Profile Element Fillet: Removing of a correction element that arises caused by non-tangential connections in the CAD drawing

What's New? – Rel. 6.1 64bit

Profile Element Fillet

Drawings from customers often are faulty. At first, if the drawings are displayed in CAD, the faults are not noticed. However, if the drawings are imported to the roll form design software **PROFIL** in order to start a new roll project, the faults are visible: Radii are not correct or there are arcs with non-tangential connections. Regular reason is: The CAD designer is not enough familiar with his CAD system. Now the roll form designer has to revise the drawing, before he can start to design the flower pattern and the roll tools.

In doing so the new function **Profile Element Fillet** helps: In **PROFIL** any two line or arc elements are selected that should be rounded out with each other. Any count of elements can exist between the selected ones that are removed and replaced by a new arc with desired fillet radius. Thus correction elements also can be removed that arose by non-tangential connections (example see element no. 2 in the above picture).

In all cases the rest of the profile contour keeps unchanged.

### Evaluating the FEA simulation result
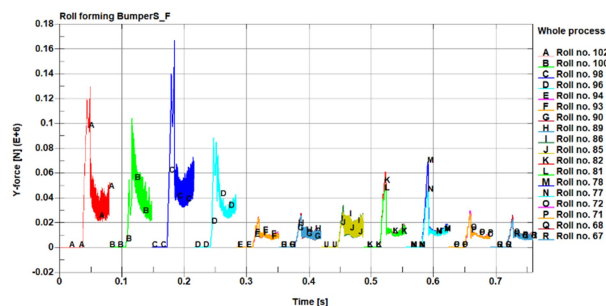
After finishing the FEA simulation of the profile project the results are evaluated by using **LS-PrePost** (included in the **LS-DYNA** package). In order to relieve the user from time-consuming operations, a Python script has been developed that shows important results as a graphic automatically. As an example the picture above shows the forces of the top shafts of each machine stand. The forces are important for configuring the shaft diameter, bearings, cardan shafts, gear box, and the drive power. If the machine already exists, the designer can determine if the machine is able to run the designed profile. The script easily can be adapted to individual user's needs.

64bit Version

The new **PROFIL** release 6 uses the full capability of 64bit computers under Windows 7, 8, 10, and 11. Thus designing larger projects will be significant faster now. Users notice it especially during screen refresh and during several output functions, e.g. file or CAD output or FEA model creation.

ActiveX Interface to ZWCAD
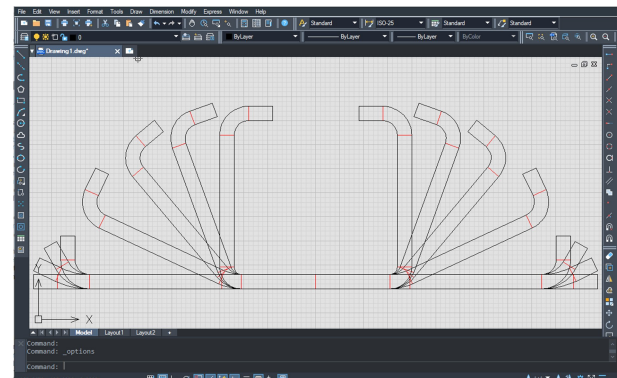
ActiveX provides the comfortable drawing and 3D-model interchange between the roll form design software **PROFIL** and a CAD system. The built-in interface is available to **AutoCAD**, **SolidWorks**, **SolidEdge** and **BricsCAD**. Now also **ZWCAD** from **ZWSOFT** (China) is supported.

ZWCAD is a low-cost CAD system with perpetual license that is popular in Asia. It is fully DWG compatible and has functions and commands like AutoCAD.

ActiveX is a WINDOWS function that enables programs to control each other and to exchange data among themselves without files.

PROFIL creates profile and roll drawings in the just opened CAD document and imports user drawn profile and roll contours from CAD.

Users of any other CAD system are able to exchange drawings and 3D models via the file formats DXF and STEP.

Stress-Strain-Curve as analytic function
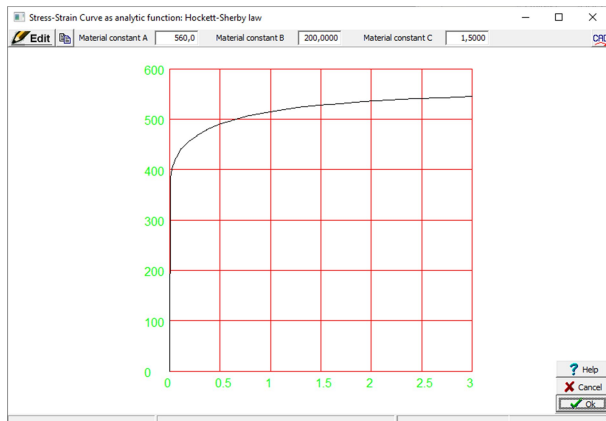
If the designer quickly wants to validate his project by FEA and the exact material data are not available (e.g. from a tensile test), it makes sense to use an approximation. **PROFIL**'s integrated curve generator creates a stress-strain curve by specification of the yield stress, tensile stress, and the curve form.

A new feature is to use an analytic function. In the literature several functions are listed, some of them are available in **PROFIL**:

- Swift power law
- Voce law with form
- Hockett-Sherby law
- Stoughton-Yoon hardening law

The picture shows the Hockett-Sherby law; in the header the function parameters are set.

Rotated Roll and Part Number
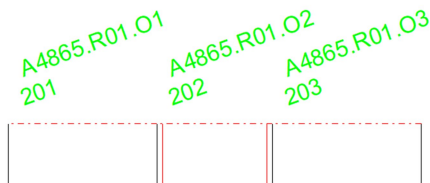
Sometimes, if the roll and part numbers are long and the rolls are small, the numbers obscure each other. Now long numbers are rotated automatically in order to prevent obscuring. The rotation angle can be preset.

Further New Features

FEA Finite Element Analysis:

- Stress-strain curve generator: Input fields can be modified by PgUp/Dn keys.
- Desired final pass L01 is shown in the sheet center after calculating spring back.

Profile Design:

- Bugfix: Leaving the input field **Strip Width** is not possible.
- Bugfix: Missing input fields in all toolboxes (Korean version only).
- Bugfix: Missing update of the stress of band edge window after toggling loaded-discharged (F9).
- Bugfix: The stress of band edge window has to be reopened after Undo/Redo.

Roll Design:

- Settings, Rolls: Number key sequence can be preset for variable $SA.
- Bugfix: Program loop if a superfluous corner point has a radius.
- Bugfix: Plausibility check, inaccuracy in case of large radii.
- Bug fix: Overlap between arcs in case of a very small contour kink.
- Bug fix: Number key is not considered if it differs from the previous.

Machine:

- Bug fix: Missing user request if a pass is removed.

CAD Interface:

- STEP output and others: Checking improper characters and double layer names.
- Bug fix: Output via ActiveX to BricsCAD, wrong text rotation angle.

Parts list:

- Bug fix: Run time error if no working sheet is opened in Excel.

User interface:

- Print button, function changed to print preview.

More info: **www.ubeco.com**