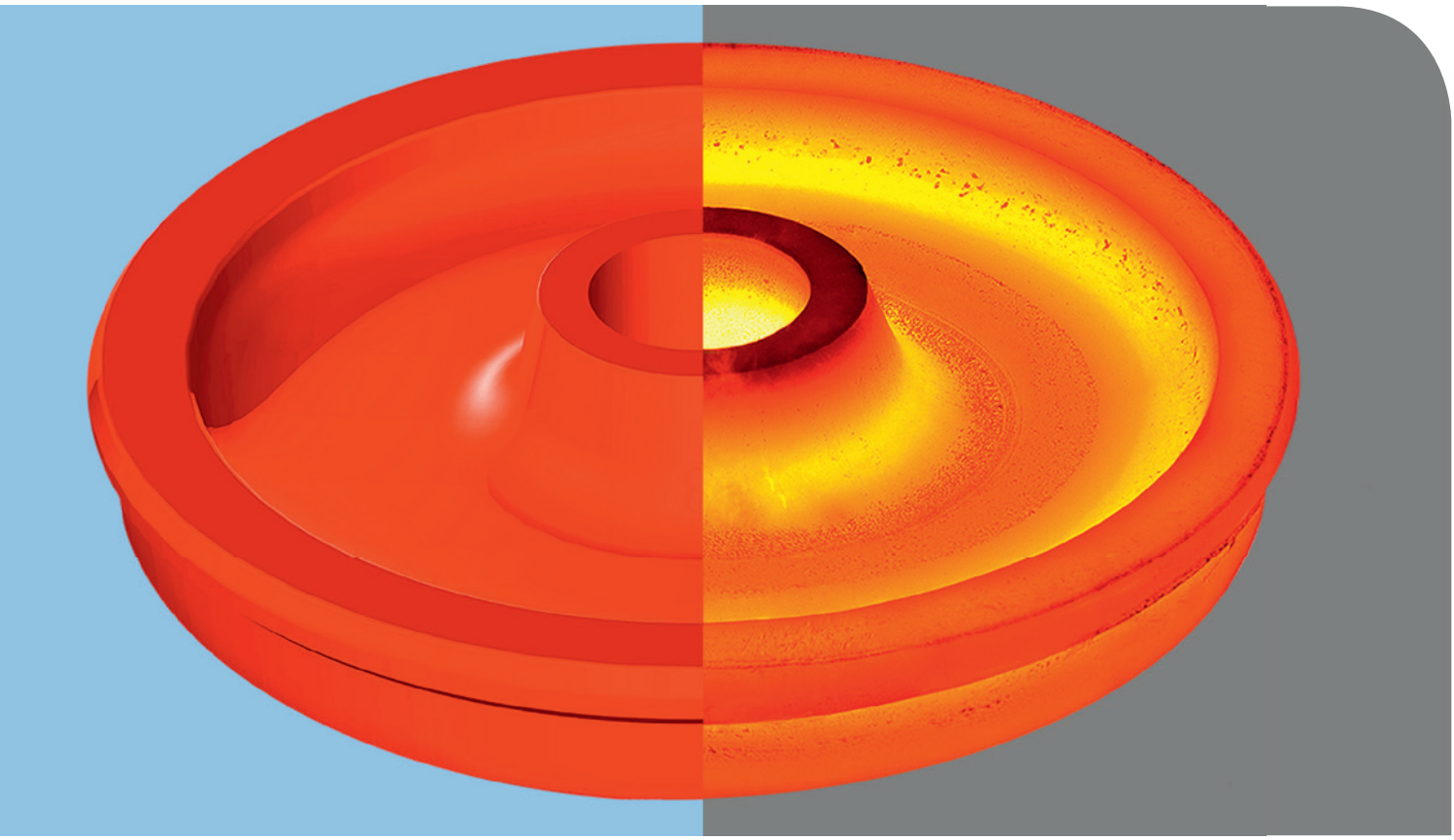
SMS group

ROLLTECH WHEELS

Technology software for enhanced quality and productivity in solid wheel production



ROLLTECH Wheels is a software package developed by SMS group which measurably improves the cost efficiency and product quality obtained from wheel rolling plants. The programme covers the entire production process. It allows wheel rolling plant owners to tap into potential to improve all stages of the process, from material selection right through to the product ready for sale.

BENEFITS AT A GLANCE

- Improved product quality with increased overall productivity
- Faster, more precise sequence planning thanks to a high level of automation
- Less scrap using precise specified settings for the wheel line control systems
- Comprehensive service including consulting, training and software updates
- Know-how-based, user-friendly databases
- Standard programme used worldwide

FLEXIBLE TECHNOLOGIES FOR MORE EFFICIENT PRODUCTION

ROLLTECH software family

Key features of SMS group's ring and wheel rolling plants include consistently high product quality and productivity in the manufacture of rings and solid railway wheels of virtually all shapes and sizes. Decades of experience in the mechanical and electrotechnical design as well as control system and process technology know-how provide the foundation for this.

ROLLTECH is the software family from SMS group used in production planning for seamlessly-rolled, axisymmetrical products in forging shops. The software ensures optimised, automated production processes on the basis of fully developed simulations. The benefits for forging shops: They can configure their material usage more efficiently, reduce design costs and labour considerably, control the forging processes more selectively and reliably attain consistently high product quality.

FLEXIBLY ADAPTABLE THANKS TO MODULAR DESIGN

ROLLTECH has a modular design and is available as both a single-user system and a network version for several users. The ROLLTECH software family can be tailored to the individual requirements of the forging shop and can be modified and expanded as and when required.

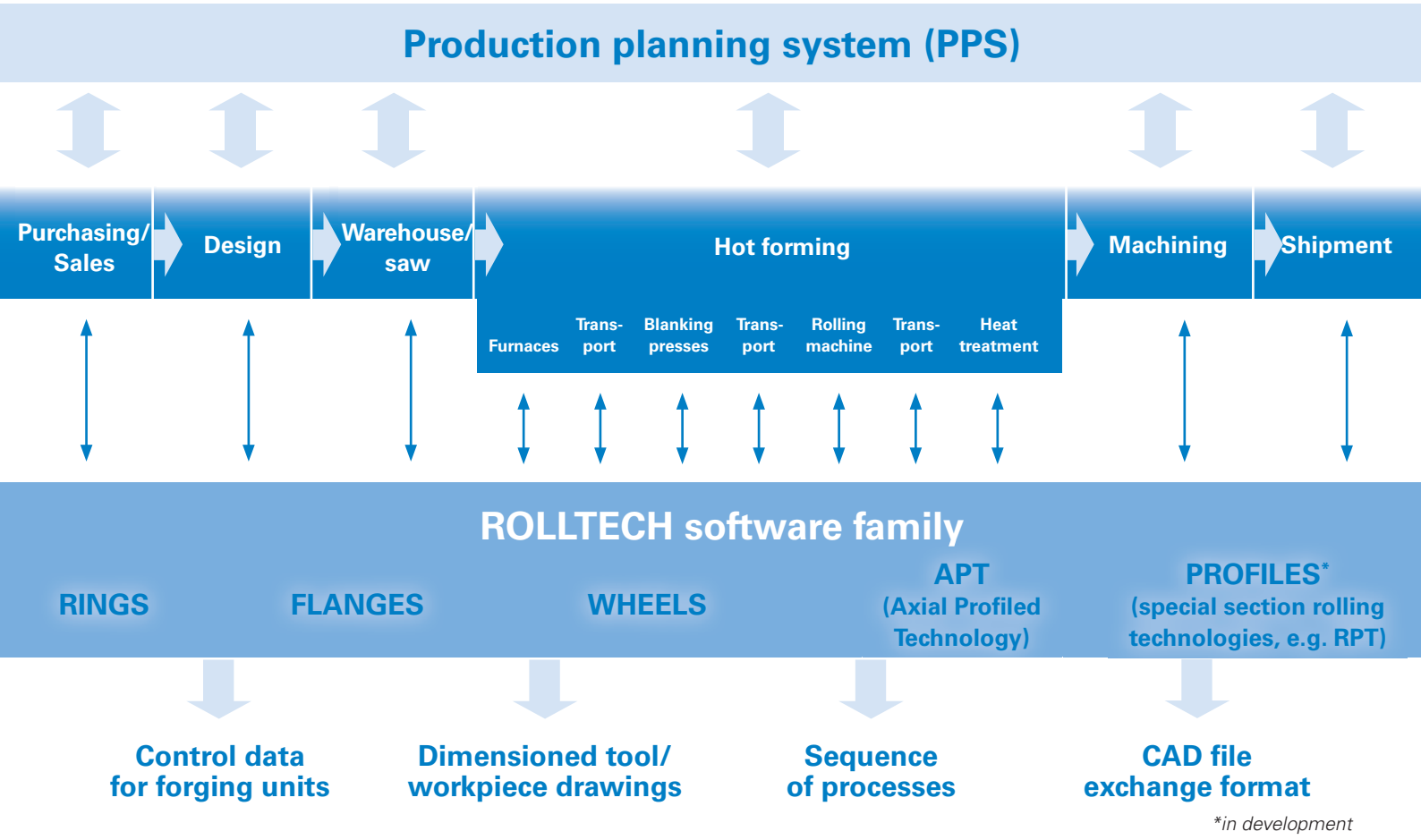
ROLLTECH SOFTWARE FAMILY

ROLLTECH takes all relevant stages of the production process into account and has the right interfaces for this. The first stage is a simulation of the production process: Where can material savings be made (allowances, tolerances, plug scrap, scale)? Which performance limits are holding back faster production? ROLLTECH has the answer to these questions. It helps users identify and eliminate bottlenecks in production. The result: enhanced performance in terms of cost efficiency and product quality and volume.

ROLLTECH provides the simulation results in the forms given below:

- Clear recommendations for production displayed on the screen
- Visual display of tools, workpieces and forging processes
- Printouts of various displays such as production data, technical drawings, graphs and tables, as well as process data for the ring and wheel rolling machine control programme
- Process data for PRESSTRONIC, the control programme for preforming presses
- Files in the DXF format for importing into CAD systems for further design processing for workpieces and tool contours

INTEGRATION OF ROLLTECH SOFTWARE FAMILY INTO BUSINESS WORKFLOW



*in development

BENEFITS AT A GLANCE

- Easy assessment of product feasibility
- Design process support through automatic provision of profile contour drawings for tooling
- Comprehensive overview of existing primary materials for warehouse and saw shop
- Full provision of process data for hot forming – from the furnace through to heat treatment
- Automatic provision of all process parameters for machining of the workpiece
- Latest data for entire system provided from a centralised data pool

HIGHER EFFICIENCY AND QUALITY IN WHEEL PRODUCTION

ROLLTECH Wheels

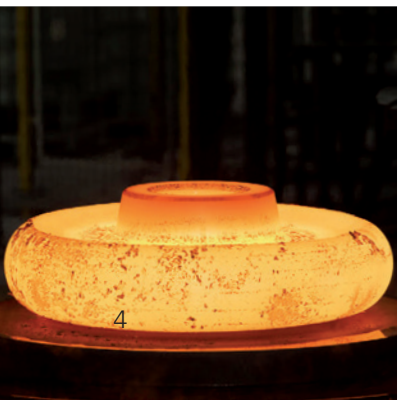
In the field of wheel production the interaction of different technologies and their impact on the product are highly complex issues. Errors in the job planning and production stages can result in product faults and thus scrap. To prevent this, SMS group now offers its ROLLTECH Wheels software package.

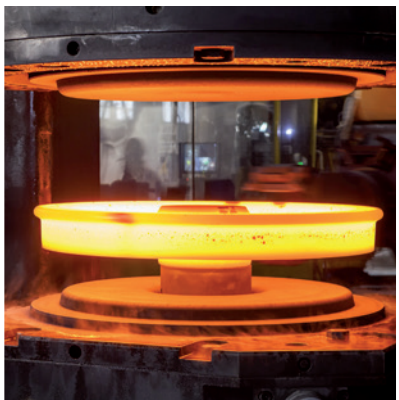
ENHANCED COST EFFICIENCY THROUGH INNOVATION

Two key requirements need to be met when manufacturing solid wheels in forging shops: First, the technical feasibility of a product has to be guaranteed, and secondly the production strategy must meet cost efficiency demands, for example the efficient use of materials or short cycle times. With its ROLLTECH Wheels programme SMS group is offering an integrated solution: the software ensures a high level of automation by pooling technological and restrictive control parameters. In this respect it is comparable with a knowledge database in offering suggestions for smooth production processes. What's more, ROLLTECH Wheels stores complex processes, from the choice of ingot to the machined final form. The result is quality products that can be precisely reproduced. In the complex field of wheel production ROLLTECH Wheels replaces the subjective assessments of operating personnel with hard, reliable data. This helps prevent costly reworks and unnecessary scrap. The result: Material consumption is reduced by five to ten percent, depending on the size and shape of the wheel.

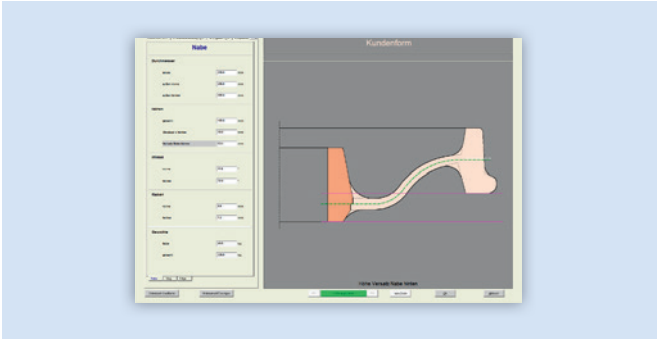
INTUITIVE OPERATION, INTEGRATED KNOW-HOW

ROLLTECH Wheels boasts simple operator prompts throughout and clear, intuitive displays for all the software's applications. This means the programme can very quickly be put to highly productive and above all profitable use in forging shops.





IN JUST TWO STEPS: PRODUCTION SIMULATION FOR A WHEEL

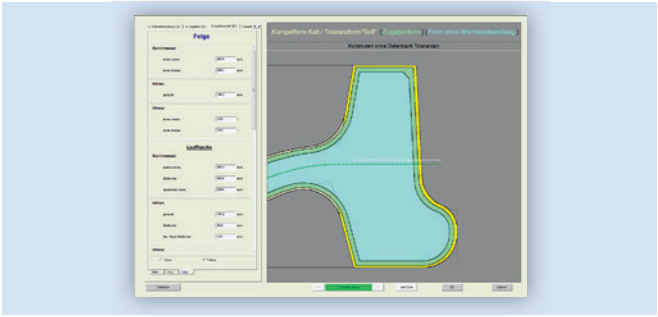


ROLLTECH Wheels is designed on the basis of the established menu structure and basic Windows operating principles.

With ROLLTECH Wheels the procedure for simulating a wheel is essentially limited to two stages:

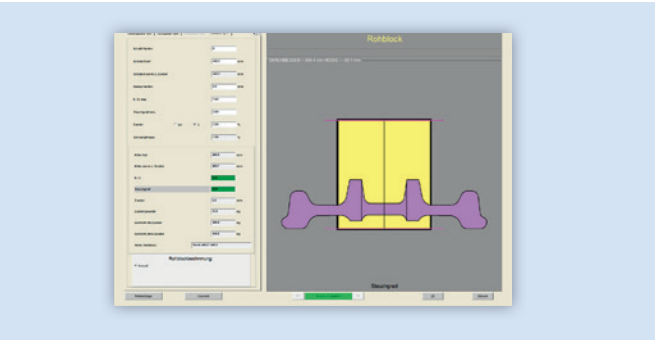
1. **The question of what material:** Plant owners can specify the material from which their product is to be made.
2. **The question of what dimensions:** The owners can also determine what dimensions the machined final form should have. All other process-related variables are then generated automatically.

AUTOMATIC OR MANUAL: FINISHED FORM, ALLOWANCE FORM, TOLERANCE FORM



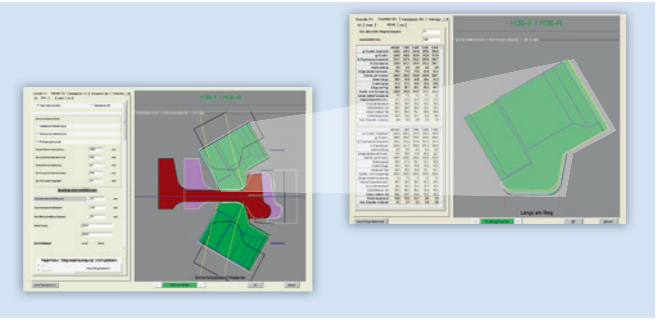
On entering the geometry of the machined finished form, the allowances for machining and production tolerances are determined either manually or automatically, depending on the preselected settings, by the operating personnel.

CALCULATION OF THE IDEAL FORM: THE DESIGN OF THE PREFORM



ROLLTECH Wheels calculates the ideal blank based on the tools being used (rolls/presses) and the minimum requirements for the deformation characteristics. Intentional deviations from this or those necessary for production engineering reasons provide the basis for the correct blank geometry.

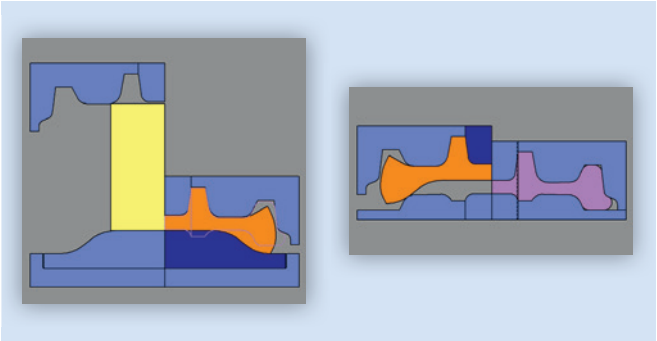
ANIMATED GRAPHICS: CHECK, EDIT AND MANAGE TOOLS



ROLLTECH immediately displays any geometric constraints, such as tool collisions or erroneously entered data using a graphical representation of the entire production process. This allows the operator to check quickly whether changes made to the tool dimensions are appropriate and correct.

The graphic displays can also be enlarged, making it easier to assess the feasibility of new products. All the tools necessary for the production process are maintained in a database. With just a few clicks of the mouse the operating personnel can access more detailed daily updates or technical drawings – quickly and easily.

IT COULDN'T BE EASIER: BLANKING PRESS ACTIVITY DISPLAY

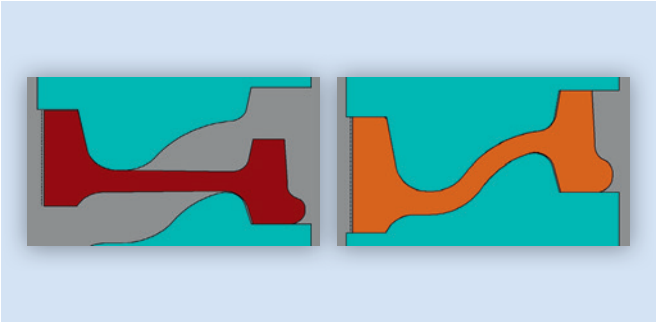


ROLLTECH displays the machine's status in terms of tooling for blank production, making it quick and easy to check:

Press tools:
- Upper die
- Lower die
- Piercer geometry

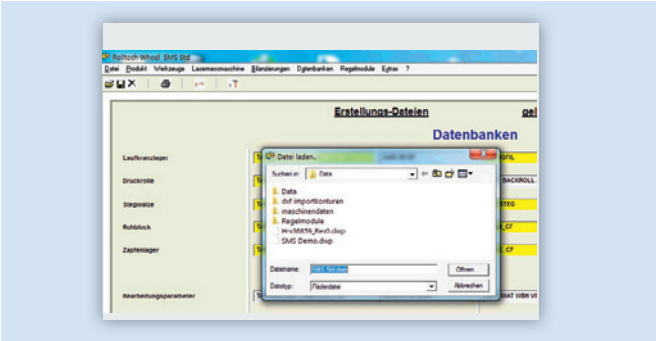
Press activity:
- Upsetting of the ingot
- Pre-punching

OPTIMISED DISHING OF THE ROLLED WHEEL



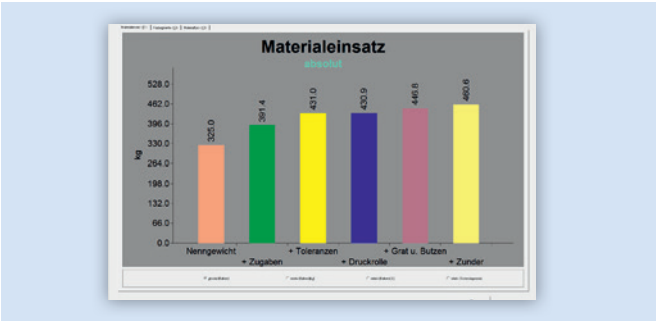
The final shape of the forged/rolled wheel is usually produced on a dishing press. For this the tool contours for the upper and lower dishing die are taken from the dish form of the wheel. The start and end status of the dishing process are also displayed at the same time, in order to check the tool contours.

MINIMAL ERROR SOURCES THANKS TO CONTROL MODULES AND DATABASES



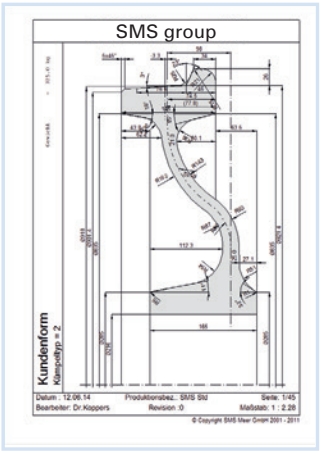
With its integrated control modules and databases ROLLTECH Wheels ensures a high level of reproducibility. This frees the operating personnel from subjective influences, and the error rate when inputting process data is reduced considerably.

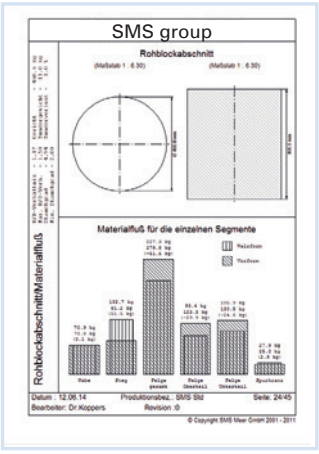
GOOD CONDITIONS FOR PRODUCTION: THE SIMULATION RESULTS



There are a number of ways to output the simulation data, depending on individual requirements. All process-related data is displayed in either graphical or tabular form:

- Geometry of the product in the sequence of stages
- Geometry of the product in all stages
- Press and wheel rolling machine control data





EXPERIENCE, EXPERTISE AND KNOW-HOW

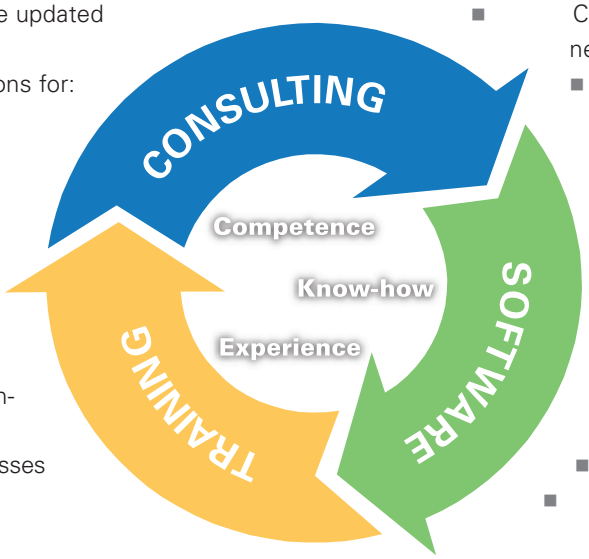
Complete package

ROLLTECH SOFTWARE – ALWAYS UP TO DATE

- Software maintenance for existing simulation programmes
- All software programmes are updated to the latest versions
- Software development/add-ons for:
  - Production planning
  - Process simulation
  - Process control
- Training for programme users

COMPREHENSIVE CONSULTING SERVICE

- Consultation on forming technology
- Optimisation of existing processes
- Reduced material input
- Process substitutions
- Expanded product range through the introduction of new methods and practices
- Geometric product enhancements
- Material-dependent innovations
- Process engineering for production technologies
- Technical optimisation of existing equipment
- Consultations prior to or when making new investments
- Supervision and/or implementation of R&D projects
- Modernisation of machine control systems
- Support with investment decisions through to start of production



CUSTOMISED TRAINING COURSES

- Process engineering training for operating personnel
- Machine operation
- Strategic and methodological optimisation of process sequences
- Introduction of tools for systematic job planning

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