

«Essentials for the Best!»

**SCHNEEBERGER**  
LINEAR TECHNOLOGY



# SCHNEEBERGER Linear technology

High precision, innovative and reliable

Company brochure





# 1923

## THE RECIPE FOR SUCCESS

### ALWAYS ONE STEP AHEAD

Since 1923

The foundations of current worldwide linear motion technology were laid by the first linear guideways developed by SCHNEEBERGER, which has been making linear motion products for more than 90 years ago.

In 1945 SCHNEEBERGER once again innovated lineartechnology, this time with the invention of the linear roller guide. We have developed upon this effective principle of linear guidance significantly in the last several years thanks to the integrated cage controls.

The same concepts that resulted in our success still apply today: Innovative spirit, an uncompromising striving for quality, and the ambition to always provide our customers with new, technically and economically superior products.

Today, SCHNEEBERGER continues being a leader, constructing linear guideways that set new standards in terms of durability, reliability, and efficiency and has since remained at the top of a highly competitive market.

The name SCHNEEBERGER is synonymous with modern linear guide technology throughout the world. At its most important production locations in Switzerland, Germany and the Czech Republic, SCHNEEBERGER is focused on investing in constant quality increases and cost optimizations. With additional production plants in China, SCHNEEBERGER is also near to its customers in places where the markets develop particularly dynamically.

SCHNEEBERGER is unique in the global linear motion technology market. We are an independent, medium-sized company and this forms the basis for a dynamic, customer-oriented and correspondingly successful business strategy.

## CORE COMPETENCES

# THE FOUNDATION

## QUALITY ADVICE AND GUARANTEED SUPPLY LINES

How does SCHNEEBERGER manage to engage its customers, and enthuse them again and again, technologically and economically? Let's take a closer look at our core competencies and our most important process phases.

### Phase 1: Consulting

Every day, we see new applications and develop creative linear technology solutions for a multitude of projects. We offer this wealth of experience back to our customers. The earlier we are involved in the planning phase of a new product, the more successful we are in integrating corresponding synergies into the system. Experience our consulting knowhow yourself! Our local sales engineers are happy to meet with you to discuss your plans, with no commitment to you.

### Phase 2: Concept development

During this phase, we create value for our customers by working with them to create the optimal solution for their challenges. Our engineers are quick to develop intelligent concepts that fit our customers' needs, thus ensuring that there are no surprises in the production phase.

### Phase 3: Production

The technical excellence of SCHNEEBERGER is best seen in the highly precise manufacture of structural parts and in the assembly of components. Where precision and consistency in linear technology determine our customers' competitive advantage, we leave nothing to chance. In our special workspaces, we assemble cleanroom and vacuum applications up to cleanroom class 1000 (ISO 6).



**Abdullah Acarbas**  
Machine Operator  
Gear racks



**Werner Kabatnik**  
Technician Quality  
Assurance



**Andreas Keller**  
Machine Operator  
Profile guideways

#### Phase 4: Logistics

Reliability of supply is key to our customers, especially those in strongly cyclical market environments. We strive to take this into account as much as possible through stability – stability in production, in planning and in quality. Our sophisticated logistical processes ensure precise and reliable deliveries when assembling customer products.

#### Phase 5: Support

When we work well together during consulting and conception, during production and logistics, then you will hardly need our support. That said, SCHNEEBERGER quality also includes flawless customer service, with special attention given to open and expedient communication.

We stand at our customers' side with the greatest expertise and commitment during all five process phases. SCHNEEBERGER does not just stand for technical excellence, it also stands for quality advice and guaranteed lines of supply.

"I am responsible for seven small process steps concerning the assembly of miniature guideways. Among other things, I sort, assemble, lubricate, and package these small parts after subjecting them to an ultrasonic wash. All of this requires a certain finesse."

Brigitte Nützi

"I work in gear rack production – a demanding and interesting challenge for me. If I do my job well, I help the SCHNEEBERGER company provide high quality in a timely manner."

Abdullah Acarbas

"I grind the profiled guideways. At my processing station, I lay the raw rails onto the grinding machine. The process is very precise and demanding."

Andreas Keller



**Josip Jukić**  
Assembly Technician  
in the clean room



**Brigitte Nützi**  
Assembly Operator  
Miniature guideway



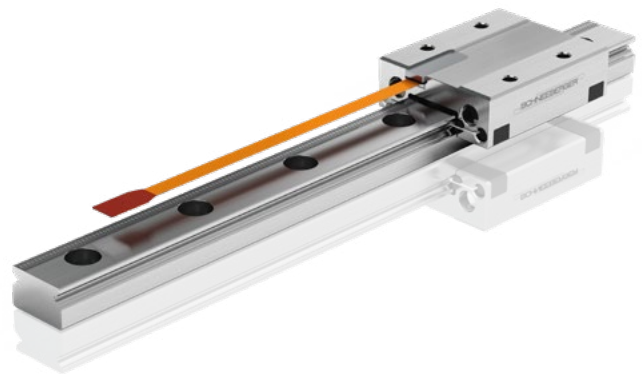
Cross rollers



Gear racks



Micro frictionless tables



Distance measuring systems

## PRODUCTS

# THE ENTIRE SPECTRUM FROM STANDARD COMPONENTS TO COMPLETE SYSTEMS

In addition to standard components, SCHNEEBERGER manufactures complete systems, often consisting of a range of SCHNEEBERGER components.

When we build complete systems, our customers benefit from our expertise in developing and producing components. Only because we manufacture these components ourselves are we in a position to perfect them for use alongside each other.

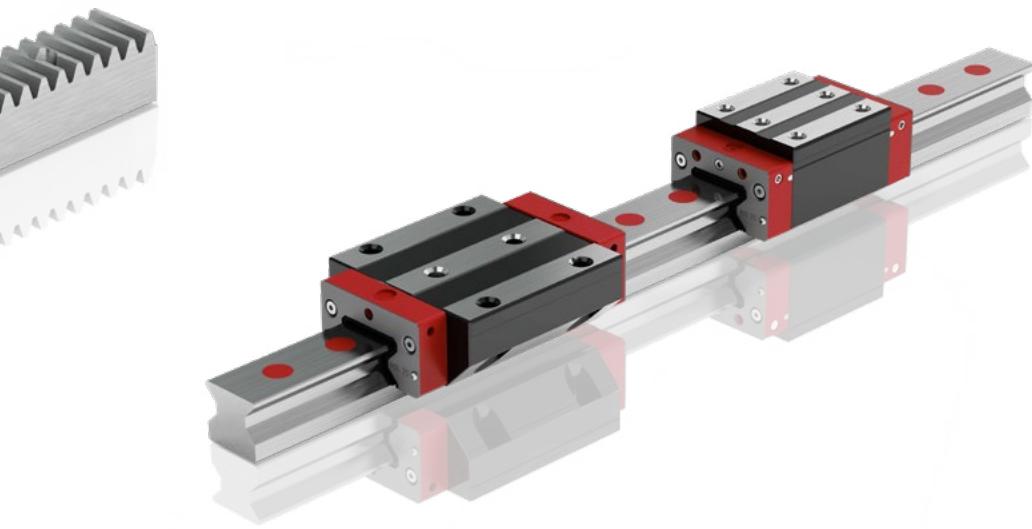
And conversely; because we also build complete systems, we know the requirements our components must fulfill to ensure that they can perform their function in complex systems. The production depth of SCHNEEBERGER is unique on the market, just as the resulting benefit for our customers are not seen anywhere else..

### 1. Our components

If the customer wants to integrate their own system, we provide them with highly precise and reliable components that can be used in a number of different linear guideway applications. If customer-specific adjustments or functional enhancements are needed, we deliver them in a prompt and expert manner.

### 2. Our highly integrated positioning and motion systems

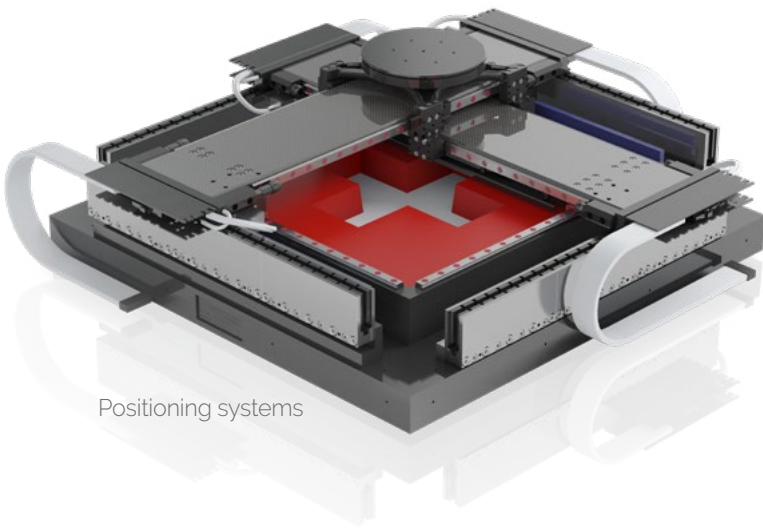
We are happy to handle the system integration for you and guarantee uninterrupted service, even when volumes change rapidly. Our core focus is on minimizing risks and creating more flexibility for you. Our standardized systems and platforms provide cost-efficient solutions for your positioning and motion tasks and are easy to integrate into your application.



Profiled guideways



Mineral casting



Positioning systems



SCHNEEBERGER ball screws SBS

### 3. Our final assembly machine structures

At the customer's request, we assemble the standard components or the highly integrated positioning systems right onto the substructure. Because we manufacture the mineral casting ourselves, we are able to adapt final assembly machine structures perfectly to the kinematic specifications.

### 4. Our precision ball screws

Precision ball screws manufactured by SCHNEEBERGER SBS and A. MANNESMANN enhance our product portfolio. Many demanding machine tool users worldwide, benefit from the performance, productivity and long-term precision that our ball screws offer. Many advantageous such as structural design and 100% quality control in production, account for their success.

A.MANNESMANN ball screws





## APPLICATION EXAMPLE FORMULA-S

# ENHANCED LIFESPAN FOR MACHINES AND FOR PEOPLE

Wherever equipment and machines must perform precise motions at high speeds, the linear guideway with integrated FORMULA-S cage control create the necessary conditions.

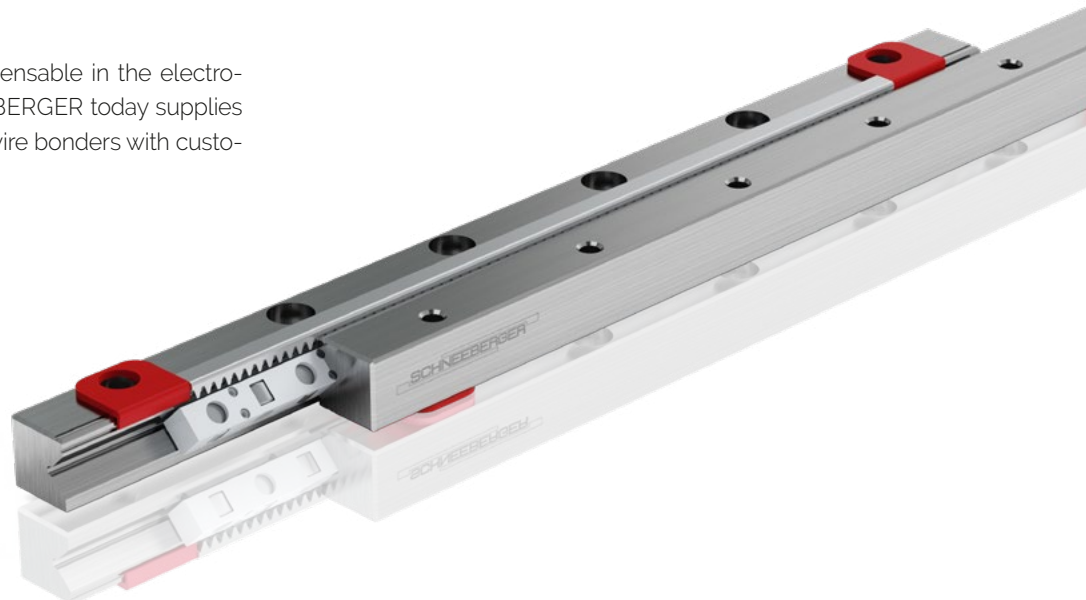
FORMULA-S guarantees that the cage, which is supported by rolling elements, is always guided steadily in the center of two rails.

Linear guideways play a vital role in medical technology. Precise motion is essential for meaningful tomography images, X-ray images or tissue samples, because it leads to more effective diagnoses.

FORMULA-S is, however, also indispensable in the electronics industry. For example, SCHNEEBERGER today supplies the world's leading manufacturer of wire bonders with customer-specific products upon request.

### Customer benefits of FORMULA-S

1. A centered cage at all times despite application-specific influences such as high acceleration, vertical applications, insufficient surrounding structure, uneven load distribution, as well as temperature deviations
2. No time lost resetting the cage, providing very high process availability
3. Selected initial load has no effect on the control system.
4. Long service life due to cage selection and involute toothing on cage controller
5. Vacuum-compatible up to  $10^{-7}$  mbar







## APPLICATION EXAMPLE MINIATURE GUIDEWAYS

# WHAT WOULD THE SMARTPHONE BE WITHOUT SCHNEEBERGER?

## HIGHLY PRECISE LINEAR TECHNOLOGY MAKES IT POSSIBLE TO MINIATURIZE ELECTRONICS

Without highly integrated electronic components, our everyday life would be inconceivable. They represent the heart of our smart phones, our navigation systems, and the reader devices for credit cards, to name a few.

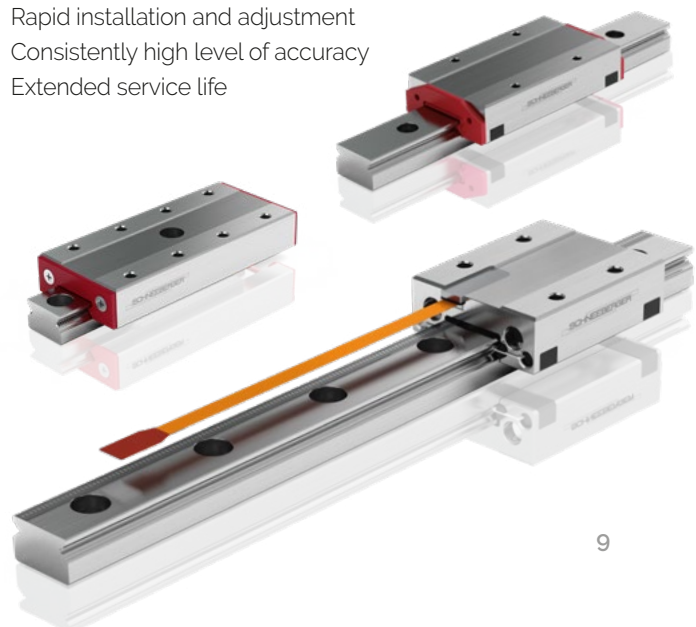
The development of electronic communication technologies is breathtakingly fast – and SCHNEEBERGER is contributing significantly to this progress. Thanks to advanced linear motion technology, it is possible to fit even the smallest of components onto PCBs reliably, ultra-fast and with extreme precision, as well as to attach and connect the micro-fine connecting wires to the integrated circuits with minimal gaps and without error.

Our miniature guideways support the highest component density on the printed circuit board and make the production process increasingly precise, fast and thus ever more profitable. They generate tangible added value for both the electronics and semiconductor industries as well as for their end customers.

The MINISCALE and MSQscale miniature guideways even have an integrated optical distance measuring system that combines the dual functions of guiding and measuring with the smallest footprint!

### Customer benefits of the miniature guideways

1. Minimal design planning
2. Minimal space requirements
3. Rapid installation and adjustment
4. Consistently high level of accuracy
5. Extended service life



## ON TO NEW SHORES

### SCHNEEBERGER INVOLVED IN CLIMATE MISSIONS IN ANTARCTICA

Wherever large ships and, in particular, their drive systems, are built, our linear technologies are making a decisive contribution. Large multifunctional long bed lathes can be used to turn, mill, grind or even repair huge crankshafts or drive shafts, over a stroke of 40 meters and with minimal tolerance.

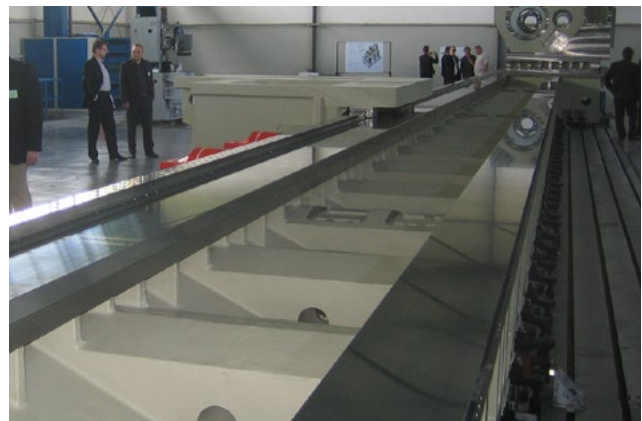
For these and similar applications, such as when manufacturing rotor heads or wind turbines for power engineering, we provide custom guideways and gear racks. That is how we help to make new sources of energy possible.

Our customized guideways and gear racks are used wherever standard guideways do not meet the specifications of the machine manufacturer either because the dimensions are incorrect or were not sufficiently precise.

In summary, we construct guideways that run perfectly smoothly, and guideways of particularly high rigidity or durability. There are no compromises with SCHNEEBERGER.



Thanks to our universal machinery and expert engineers, we are able to develop our products quickly and efficiently, even with complex customer specifications; initially in small batches as necessary for testing, and then in large-scale production, with high and constant quality and reliable and uninterrupted service.





## APPLICATION EXAMPLE - MINERAL CASTING

# IN ONE CAST

## IMPRESSIVE BENEFITS FOR THE OPTICS INDUSTRY

Anyone processing optical components and surfaces, such as industrial optics or lenses, cannot compromise in terms of surface quality, precision, and productivity; primarily because consumers' eyesight depends on their work, and also because the optical industry is extremely competitive.

High-performance machines create significantly more than 100 eyeglass lenses per hour in reproducible quality. To realize this high machine dynamism and the required product geometry with the greatest possible precision, mechanical engineers need a machine bed with perfect oscillation damping and thermal stability, which is only possible when using mineral casting.

This makes us an indispensable partner for manufacturers of production equipment – not only for high-quality industrial optics, but also for delicate eyeglass lenses.

SCHNEEBERGER manufactures its mineral casts with a cold casting process using minerals and epoxy resin. Thanks to specially developed production methods, we are able to achieve a very high level of evenness and parallelism in support surfaces, whether for guides or other precision attachment elements, such as scales or drives.

Because SCHNEEBERGER manufactures mineral casting constructions as well as linear guideways, we can perfectly adjust contact surfaces for guides to the respective guideway as well as for highly straight, parallel, and smooth linear movement, which results in the best overall technical and economic solution.

# FOR THE SMALLEST SYRINGES IN THE WORLD

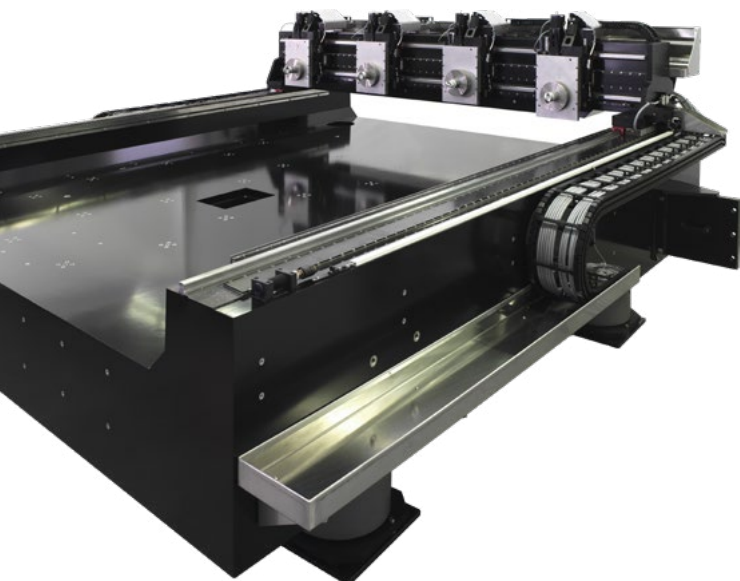
NANO-SYRINGES REVOLUTIONIZE THE TOP LABORATORIES IN  
INDUSTRY AND RESEARCH. ALSO THANKS TO SCHNEEBERGER

The smallest syringes in the world consist of structures and canals which are only a few nanometers in size. Those unique nano-instruments are embedded into a complete system. By moving the tips with the greatest precision and in consideration of the force, they provide previously unknown possibilities and applications in the top laboratories of universities and industrial companies.

The next generation of this tool even allows fully automatic motion of the nano-syringe in XYZ directions for the first time. As a result, completely opposite needs can be met, such as the nanometer-level precision in the entire macroscopic volume of a typical multi-well plate, to cultivate cells.

The leading syringe manufacturers rely on SCHNEEBERGER positioning systems to achieve nanometer-precise movement over centimeter-long distances along three axes.

The long strokes, the accuracy of the optical encoders, and the smooth running of the linear technology provide decisive customer benefits, as well as efficient actuation via a linear motor and simple axis control via a single controller.





APPLICATION EXAMPLE - BALL SCREWS

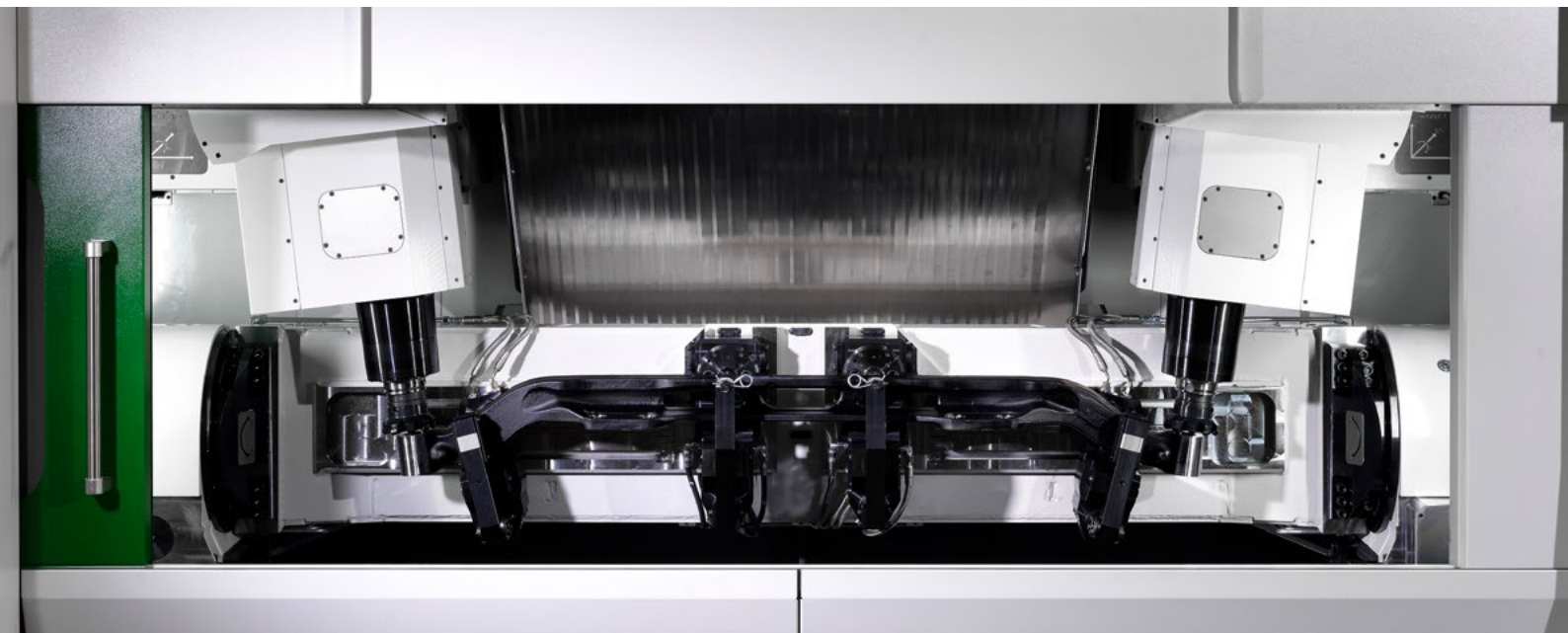
## MANUFACTURING THE MODERN TRUCK

### HIGHER PRODUCTIVITY AND LOWER UNIT COSTS

The world's leading truck manufacturers use special machining centers to produce large vehicle components such as axles, engine blocks, or chassis side members.

At a leading commercial vehicle brand, our customer wanted to reduce cycle times while also improving truck front axle quality in order to accelerate production and cut down costs. These highly modern machining centers work with double spindle machines and reduce cycle times in axle production to 4.5 minutes per axle.

A multitude of steering knuckle to bolt angles can be machined, and this in only one clamping operation. The double spindles function either simultaneously or independently of one another. Because they can be pivoted, they can be used for all types of operations; milling, boring, turning inside diameters, and reaming. This versatility provides increased productivity and lower manufacturing costs per part.



APPLICATION EXAMPLE - MONORAIL MR

## USED IN WIND POWER

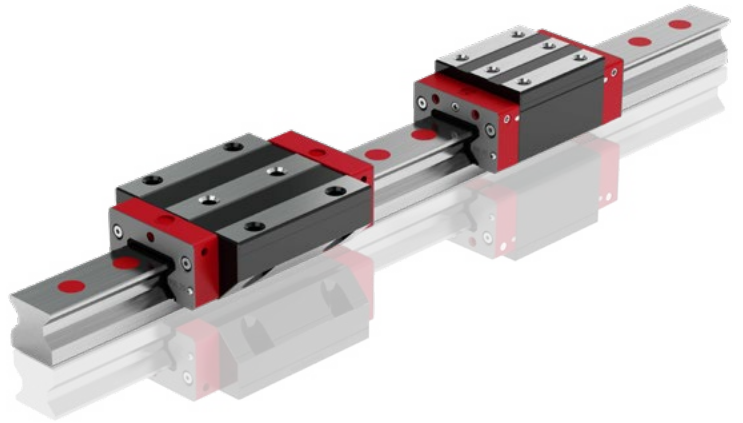
### EFFICIENT, ROBUST, AND QUIET WIND TURBINES WITH SCHNEEBERGER

When producing highly precise gears, our customer relies on high-performance and exact gear processing machines. Those gears are then installed into gearing mechanisms of various sizes – which commonly now includes wind power applications – products that enjoy enormous growth rates.

So-called gear milling and gear grinding machines are essential to wind turbine manufacturers and, among other things, ensure reproducible and very high pitch accuracy in the gears. In these gear processing machines, highly precise and rigid roller linear guideways are critical in enabling our customers to achieve their required specifications for the gears to be processed.

The MONORAIL MR profiled guideways with rollers are the perfect solution for this demanding processing step in the  $\mu\text{m}$  range. They provide sophisticated linear technology for the highest requirements and are characterized by high rigidity and high static and dynamic load capacity, as well as the highest running accuracy paired with additional, particular straightness characteristics.

The SCHNEEBERGER MONORAIL MR profiled guideway thus helps to make wind turbines more efficient, sturdy, and quiet. It is also the perfect solution for other demanding drive applications that require highly precise gear machining.



# PROFILED GUIDEWAYS CAN ALSO MEASURE

## THE SCHNEEBERGER DISTANCE MEASURING SYSTEM IS A WORLD LEADER

Until just a few years ago, machine manufacturers had to install mechanical linear guideways and electronic measuring systems individually. With the integrated AMS distance measuring system, SCHNEEBERGER has combined the functions of measurement and guidance in one product.

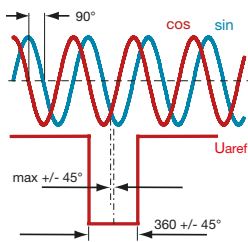
Electronically supported linear technology not only allows the user to make precise and low-loss movements from one point to another, it also provides information on the system's current position.

Even under extreme conditions, the AMS distance measure system reduces thermal deviations and works more precisely and efficiently than systems with separate components.

Inventions like this are another example prove our knowledge of our customers' challenges, our high engineering expertise and our technical excellence.

### MONORAIL AMS incremental

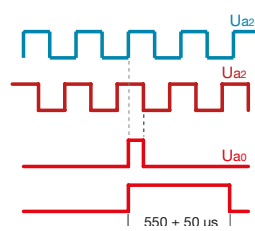
MONORAIL MR rollers  
AMSA-3B / analogue  
AMSD-3B / digital



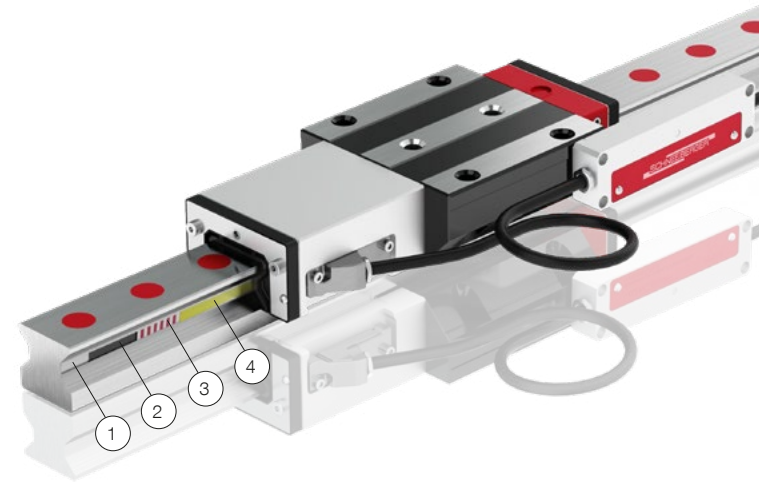
Analogue interface

### MONORAIL AMS incremental

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

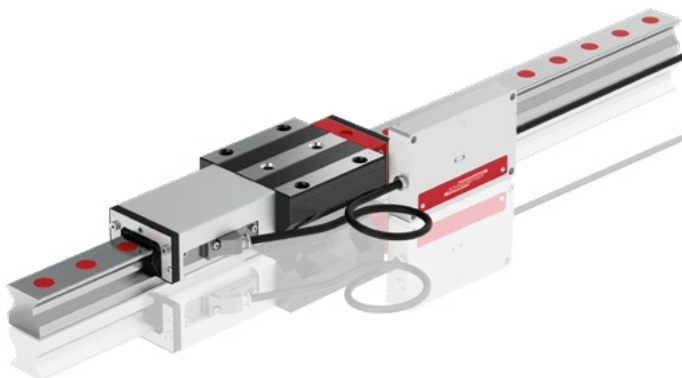


Digital interface



### Guideway with integrated dimensional scale

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



**MONORAIL AMS absolute**  
MONORAIL MR with rollers  
AMSABS 3B

**MONORAIL AMS absolute**  
MONORAIL BM with balls  
AMSABS 4B

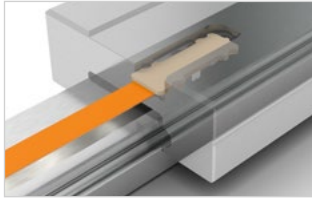


**MONORAIL AMS absolute for long axes**  
MONORAIL MR with rollers  
AMSABS 3L

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

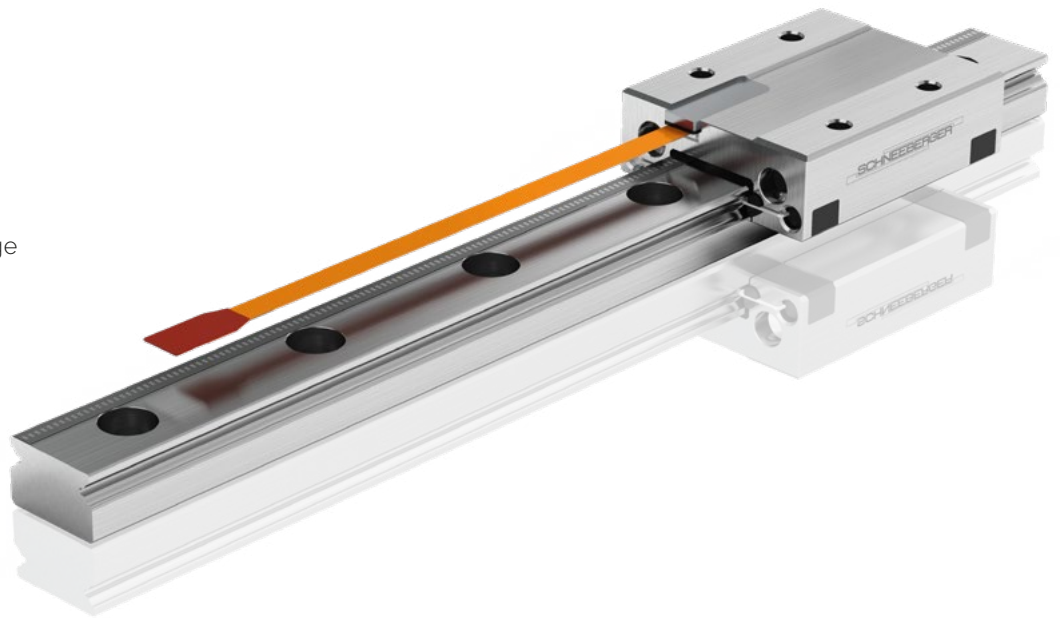
MINISCALE PLUS, THE INTEGRATED DISTANCE MEASURING SYSTEM

## GUIDING AND MEASURING IN A VERY SMALL FOOTPRINT



**Measuring sensor:**  
integrated directly in the carriage

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



MINIRAIL PROFILED LINEAR GUIDEWAY

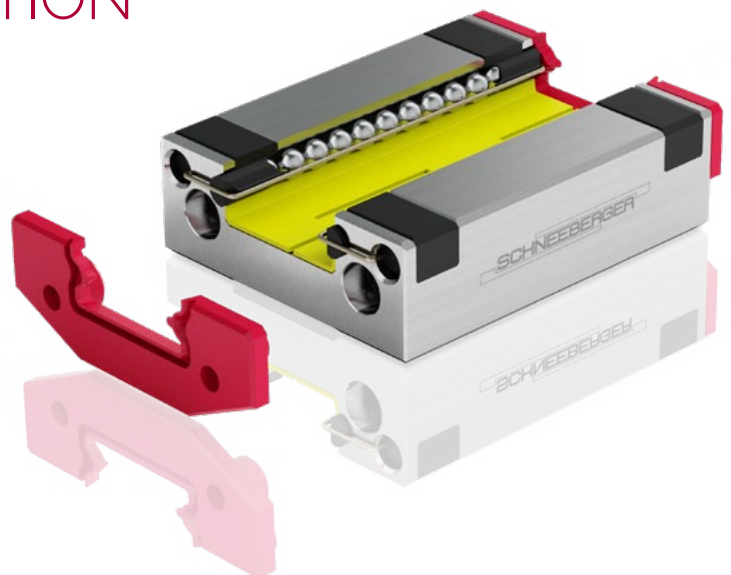
## HIGH LOAD CAPACITIES AND LONG-TERM LUBRICATION



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



Plastic plugs for sealing



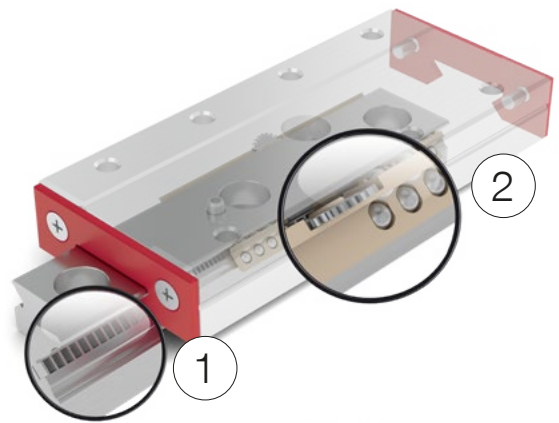
Integrated long-term lubrication unit  
LUBE-S in MINIRAIL carriage

**MINIRAIL profiled miniature guideway with ball bearings**

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



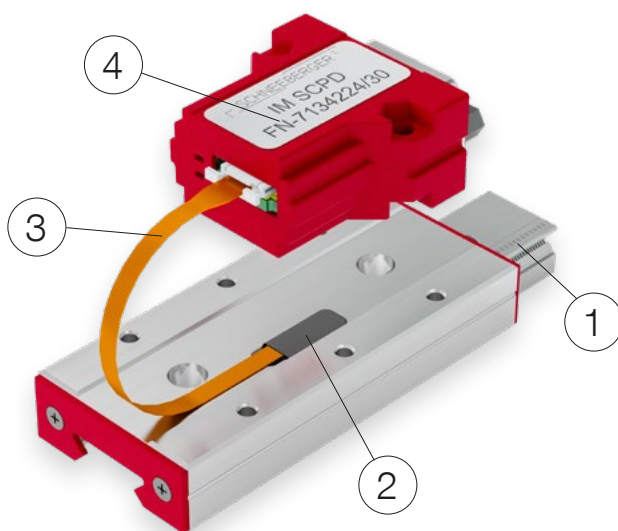
# ULTIMATE PROCESS SECURITY DUE TO INTEGRATED CAGE CONTROL SYSTEM



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

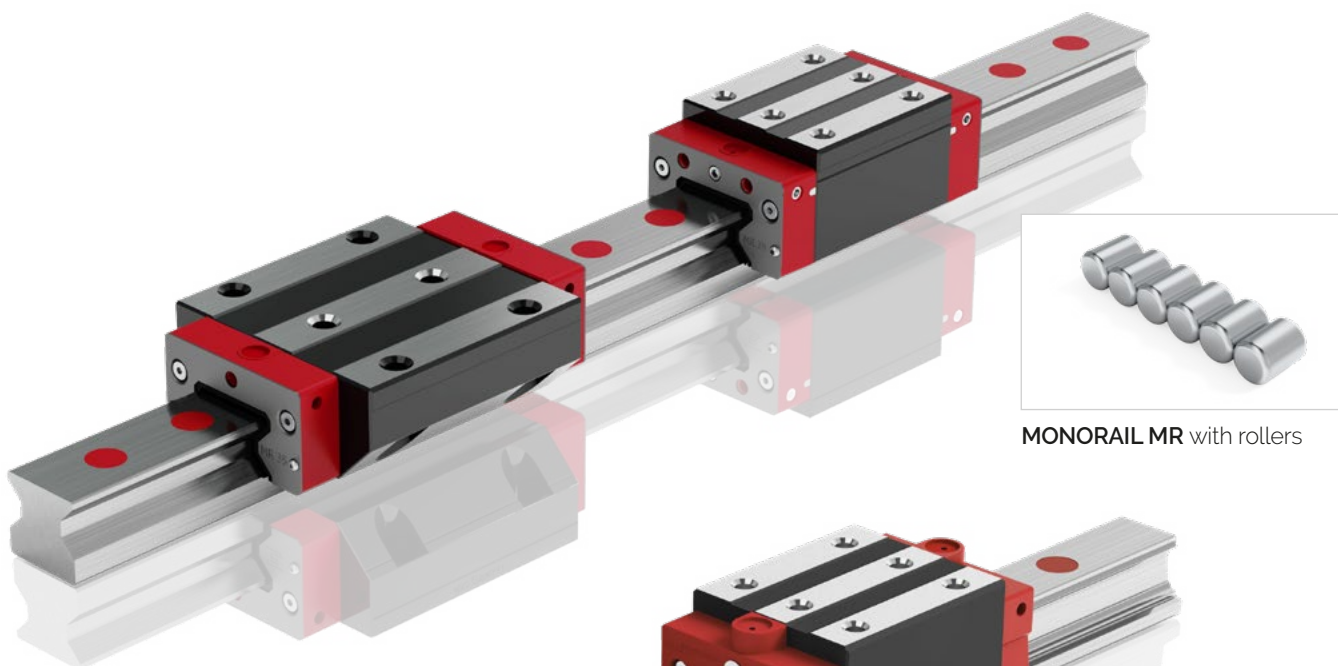
1. Dimensional scale on the guide rail
2. Optical sensor integrated into the carriage
3. Flexible print (must not be exposed to dynamic loads)
4. Interface module

## Distance measuring system integrated into the MINISLIDE micro frictionless tables

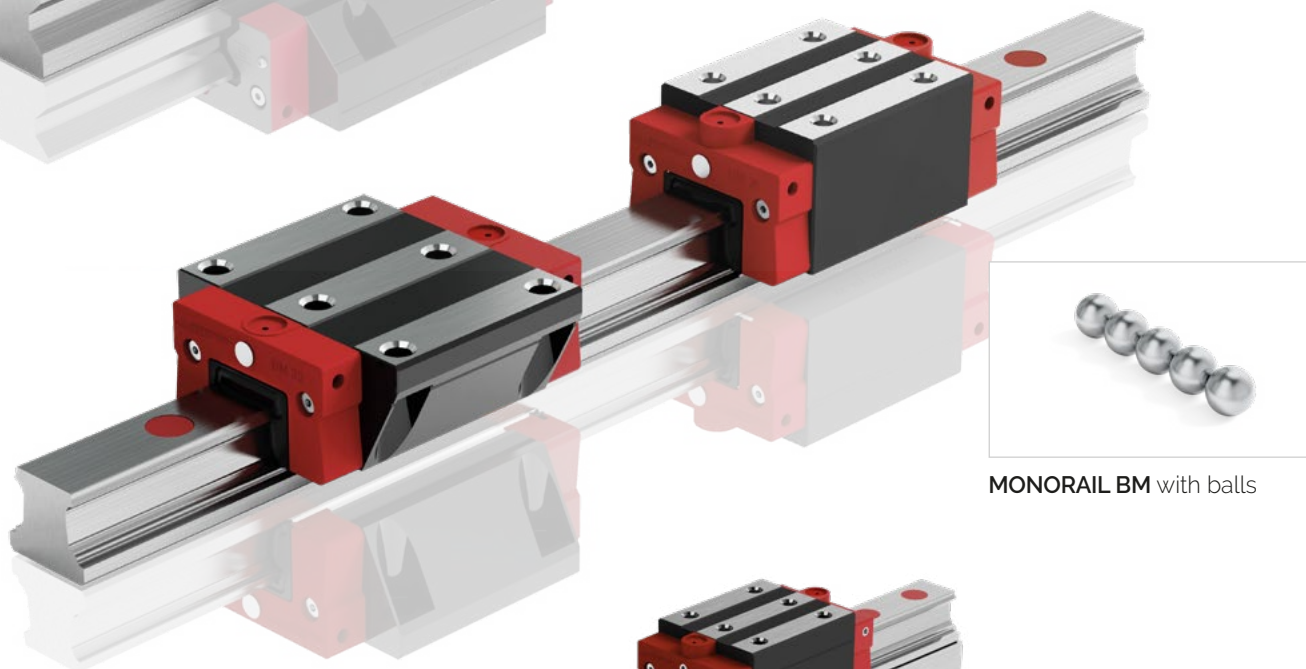
The MSQscale is an optical, incremental measuring system and consists of the MINISLIDE MSQ guide system

MONORAIL PROFILED GUIDEWAYS WITH ROLLERS OR BALLS

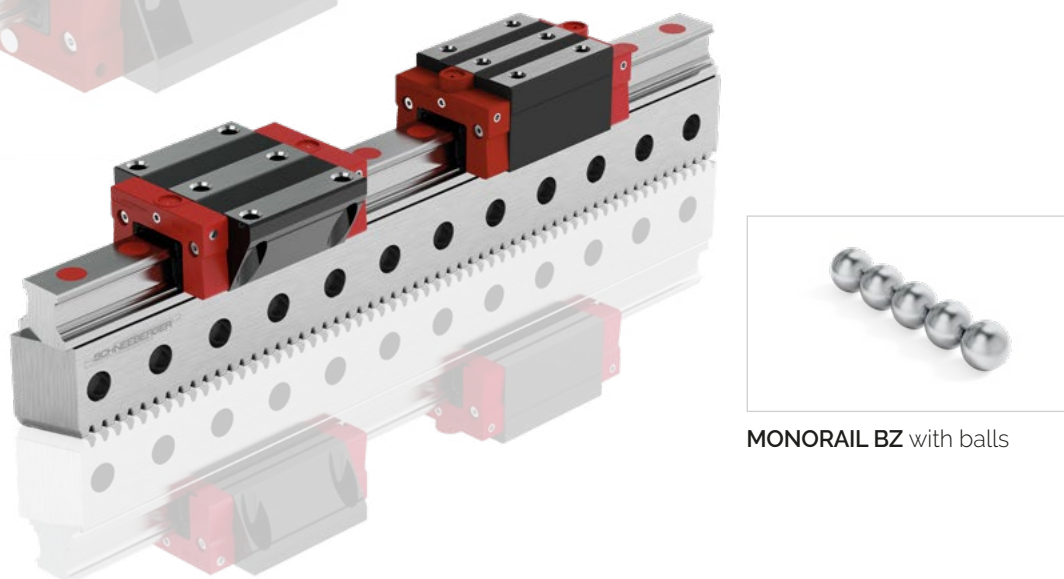
# BEST RUNNING, HIGH LOAD CARRYING CAPACITY AND RIGIDITY



MONORAIL MR with rollers



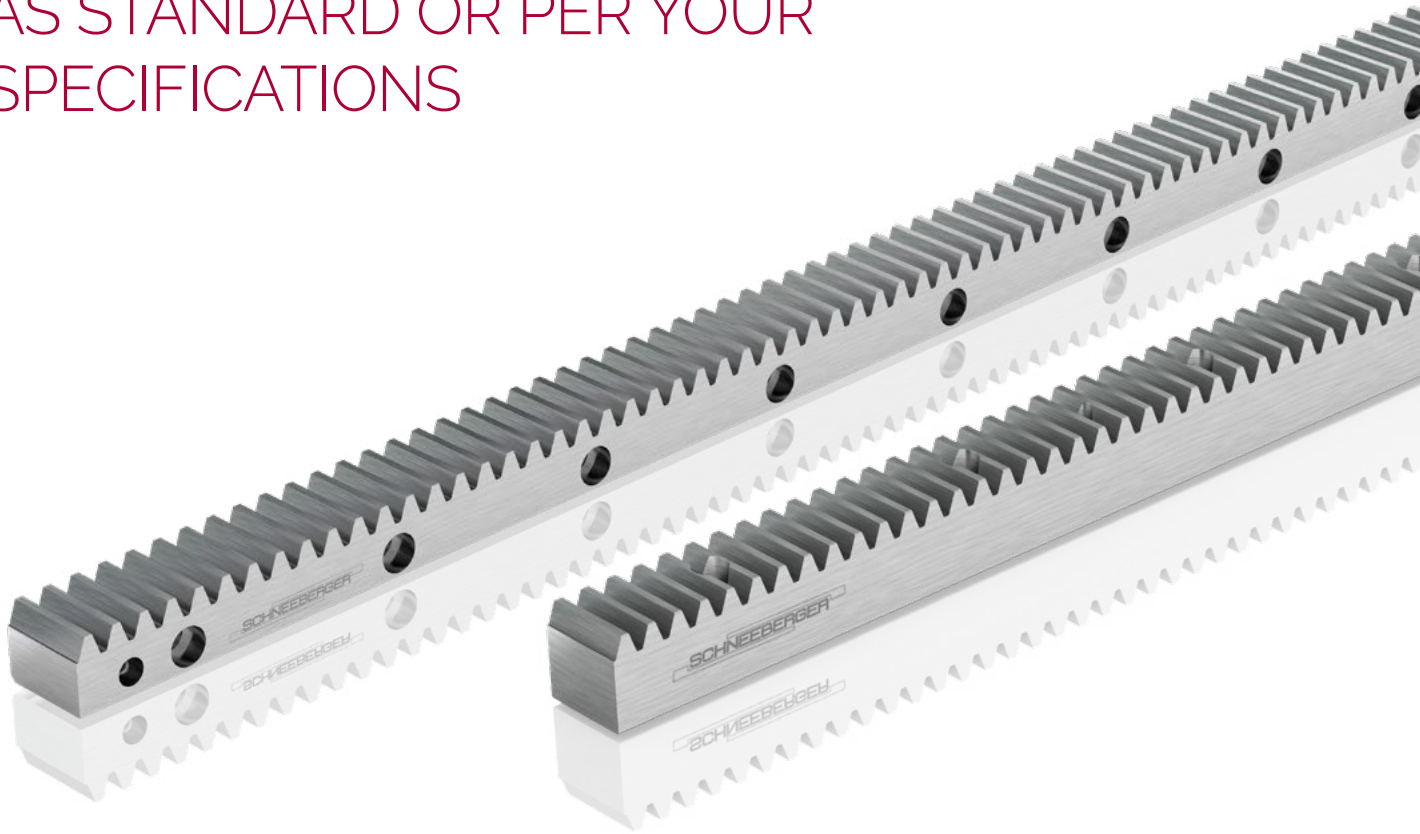
MONORAIL BM with balls



MONORAIL BZ with balls

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

# AS STANDARD OR PER YOUR SPECIFICATIONS

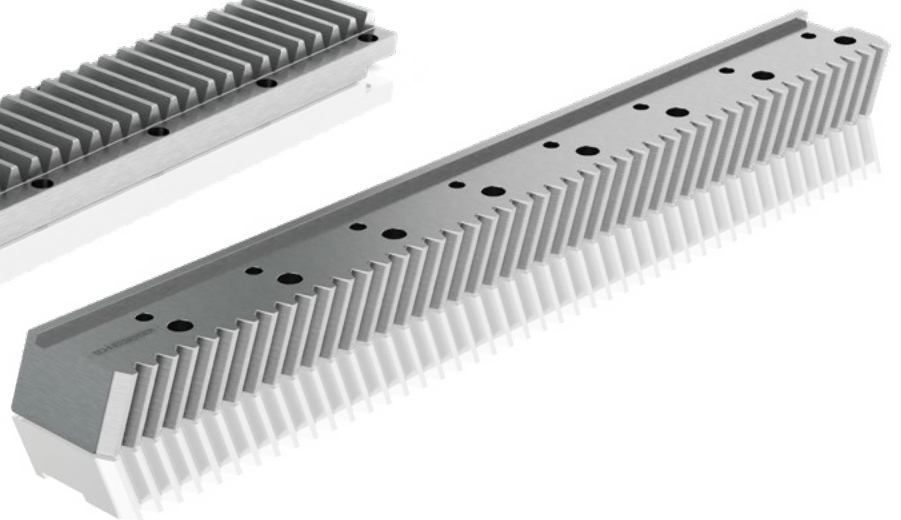


**Gear rack**  
incl. pin holes

**Gear rack**  
with special hole pattern



**Straight-toothed gear rack**  
flanged



**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

RN, RNG, N/O LINEAR GUIDEWAY

# PERFECT ACTION



**R linear bearing**  
with balls

**R linear bearing**  
with rollers

**RN and RNG linear bearing**  
with or without cage control

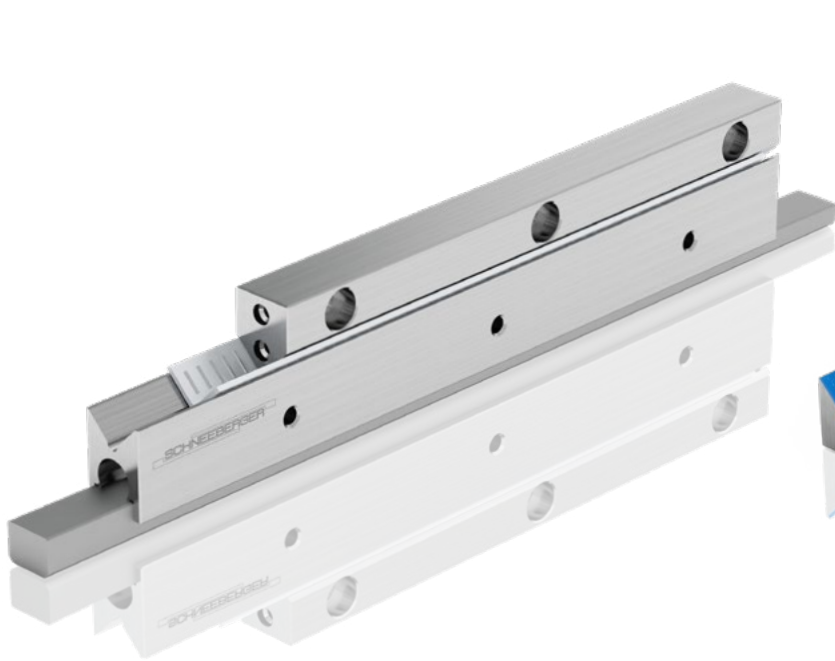


**N/O linear bearing with needles**  
with and without cage control

All linear bearings are available in variety sizes

CUSTOMIZED GUIDEWAYS

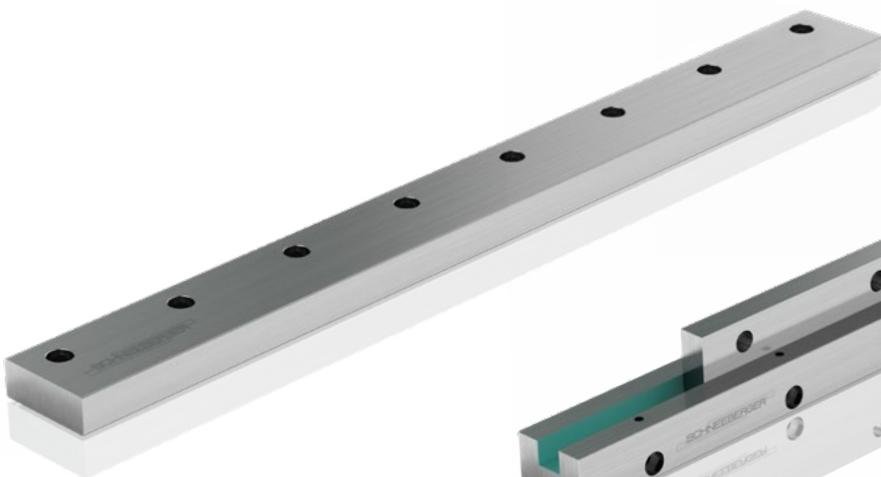
# EXPERTISE FOR CUSTOMERS



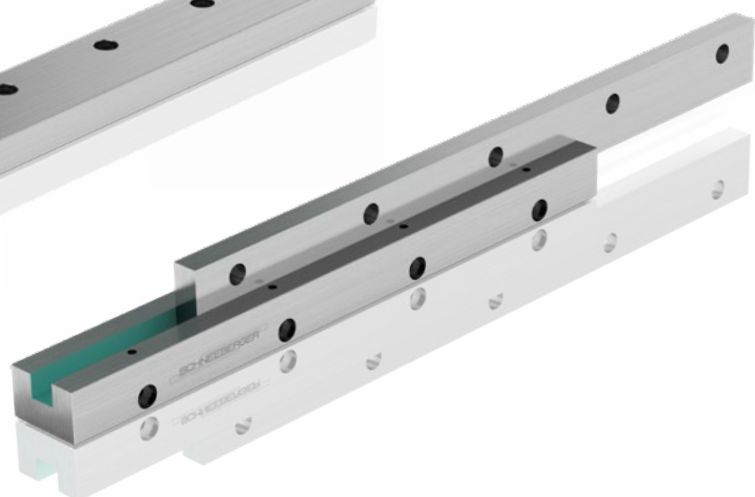
Needle cage bearing  
with integrated preload wedge



Sliding Bearings with Double Rail Guides



Box Way Bearings



Sliding guideway with box way

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

# CONSTRUCTION TECHNOLOGY

## THE TECHNICAL AND ECOLOGICAL BENEFIT OF THIS MATERIAL TO THE CUSTOMER IS ENORMOUS

Wherever very dynamic and, at the same time, precise movements are required, mineral casting is the ideal material for the frame structure, providing clear technological, economic, and ecological advantages over steel, gray iron, or cast iron.

Our customers profit from its excellent vibration dampening, chemical resistance, and excellent thermal properties; not only in the machine tool industry, but also in medical technology, in the solar, electronics, and packaging industries and in many other fields of application. When designed according to the material, ready-to-install mineral cast parts provide cost advantages of up to 30 percent compared to gray cast iron parts or comparable welded constructions, with significantly shorter throughput and delivery times.

Those are the reasons why SCHNEEBERGER relies on mineral casting. In 2007, we opened our new mineral casting plant in Cheb, Czechia, and made it into the most modern such location in all of Europe within a very short time.

The entire process from product development to manufacturing is subject to the highest quality requirements; from design to casting to highly precise final processing. This enables us to guarantee to our customers that we also deliver ready-to-install complex machine structures and assemblies with guideways and other attachment elements so that the respective customer can install it themselves – precisely and accurately – with a test certificate upon request.



## TAILORED TO YOUR BUSINESS AREA

THANKS TO OUR ENGINEERING EXPERTISE, SCHNEEBERGER CAN ALSO CONTROL COMPLEX MOTION SYSTEMS WITH GREAT PRECISION

In SCHNEEBERGER you have a partner who can supply you with carefully considered solutions for all of your motion and positioning tasks in a wide variety of applications.

We rely on our core skills in the following three areas:

**Engineering know-how:**

We plan projects and develop highly complex positioning systems, including those for particularly demanding applications, such as high vacuum.

**Application know-how:**

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

**Production and integration know-how:**

We manufacture mechanical assemblies for you and put together highly complex and precise machines with uninterrupted service.

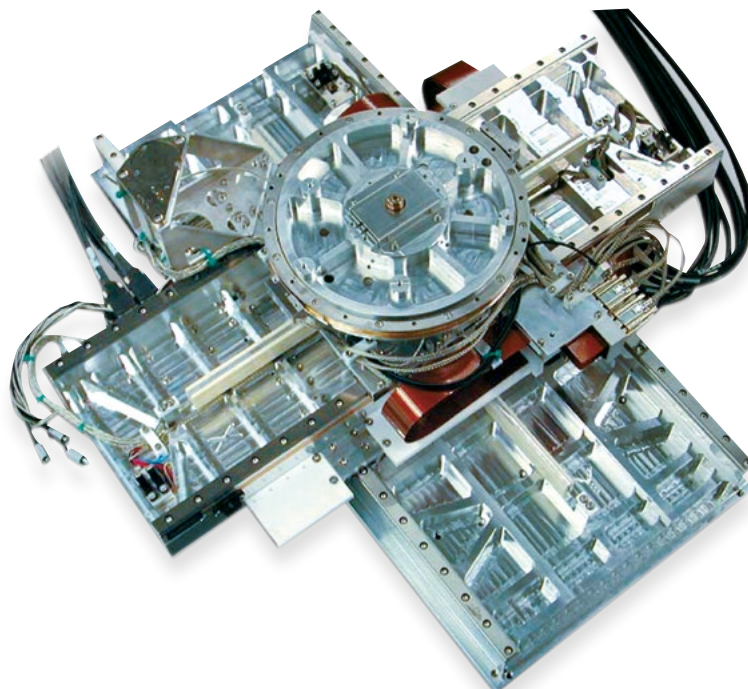
Starting with our standard components, we are able to produce tailored solutions within a very short time frame.

For example, from individual axles with integrated control units to highly complex machines based on a mineral cast construction, for example. In integration, we always go as far as the customer requires.

**Our positioning systems are used everywhere:**

Our engineers have a broad technical knowledge of many different industrial sectors and can therefore quickly understand the problems of our customers, even in new business areas. Thanks to our innovative strength, we can develop sophisticated positioning system in the following markets:

- Semiconductors
- Flat screen displays
- Solar
- Electronics
- Optics
- Printing
- Laser machining
- Dental and medical technology





## AM BALL SCREWS

# ATTENTION, PEAK PERFORMANCE! FOR MACHINE TOOLS USED OVER THE LONG-TERM

AM ball screws reach maximum speeds of 150 m/min, maximum accelerations of 20 m/s<sup>2</sup>, and rotational speeds (n x d) of 200,000 and more. Those performance figures have not been beaten anywhere in the world. They permit the extremely efficient operation of machine tools with long service lives. The performance limits of AM ball screws have been steadily increased through continuous development over many years.

A.MANNESMANN, headquartered in Remscheid, Germany, has been part of the SCHNEEBERGER Group since October 2017. The A.MANNESMANN MASCHINENFABRIK GmbH specializes in manufacturing geometrically sophisticated, highly precise machine elements.

Founded in 1796, this 180-employee company produces workpieces with a high length-to-diameter ratio in lengths up to 15 m.

The unit of measure for production tolerances – even for large dimensions – is the  $\mu\text{m}$  (micrometer). AM products are used in machines and systems within various industrial segments, such as wind power and solar technology, automotive, aerospace, medical technology, petroleum, marine engineering, compressor construction, roller mill technology, nuclear energy and much more.

The high-quality, deep-nitrided, polished spindles with a surface hardness of 67 HRC have an exceptionally high level of wear resistance. As a result, AM ball screw drives are able to maintain the set preload force on the nuts over a very long time, which results in a long service life.





## "A ONE STOP SOLUTIONS"

### SCHNEEBERGER BALL SCREWS ROUND OUT OUR PRODUCT PORTFOLIO

Precision ground ball contact surfaces enable high positioning and repeat accuracy. Furthermore, the quiet, torque-constant running behavior of the ball screws is impressive. Attractive for demanding applications in machine tools as well as measurement and testing technology.

- Spindle and nut are precision ground
- Low idling torque
- Price-performance optimized



#### ECOLOGICAL

## BETTER CO<sub>2</sub> BALANCE

### FOURFOLD APPROACH TO ENERGY REDUCTION (BLUE COMPETENCE®)

Our linear roller bearings generate minimal friction loss, which enables our customers to feed less power to the drive systems and to design those as small as possible.

We manufacture our mineral casting products in a cold casting process, without the application of heat. Thus, less power is consumed, making the CO<sub>2</sub> balance better than is possible with manufacturing processes using standard technologies in steel or cast iron.

Our gear racks allow for direct drive systems that, compared to other drive types like ball screw drivers or hydraulic cylinders, release the maximum power for linear movement with minimal heat, friction and other energy losses.

Our AMS measuring system makes it possible to take highly precise measurements in factory settings without using energy-intensive air purging equipment.



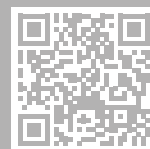
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PROSPECTUSES

- 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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