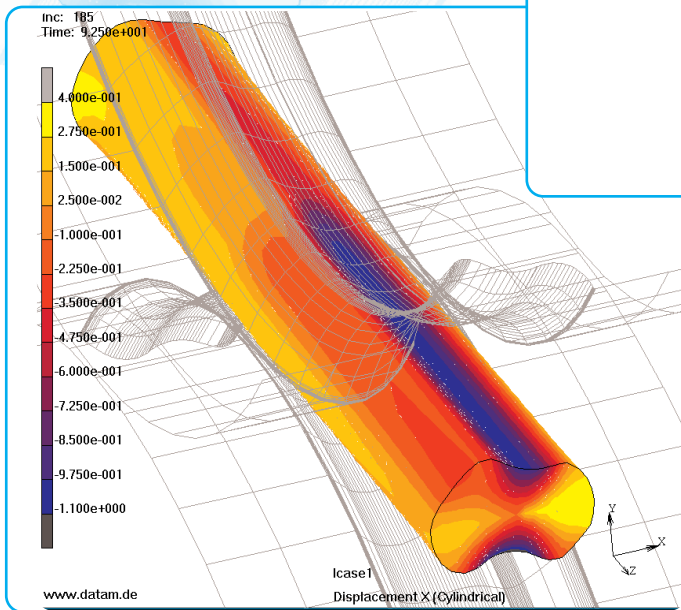
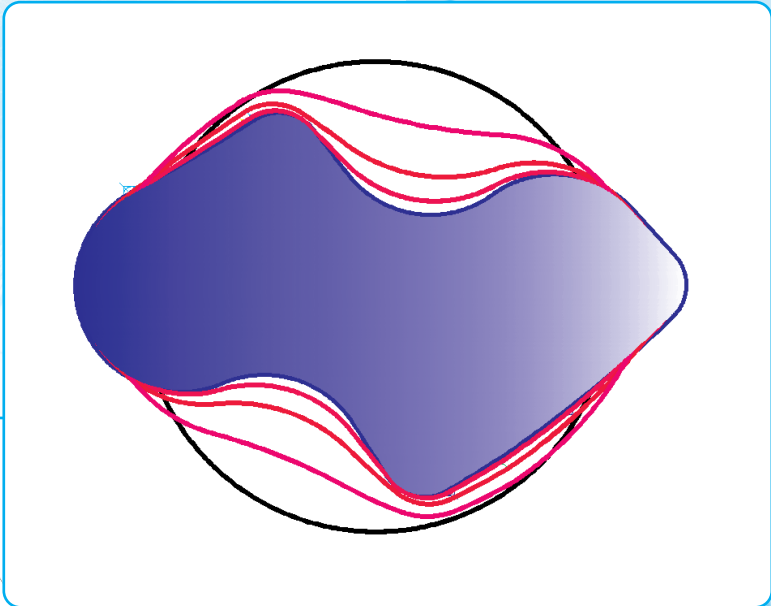


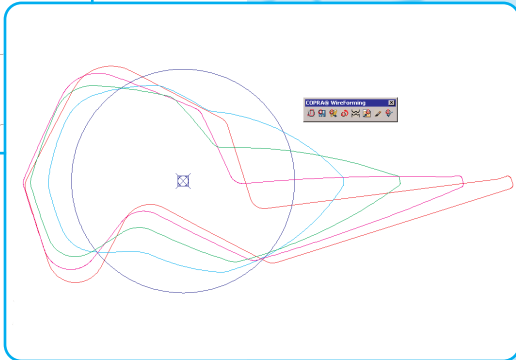
COPRA[®] Wire Rolling

COPRA[®] WR Software Solution for Rolling of Wire Profiles

Example of a wire section with automatic calculated forming steps



Simulation of wire rolling with COPRA[®] FEA WR



COPRA® WR (Wire Rolling)

COPRA® WR Software Solution for Rolling of Wire Profiles

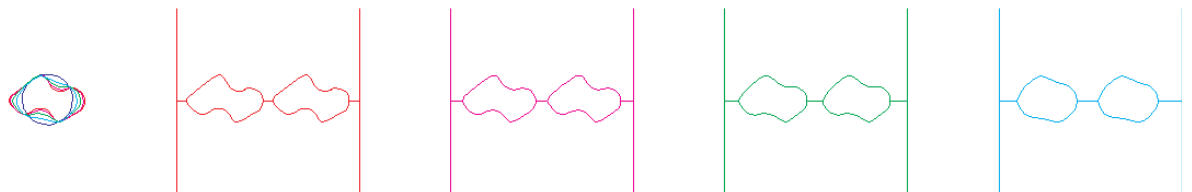
The history of wire goes back many centuries. The first step towards rationalization came in the 13th century when wire drawing was invented, and straight away used for military purposes. The coat of mail, which until then only the more well-to-do could purchase, became affordable for the simple warrior.

Today the production and rolling of wire is an industrial process by which large quantities of very different shapes can be manufactured in a highly rationalized manner. As with many other metal forming processes, the technology is still primarily based on experience. So in most cases the production of new profile shapes is not only associated with a considerable design effort but also means protracted trials and experiments during startup.

The starting product for shaped wire is very often round or rectangular wire. Proceeding from this geometry, the wire is turned into the required final form in a number of rolling passes. So only the starting and finishing state of the wire is known. Seeing as shaped wires very often have geometries with different radii, calculating the intermediate stages is a complex matter.

In addition to the purely geometric aspect, there are other factors that play a by no means negligible role. These include the fact that the material lengthens when it is formed, and can be very difficult to force into the border regions. Large deformations produce local strain hardening, as a result of which the material can become brittle and thus fissured. The COPRA® WR solution for wire rolling pursues three objectives:

- Interactive modeling of the rolling steps based on available experience: the designer draws the progressive steps and can put the areas into the required percentage ratio with the aid of COPRA® WR.
- Automatic layout of the forming steps by specifying the start and end cross-section. Here it is possible to specify the degree of deformation and the estimated reduction of the cross-section.
- Verification of the design by finite element simulation. Forming is computed based on roller geometry and the start cross-section. The actual shape to be expected can be verified in the individual steps and the change in the material examined.



Performance spectrum of COPRA® WR

- Defining the end cross-section by CAD
- Composing the finished caliber
- Defining the start caliber
- Interactive determination of forming steps
- Automatic calculation of forming steps
- Rotation of cross sections
- Automatic creation of rolls
- Export of roll data