VerSpec Valve

Welding Procedure Specification and Welder Qualification

WPS-01/PQR-01/WPQ-01

REPORT

Editor： Pan YuanYuan

Auditor： Wang Qing Guo

Date: 2016.03.28

VerSpec Valve Wenzhou Co., Ltd.

Welding Procedure Specification (WPS—01)

（Refer to ASME Furnace &Pressure vessel specification section IX，QW-200.1） 1/2 pages

Company: **VerSpec Valve Wenzhou Co.,Ltd.** Editor: Pan Yuan Yuan

WPS Number: **WPS-01** Date 2016.03.12 Qualification Record Number: **PQR-01**

Welding method **SMAW（Overlaying）** Automatic Level ☐ Auto ☐ Manual ■ Mechanical ☐ Half-Auto

Joint Head（QS-402）

Joint Head Type See diagram

Liner ☐With ■Without

Liner Material（Type）

☐Metal ☐Infusible Metal ☐Non-metal ☐Other materials

it should use sketch diagram, working drawing, welding code or description to descript arrangement of welded part, it may provide detail drawing of root gap & groove If necessary. (Base on choice of manufacturer, attach sketch diagram to descript joint head type, welding layer quantity and welding order.)

Base Metal（QW-403）

P-No. Ⅰ Group No. Ⅱ and P-No. Ⅰ Group No. Ⅱ or

Steel code and grade **WCB** Steel code and grade or

Chemical analysis & Mechanical Properties WCB and Chemical analysis & Mechanical Properties welding

Thickness：Base Metal：Overlaying **20mm** Angle welding

Pipe size range：Groove weld Angle weld other

Filling Material*（QW-404）		
SFA No.		
AWS No. (classification number)		
F—No. D507/ GB EDCr-A1-15		
A—No.		
Filling material size **Φ4**		
Thickness range of welding metal **3-5mm**		
Groove welding		
Angle welding		
Welding rod-flux（classification number）		
Welding flux brand		
Fusible strip		
Other		

Chemical analysis of welding material (%)

C	Si	p	Mn	S	Cr	Ni	Mo	V	Ti
0.20	--	0.003	--	0.03	12.20	3.12	1.8	--	--

●

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WPS No. WPS-01 Revise No.： C/0

Welding Position（QW-405）

Welding Position **Horizontal (1G)**

Welding directional： Up Down

Angle welding position

Pre-heating(QW-406)

Min. Temperature

Max layer temp. ≤ 350℃

Holding method of pre-heat

(Should record continued or special heating

Heat treatment after welding（QW-407）

Temp. range

Time range

Air (QW-408)

	(Percentage content)		
	air	Mix rate	Flow
Protect air			
Tail Protect air			
Back protect air			

Electrical Characteristics(QW-409)

AC or DC **AC** Polarity **against**

Ampere(range) **120--160** A Voltage **20--25** v

(Welding rod size, thickness, position can be recorded as below table)

Tungsten electrode size and type

Metal transit method(GMAW)

Fuse speed range 8-12cm/min

Welding technology (QW-410)

Vertical welding or Horizontal welding a bit swing

Nozzle hole or nozzle size

Clean method for bottom & middle welding line ☐Brushing ☐Grinding

Back cleaning method

Horizontal swing method

Working distance of tip

Multi-layer or single layer welding (each side) **Single layer welding**

Multi-rods or sing rod welding

Welding speed (range) 8-12cm/min

Peening or not

Other Clean up grease and rust before welding, Multi-layer welding for sing line，use small electricity，slow speed，short arcs，string bead, Shallow penetration，vertical feed welding，for each welding layer≥2mm，Fill arc crater before stop 。

Layer	Welding method	Fill Metal		Electricity		Voltage range	Welding Speed range	Hardness
		Material	Size	Polarity	Ampere			
1-2	SMAW	D507	Φ4	Against	120-160A	20-25V	8-12cm/min	≤40HRC

Editor：Pan yuan yuan **Auditor：Wang Qing Guo**

Procedure Qualification Record (PQR—01)

（Refer to ASME Furnace &Pressure vessel specification section IX，QW-200.2）

Company name **VerSpec Valve Wenzhou Co.,Ltd.**

PQR Number PQR-01 Date 2016.03.25

WPS number WPS-01 Welding method SMAW Auto level ■Manual □Auto □Half-auto

Joint head(QW-402)

Base metal(QW-403)

Material standard number

Model and Grade **WCB**

P-No . Ⅰ & P-No . Ⅱ Welded

Thickness **20mm**

Size

Other

Filling Metal (QW-404)

SFA No.

AWS No.

F－No. D507/ GB EDCr-A1-15

A－No.

Rod diameter **Φ4**

Other

Welding metal thickness

Position（QW-405）

Groove position **Horizontal（1G）**

Welding directional（Up、Down）

Other

Pre-heating（QW-406）

Pre-heat temp.

Layer Temperature ≤350℃

Other

Heat treatment after Welding(QW-407)

Temperature

Time

Other

Air (QW-408)

	Air	Mix rate	Flow
Protection air			
Tail Protect air			
Back protect air			

（Percentage Content）

Electricity Characteristic（QW-409）

Electricity **DC**

Polarity **Against**

Ampere **120--160A** Voltage **20-25V**

Tungsten electrode size

Other

Welding technology（QW-410）

Welding speed

Vertical or Horizontal welding **a bit swing welding**

Swing data

Multi-line or single line（Each side） Single line welding

Multi rods or single rod welding

Other

Procedure Qualification Record (PQR—01)

（Refer to ASME Furnace &Pressure vessel specification section IX，QW-200.2）

Penetration Test

Welding part number	Defect Number	Defect Type	Defect Position	Defect Size	Defect Treatment	Inspection Doc. Number
20160318-1	\	\	\	\	No defect	2016LH-PTXD-001

Metallographic Test

Corrosion：1: 3 Nitric Hydrate Observe：10 times Magnifier	Result：There are no defects on welding line	Inspection Doc. Number 2016LH-XD-001

Hardness Test

Sample No.	1	2	3	4	Ave.	Inspection Doc. Number
20160318-1	42.0	41.5	40.1	41.5	41.0	2016LH-XD-001

Chemical Analysis（%）

Sample No.	Sample Position	C	Cr	P	S	-	-	Inspection Doc. Number
20160318-1	Over layer	0.135	12.14	0.030	0.015	-	-	2016LH-XD-001

Inspection：**PT base on QW-195.2 Qualified（OK），**
MT base on QW-183 Qualified（OK），
HT base on QW-453 Qualified（OK），
CA base QW-462.5(a) acc.to GB/T984-2001 Qualified（OK），

Other

Welder Name Wang Ke Hong Working Card No. H01 Steel Seal No.：/

Inspection Company Hangzhou Hua An NDT technology Co,Ltd.

We hereby certify this report all is correct, and all inspection prepared, welded and tested base on ASME specification section IX.

Result: WPS-01 is qualified

Company: VerSpec Valve Wenzhou Co.,Ltd. Date：2016.03.22 Signature：Wang Qingguo

Welder Skill Qualification(WPQ—01)

(Refer to JB/T4709-2002 and ASME Furnace &Pressure vessel specification section IX，QW-301)

Welder Name Wang Ke Hong Working card No. H01 Steel Seal No.： /

Welding Method：**SMAW** Automatic level ：■Manual ☐Half-auto ☐Mechanical ☐Auto

Welder do sample welding acc. to WPS No. **WPS-01**

Base Metal Sample No.： 20110318-1 Thickness **20mm**

Filling Metal Material： D507

Each welding method variable for manual or half-auto	Actual Data	Assessment scope
Liner(Metal、Welding line metal、 Two-side welding、Flux etc)	**Overlaying**	**Overlaying**
ASME—No . **WCB** and ASME P- No .		
Base Metal thickness -OFW	**20mm**	**≥20mm**
Filling Material F—No .	**D507**	**D507**
Filling Metal Series［Solid/Hollow/Flux-cored-GTA/PAW ］		
Fusible strip (GTAW or PAW)		
Overlaying thickness while chemical analysis		
Welding position(1G，5Getc)	**1G**	**1G**
Welding directional (Upper groove welding/Down groove welding)		
Back air protection or fuel gas(GTAW、PAW or GMAW)or (OFW)		
Transit type(GTAW)		
Welding electricity type & polarity (SMAW)	**DC against**	**DC against**
Automatic/Mechanical welding variable	Actual data	Assessment data
Direct control / Remote control		
Voltage automatic control (GTAW)		
Tip automatic following		
Welding position(1G，5Getc)		
Fusible strip		
Liner(Metal、Welding line metal、Two-sides welding、Flux etc.)		

Inspection Result

Test Item	Penetration Test	Chemical analysis	Metallographic Test	Hardness Test
Base On	(QW—195.2)	(QW—462.5a)	(QW—183)	(QW---453)
Test No.	20160318-1			
Result	**Qualified**	**Qualified**	**Qualified**	**Qualified**

Inspection Company: Hangzhou Hua An NDT Technology Co.,Ltd.

Chemical Analysis Company Hangzhou Hua An NDT Technology Co.,Ltd.

PT test Company: Hangzhou Hua An NDT Technology Co.,Ltd.

We hereby certify this report all is correct, and all inspection prepared, welded and tested base on ASME specification section IX.

Result: WPS-01 is qualified, welding skill qualified to do thickness ≥20mm

Company: VerSpec Valve Wenzhou Co.,Ltd. **Date：2016-03-22** **Signature：Wang Qingguo**