

## Scope of application

- / Implementation of the Standard EN 1090 (Since the first of July 2014)
  - Manufacturers of Steel- and Aluminum constructions must transpose the requirements of this Standard and need to have a certification for their own production control, to ensure the quality of the welding seam.
  - That means that the manufacturer must reproduce every welding seam with sufficient accuracy as it is not possible to ensure the quality of the welding seam without destroying or X-ray it.
  - So many factors can have influence to the welding seam, so it is necessary that the shown and output values of the welding machine are always correct, otherwise it is not possible to reproduce a welding.
  
- / IEC 60974-1
  - The manufacturing standard for welding machines already included an allowed accuracy of the nominal and actual values.
  - It is called standard grade
  
- / EN 50504, Standard for validation of arc welding equipment
  - It demands the use of validated arc welding equipment and focused on the validation of arc welding equipment that were built according to the manufacturing-standrad EN 60974-1.
  - It itroduced an higher grade of accuracy (precision grade).
  
- / DIN EN ISO 17662, Standard for validation of equipment used for welding
  - Validation standard for the control of process variables during fabrication.
  - It demands the use of validated arc welding equipment but gives no information about the validation itself.
  - So it is primarily not the standard we have to use for the validation of arc welding equipment.

## Definition

### / Verification

- Process to evidence that a set value leads to the expect result.

### / Stability test

- Test to determine the repeatability of an output value of a welding machine over a period.

### / Standard grade

- Grade of accuracy of a machine built according to the manufacturing Standard IEC 60974-1.

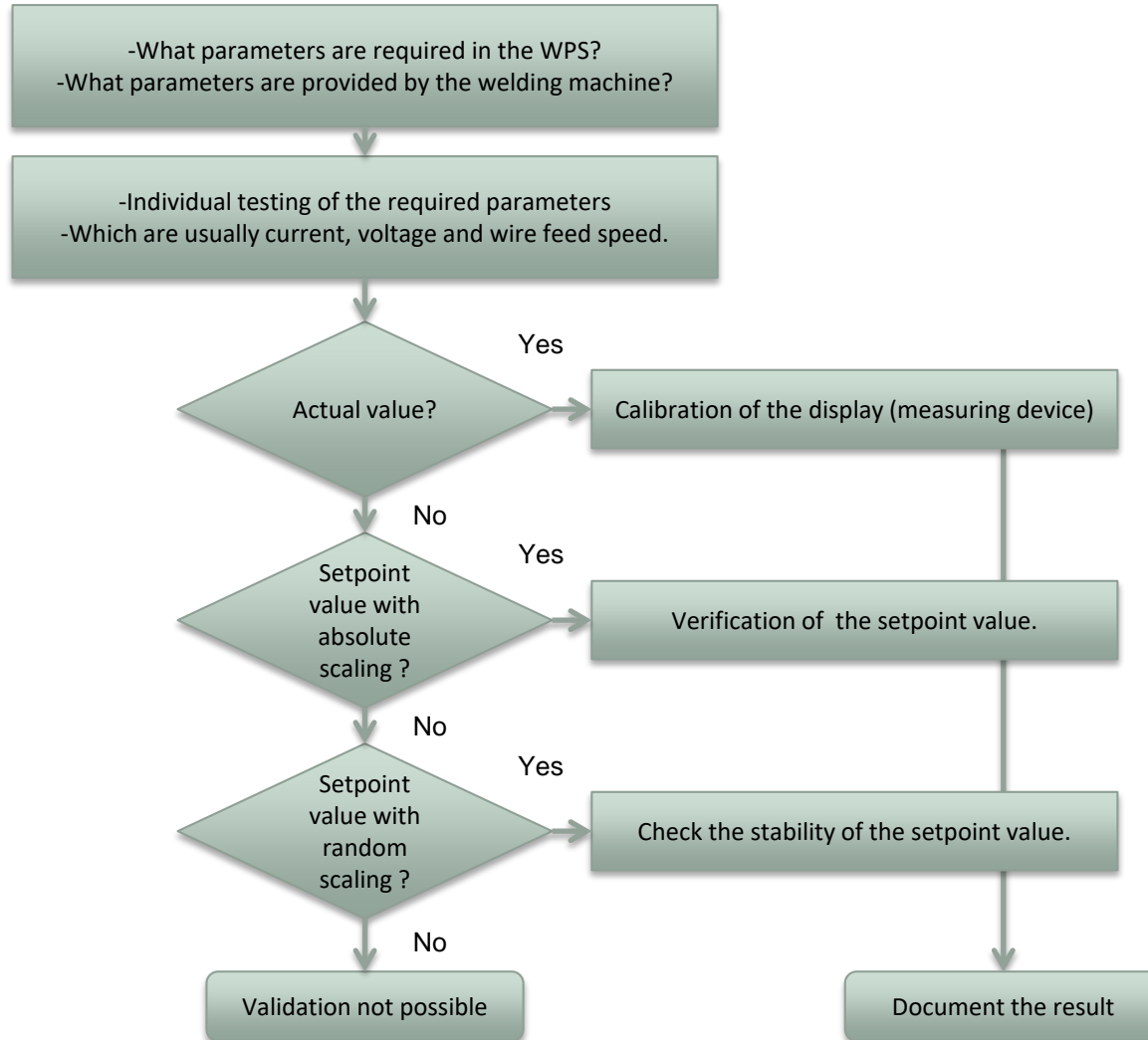
### / Precision grade

- Grade of accuracy of a machine built according to the manufacturing Standard IEC 60974-1 but with a higher grade of accuracy, for demanding welds.

## Selection of relevant values

- / Selection of calibration, verification or stability test
  - You have to check the parameters that are included in the WPS (Welding procedure specification) provided that they are available at the welding machine.
  
- / Based on the welding machine model you have to carry out a calibration, a verification or a stability test.
  - Verification: Please note that expected values can differ, due to different characteristic curves and load resistances (load simulations).
  - Therefore verifications and stability tests must always be carried out with the same load!
  - It only makes sense to carry out a verification if current and voltage are not dependent on each other, or if the machine's load-characteristic is known.

# Decision tree



# Measuring points



## / Definition of the measuring points

- The type plate shows all necessary values:
- 1  $U_0$  = OCV (Open circuit voltage)
- 2 Minimum nominal current
- 3 Maximum nominal current
- The definition of the measuring points takes place after consultation with the operator of the welding machine.
- It is allowed to validate it over the full range or a section.



# Validation



/ Connection of a welding machine to the validation device.

## calibration alphaQ

- ✓ Steuerleitung (DV <---> Maschine) anschliessen
- Leitungsverbindungen herstellen
- Tool Brenntaster anschliessen
- Lastschrank Kabelbrücke (TIG) anschliessen
- Job 127 (TIG)

- ✓ Strom
- Spannung
- Drahtvorschubgeschwindigkeit

