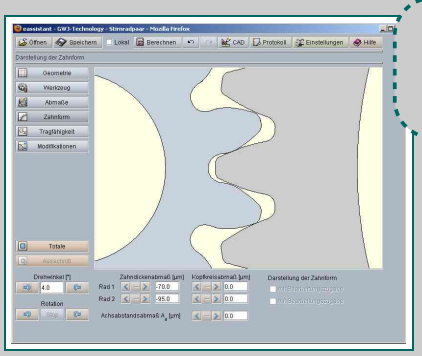
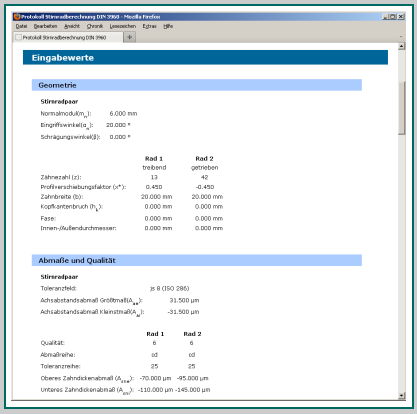
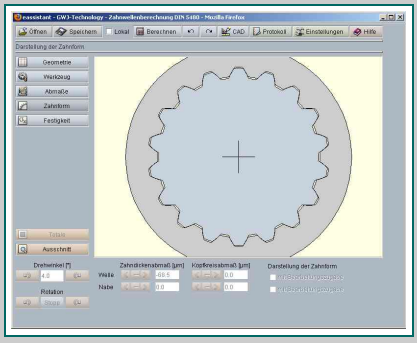
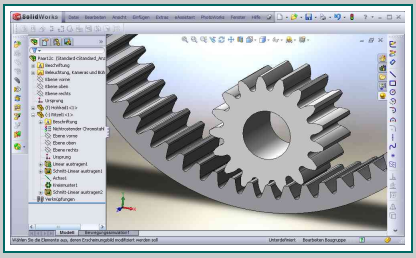
# Basics, Design & Optimization of Cylindrical Gears





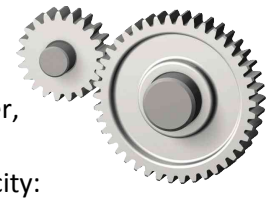




This seminar presents the essential fundamentals and explores the basics of cylindrical gears. The workshop covers the key aspects that all engineers need to know about cylindrical gears. This course also provides in-depth knowledge and skills in the dimensioning and optimizing of cylindrical gears. The attendees will dive to more advanced in-depth, technical issues.

This seminar is designed for young professionals experienced engineers, designers, technicians and for all those who want to refresh their knowledge.

## 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, 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
- Calculation of load capacity: 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
- Internal gears, rack-pinion pairings, planetary gear trains
- Design and optimization: Meshing interferences of internal and external gears, analysis and remedy of meshing interferences, load spectra, special gearings, noise optimization, modifications, guidelines for the design of cylindrical gears: requirements, module, facewidth, selection of profile shift sum, distribution of profile shift, constructive information, optimization of root, flank and scuffing load capacity
- Manufacturing drawing: Manufacturing data/drawing details: Re-calculation based on drawing details, determination of profile shift, if it is not indicated on the drawing
- 2D DXF gear tooth form and eAssistant/TBK 2014 3D CAD plugins for different CAD systems

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