

PQR, WPS & WPQR

PQR stands for Procedure Qualification Record. It is a document that shows that a given welding procedure has been tested and qualified for a given application. It includes details such as the welding process, materials, and other variables used during the welding procedure, and the results of the tests performed on the weld. This helps ensure that the welding process meets the required standards and specifications. (The company proves you can weld material A to material B with filler material xxxx and the final product was of good quality) The PQR lists the actual variables used to achieve the quality weld.

WPS stands for Welding Procedure Specification. It is a document that provides detailed instructions to the welder on how to make the weld. This includes things like the type of welding process, the welding parameters, the materials involved, and any preheat or post-weld heat treatment requirements. The WPS is essential for ensuring that welding is done in a consistent and quality manner, meeting the necessary codes and standards. (The WPS is the actual procedure developed from the results of the PQR for use in the field. Depending on the variable certain ranges are applied for example amperage 85 to 125 amps)

The Welder Performance Qualification Record (WPQR) is a document that verifies a welder's ability to produce welds meeting specified requirements. It typically includes details such as the welder's identity, welding processes and positions qualified for, the test results, and the materials and procedures used during the qualification test. This record serves as evidence that the welder is qualified to perform welding activities within the scope of the documented qualification. (This is the weld test part when you hire in with a new company, where you as the welder demonstrate that you have the ability or skills to make quality welds in accordance with the welding procedures that will be used on your job.)

This article essentially lays out the documentation that's required to make a production weld. First the welding company qualifies a PQR and WPS to show that the materials are capable of being welded with the processes, equipment, filler material etc.. The next step is to hire welder(s) that have to prove that they have the skill set to make quality welds outlined by the PQR/WPS. Once the welder(s) pass their welder performance qualification (weld test) in accordance with the PQR/WPS at that time they are "qualified" to make production welds for the company that qualified the PQR/WPS.

Your qualification from one company to another does not transfer because a different company may have qualified the PQR/WPS differently to some degree. This explains why you have to weld test every time you go to work as a welder for a different company.

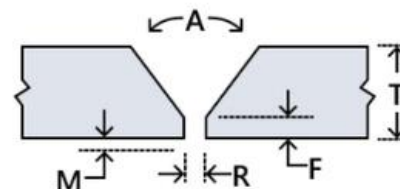
QW-482 Welding Procedure Specification (WPS)

ASME Boiler & Pressure Vessel Code

WPS Number	GT-SM-104	Date	8/12/2021	By	Frank McCain
Revision Number	2	Rev. Date	8/12/2023	Organization	ACME Welding & Fabrication
Supporting PQR(s)	GT-SM-101 AW	Appl. Codes	IX, B31.1, B31.3		
Welding Process(es)	GTAW & SMAW	Type(s)	Manual		

JOINTS (QW-402)

Joint Design	Single Vee Grooves, O-lets, & Fillets		
Backing (Yes)	SMAW	Backing (No)	GTAW
Backing Material (Type)	SMAW - Weld Metal or Base Metal		
Joint Angle (A)	75° ± 10°		
Face or Land (F)	0" - 0.125"		
Misalignment (M)	1/16" ±1/16"		
Thickness Range (T)	0.1875" - 0.872"		
Root Opening (R)	0.125" ±1/16"		
Groove Radius (r)	NA		

DETAILS

As per ASME Section IX paragraph QW-402.1, groove design is a non-essential variable. Non-essential variables can be editorially changed without requalification of the procedure. As such, the joint design depicted on the WPS can be substituted with those specified on engineering specifications, drawings, or other details which are approved for the project scope the WPS applies to.

BASE METALS (QW-403)

P-Number	1	Group No.	1 and 2	to P-Number	1	Group No.	1 and 2
Specification, type and grade or UNS Number	NA	to Spec, type, grade, or UNS #	NA				
Chemical Analysis / Mechanical Properties	NA						
to Chemical Analysis / Mechanical Properties	NA						

THICKNESS RANGE

Base Metal	Groove	0.1875" - 0.872"	Fillet	0.1875" Thru Unlimited
Pipe Diameter Range	Groove	2" and Greater	Fillet	All
Retainers	None			
Other	NA			

FILLER METALS (QW-404)

	PROCESS: GTAW	PROCESS: SMAW
Spec. Number (SFA)	5.18	5.1
AWS Number (Classification)	ER70S-2	E7018
F-Number	6	4
A-Number	1	1
UNS Number	NA	NA
Size of Filler Metals	3/32", 1/8"	3/32", 1/8"
Filler Metal Product Form	Solid	NA
Supplemental Filler Metal	None	None
Weld Metal (Deposited Thickness)		
Groove	0.250"	0.622"
Fillet	Unlimited	Unlimited
Electrode-Flux (Classification)	NA	NA
Flux Type	NA	NA
Flux Trade Name	NA	NA
Consumable Insert	None	None
Other	NA	NA

WELDER PERFORMANCE QUALIFICATIONS (WPQ)

Welder's name _____ Identification no. _____

Test Description

Identification of WPS followed _____ ☐ Test coupon ☐ Production weld
Specification and type/grade or UNS Number of base metal(s) _____ Thickness _____

Testing Conditions and Qualification Limits

Welding Variables (QW-350)	Actual Values	Range Qualified
Welding process(es)	_____	_____
Type (i.e.: manual, semi-automatic) used	_____	_____
Backing (with/without)	_____	_____
<input type="checkbox"/> Plate <input type="checkbox"/> Pipe (enter diameter if pipe or tube)	_____	_____
Base metal P- or S-Number to P- or S-Number	_____	_____
Filler metal or electrode specification(s) (SFA) (info. only)	_____	_____
Filler metal or electrode classification(s) (info. only)	_____	_____
Filler metal F-Number(s)	_____	_____
Consumable insert (GTAW or PAW)	_____	_____
Filler Metal Product Form (solid/metal or flux cored/powder) (GTAW or PAW)	_____	_____
Deposit thickness for each process	_____	_____
Process 1 _____ 3 layers minimum <input type="checkbox"/> Yes <input type="checkbox"/> No	_____	_____
Process 2 _____ 3 layers minimum <input type="checkbox"/> Yes <input type="checkbox"/> No	_____	_____
Position qualified (2G, 6G, 3F, etc.)	_____	_____
Vertical progression (uphill or downhill)	_____	_____
Type of fuel gas (OPW)	_____	_____
Inert gas backing (GTAW, PAW, GMAW)	_____	_____
Transfer mode (spray/globular or pulse to short circuit-GMAW)	_____	_____
GTAW current type/polarity (AC, DCEP, DCEN)	_____	_____

RESULTS

Visual examination of completed weld (QW-302.4) _____
☐ Transverse face and root bends [QW-462.3(a)] ☐ Longitudinal bends [QW-462.3(b)] ☐ Side bends [QW-462.2]
☐ Pipe bend specimen, corrosion-resistant weld metal overlay [QW-462.5(c)]
☐ Plate bend specimen, corrosion-resistant weld metal overlay [QW-462.5(d)]
☐ Pipe specimen, macro test for fusion [QW-462.5(b)] ☐ Plate specimen, macro test for fusion [QW-462.5(e)]

Type	Result	Type	Result	Type	Result

Alternative radiographic examination results (QW-191) _____
Fillet weld — fracture test (QW-181.2) _____ Length and percent of defects _____

☐ Fillet welds in plate [QW-462.4(b)] ☐ Fillet welds in pipe [QW-462.4(c)]

Macro examination (QW-184) _____ Fillet size (in.) _____ × _____ Concavity/convexity (in.) _____

Other tests _____

Film or specimens evaluated by _____ Company _____

Mechanical tests conducted by _____ Laboratory test no. _____

Welding supervised by _____

We certify that the statements in this record are correct and that the test coupons were prepared, welded, and tested in accordance with the requirements of Section IX of the ASME BOILER AND PRESSURE VESSEL CODE.

Manufacturer or Contractor _____

Date _____

Certified by _____



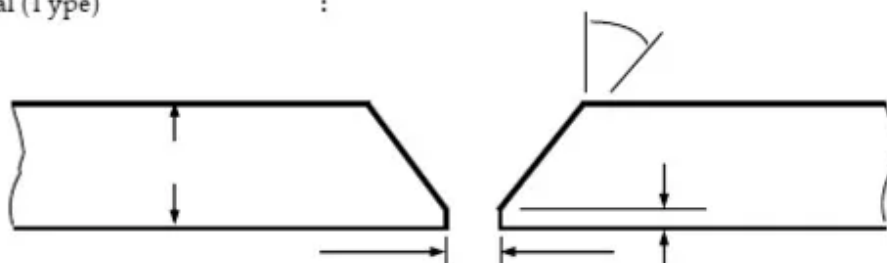
NEO STRUCTO CONSTRUCTION LTD, SURAT.

PROCEDURE QUALIFICATION RECORD(PQR) (As per ASME Section IX)

Procedure Qualification Record No	:	Revision:	Dated:
WPS No (Draft)	:	Revision:	Dated:
Welding Process(es)	:		
Types (Manual, Automatic, Semi-Auto)	:		

JOINTS (QW - 402)

Joint Design	:
Backing	:
Backing Material (Type)	:



BASEMETAL (QW -403)

Material Spec.	:
Type or Grade	:
P. No	to P. No.
Thickness of Test Coupon	:
Diameter of Test Coupon	:
Other	:

POST WELD HEAT TREATMENT (QW-407)

Temperature	:
Soaking Time	:
Heating Rate	:
Cooling Rate	:
Loading Temp.	:
Unloading Temp.	:

FILLER METALS (QW-404)

	GTAW	SMAW
SFA Specification	5.18	5.1
AWS Classification	ER 70S-2	E 7018
Filler Metal F.No.	6	4
Weld Metal Analysis A.No:	1	1
Size of Filler Metal	2.5 mm	2.5&3.15mm
Other	NONE	NONE
Weld Metal Thickness	4 mm	6 mm
Max. weld reinforcement	NONE	2.4 mm

GAS (QW -408)

	Gas	%Composition	Flow Rate
Shielding			
Trailing			
Backing			

ELECTRICAL CHARACTERISTICS (QW-409)

Current	:
Polarity	:
Amps.	:
Volts	:
Tungsten Electrode Size	:
and type	:

POSITION (QW-405)

Position of Groove	:
Weld Progression (Uphill /Downhill)	:
Other	:

TECHNIQUE (QW-410)

Travel Speed	:
String or Weave Bead	:
Oscillation	:
Multipass or Single Pass (per side)	:
Single or Multiple Electrodes	:
Other	:

PREHEAT (QW - 406)

Preheat Temp.	:
Interpass Temp.	:
Other	: