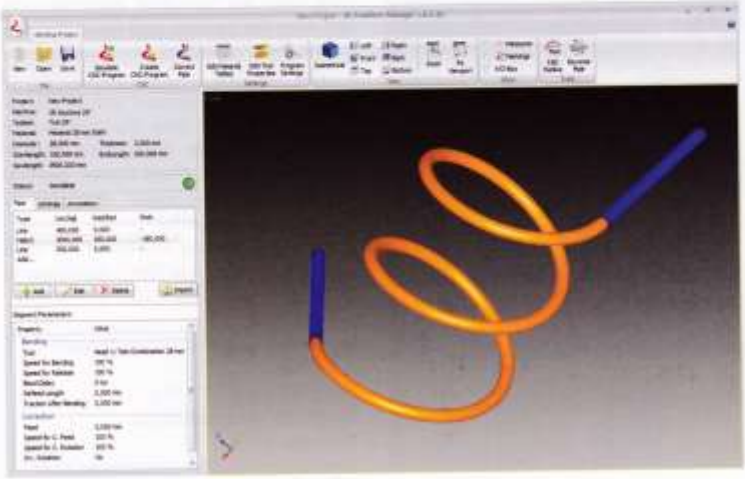
Bending of variable radius pipes

ONE of the major challenges for pipe bending is pipes with a variable radius and rotation during the bending sequence. Not only do the rollers themselves need to be positioned with the utmost precision, but the calculations of each position at every moment of the bending process are complex and involved.

In order to facilitate the bending of such complex geometries, 3R software solution developed RONIFreeformManager, which both calculates the CNC-data for bending and checks the bending process for collision.

The software can be used on both left- and right-bending machines with one or more bending levels. It also supports combination machines, which can perform both freeform roller bending and traditional rotary draw- or push-bending.

RONIFreeformManager imports the pipe data from CAD-files to create a model of the pipe geometry and also provides facilities to modify the geometry manually. Combined with 3D models of the machine and the tooling, the software graphically simulates the bending process, detecting collisions with potential interference points in the machine's environment. Just like 3R's RONIKolli7 software, RONIFreeformManager then attempts to find an alternative bending sequence that avoids these collisions. If a feasible sequence is found the CNC files are generated and sent to the machine. After bending, the pipe's measured result can be compared to the desired pipe through a comparison report.



Another feature of the RONIFreeformManager is that it corrects the bending data by using a smooth interpolation method, which means that the corrections for material factors are precise, even if only very few test measurements are taken for the according material. In fact, the software can be interfaced with measuring software to correct the bending values for subsequent pipes based on a comparison of the target geometry with the actual geometry after bending. This allows for faster calculation of the correct CNC-data and less need for test bends.

The software is intended to be efficient and versatile while still remaining intuitive and easy to operate. This means that an operator does not require intensive training over multiple weeks in order to learn how to use the software.

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