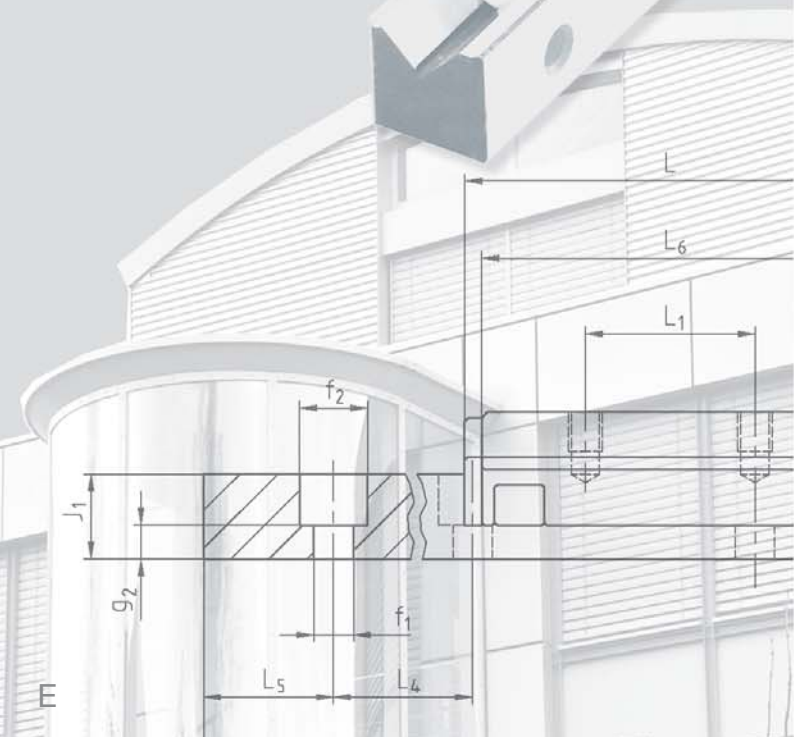


# SCHNEEBERGER

LINEAR TECHNOLOGY



«Essentials for the Best!»



## SCHNEEBERGER Linear Technology – «Essentials for the Best!»

For years the name SCHNEEBERGER has been synonymous with modern linear guide technology for the tool- and machine-building industries.

Thanks to longstanding experience and our consistent focus on linear technology we are in a position to offer our customers technological and economical benefits for all their applications.

In accordance with our slogan «Essentials for the Best!», we are oriented toward the current and potential needs of worldwide leaders in the industry and we bring the latest technological trends into our R & D work.

Roggwil, SWITZERLAND



Höfen, GERMANY



Cheb, CZECH REPUBLIC



### A global presence

Our global presence with strong sales and support organizations guarantees customer closeness in all the major industrial countries. Apart from the obvious logistics advantages, being close to the customer assures intensive on-the-spot support from the initial project design and planning phase.

## SCHNEEBERGER core competences

With SCHNEEBERGER you have a partner at your side that can provide sophisticated solutions and extensive application skills for all your motion and positioning tasks.

### Applications know-how

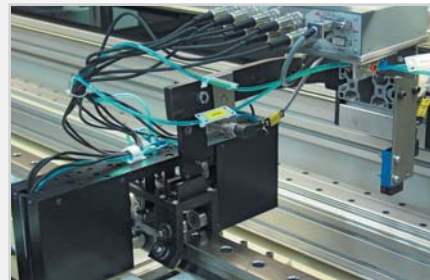
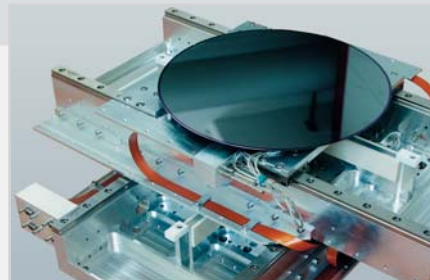
We have gained extensive technological skills from the many successful projects in various industries. In cooperation with the customer we evaluate the optimum products from our standard product range or alternatively we will define project-specific solutions.

### Development know-how

Thanks to our longstanding experience and consistent concentration on linear technology we are in a position to further develop our products and solutions in order to create technological advantages for our customers. FEM (Finite Element Method) calculations and 3D simulation show us before the first prototypes whether the required properties can be achieved.

### Manufacturing expertise

The highly precise manufacturing of components, and the integration of sub-assemblies and base machines has always been a core facet of our company. The entire manufacturing process is subject to demanding and application-oriented tests and controls.



## Guiding, measuring, driving

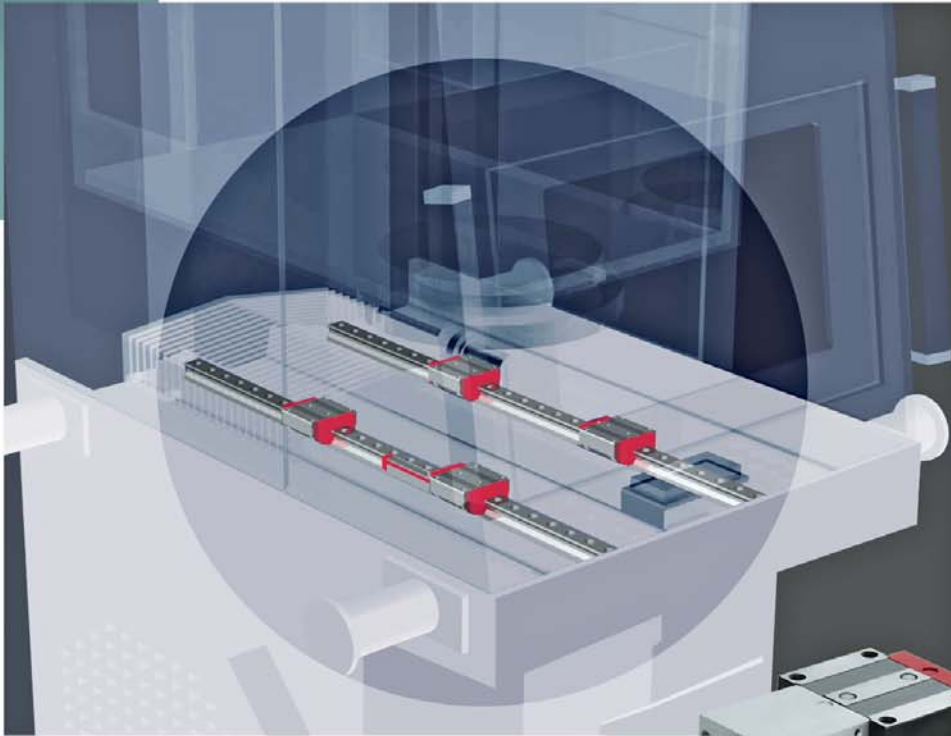
### Kinematic skills from one source

The range of our standard products encompasses the entire spectrum to solve your motion tasks: from countless tried and tested linear guideways, integrated measuring systems and sophisticated space-saving modules through to multi-axis platforms for demanding motion processes.

Furthermore, with our existing standard components and systems we are in a position to offer you complete tailored solutions at minimal development cost.

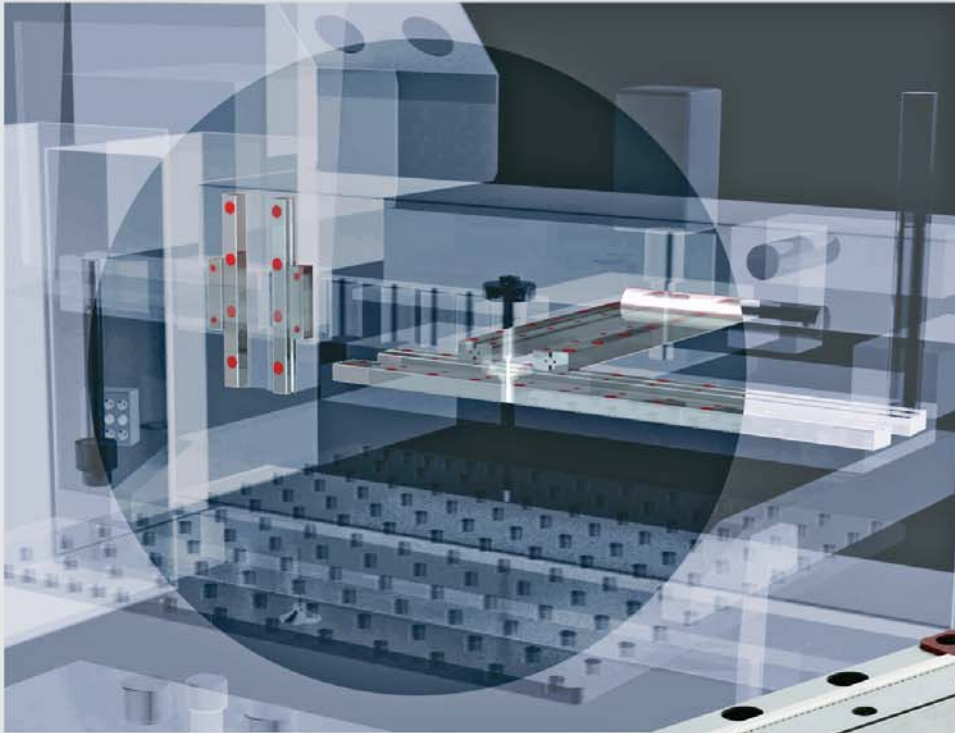
## SCHNEEBERGER products in action

Our products are being successfully used in the most diverse applications. Here are some of the most demanding examples:



### Measuring and guiding combined

SCHNEEBERGER's MONORAIL AMS offers a complete product that combines the measuring and guiding functions in one unit. Thermal deviations can be reduced because the measuring and guiding system can be located closer to the processing work. The benefits of the highly precise and rigid roller guidance as well as the accuracy and robustness of the measuring system mean that the product – in this example a grinding machine – can be used in places where there are extreme operating conditions.



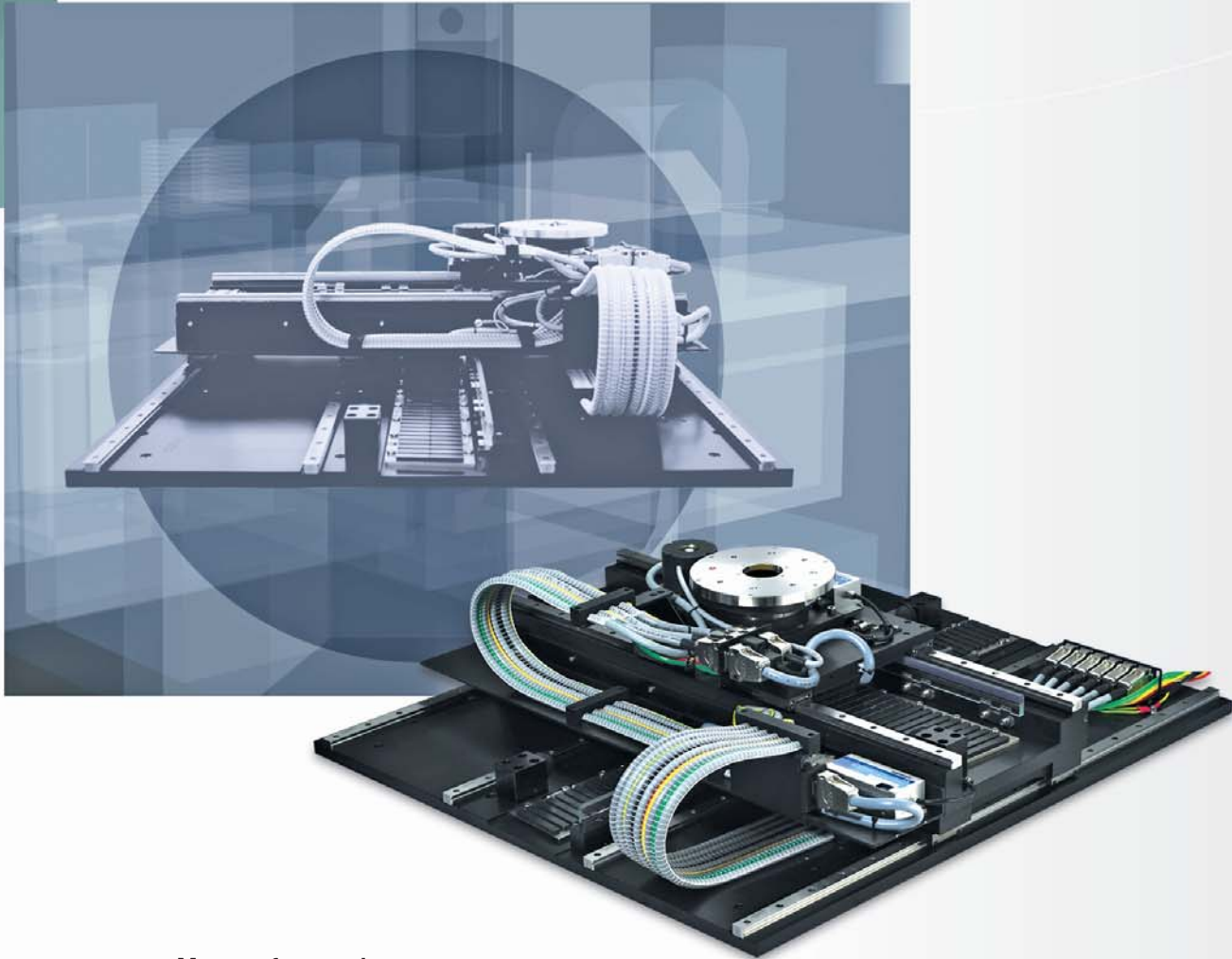
#### **Acceleration up to 300m/s<sup>2</sup>**

The linear guide FORMULA-S was specially developed for applications where exceptionally high demands are made on the guiding system, e.g. in respect of acceleration, oscillation, vertical integration, etc. In this application in a pick-and-place machine these product characteristics are fully utilised. Thanks to the operation of the FORMULA-S the occurrence of «cage creep» is fully prevented.

The «dry runner» option is also available with FORMULA-S, so that a long lifespan in dry run is achieved.

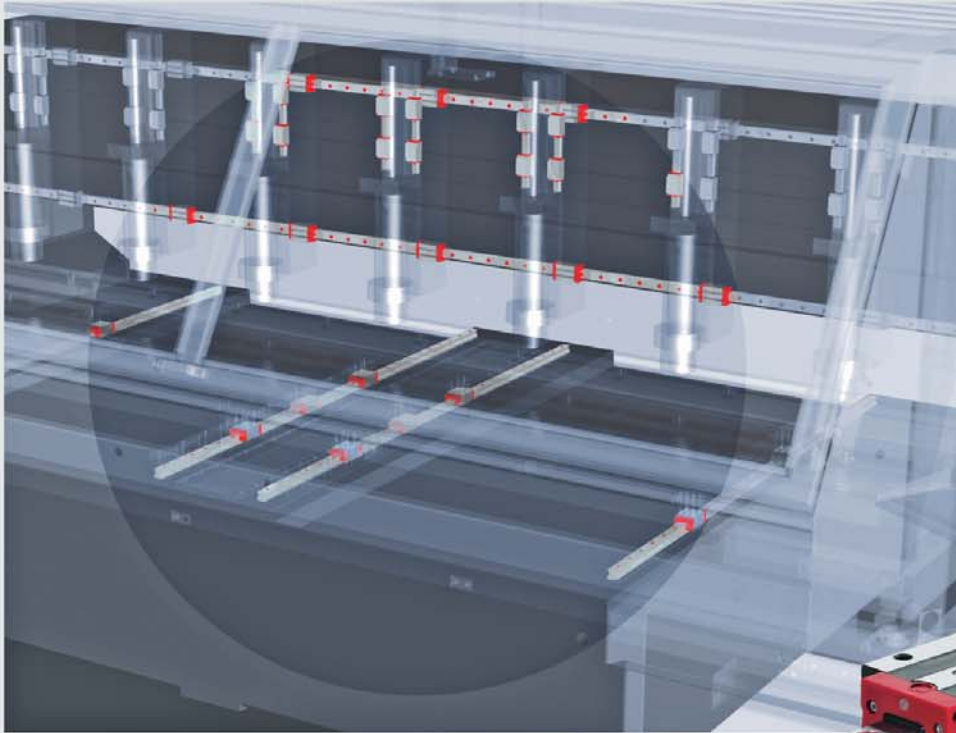
## SCHNEEBERGER products in action

We at SCHNEEBERGER are keen to continually offer our customers more economical and efficient products. We are therefore ambitiously committed to the further development of products and our product range, and are intensively involved in the improvement of our manufacturing infrastructure and logistics.



### More wafers per hour

Based on a high-precision and extremely stable platform, SCHNEEBERGER offers you individually tailored positioning systems, that can considerably shorten the cycle time during wafer inspection. Combined with a high-end controller, the full potential of these tried and tested systems can be fully exploited.



### **System competence for mechanical engineering**

Printed circuits are processed on the 4-axis drilling and milling center in portal construction. This machine sets standards in its class for efficiency and precision at high operating rates and low maintenance. The carriage drives are highly dynamic. Despite the resulting forces and moments on the frame and the guideways, the positioning accuracies of the drill heads are guaranteed in the  $\mu\text{m}$  range. For the frame this means extremely high demands on the thermal stability and rigidity under high humid conditions.

The chosen integration of the mineral casting product line with SCHNEEBERGER Linear Technology fulfils these high demands to perfection.

Our MONORAILS have also proven themselves through their high rigidity, great dynamic and static loading capacity, quiet running and universal sealing of the carriage. For the user, the MONORAIL is an economical guideway that fully meets all the demands made by modern mechanical engineering.

## Talk to us about your own vertical integration

It makes no difference how you set out your own manufacturing process, SCHNEEBERGER is your ideal supplier and partner in every project phase.

We supply you with components defined by you or we will be glad to offer you comprehensive support right at the design phase or with the machine layout. We master the entire kinematic process right through to the fully assembled machine base.

### From standard components...

With our highly precise and reliable standard components we cover a wide range of linear guidance applications.

We are able to design customer-specific adaptations or functional expansions at attractive conditions.



### ...through highly integrated positioning systems...

Our standardized systems and platforms offer efficient and economical solutions for your positioning tasks. You benefit from a perfect motion system that permits a simple integration in your application.

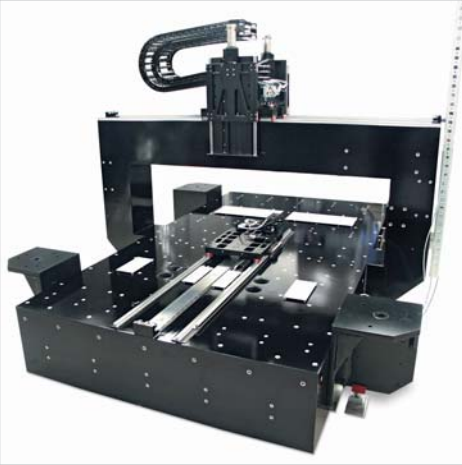






**...to final assembled machine structures**

Our common focus is on the overall quality of the end product. Our skill at mastering the unique challenge of the kinematic process, and the mineral casting of the machine structure paves the way for huge design flexibility of innovative system solutions.



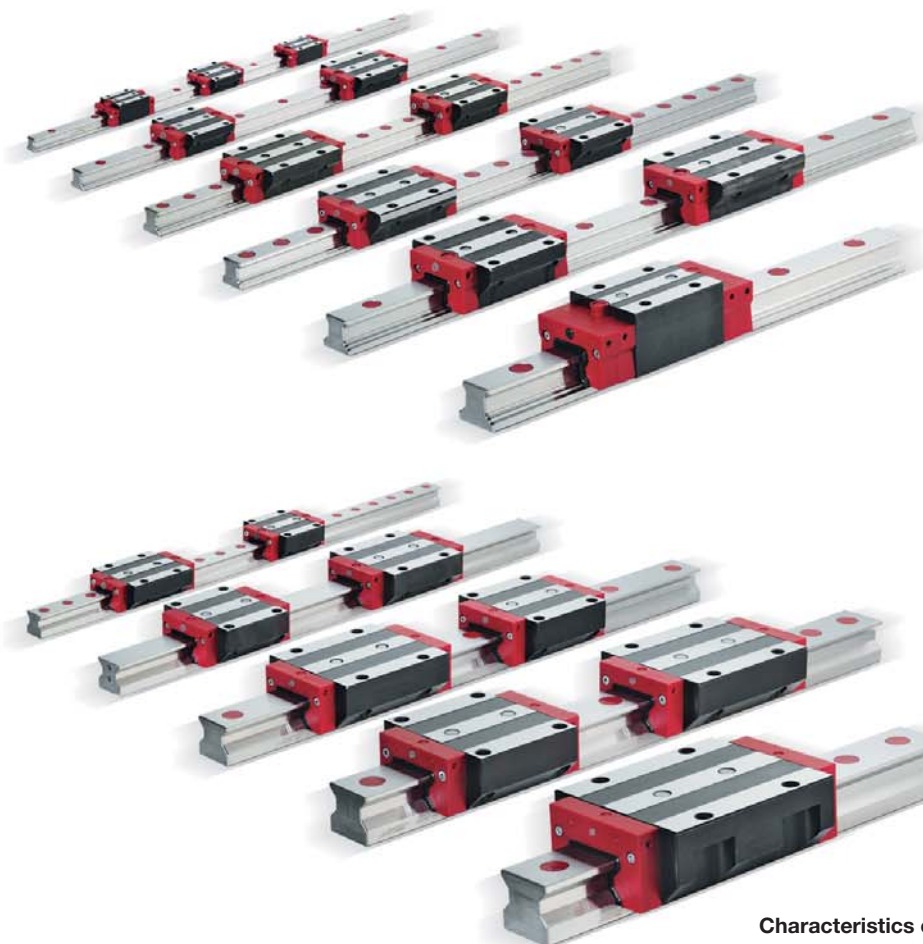
**Simplified procurement and reduced vertical integration manufacturing**

Leave the entire manufacturing process of the system to us and reduce your levels of vertical integration and the resources involved! Our core strategy is to provide you with increased flexibility and so minimise your risk.



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**Profiled linear guideways**  
MONORAIL



**MONORAIL BM**

with balls

Types BMA, BMB, BMC, BMD, BME, BMF, BMG

Sizes BM 15, 20, 25, 30, 35, 45

**MONORAIL MR**

with rollers

Types MRA, MRB, MRC, MRD, MRE

Sizes MR 25, 35, 45, 55, 65, 100

**MONORAIL BZ**

with balls

Type BME

Sizes BZ 25, 35



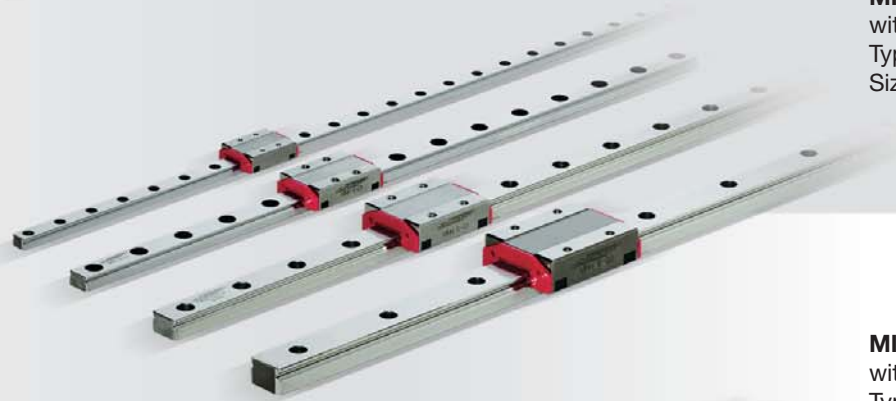
**Characteristics of MONORAIL**

	BM	MR
Loading capacity	○	●
Rigidity	○	●
Running accuracy	●	●
Lifespan	○	●
Smooth-running	●	○
Displacement resistance	●	○
High speeds	●	○
Simple installation and maintenance	●	○
Requirements on exactitude and rigidity of surrounding structure	○	○
Integrated measuring system	●	●
Integrated toothed rack	●	

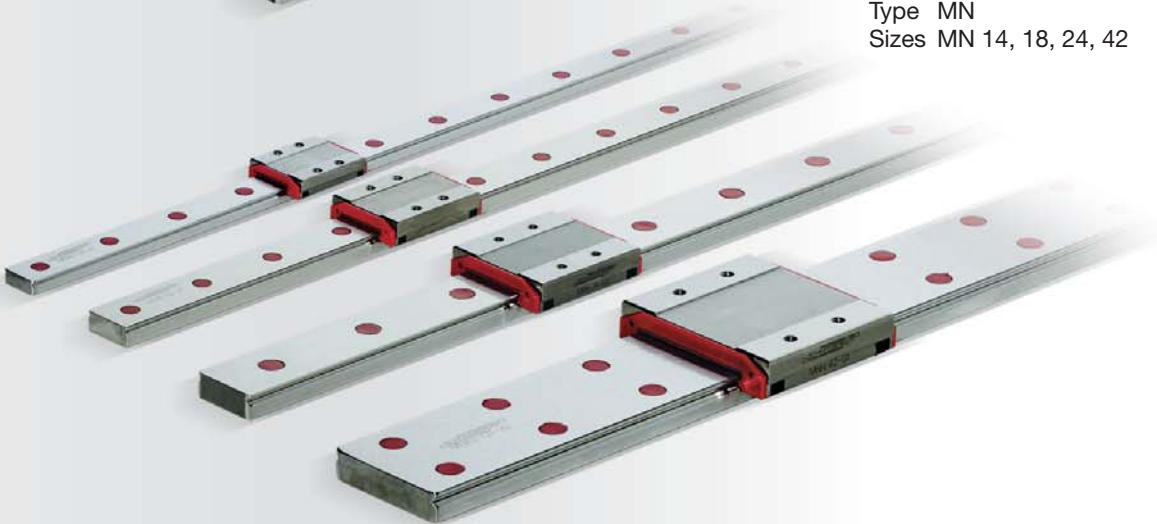
● max. ○ min.

**Miniature guideways**  
MINIRAIL

**MINIRAIL standard sizes**  
with balls  
Type MN  
Sizes MN 7, 9, 12, 15



**MINIRAIL wide sizes**  
with balls  
Type MN  
Sizes MN 14, 18, 24, 42



**Characteristics of MINIRAIL**

	Standard	Wide
Loading capacity	○	●
Rigidity	●	●
Smooth running	●	●
Requirements on exactitude and rigidity of surrounding structure	○	●
High speeds	●	●
High acceleration/oscillations	●	●
Clean-room and vacuum suitability	●	●
Corrosion resistant	●	●
Interchangeability of the carriage	●	●

● max. ○ min.

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## Linear guideways

**Type RN**  
with rollers  
Lengths 50 to 1500 mm  
Sizes 3, 4, 6, 9, 12  
FORMULA-S  
Dry runner



**Type RNG**  
with rollers  
Lengths 50 to 1500 mm  
Sizes 4, 6, 9, 12  
FORMULA-S  
Dry runner



**Type M/V**  
with needles  
Lengths 100 to 1500 mm  
Sizes 3015, 4020, 5025,  
6035, 7040, 8050



### Characteristics of linear guideways

	Type R (balls)	Type R (rollers)	Type RN (rollers)	Type RNG (rollers)	Type N/O (needles)	Type M/V (needles)
Loading capacity	○	◐	◑	◑	●	●
Smooth running	●	◐	◑	◑	◐	◐
Rigidity	○	◐	◑	◑	●	●
Cage constraint control			●	●	●	●
Requirements on exactitude and rigidity of surrounding structure	○	◐	◑	◑	●	●
Dry run ability			●	●	●	
Small space requirement	●	◐	◑	●	◐	◐

● max. ○ min.

## Recirculating units

**Type SR**  
with rollers  
Lengths 32 to 200 mm  
Sizes 2, 3, 6, 9, 12



### Characteristics of recirculating units

	Type SK	Type SKD	Type SKC	Type SR	Type NRT
Loading capacity	◐	○		◑	●
Smooth running	◑	●	●	◐	◑
Rigidity	◐	○		◑	●
Requirements on exactitude and rigidity of surrounding structure	◐	◐	◐	◑	●
Dry run ability			●		
High operating temperatures			●		

● max. ○ min.



## Our standard products

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### Integrated measuring system MONORAIL AMS

**MONORAIL AMS incremental**  
Types for roller MONORAIL MR  
AMSA-30, AMSA-3A, AMSD-3A  
Sizes MR 25, 35, 45, 55, 65

**MONORAIL AMS incremental**  
Types for ball MONORAIL BM  
AMSA-4A, AMSD-4A  
Sizes BM 15, 20, 25, 30, 35, 45



**MONORAIL AMS absolute**  
Types for roller MONORAIL MR  
AMSABS-3A  
Sizes MR 25, 35, 45, 55, 65

**MONORAIL AMS long**  
Types for roller MONORAIL MR  
AMSA-3L  
Sizes MR 25, 35, 45, 55, 65



### Characteristics of MONORAIL AMS

	Type AMSA-30	Type AMSA-3A	Type AMSA-4A	Type AMSD-3A	Type AMSD-4A	Type AMSABS-3A	Type AMSA-3L
Processing accuracy	●	●	●	◐	◐	◐	◐
High speeds	●	●	●	◐	◐	◐	◐
Simple installation and maintenance	●	●	●	●	●	●	●
Suitable for MONORAIL MR	●	●		●		●	●
Suitable for MONORAIL BM			●		●		
1Vss interface	●	●	●				●
Digital interface				●	●	●	

● max.    ○ min.

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## Linear tables

### Type NKL

Single axis layout  
Lightweight  
Main parts in aluminium  
Lengths 25 to 410 mm  
Strokes from 10 to 280 mm  
FORMULA-S  
Dry Runner



### Type NDN

Single axis layout  
Stainless steel  
Lengths 10 to 80 mm  
Strokes from 5 to 70 mm



### Type NFM

Single axis layout  
Table parts in aluminium  
Lengths 75 to 250 mm  
Strokes 25 to 150 mm



### Type MS

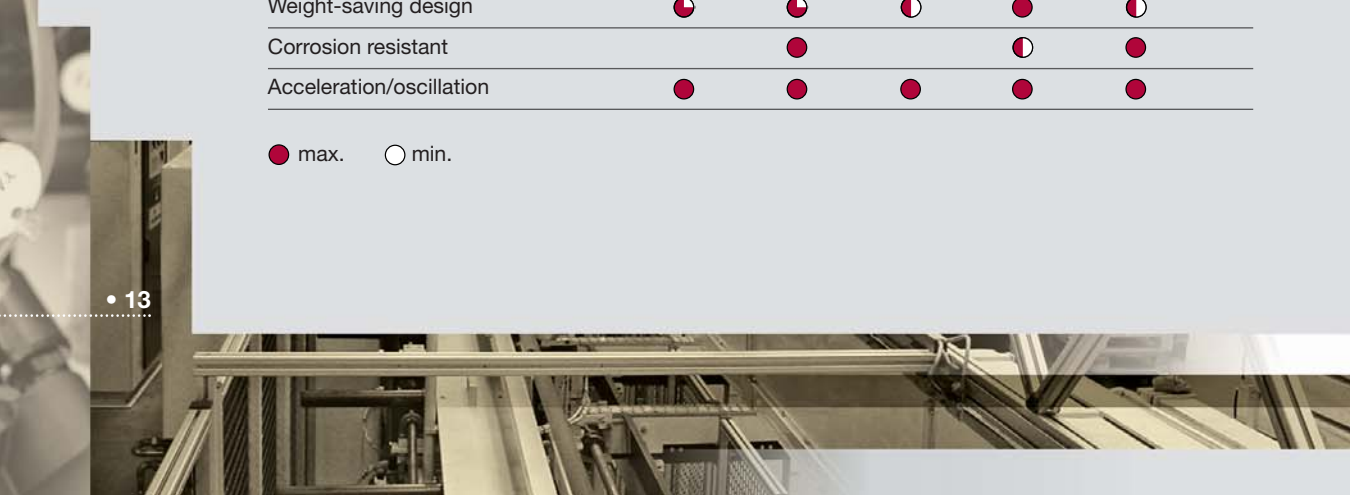
Single axis layout  
Stainless steel  
Lengths 10 to 130 mm  
Strokes 6 to 103 mm  
FORMULA-S standard for sizes 7-15



### Characteristics of linear tables

	Type ND	Type NDN	Type NK	Type NKL	Type MS
Loading capacity	●	◐	●	●	◐
Rigidity	●	◐	●	◐	◐
Smooth running	◐	●	◐	◐	◐
Cage constraint control optional		◐	●	●	●
Weight-saving design	◐	◐	◐	●	◐
Corrosion resistant		●		◐	●
Acceleration/oscillation	●	●	●	●	●

● max.    ◐ min.





## Our standard products

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### MINIMODULE

Sizes (MINIRAIL)	9, 15, 42 mm
Max. strokes	up to 886 mm
Traverse speed	up to 5 m/s
Process accuracy up to 1 m	< 5µm
Drive	synchronous belt

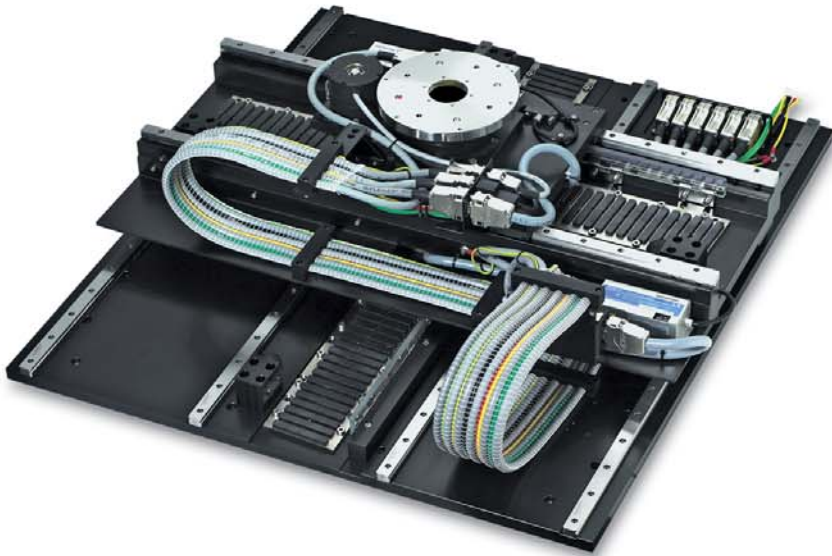


#### Your advantages at a glance:

- » Proven technology and precision in SCHNEEBERGER MINIRAIL guideways
- » Reliable drive by synchronous belts for consistently high traversing speed
- » Very compact design
- » Smaller profile section with lowest overall height (10 to 16 mm) available on the market
- » High precision and stability thanks to direct bonding of rail and carriage
- » High rigidity thanks to well-proven MINIRAIL guideways
- » Individual parts made of corrosion-resistant materials
- » Minimum assembly work because it is insertable without adapter part between the surrounding structure and the MINIRAIL guideway

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## High-end positioning platform for Wafer inspection



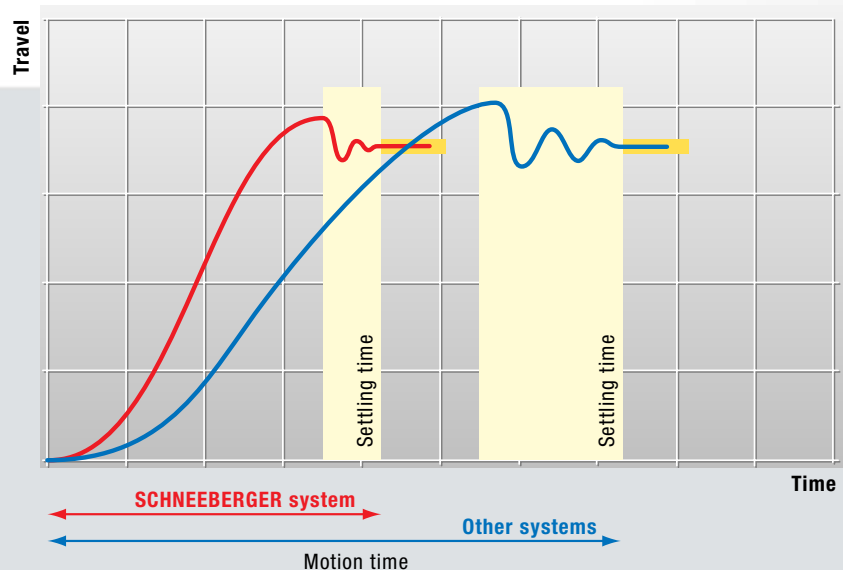
Using the SCHNEEBERGER positioning platform as a base design we offer you individual solutions, that are not just available faster, but can also position in a time and with a stability which would have been impossible before.

Thanks to the extraordinary «step-and-settle» performance you will achieve shorter cycle times for your applications, higher quality and thereby greater productivity.

SCHNEEBERGER has a flexible, high-precision positioning platform to meet the highest demands on precision and stability. Thanks to its superior design and the SCHNEEBERGER components that are tried and tested in everyday use, this cost-effective platform has an extremely stable mechanism that guarantees the highest efficiency for applications in the nanometre range, regardless of the position.

### Your advantages at a glance:

- » Lower initial costs
- » Minimum integration expenditure
- » Nanometre stability irrespective of position
- » Consistently high process speed
- » Less positioning errors
- » **More wafers per hour!**







### What you can expect from us

#### **Advisory services. A competent partner from the very start.**

Our goal is to work with a customer from an early phase in order to guarantee the maximum degree of system integration. This enables you to benefit from our experience and our technological advance in the development of complex positioning systems. Our on-the-spot agent is available for initial contact.

#### **Development. Intelligent approaches to solve your problem.**

Our engineering team develops systems that meet challenging specifications. Using powerful 3D CAD software, all parts of the installation are designed realistically and can be simulated. In this way, we can identify complex problems at the design stage and produce optimized solutions.



#### **Manufacturing and series production.**

##### **Precision and process reliability.**

The ultra-precise manufacture of structural components and the assembly of sub-assemblies is a core competence that goes back many years at SCHNEEBERGER. In this field, we have an unparalleled degree of technological expertise. Clean room or vacuum applications are assembled in our special assembly shops that meet clean room classification 1,000.

#### **Logistics. An essential part of our product.**

Logistics, – particularly in the extremely cyclical semiconductor industry – requires the maximum degree of flexibility. For this reason, we maintain intensive logistical contacts with our customers. Via our active supplychain, we are in a position to submit proposals that satisfy the manifold demands on reliability and flexibility. We understand our business in the demanding world of logistics – test us, we will be happy to prove it to you.

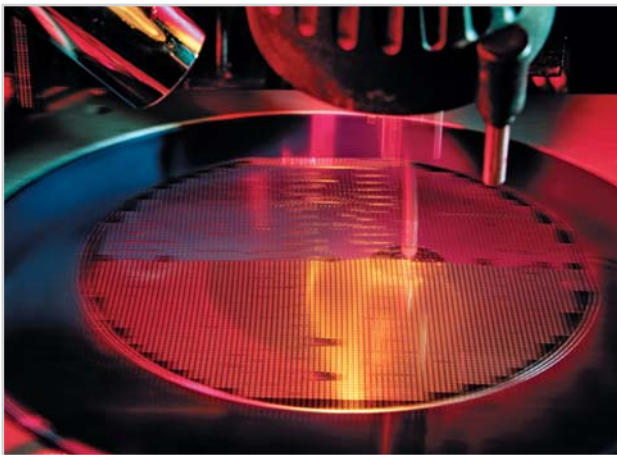
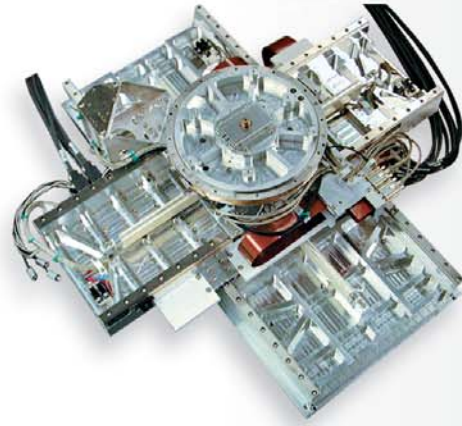
#### **Support. Whenever you need us.**

We offer our customers competent, expert support whenever they need it. Either on the spot using our international network or through modern means of communication – we take care of you. Our customers appreciate our open and honest style of communication. We are proud to be able to foster truly long-term partnerships anew every day. For our commitment, we also received the **Partnership Award** from KLA-Tencor.

### Semi-conductor sector

SCHNEEBERGER builds custom-designed systems that are decisive for the manufacturing processes involved in semi-conductor production. With their microscopically small structures, these products have to be fully tested with high precision. The cost-effective production of even faster processors and even more compact memory chips than those we are familiar with today can only be achieved in this way.

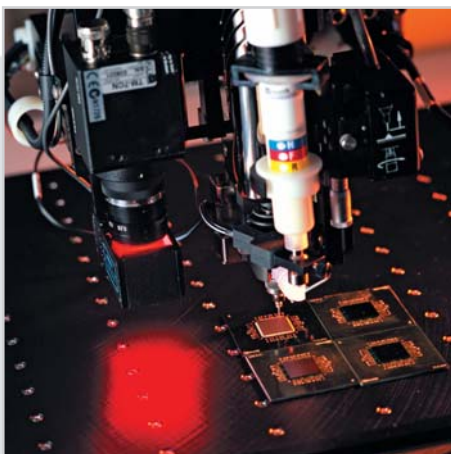
Modern production processes for integrated circuits are at the limits of what is technically feasible. New processes are being continuously developed in order to further improve and to accelerate production processes. Frequently, the yield attained by new processes like these and the resultant semi-conductor chips is often very modest in the intro-



ductory phase. As the cost-effective utilisation of production plant capacity is the goal, quality control and a pro-active influence on processes are becoming increasingly important on the basis of results.

As a manufacturer of quality-control systems, SCHNEEBERGER plays an important role in the semi-conductor industry. Demands on the resolution and precision of measuring and image-processing systems are on the increase together with the gradual miniaturisation of semi-conductor structures.

Owing to their central function in the manufacturing process, these positioning systems permit the industrial production of semi-conductor structures and guarantee the cost-effectiveness of production lines costing billions.



## Large-format system sector

Large-format positioning systems like those manufactured by SCHNEEBERGER for the flat panel display industry or the printed circuit board industry, can only be made as precisely and as robustly as our customers require thanks to our many years of expertise in these fields. The contrast between the mechanical size of a system and the microscopically small units of control structures is the greatest challenge in the engineering of such systems. The end products in large format manufacturing systems are often inspected even before delivery and assembly. Visual inspection using image-recording systems between the individual manufacturing stages and at the end of production is an important part of quality control for the manufacturers.

An electrical test at the end of production is usually accompanied by costs and requires the full range of CAD data as well as an automatic testing machine that contacts and tests all signal paths.

Optical tests are comparatively faster and more economical and can be carried out with a very high degree of precision thanks to SCHNEEBERGER systems. This gives the manufacturers of large-format products a relevant economic advantage.

The automatic optical inspection of flat panel displays or printed circuit boards has become standard in the industry in recent years. Thanks to its high-end positioning system, SCHNEEBERGER puts the manufacturers of this inspection equipment at the leading edge of technology.

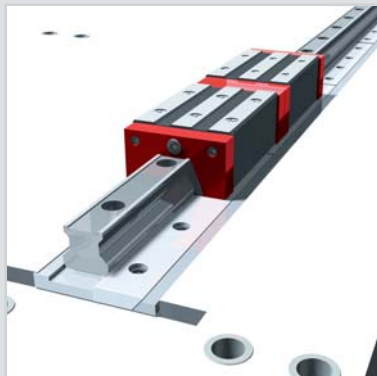
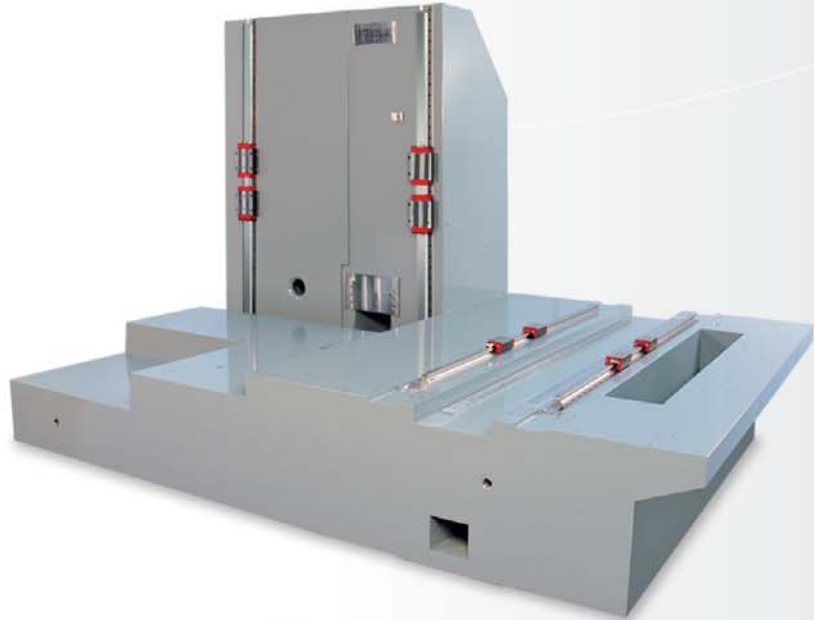
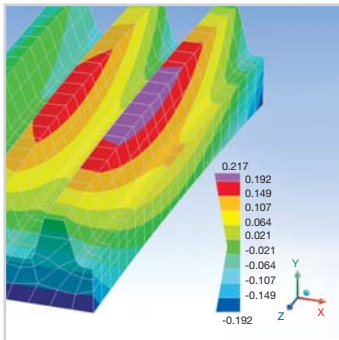
Our positioning systems meet the highest demands both on camera systems as well as on scanner systems.



### SCHNEEBERGER mineral casting

SCHNEEBERGER mineral casting is not only an alternative to conventional cast-iron or steel constructions, but in many instances it is by far the superior technology. This is demonstrated also by its economical advantages: SCHNEEBERGER mineral casting components have a short delivery time and are up to 30% cheaper.

Our longstanding experience in mineral casting and its diversity of application possibilities makes us a strong partner for machine and plant builders. Our customer and application support starts at the construction phase because, thanks to FEM (Finite Element Method), we are able to simulate the effects of dynamic and static loads without the need for costly prototypes. In this way we can verify the desired characteristics of the cast components and overall thermal behaviour.



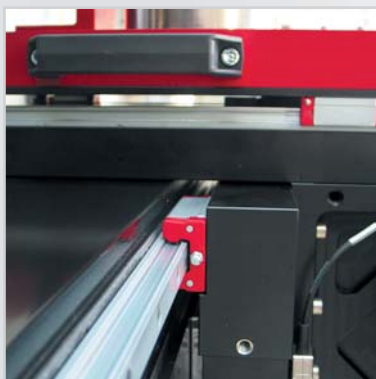
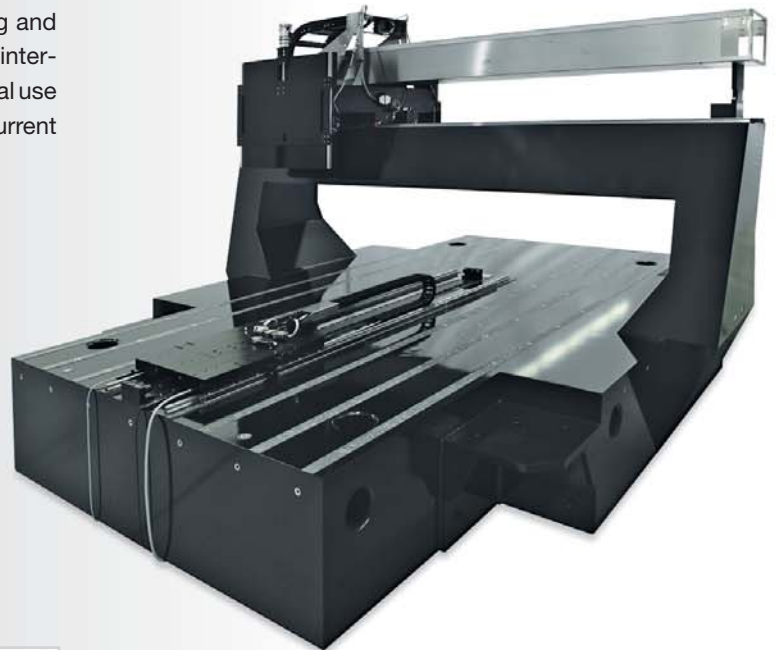
#### Assembly in the $\mu\text{m}$ range

Every machine designer knows that fitting linear guides with  $\mu\text{m}$  accuracy is a demanding task. To us, however, it is a core skill involving special technology and processes which guarantees the precision and repeatable accuracy required. We can call on our extensive expertise where mineral casting and linear guides are concerned.

## Specific overall solutions

The optimisation of logistics processes and the continual improvement and simplification of manufacturing and assembly procedures are essential economical factors in the machine and plant building sector.

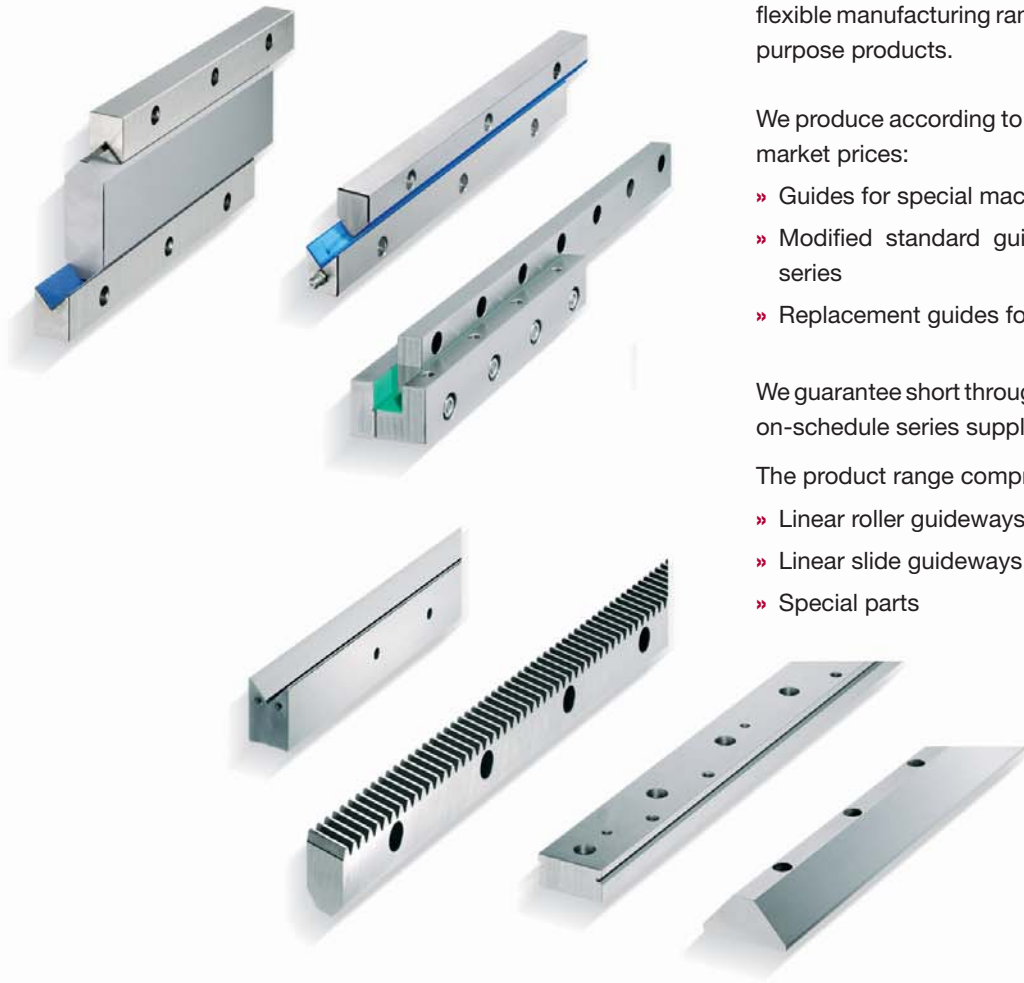
Our engineering and manufacturing competence encompasses the entire process, from production of complete sub-assemblies, from positioning systems with integrated controller unit and drive, through to mineral-casting and to the final assembly of the machine base. These interconnected SCHNEEBERGER skills guarantee optimal use of resources and the best possible advantage of current technologies.



### Your advantages at a glance:

- » The overlapping know-how in mineral casting and positioning offers the utmost potential for customer-specific and economically superior overall solutions
- » The tight integration of linear technology and mineral casting enables a flexible development of tailored solutions
- » The engineering expertise of our consultants covers the total solution
- » As customer you benefit from more efficient, seamlessly integrated processes, from design to production and right through to delivery of the ready-to-install assemblies

### Special components to your own specifications



Exceptional challenges frequently call for tailored solutions. «SCHNEEBERGER Special Components» is a flexible manufacturing range that offers rational special-purpose products.

We produce according to your own specifications at fair market prices:

- » Guides for special machine building
- » Modified standard guides as individual items and series
- » Replacement guides for machine refurbishments

We guarantee short throughput times for prototypes and on-schedule series supplies.

The product range comprises:

- » Linear roller guideways in special dimensions
- » Linear slide guideways with various coatings
- » Special parts

[www.schneeberger.com](http://www.schneeberger.com)

You will find more information about our products and applications – with illustrations – on our website.

