WELDING PROCEDURE SPECIFICATION (WPS)

WPS package for manual TIG and partly mechanized MAG stainless steel applications

/ Specially for the structural steel standard EN 1090

/ Requalified according to EN 15612:2018

Information sheet - EN 1090

Overview of EN 1090 and the CE marking of structural steel products

Since EN 1090 came into force in 2014, in-house production control (WPK) is required for welded constructions of all execution classes. This in-house production control stipulates that appropriate welding procedure specifications (WPSs) are available at the workplace and are used as a basis for welding.

The WPS package from FRONIUS is a simple and cost-effective way to obtain one of the prerequisites of a WPK and ultimately the CE marking of welded constructions. The CE mark is an internationally recognised sign of quality that gives a competitive edge but requires traceable production following welding procedure specifications.

FRONIUS WPS package for "standard welding procedure" conforming to EN ISO 15612

The qualification of welding procedure specifications according to standard welding procedures is one of five qualification options, along with in-house welding procedure qualification tests, pre-production welding tests, the qualification from filler materials or previous welding experience.

FRONIUS aims to cover a wide range of single and multi-pass butt and fillet weld applications with a variety of welding procedure specifications. Their potential use is varied and ranges from stair railings to masts and steel constructions, which all already conform to the EXC2 execution classes.

The change of standard EN1090-2:2018 allows the use of the qualification according to EN ISO 15612 also for execution class EXC3 and for the materials and steels of material group 8.1 according to CEN ISO /TR 15608.

Fronius WPS package for power sources from all manufacturers

In the MAG process, this collection of welding instructions is power source independent if the droplet transfers of the welding processes can be set on electrically and mechanically equivalent welding systems: "short arc", "transition arc, spray arc, pulsed arc"

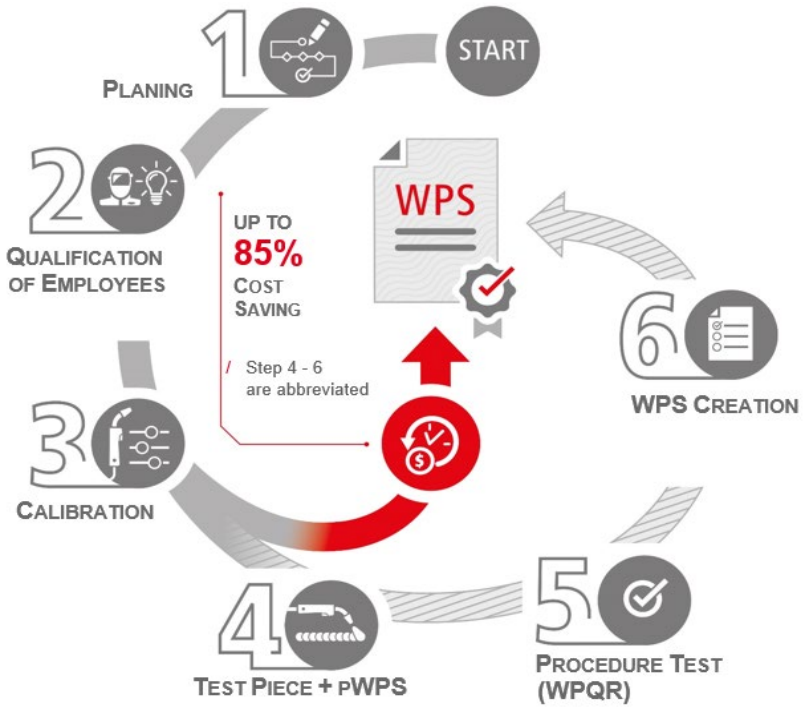
In the TIG process the collection of welding instructions is independent of the power source if an electrically and mechanically equivalent welding system is used.

The tested WPSs are to be used in the defined parameter window, whereby an upper and a lower energy input (current / voltage / energy input) into the workpiece form the framework of the use of the tested WPS.

Time and cost savings

The cost and effort involved in an in-house welding procedure qualification test can be kept very low with this WPS package, which is why SMEs are the primary users. FRONIUS partnered up with TÜV-Süd to perform all of the testing, thereby eliminating the need for the user to carry out this work:

Sheet processing → test welds → pWPS → performance of welding procedure qualification test → documentation → mechanical and technological inspection → creation of WPS



Application and explanation of the standard welding procedure specifications (SWPS)

SWPSs work with ranges of sheet and seam thicknesses and the appropriate welding parameters. First the weld seam profile including appropriate sheet and seam thickness is selected from the table of contents using the thickness ranges. The appropriate filler metal diameter and the welding position can also be found in this overview.

The following welding parameters determine the processing window that must be observed:

/ Welding current [A]

/ Welding voltage [V]

/ Wire speed [m/min]

/ Energy input [kJ/cm]

/ Gas flow rate [l/min]

/ Contact tube distance [mm]

/ Preheating temperature [°C]

/ Interpass temperature [°C]

Validity / Entry into force

The manufacturer using the Fronius WPS package hast to assign a welding procedure number for the used WPS. Then a welding coordinator or a designated employee of the manufacturer must sign and date the SWPS before it can be used in production and thus become effective. The manufacturer now owns a Fronius sWPS + Fronius Logo + TÜV SÜD Logo, which refers to the WPQR and only permits the parameters corresponding to Fronius.

Area of application

It is permitted to change the diameter of the filler metal provided that the heat input requirements are met. This is achieved by adapting the welding speed accordingly.

Welding procedure specifications for butt welds on sheets also include pipes with an external diameter > 500 mm or pipes with an external diameter > 150 mm in the PC welding position, and in the rotating PF or PA welding position.

The weld-seam sequence must be observed for different welding processes. In the case of multi-pass butt and fillet welds, the position and quantity of filling runs can be changed depending on the application. The welding sequence of the sketch is based on the test plate with an average thickness. Information on quenching and tempering or notch positions must be observed.

The included welding instructions may be welded in all welding positions except PG and J-L045 according to EN ISO 6947.

Explanations of abbreviations

FW	…	Fillet weld
BW	…	Butt weld
141	…	Tungsten inert gas welding with solid wire or solid rod filler
135-D	…	MAG dip transfer
135-P	…	MAG pulse transfer = MAG pulsed process, but also hybrid processes with pulsed arc
135-G	…	MAG globular transfer
135-S	…	MAG spray transfer

Use and liability

TÜV-Süd assumes liability for the test seams welded by FRONIUS. **The welding procedure qualification record (WPQR) of the testing organization can be provided by FRONIUS on request for every welding procedure specification. mailto:sales@fronius.com**

In the event of improper use of the welding system and the associated welding procedure specifications (WPSs) made available, deviations from the area of application, changes to the material requirements or operation of the device by personnel who have not been trained or qualified in its use, we do not accept any liability and responsibility

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