Tolerances and Fit
- ISO-Fit system
- Tolerance calculation

Moments, Approximate Values
- Approximate calculation of the roughness dimension
- Manufacturing technique of the surface
- Calculation and conversion of hardness values
- Moments of inertia of the area, mass moments of inertia

Shafts, Axes, Beams
- Recesses
- Designed diameter for axes and shafts
- Snap rings for shafts
- Reduced shafts
- Grooved shafts
- Crossed bored shafts
- Parallel key notches
- Splined shaft notches

Connections
- General tolerance
- Selection of bolt dimensions
- Determination of forces on the bolt
- Riveted joints
- Soldering joint
- Design of prestressed boltings

Surface Pressure
- Hertzian pressure
- Surface pressure
- Surface pressure for serrated profile and conical press-fit joints

Gears
- Layout of gear pair

Geometry
- Axial moments of inertia of an area
- Torsional moments of inertia of an area
- Axial mass moments of inertia of bodies
- Cross-section properties
- Geometry determination of surfaces and bodies

Hydraulics
- Sealing-surface pressure acc. to DIN/EN
- Wall thickness against inner pressure
- Hydraulic press
- Viscosity, ISO normal oils
- Cylindrical shells
- Compression load, buoyancy in liquids
- Pumping capacity
- Shape of flow
- Flow velocity and inner pipe diameter
- Pressure loss in pipeline elements
- Pipe wall calculation (thin-walled)

Manufacturing Methods
- Metal-cutting
- Deep-drawing and bending forming
- Main machine time and cutting speed
- Partition of length
- Full forward extrusion presses

Physics
- Mechanic of deformable bodies
- Hydrostatics and hydrodynamics
- Kinematics and dynamics
- Rotational movement of rigid bodies
- Damped mechanic oscillation
- Undamped mechanical oscillation (harmonic oscillation)
- Superposition of mechanical oscillation

Statics
- Buckling of rods
- Statically determinate and indeterminate beams
- Thermal expansion and calculation of elongation
- Round plates
- Beam resting on elastic support
- Friction on the bearing / ring pin
- Stress concentration
- Pressure between elastic bodies
- Frames
- Equivalent stress

Dynamics
- Dynamic stress in a tightrope
- Stress of a beam as a result of shock loading
- Stresses in a beam
- Torsional stress in the shaft
- Forces on hoisting devices
- Mechanical power at rotary motion
- Shearing strain
- Inclined plane
- Efficiency factor, total efficiency

Shells of revolution
- Cylindrical shell, membrane stresses and deformations
- Conical shell, membrane stresses and deformations
- Spherical shell, membrane stresses and deformations
- Any smooth figure of revolution, membrane stresses and deformations
- Toroidal shell, membrane stresses and deformations
- Cylinder shell, bending and membrane stresses
- Partial spherical shell, bending and membrane stresses
- Long conical shell with edge loads, bending and membrane stresses
- Cylindrical shell with open and closed ends, bending and membrane stresses
- Toroidal shell, bending and membrane stresses
- Thick-walled sphere under internal and external pressure
- Thick-walled sphere under internal and external pressure

Parameter studies
- Parameter optimization studies and interpretation of results
- Variant analysis

Documentation
- Disclosure of formulary and reference work
- Output and input format XML
- Output format PDF/A - compliant long-time format acc. to ISO
- Output format RTF (WORD compatible)
- Output format HTML
- Output format DXF (2D)
- Output format STEP (3D)
- Data exchange via Windows clipboard
- User interface and documentation German and English

result documents optionally also in Russian, Italian, French, Chinese
Shafts, Axes, Beams
- Beam calculation
- Shaft calculation acc. to DIN 743 (standard version)
- Statically determinate and indeterminate beams*
- Shaft, US standards*
- Column analysis and design*
- Combined stresses and Mohr’s Circle*
- Beam dimensions

Shaft hub connections
- Splined shaft connection
- Parallel key connection
- Split hub
- Split lever hub
- Tapered connection
- Clamping device joint
- Axial bracing
- Cylindrical press-fit connection
- Serrated shaft
- Polygonprofile P3G and P4C
- Parallel key, US standards*
- Woodruff key*

Bolts and Pins
- Crossbolt
- Guiding pin
- Longitudinal pin
- Transverse pin

Screw connections
- Calculation of bolted joints acc. to VDI 2230 (standard version)
- Power screw
- Moment loaded joint
- Bracket connection
- Bolt specification*
- Bolted connection*
- Power screw specification, US standards*

Gearings
- Spur gear, gear rack
- Bevel-, hypoid gear
- Cylindrical worm gear
- Spur gear, US standards*
- Helical gear, US standards*
- Bevel gear, US standards*
- Worm gear, US standards*
- Splines, US standards*

Belt-, Chain drives
- Synchronous belt
- Belt contact
- Normal V-belt
- Narrow V-belt
- Roller chain
- V-belt, US standards*

Roller bearings
- Ball and roller bearings (standard version)

Plane bearings
- Axial plain bearing
- Radial plain bearing
- Plain bearing, US standards*

Elastic springs
- Compression spring
- Tension spring
- Torsion spring
- Disc spring
- Torsion bar spring
- Helical extension*
- Helical compression*
- Helical torsion*

Welded connections
- Calculation of Weld
- Welded joint, US standards*

Bonded joints
- Tensile loaded bonded joint
- Tangential loaded bonded joint
- Torsional loaded bonded joints

Shock absorbers
- ACE

Clutches and brakes
- Clutch
- Brakes
- Plate type*
- Cone*

Linear technology
- Linear guides
- Ball screw

Sealing
- O-ring

* only available in English
MDESIGN libraries - modules

MDESIGN technology
- Material parameters - Consideration of FKM guideline
- General strength assessment

MDESIGN bolt (extension for MDESIGN mechanical)
- Additional draft design acc. to VDI 2230
- Consideration of eccentrically applied axial load
- Definition of company specific bolt geometries
- Hollow screws, flange screws, pin screws, stud bolts
- Calculation of screws in inch dimensions acc. to UNC, UNF, UNEF
- Clamping with up to 10 clamped parts
- Consideration of temperatures
- Individual material database for own materials
- Individual database for own bolt dimensions
- Use of an additional FKM material database
- Use of spring washers and safety nuts
- Possibility of transferring forces from FE results
- Extended level of detail of the plates
- Result-dependent clamping diagrams
- Bolted joints according to Eurocode 3

MDESIGN shaft (extension for MDESIGN mechanical)
- Calculation of hollow shafts
- Consideration of conical fillets
- Consideration of vertical shafts
- Extension up to 50 shaft fillets
- Extension up to 12 bearings
- Specification of individual notch factors
- Calculation of critical bending shaft speed values
- Extensive graphical analysis of results
- STEP interface for CAD systems (MDESIGN connect)

MDESIGN bearing (extension for MDESIGN mechanical)
- Consideration of bearing combinations
- Nominal & modified reference life expectancy acc. to DIN 26281/ISO/TS 16281
- Interpretation with the help of result graphics

MDESIGN author
- System for integrating company-owned calculations
- Build up own MDESIGN modules

MDESIGN LVR
- Load distribution and optimization of spur and helical gears

MDESIGN LVRplanet
- Load distribution and optimization of planetary gears

MDESIGN gearbox
- Design and calculation of complete gears
- Fast variant analysis and continuous safety calculations

MDESIGN gear
- Ring gear with rim influence
- Plastic gears
- Bevel- and Hypoid gears acc. to DIN, ISO, AGMA, DNV GL
- Gearpair micropitting

MDESIGN multibolt
- Multi bolt connections acc. to VDI 2230 Part 2 with integrated FEM solution
- Free flange and connecting design
- Determination of the highest loaded screw
- Export von STEP models or CAD systems (MDESIGN connect)

MDESIGN espresso
- Pressure vessels calculation acc. to AD 2000
- Pressure vessels calculation acc. to EN 13445 (current development project for pilot customers)