



**BUREAU
VERITAS**



PRD N° 009B

Membro degli Accordi di Mutuo Riconoscimento EA, IAF e ILAC
Signatory of EA, IAF and ILAC mutual Recognition Agreements

WELDING PROCEDURE QUALIFICATION RECORD

N° QP-ITA-23-00976 Rev.0

LEVEL

2

Manufacturer's WPQR no 04-2023

Manufacturer B.M.S. s.r.l. Building And Mechanical Solution SpA

Address Zona Industriale Macchiareddu 9° Strada 09010 Uta (CA)
Italy

Date of welding 30 May 2023

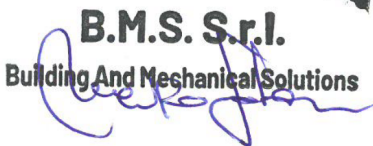
Reference standard UNI EN ISO 15614-1 Ed. 2019

Code/ Standard Supplem./Client Req PED 2014/68/EU

Certificate issued by / Authorized Inspector Mr. Giancarlo Erbi

BUREAU VERITAS ITALIA SpA

Certifies that test pieces were prepared, welded and tested satisfactorily in accordance with the requirements of the documents indicated above.
Permanent Joining Procedure Qualification Record respect the Essential Safety Requirements stated by PED Directive Appendix I- § 3.1.2. Test performed are equivalent to harmonized standard published in the Official journal of the European Union

EXAMINATION BODY	MANUFACTURER
Name, date and signature of authorized representant Mr. Giancarlo Erbi 17 Oct 2023 Stamp  	Name, date and signature of representant B.M.S. S.r.l. Building And Mechanical Solutions 

Revision No:

Reason of revision :

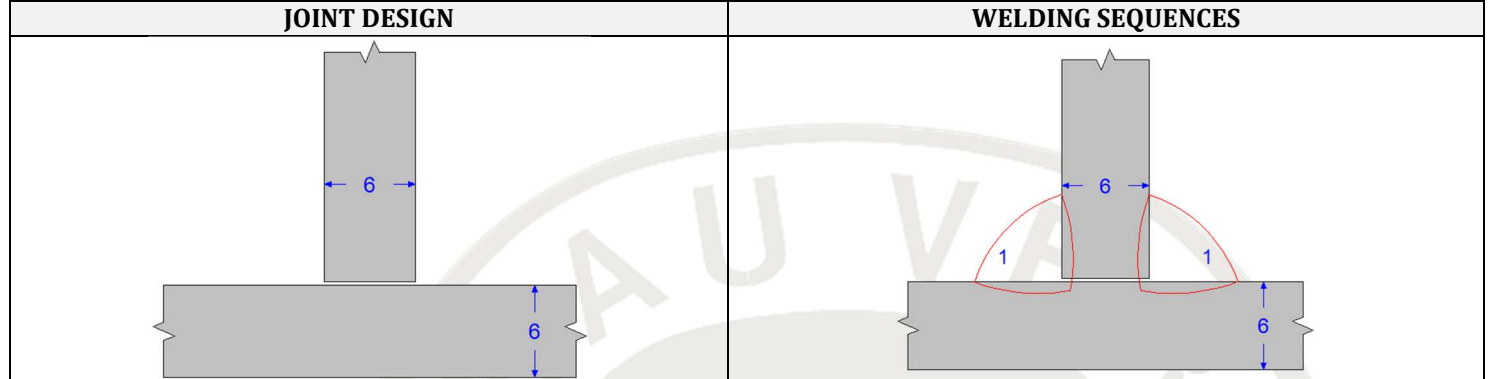
Other identification (if necessary)

: 23.SF.5436792.783 - R53440/23/GE/ge

Organization Name	B.M.S. s.r.l.			pWPS No.	04-2023
Mfr Procedure Qualification Record No.				Date	30.05.2023
Welders and/or welding operators :	Puddu Simone 7 (Pos. PB)				
Welding Process(es)	A) 136	B)		C)	
Types (Manual, Autom., Partly Mechanized)	A) Partial Mechanised	B)		C)	

WELDING PERFORMED WITNESSED BY :

PREPARATION			PARENT MATERIAL		
Joint type	FILLET JOINT		Parent material grade	S355J2+2	S355J2+2
Backing (only for BW)	Yes ☐	No ☒	Material Standard	EN 10025-5	EN 10025-5
Permanent backing Group	N.A.		Group / Subgroup	1.2	1.2
Gouging or grinding	N.A.		Thickness (mm)	30	30
Preparation and cleaning	Machining tool & brushing and degreasing		Outside diameter (mm)		



Note	WELDING POSITION: PB (EN ISO 6947)						Note	
Bevels	Angle	//	Root gap	//	Root face	//	Tack weld	136

Buttering information (if performed)

FILLER METALS			HEAT		
	A)	B)	Preheat temperature	≥ 20	°C
Filler Metal trade make	VOESTALPINE BOHLER DIAMONDSARK 46 RC	N.A.	Interpass temperature	≤ 250	°C
Filler Metal standard	EN ISO 17632: T463PM211H5 AWS A5.20:E71T-1M	N.A.	Postheat temp and time	N.A.	°C
Filler Metal designation	N.A.	N.A.	POST WELD HEAT TREATMENT		
F-No. (Only for level 1)	N.A.	N.A.			
A-No. (Only for level 1)	N.A.	N.A.			
Flux trade make	N.A.	N.A.			
Flux designation	N.A.	N.A.			
Weld Metal deposit	N.A.	N.A.	Holding temp.	N.A.	°C
Flux batch (recrushed slag)	N.A.	N.A.	Holding time	N.A.	min.
Tungsten electr. (type & Ø)	N.A.	N.A.	Heating rate	N.A.	°C/h
Other	N.A.	N.A.	Cooling rate	N.A.	°C/h
			Other info	N.A.	

GAS			TECHNIQUE		
	A)	B)	Weaving (max width of run)		
Shielding gas type %	Ar 80% - CO ₂ 20%	N.A.	Oscillation amplitude	N.A.	
Designation (EN ISO 14175)	M21	N.A.	Oscillat. frequ. - dwell time	N.A.	
flow rate l/min	10÷16	N.A.	Single or Multiple Electr.	Single	
Backing gas type %	N.A.	N.A.	Pulse welding details	N.A.	
Designation (EN ISO 14175)	N.A.	N.A.	Dist. cont. tube/work piece	10 ÷ 20	
flow rate l/min	N.A.	N.A.	Plasma welding details	N.A.	
Plasma gas type %	N.A.	N.A.	Torch angle °	N.A.	
Designation (EN ISO 14175)	N.A.	N.A.	Other		
flow rate l/min	N.A.	N.A.			

Run	Proc	Transfert Mode	Position	Filler metal (mm)	Current (A)		Voltage (V)		Curr. Type and polar	Thermal efficien. K	Wire speed (mm/s)	Welding speed (mm/s)	Heat input (J/mm)		Energy or power x arc time (J)	Weld bead lenght (mm)	Arc Energy * only for Wave form controlled (J/mm)	
1	136	WELDING	PB	2,4	255	270	28	30	DC EP	N.A.	6÷7	3,500	1,632	÷	1,851	N.A.	N.A.	N.A.

	Carried out by	Result	Report No
Visual test	BUREAU VERITAS	Satisfactory	R53073_cp_23.SF.5436792.783 - WPQR 4
Penetrant test	Aru Manuel		PT_WPQR_4
Magnetoscopic test	N.A.		
Radiographic test	N.A.		
Ultrasonic test	N.A.		
Other test	N.A.		

Report No

Test No	Direction	Position	Dimensions (mm)		Temp. °C	Rm (MPa)	Rp* (MPa)	A * (%)	Z * (%)	Fracture location	Results and remarks
			Thickness	Width Diam.		Required	Required Info	Required Info	Required Info		
Note											

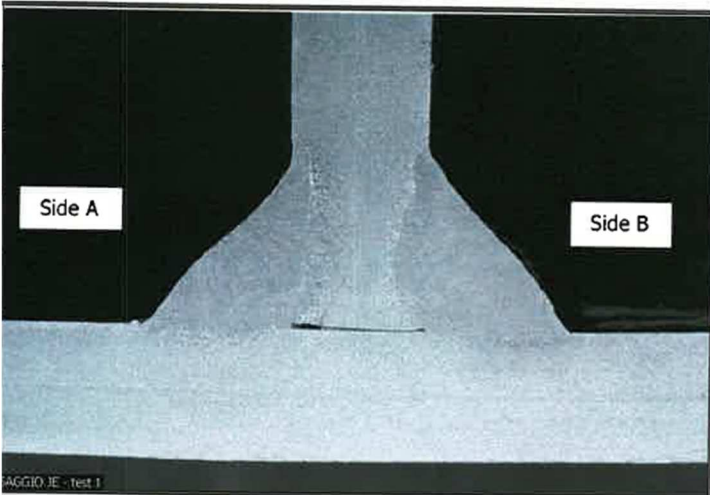
Report No

Test No	Direction	Specimen type			Dimensions (mm)		Former diameter	Angle	Results and remarks
	Transv-Long	Face	Root	Side	Thickness	Width	(mm)	°	
Note									

Report No

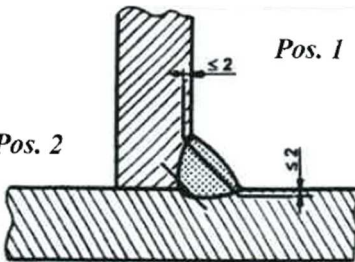
[illegible]

Report No. AQC No. 23/415 D Pag.1 del 26.07.2023



Note	<i>Absence of cracks, cavities, inclusions, lack of fusion/penetration</i> <i>Throat Thickness A: 4,2 mm; Throat Thickness B: 4,4 mm;</i> <i>Result: Satisfactory</i>
------	--

Note	Absence of cracks, cavities, inclusions, lack of fusion/penetration Throat Thickness A: 4,3 mm; Throat Thickness B: 4,0 mm; Result: Satisfactory
------	--

HARDNESS TEST In accordance with UNI EN ISO 9015-1:2011							Report No			AQC No. 23/415 D Pag.2 del 26.07.2023												
 Pos. 1 Pos. 2							Hardness type	HV10 – Position PB														
							Point	B.M. 1			H.A.Z.			W.M.			H.A.Z.			B.M. 2		
							Line 1	139	139	143	148	151	146	202	194	192	148	149	149	131	134	133
							Line 2	139	141	140	143	145	142	191	197	198	150	148	145	140	141	140
Note		Maximum measured value : 202 HV10																				

OTHER TESTS	Report No

CERTIFICATE ATTACHMENT	
1. Range of qualification (Level 2)	2. pWPS WPQR 4
3. Filler metal certificate MARCEGAGLIA no. 10114530204 Batch No. 132182	4. Visual Welding report: Bureau Veritas No. R53073_cp_23.SF.5436792.783 – WPQR 4 at 30.05.2023
5. Penetrant test report: Aru Manuel PT_WPQR_4 del at 31.05.2023	6. Laboratory test report: AQC 23/415 D at 26.07.2023

NOTE - OBSERVATION

RANGE OF QUALIFICATION
LEVEL
2
General for all process

Welding process(es)	136							
Degree of mechanization	Partly Mechanised							
Type of joint and weld	FW: P&T							
Parent material group(s) and sub group(s) included permanent backing material	Group 1.2 Test piece materials in groups 1 and 11 qualify the equal or lower specified minimum yield strength steels							
Parent Material Thickness (mm) without impact	BW		to		with		to	
Parent Material Thickness (mm) with impact	BW		to		with		to	
Parent Material Thickness (mm)	FW	≥ 5	To		with		to	
Parent Material Thickness (mm)	Branch		To		With		to	
Deposited weld Metal Thk (mm) each process :	N.A.							
Throat Thickness (mm) :	no restriction							
Outside Pipe Diameter (mm) :	outside diameter is >500 mm or when the outside diameter is >150 mm welded in the PC, in PF rotated position or in PA rotated position.							
Single run / Multi run :	Multi run							
Angle of branch connection	N.A.							
Filler Material	Equivalent mechanical properties, same type of covering core or flux, same nominal composition and the same or lower hydrogen content							
Filler Material Size	No restriction if heat input is respected. No limitation if hardness not required							
Type of Welding Current	136 Direct Current (DC EP)							
Heat Input (ISO/TR 18491)	Same used in procedure test		- 25 % when hardness requirements apply					
Welding Positions :	All positions, except for PG / PJ and J-L045							
Preheat Temperature :	> 20°C							
Interpass Temperature :	< 250°C							
Post-Heating for hydrogen release :	The temperature and duration of post-heating for hydrogen release shall not be reduced. Post-heating shall not be omitted, but may be added.							
Post-Weld Heat Treatment	Yes ☐	No ☒	Addition or deletion not permitted					
Post-Weld Heat Treatment temp.	N.A.							
Other informations								

Process 12

Number of electrodes	N.A.							
Flux make and designation (if impact required at < -20°C)	N.A.							
Flux re-crushed slag if used	N.A.							

Processes 111

FM trade name: (if impact required at < -20°C)	N.A.							
---	-------------	--	--	--	--	--	--	--

Processes 114

FM trade name : (if impact required at < -20°C)	N.A.							
--	-------------	--	--	--	--	--	--	--

Processes 13

Shielding Gas:	ISO 14175:2008 - M21							
Content of CO2	20% ± 0,36%							
Wire system (Single or multiple)	Single							
Mode of Metal Transfer :	SPRAY ARC							
Power source	☐ Waveform controlled ☐ Pulsed mode (without waveform controlled) ☒ Without pulsed and waveform							
136 and 132 Filler Material trade name: (impact required at < -20°C)	Same							

Process 14

Shielding Gas:	N.A.							
Content of He	N.A.							
Filler metal used	N.A.							

Process 15

Plasma gas composition	N.A.							
Shielding gas composition	N.A.							
Filler metal used	N.A.							
Joint preparation (if impact test required)	N.A.							

Process 311

Filler metal used	N.A.							
-------------------	-------------	--	--	--	--	--	--	--

Backing Gas

Backing gas	N.A.							
Backing gas main group (ISO 14175)	N.A.							
Change backing gas (material groups 7 and 10)	N.A.							
Deletion if production are made with mb > 5 mm	N.A.							

Firma dell'esaminatore
(Visa of examining body's represent.)

Mr. Giancarlo Erbi
Certificato N°
(Certificate No)

QP-ITA-23-00976 Rev. 0
ATTACHMENT-1