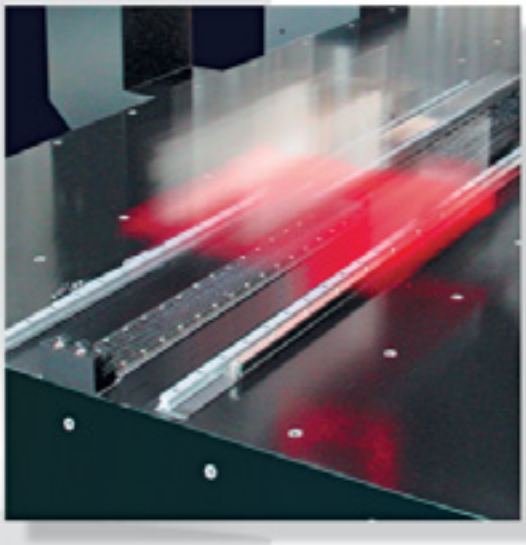
SCHNEEBERGER
MINERALGUSSTECHNIK



SCHNEEBERGER
mineral casting components
for imaginative solutions

SCHNEEBERGER mineral casting technology

SCHNEEBERGER is a leading manufacturer of high-precision mechanical and mechatronic linear guideways as well as sub-assemblies and complete systems that use linear technology.
SCHNEEBERGER's customers include market leaders in the machine and machine-tool manufacturing sector as well as manufacturers of semi-conductor equipment, medical technology, electronic manufacturing and inspection equipment.

The SCHNEEBERGER Group has focussed its extensive mineral casting expertise at SCHNEEBERGER Mineralgusstechnik s.r.o. in its Cheb location (Czech Republic) in order to produce technologically and economically superb machine and plant structures as well as turnkey systems involving linear technology.

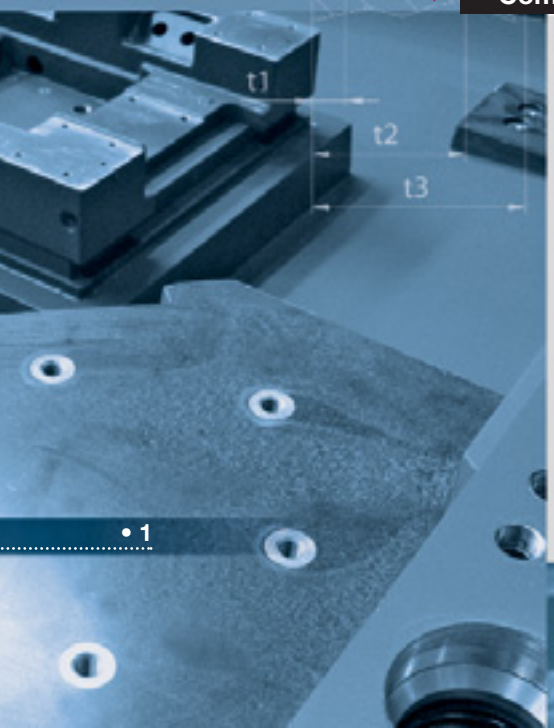
Our global presence with strong sales and support organisations guarantees closeness to the customer in all major industrial economies. Comprehensive logistics capabilities and local support, assure a close partnership starting at the project planning phase.

Roggwil, Switzerland
Main company domicile
and production facility

Cheb, Czech Republic
Product line mineral casting
SCHNEEBERGER

- SCHNEEBERGER COMPANIES
- SCHNEEBERGER SALES DEPARTMENTS
- SCHNEEBERGER REPRESENTATIVES
- SCHNEEBERGER SALES AREAS IN THE USA

Comprehensive Engineering Know-how from a single source



The integration of SCHNEEBERGER's mineral casting expertise represents a consistent continuation of the company's market-oriented product strategy. The inclusion of innovative mineral casting technology in SCHNEEBERGER's application know-how offers our customers a wide range of benefits:

- The incorporation of the mineral casting and linear technology offer great design flexibility and innovative system solutions.
- The combination of both technologies produces both commercial and technical benefits.
- Our experienced engineers can design complete, customer specific, product solutions by utilizing their extensive knowledge in both the mineral casting and linear technologies.
- As the customer, you benefit from a more efficient and seamless process, from the initial concept, through production and to the delivery of the final product.

Technology Know-how

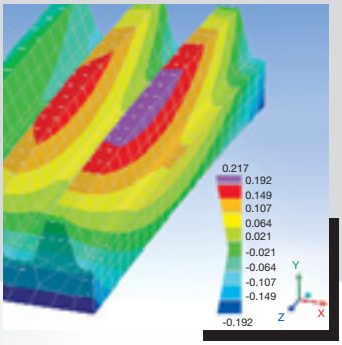
Mineral casting has been used for many years as an alternative to cast iron and steel structures and is now the preferred technology for numerous applications.

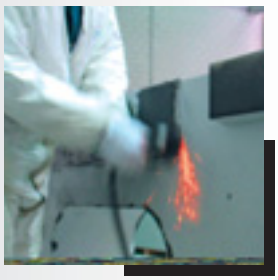
SCHNEEBERGER mineral casting technology combines the technological skills of the SCHNEEBERGER Group with those of «Fritz Studer AG». Our extensive experience with mineral casting, and its many and diverse application possibilities, make us a powerful partner for machine and system builders. Our customer and application support starts at the concept phase; thanks to FEM (Finite Element Analysis) we are able to simulate the effects of dynamic and static loads without the need to build a prototype machine. In addition, we can verify the required characteristics of the cast component parts and the overall thermal behavior.

Manufacturing know-how

SCHNEEBERGER mineral castings are manufactured by specialist staff at our production facility in Cheb. The entire process from the design phase and the actual casting process, through to final finishing is subject to rigorous quality procedures. This guarantees that complex machine structures and sub-assemblies with integrated guideways are produced to the specified dimensions and to the highest quality.

Thermal vertical deformation
to 1/100 mm





The advantages of SCHNEEBERGER mineral casting

Shaping and strength
The mineral casting process provides an exceptional degree of freedom with respect to the shape of the components. The specific characteristics of the material and of the process result in a comparatively high strength and a significantly lower weight.

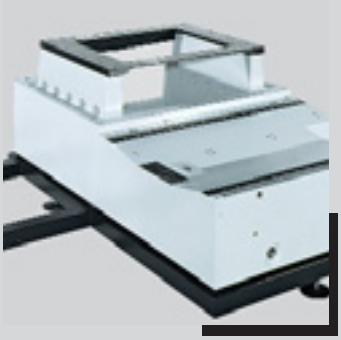
Economical dimensional accuracy
In many instances the mineral cast components are cast to the final dimensions because practically no contraction takes place during hardening. With this, further expensive finishing processes can be eliminated.

Integration of infrastructure
The mineral casting process enables the simple integration of the structure and additional components such as guideways, threaded inserts and connections for services, during the actual casting process.

No corrosion
Mineral-cast components are resistant against oils, coolants and other aggresive liquids.

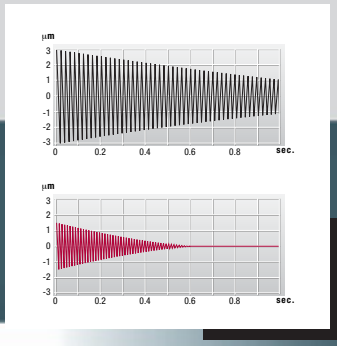
The manufacturing of complex machine structures
What would be inconceivable with conventional processes becomes possible with mineral casting: Several component parts can be assembled to form complex structures by means of bonded joints.

Precision
Highly precise reference or supporting surfaces are achieved by further grinding, forming or milling operations. As a result of this, many machine concepts can be implemented elegantly and efficiently.



Greater vibration damping for longer tool service lives

SCHNEEBERGER mineral casting achieves up to 10x better values of vibration damping than steel or cast iron. Thanks to these characteristics, an extremely high dynamic stability of the machine structure is obtained. The benefits that this has for machine tool builders and users are clear: better quality of surface finish of the machined or ground components and longer tool life leading to lower tooling costs.



Good thermal stability

Mineral casting reacts very slowly to temperature changes because the thermal conductivity is significantly lower than metallic materials. For this reason short-term temperature changes have significantly less influence on the dimensional accuracy of the machine tool. A better thermal stability of a machine bed means the overall geometry of the machine is better maintained and, as a result, geometrical errors are minimised.

Conclusion

SCHNEEBERGER mineral casting is not only an alternative to conventional cast-iron or steel constructions, but in many instances the superior technology.

It also has a major commercial benefit: SCHNEEBERGER mineral casting components are up to 30% cheaper.

Characteristic material values of SCHNEEBERGER mineral casting

Density	2.30 – 2.45 kg/dm3
Modulus of elasticity	40 – 45 kN/mm2
Tensile strength	15 – 20 N/mm2
Compressive strength	100 – 120 N/mm2
Bending-tensile strength	28 – 30 N/mm2
Coefficient of linear expansion	11.5 – 14x10-6 K-1
Thermal conductivity	1.5 – 2 W/mK
Specific heat capacity	ca. 1.2 kJ/kgK
Log. decrement	0.03 – 0.10
Linear contraction after casting	approx. 0.3 ‰

The range of applications of SCHNEEBERER mineral casting

Thanks to their product properties, short processing times and their cost-effectiveness, SCHNEEBERGER mineral castings are used in almost every branch of the machine-tool and metalworking industry. The range of products covers parts weighing only few kilograms to others weighing well over 10 tons. Today, our products are used in the machine tool industry, the metrology and electronics industry, in woodworking, in automation systems, in plant and general engineering as well as in medical equipment technology.

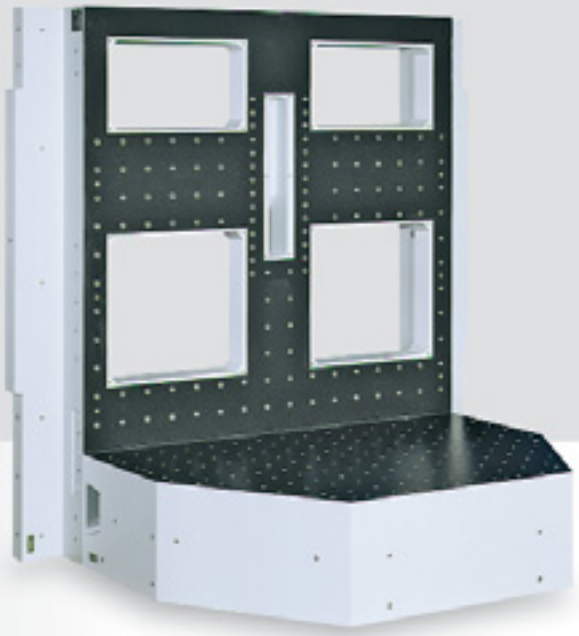
Take a look at these spectacular examples:

FPD Inspection Installation
In the production of flat panel displays for TVs and PCs, inspection installations check the integrated circuits of the screens. For this purpose, machine structures with 3-axis of motion are required.

The illustrated machine structure, with the vibration-damping benefits of SCHNEEBERGER mineral casting, contributes to a considerable reduction in processing time. The damping characteristics allow for a lower «step and settling time»of the drive. A special lacquer coating in addition renders the mineral casting structure suitable for clean room applications. The components cast into the structure are manufactured out of stainless steel.

Stands for Automatic Assembly Machines
For the production of medical components, such as insulin syringes, machines for the automation of assembly processes are required. These automatic assembly machines are conceived and manufactured the customer's specification.

The illustrated stand is manufactured out of two mineral casting components that are bonded together. The fixing threads in a grid arrangement and the integrated compressed air supply, with cast-in compressed air reservoir, result in a much more versatile component. Thanks to several built-in connections, a flexible utilisation of the compressed air is assured. A special lacquer coating makes the stand suitable for use in the medical industry.



Basic housing for dental technology
In the production of individual tooth crowns and multi-section dental bridges, blanks made out of special ceramic materials are used. To process these, 5-axis milling and grinding machines are utilised, capable of implementing the most complex geometries in a highly precise manner. In addition, these machines are capable of achieving the required high surface quality, significantly reducing cracks and fissures at the edge of the tooth crowns.

The illustrated structure is utilised as base for a machine of this type. The corrosion resistance, the outstanding damping characteristics, the simple constructional features as well as the possibilities for a demanding design of the machine are the essential advantages of SCHNEEBERGER mineral casting for this application.

Stand for wide-band grinding machines
Special wide-band abrasive machines for grindigh/ sanding wooden boards.

The stand illustrated is part of a range of modular machines, which thanks to the characteristics of mineral casting achieves an optimum surface quality. The mineral casting stand absorbs vibrations 10x better than conventional steel constructions. The complex structure is assembled and bonded together to form a stand out of 4 or more simple mineral casting components and a steel girder. This modular construction makes the most diverse machine types in 3 overall lengths possible.

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