



SPECIAL PROFILES SINCE 2007  
**VOL-STAHL**  
GROUP OF COMPANIES

# SPECIAL STEEL PROFILES

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# 01

## ABOUT US

As a production and distribution company, our strength lies in hot-rolled, cold-rolled and cold-drawn steel sections. The profiles are produced within the Group in european supply plants.

Thanks to our many years of experience, we are able to respond immediately to individual customer requirements and different demand situations, to manufacture exactly according to specifications, and thus to contribute to improved value creation. You benefit from our unique ability to control the quality of our products - from melting in our own steel mill, through modern hot and cold rolling mills and cold drawing lines, to the finished profile. In this way, special profiles with high precision and precisely fitting surfaces are produced from a wide range of steel grades. Their special properties can be easily modified by adjusting the chemical composition and different heat treatments according to customer-specific requirements.

VOL-Stahl Group supplies various industries with high-quality special profiles that have complex cross-sections.



UNLIMITED IN **FORM** AND **STEEL**

# 02

## PRODUCTION

All products supplied by VOL-Stahl GmbH are produced both in the associated steel mill and in the rolling mill, VOL-Stahl France SAS. In these plants we operate a large number of different hot and cold rolling mills. In addition, we have drawing lines and our own steelmaking facilities, ensuring high quality of the end products along the entire production chain.

## FROM SEMI-FINISHED PRODUCT TO THE FINISHED PROFILE



### HOT ROLLING

The square billets produced at an earlier stage are heated to a temperature of about 1150°C and then rolled into the desired shape.

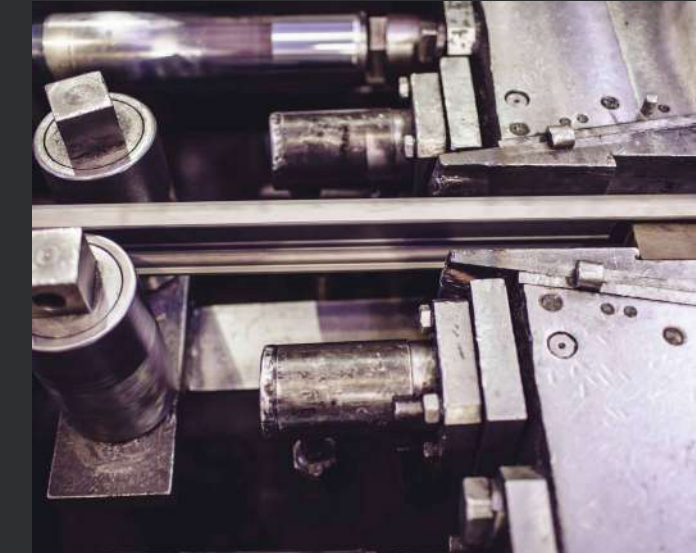
In order to obtain a small profile from a billet, the material must be rolled on several successive rolling stands, which is achieved with small profiles by setting a high tensile load ratio.



### COLD ROLLING

In this production step, the hot rolled material is used as a semi-finished product for further cold forming.

Hot-rolled semi-profiles are rolled in cold condition. This allows better control of the forming process and higher precision compared to hot rolling.



### COLD DRAWING

In cold drawing, the hot-rolled material is used as a semi-finished product for further cold forming.

Hot-rolled preforms are drawn through a rigid tungsten carbide shape to deform the material and achieve the required profile geometry. For profiles with complex shapes and tight tolerances, sometimes up to 8 drawing steps are required to achieve the desired value.

Between each drawing step, the material remains in a heat treatment furnace for hours. By heating to a high temperature and then slowly cooling (annealing), the internal stresses in the steel are released, the microstructure is refined and the hardness is removed after cold forming. Then the material is prepared for the next drawing step.



All technological processes in the entire production process are subject to permanent quality control, from semi-finished product to the final production step, and are adapted in good time as required.

From semi-finished product to the final drawing steps, VOL-Stahl controls the entire manufacturing process. In order to classify the profiles as finished, all products pass through several test stations. This procedure guarantees that defective products which do not meet the customer's requirements are detected and immediately eliminated.

Based on our comprehensive expertise, we will be pleased to advise you on alternative steel grades or modifications to better serve your specific requirements. In doing so, we consistently pursue the goal of achieving better mechanical properties and improving machinability or corrosion resistance. In addition, our engineers will be happy to advise you on how heat treatment, a specific microstructure and the grain size of the profile can ultimately have an impact.

All business processes comply with the international quality standard ISO 9001:2015. In addition, our supply plants also have certification in accordance with ISO 16949 for the automotive industry.

Type of check	Equipment
Chemical composition	Spectroscopy analyzer
Mechanical properties	Stretching machine, machines for checking hardness, impact elasticity and cryochamber for low temperature tests
Dimensions	3D measurement machines with probe and camera
Micro- and macrostructure	Electronic microscope with 1000x zoom

# 04 PROCESSING

VOL-Stahl supports you in your work not only by supplying special steel profiles, but also with other processing steps such as sawing profiles to a certain length, milling and drilling with CNC machines and packing individual orders.

**Services have always been a more important part of our company. This gives you the opportunity to concentrate on the core functions of your end product and to react and respond more quickly to changing market conditions and customer requirements.**

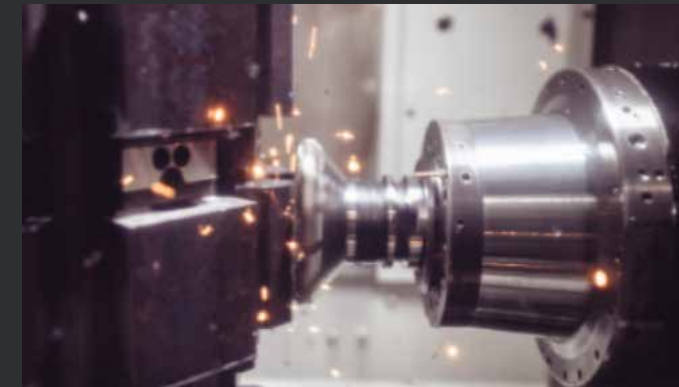


## SAWING



Sawing is used to cut rolled profiles into standard or customized lengths. High-speed or circular saws are used. Some of these run in fully automatic mode.

## MILLING



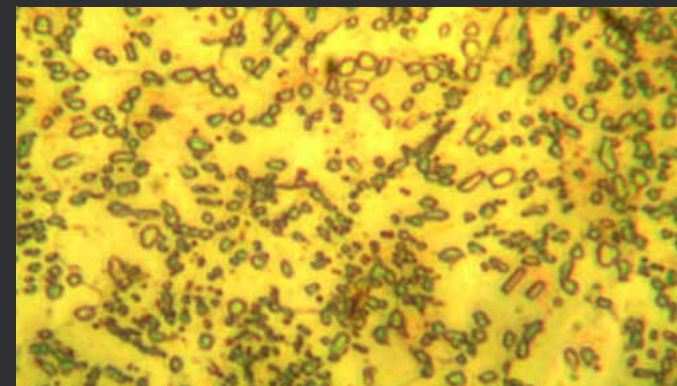
Milling is used both for the preparation of profiles and for the production of completely finished components. For this purpose, the plant has a machining center equipped with the most modern high-precision CNC equipment. A number of other CNC machines are used for the production of tools and devices necessary for rolling.

## DRILLING



As part of CNC machining or as a stand-alone operation, drilling is used to create common mounting holes, as in the case of an elevator guide rail, or for long return channels as well as tapped holes of linear guide components.

## HEAT TREATMENT



To set the required range of properties, both on the finished product and on the workpiece, in the process chain, suitable heat treatment plays the decisive role. For this purpose, our plant is equipped with modern annealing furnaces that allow various types of thermal treatments.

## HARDEN



Products where high wear resistance is required, such as knives or linear guides, are hardened. For this purpose, they are inductively heated locally to a temperature of approx. 1000°C and then quenched in a polymer solution. This process gives the material a particularly high hardness.

## POWDER COATING



Powder coating serves on the one hand for the external aesthetics of the products and on the other hand as corrosion protection. Special dry paints are used for coating, which form a thin uniform layer on the metallic surfaces.

# 05

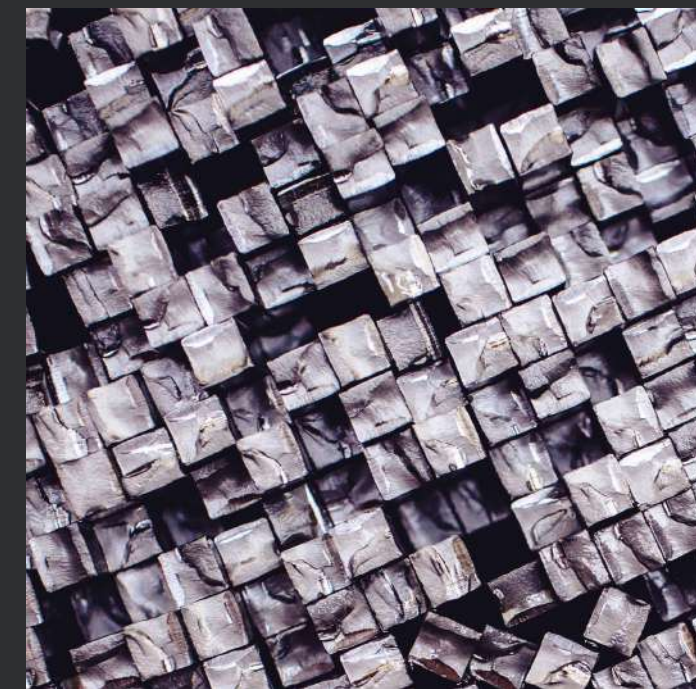
## PRODUCT GROUPS



ELEVATOR GUIDE RAILS



SPECIAL PROFILES



STANDARD PROFILES



TOOL STEEL



MANGANESE STEEL

# ELEVATOR GUIDE RAILS

With more than 30 years of production experience, we can guarantee the high surface smoothness and straightness as well as the perfect geometry of the guide rails.

At our Hoyerswerda site, all types of guide rails can be individually adapted to each elevator shaft and packed and delivered according to the requirements for transport safety and optimized assembly times.

VOL-Stahl supplies the complete range of high quality drawn and machined elevator guide rails with all complementary accessories.

## Cold Drawn EGR (A)

Cold drawn elevator guide rails are used as counterweight rails or in elevators with relatively low speeds, usually up to 1.6 m/s. VOL steel offers all dimensions of elevator guide rails according to ISO 7465, as well as special dimensions, such as RO50.9 and RO70.9.

## Machined EGR (B)

Machined elevator guide rails have a smoother running surface compared to cold-drawn ones, making them more suitable for heavy-duty and high-speed applications.

## High Quality Guide Rails (BE)

Flawless geometry, high surface smoothness and perfect joints - these are the requirements for high-quality guide rails. Key factors for safety in the environment of exceptionally high pressures and speeds are tight tolerances combined with outstanding mechanical properties of the material.

## Cabin Profiles

As a manufacturer of special profiles, we offer not only elevator guide rails but also other cold-drawn profiles that can be used in the production of elevators and especially door elements.

## Component Parts

Alle Führungsschienen sind mit entsprechendem Zubehör, wie Stoßlaschen, Schraubensätzen und T-Klemmschrauben, lieferbar.



# SPECIAL PROFILES

VOL-Stahl offers hot-rolled, cold-rolled as well as drawn special profiles made of steel and stainless steel, which find their application in various industrial sectors. All profiles can be produced from a wide range of steel grades; with additional heat treatment if required. If the steel grade is not specified by you, our engineers can recommend a suitable material - depending on the application and requirements for mechanical properties.

A defect-free surface of the hot-rolled sections is guaranteed by efficient high-pressure descaling during rolling. The scale produced in the furnace during annealing is completely removed from all sides by the billet and does not represent an obstacle to the surface quality during rolling.

The geometry of the profiles is always monitored automatically during production. The result is high shape accuracy, systematic deviations are excluded.

For applications with particularly high straightness and torsion requirements, our profiles are additionally straightened in automatic straightening presses. The geometry is precisely controlled by means of triangulation sensors.

Special profiles can be produced in various ways, depending on the product-specific application.



	Hot rolled profiles	Cold rolled/drawn profiles
Surface quality	to EN 10163-3 or higher	to EN 10277-1 or higher
Surface	Ra < 40 µm	Ra ≤ 2,5 µm
Decarburization	/	≤ 0,1 mm
Size tolerances	up to 0,5 mm	≤ 0,05 mm
Straightness	Standard ≤ 1,0 mm/m; on request ≤ 0,3 mm/m	≤ 0,1 mm/m
Twisting	Standard ≤ 1°/m; on request ≤ 0,5°/m	≤ 0,25°/m
Cross section	10 mm² up to 7000 mm²	1 mm² up to 3800 mm²
Length	≤ 12 m or cut to fixed length	≤ 6 m or cut to fixed length

By using special profiles, we enable the processing industries to reduce waste by up to 40% compared to machined production parts.

Surface roughness: Ra<2.5  
 Tolerances: h9, h10, h11  
 Cross sections: 10 to 6300 mm²  
 Bar length: 2 to 12 m, or in coils of 800 kg each

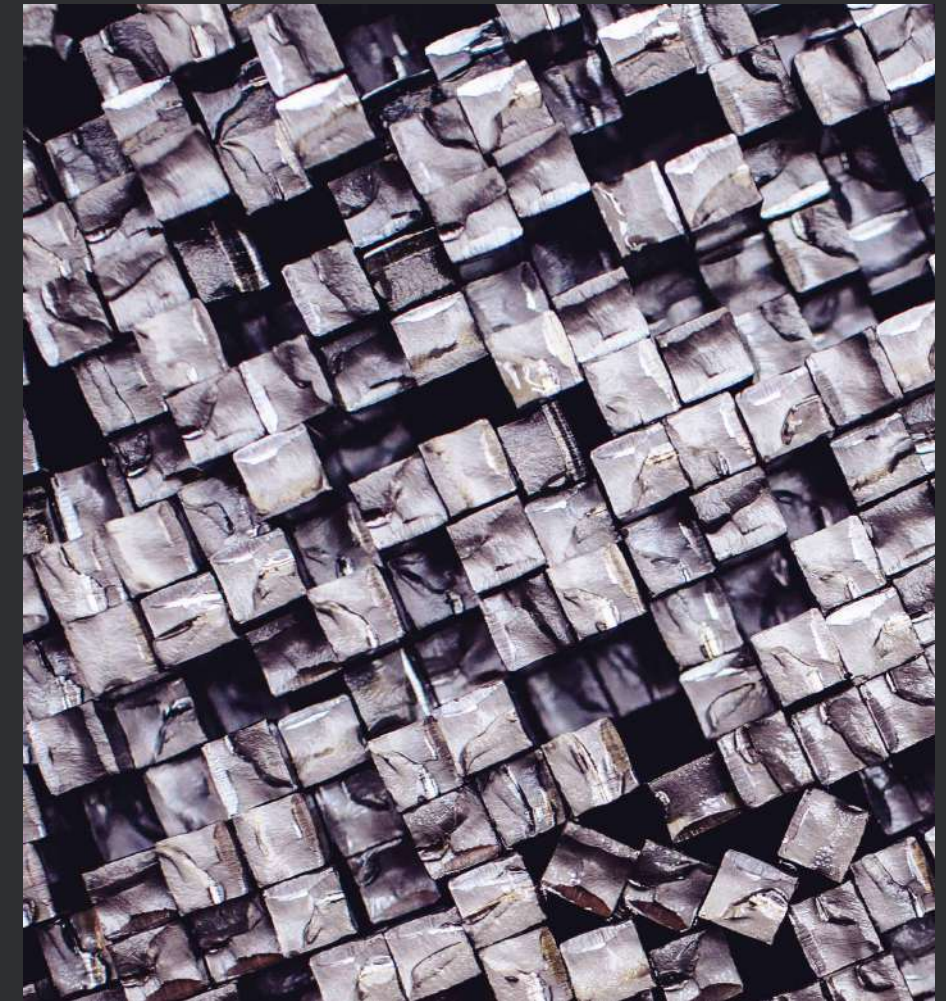
# STANDARD PROFILES

Standard profiles (round, square, flat, triangular, octagonal) are produced according to the required surface quality using the most suitable process - hot rolled, cold drawn or cold rolled.

Dimensions:	1x1 mm to 50x50 mm
Tolerances:	h9, h10, h11
steel grades:	S235, S355, C45+C, stainless steels
Surface finish:	DIN 10277-1 class 1, 2 or 3
Decarburization:	<0.1 to <0.3 mm
Length:	3 to 6 m

As a manufacturer of special steel profiles, we are accustomed to meeting the unconventional requirements of our customers and are pleased to be able to offer special solutions even for standard profiles. This is the case, for example, when particularly alloyed steel, a specific microstructure or grain size of the steel are desired.

VOL-Stahl offers a range of standard profiles used in the production of hand tools, keys and generally in mechanical engineering.



# TOOL STEEL

We produce different tool steels, as flat steel, round steel, as well as special profiles, from the areas of hot work and cold work steels for many application areas. Special are among other things our possibilities to produce many different dimensions, also intermediate dimensions, so that you receive your suitable machining allowance. This saves you time in machining and you reduce costs!

We serve your individual requirements for machinability, wear resistance, hardenability etc.- from tool steels for the production of industrial knives, cutting tools, fine and milling tools to highly loaded tools, mandrel bars, punches, drawing dies, just to name a few exemplary applications.

In addition, we also supply profiles for classic hand tools such as chisels, wrenches, scrapers etc. as hexagonal, octagonal, flat oval, flat steel with different edges, round dimensions and special profiles according to customer drawings! Some standard dimensions are also available from free stock.



# MANGANESE STEEL

Manganese steel is an austenitic steel with high wear resistance under strong impact and shock loads.

As one of the leading manufacturers in Europe, we can offer you a wide range of products in the manganese steel sector for wear-resistant applications.

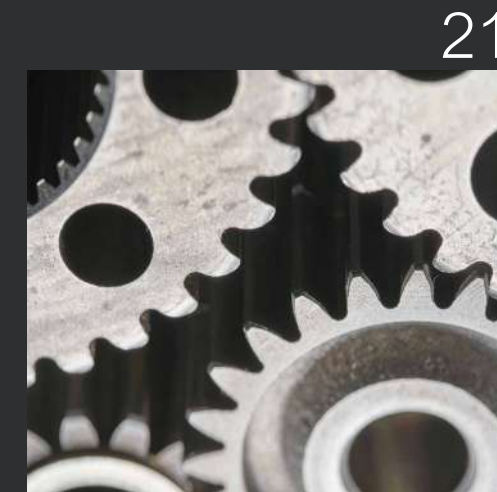
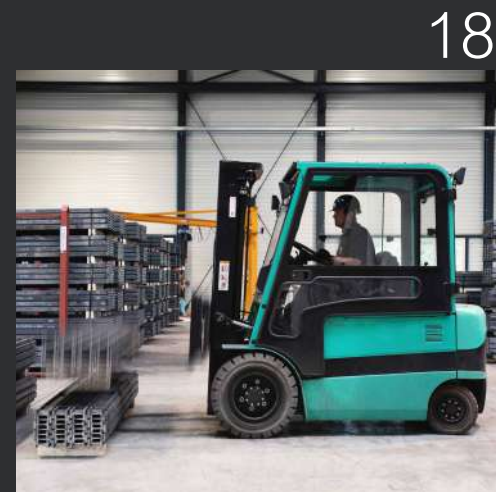
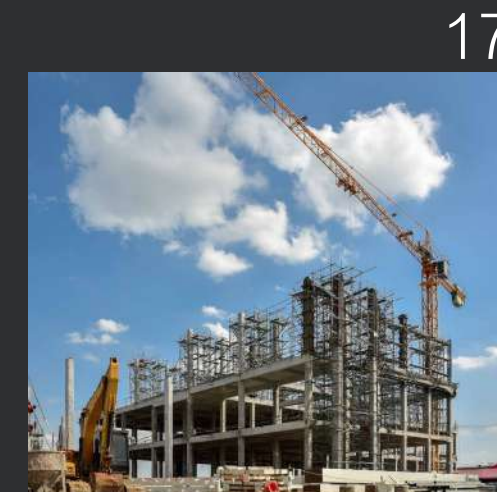
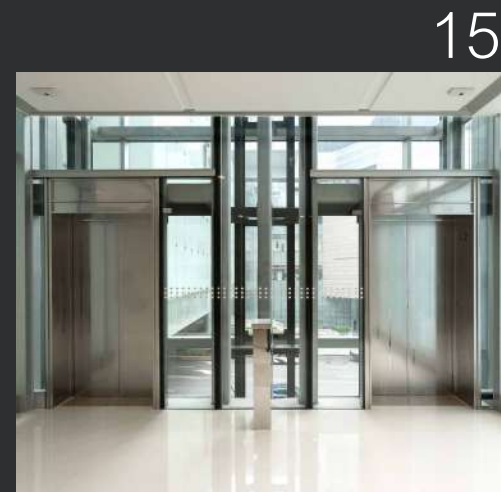
From standard profiles such as round, flat and square, which are used, among other things, as window grilles or installed in sandblasting machines, to wear rails for conveyor system construction. We also carry many dimensions in standard profiles and wear rails in stock at our Hanau branch.



# 06

## APPLICATIONS

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# ELEVATOR SYSTEMS

We have been producing high-quality guide rails for elevator systems for over 30 years. Thanks to these many years of experience, our end products are now highly regarded on the world market. For more than 10 years now, we have also been supplying internationally from our production and commissioning site in Hoyerswerda. Our customers especially appreciate our possibilities of prefabrication, assembly and just-in-time delivery directly to the construction site. In addition to guide rails, our product range includes other components for elevator systems and special profiles for elevator cabs. The guide rails are manufactured according to ISO 7465 and TS 14-11-245-88.

## PRODUCTS



ELEVATOR GUIDE RAILS



COMPONENTS FOR  
ELEVATOR CONSTRUCTION



PROFILES FOR  
LIFT CABINES



# AUTOMOBILE SECTOR

For the automotive industry VOL-Stahl supplies a wide range of hot-rolled and cold-drawn sections used for the manufacture of door hinges, valve cone pieces, pole shoes, truck wheels and other vehicle parts.

Especially for your needs, our engineers have developed special steel grades that combine increased mechanical properties with exceptionally good machinability. By using profiles made from these steel grades, you can significantly extend the life of your machining tools.

## PRODUCTS



LEAF SPRING PROFILES



DOOR HINGE PROFILES



VALVE PLUG PIECE PROFILES



PROFILES FOR RIMS



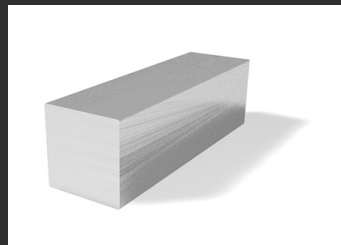
DOOR HINGE PROFILES



# BUILDING INDUSTRY

Our hot rolled profiles are widely used in hydraulic engineering, coastal fortification, construction of sea and river jetties, construction of road crossings, railroad crossings, high-rise buildings, or even for the manufacture of tools.

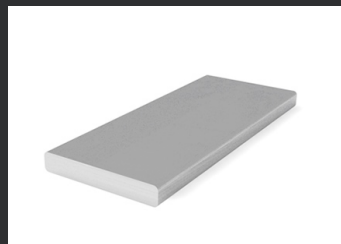
## PRODUCTS



SQUARE STEEL



STEEL WALL CONECTORS



FLAT STEEL



SEAMLESS TUBES



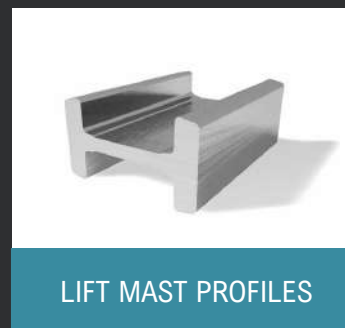
ROUND STEEL

# MATERIAL HANDLING

For customers in the material handling equipment industry, VOL-Stahl supplies high-quality hot-rolled sections for the lift mast and for attachments such as fork carriers or sideshifters. The further production steps - such as straightening and sawing - are carried out in high-precision, laser-assisted straightening machines and automatic sawing lines. This enables us to guarantee extremely precise profiles with very good. The profiles have precise straightness and are sawn to the desired length if required.

- The profile surface owes its high quality to the descaling equipment of the rolling mills
- Straightness:  $\leq 1.0$  mm/m as standard,
- $\leq 0.3$  mm/m a. A.
- Optimized steel grades offer improved mechanical properties
- $\leq 12$  m or sawn to fixed length
- Cold drawn condition for tighter tolerances with strengthened and smoother surface for higher surface hardness
- Customized design and shaping

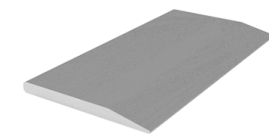
## PRODUCTS



# AGRICULTURE

For the agricultural industry, VOL-Stahl produces a wide range of hot-rolled sections, which are mainly beater bar and plough-share sections. They can be supplied in fixed lengths with holes and packed in the required quantities on pallets. For the manufacturers of tools and components for agricultural machinery, we also offer cold-drawn flat sections in customized sizes with a tolerance of h9.

## PRODUCTS



PLOUGHSHARE PROFILE



KNOCK BAR PROFILES



KNIFE FOR HARVESTERS



PROFILES FOR RIMS

# LINEAR TECHNOLOGY

Thanks to the complete production process - from steel production to cold drawing and machining - VOL-Stahl has the unique ability to offer the complete range of profiles for guideways and carriages, from miniature rails to very large dimensions. We offer not only cold drawn profiles, but also hot rolled profiles. This means that the cold drawing process can be eliminated and the carriages can be CNC machined directly from the shape-like profile.

## PRODUCTS



LINEAR GUIDE RAILS



LINEAR GUIDE RAILS

	Guide rails	Carriages
Dimensions	5-65	5-55
Decarburization layer	< 0,1 mm	< 0,1 mm
Straightness	< 0,1 mm/m	1 mm/m
Torsion	< 0,25°/m	1 °/m
Steel grades	C45, Cf53, 58CrMoV4, SUJ2, 100Cr6, SCM420H, 1.4031, 1.4034, etc.	Cf53, SUJ2, 100Cr6, SCM420H, 1.4031, 1.4034, etc.
Length	up to 6 m	up to 6 m

# MECHANICAL ENGINEERING

VOL-Stahl manufactures cold-drawn special profiles used in the production of various machine tool components - including profiles for telescopic steel curtains and T-slot profiles for the tables of CNC machines.

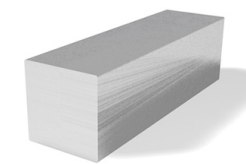
## PRODUCTS



HEXAGONAL STEELS



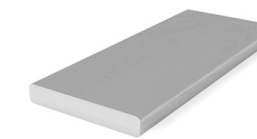
SPLINED SHAFTS



SQUARE STEELS



ROUND STEELS



FLAT STEELS



LINEAR GUIDE RAILS

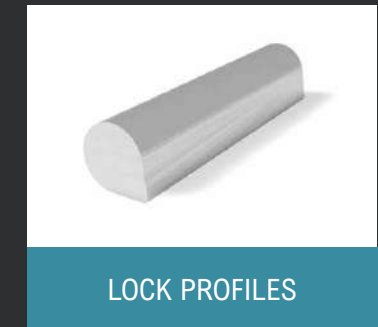


LINEAR GUIDE RAILS

# OTHER AREAS

Our company specializes in the production of special profiles according to customer drawings. To make an exact list of all the applications of special steel profiles is not very easy. This is because they are used for the production of very many possible parts and components in practically every branch of industry. Typical fields of application are e.g. the production of plastic windows, automotive engines, in oil and gas equipment, CNC machines, glass buildings, nuclear power plants, electronics industry etc.

## PRODUCTS





**UNLIMITED  
IN  
FORM  
AND  
STEEL**

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