

Efficient tube bending process for smallest bending radii

Intelligent solution for single bends with tool-related bending angles between 10° and 180°

Schmallenberg. A small bending radius is easier to produce than a big one. A world turned upside down? The solutions' supplier transfluid Maschinenbau GmbH exceeds the possibilities of conventional processes in the development of a new tube bending technology. Bending radii smaller than $1 \times D$ are usually difficult to achieve with larger tube diameters. transfluid® has just designed an efficient process with a sophisticated bending radius of $0.8 \times D$ for high-grade steel tubes.

■ Efficiency and high quality are crucial factors for success in the tube processing sector. Most bending fails to achieve these aims: the clamping lengths required for tube clamping in conventional single-bend processes have to be cut after bending. A transfluid customer was looking for a solution without cutting after bending to prevent this unnecessary loss of material.

The challenge was to develop a tube bending machine for single high-grade steel bends of $70 \times 2 \text{ mm}^2$. Furthermore, a central bending radius of $0.8 \times D$, no bend exit ovalisation and a reduction of the wall thickness of less than 3 % was required.

»Such requirements cannot be realized with conventional processes, especially with these high-grade steel tubes. Our solution is

a procedure that does not point the bends after the rotary draw bending process but presses them,« transfluid CEO Gerd Nöker explains the new development. With their bending machine, the German specialists guarantee a zero reduction of wall thickness. This simultaneously provides the advantage of additional saving of material. In addition, the transfluid bending process avoids ovalisation of the bend exit. »A cutting of overlength of the components can be avoided entirely. They can be further processed immediately after bending. If required, the next steps for further tube processing can be integrated in the same machine,« Nöker stresses the efficiency of the transfluid technology.

Tool-related bending angles of between 10° and 180° are possible. A cycle time of 3.5 seconds is possible when appropriate cutting lengths are locked in the process, even with the above-mentioned tube sizes.

»We are at our best when implementing ideas that exceed the standard. That is why we have not only created a solution with an impressive bending radius but also designed an extraordinarily efficient complete process. The low machine investment is well below that needed for the type of CNC tube bending machine with multiple tooling usually deployed for such sophisticated tube processing,« Gerd Nöker concludes.

(EE 110302611) ■



(EE 110302611/1)

Press bending with special transfluid® technology: high-grade steel tube of $70 \times 2 \text{ mm}^2$ with bend radius of $0.8 \times D$ (photos: transfluid).



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For strong compounds: the newly developed transfluid bending process avoids reduction of wall thickness.



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