/A — Pag. 1 / 1

PQR Nr. 0107 + 12-96



QW 402	Joint preparation	Grinding or Machining
	Back Gouging	Grinding
QW 403	Materials Specification	ASTM A240 TP.304
	P No. to P No.	8.1 to 8.1
	Thickness (mm)	25
	Diameter (mm)	/

	Welding Process	GTAW - MANUAL	GMAW - SEMIAUTOM.
	Weld Passes	1ST	FILL-OUT - RIEMPIMENTO
	Backing Support	NONE	YES, WELD METAL
QW 404	Deposited Weld Thickness (mm)	<6	< 30
	Size of Weld Pass (mm)	<5	< 10
	Size of Filler Metal (mm)	2,4	1.0
	Filler Metal Brand Name	FILOGASTIG	ESAB OK AUTROD 16,12
	Flux Brand Name	/	/
	A No.	8	8
	F No.	5	6
	SFA Specification	A 5.9	A 5.9
	AWS Classification	ER 316L	ER 308L
	Other	/	/
QW 405	Welding Position	1G	1G
	Welding Progression	/	/
QW 406	Preheating Temperature (° C) min.	> 20	>20
	Interpass Temperature (° C) max.	<200	< 200
	Post-heating Tem. & Time (° C& hr)	/	/
	Method of Heating	/	/
	Method of Control	/	/
QW 408	Shielding Gas	99,99 % Ar	98% Ar + 2% CO2
	Flow Rate (L / 1')	9/10 LT/1'	20 - 24
	Backing Gas	/	/
	Flow Rate (L / 1')	/	/
	Trailing Gas	/	98% Ar + 2% CO2
	Flow Rate (L / 1')	/	28 - 30
QW 409	Current	DIRECT	DIRECT
	Polarity	STRAIGHT	REVERSE
	Amps	75 - 80	120 - 150
	Volts	/	22 - 24
	Heat Imput (KJ/ cm)	/	/
QW 410	Travel Speed (cm / 1')	/	40 - 46
	Wire Feed Speed (cm / 1')	/	/
	Contact to Work Distance (mm)	/	/
	Method of Arc Transfer	GLOBULAR	GLOBULAR
	Bead Type (Weave or String)	STRING	STRING
	Oscillation (mm)	5	/
	Gas Cup Size (mm)	/	20
	Tungsten Electrode Size (mm)	/	/
	Multipass or Single Pass	SINGLE	MULTIPASS
	Single or Multiple Electrode	SINGLE	/
	Cleaning (Initial & Interpass)	BRUSHING AND GRINDING	BRUSHING AND GRINDING
	Peening	/	/
	Other	/	/
QW 407	PWHT Temperature (° C)	/	/
	PWHT Holding Time (hr)	/	/

Rev.	Date	Descr.	Prep.	Appr.
0	21/04/ 97			

Zambetti & Lumina srl

WELDER AND OPERATOR QUALIFICATION TESTS

Doc. N. WOP 110

Emesso il 20.06.91

Foglio 1 di 1

Welder Name PRIORE GIUSEPPE Stamp N. S3 Using WPS N. 0107 Rev. 0

VARIABLES	VALUE USED IN QUALIFICATION	QUALIFICATION RANGE
Process	SMAW [X] SAW [ ] GTAW [X] GMAW [ ] PAW [ ] OFW [ ] ESW [ ] EGW [ ] EBW [ ] SW [ ]	SMAW [X] SAW [ ] GTAW [X] GMAW [ ] PAW [ ] OFW [ ] ESW [ ] EGW [ ] EBW [ ] SW [ ]
Process Type	Man [X] Aut [ ] S/A [ ] Mac [ ] Oth [ ]	Man [X] Aut [ ] S/A [ ] Mac [ ] Oth [ ]
Backing	Yes [ ] No [X]	Yes [X] No [X]
Material Spec. PN	P8 [ ] [ ] to P8 [ ] [ ]	P8 [ ] [ ] to P8 [ ] [ ]
Thickness	[ ] FILLET [X] GROOVE	[X] FILLET all [X] GROOVE UP TO 16 MM
Diameter	[ ] FILLET [ ] GROOVE	[X] FILLET all [X] GROOVE OVER 2"
Filler Metal	AWS ER 316/ E316 SFA 5.4/5.9 FN. 5 [ ] [ ]	AWS ER 316/ E316 SFA 5.4/5.9 FN. 5 [ ] [ ]
Positions	1 1R 2 2R 3 4 5 6 G [X] [ ] [ ] [ ] [ ] [ ] [ ] F [ ] [ ] [ ] [ ] [ ] [ ] [ ] S [ ] [ ] [ ]	1 1R 2 2R 3 4 5 6 G [X] [X] [X] [ ] [ ] [ ] [ ] F [X] [X] [X] [X] [ ] [ ] [ ] S [X] [X] [ ]
Weld Progression	Up [ ] Down [ ]	Up [ ] Down [ ]
Type of Gas	GAS ARGON	GAS ARGON
Electrical Characteristics	CURRENT DIRECT POLARITY NEG/POS	CURRENT DIRECT POLARITY NEG/POS

Macro result: SATISFACTORY Yes [ ] No [ ]

Fracture test: /

We certify that the statement in this record are correct and that the test weld were prepared, welded and tested in accordance with: ASME IX CONJOINTLY TO PQR 0107

BEND TEST	Type	No.	Results
	Face	2	SATISFACTORY
	Root	2	SATISFACTORY
	Side		

Radiographic Results: SATISFACTORY Yes [X] No [ ]

Radiogr. Tests Cert. N. 1501/91/ND

Date	Manufacturer
15/07/91	ZAMBETTI & LUMINA S.r.l.

Test conducted by	Date	Agency Inspection
	15/07/91	BUREAU VERITAS

BUREAU VERITAS MILAN ITALY WITNESSED SURVEYOR A. NICOLINI

BUREAU VERITAS SURVEYORS PARIS 1828 MILAN INTERNATIONAL REGISTER

Revisionato da				
Revisionato il				
Revisione N.				

Zambetti & Lumina srl	WELDER / WELDING OPERATOR QUALIFICATION RECORD According to ASME Code Sect. IX	WPQ S18-12-96

NAME OF WELDER ZANNI G. FRANCO **STAMP No. S18**

WPS No. 12-96

THE ABOVE WELDER IS QUALIFIED FOR THE FOLLOWING RANGES :

VARIABLES	VALUES USED IN QUALIFICATION	QUALIFICATION RANGE
Process	GMAW	GMAW
Type	SEMI-AUTOMATIC	SEMI-AUTOMATIC
Backing	YES	YES
Materials specification	ASTM A 240 TP. 304L	
P-no. to P-no.	8 / 8	1 - 8 to 1-8
Type of Joint (Groove or Fillet)	GROOVE	GROOVE & FILLET
Thickness of Test Coupon (mm)	20	MAX TO BE WELD
Diameter of Test Coupon (mm)	/	> 78
Filler Metal SFA Spec	5.9	5.9 / 5.18 / 5.28
Filler Metal AWS Class.	ER 308L	ALL THOSE INCLUDED IN FNo
F No.	6	6
Position	1G	1G-1F
Weld Progression	/	/
Shielding Gas	Ar 98% + CO2 2%	Ar 95 / 99 % + CO2 1 / 5%
Type Of Current	DC	DC
Polarity	REVERSE	REVERSE
Joint Tracking	/	/
Visual Control	/	/

GROOVE WELD

Guided bend test (type , No. and results) :	/
Radiografphc examination of test sample :	SATISFACTORY
Radiogaphic examination of production weld :	/
Visual Examination :	SATISFACTORY

FILLET WELD

Fracture test :	/
Length and percentage of defects :	/
Macro test-Fusion :	/
Appearance and fillet size :	/
Visual Examination :	/

BUREAU VERITAS SURVEYORS PARIS 1828 MILAN INTERNATIONAL REGISTER

Test conducted by (Laboratory Test No.)

We certify that the statement in this record are correct and that the test welds were prepared , welded and tested in accordance with the requirements of Section IX of the ASME Code.

MANUFACTURER	DATE	TESTING AGENCY
Zambetti & Lumina s.r.l. Cont. Qualità II° Livello SNT-TC-1A Walter Spelgatti	18 MAR. 1996	BUREAU VERITAS MILAN ITALY WITNESSED SURVEYOR A. NICOLINI

Zambetti & Lumina

SEZIONE

SECTION

E

Zambetti & Lumina	SISTEMA QUALITA' *QUALITY SYSTEM*	RLP N° 14/97
	RAPPORTO DI ESAME CON LIQUIDI PENETRANTI *Penetrant liquid test report*	COMM. *job* 7033
		DATA *Date* 18-06-97

CLIENTE *Customer* ANSALDO ENERGIA S.P.A.	ORDINE *Order* BC 132126 DEL 11-03-97	COMM. CLIENTE *Customer's job* F1000HEM
OGGETTO *Subject* PARTICOLARI VARI CAMINO CRIOGENICO	DISEGNO *Drawing* 620RM07428 620RM07431 620RM07432	QUANTITA' *Quantity* 1 + 1 + 1

Stato di controllo *Testing status*	☐ Preliminare *Preliminary*	☒ Finale Z&L *Final Z&L*	☐ Finale ufficiale *Final official*	
Condizioni superficiali *Surface conditions*	☐ Sabbiate *Sandblasted*	☐ Lavoraz. meccanica *Machined*	☒ COME SALDATO AS WELDED	
Tipo di liquido *Liquid type*	☒ Solubile in acqua *Water-washable*	☐ Rimov. con solvente *Solvent-removable*	☐ Post emulsionabile *Post-emulsifiable*	
Metodo di rilevazione *Detection mode*	☒ Contrasto di colore *Colour contrast*	☐ Contrasto di luminosita' (luce di wood) *Brilliance contrast (wood light)*		

Procedura d'esame *Examination procedure* ASME V ART. 6	Limiti di accettazione *Acceptance standards* ASME VIII
Liquido detergente *Cleaner* / Temp. *Time* /	Liquido penetrante *Penetrant liquid* PENETRANT DP51 Temp. *Time* 15 MIN.
Emulsificatore *Emulsifier* / Temp. *Time* /	Rivelatore *Developer* DEVELOPER D100 Temp. *Time* /
Caratteristiche chimiche in accordo con *Chemical analysis in compliance with* ASME sez. V art.6 par. T530 ☒	Temperatura di prova *Testing temperature* (°C) 25 ±

Schizzo zone esaminate
Sketch of tested parts

Risultati *Results*	☒ Conforme *According to*	☐ Non conforme *Not according to*	☐ Scarto *Rejection*

Note
Remarks

1- CONTROLLO ESEGUITO SUL 100% DELLE SALDATURE DI TENUTA

2- RIF. NS. PCQ N° 03/97 FASE 3.4

Operatore *Operator*	Enti Collaudatori *Inspect. officials*	Ispettore cliente *Customer inspect.*	Capo collaudo *Inspect. Department manager*
			Zambetti & Lumina s.r.l. Cont. Qualità II° Livello SNT-TC-IA Walter Spaldatti

MODULO - MD007 Rev.00

OFFICINA CONTI SALDATURA
24049 VERDELLO (BG)
Via Fermi, 13/A - Zona Ravarolo
Tel. (035) 48.95.38 - Telefax (035) 48.11.90

CERTIFICATO RADIOGRAFICO

Radiographic Certificate

DOSSIER CERTIFIC.VO
Inspection Book

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Pag. 1 of 21

CLIENTE
Customer ZAMBETTI & LUMINA

ORDINE
Order /

COMMESSA CONTI
Conti Job /

COMPONENTE: TIPO
Component Type

SIGLA
Item

N° FABBRICA
Serial no

CORPO	FONDI	TUBI	BOCCHELLI			DISEGNO
						Drawing 620RM07428

CODICE E SPECIF. APPLICABILE
Applicable Spec. and Code ASME V - ASME VIII

PROCEDURA D'ESAME
Examinat. Procedure RT 1

OGGETTO
Object SCATOLA VALVOLE

MATERIALE
Material AISI 304

CONDIZIONI D'ESAME - Examination Conditions

SORGENTE: TIPO
Source Type "X" RAY

PROD.
Prod. GILARDONI

MACCHIA FOCALE

K e V 280 Focal Spot Size 3x3

mA 6

DIST. FOCALE 700 TEMPO ESPOS. 1' 35"
Souce to Film Distance Exposure Time

SCHERMI PIOMBO - Lead Screen

ANT. SP. Front thk. 0,10 POST SP. Back thk. 0,10

PENETRAMETRO - Penetrameter

TIPO Type 6 DIM.

☒ LATO SORG. - Source Side
☐ LATO FILM - Film Side

ESPOSIZIONE - Exposure

PARETE-Wall : ☒ SING. - Single ☐ DOPPIA - Double
FILM - Film : ☒ SING. - Single ☐ DOPPIO - Double

TIPI DI DISCONTINUITÀ - Types of Discountinuities

1a	POROSITÀ DISUNIFORME - Scattered Porosity
1b	POROSITÀ A GRAPPOLO - Cluster Porosity
1c	POROSITÀ ALLINEATE - Linear Porosity
1d	POROSITÀ ALLUNGATE (TARLI) - Piping Porosity
2a	INCLUSIONE SCORIA - Slag Inclusion
2b	INCLUSIONE TUNGSTENO - Tungsten Inclusion
3	MANCANZA FUSIONE - Incomplete Fusion
4	MANCANZA DI PENETRAZIONE - lack of penetration
5	INCISIONE MARGINALE - Undercut
6	INCISIONE ALLA RADICE - Shrinkage Groove
12a	CRICCA LONGITUDINALE - Longitudinal Crack
12b	CRICCA TRASVERSALE - Transversal Crack
12c	CRICCA DI CRATERE - Crater Crack
12f	CRICCA DI RADICE - Root Crack
16	CORDONE IRREGOLARE - Weaving Fault
17	SGOCCIOL. 1A PASS. - Excess of Pen. 1st Pass.
18	SLIVELLAMENTO LEMBI - Edges Misalignment
19	ECCESSO DI PENETRAZIONE - Excessive penetration
20	INSELLAMENTO ALLA RADICE - Root Concavity
21	RIPRESA DIFETTOSA - Stop Start Defect

SCHIZZO POSIZIONE FILMS:
Films Position Sketch

Zambetti & Lumina

N.° RER-07/97
C.C.Mod. 7033
DATA 18-06-97
CLIENTE CUSTOMER ANSALDO ENERGIA
ORDINE ORDER BC 192126
DISEGNO DRAWING 620RM07428
CONTROLLATO CONTROLLED

OFFICINA CONTI SALDATURA
24049 VERDELLO (BG)
Via Fantoni, 13/A - Zona Ravarolo
Tel. (035) 48.95.38 - Telefax (035) 48.11.90

CERTIFICATO RADIOGRAFICO

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TRATTO Position	SALD.RE Welder	DIMENSIONI Dimensions		FILM		TIPO DIFETTO Type of defect	GIUDIZIO Judg.nt	NOTE Remarks
		DIAM. Diam.	Sp. Thk.	TIPO Type	CLASSE Class			
A 1-2	–		25	D7	II		1	
B 1-2	–		25	D7	II		1	
C 1-2	–		25	D7	II		1	
D 1-2	–		25	D7	II		1	

GIUDIZIO - Judgement

1: NESSUN DIFETTO - No Defects
2: DIF.TI ACCETT.LI DAL COD. - By Code Acc.ble Defects
3: DIFETTI DA RIPARARE - Defects to Repair
4: SALDATURA DA SCARTARE - Weld to Reject

ESEGUITO DA Performed by	INTERPRETATO DA Interpreted by	APPROVATO DA Approved by	DATA Date	ISPETTORE CLIENTE Custom. Inspector	ISPETT. AUTORIZZATO Authorized Inspector
Fabio Conti	Fabio Conti ☐ I°LEVEL ☒ II°LEVEL ASNT-CICPND	Fabio Conti ☐ I°LEVEL ☒ II°LEVEL ASNT-CICPND	13/06/97		

ESAME - Examination

LETTURA LASTRE - Radiographs Viewing

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Zambetti & Lumina

SEZIONE

SECTION

F

RPR
LT n° 839/601

RAPPORTO DI PROVA
Helium leak test report

COMM GC: *Job* 839 **CLIENTE** *Customer* ZAMBETTI & LUMINA **ORDINE** *Order* 326/97 **COMM:** *Job* 7033

IMPIANTO: *Plant* — **UNITA':** *Unit*

OGGETTO: *Subject:* CAMINO CRIOGENICO RIF. ORD. ANSALDO BC192126 **ITEM**

PARTI VERIFICATE *Tested parts* SALDATURE E ACCOPPIAMENTI/SPORTELLI - FLANGIA INFERIORE

CODICE: *Code* ASME V ART. 10 APP. V ED. 95 **SPECIFICA** *Specification* ANSALDO 700RM07442 REV. 0 15/01/97 **DIS.:** *Drw* 620RM07433

STRUMENTAZIONE DI PROVA/*Testing equipment*

UNITA' DI CONTROLLO: *Control unit* ALCATEL ASM 120 H **SN:** *sn.* 1088 **SENSIBILITA':** *Sensibility* 1×10^{-9} mbar l/s **TARATURA:** *Calibration* 11/04/97

GRUPPO DI POMPAGGIO: *Pumping System* VARIAN SD-1400 **SN:** *sn* ROOTS 500 **SN:** *sn* TURBO MOL **SN:** *sn* 1506/M **SN:** *sn* /

MISURATORE DI VUOTO: *Vacuum gauge* EDWARDS 1001 **SN:** *sn* 5733-50-196 **SN:** *sn* PRL 10 **SN:** *sn* D021-58-00 **SN:** *sn* /

VAL.NOM.FUGA CAMP.A PERMEABILITA': *Permeability cal. leak nom.value* 6×10^{-8} mbar. l/sec **A** *at* 20 °C **TARATURA:** *Calibration* 05/03/97

TEMP. AMBIENTE: *Room temperature* 15 °C **COEFF. CORR. TEMPO:** *Time drift* / %ANNO *Year* **COEFF. CORR. TEMP.:** *Thermal drift* ± 3 % °C

VAL.EFF.FUGA CAMP.A PERMEAB.: *Actual calibrated leak* 5×10^{-8} mbar. l/sec **VAL.NOM.FUGA CAMP.CAPILL.:** *Capillary calibrated leak nom. value* / mbar. l/sec

CONDIZIONI DI MISURA E DATI OPERATIVI/*Testing condition and work notes*

CONDIZIONI DEL PEZZO *Tested parts conditions*	INTERNA *Internal*	ESTERNA *External*	METODO DI PROVA *Testing method*
PRESS. ☐ VUOTO ■ *Press. Vacuum*	$1{,}3 \times 10^{-3}$ mbar	A.T.M	HOOD ■ GLOBAL ■ / PRESS. ☐ JET He ☐
CONCENTRAZIONE He *He concentration*	/	45%	BOMBING ☐ SNIFFER ☐ / LOCALIZ. ☐ ACCUMUL. ☐

TECNICA DI RILEVAZIONE/*Detection tecnique* STATICA/*Static* ■ DINAMICA/*Dynamic* ☐

TEMPO DI RISPOSTA: *Response time* 10 sec. **TEMPO DI ATTESA:** *Detection time* 20 min. **PRESS. TEST PORT:** *Test port pressure* $1{,}3 \times 10^{-3}$ mbar

PRESS. ASS. S. MASSA: *M.S. abs. pressure* $< 1 \times 10^{-4}$ mbar **F.S IND. FUGA:** *F.S. of leak indication* 10^{-9} mbar

VELOCITA' DI SCANSIONE: *Scanning speed* / **DISTANZA DAL PEZZO:** *Work distance* /

RISULTATI/*Result*

LIMITE DI ACCETTABILITA': *Allowable leakage* 1×10^{-7} mbar.l/s **GLOBALE** *Global* ■ **PARZIALE** *Partial* ☐

FUGA INDICATA: *Indicate leak* 3×10^{-9} mbar.l/s **RUMORE DI FONDO: (M2)** *Background* 3×10^{-9} mbar.l/s

FUGA RILEVATA : Q = (M3-M2) *Detected leak* 0 (ZERO) **FUGA CALCOLATA : Q1 = (Q x 100/%He)** *Calculated leak* 0 (ZERO)

CONFORME/ACCEPTABLE ■ **NON CONFORME/NOT ACCEPTABLE** ☐

NOTE/Notes : RIF. QCP N° 09/97 ITEM 3.7

DATA/*Date*	OPERATORE/*Operator*	CLIENTE/*Customer*	ENTI COLLAUDATORI/*Surveyor*	PAGINA/*Page*
26/06/97	GENERALE CONTROLLI FORMENTI GRAZIANO II° LEV. MT. PT UT. MSLT. - ET.	Zambetti & Lumina s.r.l. Cont. Qualità II° Livello SNT-TC-1A Walter Solgattini		1 di 1

Mod. RPRLT GENERALE CONTROLLI S.r.l. Via Cremona 66/A CREMA WINWORD-C:\ALLALAVORO\GC\MODELLI\RAPPORTI

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