

# Advice Note

121776

## K & S Pipe Contractors LLP

Unit 1, Stock Road  
Southend-On-Sea  
Essex  
SS2 5QF

Purchasing

## Delivery :

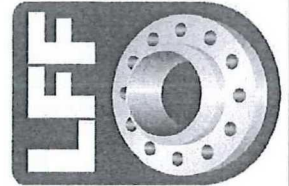
## K & S KEN SNELL

GRENFELL TOWER  
GRENFELL ROAD W11 1TQ  
KEN 7.30 ONWARDS

## Our Ref

D/19095/30062/JW

09/12/2016



## London Fittings & Flanges Ltd

Christy Way  
Southfields Industrial Park  
Basildon, Essex,  
SS15 6TE  
Tel: (Sales)

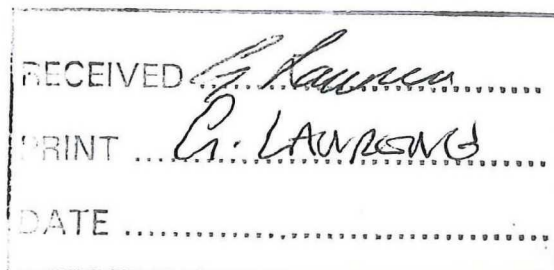
RECEIVED  
16 DEC 2016

KS3634

Your ref: HOLD KS- GRENFELL

Page: 1

Item No.	Qty	Details	Total Qty	OutStndg.
001	60.00	ASTM A106 Gr B / API 5L 2" St.Wt.	60.00	0.00
003	20.00	2" X 3/4" SW RED TEE 3000LB A105	20.00	0.00
004	36.00	ASTM A106 Gr B / API 5L 1" St.Wt.	36.00	0.00
005	20.00	1" 3000LB Equal Tee SW A105N	20.00	0.00
006	20.00	1" X 3/4" 3000LB Red Tee SW A105N	20.00	0.00
007	80.00	1" SW 3000LB A105N 90 Degree Elbow	80.00	0.00
008	10.00	2" 3000LB 90 Deg Elb SW A105N	10.00	0.00
009	22.00	2" 3000LB Full Coupling SW A105N	22.00	0.00
010	6.00	3" ASTM A106 Gr B / API 5L St.Wt.	6.00	0.00
002	7.00	2" X 1" SW RED TEE 3000LB	19.00	12.00



# Advice Note

121788

**K & S Pipe Contractors LLP**  
Unit 1, Stock Road  
Southend-On-Sea  
Essex  
SS2 5OF

Purchasing

**Delivery :**

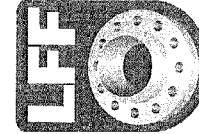
**K & S KEN SNELL**

GRENFELL TOWER  
GRENFELL ROAD W/11 1TQ  
KEN 7.30 ONWARDS

**Our Ref**

**D/19095/30062/JW**

**12/12/2016**



**London Fittings & Flanges Ltd**

Christy Way  
Southfields Industrial Park  
Basildon, Essex,  
SS15 6TE  
Tel: (Sales)

**Your ref: HOLD KS- GRENFELL**

**Page: 1**

Item No.	Qty	Details	Total Qty	OutStndg.
002	12.00	2" X 1" 3000LB Red Tee SW A105N	19.00	0.00
011	1.00	2" X 1" 3000LB INSERT SW A105N	1.00	0.00
012	1.00	2" X 3/4" SW RED INSERT 3000LB A105	1.00	0.00
<div>RECEIVED <i>G. Lawrence</i> PRINT <i>G. Lawrence</i> DATE .....</div>				

TRI000001362\_0002

adv/test

TRI000001362/2

ITEM: 077 GL/NU: 65104006

ORDER NO: L/16433/00194/34

CUST: LFF (BASTION) LTD

ADVISE NOTE: 460459  
1 of 3

ArceIorMittal South Africa Limited  
Tubular Products  
273 Genl. Hertzog Rd, Peachaven Vereeniging  
1939  
P O Box 48 Vereeniging 1930  
South Africa

MATERIAL TEST CERTIFICATE  
SEAMLESS STEEL TUBE  
CERTIFICAT DE RECEPTION - TUBES D'ACIER SANS SOUDURE  
NAHMEPRÜFZEUGNIS - NAHTLOSE STAHLROHRE

Licensed under ISO 9001: 2015  
API Spec 5L and SCT DE-395997 QM  
SL - 0319  
SCT - 0419  
Test Certificate  
EN 10204:2004 TYPE 3.1



Customer: Client Kunde	LFF GLAMAL LIMITED	Customer Order/Contract No:	SGB7 153793
Order No: No. de commande Mittel Auftrags-Nr.	4000022196	Material No: No de materiai: Werkstoff-Nr.	1000000578
Certificate Reference No: No de certificat: Zeugnis-Nr.	040061987193	Cast/Heat No: Coulée No: Schmelz-Nr.	1604304
Product: Produit: Produkt:	FULLY KILLED HOT FINISHED CARBON STEEL SEAMLESS TUBES	Page Number:	1 of 3
Specification: Spécification Angabe	1803183:2012 API 5L:2012 L245/L290/B/X42 PSL1 ASTM A106B.15/A53B.12/ A530.12 ASME SA106B.15/SA53B.15/SA530.15		
Product Marking: Lettage de produit Produktkennzeichnung	ARCELORMITTAL SA ISO3183/Spec 5L-0319 MONOGRAM 06-16 ASTM/ASME A/SA106B A/SA53B 2.375 0.154 19.700 L245/B L290/X42 PSL1 SMLS TESTED 3000 psi CAST NO: 1604304 PROD/O NO: H0642219610 NDE MADE IN SOUTH AFRICA		



General Information

Information Générale  
Allgemeine Information

Quantity Quantité Menge	Mass Poids Gewicht	Dimensions Dimensions / Maße			Total Length Longueur Länge	Steel making process Procédé de fabrication de l'acier Stahlschmelzungsverfahren	Final Rolling Operation Fin de laminage / Walzende
		Tube OD Diamètre Durchschnitt	Thickness Epaisseur Stärke	Length Longueur Länge			
463	33.296.206(lb)	2.375(")	0.154(")	19.700 (ft)	9,121.100(ft)	Electric Arc	Final hot rolling finished above 1580°F and cooled in still air
<div>YOUR NO. KS3634 OUR REF. 190951 30062/34 ITEM(S) 001 SIGNATURE [Signature] DATE 08/12/16</div> <div>LEO</div> <div>VERIFIED TRUE COPY</div>							

Chemical Composition

Element(%)	R22-(V+Nb+Ti)										R24-(Nb+V)									
	C	Si	Mn	S	P	Cr	Ni	Mo	Cu	V	Al	Ti	Sn	Ca	N	B	Nb	CE	R22	R24
Minimum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Maximum	0.200	-	1.30	0.030	0.030	0.50	0.50	0.150	0.500	-	-	-	-	-	-	-	-	0.41	0.15	0.060
Heat	0.170	0.25	0.86	0.005	0.016	0.02	0.01	0.001	0.005	0.003	0.031	0.001	0.003	0.0020	0.0060	0.0000	0.0010	0.32	0.01	0.004
Product	0.1700	0.2500	0.8600	0.0050	0.0160	0.0200	0.0090	0.0010	0.0050	0.0030	0.0310	0.0010	0.0030	0.0020	0.0060	-	0.0010	0.3191	0.0050	0.0040
Product (ADD)	0.1700	0.2500	0.8600	0.0050	0.0160	0.0200	0.0090	0.0010	0.0050	0.0030	0.0310	0.0010	0.0030	0.0020	0.0060	-	0.0010	0.3191	0.0050	0.0040

TRI000001362\_0003

TRI000001362/3

ITEM: 027 GE/NO: 6E104006

ORDER NO: L/16433/00194/JW

CUST: LFF (HAGELLAND) LTD

ADVANCE NETS: 468459  
2 of 3

**ArcelorMittal South Africa Limited**  
**Tubular Products**  
273 Genl. Hertzog Rd, Peacehaven Vereeniging  
1939  
P O Box 48 Vereeniging 1930  
South Africa

Telephone  
Fax

**MATERIAL TEST CERTIFICATE**  
**SEAMLESS STEEL TUBE**  
CERTIFICATE DE RECEPTION - TUBES D'ACIER SANS SOUDURE  
NAHMEPRÜFZEUGNIS - NAHTLOSE STAHLROHRE

Licensed under  
API Spec 5L and 5CT  
5L - 0319  
5CT - 0419

ISO 9001: 2015

DE-395997 QM

Test Certificate  
EN 10204:2004 TYPE 3.1

**ArcelorMittal**



Customer:	LFF GLAMAL LIMITED	Customer Order/Contract No:	SGB7 153793
Client:		No de commande client:	
Kunde:		Kundenauftrags-Nr:	
Order No:	4000022196	Material No:	1000000578
No. de commande Mitral:		No de matériau:	
Mittal-Auftrags-Nr:		Werkstoff-Nr:	
Certificate Reference No:	040061987193	Cast/Heat No:	1604304
No de certificat:		Coale No:	
Zertifikat-Nr:		Schmelz-Nr:	
Product:	FULLY KILLED HOT FINISHED CARBON STEEL SEAMLESS TUBES	Page Number:	2 of 3
Produit:		Blatt:	
Product:			
Specification:	ISO3183:2012/API 5L:2012 L245/L290/B/X42 PSL1 ASTM A106B.15/A53B.12/ A530.12 ASME SA106B.15/SA53B.15/SA530.15		
Specification:			
Angabe:			
Product Marking:	ARCELORMITTAL SA ISO3183/Spec 5L-0319 MONOGRAM 06-16 ASTM/ASME A/SA106B A/SA53B 2.375 0.154 19.700 L245/B L290/X42 PSL1 SMLS TESTED 3000 psi CAST NO: 1604304 PROD/O NO: H0642219610 NDE MADE IN SOUTH AFRICA		
Marquage de produit:			
Produktkennzeichnung:			

**Mechanical Properties at Room Temperature 25°C (C60 # C69)**

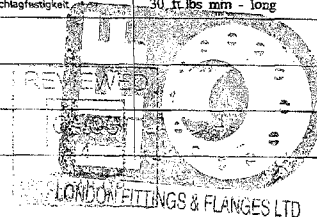
Propriétés Mécaniques à température ambiante 25°C  
Mechanische Eigenschaften bei Raumtemperatur 25°C

Specification Spécification Angabe	UTS (Rm) Force de tension Zugfestigkeit	Yield (Re) Limit élastique Fließgrenze	% EL Allong Dehnung	% EL Allong Dehnung
Limits Limites Grenze	psi	psi	2 Inch	5.65 Sq in
Minimum	60000	42000	30.0	
Maximum				
Sample (1)	72663	52648	31.0	
Sample (2)	75419	53809	33.0	
Sample (3)				
Sample (4)				
Sample (5)				
Sample (6)				
Sample (7)				
Sample (8)				
Sample (9)				
Orientation of tensile piece C02 Orientation de la poutre de tension Richtung der Zugprobe			Longitudinal, Strip	

TECHNOLOGICAL TESTS EPREUVES TECHNOLOGIQUES TECHNISCHE PRÜFUNGEN	
Bending Essai de pliage Biegeversuch	Passed
Flattening test Essai d'aplatissement Ringfließversuch	Passed
Hydrostatic D02 Hydrostatique Hydrostatisch	3000 psi for 5 Sec
Electromagnetic Insp D99 Inspection électromagnétique Elektromagnetische Prüfung	PASS - ASTM E570 - 12.5% NOTCH
Ultrasonic inspection Inspection ultrasonique Ultraschallprüfung	UT not required
Orientation of impact test piece longitudina	10 x 3.3 mm -
Width of tensile piece (inch) Largeur de l'échantillon Zugstab Breite	0.75 Inch

\* Elongation to SS EN ISO 2566 table 7: 5.65 square root S0  
Elongation zu RS EN ISO 2566 tableau 7: 5.65 racine carrée S0  
Verlängerung zu RS EN ISO 2566 Tabelle 7: 5.65 Quadratwurzel S0

TECHNOLOGICAL TESTS EPREUVES TECHNOLOGIQUES TECHNISCHE PRÜFUNGEN	
HV 22 lbs Dureté Härte	157 164 167
Impact strength (ft.lbs) Résistance au choc sur barre Kerbschlagfestigkeit	120.0 126.0 132.0 Ave. 126.0 @ 32 °F
Shear Fracture (%) C43 Rupture ductile Verf. Bruchameil	20.0 40.0 40.0 Ave. 33.3 @ 32 °F
Impact strength (Spec) Résistance au choc sur barre Kerbschlagfestigkeit (Spec)	30 ft.lbs min - long



TRI000001362\_0004

TRI000001362/4

ArcelorMittal South Africa Limited  
Tubular Products  
273 Genl. Hertzog Rd, Peacehaven Vereeniging  
1939  
P O Box 48 Vereeniging 1930  
South Africa

Telephone  
Fax

**MATERIAL TEST CERTIFICATE**  
**SEAMLESS STEEL TUBE**  
CERTIFICATE DE RECEPTION - TUBES D'ACIER SANS SOUDURE  
NARNEPRÜTZUNGS - NAHTLOSE STAHLROHRE

Licensed under  
API Spec 5L and 5CT  
5L - 0319  
5CT - 0419

ISO 9001: 2015  
DE-385997 QM  
Test Certificate  
EN 10204:2004 TYPE 3.1



Customer:	LFF GLAMAL LIMITED	Customer Order/Contract No:	SGB7 153793
Order No:	4000022196	Material No:	1000000578
Certificate Reference No:	040061987193	Cast/Heat No:	1604304
Product:	FULLY KILLED HOT FINISHED CARBON STEEL SEAMLESS TUBES	Page Number:	3 of 3
Specification:	ISO3183:2012/API 5L:2012 L245/L290/B/X42 PSL1 ASTM A106B.15/AS3B.12/ AS30.12 ASME SA106B.15/SA53B.15/SA530.15		
Product Marking:	ARCELORMITTAL SA ISO3183/Spec 5L-0319 MONOGRAM 06-16 ASTM/ASME A/SA106B A/SA53B 2.375 0.154 19.700 L245/B L290/X42 PSL1 SMLS TESTED 3000 psi CAST NO: 1604304 PROD/O NO: H0642219610 NDE MADE IN SOUTH AFRICA		

**Remarks:**

Material in accordance with NACE MR0175:2015/ISO15156-3:2015 and MR0103:2015. Dimensions to ANSI B36.10-2010. The material will conform to the hot yield strength requirements as per ASME, Sect II, Part D, Table Y-1, and the general requirements of ASME, Sect II, Part A, Ed 2013. All the material conform to the visual inspection and dimensional tolerance requirements of the specification. A suitable fine grain practice is followed in manufacturing. La Société ArcelorMittal South Africa garrantit que les produits objet du présent certificat, respectent en leur totalité les prescriptions de l'Article 15 de l'Arrêté Ministériel du 24 mars 1978 modifié.  $C \leq 0.25\%$ ,  $P \leq 0.05\%$ ,  $R \leq 700N/mm^2$ ,  $E \leq 0.9 \times R$ .  $A\% (L_0=5.65V_{So}) \min. 16\%$  en long.  $R(A-2) \geq 10500$ .  $A\% (L_0=5.65V_{So}) \min. 16\%$  en transv.  $RxA \geq 10500$ . The QM System of ArcelorMittal SA meets the requirements of PED 97/23/EC, App. 1, Sect. 4.3 as certified by TUV cert 01 202 ZA/Q-02 0004. All materials meet the requirements of PED 97/23/EC, App I, Sect 7.5. Non-harmonized materials require Particular Material Appraisal. The impact strength is guaranteed to exceed 27J at 0°C. HARDSTAMPED with low stress tool: API logo, AMSA, Size, Heat number, Grade, NDE



Quality Assurance Manager: PJ Venter

Date of Release: 2016.06.24

Certified by: [Signature]

We hereby certify that the material was manufactured, tested and inspected to and fully comply with the requirements of referenced specifications. No changes, amendments or additions may be made to this document. Any changes which are effected shall invalidate this certificate. Nous certifions que le matériel a été fabriqué, testé et inspecté et se conforme pleinement aux exigences de spécifications référencées. Il est interdit de modifier ou de corriger ce document ou d'y ajouter quoi que ce soit. Tout changement invalide le présent certificat. Wir bestätigen hiermit, daß das Material wurde hergestellt, geprüft und inspiziert und voll mit den Anforderungen der referenzierten Spezifikationen. Diese Unterlage darf in keiner Weise geändert, abgeändert oder ergänzt werden. Jede derartige Änderung wird die Gültigkeit dieses Bescheinigung aufheben.

TRI000001362\_0005

TRI000001362/5

1188243



# BOTH-WELL STEEL FITTINGS CO., LTD.

NO.303, REN-SIN ROAD, REN-WU DISTRICT, KAORSIUNG CITY, TAIWAN, R.O.C.(61460)

TEL: FAX: E-Mail: box@bothwell.com.tw

WEB SITE: http://www.bothwell.com.tw

An ISO 9001:2008 Registered Manufacturer

## MILL TEST & INSPECTION CERTIFICATE

ACCORDING TO EN 10204 3.1

CUSTOMER: MIDSTEEL FLANGES AND FITTINGS LIMITED PAGE: 60  
CERT NO.: 180343 INVOICE NO.: 5200007272 DATE: 02/04/2016  
ORDER NO.: 020881 L/C NO.: ORIGIN: TAIWAN

ITEM	RAW HEAT NO. HEAT NO.	QTY	DESC/GRADE OR SPECIFICATION NO. CHEMICAL COMPOSITION(%) MECHANICAL PROPERTIES.
59	381130 CA0370	50 PCS	RED TEE A105 2"X1" 3000# SW C:0.19 Si:0.20 Mn:0.24 P:0.011 S:0.006 Cu:0.13 Cr:0.09 Ni:0.05 Mo:0.01 V:0.002 Nb:0.002 R:0.003 Ti:0.001 CE:0.36 TS(KSI):70.2 VS 0.2% (KSI):51.5 EL(%) :34.4 R.A.(%) :62.6 HARDNESS 1(HBW):141 HARDNESS 2(HBW):143 AVG:0.1

REMARK:  
THE MATERIAL SUPPLIED IDENTIFIED AS ASIM A105N -14, ASME SA105N-2015E0  
THE FITTING SUPPLIED IDENTIFIED AS ASME D16.11 - 2011  
THE PRODUCT SUPPLIED WAS INSPECTED IN ACCORDANCE WITH SPECIFICATION(SURFACE & DIM): GOOD  
STANDARD: CHEMICAL COMPOSITION(%) & MECHANICAL PROPERTIES.

	C	Si	Mn	P	S	Cu	Gr	Ni	Mo	V	Co(Nb)
MIN	-	0.10	0.60	-	-	-	-	-	-	-	-
MAX	0.35	0.35	1.05	0.035	0.040	0.40	0.30	0.40	0.12	0.09	-
	N	Al	Ti	Zr	CE	TS(KSI)	YS	YS 0.2%(KSI)	EL(%)	R o f A(%)	HARDNESS(HBW)
MIN	-	-	-	-	-	70	-	36	22	30	-
MAX	-	-	-	-	0.43	-	-	-	-	-	187

HEAT TREATMENT: NORMALIZED: 900°C (1652°F) A.C.

STEEL MAKING PROCESS: ELECTRIC FURNACE

CONFORMS TO NACE MR0175-15/ISO 15156-15/MR0103-12

FULLY KILLED AND FINE GRAIN PRACTICE

YOUR NO. 183634  
OUR REF: 14095/30062/IC  
ITEM(S) 002  
SIGNATURE DATE 3/2/16

WE CERTIFY THE ABOVE MENTIONED FITTINGS HAVE BEEN MANUFACTURED, SAMPLED, TESTED, AND INSPECTED IN ACCORDANCE WITH THE SPECIFICATIONS SHOWN

C.C. Huang Q.C. MANAGER  
C.L. Ko INSPECTOR

RF-00839 REV:4



LONDUM FITTINGS & FLANGES LTD



CUSTOMER  
LEF LONDON FITTINGS & FLANGES LTD

CERTIFICATE N° 3369/2014 DATE 18/12/2014 SHEET 1

INTERNAL ORDER NUMBER 1363/2014 DATE 16/10/2014

CUSTOMER ORDER REF.  
L/16057/00169/JW - 16/10/2014

TEST CERTIFICATE ACCORDING TO EN 10204 3.1 - EXTENT OF MATERIAL DELIVERY

POS.	TEST NO.	HEAT CODE	HEAT NUMBER	Q.TY	DESCRIPTION	MAT.REQUISITION / TAG N° / ITEM CODE / COMPUTER CODE / UB	ENCLOSURE / NOTES
39	1	39863/2014	B36E	P3141437170	1500 90 DEG ELBOW SW 3/4" S/3000 A105	F0010	
40	1	38683/2014	I15E	13/77634	182 90 DEG ELBOW SW 2" S/3000 A105	F0013	
40	2	38212/2013	E-UT	170000344	147 90 DEG ELBOW SW 2" S/3000 A105	F0013	
41	1	38679/2014	FC-BP	13/78243	200 R.TEE SW S/3000 A105 2"X1"	F0065	
42	1	38762/2014	13/38317	13/38317	1000 FULL COUPLING SW 1" 3000 A105	F0102	
43	1	36332/2013	12/33762	12/33762	500 FULL COUPLING SW 2" 3000 A105	F0104	
44	1	39147/2014	14/70198	14/70198	175 RED INSERT SW 2"X3/4" 3000 A105	F0225A	
44	2	38760/2014	14/79266	14/79266	25 RED INSERT SW 2"X3/4" 3000 A105	F0225A	
45	1	39326/2014	23980	23980	200 P.NIPPLE TEE S80 A106/B 1/2" L100	F0271	
46	1	39679/2014	FC-BP	13/78243	300 R.TEE SW S/3000 A105 2"X3/4"	F0278	

YOUR NO. 453634  
OUR REF. 19095/30062/JW  
ITEM(S) 003  
SIGNATURE DATE 3/12/16



NOTES	THIRD PARTS	CUSTOMER INSPECTOR	QUALITY CONTROL
THIS IS TO CERTIFY THAT MATERIAL REQUIREMENTS ARE ACCORDING TO ORDER SPECIFICATIONS. MATERIAL ACC. TO NACE MR 01.75 ED.2009 + ASME SECTION II ED.2013. VISUAL, DIMENSIONAL AND MARKING CHECK HAVE BEEN CARRIED OUT WITH SATISFACTORY RESULTS. MATERIAL ACC. WITH PED 97/23/EC ANNEX 1.			 CHERO PIPING S.P.A.

TRI000001362\_0007

TRI000001362/7

CUSTOMER  
LFF LONDON FITTINGS & FLANGES LTD

CERTIFICATE N° 3369/2014 DATE 18/12/2014 SHEET 2

INTERNAL ORDER NUMBER 1363/2014 DATE 16/10/2014

CUSTOMER ORDER REF.  
L/16057/00169/JW - 16/10/2014

TEST.N°	MATERIAL SPECIFICATION AND GRADE	HEAT NUMBER	LADLE ANALYSIS (%)																									
			C	Mn	Si	P	S	Cr	Mo	Ni	Ti	Cu	V	Fe	Al	Co	Ta	Nb	W	Zn	Pb	Sn	As	Sb	Ca	O	S	H
3369/2014	ASTM A105	P3141437170	0.180	0.975	0.205	0.012	0.006	0.005	0.004	0.028	0.000	0.068	0.002		0.001											0.000	0.355	(7)
3363/2014	ASTM A106	1377354	0.195	0.860	0.210	0.011	0.010	0.100	0.020	0.080	0.000	0.200	0.012		0.003											0.000	0.383	(7)
33212/2013	ASTM A105	170000344	0.182	0.926	0.225	0.009	0.010	0.058	0.024	0.104	0.000	0.178	0.000		0.003											0.000	0.353	(7)
3369/2014	ASTM A105	1378243	0.196	0.920	0.223	0.011	0.010	0.145	0.020	0.120	0.000	0.180	0.015		0.001											0.000	0.403	(7)
3369/2014	ASTM A105	1378217	0.205	0.990	0.220	0.007	0.006	0.110	0.010	0.060	0.000	0.130	0.020		0.002											0.000	0.356	(7)
3332/2013	ASTM A105	1233762	0.200	0.950	0.220	0.007	0.007	0.050	0.020	0.050	0.000	0.110	0.015		0.001											0.000	0.393	(7)
33147/2014	ASTM A105	1470936	0.200	0.910	0.220	0.013	0.007	0.110	0.010	0.050	0.000	0.180	0.002		0.002											0.000	0.291	(7)
3369/2014	ASTM A105	1473256	0.189	0.860	0.210	0.015	0.010	0.130	0.020	0.030	0.000	0.220	0.015		0.001											0.000	0.378	(7)
3369/2014	ASTM A106 GR.B	2380	0.173	0.530	0.210	0.012	0.009	0.040	0.009	0.053	0.000	0.140	0.007		0.000											0.000	0.231	(2)

TEST.N°	TENSILE TEST [Mpa]				IMPACT TEST [Joule]				HARDNESS TEST		HYDROSTATIC TEST		FLANGING TEST		BENDING TEST		FLATTENING TEST		EDDY CURRENT		REFERENCES
	Test Temperature	Tensile Strength	Elongation 5	Reduction Area 5	Test Temperature	Absorbed Energy	Type	Specimen Size	HL	Value	Scale	Pressure	Test	Dr	Radius	Angle	Test	Test	Current	Current	
3369/2014	+ 20 °C	500	402	25.80	55.00					150.0	HR										SIDER TEST REPORT HARD.T.: 168,171,174 SIDER TEST REPORT SIDER TEST REPORT HARD.T.: 176,177,178 SIDER TEST REPORT
3369/2014	+ 20 °C	492	301	35.10	67.00					158.0	HR										
33212/2013	+ 20 °C	515	333	35.20	54.00					171.0	HR										
3369/2014	+ 20 °C	495	366	33.00	69.00					145.0	HR										
3369/2014	+ 20 °C	514	360	34.80	65.00					140.0	HR										
3332/2013	+ 20 °C	517	237	29.90	64.00					157.0	HR										
33147/2014	+ 20 °C	514	321	31.50	60.00					157.0	HR										
3369/2014	+ 20 °C	496	308	33.60	58.70					155.0	HR										
3369/2014	+ 20 °C	519	421	31.10						152.0	HR	207							OK		

TEST.N°	H.T. (1)	SCALE	MAX. T	BELOW TO	COOLING MEDIA	H.T. (2)	SCALE	MAX. T	BELOW TO	COOLING MEDIA	HEAT TREATMENTS REFERENCES	BASE MATERIAL CERTIFIC. REF.	STEEL WORKS
3369/2014	NORMAL.	°C	920		AIR							2014 100000060974	LUCCINI
3369/2014	NORMAL.	°C	920		AIR							34569	RIVA
33212/2013	NORMAL.	°C	920		AIR							AS03349/2013	DEALY SPA
3369/2014	NORMAL.	°C	920		AIR							41794	RIVA
3369/2014	NORMAL.	°C	920		AIR							11113	RIVA
3332/2013	NORMAL.	°C	920	2.00	AIR							41164	RIVA
33147/2014	NORMAL.	°C	920		AIR							16248	RIVA
3369/2014	NORMAL.	°C	920		AIR							9775	RIVA
3369/2014	NORMAL.	°C	920		AIR							43929/1/2012	MELETTARNE-PODOLSKOVA

NOTES										THIRD PARTS		CUSTOMER'S REPRESENTATIVE		QUALITY CONTROL	
(1) V=ND+Ti<0.10%; Cu+Ni+Cr+Mo<1%; E<0.0031 C.E.=C+Mn/6+(Cr+Mo+V)/5+(Cu+Ni)/15 (2) FULLY KILLED CARBON STEEL - FINE GRAIN ACCORDING TO ASTM E112 - 7										LONDON FITTINGS & FLANGES LTD		LFF LTD		CHERO PIPING S.P.A.	

TRI000001362\_0008

TRI000001362/8



**CHERO PIPING**

S.p.A.

RACCORDERIA FORGIATA / FORGED STEEL FITTINGS  
Località Pradivolo, 37 - 28013 C.A.P. AUSETO PIACENTINO - PC  
Tel. 0521/200001 Fax 0521/200002 E-mail: info@cheropiping.com

CUSTOMER  
LFF LONDON FITTINGS & FLANGES LTD

CERTIFICATE N° DATE SHEET  
3369/2014 18/12/2014 3

INTERNAL ORDER NUMBER DATE  
1363/2014 16/10/2014

CUSTOMER ORDER REF.  
L/16057/00169/JW - 16/10/2014

TEST N°	MATERIAL SPECIFICATION AND GRADE	HEAT NUMBER	LAOLE ANALYSIS (%)																											
			C	Mn	Si	P	S	Cr	Mo	Ni	Ti	Cu	V	Fe	Al	Co	Ta	Co	N	W	Zn	Pb	Sn	As	Sb	Ca	O	B	H	C.E.

TEST N°	TENSILE TEST [Mpa]				Elongation %	Reduction Area %	IMPACT TEST [Joule]				Type	Specimen Size	Dir.	HARDNESS TEST		HYDROSTATIC TEST [bar]	FLARING TEST	BENDING TEST			FLATTENING TEST	Edgy Current	REFERENCE/TS
	Yield Temperature	Tensile Strength	Yield Strength	Tensile Strength			Absorbed Energy	Temp	Value	Scale				Sw.	Standard			Angle					
38653/2014/B							- 46 °C	29	30	35	KV	10 X 10,0	L										
38653/2014/B							- 46 °C	47	50	48	KV	10 X 10,0	L										
38212/2012/B							- 46 °C	58	52	51	KV	10 X 10,0	L										
38679/2014/B							- 46 °C	45	46	47	KV	10 X 10,0	L										
38752/2014/B							- 46 °C	55	54	56	KV	10 X 10,0	L										
38352/2012/B							- 46 °C	52	53	54	KV	10 X 10,0	L										
38747/2014/B							- 46 °C	44	45	46	KV	10 X 10,0	L										
38759/2014/B							- 46 °C	51	49	50	KV	10 X 10,0	L										
38526/2014/B							- 46 °C	47	49	45	KV	10 X 10,0	L										

TEST N°	H.T. (1)	SCALE	MAX. T	BELOW TO	COOLING MEDIA	H.T. (2)	SCALE	MAX. T	BELOW TO	COOLING MEDIA	HEAT TREATMENTS REFERENCES	BASE MATERIAL CER HRC. REF.	STEEL WORKS

NOTES

(7) V=Nb+Ti<0,10%; Cu+Ni+Cr+Mo<18; B<0,0001 C.E.=C+Mn/6-(Cr+Mo+V)/5+(Cu+ Ni)/15

(2) FULLY KILLED CARBON STEEL - FINE GRAIN ACCORDING TO ASTM E112 - 7

LONDON PARTSINGS & FLANGES LTD



QUALITY CONTROL

CHERO PIPING S.P.A.

TRI000001362\_0009

TRI000001362/9

CUSTOMER  
 D.K. JONES LTD

CERTIFICATE N° 2517/2012 DATE 19/10/2012 SHEET 1

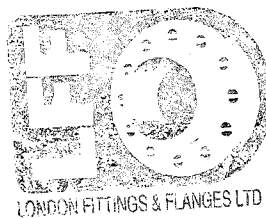
INTERNAL ORDER NUMBER 1193/2012 DATE 31/08/2012

CUSTOMER ORDER REF.  
 M22467/STOCK - 29/08/2012

TEST CERTIFICATE ACCORDING TO EN 10204 3.1 - EXTENT OF MATERIAL DELIVERY

POS.	TEST NO.	HEAT CODE	HEAT NUMBER	Q.TY	DESCRIPTION	MAT. REQUISITION / TAG N° / ITEM CODE / COMPUTER CODE / UB	ENCLOSURE / NOTES
1	35814/2012	FC-PO	12/70053	20	90° ELBOW SW 3000 A105 3 NACE		
5	35722/2012	E-TX	12/71912	50	RED. TEE SW 3000 A105 2X1 NACE		
15	33226/2011	10/72250	10/72250	50	ROUND H. PLUG NPT 3/6000 A105 1/3 NACE		
20	35545/2012	12/70705	12/70705	50	RED. COUPLING NPT 3000 A105 1/2X3/8 NACE		

YOUR NO. 453634  
 OUR REF. 19095/3002/JW  
 ITEM(S) 002  
 SIGNATURE *[Signature]* DATE 13/12/12



LONDON FITTINGS & FLANGES LTD

D.K. JONES LTD  
 No: 36334  
 ACCEPTED BY QA

NOTES

THIRD PARTS

CUSTOMER INSPECTOR

QUALITY CONTROL

VISUAL, DIMENSIONAL & MARKING CHECK HAVE BEEN SATISFACTORILY PERFORMED  
 ACCORDING TO ANSI B16.11 ED. 1996, BS 3799-74 AND MSS SP95 ED. 1986  
 MATERIAL ACCORDING TO ASME SECTION II EDITION 2003 AD. 2005,  
 NACE MR 01-75 ED. 2005 AND NACE MR 01-03.

*[Signature]*  
 PATRIZIA GHISONI  
 CHERO PIPING S.P.A.

TRI000001362\_0010

TRI000001362/10

**CHERO PIPING**

RACCORDERIA FORGIATA / FORGED STEEL FITTINGS  
Località Pradelle, 37 - 29011 CASALE D. PIACENTINO - PC  
Tel. 0521 811111 - Fax 0521 811112 - info@cheropiping.com

CUSTOMER  
D.K.JONES LTD





CERTIFICATE N° 2517/2012 DATE 19/10/2012 SHEET 2

INTERNAL ORDER NUMBER 1193/2012 DATE 31/08/2012

CUSTOMER ORDER REF.  
M22467/STOCK - 29/08/2012

TEST.N°	MATERIAL SPECIFICATION AND GRADE	HEAT NUMBER	LADLE ANALYSIS (%)																			
			C	Mn	Si	P	S	Cr	Mo	Ni	Ti	Cu	V	Fe	Al	Co	Te	Co	N	W	Zn	Pb
35814/2012	ASTM/A516 A/S4105	1270053	0.190	0.540	0.250	0.010	0.005	0.080	0.010	0.040	0.110	0.004	0.002									
35722/2012	ASTM/A516 A/S4105	1271912	0.190	0.500	0.210	0.014	0.008	0.120	0.020	0.080	0.170	0.022	0.002									
33226/2011	ASTM/A516 A/S4105	1072250	0.180	0.870	0.190	0.010	0.010	0.070	0.010	0.040	0.120	0.018	0.002									
35545/2012	ASTM/A516 A/S4105	1270705	0.190	0.870	0.210	0.009	0.010	0.100	0.020	0.080	0.170	0.020	0.002									

TEST.N°	TENSILE TEST [Mpa]				IMPACT TEST [Joule]				HARDNESS TEST		HYDROSTATIC TEST (bar)	FLARING TEST	SENDING TEST		FLATTENING TEST	Eddy Current	REFERENCES
	Test Temperature	Tensile Strength	Yield Strength	Elongation %	Test Temperature	Standard	Type	Specimen Size	Value	Scale			Dr	Number	Angle		
35814/2012	+ 20 °C	510	316	32,90	56,90				155,0	HR							
35722/2012	+ 20 °C	505	311	33,00	57,50				157,0	HR							
33226/2011	+ 20 °C	507	315	32,90	57,50				163,0	HR							
35545/2012	+ 20 °C	504	313	33,00	57,90				150,0	HR							

TEST.N°	H.T. ①	SCALE	 °C	MAX. T	 °C	BELOW TO	COOLING MEDIA	H.T. ②	SCALE	MAX. T	 °C	 °C	BELOW TO	COOLING MEDIA	HEAT TREATMENTS REFERENCES	BASE MATERIAL CERTIFIC. REF.	STEEL WORKS
35814/2012	NORMAL.	°C		920			AIR									11605	RIVA
35722/2012	NORMAL.	°C		920			AIR									14253	RIVA
33226/2011	NORMAL.	°C		900			AIR									23536	RIVA
35545/2012	NORMAL.	°C		920			AIR									5219	RIVA

NOTES		THIRD PARTS	CUSTOMER INSPECTOR	QUALITY CONTROL
(7) V+Nb+Ti<0,10%; Cu+Ni+Cr+Mo<1%; B<0,0001 C.E.=C+Mn/6+(Cr+Mo+V)/5+(Cu+ Ni)/15		LONDON FITTINGS & FLANGES LTD		<del>PAERZIA CHISONI</del> 16/2/85 CHERO PIPING S.P.A.

TRI000001362\_0011

TRI000001362/11



CERTIFICATE NR.  
CE/2015/2749 - Rev. 0  
INTERNAL ORDER NR  
OC/2015/1287

DATE  
21/12/2015  
DATE  
13/11/2015

CUSTOMER ORDER REF.  
L/16335/00183/JW - 13/11/2015  
CUSTOMER  
LFF LONDON FITTINGS & FLANGES LTD

FS1661/16

SHEET  
1/4

TEST CERTIFICATE ACCORDING TO EN 10204 3.1 - EXTENT OF MATERIAL DELIVERY

POS.	TEST No.	HEAT CODE	HEAT NUMBER	Q.T.Y.	DESCRIPTION / MAT. REQUISIT. - TAG N. - ITEM CODE - COMPUTER CODE - U8 / ENCLOSURE - NOTES
28	1.43115/2015	B21F	15/74951	50.00	90 Deg ELBOW NPT S/3000 A/SA105 1/2" / CIG: F0003
29	1.43120/2015	B20F	15/74951	1,000.00	90 Deg ELBOW SW S/3000 A/SA105 3/4" / CIG: F0010
30	1.39962/2014	B40E	P3141437170	500.00	90 Deg ELBOW SW S/3000 A/SA105 1" / CIG: F0011
31	1.40309/2015	E-VT	14/70217	100.00	90 Deg ELBOW SW S/3000 A/SA105 1.1/2" / CIG: F0012
32	1.43320/2015	I22F	15/74951	500.00	90 Deg ELBOW SW S/3000 A/SA105 2" / CIG: F0013
33	1.43114/2015	IN1	15/74955	100.00	45 Deg ELBOW SW S/3000 A/SA105 3/4" / CIG: F0031
34	1.37822/2013	FC-ZV	P4131342531	50.00	45 Deg ELBOW SW S/3000 A/SA105 2" / CIG: F0034
35	1.40300/2014	FM-IZ	14/72312	50.00	TEE NPT S/3000 A/SA105 1/2" / CIG: F0041
36	1.39006/2014	E-UJ	14/73865	24.00	TEE NPT S/3000 A/SA105 2" / CIG: F0045
37	1.43322/2015	E-ZW	602165	150.00	TEE SW S/3000 A/SA105 2" / CIG: F0051
38	1.40172/2014	E-VL	14/79257	50.00	RED. TEE SW S/3000 A/SA105 1.1/2" x 3/4" / CIG: F0053
39	1.40726/2015		13/76918	50.00	FULL COUPLING NPT S/3000 A/SA105 1" / CIG: F0095
40	1.40551/2015		14/71656	100.00	FULL COUPLING SW S/3000 A/SA105 1.1/2" / CIG: F0103
41	1.36382/2013		12/33762	300.00	FULL COUPLING SW S/3000 A/SA105 2" / CIG: F0104
42	1.40485/2015		14/54571	60.00	FULL COUPLING SW S/3000 A/SA105 3" / CIG: F0105
43	1.40555/2015		14/72081	120.00	CAP FEMALE SW S/3000 A/SA105 1" / CIG: F0134
44	1.40484/2015		14/55638	150.00	CAP FEMALE SW S/3000 A/SA105 2" / CIG: F0135
45	1.40380/2014	1T11	171181	120.00	H.H PLUG NPT S/3000 A/SA105 1" BS3799 / CIG: F0232
46	1.43510/2015		62423	200.00	P.NIPPLE TBE S60 A/SA105 1/2 L80 / CIG: F0271
47	1.43546/2015		54799	120.00	PIPE NIPPLE TBE S60 A/SA105 3/4" L100 / CIG: F0272
48	1.40881/2015	E-VV	14/72173	120.00	RED. TEE SW S/3000 A/SA105 2" x 3/4" / CIG: F0278

YOUR NO. **VS3634**  
OUR REF. **1945/30062/JW**  
ITEM(S) **03+007**  
SIGNATURE **[Signature]** DATE **13/12/16**



NOTES  
THIS IS TO CERTIFY THAT MATERIAL REQUIREMENTS ARE ACCORDING TO ORDER SPECIFICATIONS. MATERIAL ACC. TO NACE MR 01.75 ED.2009. MATERIAL ACC. TO ASME SECTION II ED.2013 + ASTM ED.2013. VISUAL, DIMENSIONAL AND MARKING CHECK HAVE BEEN CARRIED OUT WITH SATISFACTORY RESULTS. MATERIAL ACC. WITH PED 97/23/EC ANNEX 1.

CUSTOMER INSPECTOR

THIRD PARTS

QUALITY CONTROL

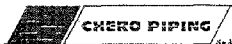
Dolita Malchiodi

[Signature]

CHERO PIPING S.P.A.

TRI000001362\_0012

TRI000001362/12



CERTIFICATE NR.  
CE/2015/2749 - Rev. 0  
INTERNAL ORDER NR.  
OC/2015/1267

DATE  
21/12/2015  
DATE  
13/11/2016

CUSTOMER ORDER REF.  
L/16335/00183/JW - 13/11/2015  
CUSTOMER  
LFF LONDON FITTINGS & FLANGES LTD

FS1661/16

SHEET  
2/4

TEST CERTIFICATE ACCORDING TO EN 10204 3.1 - EXTENT OF MATERIAL DELIVERY

TEST No.	MATERIAL SPECIFICATION AND GRADE	HEAT NUMBER	BASE MATERIAL CERTIFICATE REF.	STEEL WORKS
36382/2013	ASTM/A516	1253762	41164	RNA
27822/2013	ASTM/A516	P4131342531	2013 100000062307	LUCCHINI
39006/2014	ASTM/A516	1478865	5430	RNA
39962/2014	ASTM/A516	P3141437170	2014 100000066974	LUCCHINI
40172/2014	ASTM/A516	1479290	15040	RNA
40300/2014	ASTM/A516	1472312	36601	RNA
40380/2014	ASTM/A516	1T1181	044121	RODACCIAI
40454/2015	ASTM/A516	1456638	48971	RNA
40485/2015	ASTM/A516	1454571	12227	RNA
48509/2015	ASTM/A516	1470217	27233	RNA
40551/2015	ASTM/A516	1471555	35365	RNA
40552/2015	ASTM/A516	1472031	36124	RNA
40726/2015	ASTM/A516	1376918	34147	RNA
40881/2015	ASTM/A516	1472773	44596	RNA
43114/2015	ASTM/A516	1574565	37301	RNA
43115/2015	ASTM/A516	1574951	20957	RNA
43120/2015	ASTM/A516	1574951	20957	RNA
43230/2015	ASTM/A516	1574951	20957	RNA
43222/2015	ASTM/A516	802165	1114751	ABS ACCIAIERIE BERTOU SAFALI
43510/2015	ASTM/A516 GR.B	52423	35668/1/2015	ZELEZARNE-PODBREZOVA
43546/2015	ASTM/A516 GR.B	54799	52616/1/2015	ZELEZARNE-PODBREZOVA

NOTES

THIS IS TO CERTIFY THAT MATERIAL REQUIREMENTS ARE ACCORDING TO ORDER SPECIFICATIONS. MATERIAL ACC. TO NACE MR 01.75 ED.2009. MATERIAL ACC. TO ASME SECTION II ED.2013 - ASTM ED.2013. VISUAL, DIMENSIONAL AND MARKING CHECK HAVE BEEN CARRIED OUT WITH SATISFACTORY RESULTS. MATERIAL ACC. WITH PED 97/23/EC ANNEX 1.

CUSTOMER INSPECTOR

LONDON FITTINGS & FLANGES LTD

QUALITY CONTROL

Dalla Matchless

L. J. Matchless

CHERO PIPING S.P.A.

TRI000001362\_0013

TRI000001362/13



CERTIFICATE NR.  
CE/2015/2749 - Rev.0  
INTERNAL ORDER NR.  
OC/2015/1287

DATE  
21/12/2015  
DATE  
13/11/2015

CUSTOMER ORDER REF.  
L/16335/00183/JW - 13/11/2015  
CUSTOMER  
LFF LONGON FITTINGS & FLANGES LTD

FS1661/16

SHEET  
3/4

TEST CERTIFICATE ACCORDING TO EN 10204 3.1 - EXTENT OF MATERIAL DELIVERY

ASTM/ASME/ASA105

Test	Hest Number	36382/2013	37822/2013	39006/2014	39992/2014	40172/2014	40300/2014	40380/2014	40464/2015	40465/2015	40509/2015	40551/2015	40555/2015	40726/2015	40801/2015
		12/23/762	P4181342831	1407866	P3141437170	14/76250	14/72312	111181	14/35638	14/34571	14/70217	14/71656	14/72091	13/76918	14/72773
Tensile Test	C %	0.200	0.180	0.180	0.180	0.155	0.155	0.188	0.185	0.200	0.180	0.200	0.185	0.100	0.170
	Mn %	0.350	0.280	0.370	0.370	0.350	0.350	0.318	0.340	0.360	0.340	0.370	0.370	0.350	0.320
	Si %	0.220	0.200	0.230	0.205	0.230	0.210	0.238	0.220	0.210	0.230	0.190	0.210	0.220	0.210
	P %	0.007	0.015	0.015	0.012	0.010	0.013	0.012	0.009	0.009	0.011	0.013	0.015	0.012	0.011
	S %	0.007	0.004	0.006	0.006	0.003	0.010	0.023	0.010	0.009	0.001	0.010	0.008	0.009	0.004
	Cr %	0.090	0.096	0.140	0.089	0.090	0.080	0.115	0.080	0.100	0.100	0.130	0.130	0.120	0.100
	Mo %	0.020	0.005	0.010	0.004	0.010	0.010	0.037	0.010	0.010	0.010	0.020	0.010	0.010	0.010
	M %	0.050	0.024	0.060	0.026	0.050	0.070	0.208	0.050	0.050	0.060	0.090	0.060	0.070	0.070
	Ti %	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.015	0.000	0.018	0.024	0.015	0.015
	Cu %	0.110	0.055	0.180	0.068	0.180	0.150	0.301	0.150	0.170	0.100	0.200	0.180	0.160	0.140
	V %	0.013	0.000	0.012	0.002	0.017	0.017	0.000	0.013	0.012	0.015	0.011	0.016	0.015	0.017
	Nb %	0.001	0.000	0.002	0.001	0.001	0.002	0.002	0.001	0.002	0.002	0.001	0.001	0.001	0.001
	B %	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Tensile Test	Ce %	0.394	0.367	0.373	0.367	0.352	0.361	0.415	0.377	0.401	0.377	0.387	0.361	0.357	0.363
	Test Temperature °C	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20
	Tensile Strength MPa	517	499	511	503	495	515	520	497	492	492	486	511	506	495
	Yield Strength MPa	375	280	308	378	300	325	362	344	342	300	315	322	366	316
Hardness Test	Elongation %	36.60	28.30	34.10	35.60	33.30	33.10	36.00	29.70	34.70	34.40	32.80	32.70	32.00	33.10
	Reduction Area %	68.00	64.00	59.20	68.00	59.10	58.40	58.50	56.70	72.00	60.10	56.50	57.00	63.00	58.80
	Scale	HB 30	HB 30	HB 30	HB 30	HB 30	HB 30	HB 30	HB 30	HB 30	HB 30	HB 30	HB 30	HB 30	HB 30
	Value	156	154	154	152	152	152	175	175	175	155	153	153	153	153
Heat Treatment	Average Value	163.0	153.500	157.0	128.0	159.000	158.0	166.0	177.000	104.0	151.0	152.000	158.0	165.3	158.6
	Reference: CITER TEST REF														
	Temp	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
	Holding Temperature °C	+920	+920	+920	+920	+920	+920	+920	+920	+920	+920	+920	+920	+920	+920
Heat Treatment	Holding Time h:min	2.00	2.00	2.00	2.00	2.00	1.00	0.50	1.50	2.30	1.00	1.10	1.00	0.80	1.00
	Cooling Media	AIR	AIR	AIR	AIR	AIR	AIR	AIR	AIR	AIR	AIR	AIR	AIR	AIR	AIR

NOTES

FULLY KILLED CARSON STEEL - FINE GRAIN ACCORDING TO ASTM E112 = 7

CUSTOMER INSPECTOR

THIRD PARTS  
LONGON FITTINGS & FLANGES LTD

QUALITY CONTROL

Oallio Malchiodi

J. Kili Lunde

CHERO PIPING S.P.A.

TRI000001362\_0014

TRI000001362/14





CERTIFICATE NR.  
CE/2015/2749 - Rev. 0

DATE  
21/12/2015

CUSTOMER ORDER REF.  
L/16335/00163/JW - 13/11/2015

FS1661/16

SHEET  
4/4

INTERNAL ORDER NR.  
OC/2015/1257

DATE  
13/11/2015

CUSTOMER  
LFF LONDON FITTINGS & FLANGES LTD

TEST CERTIFICATE ACCORDING TO EN 10204 3.1 - EXTENT OF MATERIAL DELIVERY

		ASTM A516					ASTM A516 GR.B	
		43114/2015	43115/2015	43120/2015	43220/2015	43322/2015	43510/2015	43546/2015
Lactic Analysis	Heat Number	1574585	1574951	1574951	1574951	802165	52423	54759
	C %	0.200	0.185	0.185	0.185	0.180	0.180	0.160
	Mn %	0.940	0.900	0.900	0.900	1.170	0.580	0.510
	Si %	0.170	0.200	0.200	0.200	0.260	0.240	0.220
	P %	0.015	0.011	0.011	0.011	0.012	0.012	0.013
	S %	0.007	0.010	0.010	0.010	0.004	0.003	0.009
	Cr %	0.150	0.100	0.100	0.100	0.150	0.050	0.050
	Mo %	0.010	0.010	0.010	0.010	0.020	0.010	0.010
	Ni %	0.090	0.050	0.050	0.050	0.110	0.060	0.085
	Ti %	0.020	0.015	0.015	0.015	0.003	0.001	0.002
	Cu %	0.210	0.150	0.150	0.150	0.210	0.160	0.170
	V %	0.024	0.019	0.019	0.019	0.004	0.007	0.005
	Nb %	0.002	0.002	0.002	0.002	0.002		0.001
	B %		0.008	0.000	0.000	0.002		
	Co %					0.419		
Tensile Test	Test Temperature °C	+20	+20	+20	+20	+20	+20	+20
	Tensile Strength MPa	530	510	510	510	525	428	493
	Yield Strength MPa	352	321	321	320	388	321	381
	Elongation %	30.40	33.00	33.00	33.00	37.50	37.45	33.70
	Reduction Area %	56.90	57.50	59.00	57.90	67.00	0.00	0.00
	Specimen Size				38 (L)		21.31 x 3.76 (L)	25.73 x 4 (L)
Impact Test	Test Temperature °C	-15	-46	-46	-46	-46	-15	-15
	Absorbed Energy Joule	43	48.9	46.8	47	105		100
	Absorbed Energy 2 Joule	45.9	49.8	50	50	105		100
	Absorbed Energy 3 Joule	48.2	49	49	49	104		104
	Type	KV	KV	KV	KV	KV		
	Specimen Size	10 x10 (L)	10 x10 (L)	10 x10 (L)	10 x10 (L)	10 x10 (L)	10 x10 (L)	10 x10 (L)
Hardness Test	Scale	HB 30	HB 30	HB 30	HB 30	HB 30	HB 30	HB 30
	Value 1	145	129	137	148	147	140	138
	Value 2	143	133	136	147	139	136	140
	Value 3	146	127	140	143	142	132	141
	Average Value	147.667	129.667	133.667	147.667	142.667	136.000	139.667
	Value Ref.						207	205
Hydrostatic & Eddy Current	Result						OK	OK
	Type	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
	Heating Rates °C/s	150	150	150	150	150	150	150
	Holding Temperature °C	+920	+920	+920	+920	+920	+920	+920
	Holding Time h:min	0:30	0:30	0:30	1:30	1:30	0:10	0:10
	Cooling Media	AIR	AIR	AIR	AIR	AIR	AIR	AIR



NOTES

FULLY KILLED CARBON STEEL - FINE GRAIN ACCORDING TO ASTM E112 = 7

CUSTOMER INSPECTOR

THIRD PARTS

QUALITY CONTROL

Daila Molehodi

J. Molehodi

CHERO PIPING S.P.A.



TRI000001362\_0015

TRI000001362/15



ArcelorMittal

Inspection certificate "3.1" (EN 10 204)

Document No.: 60464/16  
Customer's Order (P.O.) No./Item No.: L/116335/00183/JW  
Supplier's Order No.: 3180063786  
Quantity delivered: pcs 524, mtrs 3144,000, B13 Adjust mass kgs 8100  
Dimensions: 33,4 x 3,381 mm (1" SCH40)  
Steel designation: L246/B PSL1 L280/X42 PSL1 Grade B  
Product, conditions and terms of delivery: Seamless steel tubes, API Spec. 6L-45 ed. 12, PSL1, ASME B36.10M-10, ASTM A106/A106M-14, ASME SA106/SA106M-13 - PED 97/23/EC, NACE MR0176/ISO 15156-2/09, Normalized hot finished (min. 880-980°C).  
Marking: Manufacturer's mark, mill inspector's stamp  
AMTP OSTRAVA  
LONDON FITTINGS & FLANGES LTD  
Steel made by basic oxygen process, fully killed, strand cast.  
Heat (H) and product (P) chemical analyses (%)  
Heat No.: 71341K  
C 0,17, MN 1,14, SI 0,210, P 0,012, S 0,008, CU 0,09, NI 0,03, CR 0,04, MO 0,008, V 0,002, TI 0,001, Nb 0,003, CEQ 0,37  
P 0,16, 1,13, 0,216, 0,012, 0,008, 0,00, 0,03, 0,04, 0,004, 0,002, 0,001, 0,001, 0,37  
P 6,16, 1,13, 0,212, 0,012, 0,008, 0,08, 0,03, 0,04, 0,005, 0,002, 0,001, 0,001, 0,37  
Test results:  
Heat No. 71341K  
Specimen No. Orada B  
Requirements: L280/X42, L246/B  
c11 Yield Point min. 240, min. 280, min. 245  
c12 Tensile Strength min. 416, min. 416, min. 416  
c13 Elongation min. 20,0, min. 20,0, min. 20,9  
Longitudinal strip specimen 10,0 mm  
c14-15 Impact test  
c30-32 Hardness max. 89  
74  
Visual and dimensional inspection with satisfactory results  
X  
c50 Flattening test - satisfactory  
c51 Expanding test - satisfactory  
c52 Bonding test - satisfactory  
X  
c53 Ring expanding test (DIN EN 10236) - satisfactory  
c54 Ring tensile test (DIN EN 10237) - satisfactory  
X  
PED 97/23/EC and AD 2000-Merkblatt W0 certified by TÜV NORD, cert. No. 07-202-9190-WZ-0807/12/Q and 07-203-9190-WP-0807/12/G  
22 HRC = 89 HRB max.  
MANUFACTURER OF BILLETS: AM OSTRAVA  
Impact strength is guaranteed on the basis of statistical data evaluation (28J/-10°C).  
Residual magnetic field [mT] max. 3 - satisfactory  
All pipes conform to the above mentioned standards and ordering requirements and agreements.

Date of issue 22.2.2018/ZR

Tel.: +420 595083044

ArcelorMittal

Ad: ArcelorMittal Tubular Products Ostrava a.s.  
Ad: QA Department  
Vratimovská 689  
707 02 Ostrava-Kunčice  
Czech Republic

YOUR NO: KS3634  
OUR REF: 19095/36062/361  
ITEM(S): 004  
SIGNATURE: [Signature]  
DATE: 3/12/16

ArcelorMittal Tubular Products Ostrava a.s.  
Vratimovská 689, 707 02 Ostrava 7  
Czech Republic

Bo. Petr Pastucha

Work's Inspector  
202 Validation

E z 2574/16/16P

TR1000001362/16

TR1000001362\_0016

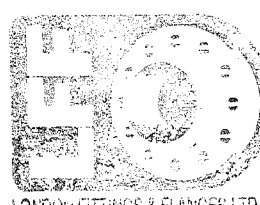
CUSTOMER  
LFF LONDON FITTINGS & FLANGES LTD

CERTIFICATE N° 727/2015 DATE 27/03/2015 SHEET 1

INTERNAL ORDER NUMBER 16/2015 DATE 9/01/2015

CUSTOMER ORDER REF.  
L/16125/00174/JW - 07/01/2015

TEST CERTIFICATE ACCORDING TO EN 10204 3.1 - EXTENT OF MATERIAL DELIVERY

POS.	TEST NO.	HEAT CODE	HEAT NUMBER	QTY	DESCRIPTION	MAT. REQUISITION / TAG N° / ITEM CODE / COMPUTER CODE / UB	ENCLOSURE / NOTES
12	39863/2014	B36E	8314143717	2000	90 DEG ELBOW SW 3/4" S/3000 A105N	PRODUCT CODE: F0010	
13	35769/2014	B33E	8314143717	1000	90 DEG ELBOW SW 1" S/3000 A105N	PRODUCT CODE: F0011	
14	40509/2015	E-VT	14/70217	100	90 DEG ELBOW SW 1.1/2" S/3000 A105N	PRODUCT CODE: F0012	
15	40675/2015	E-2H	15/73352	500	90 DEG ELBOW SW 2" S/3000 A105N	PRODUCT CODE: F0013	
16	38871/2014	FM-IF	170000838	200	45 DEG ELBOW SW 3/4" S/3000 A105N	PRODUCT CODE: F0031	
17	39488/2014	FC-CU	14/70849	200	45 DEG ELBOW SW 1" S/3000 A105N	PRODUCT CODE: F0032	
18	40217/2014	FC-IM	170002473	100	TEE SW S/3000 A105N 3/4"	PRODUCT CODE: F0048	
19	39204/2014	FC-CM	14/70163	100	TEE SW S/3000 A105N 1"	PRODUCT CODE: F0049	
20	39679/2014	FC-BP	13/79243	100	TEE SW S/3000 A105N 2"	PRODUCT CODE: F0051	
21	39204/2014	FC-CM	14/70193	200	RED TEE SW S/3000 A105N 1"x3/4"	PRODUCT CODE: F0062	
22	39679/2014	FC-BP	13/78243	200	RED TEE SW S/3000 A105N 2"x1"	PRODUCT CODE: F0065	
23	40555/2015	14/72031	14/72091	500	FULL COUPLING SW 1" 3000 A105N	PRODUCT CODE: F0102	
24	36385/2013	12/33762	12/33762	200	FULL COUPLING SW 2" 3000 A105N	PRODUCT CODE: F0104	
25	38764/2014	12/30285	12/30285	100	FULL COUPLING SW 3" 3000 A105	PRODUCT CODE: F0105	
26	40484/2015	14/35638	14/35636	100	CAP SW S/3000 A105N 2"	PRODUCT CODE: F0136	
27	39445/2014	13/78025	13/78025	100	RED INSERT SW 1"x3/4" 3000 A105N	PRODUCT CODE: F0223	
28	38760/2014	14/79266	14/79266	35	RED INSERT SW 2"x3/4" 3000 A105	PRODUCT CODE: F0225A	
29	39147/2014	14/70198	14/70198	60	RED INSERT SW 2"x3/4" 3000 A105	PRODUCT CODE: F0225A	
29	24759/2006	79747	06/79747	5	RED INSERT SW 2"x3/4" 3000 A105	PRODUCT CODE: F0225A	
29	39147/2014	14/70198	14/70198	100	RED INSERT SW 2"x1" 3000 A105N	PRODUCT CODE: F0226	
30	39679/2014	FC-BP	13/78243	300	RED TEE SW S/3000 A105 2"x3/4"	PRODUCT CODE: F0278	

YOUR NO. **KS3634**  
OUR REF. **19095/3062/JW**  
ITEM(S) **005+012**  
SIGNATURE **W. J. D.** DATE **12/1/15**



NOTES  
THIS IS TO CERTIFY THAT MATERIAL REQUIREMENTS ARE ACCORDING TO ORDER SPECIFICATIONS.  
MATERIAL ACC. TO NACE MR 01.75 ED.2005 + ASME SECTION II ED.2013.  
VISUAL, DIMENSIONAL AND MARKING CHECK HAVE BEEN CARRIED OUT WITH SATISFACTORY RESULTS. MATERIAL ACC. WITH PED 97/23/EC ANNEX 1.

THIRD PARTS

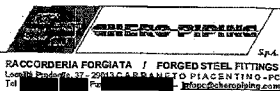
CUSTOMER INSPECTOR

QUALITY CONTROL

**Mich Laurini**  
CHERO PIPING S.P.A.

TRI000001362\_0017

TRI000001362/17



RACCORDERIA FORGIATA / FORGED STEEL FITTINGS  
Lombardia - 37-20013 CARRATE PIACENTINO - PC  
Tel. 0521/850000 - Fax 0521/850001  
E-mail: info@cheropiping.com

CUSTOMER  
LFF LONDON FITTINGS & FLANGES LTD

CERTIFICATE N° 727/2015 DATE 27/03/2015 SHEET 2

INTERNAL ORDER NUMBER 16/2015 DATE 9/01/2015

CUSTOMER ORDER REF.  
L/16125/00174/JW - 07/01/2015

TEST.N°	MATERIAL SPECIFICATION AND GRADE	HEAT NUMBER	LADLE ANALYSIS (%)																												
			C	Mn	Si	P	S	Cr	Mo	Ni	Ti	Cu	V	Fe	Al	Ch	Ta	Co	N	W	Zn	Pb	Sn	As	Sb	Ca	O	B	H	C.E.	
398632014	ASTM A305	P3941437170	0.180	0.570	0.255	0.012	0.005	0.089	0.004	0.025	0.000	0.068	0.002																		
397692014	ASTM A305	P3941437170	0.180	0.570	0.265	0.012	0.005	0.089	0.004	0.025	0.000	0.068	0.002																		
405082015	ASTM A305	1470227	0.180	0.580	0.250	0.011	0.001	0.090	0.010	0.002	0.000	0.130	0.018																		
405752015	ASTM A305	1572332	0.180	0.520	0.230	0.013	0.005	0.120	0.010	0.000	0.000	0.180	0.022																		
338712014	ASTM A305	11000538	0.175	0.540	0.234	0.011	0.007	0.083	0.022	0.125	0.000	0.242	0.091																		
394582014	ASTM A305	1470849	0.185	0.590	0.180	0.015	0.010	0.120	0.010	0.080	0.000	0.210	0.116																		
402172014	ASTM A305	110002473	0.172	0.550	0.222	0.016	0.012	0.153	0.034	0.171	0.000	0.284	0.101																		
392442014	ASTM A305	1470193	0.180	0.520	0.240	0.011	0.008	0.110	0.010	0.050	0.000	0.180	0.115																		
397782014	ASTM A305	1570243	0.185	0.620	0.220	0.011	0.010	0.140	0.030	0.120	0.000	0.180	0.115																		
405552015	ASTM A305	1472081	0.185	0.570	0.210	0.015	0.008	0.150	0.016	0.080	0.000	0.180	0.016																		

TEST.N°	TENSILE TEST [Mpa]	IMPACT TEST [Joule]	HARDNESS TEST	HYDROSTATIC TEST	FLARING TEST	BENDING TEST	FLATTENING TEST	Eddy Current	REFERENCES																							
										Yield Strength	Ultimate Tensile Strength	Elongation	Reduction of Area	Charpy	Rockwell	Brinell	Hydrostatic Pressure	Flaring Angle	Bending Angle	Flattening Force												
398632014	+20 °C	500	372	25,80	55,00																											
397692014	+20 °C	500	403	25,40	52,00																											
405082015	+20 °C	486	300	34,40	50,10																											
405752015	+20 °C	517	325	32,10	55,90																											
338712014	+20 °C	502	300	33,20	59,40																											
394582014	+20 °C	515	319	35,40	59,70																											
402172014	+20 °C	540	365	31,30	53,00																											
392442014	+20 °C	513	356	32,80	66,00																											
397782014	+20 °C	499	356	33,60	69,00																											
405552015	+20 °C	511	322	32,70	57,00																											

TEST.N°	H.T.	SCALE	MAX. T	BELOW TO	COOLING MEDIA	H.T.	SCALE	MAX. T	BELOW TO	COOLING MEDIA	HEAT TREATMENTS	BASE MATERIAL CERTIFIC. REF.	STEEL WORKS
398632014	NORMAL.	°C	920		AIR							2014.100000068974	LUCHINI
397692014	NORMAL.	°C	920		AIR							2014.100000068974	LUCHINI
405082015	NORMAL.	°C	920	1,00	AIR							27283	RIVA
405752015	NORMAL.	°C	920	1,50	AIR							5533	RIVA
338712014	NORMAL.	°C	920		AIR							AS00024/2014	RIVA
394582014	NORMAL.	°C	920		AIR							AS11594/2014	RIVA
402172014	NORMAL.	°C	920		AIR							17572	RIVA
392442014	NORMAL.	°C	920		AIR							17794	RIVA
397782014	NORMAL.	°C	920		AIR							16124	RIVA
405552015	NORMAL.	°C	920	1,00	AIR								RIVA

NOTES

(7) V=Nb+Ti<0,10%; Cu+Ni+Cr+Mo<1%; B≤0,0001 C.E.=C+Mn/6+(Cr+Mo+V)/5+(Cu+Ni)/15

THIRD PARTS

CUSTOMER INSPECTOR

QUALITY CONTROL

M. J. Laurini  
CHERO PIPING S.P.A.

TRI000001362\_0018

TRI000001362/18

FSIS68/15

**CHERO PIPING** S.p.A.  
RACCORDERIA FORGIATA / FORGED STEEL FITTINGS  
Località Pradeda, 37 - 28046 CARONNO PIACENTINO - PC  
Tel. 0522/860001 - Fax 0522/860002 - info@cheropiping.com

CUSTOMER  
LEF LONDON FITTINGS & FLANGES LTD

CERTIFICATE N° DATE SHEET  
727/2015 27/03/2015 3

INTERNAL ORDER NUMBER DATE  
16/2015 9/01/2015

CUSTOMER ORDER REF.  
L/16125/00174/JW - 07/01/2015

TEST.N°	MATERIAL SPECIFICATION AND GRADE	HEAT NUMBER	LADLE ANALYSIS (%)																											
			C	Mn	Si	P	S	Cr	Mo	Ni	Ti	Cu	V	Fe	Al	Co	Ta	Co	N	W	Zn	Pb	Sn	As	Sb	Ca	O	B	H	C.E.
363852013	ASTM A105	1232767	0.230	0.950	0.223	0.007	0.007	0.000	0.020	0.000	0.000	0.110	0.013		0.001													0.000	0.263	(7)
367842014	ASTM A105	1232765	0.185	0.940	0.223	0.008	0.008	0.000	0.010	0.000	0.000	0.130	0.011		0.002													0.000	0.263	(7)
404842015	ASTM A105	1458833	0.185	0.940	0.220	0.009	0.010	0.000	0.010	0.000	0.000	0.150	0.010		0.001													0.000	0.276	(7)
364452014	ASTM A105	1378825	0.180	0.850	0.200	0.015	0.010	0.140	0.020	0.000	0.000	0.180	0.015		0.002													0.000	0.273	(7)
367802014	ASTM A105	1478256	0.180	0.860	0.210	0.015	0.010	0.130	0.020	0.000	0.000	0.220	0.018		0.001													0.000	0.275	(7)
391472014	ASTM A105	1470198	0.200	0.970	0.220	0.013	0.007	0.110	0.010	0.000	0.000	0.180	0.002		0.002													0.000	0.281	(7)
247592006	ASTM A105	0677977	0.189	0.930	0.180	0.011	0.007	0.030	0.010	0.040	0.002	0.150	0.024		0.001													0.000	0.282	(7)

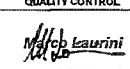
  

TEST.N°	TENSILE TEST [Mpa]				IMPACT TEST [Joule]				HARDNESS TEST		HYDROSTATIC TEST		FLARING TEST		BENDING TEST		FLATTENING TEST		Eddy Current	REFERENCES	
	Yield Strength	Tensile Strength	Elongation %	Reduction Area %	Test Temperature	Absorbed Energy	Type	Specimen Size	Disc	Value	Scale	Pressure	Time	Test	Disc	Value	Angle	Test			
363852013	+ 20 °C	510	342	28.10	59.20							175.0	HR								
367842014	+ 20 °C	505	341	30.35	57.60							150.0	HR								
404842015	+ 20 °C	497	344	29.70	55.70							177.0	HR								
364452014	+ 20 °C	496	308	33.60	59.60							153.0	HR								
367802014	+ 20 °C	496	309	33.60	59.70							155.0	HR								
391472014	+ 20 °C	554	321	31.90	60.00							157.0	HR								
247592006	+ 20 °C	513	316	32.60	56.90							158.0	HR								

TEST.N°	H.T. (1)	SCALE	MAX. T	BELOW TO	COOLING MEDIA	H.T. (2)	SCALE	MAX. T	BELOW TO	COOLING MEDIA	HEAT TREATMENTS REFERENCES		BASE METAL CERTIFICATES		STEEL WORKS
											1	2	1	2	
363852013	NORM.L.	°C	920		AIR								41398		RIVA
367842014	NORM.L.	°C	920	2.00	AIR								1912		RIVA
404842015	NORM.L.	°C	920	1.50	AIR								48971		RIVA
364452014	NORM.L.	°C	920		AIR								37630		RIVA
367802014	NORM.L.	°C	920		AIR								3775		RIVA
391472014	NORM.L.	°C	920		AIR								16299		RIVA
247592006	NORM.L.	°C	920		AIR								14541		RIVA

NOTES	THIRD PARTS	CUSTOMER INSPECTOR	QUALITY CONTROL
(7) V+Sn+Ti<0.10%; Cu+Ni+Cr+Mo<1%; B<0.0001 C.E.=C+Mn/5+(Cr+Mo+V)/5+(Cu+Ni)/15			 <b>M. Laurini</b> CHERO PIPING S.P.A.

TRI000001362\_0019

TRI000001362/19

CUSTOMER  
LFF LONDON FITTINGS & FLANGES LTD

CERTIFICATE N° 727/2015 DATE 27/03/2015 SHEET 4

INTERNAL ORDER NUMBER 16/2015 DATE 9/01/2015

CUSTOMER ORDER REF.  
L/16125/00174/JW - 07/01/2015

TEST.N°	MATERIAL SPECIFICATION AND GRADE	HEAT NUMBER	LAOIE ANALYSIS (%)																									
			C	Mn	Si	P	S	Cr	Mo	Ni	Ti	Cu	V	Fe	Al	Co	N	W	Zn	Pb	Sn	As	Sb	Ca	O	B	N	C.E.

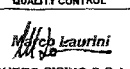
  

TEST.N°	TENSILE TEST [Mpa]				IMPACT TEST [Joule]				HARDNESS TEST		HYDROSTATIC TEST [bar]	FLANGING TEST	BENDING TEST	FLATTENING TEST	Edy/Current	REPERMENTS	
	Yield Tensile Strength	Tensile Strength	Yield Strength	Reduction Area %	Yield Temperature	Transition Temp	Type	Max. Value	Scale								
38863/2014B					-46 °C	25	30	31	RV	10 X 10,0	1						
39789/2014B					-46 °C	30	31	32	RV	10 X 10,0	1						
40599/2015B					-46 °C	52	50	49	RV	10 X 10,0	1						
40675/2015B					-46 °C	49	48	47	RV	10 X 10,0	1						
38871/2014B					-46 °C	36	32	33	RV	10 X 10,0	1						
39489/2014B					-46 °C	44	46	45	RV	10 X 10,0	1						
40217/2014B					-46 °C	46	47	48	RV	10 X 10,0	1						
39204/2014B					-46 °C	51	48	50	RV	10 X 10,0	1						
38578/2014B					-46 °C	49	46	47	RV	10 X 10,0	1						
40550/2015B					-46 °C	46	40	50	RV	10 X 10,0	1						

TEST.N°	H.T. ①	SCALE	MAX. T	BELOW TO	COOLING MEDIA	H.T. ②	SCALE	MAX. T	BELOW TO	COOLING MEDIA	HEAT TREATMENTS REPERMENTS	EASE MATERIAL CERTIFIC REF.	STEEL WORKS

NOTES	THIRD PARTS	CUSTOMER INSPECTOR	QUALITY CONTROL
(7) V=NB+T1<0,10%; Cu+Ni+Cr+Mo<1%; B<0,0001 C.E.=C+Mn/6+(Cr+Mo+V)/5+(Cu+Ni)/15			 <b>M. Jaurini</b> CHERO PIPING S.P.A.

TRI000001362\_0020



SpA  
RACCORDERIA FORGIATA / FORGED STEEL FITTINGS  
Lavoro Prodotti 37-29973 CARPANELLO PIACENTINO - PC  
Tel. Fax E-mail info@cheropiping.com

CUSTOMER  
LFF LONDON FITTINGS & FLANGES LTD

CERTIFICATE N° DATE SHEET  
727/2015 27/03/2015 5  
INTERNAL ORDER NUMBER DATE  
16/2015 9/01/2015  
CUSTOMER ORDER REF.  
L/16125/00174/JW - 07/01/2015

TEST N°	MATERIAL SPECIFICATION AND GRADE	HEAT NUMBER	LADLE ANALYSIS (%)																											
			C	Mn	Si	P	S	Cr	Mo	Ni	Ti	Cu	V	Fe	Al	Co	Ta	Co	N	W	Zn	Pb	Sn	As	Sb	Ca	O	B	H	C.E.

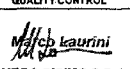
  

TEST N°	TENSILE TEST [Mpa]				IMPACT TEST [Joule]				HARDNESS TEST		HYDROSTATIC TEST [bar]	FLARING TEST	BENDING TEST DE TORSION S.P.A.	FLATTENING TEST	Safety Current	REFERENCES	
	Yield Strength	Tensile Strength	Yield Strength	Tensile Strength	Yield Strength	Tensile Strength	Type	Hardness									
3036500136					- 46 °C	52	53	54	RV	10 X 10,0	L						
3036420146					- 46 °C	53	55	56	RV	10 X 10,0	L						
4048420156					- 46 °C	54	55	56	RV	10 X 10,0	L						
3844520146					- 46 °C	52	48	49	RV	10 X 10,0	L						
3016020146					- 46 °C	51	49	50	RV	10 X 10,0	L						
3014020146					- 46 °C	44	45	46	RV	10 X 10,0	L						
247582006E	+200 °C		286	0,20	- 46 °C	46	48	45	RV	10 X 10,0	L						

TEST N°	H.T. ①	SCALE	MAX. T	BELOW TO	COOLING MEDIA	H.T. ②	SCALE	MAX. T	BELOW TO	COOLING MEDIA	HEAT TREATMENTS REFERENCES	BASE MATERIAL CERTIFIC. REF.	STEEL WORKS

NOTES	THIRD PARTS	CUSTOMER INSPECTOR	QUALITY CONTROL
(7) V+Nb+Ti<0,10%; Cu+Ni+Cr+Mo<1%; B<0,0001 C.E.=C+Mn/5+ (Cr+Mo+V)/5+ (Cu+ Ni)/15			 M. Laurini CHERO PIPING S.P.A.

TRI000001362\_0021

TRI000001362/21

# M.E.G.A.

## INSPECTION CERTIFICATE Certificato d'ispezione

198348



REPORT N. Rapporto N.	TC-014017-14-0001	Issued on Emissione	20/11/2014	Customer Cliente	MARLA TUBE FITTINGS LIMITED KINWATON FARM ROAD ARDEN FOREST INDUSTRIAL ESTATE ALCESTER - WARWICKSHIRE B49 6EH - ENGLAND	Job n. / Com. n.	14017	Page n. / Pagina n.	12 of 18
Revision Revisione	0	According to In accordo a	EN 10204:2005	Type Tipo	3.1	Purchase order and project/Ordine e progetto	PH011966		

Test Prova	Item Pos.	Qty Q.tà	Customer code Codice cliente	Material Materiale	Heat Cottura	Product Prodotto
JDAO	81	124		A/SA105-13	P4121241116	TEES. 3000 SW A/SA105N 1x3/4
JTSL	81	636		A/SA105-13	13/76962	TEE S. 3000 SW A/SA105N 1x3/4
JTNX	82	64		A/SA105-13	13/76545	TEE S. 3000 SW A/SA105N 1.1/4x1/2
JCTX	83	1		A/SA105-13	P4111148676	TEE S. 3000 SW A/SA105N 2x1/2
KDNL	83	203		A/SA105-13	0834857/08	TEE S. 3000 SW A/SA105N 2x1/2

YOUR NO. 153634  
OUR REF. 19095 30062/JC  
ITEM(S) 006  
SIGNATURE [Signature]  
DATE 3/12/16

Test Prova	HEAT TREATMENT DATA AND REFERENCES TO OTHER CERTIFICATES / Oetaggi di trattamento termico e riferimenti ad altri certificati	RAW AND FORGING MATERIAL CERTIFICATES / Certificati di acciaio/forgia
JDAO	MATERIAL PRODUCED BY ELECT.FURNACE-NORMALIZED AT 880 C COOLED IN STILL AIR.	CERT.12856.MEGA/1*0030MEGA
JTSL	MATERIAL PRODUCED BY ELECT.FURNACE-NORMALIZED AT 900 C COOLED IN STILL AIR.	CERT.373.EVASI*0015MEGA
JTNX	MATERIAL PRODUCED BY ELECT.FURNACE-NORMALIZED AT 900 C COOLED IN STILL AIR.	CERT.8.EVASI*
JCTX	MATERIAL PRODUCED BY ELECT.FURNACE-NORMALIZED AT 880 C COOLED IN STILL AIR.	CERT.4310-12-14.MLGA/1*0069MEGA
KDNL	MATERIAL PRODUCED BY ELECT.FURNACE-NORMALIZED AT 900 C COOLED IN STILL AIR.	CERT.10121.MEGA/1*55448MEGA

MATERIAL PRODUCED BY ELECT. FURNACE-NORMALIZED AT 900 °C COOLED IN STILL AIR																				CERT. 101.212MEGAFIT-3594956504									
TENSILE TEST AT ROOM TEMPERATURE / Trazione a temperatura ambiente		CVN (KV) / Prova di resilienza																		Bend		Flatten		Hardness					
Test Prova	Test loc. Preso.a	Orient. Direz.	Specimen / Provino			Yield strength Snerv [Mpa] Min:	Tensile strength Rottura [Mpa] Min:	Elongation Allung. [%] Min:	Red. Of Area Contraz. [%] Min:	Dimens. Dimens. [mm]	T Temp. [°C]	Abs. Energy Energia ass. [J]	Shear A Area d [%]	Lat Exp Esp. Lat. [mm]	Piegia	Schlacc.	Durezza [HBN]												
			Shape Forma	A [mm] Sezione	L [mm] Lung.																								
JDAO	T/2	LONG	Round	30.400	25.080	286.000	492.400	41.600	71.700	10x10x55	0	163 - 132 - 139	—	—	—	—	142 - 144												
JTSL	T/2	LONG	Round	59.200	35.000	340.400	532.700	42.000	67.500	10x10x55	0	138 - 132 - 132	—	—	—	—	155 - 157												
JTNX	T/2	LONG	Round	59.200	35.000	355.600	530.100	37.000	67.300	10x10x55	0	83 - 67 - 115	—	—	—	—	150 - 152												
JCTX	T/2	LONG	Round	122.300	50.000	311.200	500.400	32.800	65.400	10x10x55	0	108 - 123 - 119	—	—	—	—	153 - 156												
KDNL	T/2	LONG	Round	122.600	50.000	363.000	526.000	32.300	69.200	10x10x55	0	40 - 44 - 42	—	—	—	—	143 - 146												
Test Prova	C	Si	Mn	S	P	Cr	Ni	Mo	Ti	Cu	V	Al	Co	Nb	N	Sn	W	B	Fe	Zr	CE*	PREN*	X fact.*	I fact.*					
JDAO	0.1700	0.2400	1.0500	0.0040	0.0150	0.1750	0.0340	0.0070	0.0740	0.0040	0.0367	0.0029	0.0029	0.0029	0.0070	0.0070	0.0003	0.0003	0.3894	0.3661	0.3761	0.4176	0.4181						
JTSL	0.1800	0.2500	0.8500	0.0050	0.0150	0.1300	0.0500	0.0100	0.0170	0.1500	0.0160	0.0290	0.0020	0.0070	0.0070	0.0003	0.0003	0.3894	0.3661	0.3761	0.4176	0.4181							
JTNX	0.1750	0.2500	0.9400	0.0070	0.0140	0.1400	0.0600	0.0100	0.0130	0.1200	0.0160	0.0280	0.0070	0.0070	0.0070	0.0003	0.0003	0.3894	0.3661	0.3761	0.4176	0.4181							
JCTX	0.1750	0.2300	1.0800	0.0050	0.0150	0.1600	0.0370	0.0100	0.0170	0.1500	0.0160	0.0290	0.0070	0.0070	0.0070	0.0003	0.0003	0.3894	0.3661	0.3761	0.4176	0.4181							
KDNL	0.1950	0.2600	1.1200	0.0030	0.0100	0.1200	0.0380	0.0100	0.0170	0.1500	0.0160	0.0290	0.0070	0.0070	0.0070	0.0003	0.0003	0.3894	0.3661	0.3761	0.4176	0.4181							

REMARKS / Note										QUALITY INSPECTOR REPRESENTATIVE									
1: MATERIAL ACCORDING TO NACE MR0175/ISO 15156-1-2-3 Ed.2009 2: MATERIAL ACCORDING TO NACE MR0103 Ed.2012 3: FULLY KILLED STEEL AND FINE GRAIN TREATED 4: ITEMS HOT-DIPPED GALVANIZED (HDG) AS PER ASTM A153 CLASS B										A: CE = C + Mn/5 + (Cr+Mo+V)/5 + (Cu+Ni)/25   B: PREN = Cr + 3.3Mo + 16N C: X factor = (10P + 55b + 45n + As)/100   elements expressed in ppm D: J factor = ((Mn + Si) / P - Sn) / 104									
										Quality inspector representative Ispezziere controllo qualità									

TRI000001362\_0022

TRI000001362/22

**M.E.G.A.****INSPECTION CERTIFICATE**  
Certificato d'ispezione

FS1522/15



REPORT N. Rapporto N.	TC-014017-14-0001	Issued on Emissione	19/11/2014	Customer Cliente	MAARLA TUBE FITTINGS LIMITED KINWATON FARM ROAD ARDEN FOREST INDUSTRIAL ESTATE ALCESTER - WARWICKSHIRE B49 6EH - ENGLAND	Job n. / Com. n.	14017	Page n. / Pagina n.	18 of 18
Revision Revisione	0	According to In accordo a	EN 10204:2005	Type Tipo	3.1	Purchase order and project/Ordine e progetto PH011966			

We hereby certify that all items supplied for the above purchase orders meet all the requirements of the applicable specification of manufacture, the purchase item descriptions, purchase specifications and purchase order requirements. Visual, dimensional and marking check of items supplied has been carried out by our internal inspectors with satisfactory results.

The chemical and mechanical values shown on the EN 10204 certificate are true copy of the mill test certificate issued by the steel mill, or by the laboratory that determined it. All material is certified to be mercury free. No weld repair was performed. Marking was performed by low stress stamps in accordance with MSS SP25.

**Manufacturing standards:**

- 45° and 90° elbows, tees, crosses, full and half couplings, caps, square, hexagonal and round plugs, hexagonal and flush bushings are manufactured in accordance with ASMEB. 16.11; threads in accordance with ANSI/ASME B1.20.1.

- Outlet branches are manufactured in accordance with: ASME B.31.1, B.31.3 and MSS-SP-97

- Seamless swage nipples are manufactured in accordance with: BS3799-74 or MSS SP95-86

- Seamless pipe nipples are manufactured in accordance with: B36.10-95 or B36.19-35

- Flanged outlet branches are manufactured in accordance with: ASME B.31.1, B.31.3 and B.16.5

- Unions are manufactured in accordance with: BS 3799 or MSS SP-83

When the length of flanged nipple is not specified in the description, it is 150 mm.

The material is according to ASTM and ASME Boiler and Pressure Vessel Code Section II.

When the Edition/Revision of the listed standards is not mentioned, it is assumed to be the latest.

Yield strength detected by 0.2% off-set method

Austenitic and duplex stainless steels have been pickled and passivated. Machined surfaces do not require pickling and passivation.

M.E.G.A. is approved with certificate 75/2002/MUC by T.U.V. (certification Body N.0036) to issue certificate of specific product control in accordance with the Pressure Equipment Directive 97/23/EC (PED) Annex 1, Paragraph 4.3.

**Testing equipment used:**

- Tensile test machine Galdabini Quasar 250 serial No. VAOG - Procedure QC-03 Rev. 1

- Impact test Cermac JB-W500 serial No. 04031 - Procedure QC-02 Rev. 1

- Hardness test Wolpert Dia Testor 2RC serial No. 8900298/0001 - Procedure QC-04 Rev. 0

- Chemical analysis spectrometer Baird DV4 serial No. P017 (ASTM E415 and E1086) - Procedure QC-07 Rev. 0

The product are manufactured in Italy.

Quality control laboratory  
M.E.G.A. FITTINGS & FLANGES LTD  
Laboratorio controllo qualità

Ricardo Scorsetti

This certificate is issued by a computerized system and it is valid with electronic signature. On the original certificate the trademark M.E.G.A. is printed in green color.

Form QC-01-01 Rev. 0 2013-03-15

M.E.G.A. S.p.A. - Via Dalla Chiesa, 3 - 24020 Scarzorosciate (Bergamo) - Italy - VAT IT 00210060166 - Ph. [REDACTED] - Fax - [REDACTED] - E-mail inspection@mega-fittings.com

TRI000001362\_0023

TRI000001362/23

## MILL TEST &amp; INSPECTION CERTIFICATE

ACCORDING TO EN 10204 :2004 3.1

CUSTOMER : M&amp;S STEEL FLANGES AND FITTINGS LIMITED

CERT. NO. : 133983

L/C NO. :

ORDER NO. : 013904

DATE : 12/28/2013

INVOICE NO. : BWO1310210074

PAGE : 2 ORIGIN : TAIWAN



柏緯鋼鐵股份有限公司

BOTH-WELL STEEL FITTINGS CO., LTD.

高雄市中區武聖路五仁心路303號

NO.303, REN-SIN ROAD, REN-WU DISTRICT, KAOSHIUNG CITY, TAIWAN R.O.C. (81460)

TEL : 09-2222222

FAX : 09-2222222

Web site: http://www.bbothwell.com.tw

e-mail: box@bothwell.com.tw

ITEM	FW HT. CD.	RAW MATERIAL HEAT NO.	DESCRIPTION	QUANTITY	SPECIFICATION FOR		INSPECTION	
					MATERIAL	FITTING	SURFACE	DTM.
001	4199	0095966	RED. TH 1"x3/4" 3000# S/W T110326	100 PC	ASME A10N -12	ASME B16.11 - 2011	GOOD	GOOD
003	3792	569236	FULL CHG 2-1/2" 3000# NET T110327	10 PC	ASME SA103N-2012D			
004	4151	336789	HALF CHG 2-1/2" 3000# FT T110328	15 PC				
005	3917	330614	HALF CHG 3" 3000# FT T110329	25 PC				
006	4117	335728	HEX FLG 1/4" FT T110330	300 PC				

ITEM	FW HT. CD.	CHEMICAL COMPOSITION (%)																MATERIAL SUPPLIER
		C	Si	Mn	P	S	Cu	Cr	Ni	Mo	V	Co(Nb)	N	Al	Ti	Zr	Ce	
Min		0.35	0.35	0.60	0.035	0.040	0.40	0.30	0.40	0.12	0.08	-	-	-	-	-	0.43	
Max		0.35	0.35	1.05	0.035	0.040	0.40	0.30	0.40	0.12	0.08	-	-	-	-	-	0.43	
001	4199	0.18	0.19	0.92	0.014	0.004	0.17	0.09	0.08	0.01	0.001	0.000	-	-	-	-	0.370	
003	3792	0.180	0.320	0.560	0.010	0.002	0.100	0.150	0.070	0.020	0.002	0.001	-	-	-	-	0.392	
004	4151	0.20	0.20	0.86	0.021	0.010	0.20	0.10	0.07	0.02	0.003	0.002	-	-	-	-	0.386	
005	3917	0.21	0.19	0.85	0.016	0.010	0.16	0.09	0.05	0.01	0.002	0.001	-	-	-	-	0.386	
006	4117	0.20	0.21	0.81	0.030	0.011	0.18	0.08	0.05	0.01	0.003	0.002	-	-	-	-	0.369	

ITEM	FW HT. CD.	MECHANICAL PROPERTIES					HEAT TREATMENT		ADDITIONAL TEST/REMARKS	
		T. S. (KSI)	Y. S. (KSI)	EL. (%)	R of A (%)	Hardness (HRC)(AVG)	Charpy Impact (Joule)	NORMALIZED		
Min		70	36	22	30	187	1	2	3	AVG.
Max		70	36	22	30	187	1	2	3	AVG.
001	4199	76.9	53.9	37.4	66.4	146	143			
003	3792	73.8	51.4	33.4	71.4	149	142			
004	4151	76.3	57.9	35.0	65.5	144	146			
005	3917	75.6	52.5	35.8	62.6	141	144			
006	4117	77.4	54.0	31.8	67.3	143	145			

WE HEREBY CERTIFY, THAT THE MATERIAL DESCRIBED ABOVE HAS BEEN TESTED AND COMPLIES WITH THE TERMS OF THE ORDER CONTRACT.

Q.C. Manager: CHEN CHU HUANG  
Inspector: YUAN YAO CHANG

BW-D0839 REV: 2

YOUR NO. 155634  
OUR REF. 4/19098/3062/34  
ITEM(S) 006  
SIGNATURE [Signature] DATE 12/26

Order No. 058422  
Item No. 003  
Reference No. 381766 / 003  
T Number T110326  
Page 1 of 1

TRI000001362\_0024

TRI000001362/24



RACCORDERIA FORGATA E DERIVAZIONI  
FORGED STEEL FITTINGS AND OUTLETS

# CERTIFICATO DI COLLAUDO / TEST CERTIFICATE

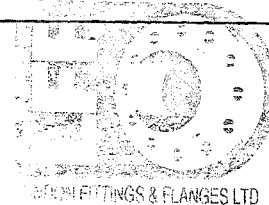
Cliente/Customer GELDBACH UK LTD  
Ordine cliente/Customer order n. 100323 add del 13/09/16  
Documento di trasporto DTVEND201600001321

Certific. N. CTCERT201600001380  
Data/Date 14/09/2016

Lista/Job 2334

Item	Quantity	Heat code	Heat Number	Description	Type and mat. specific / year date	Steel Mill	Steel mill cert. - forgermaster cert.
1	250	MFP3	1575224	RED TEES 1X1/2 2010 SW	ASTM SA/A105N-13	RIVA ACCIAIO SPA	24494 - 5712
ANALISI CHIMICA DI ACCIAIERIA				C% Mn% P% S% Si% Cr% Ni% Mo% Ti% Cu% Nb% Co% Y% N% CEN% Al%	Z% TRATTAMENTO TERMICO / HEAT TREATMENT		
STEEL MILL CHEMICAL ANALYSIS				0.199 0.850 0.0109 0.0450 0.150 0.100 0.070 0.010 0.017 0.180 0.002 0.000 0.015 0.003 0.370 0.020 0.000	Electric furnace - NORM. AT 900°C / cooled in still air		
CARATTERISTICHE MECCANICHE				Stressamento Rmura Yold str. Ten. Str.	Alp% Cw% Durezza B% Red. of. Hardness	Resilience Impact test val. J/cm(2)	Proof idraulica Flg. Viscid and dimensional check "OK"
MECHANICAL PROPERTIES				N/mm(2) 311.00 N/mm(2) 490.00	33.20 58.40 HBW 154 165 46.1 47.9 49.3 -46°C	0.00	
RACCORDI SECONDO FITTINGS IN ACC. TO				ASME B16.11-2011, BS 3799-24, MSS SP-25 L.E., ASME SEC. II PART A L.E., NACE MR0175-2009 ISO 15156			
Item	Quantity	Heat code	Heat Number	Description	Type and mat. specific / year date	Steel Mill	Steel mill cert. - forgermaster cert.
2	150	ENT	240894	90DEG ELBOWS 2.000 SW	ASTM SA/A105N-13	ACC. VENETE SPA	255539 - 287
ANALISI CHIMICA DI ACCIAIERIA				C% Mn% P% S% Si% Cr% Ni% Mo% Ti% Cu% Nb% Co% Y% N% CEN% Al%	Z% TRATTAMENTO TERMICO / HEAT TREATMENT		
STEEL MILL CHEMICAL ANALYSIS				0.161 1.044 0.0090 0.0050 0.136 0.128 0.126 0.029 0.011 0.210 0.002 0.009 0.004 0.000 0.392 0.025 0.000	Electric furnace - NORM. AT 900°C / cooled in still air		
CARATTERISTICHE MECCANICHE				Stressamento Rmura Yold str. Ten. Str.	Alp% Cw% Durezza B% Red. of. Hardness	Resilience Impact test val. J/cm(2)	Proof idraulica Flg. Viscid and dimensional check "OK"
MECHANICAL PROPERTIES				N/mm(2) 375.00 N/mm(2) 527.00	31.00 63.00 HBW 157 159 101 109 107 -46°C	0.00	
RACCORDI SECONDO FITTINGS IN ACC. TO				ASME B16.11-2011, BS 3799-24, MSS SP-25 L.E., ASME SEC. II PART A L.E., NACE MR0175-2009 ISO 15156			

YOUR NO. 100323  
OUR REF. 19095/30062/JC  
ITEM(S) 008  
SIGNATURE *[Signature]* DATE 13/12/16



I risultati dell'analisi chimica sono in buona corrispondenza del certificato emesso dall'acciaieria.  
I risultati delle prove meccaniche sono in buona corrispondenza del certificato emesso dall'acciaieria.  
Dichiaro che il prodotto fornito è conforme alle normative sopra indicate ed ai requisiti dell'ordine.  
The results of the chemical analysis are in good agreement with the certificate issued by the steel mill.  
The results of the mechanical tests are in good agreement with the certificate issued by the steel mill.  
We declare that the delivered product complies with the above stipulations and to the order's requirements.

Certificato secondo / Certificate acc. to: EN 10204/2.1  
ANNUAL BOOK ASTM SEZ. 1 VOL. 01/01, 2014  
MATERIAL MANUFACTURER APPROVED by TÜV RHEINLAND INDUSTRIE SERVICE GmbH ACCORDING TO PED. 97/23/EC  
ANNEX 1 POINT 4.3 & AD 2000 W0.

ENTE COLLAUDO / INSPECTOR

C. QUALITY CONTROL  
LAME S.p.A.  
20126 - 20126  
C. QUALITY CONTROL  
LAME S.p.A.  
20126 - 20126



LAME S.p.A. - 21040 TERAGO (VA) ITALY - Via Papa Giovanni XXIII, 1 - Tel. 0323/861111 - 1 - TELEFAX 0323/861112 - E-mail: info@lame-italy.it

Pag. 1/1

TRI000001362\_0025

TRI000001362/25



RACCORDERIA FORGIATA E DERIVAZIONI  
FORGED STEEL FITTINGS AND OUTLETS

# CERTIFICATO DI COLLAUDO / TEST CERTIFICATE

Cliente/Customer: GELDBACH UK LTD  
Ordine cliente/Customer order n.: 10059 dtd 29/01/16  
Documento di trasporto: DTVEND201600000776

Certific. N.: CTCERT201600000804  
Data/Date: 23/05/2016

Lista/Job: 217

FS 17-28/1

Item	Quantity	Heat code	Heat Number	Description	Type and mat. specific/year date													Steel Mill	Steel mill cert. - forgermaster cert.		
4	200	E.M.	257920	50DEG ELBOWS 1300G SW	ASTM SA/A105N-13													ACC. VENETE SPA	239532 - 78		
ANALISI CHIMICA DI ACCIAIERIA:				C%	Mn%	P%	S%	Si%	Cr%	Ni%	Mo%	Ti%	Cu%	Nb%	Co%	V%	N%	CEN%	AISI	Zn%	TRATTAMENTO TERMICO / HEAT TREATMENT
STEEL MILL CHEMICAL ANALYSIS				0.164	1.028	0.0070	0.0010	0.181	0.067	0.109	0.016	0.000	0.150	0.002	0.000	0.004	0.000	0.370	0.033	0.000	Electric furnace - NORM. AT 900°C / cooled in still air
CARATTERISTICHE MECCANICHE				Snervamento	Rottura	Resistenza													Prova idraulica	Pig.	Visual and dimensional check
MECHANICAL PROPERTIES				Yield str.	Ten. Str.	Hardness													H.T. Test	D.T. Test	**OK**
RACCORDI SECONDO / FITTINGS IN ACC.TO				N/mm(2)	295,00	N/mm(2)	490,00	32,70	48,00	HBW	161	163	106,5	106,8	107,1	-46°C	0,00				
				ASME B16.11-2011, BS 3799-74, MSS SP-25-L.E., ASME SEC. II PART A L.E., NACE MR0175-2009/ISO 15156																	
5	450	RL-ER	15-75324	COUPLINGS 2300G SW	ASTM SA/A105N-13													RIVA ACCIAIO SPA	25292		
ANALISI CHIMICA DI ACCIAIERIA:				C%	Mn%	P%	S%	Si%	Cr%	Ni%	Mo%	Ti%	Cu%	Nb%	Co%	V%	N%	CEN%	AISI	Zn%	TRATTAMENTO TERMICO / HEAT TREATMENT
STEEL MILL CHEMICAL ANALYSIS				0.190	0.920	0.0130	0.0070	0.179	0.110	0.050	0.010	0.017	0.170	0.002	0.000	0.015	0.000	0.390	0.000	0.000	Electric furnace - NORM. AT 900°C / cooled in still air
CARATTERISTICHE MECCANICHE				Snervamento	Rottura	Resistenza													Prova idraulica	Pig.	Visual and dimensional check
MECHANICAL PROPERTIES				Yield str.	Ten. Str.	Hardness													H.T. Test	D.T. Test	**OK**
RACCORDI SECONDO / FITTINGS IN ACC.TO				N/mm(2)	324,00	N/mm(2)	514,00	32,00	26,80	HBW	152	153	49	45,5	46,8	-16°	0,00				
				ASME B16.11-2011, BS 3799-74, MSS SP-25-L.E., ASME SEC. II PART A L.E., NACE MR0175-2009/ISO 15156																	
6	125	E.M.L.	231751	90DEG ELBOWS 3/4 3000 BSPT HDG	ASTM SA/A105N-13													ACC. VENETE SPA	215805 - 318		
ANALISI CHIMICA DI ACCIAIERIA:				C%	Mn%	P%	S%	Si%	Cr%	Ni%	Mo%	Ti%	Cu%	Nb%	Co%	V%	N%	CEN%	AISI	Zn%	TRATTAMENTO TERMICO / HEAT TREATMENT
STEEL MILL CHEMICAL ANALYSIS				0.163	1.011	0.0120	0.0050	0.186	0.099	0.091	0.021	0.000	0.109	0.040	0.000	0.004	0.000	0.370	0.024	0.000	Electric furnace - NORM. AT 900°C / cooled in still air
CARATTERISTICHE MECCANICHE				Snervamento	Rottura	Resistenza													Prova idraulica	Pig.	Visual and dimensional check
MECHANICAL PROPERTIES				Yield str.	Ten. Str.	Hardness													H.T. Test	D.T. Test	**OK**
RACCORDI SECONDO / FITTINGS IN ACC.TO				N/mm(2)	365,00	N/mm(2)	512,00	33,00	69,00	HBW	157	159	102	104	103	-46°C	0,00				
				ASME B16.11-2011, BS 3799-74, MSS SP-25-L.E., ASME SEC. II PART A L.E., ASTM A1581A153M-03, DWT 10226-3, NACE MR0175-2009/ISO 15156																	

I risultati dell'analisi chimica sono la corretta trascrizione del certificato emesso dall'acciaieria.  
I risultati delle prove meccaniche sono la corretta trascrizione del certificato emesso dall'acciaieria  
che ha eseguito l'ultima trasformazione del materiale.  
Dichiaro che il prodotto fornito è conforme alle normative sopraindicate ed ai requisiti dell'ordine.  
The results of the chemical analysis are a true and correct copy of the steel mill certificate.  
The results of the mechanical tests are the correct records of the certificate issued from the company that has  
executed the last transformation of the material.  
We state that the delivered product complies with the above standards and to the order's requirements.

ENTE COLLAUDO / INSPECTOR

Certificato secondo / Certificate acc. to: EN 10204/3.1

ANNUAL BOOK ASTM SE2.1 VOL.01.01, 2014

MATERIAL MANUFACTURER APPROVED BY TÜV RHEINLAND INDUSTRIE SERVICE GMBH ACCORDING TO F.E.D. 97/3/EC

ANNEX I POINT 4.3 & AD 2000 W0.

YOUR NO: VCS3634  
OUR REF: 11969530062/56  
ITEM(S): 009  
SIGNATURE: [Signature]  
DATE: 3/12/16

LONDON FITTINGS & FLANGES LTD

QUALITY CONTROL

LAME SMI

VERIFIED

24/05/16

LAME Srl - 21049 VERAGO (VA) ITALY - Via Papa Giovanni XXIII, 1 - TEL. 0332/860001 - E-mail: info@lame.it

Page: 2/8

TRI000001362\_0026

TRI000001362/26



ITEM: 042 GE/NO: 02101757

ORDER NO: 1716420/00193/JW

CUST: LFF (NASSILION) LTD

INVOICE NOTE: 466630  
1 of 3

ArcelorMittal South Africa Limited  
Tubular Products  
273 Genl. Hertzog Rd, Peacehaven Vereeniging  
1939  
P O Box 48 Vereeniging 1930  
South Africa

Telephone  
Fax

**MATERIAL TEST CERTIFICATE**  
**SEAMLESS STEEL TUBE**  
CERTIFICATE DE RECEPTION - TUBES D'ACIER SANS Soudure  
NAHMEPRÜFZEUGNIS - NAHTLOSE STAHLROHRE

Licensed under  
API Spec SL and SCT  
SL - 0319  
SCT - 0419

ISO 9001:2008

DE-395997 QM

Test Certificate  
EN 10204/2004 TYPE 3.1

ArcelorMittal

Customer:	GLAMAL LIMITED	Customer Order/Contract No:	SGB2 152S50
Order No:	4000021453	Material No:	1000000700
Certificate Reference No:	040061910740	Cast/Heat No:	28B4610
Product:	FULLY KILLED HOT FINISHED CARBON STEEL SEAMLESS TUBES	Page Number:	1 of 3
Specification:	ISO3183:2012/API 5L2012 L245/L290/B/X42 PSL1 ASTM A106B.15/A53B.12/ A530.12 ASME SA106B.13/SAS3B.13/SA530.13		
Product Marking:	ARCELORMITTAL SA ISO3183/Spec SL-0319 MONOGRAM 02-16 ASTM/ASME A/SA106B A/SA53B 3.500 0.216 19.700 L245/B L290/X42 PSL1 SMLS TESTED 3000 psi CAST NO: 28B4610 PROD/O NO: T0142146310 NDE MADE IN SOUTH AFRICA		

**General Information**

Information Générale  
Allgemeine Information

Quantity Quantité Menge	Mass Poids Gewicht	Dimensions Dimensions / Maße			Total Length Longueur Länge
		Tube OD Diamètre Durchmesser	Thickness Épaisseur Stärke	Length Longueur Länge	
335	50,036.153(kb)	3.500 (")	0.216 (")	19.700 (ft)	6,599.500 (ft)

Steel making process Procédé de fabrication de l'acier Stahlschmelzungsverfahren	Final Rolling Operation Fin de laminage / Walzende
Electric Arc	Final hot rolling finished above 1,580°F and cooled in still air

**Chemical Composition**

		R05-(Cr+Ni+Mo+Cu+V)					R22-(V+Nb+Ti)					R24-(Nb+V)																	
Element(%)	C	Si	Mn	S	P	Cr	Ni	Mo	Cu	V	Al	Ti	Sn	Ca	Nb	CE	R05	R22	R24										
Minimum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.41	-	0.15	0.060	-	-	-	-	-	-	-	-	-	-
Maximum	0.200	-	1.30	0.030	0.030	0.50	0.50	0.150	0.500	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat	0.187	0.34	0.75	0.008	0.017	0.05	0.08	0.014	0.060	0.005	0.035	0.001	0.005	0.0013	0.0054	0.0002	0.0010	0.34	0.21	0.01	0.006	-	-	-	-	-	-	-	-
Product	0.1870	0.3400	0.7500	0.0080	0.0170	0.0500	0.0800	0.0140	0.0600	0.0050	0.0350	0.0013	0.0050	0.0013	0.0054	0.0002	0.0010	0.3351	0.2090	0.0073	0.0060	-	-	-	-	-	-	-	-
Product (ADD)	0.1870	0.3400	0.7500	0.0080	0.0170	0.0500	0.0800	0.0140	0.0600	0.0050	0.0350	0.0013	0.0050	0.0013	0.0054	0.0002	0.0010	0.3351	0.2090	0.0073	0.0060	-	-	-	-	-	-	-	-

TRI000001362\_0027

TRI000001362/27

ArcelorMittal South Africa Limited  
Tubular Products  
273 Genl. Hertzog Rd, Peacehaven Vereeniging  
1939  
P O Box 48 Vereeniging 1930  
South Africa

**MATERIAL TEST CERTIFICATE**  
**SEAMLESS STEEL TUBE**  
CERTIFICATE OF RECEPTION - TUBES D'ACIER SANS SOUDURE  
NAHMEPRÜFZEUGNIS - NAHTLOSE STAHLROHRE

Licensed under  
API Spec 5L and 5CT  
5L - 0319  
5CT - 0419  
ISO 9001:2008  
DE-355957 QM  
Test Certificate  
EN 10204:2004 TYPE 3.1

ArcelorMittal

Customer: Client Kunde	GLAMAL LIMITED	Customer Order/Contract No:	SGB2 152550
Order No: No. de commande Mital: Mital-Auftrag-Nr.	4000021453	Material No: No de matiere: Werkstoff-Nr.	1000000700
Certificate Reference No: No de certificat: Zeugnis-Nr.	040061910740	Cast/Heat No: Coulée No: Schmelz-Nr.	28B4610
Product: Produit: Produkt:	FULLY KILLED HOT FINISHED CARBON STEEL SEAMLESS TUBES	Page Number:	2 of 3
Specification: Spécification Angabe	ISO3183:2012 L245/L290/B/X42 PSL1 ASTM A106B.15/A53B.12/ A530.12 ASME SA106B.13/SA53B.13/SA530.13		
Product Marking: Légende de produit Produktkennzeichnung	ARCELORMITTAL SA ISO3183/Spec 5L-0319 MONOGRAM 02-16 ASTM/ASME A/SA106B A/SA53B 3.500 0.216 19.700 L245/B L290/X42 PSL1 SMLS TESTED 3000 psi CAST NO: 28B4610 PROD/O NO: T0142145310 NDE MADE IN SOUTH AFRICA		

**Mechanical Properties at Room Temperature 25°C (C60 # C69)**

Propriétés Mécaniques à température ambiante 25°C  
Mechanische Eigenschaften bei Raumtemperatur 25°C

Specification Spécification Angabe	UTS (Rm) Force de tension Zugfestigkeit	Yield (Re) Limit élastique Fließgrenze	% EL Allong Dehnung	% EL Allong Dehnung
Limits Limites Grenze	psi	psi	2 Inch	5.65 Sq in
Minimum	60000	42000	30.0	
Maximum	-	-	-	-
Sample (1)	71938	46412	37.0	
Sample (2)	72954	47282	39.0	
Sample (3)				
Sample (4)				
Sample (5)				
Sample (6)				
Sample (7)				
Sample (8)				
Sample (9)				
Orientation of tensile piece C02 Orientation de la pièce prélevée de tension Richtung der Zugprobe			Longitudinal, Strip	

TECHNOLOGICAL TESTS ÉPREUVES TECHNOLOGIQUES TECHNISCHE PRÜFUNGEN	
Flattening test Essai d'aplatissement Ringflachversuch	Passed
Hydrostatic D02 Hydrostatique Hydrostatisch	3000 psi for 5 Sec
Electromagnetic Insp DS9 Inspection électromagnétique Elektromagnetische Prüfung	PASS - ASTM E570 - 12.5% NOTCH
Ultrasonic inspection Inspection ultrasonique Ultraschallprüfung	UI not required
Orientation of impact test piece Orientation de la pièce prélevée Richtung des Probenteils	10 x 5 mm - longitudinal
Width of tensile piece (inch) Largeur de l'échantillon Zugstab Breite	0.75 Inch

\* Elongation to BS EN ISO 2566 table 7: 5.65 square root SO  
Elongation au BS EN ISO 2566 tableau 7: 5.65 racine carrée SO  
Verlängerung zu BS EN ISO 2566 Tabelle 7: 5.65 Quadratwurzel SO

TECHNOLOGICAL TESTS ÉPREUVES TECHNOLOGIQUES TECHNISCHE PRÜFUNGEN	
HV 22 lbs Dureté Härte	157 164 169
Impact strength (ft.lbs) Résistance au choc sur barre Kerbschlagfestigkeit	76.0 80.0 92.0 Ave. 82.7 @ 32 °F
Shear Fracture (%) C43 Rupture ductile Verf. Bruchanteil	30.0 30.0 30.0 Ave. 30.0 @ 32 °F
Impact strength (Spec) Résistance au choc sur barre Kerbschlagfestigkeit	30 ft.lbs min - long

REVIEWED

QA/QC



LONDON FITTINGS & FLANGES LTD

TRI000001362\_0028

TRI000001362/28

ArcelorMittal South Africa Limited  
Tubular Products  
273 Genl. Hertzog Rd, Peacehaven Vereeniging  
1939  
P O Box 48 Vereeniging 1930  
South Africa

Telephone  
Fax

**MATERIAL TEST CERTIFICATE**  
**SEAMLESS STEEL TUBE**  
CERTIFICATE DE RECEPTION - TUBES D'ACIER SANS SOUDURE  
NAHMEPRÜFZEUGNIS - NAHTLOSE STAHLROHRE

Licensed under  
API Spec 5L and SCT  
SL - 0319  
SCT - 0419

ISO 9001: 2008

DE-395997 GM

Test Certificate  
EN 10204/2004 TYPE 3.1

ArcelorMittal

Customer:	GLAMAL LIMITED	Customer Order/Contract No:	SGB2 152550
Client:		No de commande client:	
Kunde:		Kundenbestellungs-Nr:	
Order No:	4000021453	Material No:	1000000700
No. de commande Mitral:		No de matériel:	
Mitral-Auftrags-Nr:		Workorder-Nr:	
Certificate Reference No:	040061910740	Cast/Heat No:	28B4610
No de certificat:		Coude No:	
Zertifikat-Nr:		Schmelz-Nr:	
Product:	FULLY KILLED HOT FINISHED CARBON STEEL SEAMLESS TUBES	Page Number:	3 of 3
Produit:		Page:	
Produkt:		Blatt:	
Specification:	ISO3183:2012/API 5L:2012 L245/L290/B/X42 PSL1 ASTM A106B.15/A53B.12/ A53B.12 ASME SA106B.13/SA53B.13/SA530.13		
Specificatie:			
Angebot:			
Product Marking:	ARCELORMITTAL SA ISO3183/Spec SL-0319 MONOGRAM 02-16 ASTM/ASME A/SA106B A/SA53B 3.500 0.216 19.700 L245/B L290/X42 PSL1 SMLS TESTED		
Marquage de produit:	3000 psi CAST NO: 28B4610 PROD/O NO: T0142145310 NDE MADE IN SOUTH AFRICA		
Produktmarkierung:			

**Remarks:**

Remarque:

Bemerkung:

Material in accordance with NACE MR0175:2009/ISO15156-3:2009 and MR0103:2012. Dimensions to ANSI B36.10-2010.

The material will conform to the hot yield strength requirements as per ASME, Sect II, Part D, Table Y-1, and the general requirements of ASME, Sect II, Part A, Ed 2013

All the material conform to the visual inspection and dimensional tolerance requirements of the specification.

A suitable fine grain practice is followed in manufacturing.

La Société ArcelorMittal South Africa garantit que les produits objet du présent certificat, respectent en leur totalité les prescriptions de l'Article 15 de l'Arrêté Ministériel du 24 mars 1978 modifié.

$C \leq 0.25\%$ ,  $P \leq 0.05\%$ ,  $R \leq 700N/mm^2$ ,  $E \leq 0.9xR$

$A\% (L_0 = 5.65V_{S0}) \min. 16\%$  en long.  $R(A-2) \geq 10500$

$A\% (L_0 = 5.65V_{S0}) \min. 16\%$  en transv.  $RxA \geq 10500$

The QM System of ArcelorMittal SA meets the requirements of PED 97/23/EC, App. 1, Sect. 4.3 as certified by TUV cert 01 202 2A/Q-02 0004. All materials meet the requirements of PED 97/23/EC, App 1, Sect 7.5. Non-harmonized materials require Particular Material Appraisal. The impact strength is guaranteed to exceed 27J at 0°C

HARDSTAMPED with low stress tool: API logo, AMSA, Size, Heat number, Grade, NDE



Quality Assurance Manager: PJ Venter

Chef des services de l'assurance de qualité:

Qualitätsüberwachungsmanager:

We hereby certify that the material was manufactured, tested and inspected in and fully comply with the requirements of referenced specifications. No changes, amendments or additions may be made to this document. Any changes which are effected shall invalidate this certificate.  
Nous certifions que le matériel a été fabriqué, testé et inspecté et se conforme pleinement aux exigences des spécifications référencées. Il est interdit de modifier ou de corriger ce document ou d'y ajouter quoi que ce soit. Tout changement invalide le présent certificat.  
Wir bescheinigen hiermit, daß das Material wurde hergestellt, geprüft und inspiziert und voll mit den Anforderungen der referenzierten Spezifikationen. Diese Urkunde darf in keiner Weise geändert, abgeändert oder ergänzt werden. Jede derartige Änderung wird die Gültigkeit dieser Bescheinigung aufheben.

Date of Release: 2016.02.11

Certifié par:

Bescheinigt von:

Certified by:

Emis

Freigegeben

ITEM: 042 GR/NO: GE101757

ORDER NO: L/14420/00193/JM

CUST: LFF (HARSTAMP) LTD

ADVICE NOTE: 466638  
3 of 3

TRI000001362\_0029

TRI000001362/29



## BOTH-WELL STEEL FITTINGS CO., LTD.

NO.303, REN-SIN ROAD, REN-WU DISTRICT, KAOSIUNG CITY TAIWAN R.O.C.(81460)

TEL : [REDACTED] FAX : [REDACTED]

WEB SITE : <http://www.bothwell.com.tw> E-Mail : [box@bothwell.com.tw](mailto:box@bothwell.com.tw)



### MILL TEST & INSPECTION CERTIFICATE

ACCORDING TO EN 10204 3.1

CUSTOMER : I  
CERT NO. : 151848  
ORDER NO. : 018641

INVOICE NO. : 5200005625  
L/C NO. :

PAGE : 53  
DATE : 07/11/2015  
ORIGIN : TAIWAN

ITEM	RAW HEAT NO. HEAT NO.	QTY	DESC/GRADE OR SPECIFICATION NO. CHEMICAL COMPOSITION(%) MECHANICAL PROPERTIES.
107	331891 33988	50 PCS	RED INSERT AIDS 2"x1" 3000# S/W C:0.20 SI:0.21 MN:0.85 P:0.013 S:0.008 CD:0.15 CE:0.08 NI:0.04 MO:0.01 V:0.002 MB:0.002 N:- CE:0.37 TS(RSI):76.8 YS 0.2%(MSI):49.2 EL(%) :35.8 R.A.(%) :65.5 HARDNESS 1(RBW):143 HARDNESS 2(HBW):144

#### REMARK :

THE MATERIAL SUPPLIED IDENTIFIED AS ASTM A105N -13, ASME SA105B-2013E0

THE FITTING SUPPLIED IDENTIFIED AS MSS SP-79 - 2009

THE PRODUCT SUPPLIED WAS INSPECTED IN ACCORDANCE WITH SPECIFICATION(SURFACE & DIM) : 0000

STANDARD : CHEMICAL COMPOSITION(%) & MECHANICAL PROPERTIES.

	C	SI	Mn	P	S	Cu	Cr	NI	Mo	V	Co(Nb)
MIN	-	0.10	0.60	-	-	-	-	-	-	-	-
MAX	0.35	0.35	1.05	0.035	0.040	0.40	0.30	0.40	0.12	0.08	-
	N	Al	Ti	Zr	CE	TS(MSI)	YS	YS 0.2%(ISI)	EL(%)	R of A(%)	HARDNESS(REQ)
MIN	-	-	-	-	-	70	-	36	22	30	-
MAX	-	-	-	-	0.43	-	-	-	-	-	187

HEAT TREATMENT : NORMALIZED: 900°C(1652°F) A.C.

STEEL MAKING PROCESS : ELECTRIC FURNACE

CONFORMS TO KACE WR0175-09/ISO15156-00/WR0103-12

FULLY MILLED AND FINE GRAIN PRACTICE

YOUR NO: 153634  
OUR REF: 19095/3062/JL  
ITEM(S) 011  
SIGNATURE: [Signature] DATE: 13/12/16

WE CERTIFY THE ABOVE MENTIONED FITTINGS HAVE BEEN MANUFACTURED, SAMPLED, TESTED, AND INSPECTED IN ACCORDANCE WITH THE SPECIFICATIONS SHOWN

C.C. Huang  
Q.C. MANAGER

C.L. Ko  
INSPECTOR



BR-D0839 REV:3

