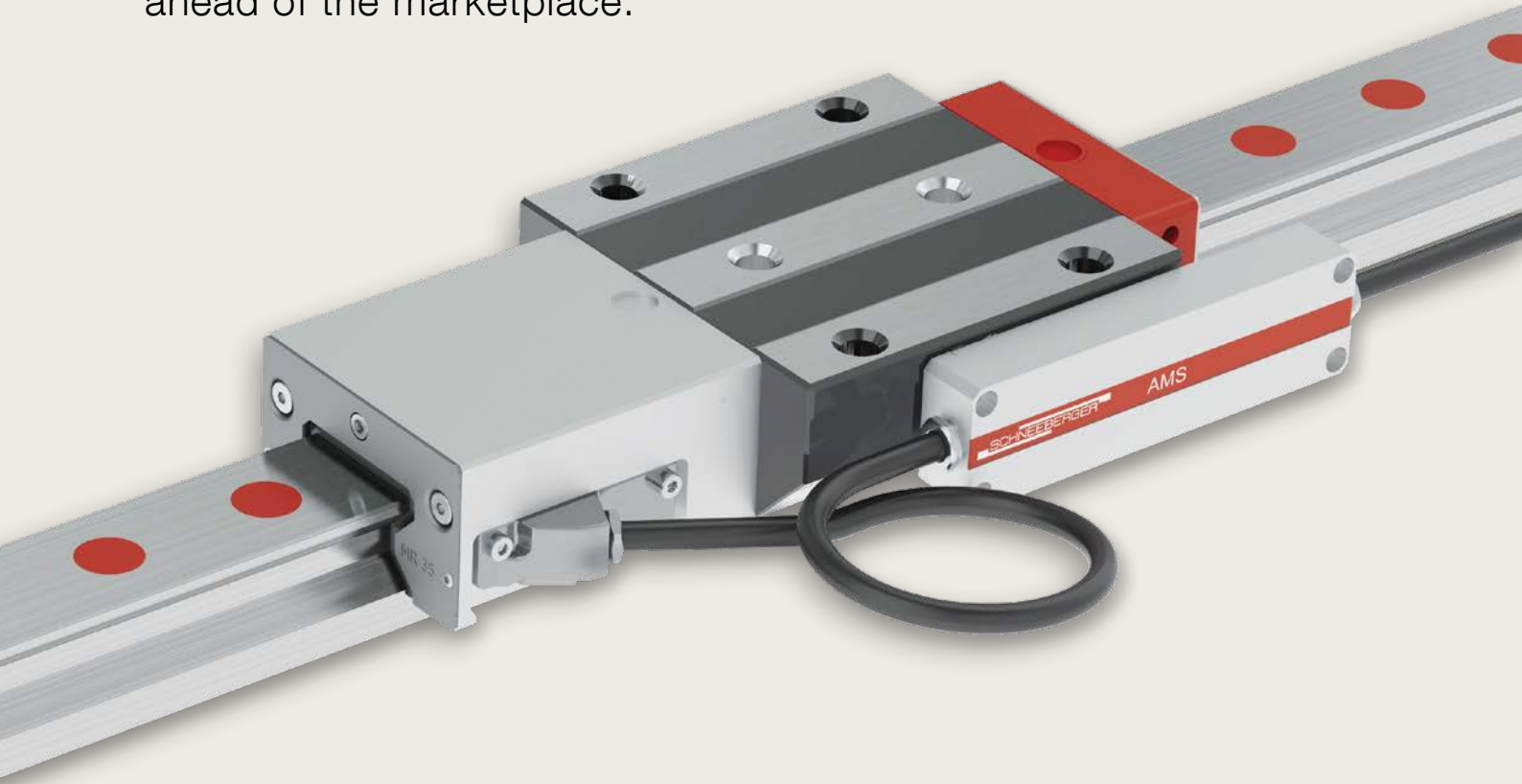




Schneeberger Linear Technology
High precision, innovative and reliable

The secret of success.

With its expertise in engineering Schneeberger is always one step ahead of the marketplace.



Until a few years ago, mechanical engineers had to install separate mechanical linear bearings and electronic measuring systems. Now, with its integrated AMS measuring system, Schneeberger has combined the measurement and guide functions in one unified product.

Electronically supported linear technology not only allows for precise, low-friction movements from one point to another, but also provides instant information about the system's current position. The AMS measuring system reduces thermal variations and functions more precisely and cost effectively, in extreme conditions, than a system with separate components.

Inventions such as this integrated measuring system are clear evidence of our engineering expertise and technical excellence. Founded in 1923, Schneeberger built the foundations of modern linear technology in 1945 and has remained at the top of this highly competitive market ever since. Back then, Schneeberger revolutionised linear technology with the invention of frictionless linear bearing guides.

In recent years, we have further developed this efficient principle of linear bearings, which remains key to this day, with our built-in cage control system.



At both of its key production facilities in Germany and in Switzerland, Schneeberger is targeting investment into a permanent round of quality improvements and cost optimisation. With additional production plants in the Czech Republic and in China, Schneeberger has a local presence in markets that are experiencing particularly dynamic growth.

In the global market for linear motion technology, Schneeberger is unique. We are an independent SME. This structure forms the basis for our dynamic, customer-focused and successful approach to business.

Four-pronged approach to reducing CO₂ and energy (Blue Competence®)

Our linear frictionless guides lose a minimum amount of energy through friction, allowing our customers to use less energy in their drive systems, which can be kept small as a result.

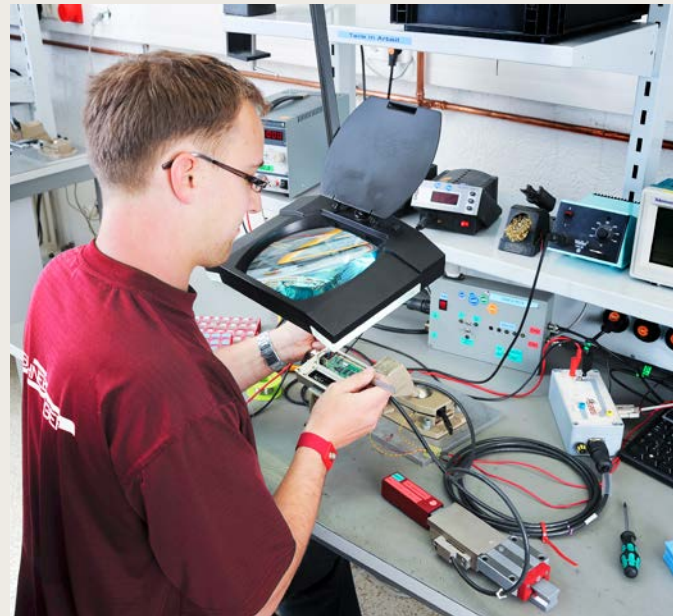
Our AMS measurement system allows highly precise measurements to be taken in workshop environments without the need for high cost compressed air sealing.

Our mineral casting construction technique uses a cold casting process, without the need for additional heat. As a result, our energy consumption and carbon footprint is much lower and better than can be achieved by manufacturing processes with traditional steel and iron-based technologies.

Our racks enable direct drives which, in comparison to other drive types such as ball screws or hydraulic cylinders, transmit the maximum amount of energy into linear motion with the minimum amount of heat, friction and other energy losses.



Schneeberger Switzerland



Schneeberger Germany



Schneeberger China



Schneeberger Czech Republic



Abdullah Acarbas
Machine Operator
Gear racks



Kabatnik Werner
Technician Quality
Assurance

CORE COMPETENCIES

Solving problems on our customers' behalf.

Schneeberger is not just about technical excellence, but also provides quality advice and guaranteed lines of supply.

How does Schneeberger manage to consistently provide its customers with new technical and cost effective solutions? Let our five key process phases demonstrate our abilities to you.

Phase 1: Consultation

Every day we see new applications and develop new solutions for linear motion technology in a variety of projects. We offer this treasure trove of experience to our customers. The earlier we can become involved in the design phase of a new product, the better we are able to integrate our systems and help customers achieve the corresponding synergies. Experience our excellent advice for yourself! Our sales engineers will visit your site for a no-obligation initial meeting.

Phase 2: Concept & Design

During this phase, we create value for our customers by working with them to develop the best possible solutions for their products. Our engineers have early involvement in drawing up intelligent solutions for your requirements, making sure that nothing is overlooked prior to production.

Phase 3: Production

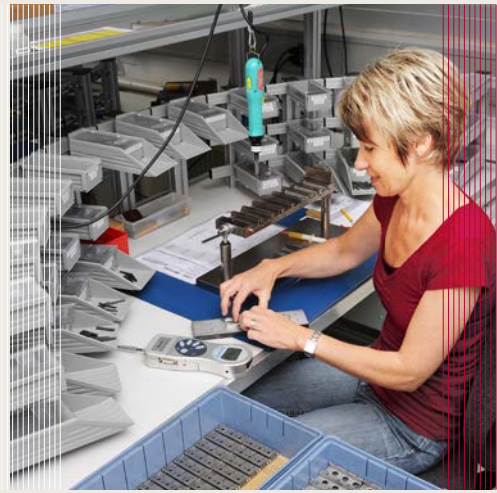
The technical excellence of Schneeberger comes to the fore during the high-precision production of structural parts and in assembly of components. When precision and consistency of linear motion technology play such a decisive role in determining the competitive advantage of our customers, we leave nothing to chance. We assemble clean room and vacuum applications in our special assembly shops which meet clean room class 1000 requirements.



Andreas Keller
Machine Operator
Profile guideways



Heinz Zimmerli
Assembly Technician
in the clean room



Brigitte Nützi
Assembly Operator
Miniature guideway

Phase 4: Logistics

Ensuring continuity of supply is key for our customers, especially those who operate in cyclical markets. We pay particular heed to this, with stability in production, planning and quality.

Our finely honed logistics processes guarantee on-time delivery of our customer's products for assembly.

Phase 5: Support

If we do our jobs properly in consultation, concept and design, production and logistics phases, you will hardly need our support services. Nevertheless, we are always there for our customers whenever they need us, with comprehensive, expert assistance. Our customers love our honest and straight-to-the-point way of communicating.

Throughout the five process phases, we provide our customers with the best in expertise and commitment.

«I am responsible for seven small stages in the miniature guideway manufacturing process. These include sorting, assembling, lubricating and packaging the small parts after they have been through ultrasonic cleaning. This is real precision, fingertip work.»

Brigitte Nützi

«I work in the production of gear racks. I particularly enjoy the challenges presented by the complexity of this work. When I do a good job, I know that I am playing a vital role in ensuring that Schneeberger delivers high quality parts to its customers on time.»

Abdullah Acarbas

«I work in manufacturing of profile guideways. My role in the production process is to set up the rails on the grinding machine. The process is very demanding, precise work.»

Andreas Keller



Racks



Linear bearings



Measuring systems

PRODUCTS

The entire spectrum.

From standard components to complete systems, Schneeberger offers a unique spectrum of products and services. And we do it all for our customers' benefit.

Alongside standard components, Schneeberger manufactures complete systems, often consisting of a range of Schneeberger components.

When we build the complete system, our customers benefit from our expertise in components. As we manufacture the components ourselves, we can develop them so that they can be optimised for use alongside each other.

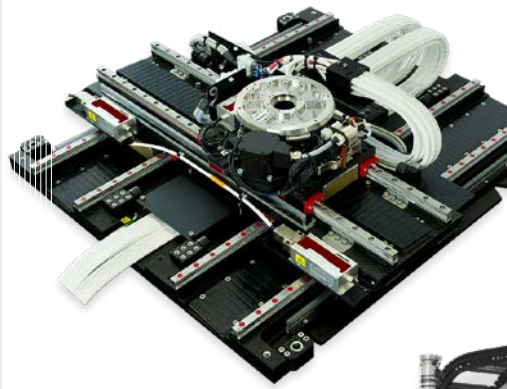
And vice versa: As we also build complete systems, we know what requirements our components have to meet in order to do their jobs in complex systems. Schneeberger's vertical range of manufacturing is unique in the marketplace, just like the advantage that our customers derive as a result.

1. Our components

If our customers want to do their own system integration, they can buy the high-precision, reliable components from us to cover their needs for a broad range of linear motion applications. If specific modifications or additional functionality are needed, we can realise these quickly and expertly.



Micro frictionless tables

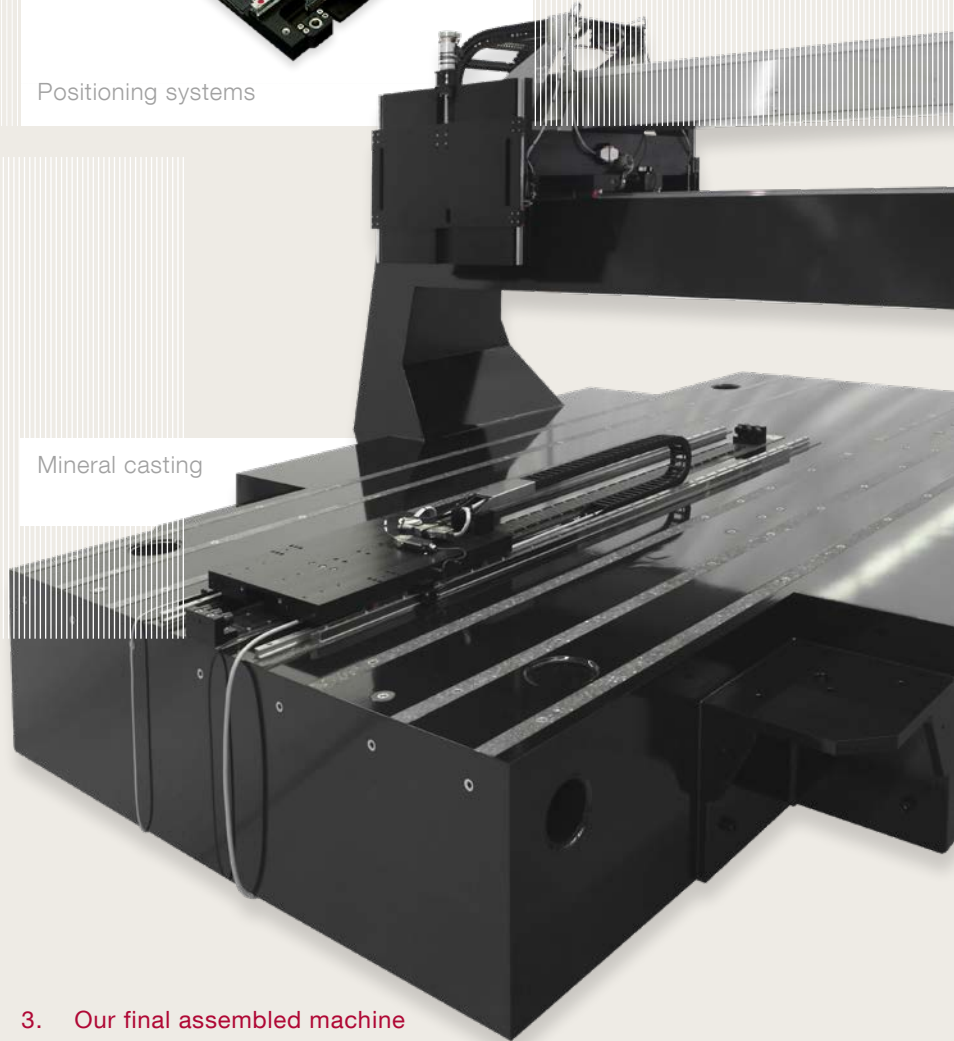


Positioning systems



Profiled guideways

Mineral casting



2. Our highly integrated positioning and motion systems

We will be happy to take on your system integration project and can offer a guaranteed source of supply even if your manufacturing volumes change rapidly. Our core business is concerned with offering you more flexibility and reducing risk. Our standardised range of systems and platforms provide cost-efficient solutions for your positioning and motion needs, and can easily be integrated into your application.

3. Our final assembled machine structures

At our customers' request, we can mount standard components or highly integrated positioning systems straight on to machine bases. As we also manufacture the mineral casting bases ourselves, we are able to adjust the final assembled machine structure to achieve the best possible fit with customers' kinematic requirements.



FORMULA-S

Our guides increase life expectancy.

Not only of machines, but also of people.

Wherever devices and machines need to make highly dynamic and precise linear movements, linear guides with the integrated FORMULA-S cage control system meet the requirement.

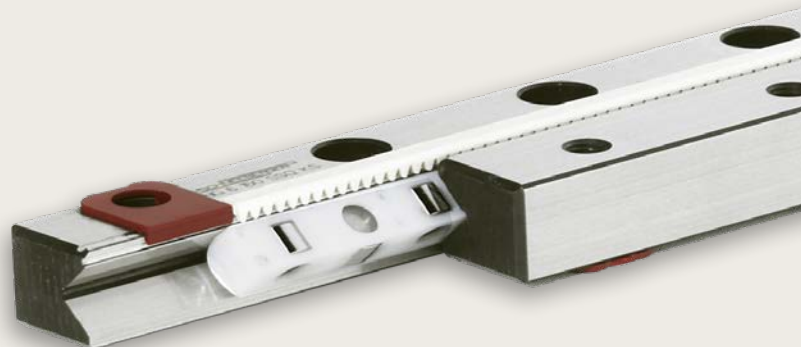
FORMULA-S guarantees that the cage, which is supported by frictionless bearings, is guided reliably in the centre of two rails.

Linear bearings play a vital role in the prevention, diagnosis and treatment of tumors. The more precise the movements, the more meaningful the tomography images, x-rays and tissue probes. And that produces more accurate diagnosis.

FORMULA-S is also a key component for the electronics sector. The technology is so mature that Schneeberger now supplies the world's leading manufacturers of wire bonders, sometimes also integrating customer specific products.

The customer benefits of FORMULA-S

1. The cage is always centered despite any application-specific factors (such as uneven load, high acceleration, installation orientation, temperature variation).
2. No time lost due to corrective adjustments, resulting in very high MTBF and MTBR.
3. Selected preload has no effect on the control system.
4. Long lifetime thanks to selection of materials and rack profile.
5. Supports vacuum applications to 10^{-7} mbar.





MINIATURE BEARINGS

Imagine a smartphone without Schneeberger.

High precision linear motion technology allows miniaturisation of electronics.

Our day-to-day lives would be inconceivable if highly integrated electronics components did not exist. They are at the core of our smartphones, sat-navs and credit card readers.

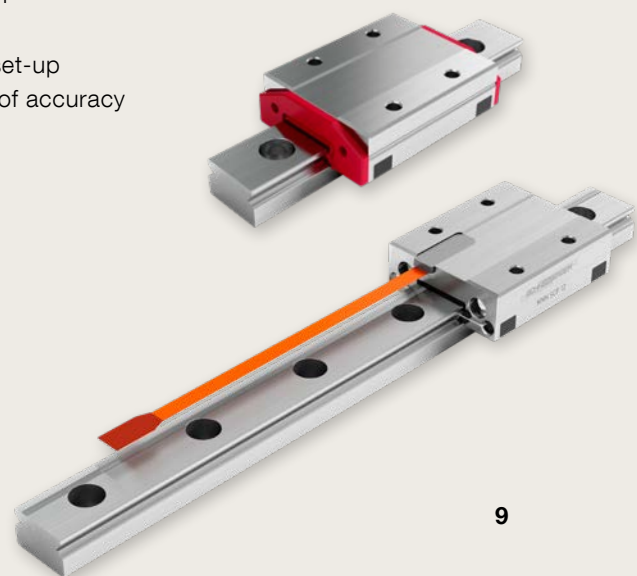
The scale of development in electronic communications technologies is breathtaking, and Schneeberger has made a significant contribution to these advances. Thanks to high-quality linear motion technology, it is possible to place even the smallest components reliably, very rapidly and extremely precisely onto carrier strips and attach and weld the micro-thin wires from the integrated components extremely close together.

Our miniature bearings allow our customers to achieve the greatest density of components on their circuit boards, and make the production process ever more precise and fast and therefore more economic. They generate real added value for the electronics and semiconductor industries and its end customers.

Our MINISCALE miniature products even feature an integrated optical measuring system. This combines the two core functions of guiding and measuring within the smallest footprint.

Customer benefits from miniature bearings

1. Low cost construction
2. Minimum footprint
3. Fast installation and set-up
4. Consistent high level of accuracy
5. Long lifetime





MONORAIL MR

Efficient exploitation of wind power.

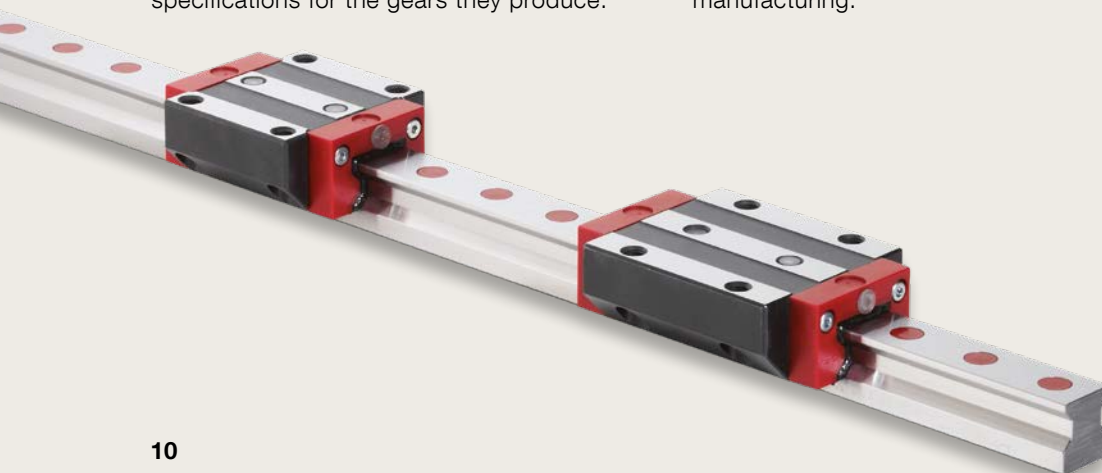
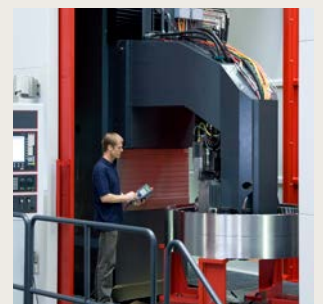
Schneeberger MONORAIL profile guideways in use in wind power system manufacturing machines.

When it comes to the production of high precision gears, our customers demand powerful, highly accurate gear cutting machines. The resulting gears are used in gearboxes of various sizes – increasingly in applications for wind power, products that are enjoying massive growth rates.

Manufacturers of gearboxes for use in wind turbines are absolutely reliant on machines to cut and mill gear wheels that guarantee precisely reproducible and extremely accurate gear parts. This gear machinery demands high precision and highly rigid roller guideways so that our customers can meet the exacting specifications for the gears they produce.

Our MONORAIL MR profile guideways offer the best possible solution for this demanding engineering task which has tolerances in the micron range. They provide a high-quality linear motion technology that meets the most precise requirements, including high rigidity, high dynamic and static load bearing capacity, the best possible running tolerances and additional special straightness properties.

The Schneeberger MONORAIL MR profile guideway thus helps wind power systems become more efficient and robust, while reducing noise. There are many other exacting gear applications that require high precision gear manufacturing.



Exploring new shores.

When research vessels investigate climate change in the Antarctic, Schneeberger has already played its part in the expedition.

Our linear motion technology makes an important contribution in the construction of large ships and their drive systems in particular. Gigantic crankshafts and driveshafts are turned, milled, ground and repaired on large, multipurpose extended-bed lathes – with exacting tolerances despite a 40 metre stroke. When our customers approach us about applications such as this, we respond with custom bearings and gear racks. We also supply components for use in electricity generation, for example in the manufacturing of rotor heads or gears for wind turbines. This means we can make our own contribution to exploiting new sources of energy.

Our custom bearings and gear racks can be used in any application where standard bearings do not meet the machine builder's requirements due to size or accuracy. The results are customer-specific, innovative solutions.

We can create guideways with running characteristics, with exceedingly high rigidity or with extremely high load carrying capacities. When you come to Schneeberger, you do not have to accept any compromises. Our universal machine pool and highly competent engineers allow us to respond to complex customer demands for products both quickly and efficiently. Initially in small batches for prototype requirements, and then in larger series volumes, guaranteeing consistently high quality and a reliable, secure source of supply.



Schneeberger opts for mineral casting.

The technical, economic and ecological benefits are clear to see.

When it comes to situations involving extremely dynamic yet very precise movements, mineral casting is the ideal technology for base construction, with clear technological, economic and ecological advantages over steel or cast iron.

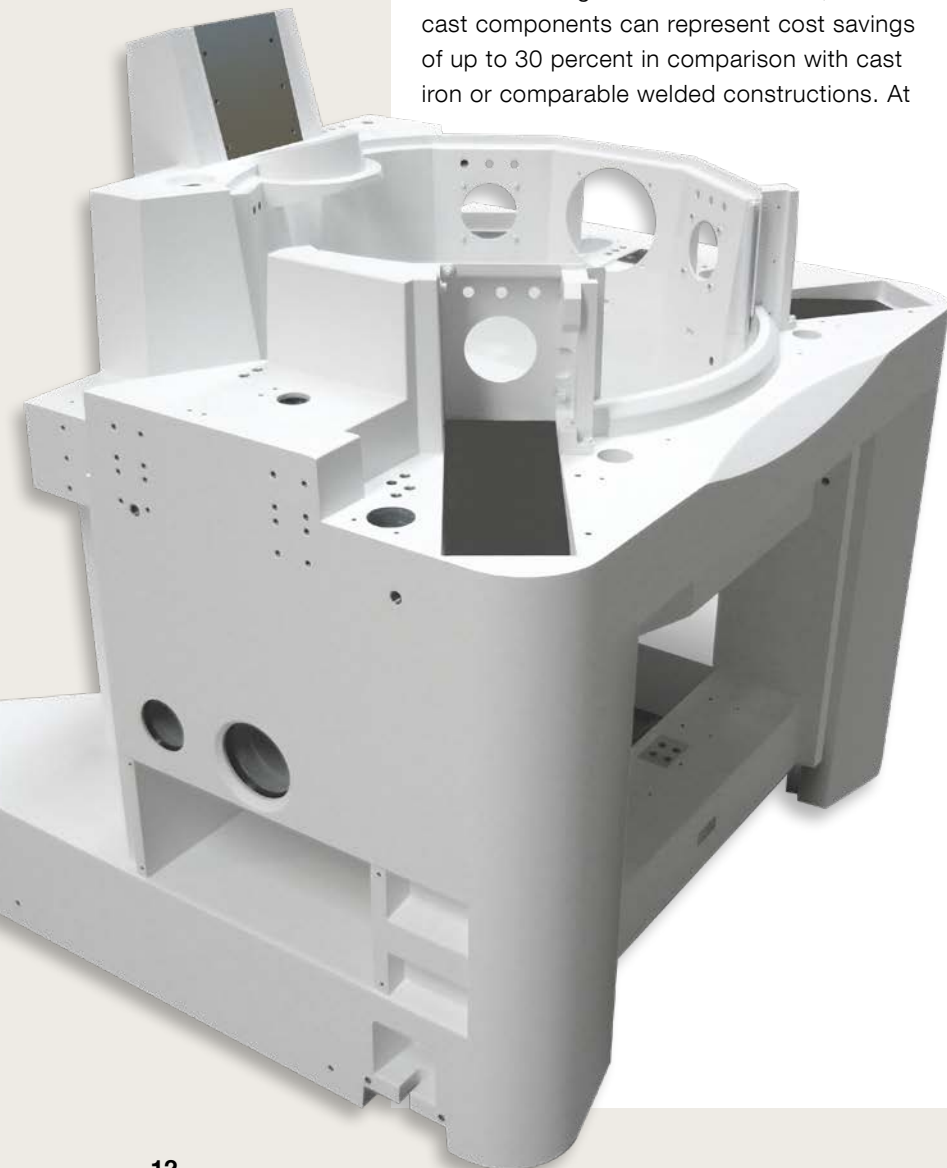
Its excellent vibration damping properties, chemical resistance and thermal advantages have convinced our customers – not just in machine tool construction, but also in medical technology, in the solar power and electronics industries and in the packaging sector, as well as many other fields of application.

When the right materials are used, mineral cast components can represent cost savings of up to 30 percent in comparison with cast iron or comparable welded constructions. At

the same time, manufacturing time and delivery lead times are significantly shorter.

As a result, Schneeberger opts for mineral casting. In 2007 we opened our newest mineral casting facility in Cheb, in the Czech Republic. It has quickly become the most modern facility of its kind in the whole of Europe.

The entire process of product development and manufacturing is subject to the most exacting quality requirements, from construction to the casting process and the high precision finishing work. This means that we can guarantee our customers that we can supply even the most complex machine structures and assemblies with guideways and other elements installed and aligned, on time, to specification and with an inspection certificate if required.





SAMPLE APPLICATION

A single cast.

Mineral casting from Schneeberger offers unbeatable advantages, which come to the fore in the optical industry.

Anyone who works with optical components and surfaces, such as industrial lenses or glass for spectacles, cannot afford to cut corners when it comes to surface quality, precision and productivity. After all, their customers' sight depends on it, as does the ability of machine manufacturers to compete in the optical industry.

Powerful machines can manufacture well over 100 spectacle lenses per hour, with consistently reproducible levels of quality. In order to realise the high engineering dynamics and required product geometry while maintaining the utmost precision, machine constructors require a machine bed that has exemplary vibration dampening and thermal stability, such as can only be achieved by mineral casting.

This means we are an indispensable partner for manufacturers of production equipment, not only for high quality industrial optics but also for fine spectacle lenses.

Schneeberger produces its mineral casting in a cold casting process using minerals and

epoxy resin. Thanks to the especially perfected production methods, we can achieve exceptionally flat and parallel reference surfaces, whether for guideways or other precision components such as measuring scales or linear motors.

As Schneeberger manufactures both mineral cast constructions and linear bearings, we are able to adjust the bearing support surfaces so that they are an optimum match for each bearing type and for the specific application. This ensures the most linear, parallel and flat operation possible for linear movements, resulting in optimum technical and economic solutions.

Tailored for every customer.

Thanks to its high level of engineering expertise, Schneeberger is also able to control complex motion systems with great precision.

In Schneeberger you have a partner who will supply you with well thought-out solutions for your entire motion and positioning requirements for many different applications.

We rely on expertise in three core fields:

Engineering: We project manage and develop highly complex positioning systems, including those for particularly demanding applications such as high-vacuum environments.

Applications: We have successfully tested a range of system approaches in many different industries under many different conditions. On this basis we work together with our customers to evaluate the optimum products and project-specific solutions.

Manufacturing and integration: We manufacture mechanical sub assemblies and assemble highly complex and precise systems, while guaranteeing a very secure source of supply.

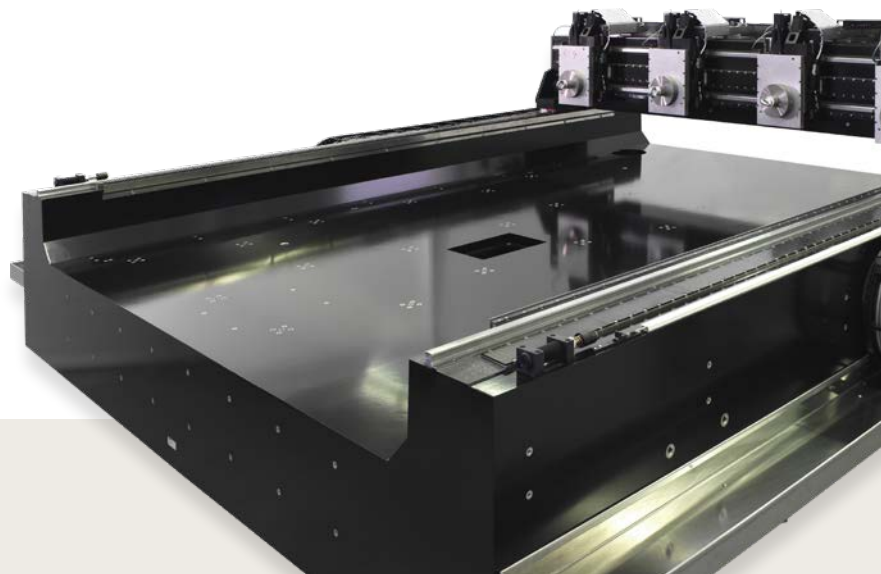
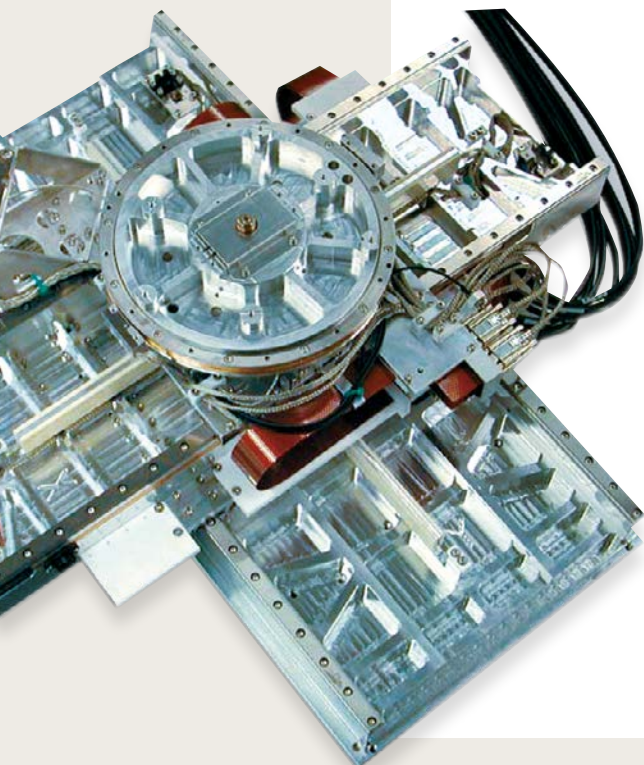
Using our standard component range, we are able to produce tailored solutions within a

very short time frame. From single axes with integrated control units to highly complex systems based on mineral cast constructions. When it comes to integration, we always go just as far as the customer wants us to.

Our positioning systems are used in all sorts of situations.

Our engineers have a broad technical knowledge of many different branches of industry and can therefore quickly adapt to problems posed by our customers, including in new fields of business. Our great capacity for innovation allows us to develop complex positioning systems in the following markets:

- Semiconductor
- Flat Panel
- Solar
- Electronics
- Optical
- Printing
- Laser processing
- Dental and medical technology





EXAMPLE APPLICATION

Highest degree of precision for the smallest syringes in the world.

Schneeberger positioning systems are helping revolutionize leading industrial and research laboratories with nano-syringes.

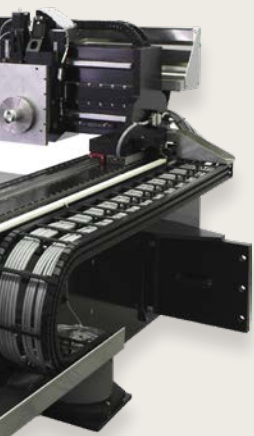
The smallest syringes in the world consist of structures and channels which are only a few nanometers in size.

These unique nano-instruments are now being used as part of a complete system. By positioning the tips with a high degree of accuracy and a precise amount of force, leading industrial and research laboratories are now able to utilize the nano-syringes in applications that were previously not possible.

The next generation of these tools will allow fully automatic motion of the nano-syringe in X, Y and Z directions for the first time. As a result, cultivating cells in a multi-well plate will

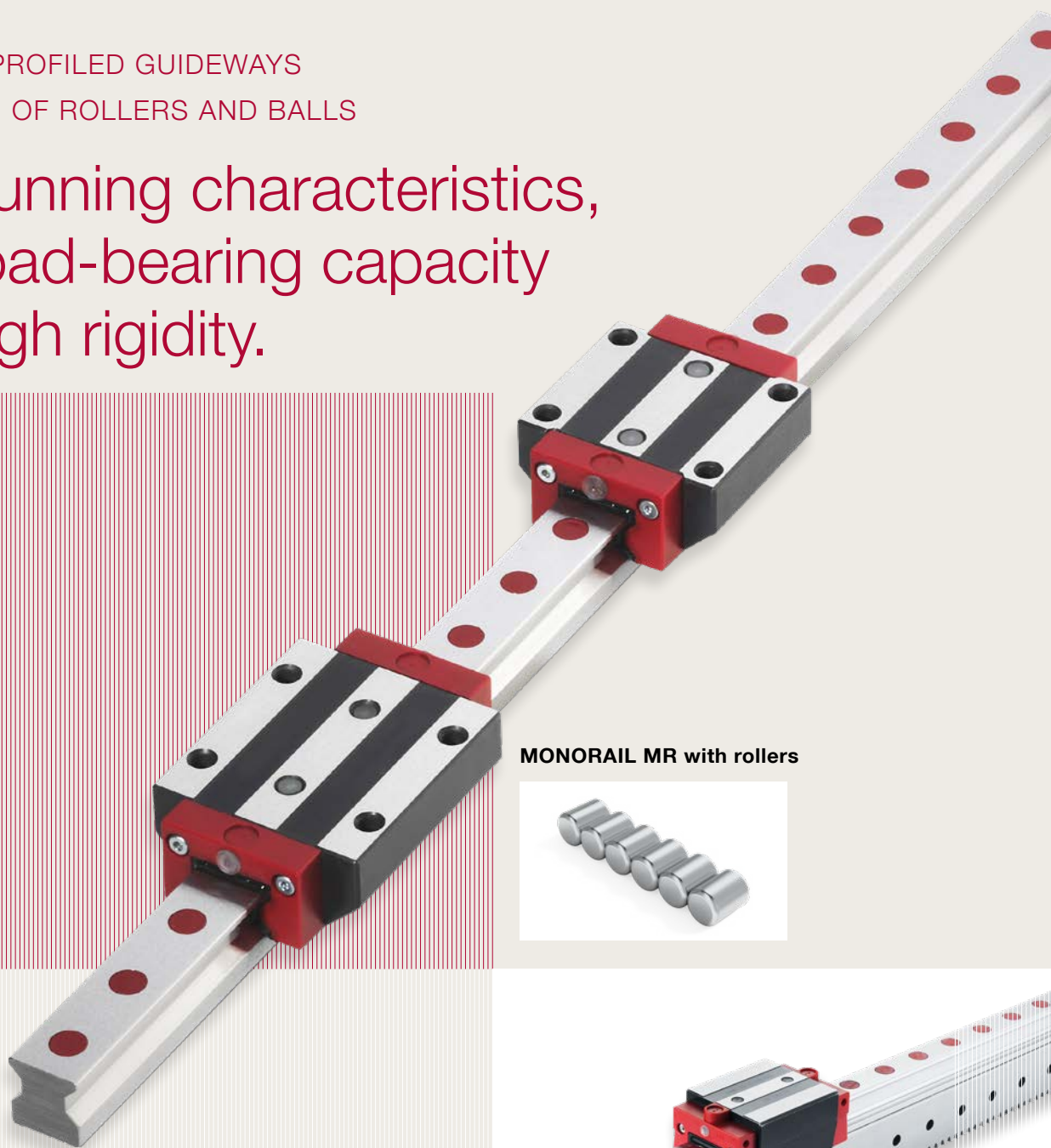
be able to be done with nanometer-level precision in the entire macroscopic volume.

To achieve this nanometer-level motion over centimeter long distances in three axes, the leading syringe manufacturers are relying on positioning systems by Schneeberger. By utilizing linear motors and easy axis control with a single controller along with the accuracy of the optical encoder and smoothness of the linear guides, Schneeberger's nano-syringe customers are able to achieve longer and faster travel with incredible results.

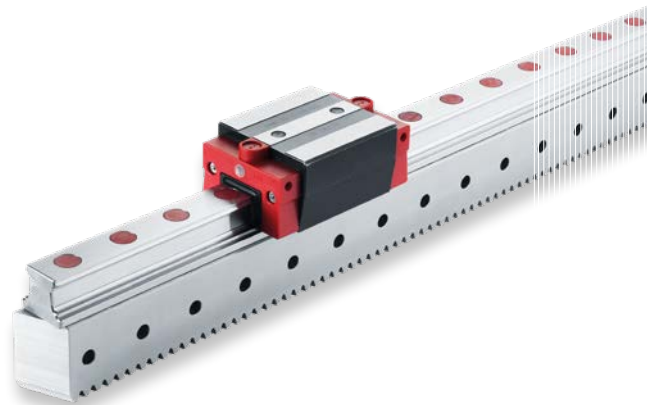


MONORAIL PROFILED GUIDEWAYS
CONSISTING OF ROLLERS AND BALLS

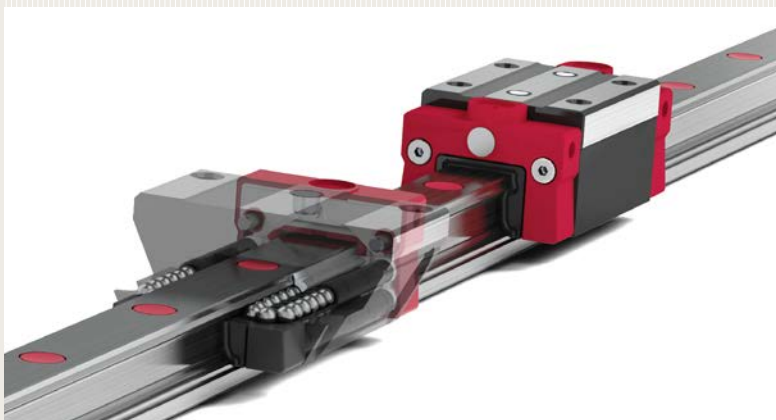
Best running characteristics,
high load-bearing capacity
and high rigidity.



MONORAIL MR with rollers



MONORAIL BZ with balls



MONORAIL BM with ball bearings

All MONORAIL profiled guideways are available in different sizes with a variety of carriage types

PROFILED LINEAR GUIDEWAYS CAN ALSO MEASURE
 MONORAIL AMS, THE INTEGRATED DISTANCE MEASURING SYSTEM

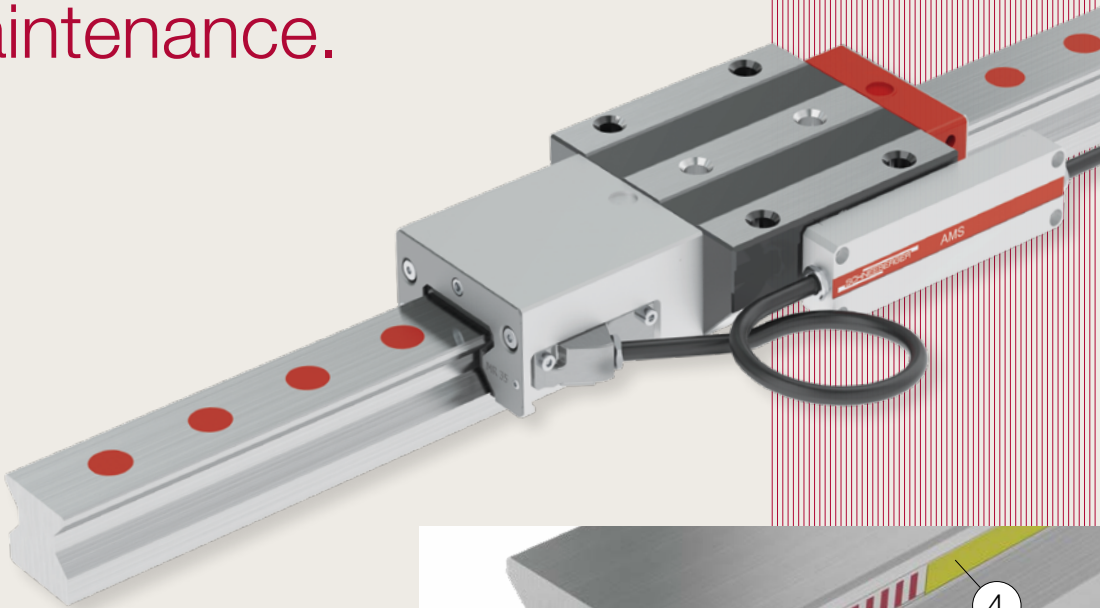
Highly precise, reliable and low-maintenance.

MONORAIL AMS incremental

MONORAIL MR rollers
 AMSA-3B / analogue
 AMSD-3B / digital

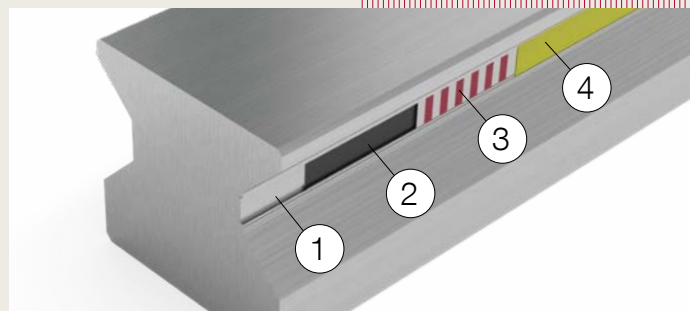
MONORAIL AMS incremental

MONORAIL BM balls
 AMSA-4B / analogue
 AMSD-4B / digital



Guideway with integrated dimensional scale

1. The groove is ground into the finished guideway profillet
2. Attaching the magnetizable tape
3. Sanding and magnetizing
4. Protective cover is welded to the guideway

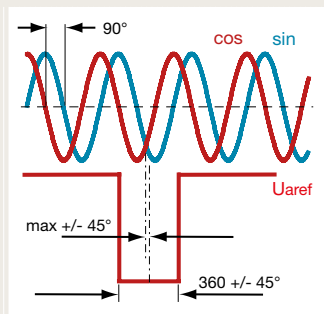


MONORAIL AMS absolute

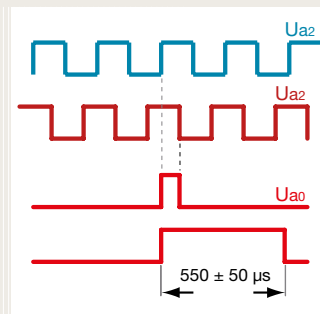
MONORAIL MR rollers
 AMSABS-3B

MONORAIL AMS length

MONORAIL MR rollers
 AMSA-3L / analogue



Analogue interface



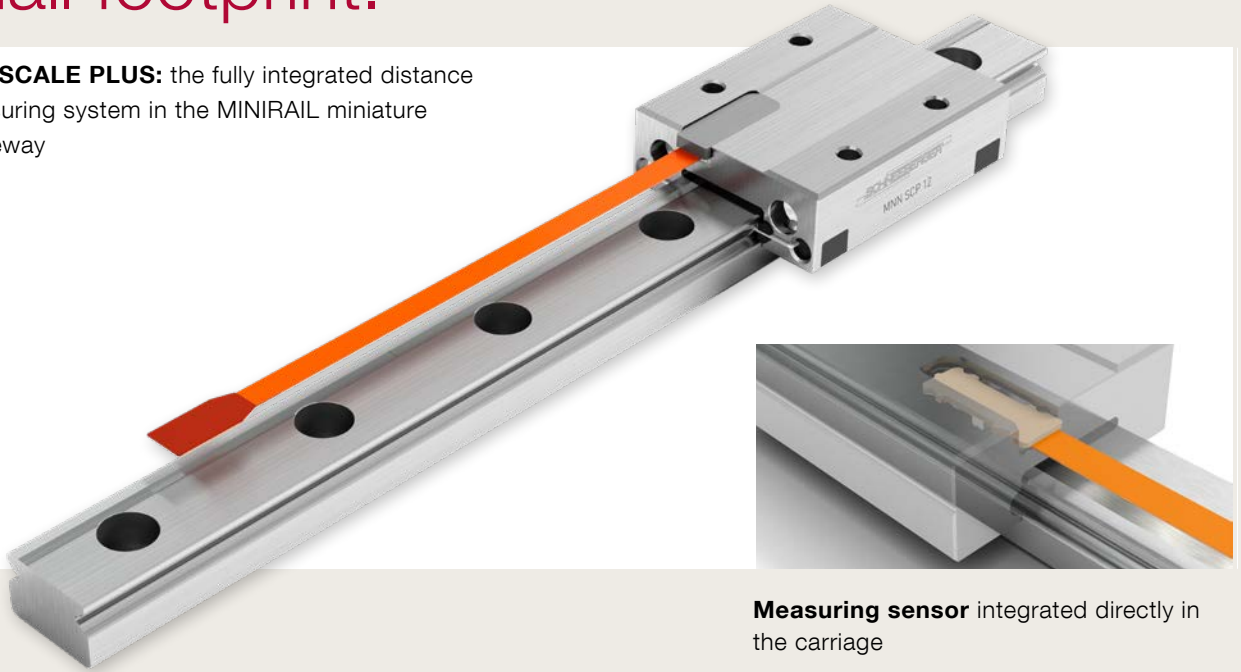
Digital interface

All MONORAIL AMS integrated measurement system are available in different sizes with a variety of carriage types

GUIDEWAYS CAN ALSO MEASURE
MINISCALE PLUS, THE INTEGRATED DISTANCE MEASURING SYSTEM

Guiding and measuring in a very small footprint.

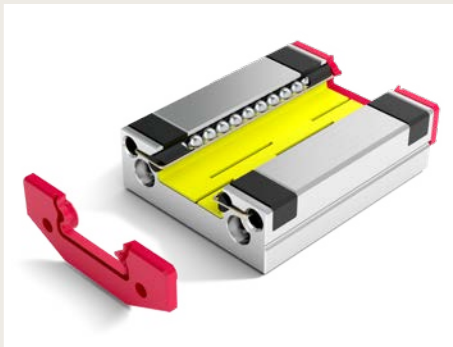
MINISCALE PLUS: the fully integrated distance measuring system in the MINIRAIL miniature guideway



Measuring sensor integrated directly in the carriage

MINIRAIL PROFILED LINEAR GUIDEWAY

High load capacities and long-term lubrication.



Integrated **LUBE-S** long-term lubrication unit for MINIRAIL carriage



The Gothic arc profile of the guideway tracks allows high load capacities



Plastic plugs for sealing

MINIRAIL profiled miniature guideway with ball bearings

The miniature guideways are available in eight different sizes and with different carriage lengths

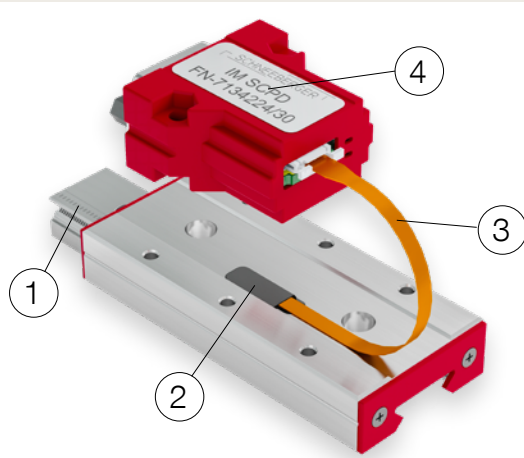
Ultimate process security due to integrated cage control system.



The robust cage control of the MINISLIDE MSQ

- 1. Gear rack pinion on carriage and guideways
- 2. Cage with pinion

Compact, ready to install and reliable.



MINISLIDE MSQscale

- 1. Dimensional scale on the guide rail
- 2. Optical sensor integrated into the carriage
- 3. Flexible print (must not be exposed to dynamic loads)
- 4. Interface module

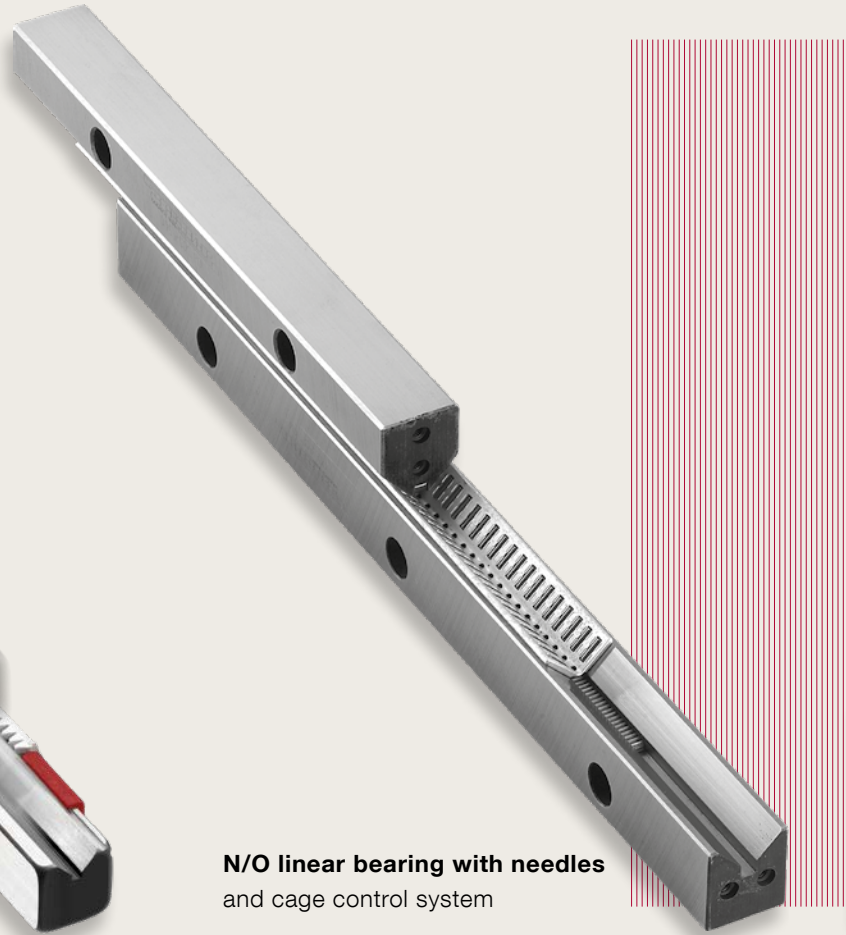
Distance measuring system integrated into the MINISLIDE micro frictionless tables

The MSQscale is an optical, incremental measuring system and consists of the MINISLIDE MSQ guide system

High precision with extremely low friction movement.



RNG linear bearing with roller bearings and cage control system ⁽¹⁾



N/O linear bearing with needles and cage control system



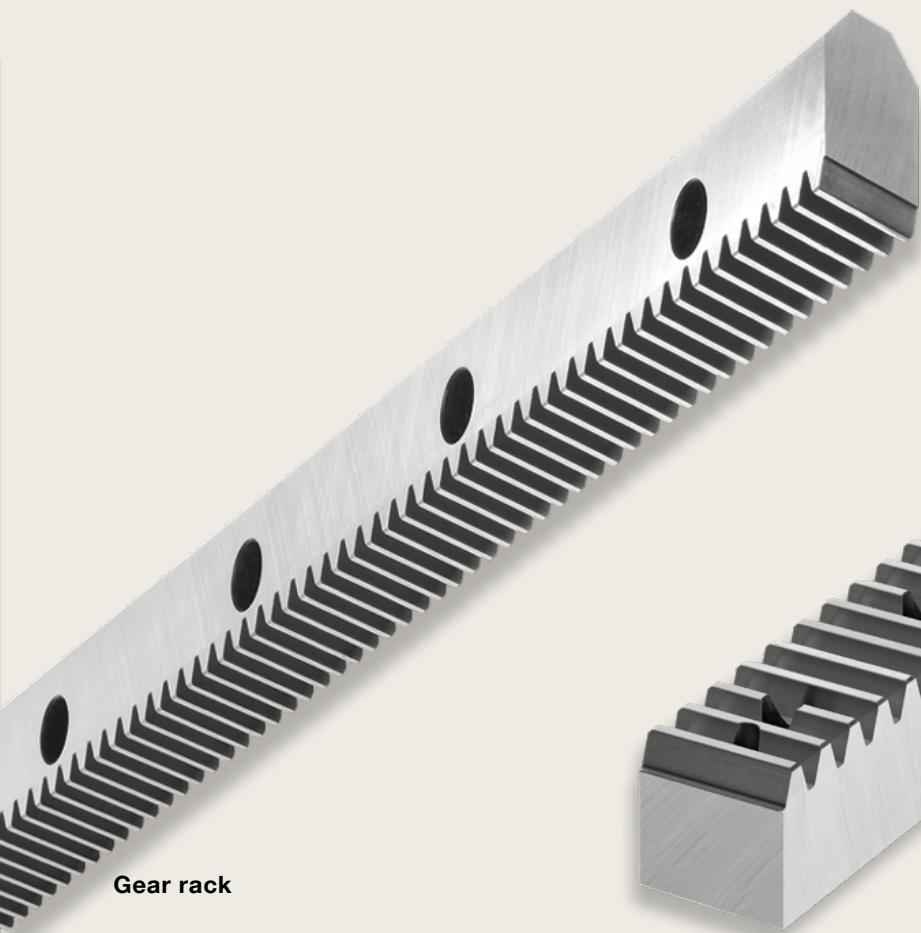
R linear bearing with balls



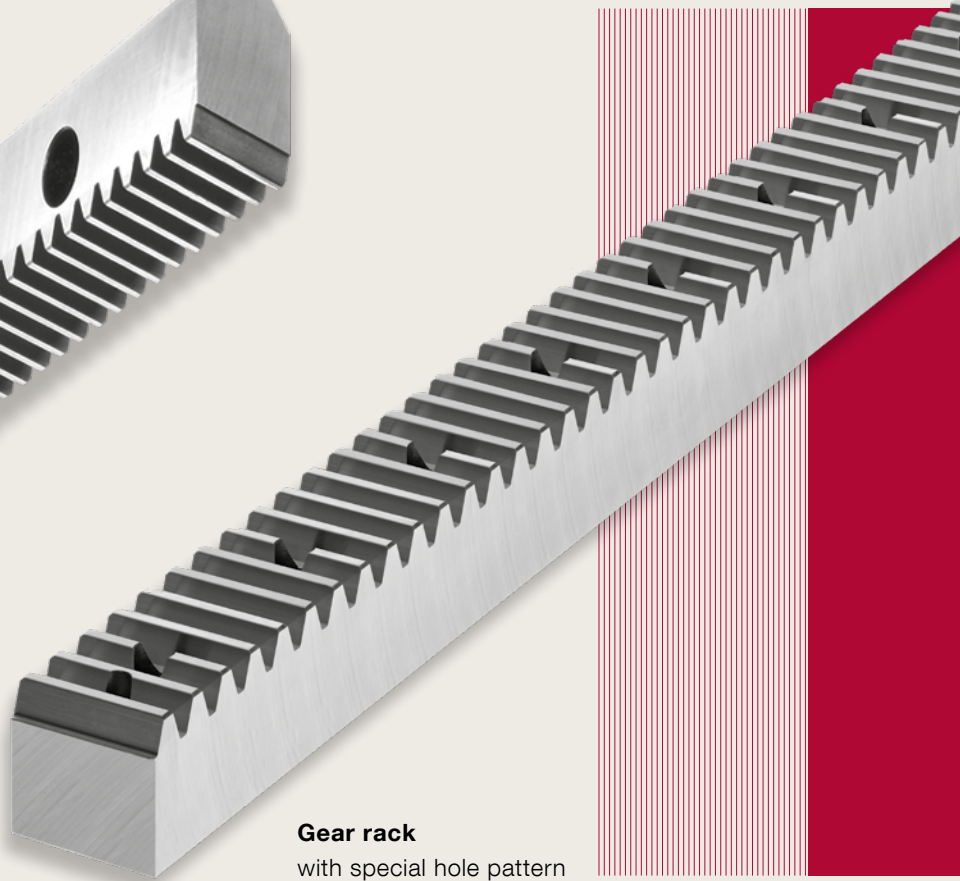
R linear bearing with rollers

All linear bearings are available in variety sizes

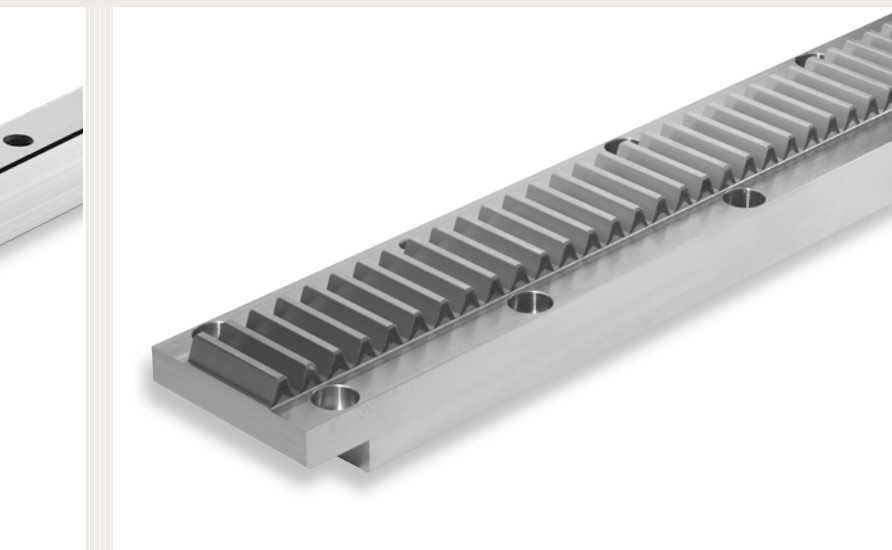
Standard and custom designs.



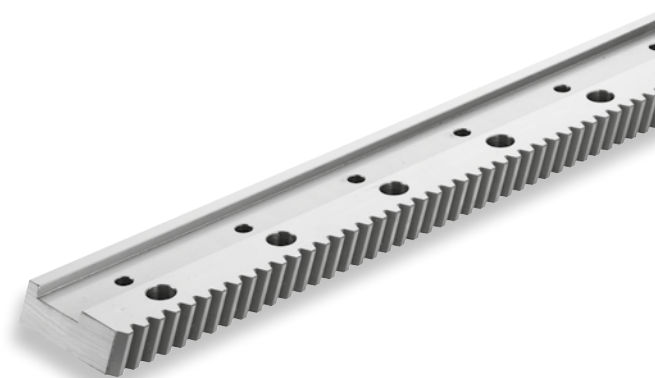
Gear rack



Gear rack
with special hole pattern



Flanged, straight toothed gear rack



Helical gear rack
for integration with MONORAIL profiled guideways

In addition to standard models, our gear racks are also available in a variety of special designs

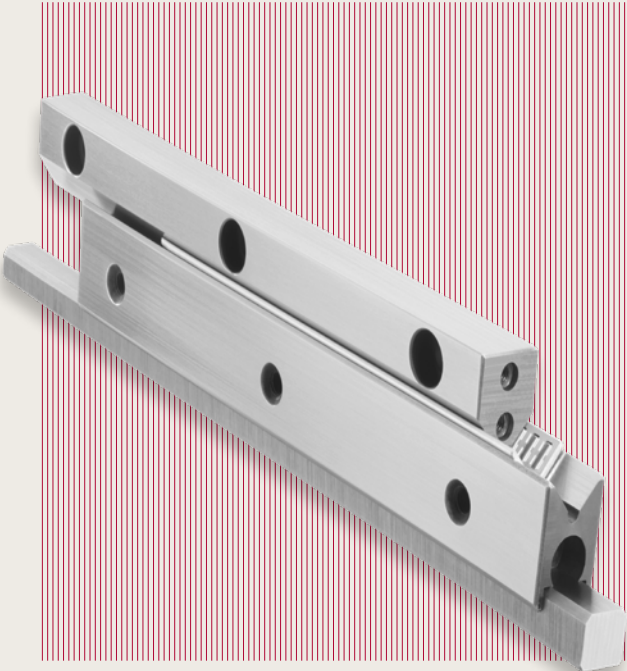
Competence in linear bearings.



Double V-shaped guide



Prismatic guide



Frictionless guideway with integrated preload wedge



Sliding guideway

Any cross-section up to 6 meter in length with measuring machine accuracy levels

PROSPECTUSES

- COMPANY BROCHURE
- CUSTOMIZED BEARINGS
- GEAR RACKS
- LINEAR BEARINGS and RECIRCULATING UNITS
- MINERAL CASTING SCHNEEBERGER
- MINISLIDE MSQscale
- MINI-X MINIRAIL / MINISCALE PLUS / MINISLIDE
- MONORAIL and AMS profiled linear guideways with integrated measuring system
- MONORAIL and AMS application catalog
- POSITIONING SYSTEMS
- SLIDES



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