

WELDING PROCEDURE QUALIFICATION RECORD (PQR)

Qualification: Codes/Standards
BS EN 288-3: 92

Date of issue 29 May 2001
LR Office PIRAEUS
PQR certificate number PIR 0107457/15/A1

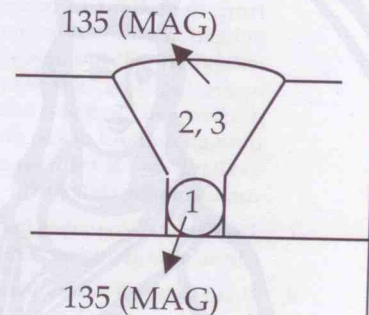
p WPS* number and revision 135 Rev. 0	Date of welding 11 April 2001
Test place/location shop/site CHALKIS SHIPYARDS, VATHI	
RANGE OF APPROVAL	
Welding process(es) 135 (MAG)	Single pass/multipass MULTIPASS
Joint type(s) BUTT & FILLET	Parent metal group(s) GROUP W01
Plate thickness range 3.0<t<24.0 mm	Pipe outside diameter range > 500 mm
Filler metal type/designation ER 70 S-6, 5.18	Heat treatment -
Gas/flux 82% ARGON, 18% CO2	Type of welding current DC
Welding positions ALL	Progression (up/down) UPHILL
WELD AND FILLER METAL DETAILS	
Parent Materials LRS GRADE A	Test piece position PF
Welding process 135 (MAG)	Joint type BUTT, SINGLE VEE
Filler material AWS: ER 70 S-6, SFA: 5.18	Shielding gas/flux flow rate -
Make/type/diameter BOHLER, EMK 6/S	Gas composition 82% ARGON, 18% CO2
Composition -	Flux type -
Other information -	
Preheat and interpass temperature (method) and control PREHEAT AMBIENT: MIN 10 °C	
Postweld heat treatment temperature (method) and control N/A	

Manufacturer's name and address
**CHALKIS SHIPYARDS
VATHI, AVLIDAS
34100 EVIA
GREECE**

Test joint details (sketch with dimensions) of weld preparation

**BUTT SINGLE VEE
ROOT FACE 1.5 mm
ROOT GAP 3.0 mm
BEVEL ANGLE 60°
THICKNESS 12.0 mm**

Bead sequence detail (sketch to include weld metal thickness and back gouging where applicable)



PROCEDURE DETAIL

RUN NUMBER	PROCESS	SIZE OF FILLER MATERIAL	CURRENT A	VOLTAGE V	AC/DC POLARITY	WIRE FEED/ TRAVEL SPEED	HEAT INPUT kJ/mm
1	111	1.2 mm	100-110	20 - 22	DC RP	-	-
2, 3	111	1.2 mm	110-130	20 - 22	DC RP	-	-

Date 30 May 2001	Welder's name LATHOURAS VASILIOS	WPQ certificate number PIR 0107457/11/A1
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*Manufacturer's Preliminary Welding Procedure Specification

Date of issue 29 May 2001
LR Office PIRAEUS
PQR certificate number PIR 0107457/15/A1

TEST RESULTS

NON-DESTRUCTIVE EXAMINATION (STATE 'ACCEPTABLE', 'UNACCEPTABLE' OR 'NONE')

Visual Acceptable	Magnetic particle None	Liquid penetrant None	Radiography Acceptable	Ultrasonics
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DESTRUCTIVE TESTS

TEST	TENSILE	YIELD	% ELONGATION	% REDUCTION OF AREA	FRACTURE	TEST
Units	N/mm ²					
Transverse tensile	493.4/541.2				B.M.	24 °C
All-weld tensile	NONE					

BEND TESTS

ORIENTATION	FORMER DIAMETER	RESULTS	FILLET WELD FRACTURE (RESULTS)
Root/face/side	50 mm	ACCEPTABLE	1.
Root/face/side	50 mm	ACCEPTABLE	2.
Root/face/side	50 mm	ACCEPTABLE	3.
Root/face/side	50 mm	ACCEPTABLE	Macro examination ACCEPTABLE
Longitudinal			

IMPACT TESTS

RUN NUMBER	NOTCH LOCATION/ ORIENTATION	TEMP °C	VALUES (J)			AVERAGE (J)	REMARKS
			1	2	3		
Requirement							
Size							
Type							
Retest							

HARDNESS SURVEY

Type	Load	Location of hardness measurements (sketch)
	HARDNESS RANGE	
Parent Material		
H.A.Z.		
Weld		

Additional test(s) and result(s), eg. chemical analysis, micro examination, ferrite measurement

We certify that the foregoing statements are correct and the test welds were prepared, welded and tested in accordance with the specified Codes or Standards

Signature - Manufacturer 	Name in BLOCK CAPITALS CHALKIS SHIPYARDS S.A.	Date 30 May 2001
Signature - Surveyor to Lloyd's Register 	Name in BLOCK CAPITALS P. KAMARADOS	Date 30 May 2001

TEST RESULTS

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Manufacturer's Welding Procedure **111 Rev. 0**
Reference No: -

Inspecting Authority: **LR Piraeus**
Reference No: **PIR 0307354/16**

Visual Examination: **Acceptable**
Penetrant/Magnetic Particle Test*: **Acceptable**

Radiography*: **Acceptable**
Ultrasonic Examination*: **N/A**

TENSILE TESTS

Temperature: **Ambient**

Type/No	Re N/mm ²	Rm N/mm ²	A% on	Z%	Fracture Location	Remarks
Requirement	-	400-520	-	-		
Transverse 1	-	487.5	-	-	Parent Metal	Acceptable
Transverse 2	-	494.2	-	-	Parent Metal	Acceptable

BEND TESTS

Former Diameter: **4t**

Type/No	Bend Angle	Elongation*	Result
Face 1	> 120°	N/A	Acceptable
Face 2	> 120°	N/A	Acceptable
Root 1	> 120°	N/A	Acceptable
Root 2	> 120°	N/A	Acceptable

Fillet Fracture Test*:
N/A

Macro/Micro Examination*:
Acceptable

IMPACT TESTS*

Type: **V-Notch**

Size: **10x10x55mm**

Requirement: **-**

Notch Location/Direction	Temp °C	Values			Average	Remarks
		1	2	3		
Weld	- 20 °C	165	105	110	127	Acceptable
HAZ	- 20 °C	170	193	203	189	Acceptable

HARDNESS TESTS*

Location of Measurements (Sketch)*

Type/Load: **Vickers (HV 10)**
Values - Parent Metal: **170 - 175**
- H.A.Z.: **215 - 235**
- Weld Metal: **200 - 215**

OTHER TESTS


None

REMARKS

Spectrumlabs Reports No. 030416-1/2, 030602-1 & 0300602-2

Tests carried out in accordance with the requirements of: **BS EN 288-3:92/A1:97**
Laboratory Report Reference No: **Refer to "REMARKS"**
Test Results were acceptable/~~not acceptable~~ (Delete as appropriate)

Tests carried out
in the presence of:
P. MINTZARIDIS


Lloyd's Register
Name and Signature of Surveyor
P. MINTZARIDIS
Inspecting Authority
(CEOC Member Organisation)
Lloyd's Register of Shipping

Übersetzung des gedruckten Textes
auf der zweiten Seite

Translation of printed text
on the second page

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sur la deuxième page

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4 Beleg-Nr.: / Prüf-Nr.:	Inspecting Authority	Organisme de contrôle	4
5 Sichtprüfung:	4 Reference No:	4 No de référence: / No de référence:	4
Durchstrahlungsprüfung*:	5 Visual Examination:	5 Examen visuel:	5
6 Farbeindring- / Magnetpulverprüfung*:	5 Radiography*:	Radiographie*:	5
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22 Die Prüfungen wurden ausgeführt in Übereinstimmung mit den Anforderungen des:	21 REMARKS:	21 REMARQUES:	21
	22 Test carried out in accordance with the requirements of:	22 Les essais ont été effectués en conformité avec les exigences de:	22
23 Laborbericht Nr.:	23 Laboratory Report Reference No:	23 No de référence du rapport du laboratoire:	23
24 Die Prüfergebnisse sind zufriedenstellend / nicht zufriedenstellend (Nicht Zutreffendes streichen)	24 Test results were acceptable / not acceptable (Delete as appropriate)	24 Les résultats des essais sont acceptables / non acceptables (Rayer la mention inutile)	24
25 Die Prüfungen wurden ausgeführt in Anwesenheit von:	25 Test carried out in the presence of:	25 Les essais ont été effectués en présence de:	25
Name und Unterschrift	Name and Signature of Surveyor	Nom et signature	26
26 Prüfstelle	26 Inspecting Authority	26 Organisme de Contrôle	26
27 (CEOC Mitglieds-Organisation)	27 (CEOC Member Organisation)	27 (Organisation Membre de la CEOC)	27
*) falls gefordert	*) if required	*) si nécessaire	*)

WELDING PROCEDURE QUALIFICATION RECORD (PQR)

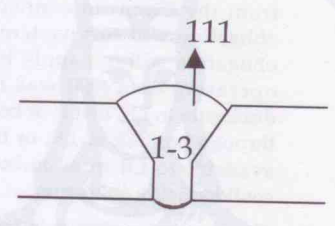
Qualification: Codes/Standards
BS EN 288-3 : 92

Date of issue 22 June 2001
LR Office PIRAEUS
PQR certificate number PIR 0107457/10

Manufacturer's name and address CHALKIS SHIPYARDS S.A. VATHI, AVLIDAS 34100 EVIA GREECE

Test joint details (sketch with dimensions) of weld preparation BUTT SINGLE VEE ROOT GAP 3.0 mm ROOT FACE 1.5 mm BEVEL ANGLE 60° THICKNESS 12.0 mm
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Bead sequence detail (sketch to include weld metal thickness and back gouging where applicable)



p WPS* number and revision	Date of welding 11 April 2001
Test place/location shop/site CHALKIS SHIPYARDS, VATHI	
RANGE OF APPROVAL	
Welding process(es) 111 (MAW)	Single pass/multipass MULTIPASS
Joint type(s) BUTT, SINGLE -VEE	Parent metal group(s) GROUP W01
Plate thickness range 3.0<t<24.0 mm	Pipe outside diameter range > 500 mm
Filler metal type/designation SFA 5.1, AWS:E-7018, B	Heat treatment N.A.
Gas/flux -	Type of welding current DC
Welding positions ALL	Progression (up/down) UPHILL
WELD AND FILLER METAL DETAILS	
Parent Materials LRS GRADE A	Test piece position PF
Welding process 111	Joint type BUTT, SINGLE VEE
Filler material E 7018	Shielding gas/flux flow rate -
Make/type/diameter BOHLER, ESAB, 48.00, E 7018	Gas composition -
Composition -	Flux type -
Other information WELDED BOTH SIDES WITH BACK GAUGING	
Preheat and interpass temperature (method) and control PREHEAT AMBIENT, 10°C MIN	
Postweld heat treatment temperature (method) and control N.A.	

PROCEDURE DETAIL

RUN NUMBER	PROCESS	SIZE OF FILLER MATERIAL	CURRENT A	VOLTAGE V	AC/DC POLARITY	WIRE FEED/ TRAVEL SPEED	HEAT INPUT kJ/mm
1	111	2.5 mm	80-90	60	DC RP	-	-
2	111	3.25 mm	110-120	60	DC RP	-	-
3	111	3.25 mm	120-130	60	DC RP	-	-

Date 15 May 2001	Welder's name STAMATOUKOS LAMBROS	WPQ certificate number PIR 0107457/2
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*Manufacturer's Preliminary Welding Procedure Specification

Date of issue 22 June 2001
LR Office PIRAEUS
PQR certificate number PIR 0107457/10

TEST RESULTS

NON-DESTRUCTIVE EXAMINATION (STATE 'ACCEPTABLE', 'UNACCEPTABLE' OR 'NONE')

Visual Acceptable	Magnetic particle None	Liquid penetrant None	Radiography Acceptable	Ultrasonics None
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DESTRUCTIVE TESTS

TEST	TENSILE	YIELD	% ELONGATION	% REDUCTION OF AREA	FRACTURE	TEST
Units	N/mm ²					
Transverse tensile	508.2/506.8				B.M.	24.0 °C
All-weld tensile	-					

BEND TESTS

ORIENTATION	FORMER DIAMETER	RESULTS	FILLET WELD FRACTURE (RESULTS)
Root/face/side	50 mm	ACCEPTABLE	1.
Root/face/side	50 mm	ACCEPTABLE	2.
Root/face/side	50 mm	ACCEPTABLE	3.
Root/face/side	50 mm	ACCEPTABLE	Macro examination ACCEPTABLE
Longitudinal	NONE		

IMPACT TESTS

RUN NUMBER	NOTCH LOCATION/ ORIENTATION	TEMP °C	VALUES (J)			AVERAGE (J)	REMARKS
			1	2	3		
Requirement							
Size							
Type							
Retest							

HARDNESS SURVEY

Type	Load	Location of hardness measurements (sketch)
HARDNESS RANGE		
Parent Material		
H.A.Z.		
Weld		

Additional test(s) and result(s), eg. chemical analysis, micro examination, ferrite measurement

We certify that the foregoing statements are correct and the test welds were prepared, welded and tested in accordance with the specified Codes or Standards

Signature - Manufacturer	Name in BLOCK CAPITALS CHALKIS SHIPYARDS S.A.	Date 22 June 2001
Signature - Surveyor to Lloyd's Register <i>P.P. Kamarados</i>	Name in BLOCK CAPITALS P. KAMARADOS	Date 22 June 2001