

VeraCAD Technology Chat

Title: OVAL Shape in Reducer Rolling
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One of the most important cross-sections in reducer rolling is the Oval.
Therefore a diploma work did deal with CIRCLE-OVAL.
But I believe the Oval should be a little bit more wide and thinner.
ERATZ Engineering will redo this research when I will do the bigger research package.

Meanwhile we have to live with it.
If we can do simulation and we find the ovals are too narrow we should make the oval more flat and more wide by keeping the cross-section area constant.
This can be done with height and width correction. But I do not like this method. Especially I do not like the width correction, because it makes a small extra patch-line in the center of the cross-section.
See the increasing number of tick-marks in 2D view of cross-section.

I prefer to do this job with modification of side and top radius.
This method did work in VeraCAD 3.84 very well, but made crashes in VeraCAD 4.0 before Beta 16 came out.
In Beta 16, I have made an important modification.
An Oval is determined by 4 Parameters.

These are:
A = Cross-section area of Oval
Rtop = Top Radius
Rside = Side radius
W2H = Width / Height – relation

It is not possible to choose all 4 parameters individually at the same time.
If the user modifies the 2 radii by himself and also the cross-section area, the relation W2H is calculated automatically. It is fixed.
The cross-section area all times is fixed, because it comes from reduction rate.
There is only one option to change the cross-section area that is via reduction rate.
Next VeraCAD will try to hold the relation W2H exactly.
This value comes from the diploma work of Mr Faidi.
It is determined by different reducer roll parameter, like reduction relative machine size, a.s.o.

VeraCAD tries to keep W2H constant, based on the research results.
This is possible, if we do not provide Rtop and Rside.
VeraCAD will calculate these radii by itself.
The relation W2H can stay constant. W2H is one of the Technology parameters and can be displayed in calibration plan navigator.
This is subject of change.

If we provide one of the 2 radii, does not matter if Rtop or Rside, VeraCAD can keep W2H like given by database and so will do.
Width and Height of the Oval will change very little (0.1 mm).
This is not what we like. We like an Oval that is significantly wider than before.
We are on the way to override the research results of the database.

If we change both radii and the cross-section area is fixed, VeraCAD gives up the rule to hold the relation W2H and changes this value. The mechanism works immediately and strong.
If the user changes from the automatic proposal by just 0.1 mm, may be he changes side radius from 10 mm to 10.1 mm and now start to change the Top radius, we will see a quick modification of Oval width.
Now we have a strong instrument to change the width.
Use of the button „Reset Radius“, will go back to the original radius.

Since VeraCAD B16 the values that are not subject to alter are displayed in grey color.
This gives the option to read and to know the value.
If you want to change it the user has to use the checkbox near the value.

I hope this explanation will help to understand the ovals.
For other cross-section types that can spread, we will implement the same behavior very soon.