

Machining

Precision for plastic components



Precision for small production runs

Machining is the fastest, most economical way to arrive at a finished plastic component, in particular for small production runs. In this field, Ensinger can provide a complete production service for your precision components, systems and assemblies. In our Cham location, our highly skilled engineers produce precision components to the very narrowest tolerances.

Over 30 years of experience in the field of engineering and high-temperature plastics form an outstanding basis for the most stringent quality standard. No matter what the design of your plastic part and the complexity of its geometry: You will benefit from the pooled expertise of the entire Ensinger group. Our Sales Department will be pleased to support you throughout the implementation of your complete project. The advice we offer includes not only material recommendations and component configuration, but also the design of the finished part taking into account the material used and all defined tolerances.

In the vast majority of cases, we process semi-finished products or injection moulded parts from our own production. The experience spectrum of the Machining Division encompasses every key branch of industry. Outstanding customer satisfaction is guaranteed by our highly motivated and qualified team of experts. Ensinger attaches enormous importance to training its own skilled personnel in-house and reducing the turnover of staff. Our aim is to achieve the best possible economic outcome for our customers.

Technical component development: from the prototype to volume production

During an initial discussion, we enquire about the functions to be performed by the component in its intended application. Advance consultation and co-operation with our technicians and engineers produces valuable knowledge which flows into the design process, eliminating a number of steps such as time-consuming and cost-intensive modification and grinding. On the basis of the designs, drawings are then derived complete with dimensioning and plastic material-specific tolerance specifications. Manufacture of complex, top-quality plastic components can then begin.

Extensive machine base - extreme production output

Our machine shop in Cham is equipped with highly flexible ultramodern equipment. 26 milling centres and 23 turning centres take care of high-performance production and supply reliability in a three-shift operation.

Facts and figures

Established 1980
Ensinger plant in Cham

Workforce approx. 115

Worldwide supply capability

Certification:
DIN EN ISO 9001:2000,
DIN EN ISO 13485:2003,
QSF-B (EADS)

Engineering expertise
from a single source

Trade-specific knowledge
for perfect products

Flexibility for large and
small production runs





Automated equipment of milling centres with insertion robots and palletizing systems



Milling with simultaneous actuation of 5 axes

Production possibilities

Milling

- Twenty-six CNC machining centres
- Thirteen 5-axis centres, of which three are automated
- Seven 4-axis centres, of which three are long-bed machines
- Five 3-axis centres

Benefits in production

- Milling centres with internal tool cooling systems
- Solid model milling program generation
- Insertion system for medium and large volume runs
- Production and machine data acquisition
- Clamping system with female coupling and pallet on each milling centre
- Milling automation

Five-axis milling with post-processor

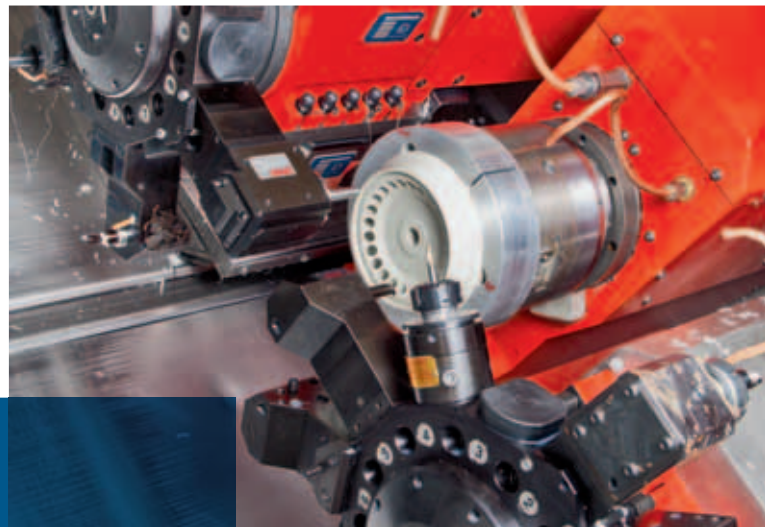
- Machining of freeform surfaces
- Solid model milling program generation
- Milling with simultaneous actuation of 5 axes

Turning

- Twenty-three CNC machining centres
- Five machining centres with Y-axis (of which one with B axis)
- Three machining centres for large volumes
- Two machining centres for the production of single parts and prototypes

Benefits in production

- Turning centre with powered tools
- Counter-spindle for reverse-side machining
- Two turrets for simultaneous machining
- NC-controlled machines for prototype production
- Insertion system for medium and large production runs
- Bar feeder with 3 m length and short loader with 1.5 m length
- Production and machine data acquisition



Finish machining

- Surface finish on components using blasting systems and vibratory grinding
- Laser inscription for engraving of parts (for batch traceability)
- Deburring and part cleaning with disinfectant and check under the microscope
- Ultrasound welding
- Assembly and packaging in the clean room
- Module assembly and function tests, e.g. seal tests





Quality

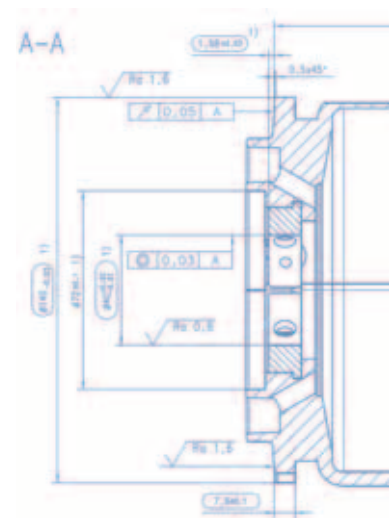
We attach maximum importance to supply our customers with the best quality at all times. To allow our work results to be assessed in compliance with current standards, our products and processes have to be continuously monitored. Equipped with everything from tactile co-ordinate measuring machines to optical measuring devices, surface gauges, a contourograph and a large selection of other measuring instruments, we are ideally placed to meet every conceivable measurement-related challenge.

Quality assurance

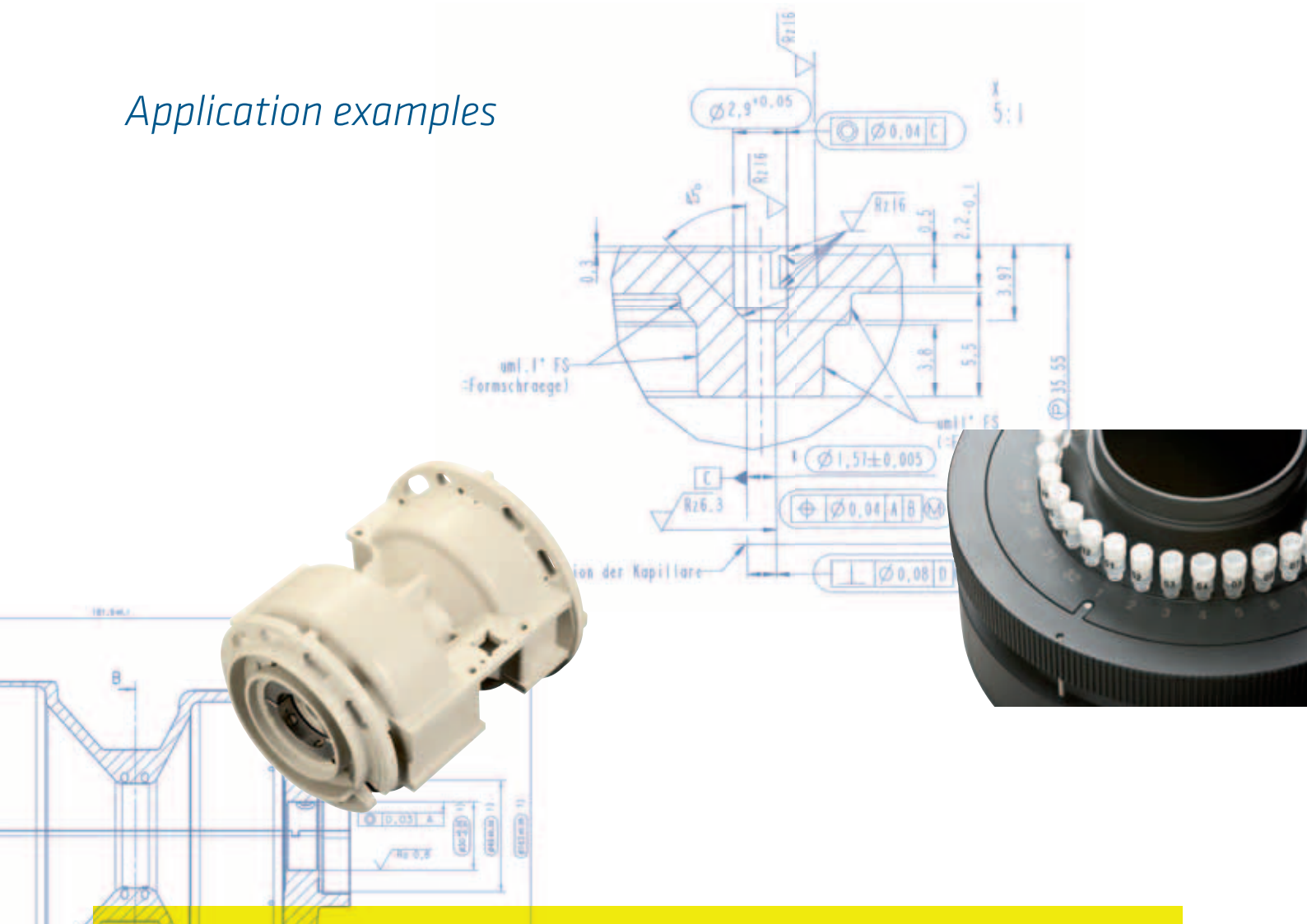
Our daily work includes in-process recording and documentation. Above and beyond certification to DIN EN ISO 2001, we are also geared to currently valid sector-specific requirements. In addition to the standard audits, our company is regularly audited and assessed by our customers. Customers and suppliers are subject to the specific standards and regulations of their respective branches of industry. Our various certifications verify our compliance with these requirements.

Batch traceability

Seamless batch traceability is a matter of course at Ensinger. And the fact that a high percentage of the semi-finished products we process are from Ensinger's own extrusion department represents another clear quality advantage. Internal article number management with storage of fixtures for production help to optimize repeat accuracy. The result: a consistent standard of component quality.



Application examples



Assembly for a computer tomograph

TECAPEEK (PEEK)

- Internal geometry manufactured using 3D milling
- Machining on 5-axis milling machine
- Dimensional tolerances of ± 0.02 mm are adhered to
- Issue of shape and position tolerances, adherence to a concentricity of 0.03 mm and radial runout of 0.05 mm
- 100% inspection of dimensional, shape and position tolerances using co-ordinate measuring machines

Pad cover

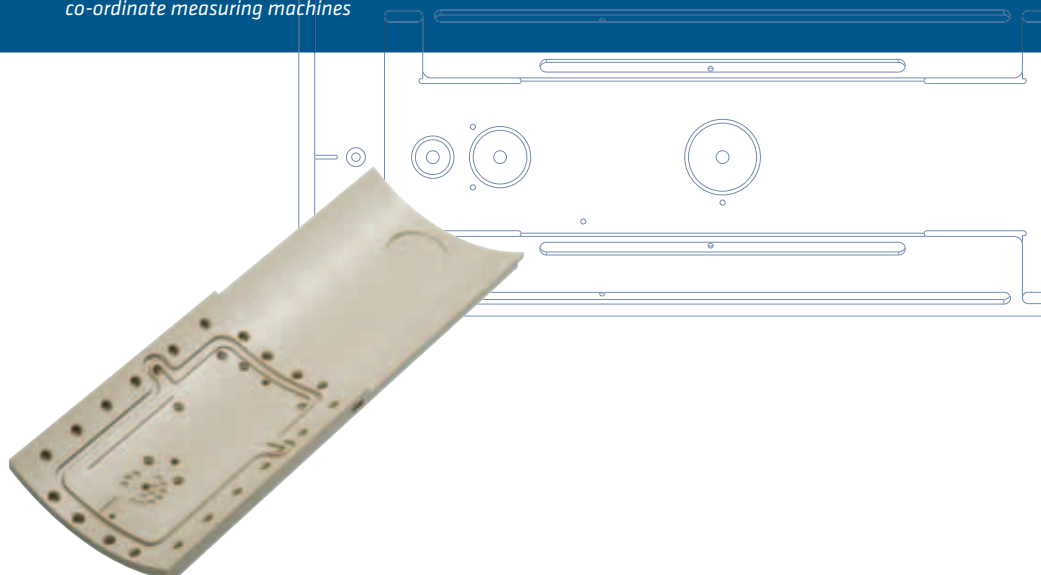
TECAPEEK (PEEK)

- Parts are pre-processed and thermally treated several times
- Machining in 5-axis milling centres using 3D milling technology
- Part-specific geometry entails a major risk of warping (shape and position)
- Dimensional tolerances of 0.05 mm are implemented
- Perpendicularity of 0.05 mm and parallelism of 0.1 mm are implemented
- 100% inspection of dimensional, shape and position tolerances using co-ordinate measuring machines

Capillary carousel for PCR analysis

TECAPEEK MT black (PEEK)

- High precision drilling tolerance
- Tolerances of ± 0.05 mm are implemented
- 100% inspection of drilling tolerance
- Complete module assembly
- Laser lettering
- Cost reduction implemented
- Prototypes and small production runs made from stock shapes, volume production from pre-injection moulded blanks



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