

Joint between a Steel Pipe and a Flange

from **Handbook of Inductive Soldering** by Hans-Joachim Peter

This joint type is widespread. For example, the flanges may consist not only of solid sheet but also of thin, bent sheet. The heating can be carried out both from the outside and the inside, depending on the design type.

In the following example, the heating is carried out from the top side of the flange and from the inner wall of the pipe to be brazed in using two turns under shielding gas. The forming gas, e.g. 10 % H₂ and 90 % N₂, is guided directly from the inductor via a shower sheet to the brazing zone.

Copper-based brazing alloys or even high-melting build-up welding alloys on a CrNi basis can be used as the brazing



Fig. 1: High-temperature shielding gas brazing of a special flange with a pipe using an outer field inductor with an integrated shielding gas shower (sources: TU Dresden and eldec).



Fig. 2: Pipe/flange joint brazed with a CrNi alloy (sources: TU Dresden and eldec).

alloys. In this respect, these alloys are only available in a conventional powder form. However, the alloy is easy to apply in a paste form.

Fig. 1 shows the brazing operation at a brazing temperature of approx. 1,240 °C while the brazing result with a high-melting CrNi alloy (15 kW MF, heating time: approx. 30 s) can be seen in **Fig. 2**.

REMARKS ABOUT THE INDUCTOR

The utilised ring inductor is an outer field inductor with two turns connected in series. A shielding gas ring is brazed on to the upper turn. The input shielding gas emerges from the perforated plate attached to the bottom. The lower turn heats the pipe additionally from the inside. **Fig. 3** shows the brazing arrangement.

The inductor with the two turns connected in series is portrayed on **Fig. 4**. Both the laterally attached pipes serve to supply the shielding gas which then flows out of the boreholes of the shielding gas outflow brazed on to the bottom to the brazing zone. The outlet quantity is easy



Fig. 4: Two-turn ring inductor with a shielding gas shower device.

to adjust on the basis of the visible flame resulting from a combustible shielding gas (e.g. forming gas with min. 10 % H₂). This and other examples are described in detail in [1, see on the left page].

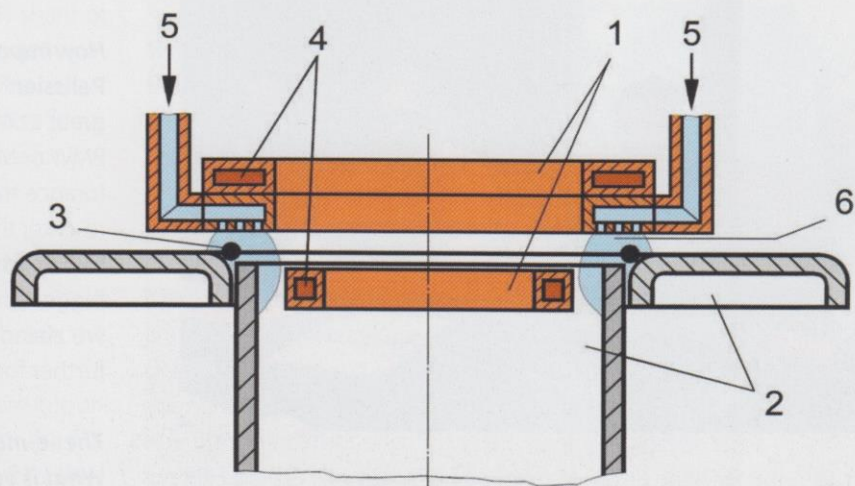


Fig. 3: Brazing arrangement for the high-temperature brazing of the joint between a pipe and a flange; (1) outer field inductor, (2) brazing workpieces, (3) brazing alloy application, (4) inductor cooling, (5) shielding gas supply lines, (6) shielding gas outlet.