

From tube to isometry and vice versa

OBJECT tubing is a frequent application in the shipbuilding industry in general and especially in hydraulics tubing. However, it is a fact that economic efficiency falls by the wayside if tubes are made-up at the object, manually drawn, bent on manual bending machines and built in, because after the bending process it is necessary to cut excess lengths. This means a high loss of material. Moreover, a precise documentation is missing, the spent working time is high and the processed tube does not always fit. Here an advanced, economic solution is in demand that transfluid Maschinenbau GmbH has just designed.

“To guarantee a constant quality of the tubing and to achieve a minimal waste of material with shortest possible clamp lengths and small radii it is important to bend the tubes in a bending centre”, explains Gerd Nöker, transfluid CEO. “This not only provides for the ideal quality of the tubing but also makes possible a detailed documentation of the tube data.”

But how do these bending tube data come to the CNC bending machine? The provider of solutions transfluid created two different ways to directly compile a tube isometry that, for example, can be made available online (via network or email) or manually (via USB flash drive) to the bending centre and the bending machine. Digital drawing with t control: The easiest method is the

use of a digital drawing tablet. transfluid makes available the appropriate programs for creating isometry drawings with its high-performance software “t control”, as Gerd Nöker explains: “A customary tablet PC can be used. Our transfluid software enables 3D drawings of the tubes by using a pen on digital isometry paper. An operator can measure the desired geometry directly at the object with the drawing tablet, draw and send it via email to the bending centre.” Additionally, there is the possibility to equip the drawn geometry with flanges, welded connections or endforming. By this, not only a simple bending geometry can be sent to the bending centre but a completely ready-to-install component can be pre-finished. For an easy inspection if the drawn geometry matches the desired component a 3D view of the tube is available. With its help the drawer can identify elementary mistakes at first glance.

Flexibility and freedom with precise measuring arm: An optional procedure that transfluid is providing for the safe measurement of a tube (for example, for reproduction) is a special measuring arm with appropriate software. transfluid uses measuring arms equipped with absolute rotary encoders. They are deployed at the object or, for example, attached with magnet feet and provide the advantage that they do not have to be referenced.

With these measuring systems the tubes can be acquired by simple scanning of the cylinders between the bends or by scanning of the geometry. The data can be transferred into coordinates and can be sent, for example, by email directly to the bending centre.

For the increase of the mobility of these devices the systems used by transfluid can be additionally equipped with accumulators. The measuring data are sent directly to a notebook computer via a wireless connection. This provides for a maximum of mobility without annoying cables.

Efficient bending technology: transfluid offers the complete range for tube diameters of 4 to 275mm for the processing of isometries to tube geometry. The CNC controlled and also the semi-automatic tube bending machines are able to process the measured or drawn tube data, to perform a bending collision test and to appropriately collimate and bend components that are already equipped with flanges or transformations. By this, the provider of solutions transfluid has designed highly efficient options that enable a long term economic tube bending in the ship building industry.

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