

**SPRING TECHNOLOGY**

***Eibach***<sup>®</sup>  
**FEDERN**





## ABOUT US

Founded in Germany in 1951, Heinrich Eibach laid the basis for the Eibach Group which is now active around the world. After Heinrich passed away in 1967, his son Wilfried took charge and grew the company to its current market-leading position. For several years, Wilfried's son Ralph and daughter Swantje have taken an active role in the daily business and success of the company. Wilfried, Ralph and Swantje are also the only shareholders of Eibach Holding AG.

Today, Eibach is represented in Germany, the USA, UK, Japan, Australia, South Africa and China with its own production plants and | or engineering- and distribution companies. In addition, we are represented in more than 80 countries worldwide by exclusive importers, distributors and local partners.

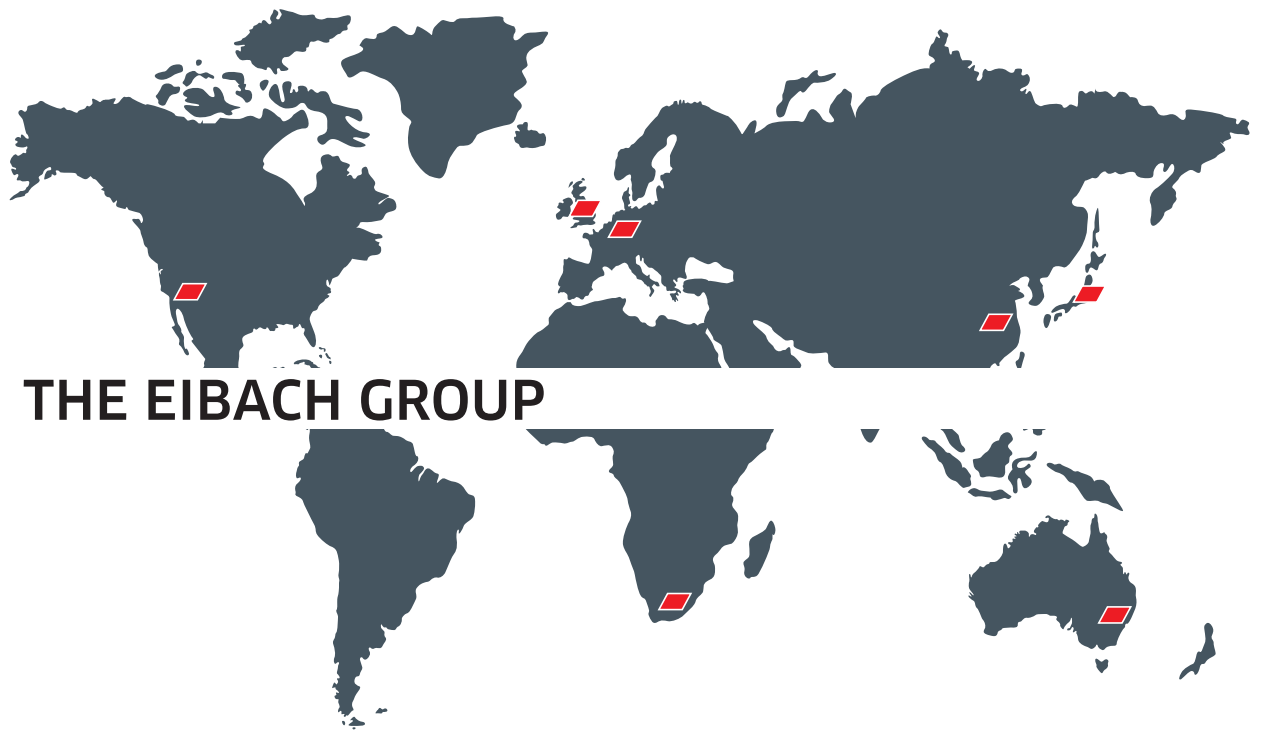
Eibach enjoys a worldwide reputation as a leading manufacturer of high-performance suspension springs, -components and -systems as well as hi-tech industrial springs – specially for demanding applications.

Eibach combines highest quality with the highest level of flexibility and efficiency, from small production batches to midsize series runs.

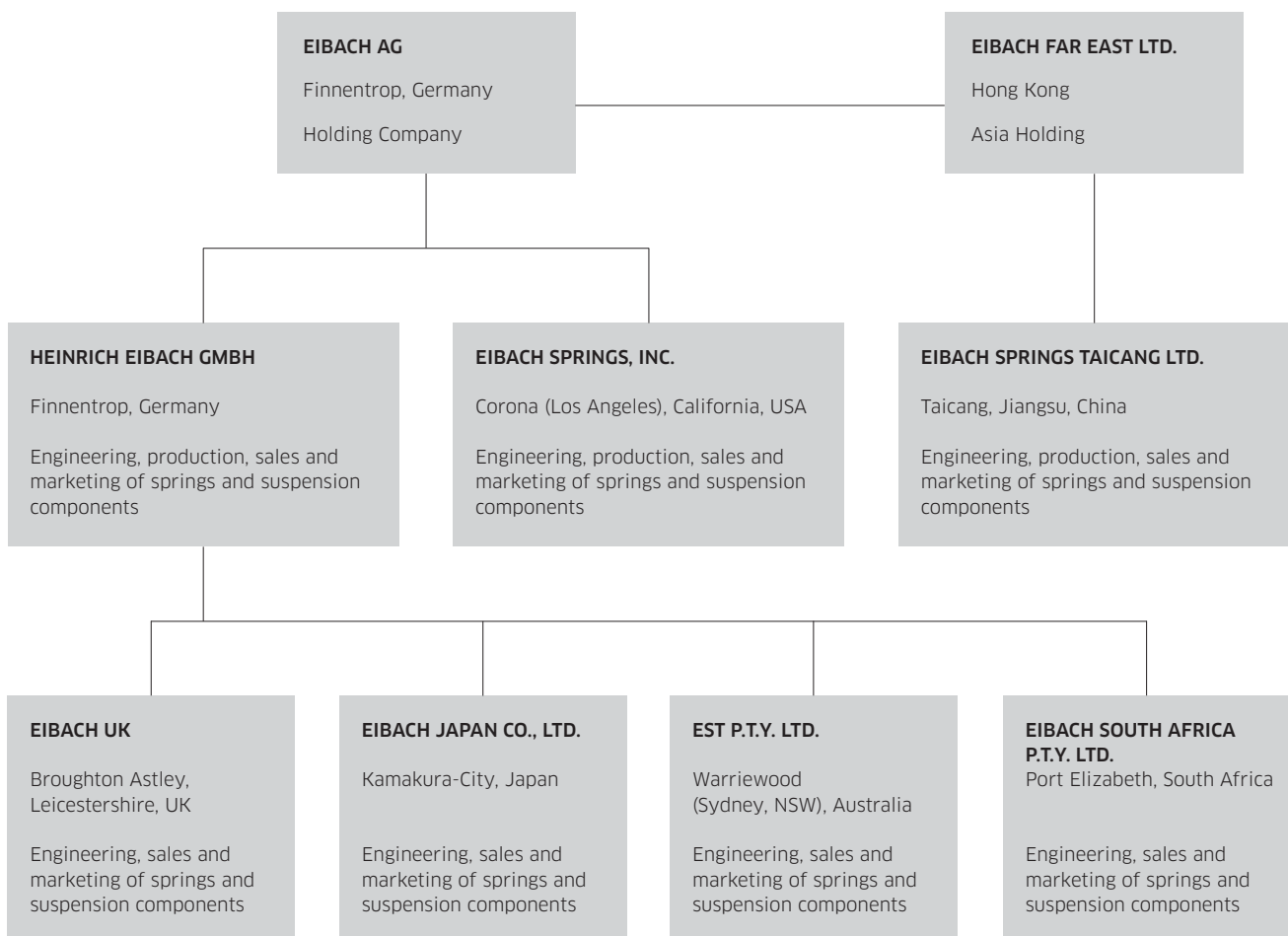


# CONTENT





About Us .....	2
The Eibach Group .....	4
Company Profile .....	5
Helical Compression Springs - cold formed .....	6
Helical Compression Springs - hot formed .....	7
Tension Springs .....	8
Torsion Springs .....	9
Flat Spiral Springs .....	10
Bent Wire- and Bent Strip Springs .....	11
PlayCom - Components for Spring Riders .....	12
Precision Springs for Ship- and Stationary Diesel- and Gas Engines .....	13
Springs for Sealing Technology .....	14
Sine Springs .....	15
Screw Conveyors and Metering Spirals .....	16
Corrosion Protection .....	17
Production .....	18, 19
Research and Development .....	20
Suspension Technology for Highest Demands .....	21
Eibach - Motorsports and Automotive .....	22
Team Eibach .....	23



## THE EIBACH GROUP



### Affiliated companies:

-  EPUS | Eibach Partnership US
-  EPI | Eibach Property Investment Australia
-  EOT | Eibach Oberflächentechnik 





## COMPANY PROFILE

- Medium size - with above 400 employees
- Above average equity ratio
- Targeted risk management through industrial diversity and process reliability in development and production
- Ahead of the curve with investment into state-of-the-art production technologies and infrastructure
- Decades of nationally accredited apprenticeship within a dual system
- Innovative engineering in developing groundbreaking production technologies
- State-of-the-art CAD systems (CATIA V 5, SolidWorks, AutoCad)
- Complete involvement in fundamental research | R&D
- Decades of an integrated QM system, certified according to international standards
- Over 60 years of experience
- Strong commitment and loyalty between staff, management and the owner family - "Team Eibach"



## HELICAL COMPRESSION SPRINGS COLD FORMED

### Production program:

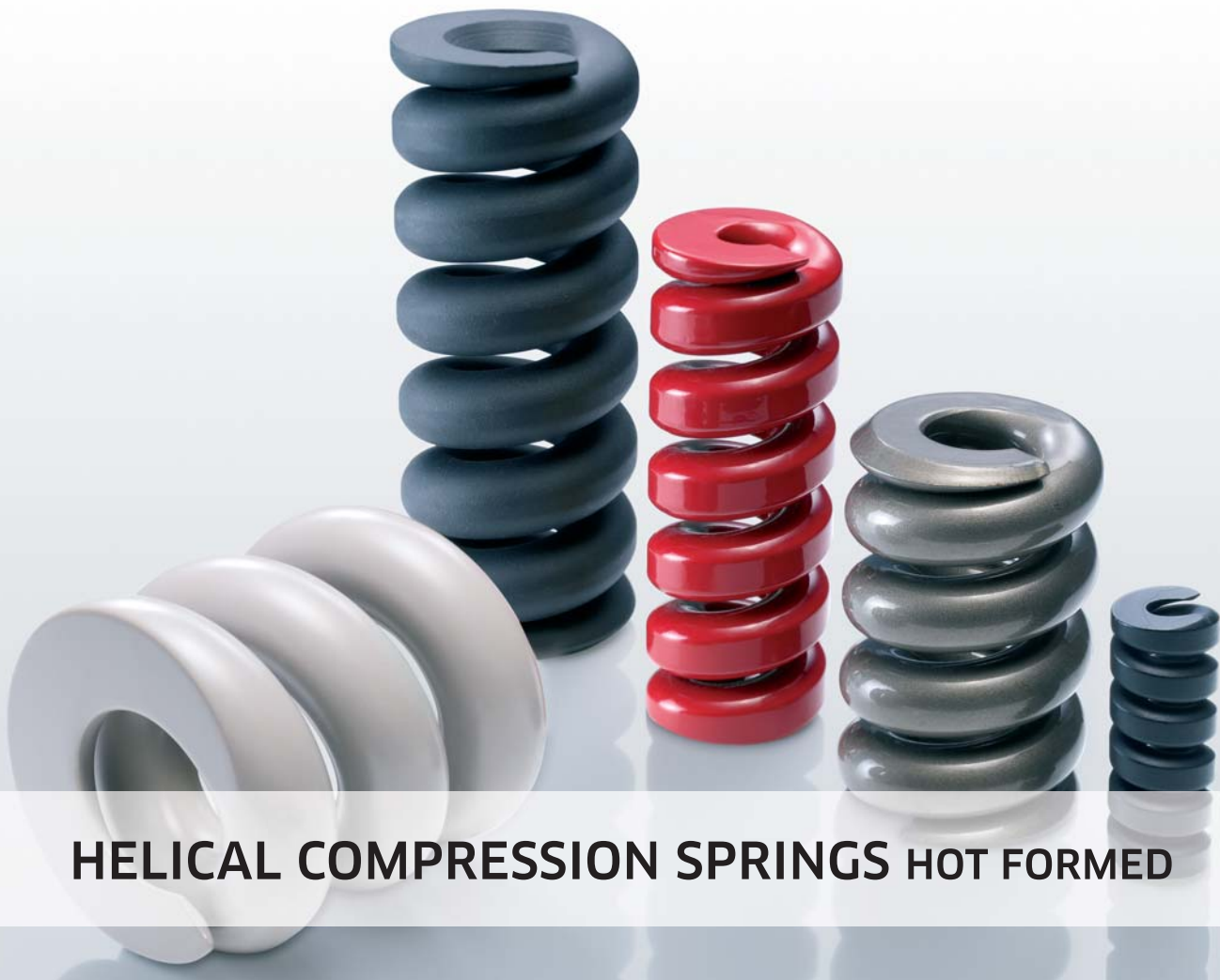
- 0.2 mm to 25 mm wire diameter

### Material profiles:

- Round, rectangular, trapezoid

### Materials:

- Patented cold drawn unalloyed steel wire according to DIN EN 10270-1
- Oil hardened and tempered spring steel wire according to DIN EN 10270-2
- Stainless spring steel wire according to DIN EN 10270-3 up to 25 mm wire diameter
- Special qualities:  
Inconel, Nimonic, Titanium, Hastelloy, Elgiloy



## HELICAL COMPRESSION SPRINGS HOT FORMED

### Wound from round bars

Production program:

- 18 mm to 55 mm bar diameter
- 8.30 m maximal bar length

Materials:

- 51 CrV4 or 52 CrMoV4, hot rolled steel for hardened and tempered springs according to DIN EN 10089

Surface:

- Peeled and polished
- Ground
- Rolled

### Wound from coil

Production program:

- 10 mm to 32 mm wire diameter
- Wire length practically unlimited
- Very tight spring index possible, minimal 2

Materials:

- 51 CrV4, hot rolled steel for hardened and tempered springs according to DIN EN 10089

Surface:

- Drawn
- Peeled





## TENSION SPRINGS

Production program:

- 0.2 mm to 32 mm wire diameter

Materials:

- Patented cold drawn unalloyed spring steel wire according to DIN EN 10270-1
- Oil hardened and tempered spring steel wire according to DIN EN 10270-2
- Stainless spring steel wire according to DIN EN 10270-3

With the above mentioned materials a coiled-in initial stress is possible.

- 51 CrV4 or 52 CrMoV4 according to DIN EN 10089

Springs made out of the above-mentioned two materials need to be hardened and tempered after the coiling process. Therefore a coiled-in initial stress is not possible.

Special materials:

- Inconel, Titanium, Hastelloy, Elgiloy

Examples of end configurations:

- Bend loops, special loops made of cast iron or sheet metal, screwed-in components and more.





## TORSION SPRINGS

### Production program:

- 0.2 mm to 35 mm wire diameter

### Materials:

- Patented cold drawn unalloyed spring steel wire according to DIN EN 10270-1
- Oil hardened and tempered spring steel wire according to DIN EN 10270-2
- Stainless spring steel wire according to DIN EN 10270-3

### Material profiles:

- Mainly round
- Shaped wire possible

### Forming of the ends:

- This kind of springs have a tangential power transmission, thus in the direction of coiling. Therefore the shape of the ends must be adjusted to the location after installation.



## FLAT SPIRAL SPRINGS

### Production program:

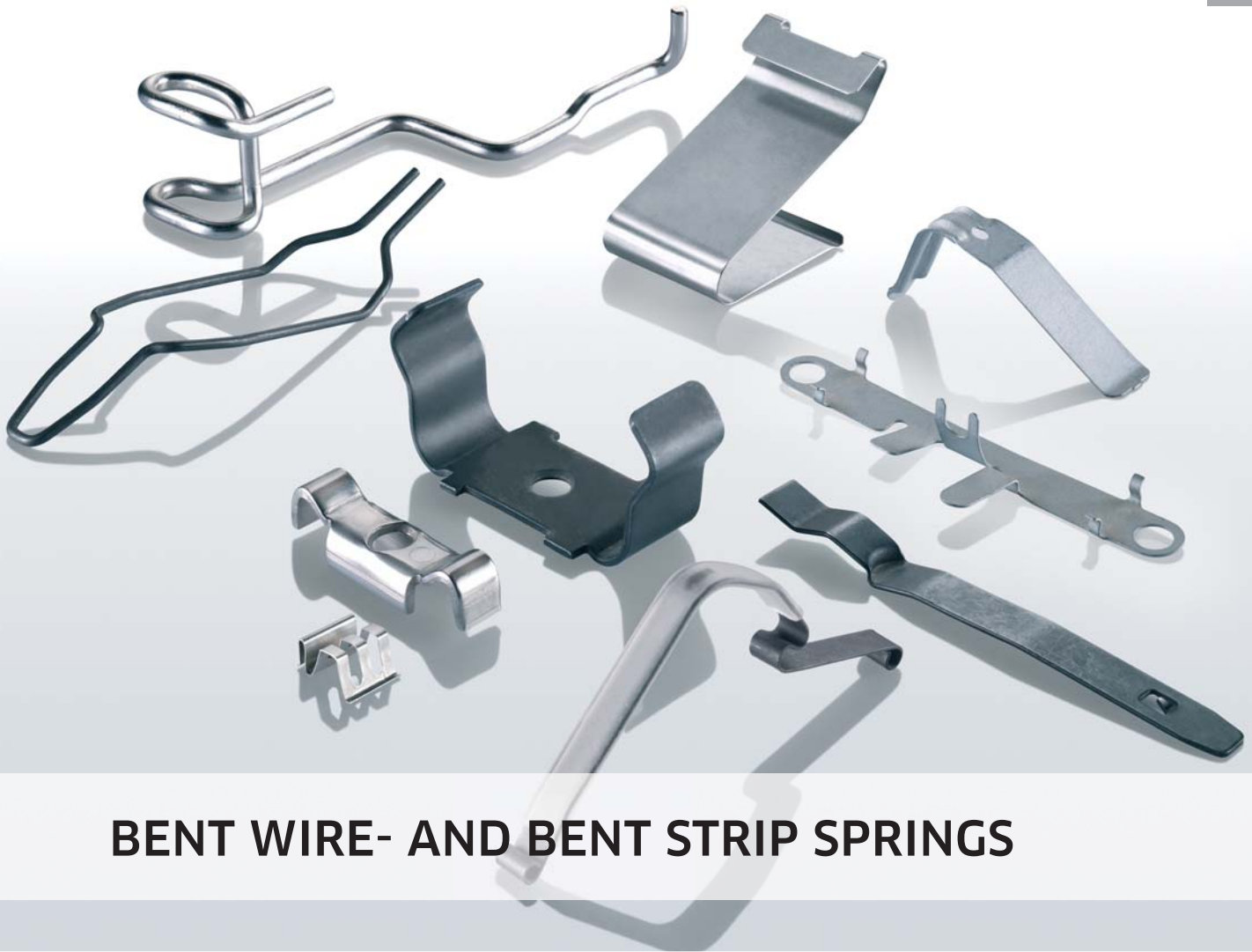
- 0.1 mm to 10 mm strip gauge
- From 0.2 mm wire diameter

### Materials:

- Alloyed or unalloyed spring steel strip, pre-hardened or hardened and tempered after coiling

### Features:

- For reset- or measuring applications springs are manufactured with gaps between the coils.
- Spring ends for power transmission are individually formed according to the specific requirement.
- Instead power- and constant force springs are manufactured without gaps inbetween the coils and are fixed in a preloaded condition. They are then installed into housings.



## BENT WIRE- AND BENT STRIP SPRINGS

Production program:

- 0.1 mm to 10 mm strip gauge
- From 0.2 mm wire diameter

Materials:

- All kinds of customary spring materials

Features:

- Variety of shapes and range of applications result in almost unlimited design options.
- We provide modern production facilities including internal tool shops and qualified technical service, also in the form of simultaneous engineering.





## PLAYCOM COMPONENTS FOR SPRING RIDERS

### PlayCom - a component system developed by Eibach

- EKS (Eibach Kid Spring) available in several standard sizes as well as in HD version (reinforced design for heavier loads)
- Spring perch: a patented link between the ground anchor | body-design and the spring
- Ground anchor: made of individual hot-dip galvanized components; pyramid-shaped elements for ground installation, delivered dismantled
- Installation beams as platform for an individual assembly
- UV-resistant zinc phosphating + powder coating
- Customized RAL colors (apart from ground anchor)
- Testing facility (own development) for dynamic tests of individual components till the finished play item

### Customized designs:

- Variations on any PlayCom design are possible.

Please contact us with your special request.



## PRECISION SPRINGS FOR SHIP- AND STATIONARY DIESEL- AND GAS ENGINES

**Intake | exhaust valve springs, injection system springs (injection pumps, injection valves). Compression springs for the periphery on the engine as well as special springs for pressure relief valves on crankcases**

- A crucial safety component for fast, medium and slow running diesel- and gas engines
- Market segments include the ship building industry, railway | locomotive technology and power | generator applications.
- State-of-the-art manufacturing- and testing facilities are required to ensure the operational safety and life expectancy.

Specialties:

- Reduction of relaxation
- Increase of compressive stress
- Application of the highest level of materials | wire technology currently available (SuperClean)
- Dynamic durability tests under the influence of corrosion



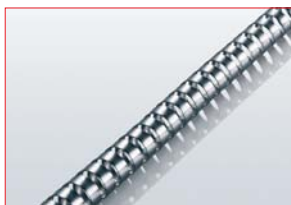
## SPRINGS FOR SEALING TECHNOLOGY

Spring support elements are inlaid elements for radial seals. They provide spring properties to most of the highly corrosion resistant sealing materials. Spring support elements are loaded radially without exception.

- According to the elasticity grade we stock Helicoils (elasticity grade hard), Meandersprings (elasticity grade medium) and Diametral springs (elasticity grade soft).

- Depending on the type of spring, we use wire (round or flat-rolled) according to DIN EN 10270-3, stainless steel spring strip according to DIN EN 10151 or Hastelloy C4.
- The springs are usually supplied in stock lengths and shortened to the requested size, either by the customer or by us.

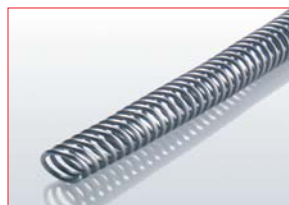
Detailed information is available in our Dynaflex catalogue.



Helicoil



Meanderspring



Diametral spring





## SINE SPRINGS

### Sine springs

- 2 - or 3 - waved spring elements, connected by special welding

Production program:

- Standardized stock program with nominal diameters from 10 mm to 105 mm

Materials:

- 1.4310 | 1.4571 according to DIN EN 10088-3
- Hastelloy C4

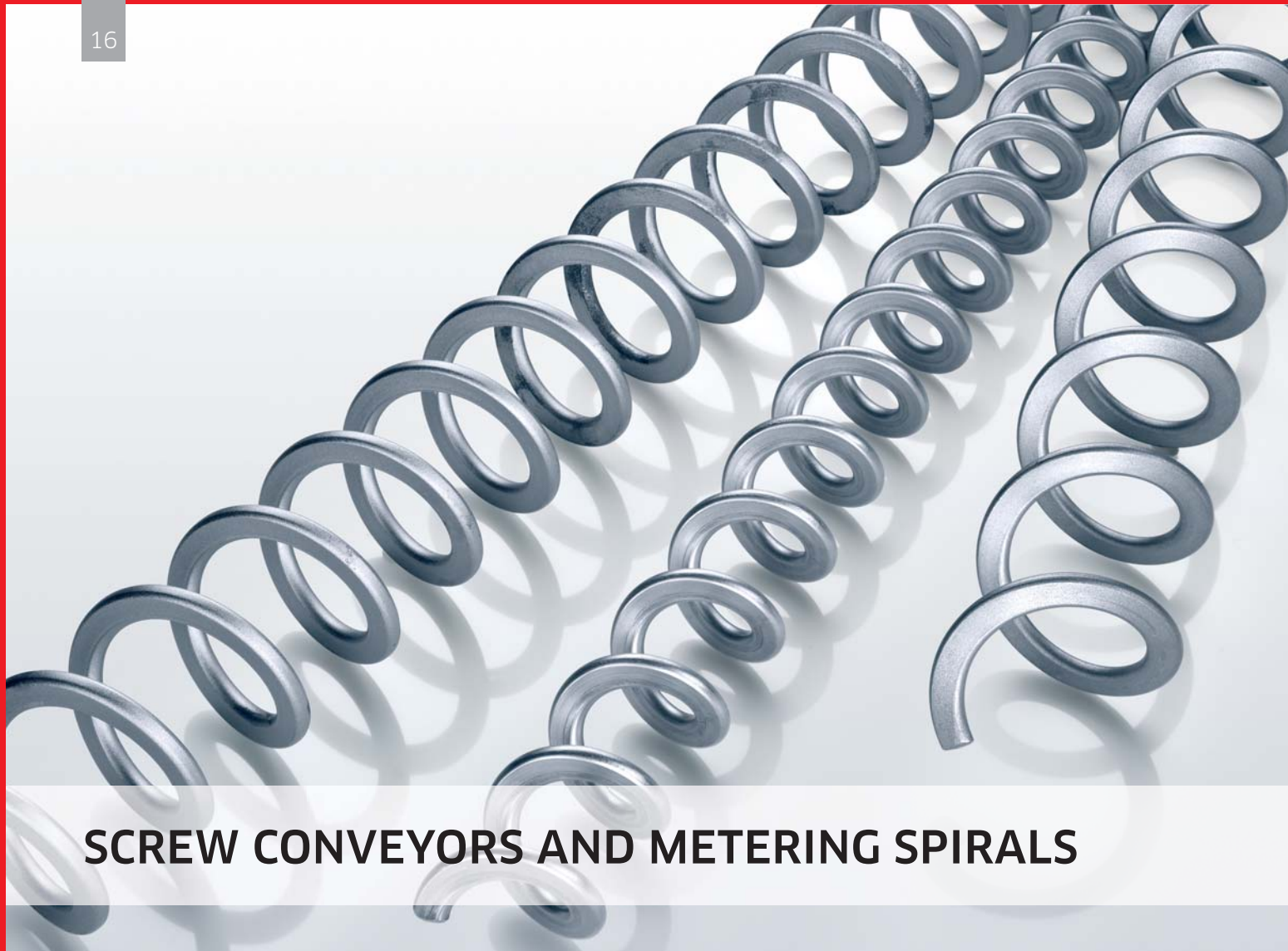
### Super sine springs

- Coiled springs (not welded) with application-orientated variations of quantity and height of waves as well as the quantity of layers

Materials:

- Stainless steel according to DIN EN 10270-3

Detailed information is available in our Dynaflex catalogue.



## SCREW CONVEYORS AND METERING SPIRALS

### **Screw conveyors** used as flexible transport elements

Production program:

- 30 mm to 120 mm external diameter
- Maximal pitch = outer diameter

Materials:

- Patented cold drawn unalloyed steel wire according to DIN EN 10270-1 SH
- Stainless spring steel wire according to DIN EN 10270-3 (1.4301)

Material profiles:

- Round wire
- Flat-rolled wire

We keep various profiles continuously in stock for flat-rolled wire - between 10 mm x 5 mm and 12 mm x 7 mm profiles.

### **Metering spirals**

- Fixed lengths or separable standard lengths

Materials:

- Mainly stainless spring steel wire according to DIN EN 10270-3

Material profiles:

- Round, rectangular, square

## CORROSION PROTECTION

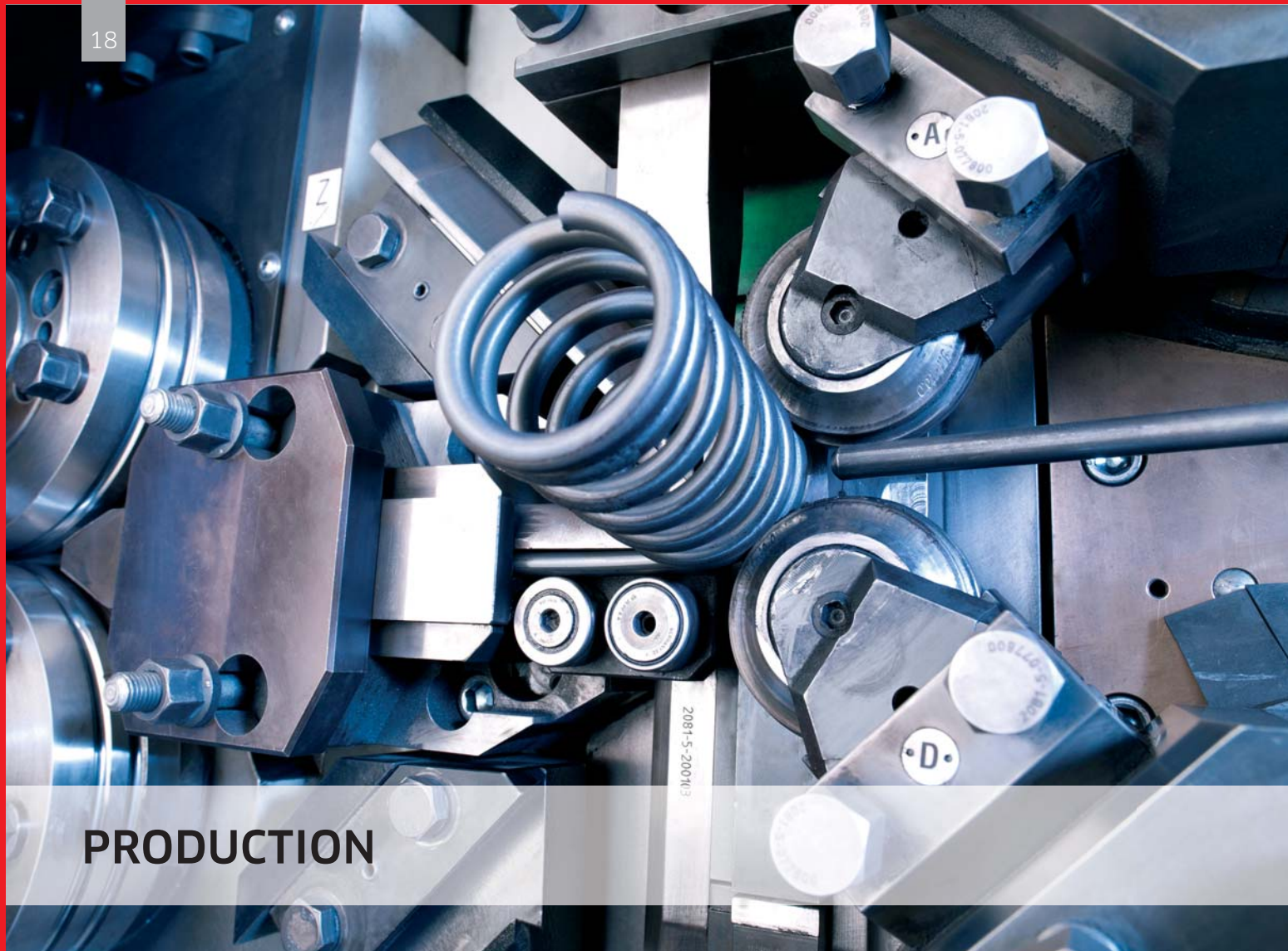
- In-house electrostatic powder-coating (polyester | epoxy resin)
- Zinc phosphating as pre-treatment and to prevent infiltration of corrosion
- Extensive range of colors, including UV-resistant powders
- Durability tests (static | dynamic), also under corrosion influence

Via Eibach Oberflächentechnik GmbH **EOT** we provide the micro layer corrosion protection system "Microcor", based on components like Deltatone, Deltaseal and Magni.

- Application methods are dip-, dip-spin-, centrifuging- or spraying processes without the risk of hydrogen embrittlement.
- Best corrosion protection
- High temperature resistance
- Marginal coating strength
- Choice of different colors by using organic top-coats as well as selectable friction characteristics, if PTFE is added
- Tests of corrosion resistance (Kesternich | salt spray | climate change) with or without premature damage for example through stone chip simulation

More information is available at [www.eot-gmbh.de](http://www.eot-gmbh.de).



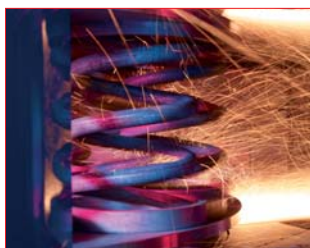


## PRODUCTION

- Raw material availability: In our warehouses we stock coils and bars in approximately 4000 different types, differing in specifications, dimensions, surface grades and similar. This extensive stock of raw materials ensures a rapid turnaround for prototypes and single pieces as well as for small, medium and large production runs.
- Quality and flexibility: It is our top priority to combine highest quality with maximum flexibility.
- CNC manufacturing technology: the use of state-of-the-art CNC technology in the entire production process allows minimal set-up times, ensuring the highest precision, smallest tolerances and optimum surface quality.

Some significant production features:

- State-of-the-art CNC cold forming of springs, using very high tensile strength, alloyed, oil-tempered spring materials up to 19 mm wire diameter; above 19 mm and up to 25 mm wire diameter, using our pre-hardened patented cold-drawn wire
- CNC Cold forming of springs up to 32 mm wire diameter, using annealed materials (for example 50 CrV4) in coils, heat-treated after winding
- Hot forming of coil springs up to 55 mm bar diameter (bar length max. 8.30 m)
- State-of-the-art grinding- and production machinery through implementation of our own production knowledge
- Chamfering of spring ends (in- and outside) by robots and especially developed handling systems
- Internal tool- and gauge shop



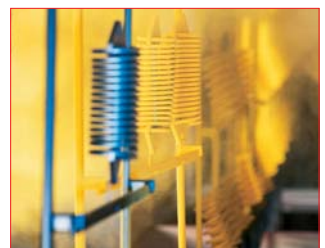
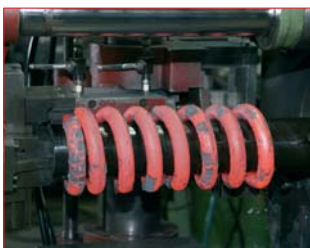


## PRODUCTION

- Improvement of dynamic durability through state-of-the-art shot peening techniques including thermal and stress peening
- Relaxation minimization through controlled heat-setting processes
- Economic in-house developed CNC bending technologies for stabilizer bars, made of pre-hardened solid or tubular material for small batch sizes and series, mostly used without additional tools
- Stabilizer end processing, using in house developed robot-supported systems
- Vulca-bonding process: especially designed by our engineers for the fixation of rubber bushings on stabilizer bars

- Zinc phosphating with subsequent powder coating (polyester | epoxy resin) or EPD as alternative
- Extensive range of colors available including UV-resistant powders
- Product identification through pad-, ink-jet printing or laser marking

For just-in-time | just-in-sequence deliveries, compliance with call-off- and delivery plans as well as for the implementation of economical production batches, we offer an extensive, barcode-controlled warehouse for finished goods. This includes Eibach standard suspension- and industrial products as well as custom-made springs for call-off orders.





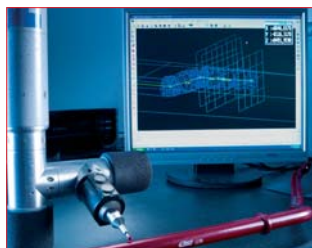
## RESEARCH AND DEVELOPMENT

We design new and improve existing products by continual dialogue with our customers and suppliers, as well by collaborating with well-known universities and research institutions. We also develop state-of-the-art manufacturing technologies and optimized manufacturing processes, implement concepts for improved energy efficiency and contribute our share for the conservation of the environment.

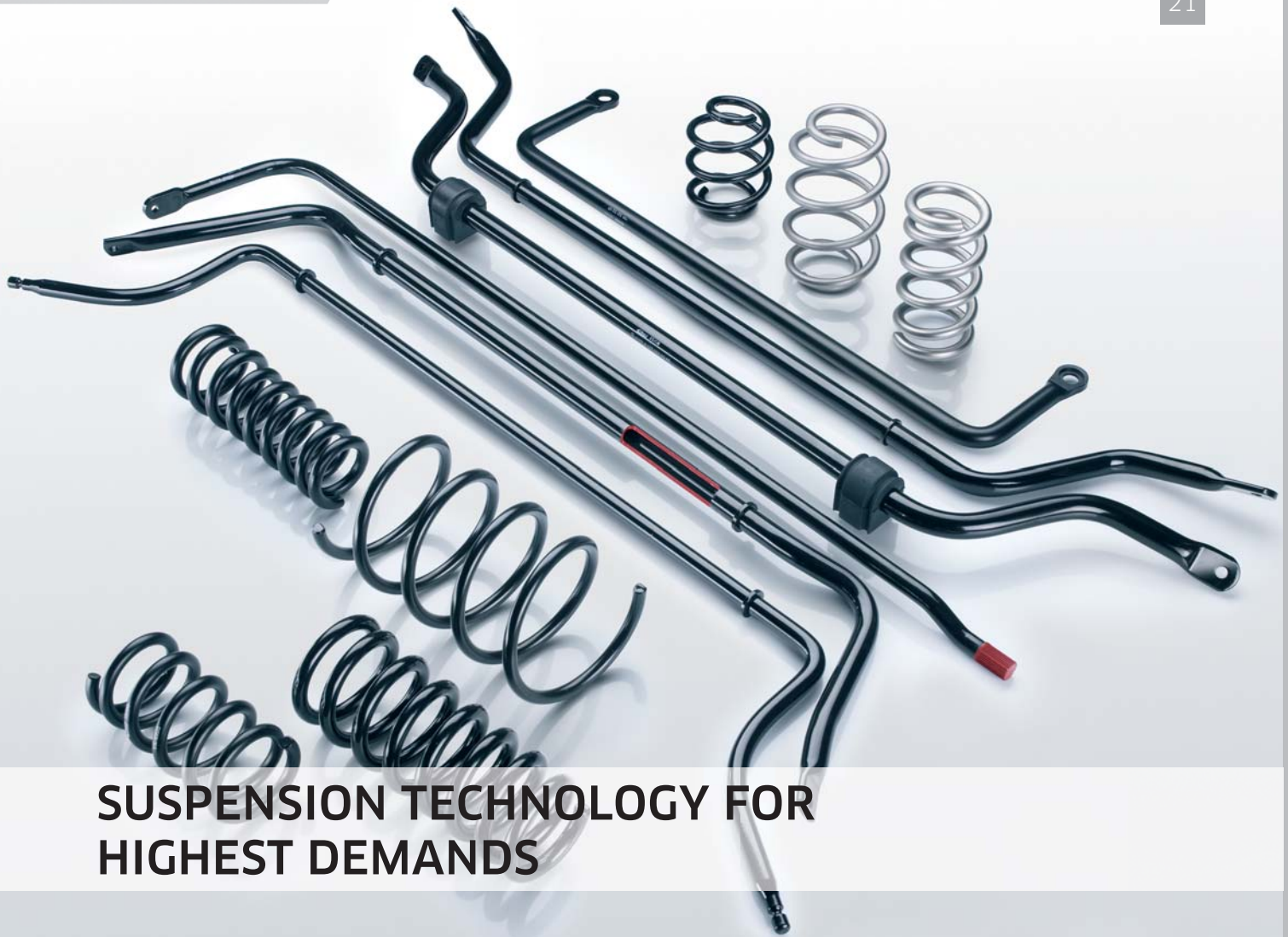
Our research and development activities ensure our essential competitive edge in technology and form the basis for our qualified technical customer service program.

### Supportive Methods:

- Metallographic analysis
- Mechanical | technological material tests
- Durability tests with or without the influence of corrosion
- Transverse force- and load axle inspections
- Relaxation tests







## SUSPENSION TECHNOLOGY FOR HIGHEST DEMANDS

Eibach offers both automotive and original equipment manufacturers the complete infrastructure of an established supplier, providing the parts for a complete suspension system.

Very flexible structures in development as well as in production make Eibach an ideal partner for small- and medium-sized productions as well as for prototypes.

The special manufacturing technology for stabilizer bars (both solid as well as tubular material) allows production without high tooling costs.

More information is available in our brochure "Automotive OEM | OES".





 **Audi Sport**  
Official Supplier

## EIBACH - MOTORSPORTS AND AUTOMOTIVE

The spring is the heart of the suspension. For decades, motorsport has been an ideal proving ground for technical innovations in suspension components: from Formula 1, the DTM, rally racing, moto-cross and off-road series such as the Dakar or the Baja to touring car series like for example like NASCAR in the USA or V8 Supercars in Australia. Wherever there is racing—you will always find Eibach springs at the front!

Eibach has implemented the experience gained in the development of high quality suspension components - particularly suspension springs and stabilizer bars - in many other market segments.

- OEM - series supplier, particularly for manufacturers of sports cars and special edition series, both with suspension springs and stabilizer bars - including tubular bars
- OES - sport suspension accessories via the car manufacturers
- Specialty vehicles - from development through road testing - delivery of complete suspension systems
- Tuners - we develop and produce an extensive program of customer-specific private label components
- Eibach Performance Suspension - our own extensive line of performance suspension components and systems





## TEAM EIBACH

People are our top priority - our customers, suppliers, business partners and above all our employees - this is what we call "Team Eibach". Enjoyment to work, motivation and excellent apprenticeship combined with experience and craftsmanship are the key factors for success and outstanding performance.

We put a lot of emphasis on a balanced team, which consists of young, well-trained junior staff as well as colleagues with years of experience. For decades we have successfully committed ourselves to educate young people. As a result, more than a third of the Eibach Team at our location in Finnentrop, Germany are either former or current trainees.

Our high level of education is often confirmed by official awards assigned to apprentices of Eibach. We promote training on-the-job and further qualification as well as training in foreign languages and support our junior staff in their continual studies.

Hereby we create a cooperative relationship that ensures the future of our company as well as the future of our employees. At the same time we see our intensive and successful training program as an important service to the community.



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Partnumber: S9950143

