

Optimised processes for tube bending and forming

TRANSFLUID Maschinenbau GmbH develops free-of-interface automation systems from a single source, and ensures the optimal set-up for the whole tube processing.

At the beginning of each transfluid solution there are specific requirements. "In this concrete case aluminium tubes of 17 x 1mm diameter were to be bent in a bending radius of 10mm (0.58 x D)," said Gerd Nöker, one of transfluid's CEOs. "The wall thinning on the exterior bend was permitted a maximum of 30%. Additional requirements were the possibility for a bend sequence with various radii, end

forming on both ends and a cycle time of maximal 15 seconds per component with up to six bends."

To speed up the tube bending process and at the same time reduce handling costs, transfluid developed a solution that forms one side of the aluminium tube before bending. After that, a 4-axle handling system takes over loading the fully electric transfluid bending machine. The safe inward transfer of the 80 to 800mm-long tubes is guaranteed by loading from a step feeding system with a capacity up to 500 workpieces.

To ensure optimal quality upon bending, the length of every tube is exactly checked before feeding. The bent tubes are then removed by a robot and fed into a combined transfluid forming machine. In one step, the chipless cutting of overlength takes place as well as simultaneous axial forming. Subsequently, the robot feeds the single tubes to an optical measurement to completely control the forming geometries and surfaces.

The integrated transfluid automation system (t motion) can also process very short parts that, on customer request, are to be end-formed on both ends after bending. For this, the forming machine is equipped

with an automatic clamping jaw changer. This allows quick changing between two different form clamping pieces, according to requirements.

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From a single source to a bent and formed tube, even with very small bending radii