RINA

ACCREDIA
L'ENTE ITALIANO DI ACCREDITAMENTO

SGQ N° 002 A SSI N° 001 G
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PRD N° 002 B PRS N° 066 C
SCR N° 003 F LAB N° 0832

Signatory of EA, IAF and ILAC Mutual Recognition Agreements

WELDING PROCEDURE QUALIFICATION RECORD (WPQR)

N. 12FI0136PO1/A

Manufacturer **L.A.F.A.P. SRL – MONTEFALCO (PG)**

WPQR No. **LAFFW/2012-A1** Dated **23/7/2012**

Manufacturer's welding procedure (WPS) No. **LAFFW/2012** Dated **29/6/2012**

RANGE OF APPROVAL

Welding process	**135**	Type	**Partly mechanized**
Joint type	**Plates and Pipes FW**		
Single/Multiple pass	**Multiple**		
Parent material group(s)	**1 to 1**	ISO/TR 15608	
	with a specified minimum yield strength ≤ 355 MPa		
Parent material thickness (mm)	Butt Joint = **N.A.**	Fillet Joint t_1 **5 to 20**	t_2 **5 to 20**
Throat thickness (mm)	**No restriction**		
Weld deposit thickness (mm)	**N.A.**		
Outside diameter (mm)	**over 150 (PA - PB); over 500 (all other qualified positions)**		
Filler metal type	**Solid wire EN ISO 14341-A: G4Si1**		
Shielding gas (ISO 14175)	**M21 with max. CO2 % = 19,7**	Backing gas (ISO 14175)	**N.A.**
Type of welding current	**DCEP**	Heat input kJ/cm	**Min. 6**
Welding position	**All positions (vertical down excluded)**		
Preheat min. (°C)	**20**	Interpass temp. Max. (°C)	**200**
Post weld heat treatment / Ageing	**None**		
Other information	-		

Welders name **FLAMINI CLAUDIO** Stamp No. **FC**

Welding test conducted by **L.A.F.A.P. SRL – MONTEFALCO (PG)**

Mechanical test conducted by **TECNOLAB Rina - IIS S.r.l.** Laboratory test No. **478 dated 23/7/2012**

At presence of RINA Surveyor **Mauro Arecco**

We certify that statements in this certificate are correct and that the test welds were prepared, welded and tested in accordance with the requirements of **UNI EN ISO 15614-1: 2012** Standard

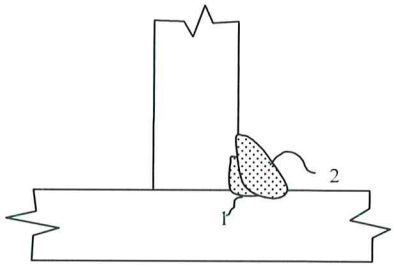
Issued at: Genova on 07 August 2012

RINA Services S.p.A.

JOINT DETAILS AND WELDING SEQUENCES

PLATE TO PLATE; FILLET WELD IN MULTIPASS

Pass No.	Process	Filler metal diam. (mm)	Filler metal classification	Amps	Volt	Travel speed (cm/min)	Heat input (kJ/cm)	Other
1	135	1,2	G4Si1	240	25	36	8	--
2	135	1,2	G4Si1	240	25	24,3	11,8	--



PARENT MATERIAL

Material specification	**EN 10025-2**		
Type or grade	**S355J2**		
Group(s)/Subgroup(s) No. (ISO/TR 15608)	**1.2**		
Thickness (mm)	**t_1= t_2=10**	Throat thickness (mm)	**6,5**
Diameter (mm)	**N.A.**		
Branch connection angle	**N.A.**		
Other	-		

WELDING CONSUMABLES

Process	**135**
Trade name(s)	**LAFILI LA/S6HC**
Specification	**EN ISO 14341-A**
Classification / designation	**G4Si1**
Size (mm)	**1,2**
Deposited metal thickness	
Groove	**N.A.**
Throat	**6,5 mm**
Flux trade name	**N.A.**
Consumable insert	**N.A.**
Other	-

GAS

	Gas	Mixture	Flow rate (l/min.)
Shielding	-	**82%Ar+18%CO2**	**14**
Trailing	-	-	-
Backing	-	-	-

POSITION

Welding position **PB**

Other -

PREHEAT

Preheat temperature **20 °C**

Interpass temperature **200°C**

Other -

POSTWELD HEAT TREATMENT

Temperature **None**

Time **N.A.**

Other -

ELECTRICAL CHARACTERISTICS

Current **DCEP**

Ampere (range) **See table** Volts (Range) **See table**

Mode of metal transfer **Spray arc**

Tungsten electrode size and type **N.A.**

Other -

TECHNIQUE

Travel speed (range) **See table**

String or weave bead **String**

Oscillation (*) **N.A.**

Method of groove/edge preparation **Grinding**

Interpass cleaning **Brushing, grinding**

Method of back gouging **N.A.**

Orifice or gas cup size **19 mm**

Stand off distance (*) **N.A.**

Multiple or single pass **Multiple**

Multiple or single electrodes **Single**

Torch angle (*) **N.A.**

Other (*) for fully mechanized/robotic only

HARDNESS TEST		
Location	Type/load	Maximum value
Parent metal(s)	**HV10**	**188**
H.A.Z.(s)	**HV10**	**241**
Weld metal	**HV10**	**204**

OTHER TEST

MACROGRAPHIC EXAMINATION	**Acceptable**
MICROGRAPHIC EXAMINATION	**Not required**

NON DESTRUCTIVE EXAMINATION

VISUAL EXAMINATION	**Acceptable**
RADIOGRAPHIC EXAMINATION	**Not required**
PENETRANT TEST	**Not required**
MAGNETIC PARTICLE	**Acceptable**
ULTRASONIC TEST	**Not required**

Issued at: Genova on 07 August 2012

RINA Services S.p.A.

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WELDING PROCEDURE QUALIFICATION RECORD (WPQR)

N. 12FI0136PO2/A

Manufacturer **L.A.F.A.P. SRL – MONTEFALCO (PG)**

WPQR No. **LAFFW/2012-A2** Dated **29/6/2012**

Manufacturer's welding procedure (WPS) No. **LAFFW/2012** Dated **23/7/2012**

RANGE OF APPROVAL

Welding process	**135**	Type	**Partly mechanized**
Joint type	**Plates and Pipes FW**		
Single/Multiple pass	**Multiple**		
Parent material group(s)	**1 to 1** ISO/TR 15608 with a specified minimum yield strength ≤ 355 MPa		
Parent material thickness (mm)	Butt Joint = **N.A.**	Fillet Joint t_1 **10 to 40**	t_2 **10 to 40**
Throat thickness (mm)	**No restriction**		
Weld deposit thickness (mm)	**N.A.**		
Outside diameter (mm)	**over 150 (PA - PB); over 500 (all other qualified positions)**		
Filler metal type	**Solid wire EN ISO 14341-A: G4Si1**		
Shielding gas (ISO 14175)	**M21 with max. CO2 % = 19,7**	Backing gas (ISO 14175)	**N.A.**
Type of welding current	**DCEP**	Heat input kJ/cm	**Min. 8,48**
Welding position	**All positions (vertical down excluded)**		
Preheat min. (°C)	**20**	Interpass temp. Max. (°C)	**200**
Post weld heat treatment / Ageing	**None**		
Other information	-		

Welders name **FLAMINI CLAUDIO** Stamp No. **FC**

Welding test conducted by **L.A.F.A.P. SRL – MONTEFALCO (PG)**

Mechanical test conducted by **TECNOLAB Rina - IIS S.r.l.** Laboratory test No. **479 dated 23/7/2012**

At presence of RINA Surveyor **Mauro Arecco**

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Issued at: Genova on 07 August 2012

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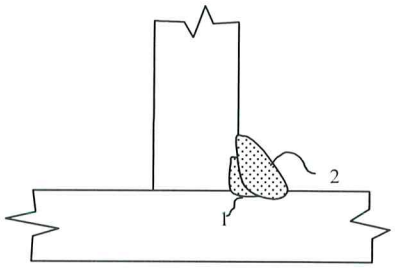
JOINT DETAILS AND WELDING SEQUENCES

PLATE TO PLATE; FILLET WELD IN MULTIPASS

Pass No.	Process	Filler metal diam. (mm)	Filler metal classification	Amps	Volt	Travel speed (cm/min)	Heat input (kJ/cm)	Other
1	135	1,2	G4Si1	243	25	25,7	11,3	--
2	135	1,2	G4Si1	243	25	18,9	15,4	--



PARENT MATERIAL

Material specification	**EN 10025-2**		
Type or grade	**S355J2**		
Group(s)/Subgroup(s) No. (ISO/TR 15608)	**1.2**		
Thickness (mm)	**t_1= t_2=20**	Throat thickness (mm)	**8**
Diameter (mm)	**N.A.**		
Branch connection angle	**N.A.**		
Other	**-**		

WELDING CONSUMABLES

Process	**135**
Trade name(s)	**LAFILI LA/S6HC**
Specification	**EN ISO 14341-A**
Classification / designation	**G4Si1**
Size (mm)	**1,2**
Deposited metal thickness	
Groove	**N.A.**
Throat	**8 mm**
Flux trade name	**N.A.**
Consumable insert	**N.A.**
Other	**-**

GAS

	Gas	Mixture	Flow rate (l/min.)
Shielding	-	**82%Ar+18%CO2**	**14**
Trailing	-	-	-
Backing	-	-	-

POSITION

Welding position **PB**

Other -

PREHEAT

Preheat temperature **20 °C**

Interpass temperature **200°C**

Other -

POSTWELD HEAT TREATMENT

Temperature **None**

Time **N.A.**

Other -

ELECTRICAL CHARACTERISTICS

Current **DCEP**

Ampere (range) **See table** Volts (Range) **See table**

Mode of metal transfer **Spray arc**

Tungsten electrode size and type **N.A.**

Other -

TECHNIQUE

Travel speed (range) **See table**

String or weave bead **String**

Oscillation (*) **N.A.**

Method of groove/edge preparation **Grinding**

Interpass cleaning **Brushing, grinding**

Method of back gouging **N.A.**

Orifice or gas cup size **19 mm**

Stand off distance (*) **N.A.**

Multiple or single pass **Multiple**

Multiple or single electrodes **Single**

Torch angle (*) **N.A.**

Other (*) for fully mechanized/robotic only

HARDNESS TEST		
Location	Type/load	Maximum value
Parent metal(s)	**HV10**	**168**
H.A.Z.(s)	**HV10**	**238**
Weld metal	**HV10**	**225**

OTHER TEST

MACROGRAPHIC EXAMINATION	**Acceptable**
MICROGRAPHIC EXAMINATION	**Not required**

NON DESTRUCTIVE EXAMINATION

VISUAL EXAMINATION	**Acceptable**
RADIOGRAPHIC EXAMINATION	**Not required**
PENETRANT TEST	**Not required**
MAGNETIC PARTICLE	**Acceptable**
ULTRASONIC TEST	**Not required**

Issued at: Genova

on 07 August 2012

RINA Services S.p.A.