

## Calculating Asymmetrical Gears

KISSsoft offers various calculation and input options for asymmetrical gears.

Gears usually rotate in one direction only. One of the advantages of using asymmetric gears is the decrease of Hertzian pressure on the flank using the large pressure angle. Thanks to the further development of our software, a complete calculation of asymmetric gears is available, also including strength calculation.

### Calculation options

- Strength calculation acc. Langheinrich
- Contact analysis, Transmission error, Hertzian pressure, Scuffing, Micropitting, Loss, Wear, etc.
- Tooth root stress using FEM

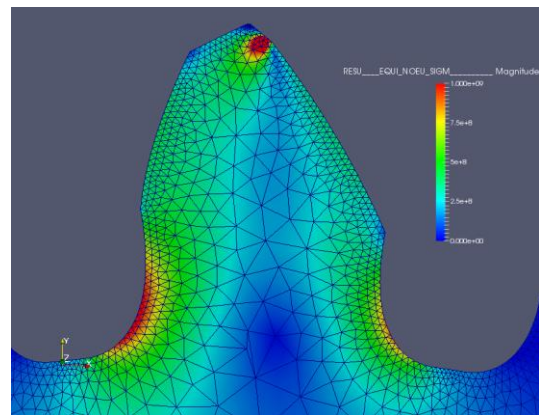
It is possible in KISSsoft to define pressure angle and reference profile independently for left and right flank. Profile and flank modifications can also be specified individually for both flanks, as for symmetrical gears.

The strength calculation for root and flank is based on a PhD thesis from Langheinrich. He modified the ISO 6336 calculation so that it considers different reference profile and pressure angle for left and right flank.

Pressure angle at normal section (left/right)  $\alpha_n$    °  
left right

Tool selection	Reference profile gear	
Input	Factors	
Label	Input...	
Dedendum coefficient	$h_{fp}^*$	1.5000
Root radius coefficient	$\rho_{fp}^*$	0.2250
Addendum coefficient	$h_{ap}^*$	1.1500
Protuberance height coefficient	$h_{prp}^*$	0.0000
Protuberance angle	$\alpha_{prp}$	0.0000 °
Tip form height coefficient	$h_{Fsp}^*$	0.0000
Ramp angle	$\alpha_{rp}$	0.0000 °

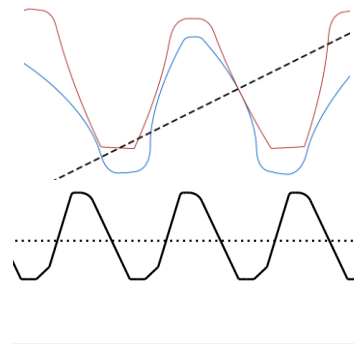
With the FEM tool, the tooth root stress can also be calculated for asymmetrical gears.



### Input variants and calculations

- Modified ISO 6336 or VDI 2736/2545
- Reading in a DXF file

An asymmetrical tooth form can be calculated for all cylindrical gear configurations. This option must be activated in the module-specific settings. Either the modified ISO 6336 or VDI plastic methods can then be used to evaluate strength.



Alternatively, asymmetric gears can be defined also by defined in the tab 'Tooth form' by reading in a DXF file.

If you are interested in acquiring a test license, please contact us at [info@KISSsoft.AG](mailto:info@KISSsoft.AG)