



Welding Procedure Qualification Certificate (EN ISO 15614-1)

Manufacturer's Welding Procedure Qualification Record No.: **LPS-WP-P1** Examining body Reference No: **HUL1700004 / 002**

Manufacturer: **Linmar Pipework Limited**
Address: **Baltic Works, Effingham Road, Sheffield**
Welders Name: **Mr. Mark Crossley**

Code/Testing Standard: **BS EN ISO 15614 : 2004 + A2 : 2012**
Date of Welding: **11 January 2017**

Range of Qualification

Welding Process(es):	111 - Manual Metallic Arc Welding (MMA)
Type of joint and weld:	Pipe and Plate Butt Weld (BW) and Fillet Weld (FW)
Parent material group(s) and sub-group(s):	ISO : 15608 : 2013 : Group 1.1
Parent Material Thickness (mm):	BW: 3.0mm to 19.04mm, FW : 4.76mm to 19.04mm
Weld Metal Thickness (mm):	BW: 3.0mm to 19.04mm
Throat Thickness (mm)	No Restriction
Single Run/Multi Run	Multi
Outside Pipe Diameter (mm):	70.65mm and above
Filler Material Designation:	EN ISO 2560-A : E 42 4 B 42 H5
Filler Material Make:	Any name of consumable that meets the designation above
Filler Material Size:	Any filler size compliant with stated heat input range
Designation of Shielding Gas/Flux:	Basic hydrogen controlled
Designation of Backing Gas:	Not Applicable
Type of Welding Current and Polarity:	DCEP
Mode of Metal Transfer:	Not Applicable
Heat Input:	0.84 to 1.35 - 25%
Welding Positions:	All except PG and J-L045
Preheat Temperature:	5° C Minimum
Interpass Temperature:	200° C Maximum
Post-Heating:	Not Applicable
Post-Weld Heat Treatment and/or Ageing:	Not Applicable

Other Information

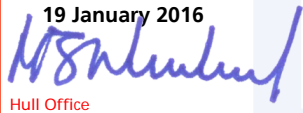
Material Cast/Heat Number: 2643, Consumable Lot Numbers : SFQ43158 2.5mm Ø & SFQ21118 3.2mm Ø

Certified that test welds were prepared, welded and tested satisfactorily in accordance with the requirements of the code/testing standard indicated above.

Location: **Workshop**

Date of Issue: **19 January 2016**

Surveyor


Hull Office
Lloyd's Register EMEA

Mr M. J. Woodward

Surveyor to Lloyd's Register EMEA

A subsidiary of Lloyd's Register Group Limited

Examining Body **Lloyd's Register EMEA**

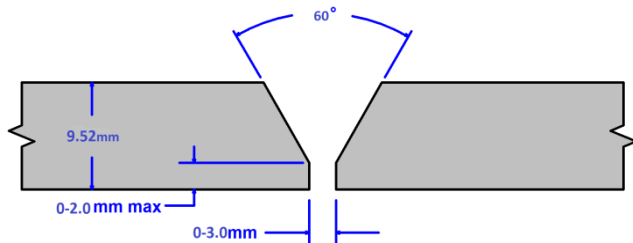
Lloyd's Register Group Limited, its affiliates and subsidiaries and their respective officers, employees or agents are, individually and collectively, referred to in this clause as 'Lloyd's Register'. Lloyd's Register assumes no responsibility and shall not be liable to any person for any loss, damage or expense caused by reliance on the information or advice in this document or howsoever provided, unless that person has signed a contract with the relevant Lloyd's Register entity for the provision of this information or advice and in that case any responsibility or liability is exclusively on the terms and conditions set out in that contract.

Details of Test Weld

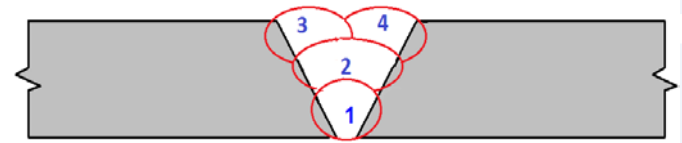
Manufacturer's provisional Welding Procedure Specification Reference No.	LPS-WP-P1	Examining Body: Reference No:	HUL1700004/ 002
Manufacturer's Welding Procedure Qualification Record No.:	LPS-WP-P1	Date of Welding:	11 January 2017
Manufacturer:	Linmar Pipework Limited	Location:	Baltic Works, Effingham Road, Sheffield
Welder's Name:	Mr. Mark Crossley	Method of Preparation and Cleaning:	Machine cut and grind, remove all surface contamination either side of joint.
Mode of Metal Transfer:	Not Applicable	Parent Material Specification: (attach material certificates)*	API 5L PSL1 (ASTM A106/A53) Grade B
Joint Type and Weld:	Butt Weld (ss gb)	Parent Material Thickness (mm):	9.52mm
Test Piece/Welding Position:	HL 045	Outside Pipe Diameter (mm):	Not Applicable

Weld Preparation Details (Sketch)

Joint Design




Welding Sequences



Welding Details

Run	Process	Size of Filler Metal	Current A	Voltage V	Type current Polarity	Wire Feed m/min	Travel Speed mm/min	Heat Input kJ/mm	Metal Transfer
1	111	2.5mm	84-87	22-25	DCEP	N/A	105.5	0.84-0.99	N/A
2	111	2.5mm	97-100	23-25	DCEP	N/A	93.6	1.14-1.28	N/A
3	111	3.2mm	117-120	23-26	DCEP	N/A	110.7	1.17-1.35	N/A
4	111	3.2mm	117-120	23-26	DCEP	N/A	119.2	1.08-1.26	N/A

Filler Material:

Type, Designation, Trade Name:	111 : Basic Coated : EN ISO 2560-A : E 42 B 42 H5 : ESAB OK 48.00	Other Information*:	
Any Special Baking or Drying:	As specified by the manufacturer	Remove all slag between each weld run.	
Gas/Flux:	Shielding Not Applicable	Wire brush between each weld run, Grind all stop/starts.	
	Backing Not Applicable		
Gas Flow Rate :	Shielding Not Applicable		
	Backing Not Applicable	Post-Weld Heat Treatment and/or Ageing	Not Applicable
Tungsten Electrode – Type/Size:	Not Applicable	Time, Temperature, Method:	Not Applicable
Details of Back Gouging/Backing:	Not Applicable	Heating and Cooling Rates:	Not Applicable
Preheat Temperature:	5° C minimum		
Interpass Temperature:	200° C maximum		
Post-Heating:	Not Applicable		
Manufacturer's Name	Linmar Pipework Limited	Surveyor	
Manufacturer's Signature			Hull Office Lloyd's Register EMEA

Mr M. J. Woodward
Surveyor to Lloyd's Register EMEA

A subsidiary of Lloyd's Register Group Limited
Lloyd's Register EMEA

Date: **19 January 2016**

Examining Body

* As Required

Test Results

Manufacturer's Welding Procedure Qualification Record No.: **LPS-WP-P1** Examining Body: **HUL1700004 / 002**
 Reference No:
 Visual Examination: **Acceptable** Radiography*: **Acceptable**
 Penetrant/Magnetic Particle Test*: **Acceptable** Ultrasonic Examination*: **Not Applicable**
 Coloration Assessment**: **Not Applicable**

Tensile Tests*

Type/No	Re N/mm ²	Rm N/mm ²	A% on	Z%	Fracture Location	Temperature:	Remarks
Requirements		414 Min					
Transverse 1	-	416	-	-	Parent Break	21° C	Acceptable
Transverse 2	-	432	-	-	Parent Break	21° C	Acceptable

Bend Tests*

Type/No	Bend Angle	Former Diameter	Elongation*	Result
Root Bend 1	180	40mm	-	Acceptable
Root Bend 1	180	40mm	-	Acceptable
Face Bend 1	180	40mm	-	Acceptable
Face Bend 1	180	40mm	-	Acceptable

Macroscopic Examination: **1 off Acceptable (143455M1)**
 Microscopic Examination: **Not Applicable**

Impact Tests* Type: **Not Applicable** Size: Requirement:

Notch Location/Direction	Temp °C	Values (J)			Average (J)	Remarks
		1	2	3		

Hardness Tests* Other Tests:

Type/Load: **Not Applicable** **None**
 Values - Parent Metal: **123-133**
 - H.A.Z.: **147-172** Remarks
 - Weld Metal: **180-201** **None**

Location of Measurements (Sketch)* see attached

Tests carried out in accordance with the requirements of: **BS EN ISO 15614 : 2004 + A2 2012**
 Laboratory Report Reference No: **143455, 143456, 143457, 17126715, 17126462,**

Test Results were **acceptable**

Test carried out in the presence of: **Lloyd's Register EMEA**

Surveyor 
 Hull Office
 Lloyd's Register EMEA

Mr M. J. Woodward ERT101.2014.05 CERT
 Surveyor to Lloyd's Register EMEA
 A subsidiary of Lloyd's Register Group Limited
 Examining Body **Lloyd's Register EMEA**

* As Required
 ** 15614-5 only