

Special reinforcing steels

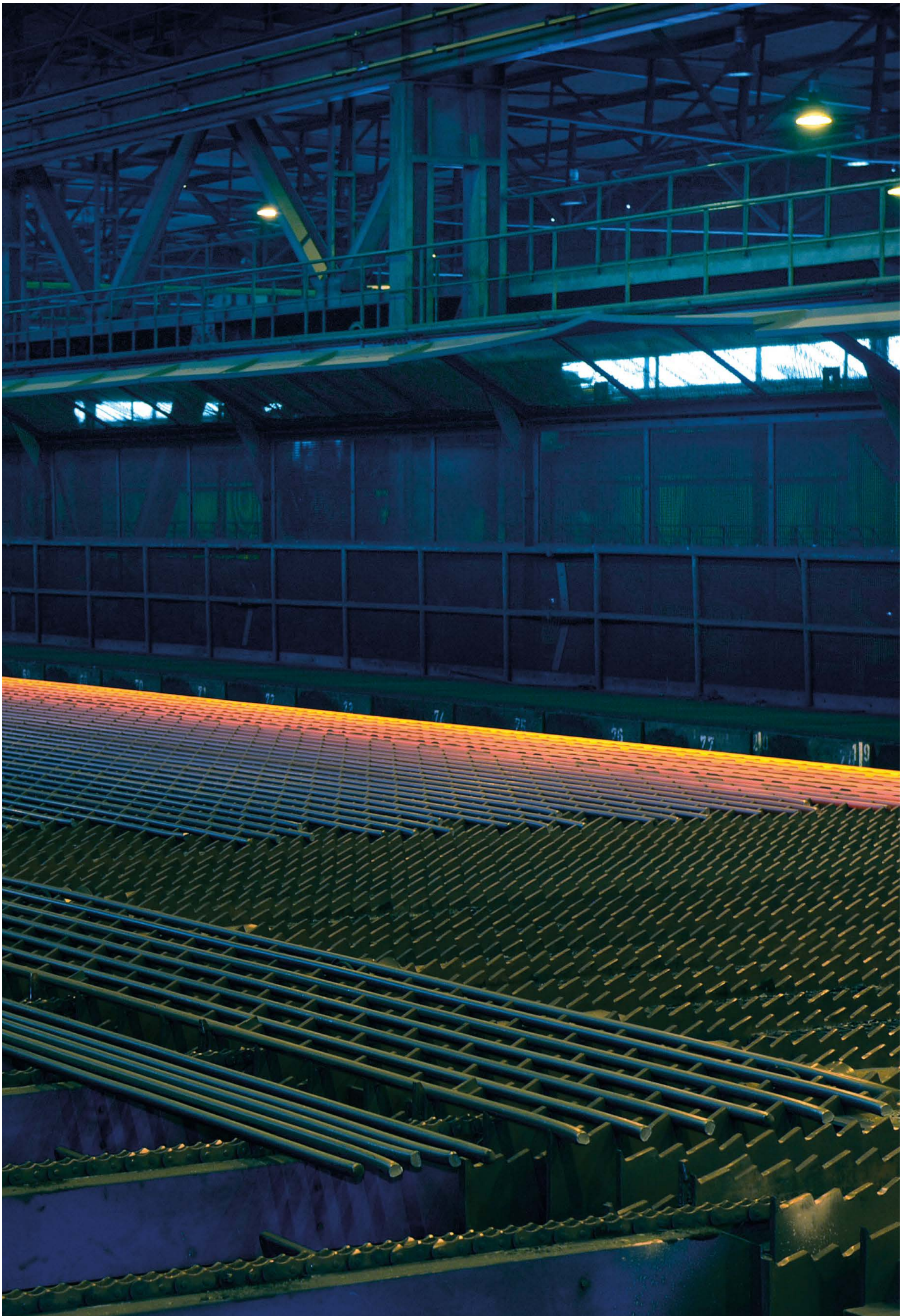
Top12 and Top700:

Longer lasting and more attractive structures.



Steeltec

Member of Swiss Steel Group



New solutions for the construction industry: More options, fewer costs.

Top12 and Top700 are innovative reinforcing steels from Swiss Steel, the competence center for special steels. Developed to keep a step ahead of increasing demands for durability in construction. And to establish new aesthetic freedom of design. At costs that sustainably guarantee financial flexibility.

Top12: Stainless special reinforcing steel for civil engineering and construction projects

The high-alloy class 1.4003 material is much more resistant to corrosion than conventional reinforcing steels because it contains at least 12 weight percent chromium. It requires no special handling and can be conventionally processed using conventional processes.

Resistant to chlorides in civil engineering and underground projects:

Top12 is used in civil engineering and underground projects primarily for components exposed to chloride in splash and spray zones. It is three times more resistant to chlorides than conventional reinforcing steel, and depending on the test conditions, even more. This reliable protection from corrosion can exponentially extend the lifetime of structures.

Resistant to carbonation in building construction:

Top12 also provides reliable protection from corrosion in building construction applications thanks to its resistance to carbonation of concrete. It only needs a very minimal concrete cover.

Double corrosion protection for retaining elements:

One Top12 variant with higher yield strength provides the necessary protection for temporary and permanent anchors of protection level 2 in every foundation soil – even in aggressive groundwater. The usual coating of the anchoring tension member is thus unnecessary.

Top700: Microalloyed reinforcing steel for lean construction or maximum stability

The higher strength microalloyed concrete reinforcing steel Top700 with a yield strength of $>700\text{N/mm}^2$ means on the one hand more streamlined construction designs with less steel in concrete. On the other hand, it guarantees the stability of heavily reinforced structures expected to meet the highest requirements, e.g. earthquake proof designs.



No compromises: Different applications, the same reliability.

Our special concrete reinforcing steels are used in a wide range of structures. Whether in civil engineering or building construction, these high-quality steels solve problems which in times past often resulted in unsatisfactory compromises. Efficient, reliable and durable.

Top12 in civil engineering and underground projects

The most frequent applications include:

- Domes
- Columns
- Bridge center piers
- Tunnel walls and portals
- Pile caps and pile head beams
- Bore piles
- Groundwater tanks

These are structures that are generally exposed to high levels of chloride against which Top12 is especially resistant.

Top12 in building construction projects

The principal applications are:

- Precast concrete components
- Sandwich panels
- Park structures
- Cellular concrete

The resistance of Top12 to concrete carbonation means durable or aesthetically pleasing, high-quality structures with minimal concrete cover.

TOP12

1000x

RELIABLE

Top12 in Geotechnology

As nails for:

- excavation
- slope stabilization
- rock nails
- tunnel construction
- falling object protective structures

As piles for:

- foundation plates
- bridge foundations
- foundation refurbishment
- underpinning
- buoyancy prevention
- absorption of horizontal forces

In all those applications, the special Top12 steel with a yield strength of 670 N/mm² has decisive advantage.

Top700

With a yield strength more than of >700 N/mm² this special steel is ideally suited for:

- earthquake-proof applications
- heavily reinforced components
- precast concrete components
- columns
- warehouses

These are applications for which either the percentage of steel in concrete is to be reduced or very high strength is required or even earthquake-proof structures.



7x

MORE DURABLE

Top12 in civil engineering and underground applications: It pays to take a far-sighted approach.

With a resistance to chlorides three times higher than conventional reinforcing steel – or even higher, depending on test conditions, Top12 provides reliable protection against corrosion and increases the life of structures sevenfold. Maintenance work is thus preventable, lifecycle costs plummet.

Numerous reinforcing steel structures today have visible damage due to reinforcement corrosion and must be repaired with great technical and financial expense. The main problem in civil engineering and underground applications are the chlorides of the de-icing chemicals found in splash water and in sprays. The chlorides penetrate the concrete of bridges and tunnels and lead to depassivation of the steel, resulting in corrosion.

Extend the lifecycle and reduce costs

In construction, the current trend is increasingly a far-sighted approach. The costs of future structural maintenance – the lifecycle costs – are frequently taken into account during the design phase. The aim is to improve the durability of structures and thus avoid future maintenance work. This means less refurbishment of roads, for example, and thus fewer construction sites and consequently fewer traffic jams which are known to be the source of much avoidable CO₂. Use of Top12 thus also has an ecological value that should not be underestimated.

ONLY

20 mm

COVER

Top12 in structural engineering: More creative freedom in design.

Concrete structures and building elements that are long-lasting, safe and beautiful as well as flawless exposed concrete are better achieved with Top12. Many of a building contractor's aesthetic wishes and an architect's creative ideas can easily be accommodated.

There is virtually no limit to design and structural possibilities when reinforced concrete is used. At the same time, however, the structures themselves are expected to last, resulting in the past in thicker concrete cover for the reinforcement and thus heavier structural elements. This is where Top12, the affordable stainless steel with 12 weight percent chromium, has its advantages. It solves the corrosion problem that can commonly occur in building construction due to the carbonation of alkaline cement and also requires much less cover for the reinforcement.

Added options, better safety

Thanks to its corrosion resistance, Top12 is suitable for numerous structural engineering applications. It is ideal, for example, for slender constructions or in applications at greater risk for cracking, for structured surfaces or for use in new types of concrete with a very short history of use. Another aspect is not to be forgotten: Because the cover is thinner, less concrete is needed which also means a lower transport volume.





YIELD STRENGTH N/mm²

Top12 in Geotechnology: Corrosion protection without cover.

The stainless reinforcing steel Top12 adequately protects temporary or permanent safety elements in any subsoil, even in aggressive groundwater. It makes the standard coating for anchor tension members unnecessary.

Anchors – depending on intended useful life, building class and risk of corrosion – are used as temporary or permanent safety elements, e.g. for shoring and anchoring excavation or earth retaining and support structures as well as for taking up tensile forces in soundproof walls. Adequate corrosion protection is a relevant to safety, particularly for anchors intended to remain permanently in the ground.

Less work, more protection

Top12 is already protected from corrosion by its chemical composition. The complete anchoring system consists of stainless components and meets all requirements of protection level 2b pursuant to Swiss standard SIA 267:2013. Consequently, no additional corrosion protection measures such as cladding tubes are required. This makes the overall system lighter and a smaller borehole diameter possible.



Top700: Streamlined designs in construction thanks to stronger steel.

When Top700 is used for applications requiring heavy-duty columns or long cast-in-place ceilings, less reinforcing steel is needed. The micro alloyed steel with a yield strength of $>700 \text{ N/mm}^2$ meets high static requirements and opens up new possibilities in reinforced concrete construction.

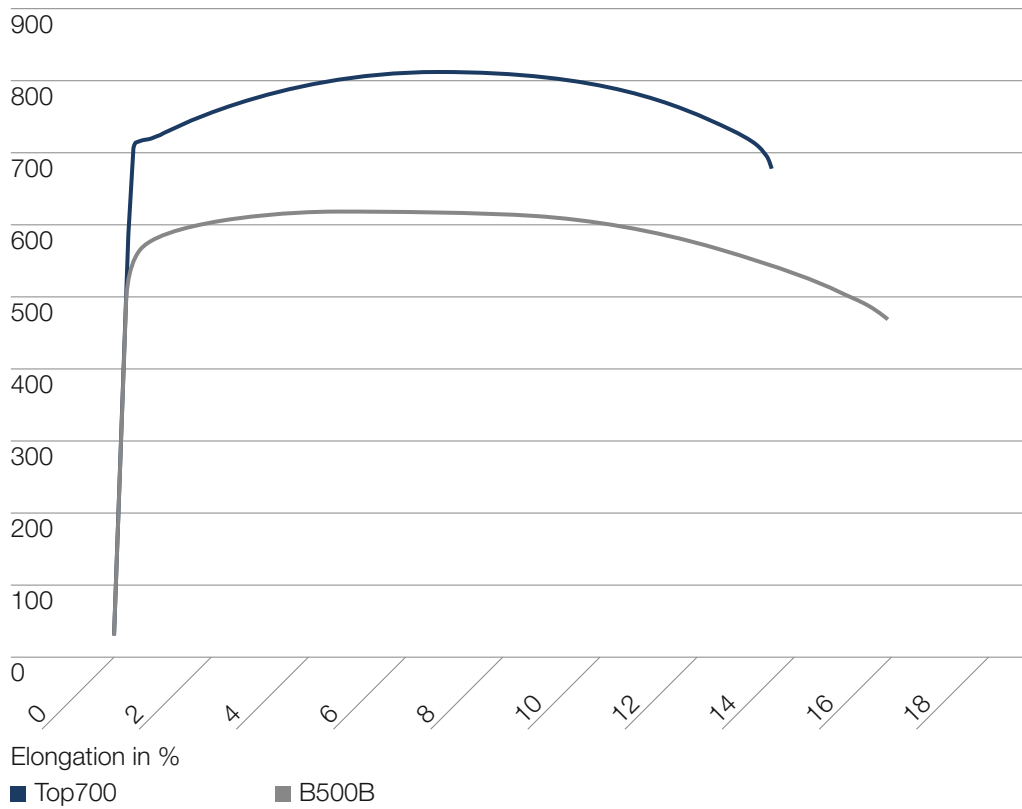
Architectural and structural design should not be limited by the properties of the materials used. The availability of Top700 – a higher strength grade reinforcing steel, ductility class B – pushes the limits of the possible to beyond what is expected. The clear advantages are slimmer constructions with better utilization of space and less weight.

Reduce the volume of steel or increase the strength

Reinforced concrete constructions using Top700 do not require specific concrete properties. It is possible, however, to reduce the amount of steel in kg/m^3 by 40 percent. This means less steel needs to be produced and transported – a very welcome factor under environmental aspects. On the other hand, the standard values for the amount of reinforcement can be lighter in highly reinforced structural members. Top700 guarantees the highest stability for structures with special requirements.



Strain in N/mm²





MORE THAN

650000 tons

Production: High efficiency thanks to lean processes at the highest quality level.

Swiss Steel is a producer of high-quality steel products for the automotive, process equipment and machine industries. The high standards of quality that apply for these steels is also reflected in the production of reinforced steels.

The quality requirements for a steel are generally defined by its intended applications. So far, so good. At Swiss Steel, the demands go a step further: innovative alloys and processes are meant to give rise to new products or product variants and thus to new potential applications. The special reinforced steels Top12 and Top700 are typical results of this way of thinking.

Improve corrosion resistance

The secret to outstanding mechanical and technological properties and high corrosion resistance is production. A decisive factor is the addition of alloying elements to the steel melt, including more than 12 weight percent chromium. The molten steel is then cast on the continuous casting line into billets. Ribbed reinforced steel is manufactured directly from the steel billet using a patented hot-rolling.

Once it has been hot rolled, Top12 is pickled in a process that significantly improves the product's resistance to corrosion. Pickling removes the rolling scale. This makes the rebar surface smoother and more homogeneous, and the ribbed steel is well-protected from surface corrosion and pitting.

TOP12

6-43 mm

The Products: The right solution for almost everything.

Our reinforced steel program meets a wide range of the construction industry's requirements and requests. But developments are not standing still. And the possibilities of our reinforced steels may even inspire concepts for new construction designs. Just ask: we are open to every feasible solution.

» For details about our reinforced steel grades, please see the corresponding product data sheets.

Our reinforced steel program includes:

Top12

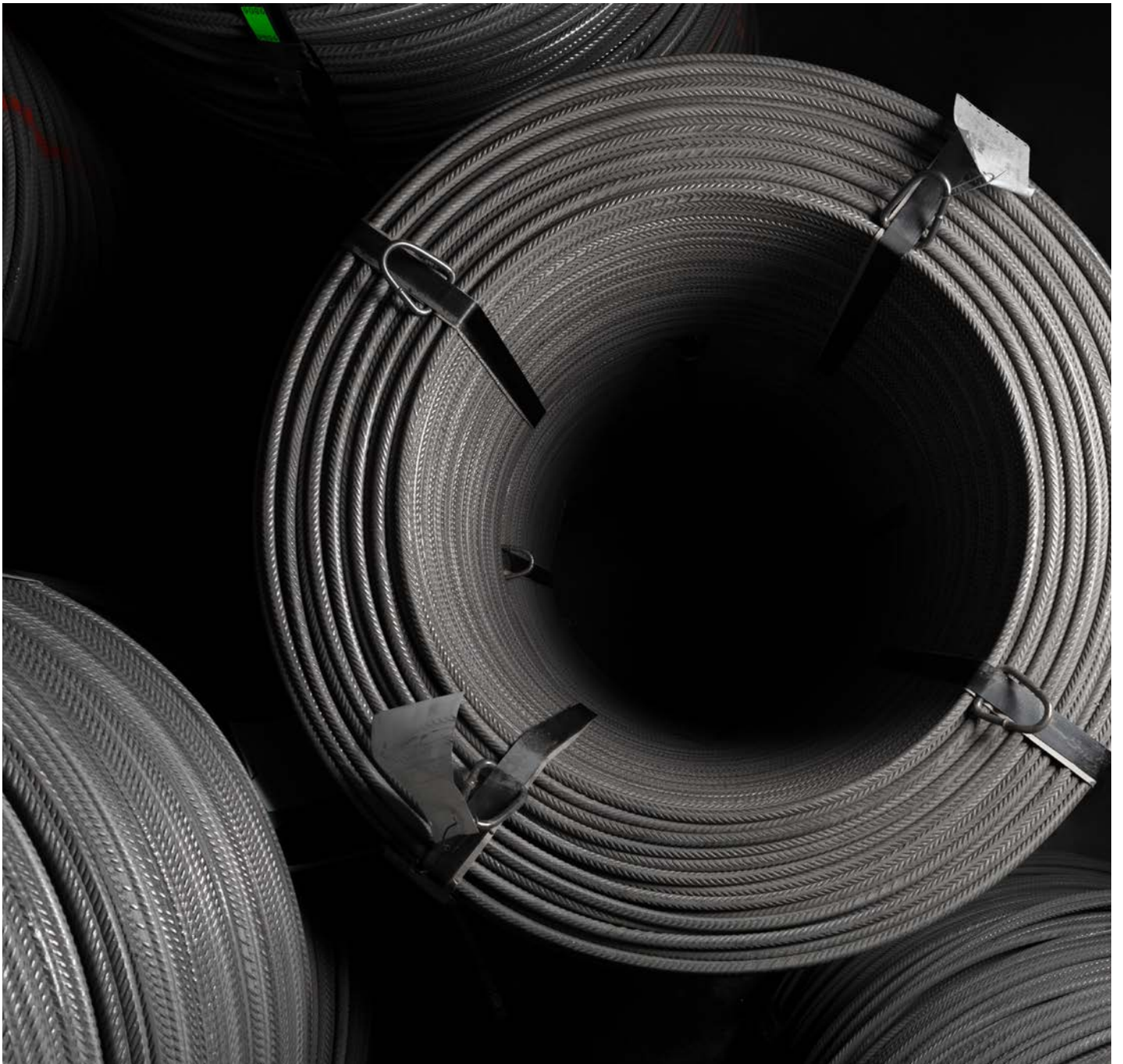
Stainless reinforced steel

- Wire rod in coils 6 - 14 mm
- Bar steel in bundles 16 - 43 mm

Top700

Higher strength reinforced steel

- Bar steel in bundles 26 - 40 mm



Research and Development: Our partners make us stronger.

Swiss Steel has relied on development partnerships with customers, universities and other institutes for many years. Useful innovations are created with a maximum of knowledge and experience from different sources.

To develop our products and processes, we use the principle of Open Innovation. This means that, depending on the nature of a problem, we seek the best partners with whom we can work together to strengthen our innovation potential. For example technical institutes like the Eidgenössische Technische Hochschule (ETH) in Zurich or the Technische Universität München (TUM). Swiss Steel is also a member of the German Committee for Structural Concrete, the Swiss and European Committee for Standardization for Reinforcement and part of Netzwerk für Brückensanierung BriSanT, a network for companies specializing in bridge refurbishment and repair.

Our customers empower us

Our long-standing customers naturally possess a vast store of knowledge and experience in the use of our steels. That is why the exchange of knowledge is an important source of information for us when it comes to the further development of our products and processes. Because our customers continue in research and development in their areas of expertise; they involve us and challenge us wherever the use of steel plays a decisive role for innovations.



Technik und Forschung im Betonbau

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Ingenieurakultät Bau Geo Umwelt
Technische Universität München



Fakultät für
Bauingenieurwesen



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BAM

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Materialforschung
und -prüfung

INGENIEURBÜRO

SCHIESSL • GEHLEN • SODEIKAT

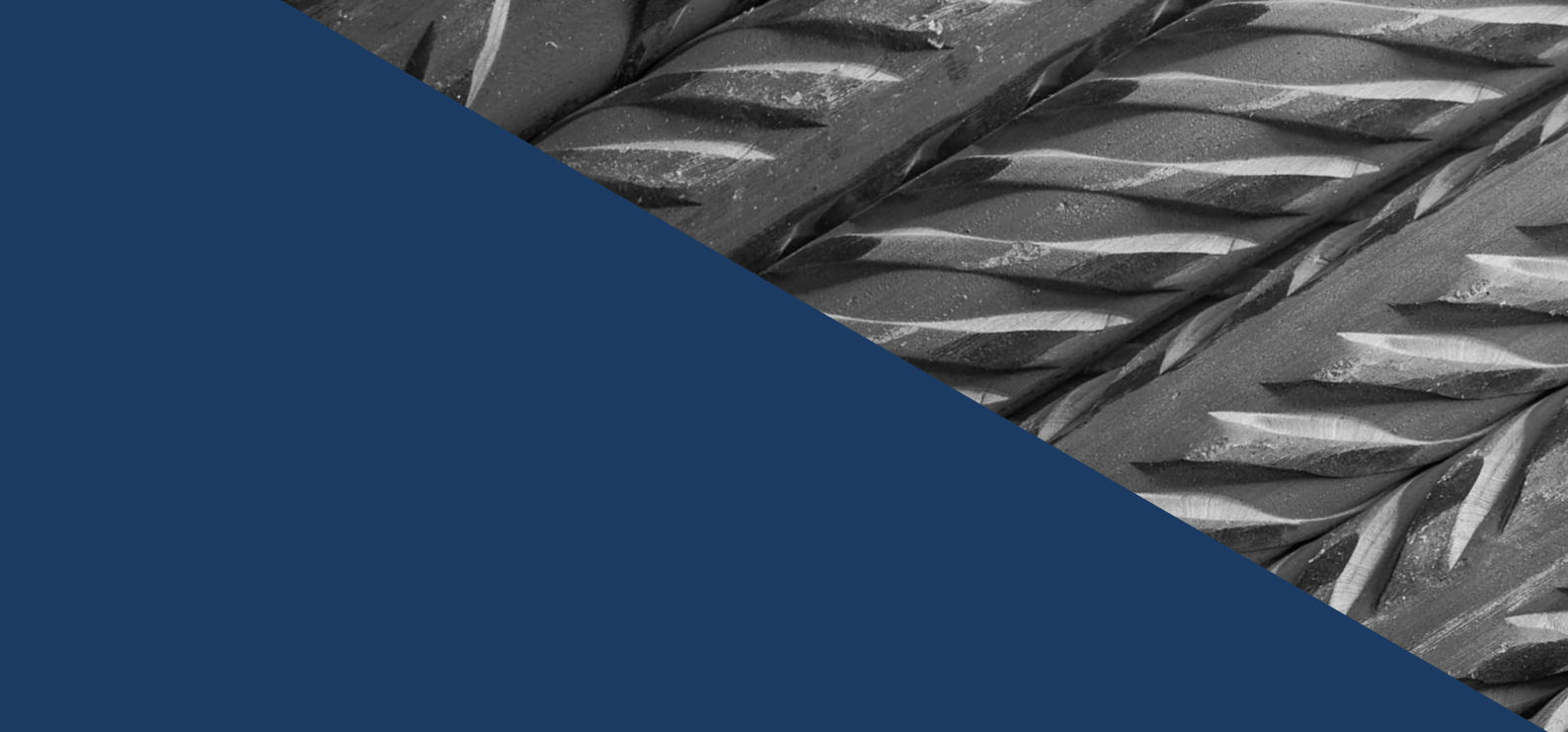


Bri San T

Innovationsnetzwerk Brückensanierung

SENSORTEC . DE





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