

# Theoretical Basics of Cylindrical Gears

This seminar presents the essential fundamentals and explores the basics of cylindrical gears. The workshop covers the key aspects that all engineers need to know about cylindrical gears. This seminar is designed for young professionals, experienced engineers, designers as well as technicians and for all those who want to refresh their knowledge. This seminar is the perfect basis for the advanced course „Principles to Dimension and Optimize Cylindrical Gears“. The software products eAssistant and TBK 2014 are used in order to illustrate certain principles. Special eAssistant or TBK 2014 knowledge is not necessary.

## Main Topics

- Gear tooth parameters, main gear geometry: Profile shift, generating profile shift, module, pressure angle, helix angle, centre distances, pitch circle, reference circle, modification of tip diameter
- Backlash: Tip clearance, backlash normal plane, backlash at pitch line, radial backlash
- Contact ratios
- Tools: Hob and gear shaper cutter
- Basic rack profiles, protuberance, machining allowance
- Quality, allowances and test data
- Accurate gear tooth form
- Root and tip circle diameter: Generated root diameter, form diameter, diameter of active flank
- Internal gears
- Calculation of load capacity: Geometrical influences, face coefficient, material, kind of material treatment, hardening depth, roughness, lubrication, mode of operation, minimum safeties, modifications, load capacity of tooth flank and tooth root, scuffing (flash and integral temperature), differences between DIN 3990 and ISO 6336
- Involute splines according to DIN 5480, DIN 5482, ISO 4156, ANSI B92.2M, ANSI B92.1 and similar
- Manufacturing drawing: Manufacturing data / drawing details
  - Re-calculation based on drawing details
  - Determination of profile shift, if it is not indicated on the drawing
- 2-D DXF gear tooth form & eAssistant / TBK 2014 3-D CAD plugins for different CAD systems



**The full-day seminar includes practical exercises with eAssistant or TBK 2014. Individual questions are allowed and welcomed during the workshop (depending on time).**

