

Specifications on welding / soldering

General:

- Only steels suitable for welding may be welded (carbon content $\leq 0.22\%$ / equivalent carbon content ≤ 0.44).
- The welding method shown on the drawing must be used. If no welding method is specified, the method most suitable to the task must be selected. Technological, economic and quality aspects must be considered.
- The weld seam must correspond to the drawing. If the specifications on the seam are incomplete or faulty, please notify Heidelberg.
- The weld seam may only rupture if the basic material has been plastically deformed / the seam must withstand a minimum load, if so specified.
- Quality class for irregularities at welds with St in accordance with DIN ISO 5817 – D if no other quality class is stated on the drawing.
- Quality class for irregularities at welds with Al in accordance with DIN ISO 10042 –D if no other quality class is stated on the drawing.
- The use of other welding methods than the ones stated in the component part specification must be arranged with Heidelberg.
- Temper colors of austenitic steels must be removed/avoided (e.g. by purging with gas).

Welding specifications by method:

Fusion welding:

- Inert gases and filler materials must be selected in accordance with the welding task. They are usually not specified by Heidelberg.

Beam welding:

- The selected parameters for initial process approval / approval of the series processes must be documented.
- The analyses conducted to determine parameters – especially metallurgical analyses – must be verified.
- Quality class for irregularities at beam-welded seams in accordance with DIN ISO 13919 - 1 – D if no other quality class is stated on the drawing.

Appendix 35_INT

Welding / Soldering

Heidelberg specifications

VERSION: JANUARY 2008, PAGE 2 OF 2

Resistance welding:

- The geometrical features of the join partners that are specific to the welding method (e.g. annular projection on pulsed current arc welding parts) must be selected so that the resulting weld can reliably withstand the required minimum load.
- The quality of a spot-welded seam must be verified using the "Ausknüpfprobe".
- To ensure the safety of component parts and the stability of the process, the parts should preferably be welded with the drawn arc stud welding method.

Soldering specifications by method:

- The selected parameters for initial process approval / approval of the series processes must be documented.
- The analyses conducted to determine parameters – especially metallurgical analyses – must be verified.
- The soldering gap / dimensions of the parts to be joined must be selected in such a way (taking into account the soldering method and the solder used) that the soldered joint is strong enough and able to reliably withstand the specified minimum load.
- Geometrical, component-specific joining aids (e.g. bevels) may be used if they do not impair the strength of the soldered joint.
- If no loads to be withstood / moments are specified, the soldered joint may only fail if the basic material is plastically deformed.
- Selection of the solder according to DIN EN 1044. Nickel-based solder must be used for stainless steel parts.
- If no solder is specified, the solder best suited to the task must be selected. Technological, economic and quality aspects must be considered.