



# ELECTROGALVANIZED STEEL STRIP

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Technical terms of delivery  
1 September 2019



PREMIUM QUALITY  
WITH REDUCED  
CARBON FOOTPRINT

These general terms apply to all electrogalvanized steel strip supplied by companies in the voestalpine Steel Division. Please use the following link to find a list of the companies affiliated with the Steel Division:

[www.voestalpine.com/stahl/en/Companies](http://www.voestalpine.com/stahl/en/Companies)

The names of companies in the voestalpine Steel Division are referred to simply as **voestalpine** in this document.

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# INTRODUCTION

voestalpine operates one of Europe's most modern steelmaking facilities in Linz. Each of the modern lines required for the production of high-quality steel strip is located next to related facilities and is highly integrated into the works.

Our goal is to innovate and go beyond standard steels, to continually offer high-quality products. The most modern manufacturing technologies, continuous quality control systems as well as intense research and development guarantee optimum product quality.

These technical terms of delivery provide information on the ordering and processing of **electro-galvanized steel strip**. Please direct any of your questions to your responsible sales personnel or technical specialist at voestalpine.

# QUALITY MANAGEMENT

voestalpine is a quality leader in a challenging market environment, and it has become the company philosophy to meet the justified expectations and requirements of both the market and the customer with respect to every possible aspect of quality. Comprehensive quality management is a central component of the company strategy. In addition to this comprehensive quality management system, production monitoring using the most modern testing systems is also a necessity. These systems are inspected on a regular basis by external and independent agencies.

## COMPREHENSIVE QUALITY MANAGEMENT

The voestalpine companies meet the highest standards of quality management and are certified pursuant to **Lloyd's Register QA Ltd.** in the United Kingdom as well as **ISO 9001** and **IATF 16949**.

This has been confirmed by numerous customer awards presented for best quality performance. Focus has been continually on this pursued path as well as on consistent implementation of all quality standards.

## STATE-OF-THE-ART TESTING TECHNIQUES

voestalpine uses the most modern testing techniques and methods, laboratory information and management systems equipped with state-of-the-art technologies. The technical expertise of our testing and inspection laboratories is certified in accordance with international standards, e.g. **ISO/IEC 17025** and **ISO/IEC 17020**, and is accredited by Austrian national standards.

# STEEL GRADE OVERVIEW

All steel grades named in **EN 10268**, **10338**, **10152** or **VDA 239-100** can be supplied. Customer specifications or special orders are subject to special agreement between the customer and voestalpine and must be included in written form in the order. Please ask for more detailed information from your voestalpine sales contact or technical customer service representative. Please use the following link to find further information on available electrogalvanized steel strips and dimensions: [www.voestalpine.com/stahl/en](http://www.voestalpine.com/stahl/en)

## STRUCTURAL STEELS

The structural steel product family is defined by minimum yield strength, tensile strength and total elongation requirements. The alloy is based on a low-carbon strategy, whereas the strength can be adjusted by adding solid-solution-strengthening alloys. Structural steels are suitable for simple forming operations such as folding, edging and profiling.

## MILD STEELS

Differentiation is made between LC and ULC/IF steels in the mild steel product family. Their field of application ranges from simple structural members to complex pressed parts that meet the highest forming requirements. The alloy design is based on a low-carbon strategy for moderate demands on forming properties. An interstitial-free (IF) alloy design is used to meet the highest forming requirements. Interstitially dissolved elements such as carbon and nitrogen are stabilized by added niobium and/or titanium. ULC/IF steels provide the best forming properties with respect to deep drawing because of their low yield strength, high total elongation and high r values. This property profile makes ULC/IF steels suitable for applications with high deep drawing demands and for creating visible parts with an attractive surface appearance.

## MICROALLOYED STEELS

Microalloyed steels (HSLA = high strength low alloyed) are members of the product family of conventional high-strength steels. They feature a wide variety of yield strength levels and cover the upper strength range of conventional high-strength steels. Microalloyed steels are characterized by a high ratio of yield to tensile strength, good cold formability and good weldability. The individual strength classes are adjusted essentially by adding microalloying elements such as niobium, titanium and vanadium. These alloying elements can be added individually or in combination and lead to increased strength through grain refinement and precipitation hardening. Carbon additions and solid-solution strengthening are also used to increase the strength. As a result of their wide range of strength levels, microalloyed steels offer the possibility of optimally selecting the materials to conform to component requirements and are thus very well suited to the manufacture of structural and chassis parts.

## **CARBON-MANGANESE STEELS**

Carbon-manganese steels belong to the product family of conventional high-strength steels. They are characterized by intermediate tensile strength and a high total elongation. Their strength is achieved through high carbon content and solid-solution-strengthening elements, particularly manganese. Adding niobium and/or titanium as alloying elements leads to precipitation hardening and grain refinement. Carbon-manganese steels are especially suitable for the production of structural and reinforcing components in the automotive industry.

## **BAKE-HARDENING STEELS**

Bake-hardening steels belong to the product family of conventional high-strength steels. Based on their various strengths, these steels provide additional increases in yield strength during the heat treatment applications generally used in automotive painting processes. This increase in yield strength is achieved by adjusting the right amount of dissolved carbon in the steel. Bake-hardening steels are characterized by excellent forming properties, higher strength in the finished part following the coating process as well as high dent resistance and strength. This excellent property profile predestines bake-hardening steels for the production of structural components and exposed panels. They contribute substantially to the design of the automobile.

## **HIGH-STRENGTH IF STEELS**

High-strength IF (interstitial-free) steels belong to the product family of conventional high-strength steels. They feature the best forming properties among the conventional high-strength steels as a result of their high level of work hardening, lack of a pronounced yield strength, high total elongation and a high  $r$  value. The alloy is based on a vacuum-decarburized IF strategy that is stabilized with titanium and/or niobium. The individual strength classes are achieved through adding solid-solution-strengthening alloying elements such as manganese, phosphorus and/or silicon. Their excellent property profile makes high-strength IF steels predestined for complex component applications with high demands on deep-drawing suitability and strength.

## **DUAL-PHASE STEELS**

Dual-phase steels are part of the ahss classic product line of voestalpine in the field of ultralights and are characterized by excellent physical properties, including low yield strength, high work hardening, high tensile strength as well as high uniform and total elongation. The microstructure of dual-phase steels consists primarily of ferrite and martensite and, as its strength increases, can contain bainite, tempered martensite and residual austenite. The finely tuned microstructure achieves a balance between deep-drawing capacity and resistance to edge cracking, which is why these steels are ideal for applications in complex structural components. The balance between strength, formability and weldability of dual-phase steels leads to enormous potential in light-weight design while also achieving improved crash performance.

## **COMPLEX-PHASE STEELS**

Complex-phase steels are part of the ahss classic product line of voestalpine in the field of ultralights and are characterized by high yield ratios at high strength, very high resistance to edge cracking and excellent bending properties. The finely tuned multiphase microstructure consists of martensite, bainite, ferrite and tempered martensite, whereas the occurrence of hard phases rises as the strength class increases. Complex-phase steels were specially developed for roll-profiling, bending and edging processes. These steels have proven themselves in industrial-scale serial production and are recommended for innovative light-weight automotive applications such as stiffeners, sills, door impact bars, seat mounting rails and auto chassis components. As a result of this balanced property profile, complex-phase steels are predestinated for applications containing crash components with a high potential for light-weight design.

## **DUAL-PHASE HIGH-DUCTILITY STEELS**

Dual-phase high-ductility steels are an innovation of voestalpine in the field of ultralights. In contrast to classical dual-phase steels, dual-phase high-ductility steels feature significantly improved formability with respect to deep drawing. Depending on the strength class, the multiphase microstructure of dual-phase high-ductility steels consists of certain amounts of ferrite, martensite, bainite and residual austenite. This results in high resistance to edge cracking and excellent crash behavior. Based on their unique properties, dual-phase high-ductility steels make a substantial contribution to innovative light-weight design in safety-related and crash-relevant components.

## **COMPLEX-PHASE HIGH-DUCTILITY STEELS**

Complex-phase high-ductility steels are an innovation of voestalpine in the field of ultralights. They are characterized by substantially improved forming properties when compared to classical complex-phase steels. The precisely defined, very fine and high-strength microstructure leads to high yield strength, high resistance to edge cracking, improved deep-drawing characteristics and unique bending properties. The microstructure consists of bainite, martensite, tempered martensite and residual austenite. Based on their unique properties, complex-phase high-ductility steels make a substantial contribution to innovative light-weight design in safety-related and crash-relevant components.

## **TRIP STEELS**

TRIP (transformation-induced plasticity) steels are part of the ahss classic product line of voestalpine in the field of ultralights. They maintain high tensile strength while achieving excellent deep-drawing properties through extraordinary uniform and total elongation. The microstructure consists of a ferritic matrix with embedded phases of bainite and residual austenite. The residual austenite is metastable and transforms during plastic deformation to martensite. This strain-induced transformation makes it possible for TRIP steels to achieve excellent deep-drawing properties and predestines them for the manufacture of complex components with pronounced deep-drawing capacity. As a result of their high crash energy absorption, TRIP steels are ideal for safety-related and crash-relevant structural components.

## **MARTENSITIC STEELS**

Martensitic steels made by voestalpine fall into the ultralights field of expertise. The property profile of martensitic steels is characterized by highest strengths without any compromise of excellent formability during bending and roll forming. The very high resistance to edge cracking during the forming of stamped edges is a result of the single-phase martensitic microstructure. The special annealing and cooling technologies of voestalpine result in excellent strip flatness in martensitic steels. The unique property profile of martensitic steels makes them highly suitable for applications in light-weight automotive design and the manufacture of safety parts and crash-relevant components.

# METALLIC COATING

Electrogalvanized steel strip can be supplied according to the provisions of **EN 10152, 10268** and **10338** or **VDA 239-100**. Customer specifications or special requests are subject to special agreement. Please ask for more detailed information from your voestalpine sales contact or technical customer service representative. The zinc coating is continually monitored by means of the beta backscatter method on each side and across the entire width of the strip.

## ELECTROGALVANIZED ON BOTH SIDES

To the extent not otherwise agreed, both sides are electrogalvanized based on the above standards.

## ELECTROGALVANIZED ON ONE SIDE

If not otherwise agreed, the non-galvanized side is located on the outer side of the strip.

## DIFFERENTIAL GALVANIZATION

In the event of differential galvanization, this applies to the top side of the strip with less zinc coating.

# SURFACE

## SURFACE TYPES

Electrogalvanized steel strip is available featuring several different surface finishes (supply in accordance with **EN 10152, 10268, 10338** and **VDA 239-100**).

- » Normal surface (A) or unexposed (U)
- » Best surface (B) or exposed (E)

Please ask for more detailed information from your voestalpine sales contact or technical customer service representative.

## SURFACE FINISH

A mat surface with a permissible mean roughness ranging from  $R_a$  0.6 to 1.9  $\mu\text{m}$  is the default delivery standard. Other surface finish values may be agreed upon for special final applications at the time of the order.

A cutoff of 2.5 mm applies when determining the mean roughness value  $R_a$  according to the provisions of **EN 10049** (standard length of 12.5 mm).

# SURFACE TREATMENTS

Because of the heightened risk of white rust occurring during transport and storage, electrogalvanized steel strip is always final-treated with one of the following processes prior to delivery. The final treatment methods are assigned letter codes. Delivery in non-treated condition is permitted only in exceptional cases or when the customer explicitly accepts corrosion risks from the time the material is made ready for dispatch. The type of post-treatment must be indicated at the time the order is placed. To the extent that no other instructions are provided at the time of the order, electrogalvanized steel strips are delivered in oiled condition (O).

## OILED (O)

An anticorrosive forming oil is applied that can be easily removed with conventional cleaning agents that do not attack zinc (such as alkaline degreasing). Depending on the stress during treatment, the following types of oil application are available.

- » Slightly oiled, roughly 0.7 g/m<sup>2</sup> per side
- » Oiled, roughly 1.2 g/m<sup>2</sup> per side
- » Heavily oiled, roughly 1.6 g/m<sup>2</sup> per side

Other oil coating masses ranging from 0.5 to 2.0 g/m<sup>2</sup> and side are subject to special agreement between the customer and voestalpine and must be included in written form in the order. Should no other data be provided at the time of the order, 1.2 g/m<sup>2</sup> will be applied per side. Although the oil is distributed evenly, a certain degree of oil will invariably spread across the length and width of the strip and some oil from heavily oiled strip will be shed from the surface during transportation and storage. This is technically unavoidable.

## PHOSPHATED (P)

A phosphate layer also provides an optimum bonding layer for further organic coating in addition to providing temporary protection against white rust during transport and storage. These different shades, however, have no bearing on product quality. Electrogalvanized and phosphated steel strip can only be delivered with a zinc coating on both sides.

## PHOSPHATED AND OILED (PO)

Phosphating in combination with oiling improves formability.

## CHEMICALLY PASSIVATED (C)

The surface can be chemically passivated upon request to achieve additional temporary protection during transport and storage. Local discoloration caused by chemical passivation is permitted and does not negatively influence other quality properties. Passivation may influence further surface treatments carried out by the customer, for example phosphating. An alternative surface treatment method, e.g. oiling, is recommended in such instances.

## CHEMICALLY PASSIVATED AND OILED (CO)

This combination of surface treatment is recommended where increased protection against white rust or oiling as a forming aid is required.

A certain degree of oil will invariably spread across the length and width of the strip, and some oil from heavily oiled strip will be shed from the surface during transportation and storage. This is unavoidable.

## PHOSPHATED AND CHEMICALLY PASSIVATED (PC)

Surface treatment in the form of phosphating and chemical passivation increases temporary protection against corrosion caused by white rust. Electrogalvanized and PC steel strip can only be delivered with a zinc coating on both sides.

## PHOSPHATED, CHEMICALLY PASSIVATED AND OILED (PCO)

All three surface treatments provide the highest-possible protection against white rust during transport and storage. An oil layer leads to additionally improved forming behavior. Supply is only possible with zinc coating on both sides.

# ORDER QUANTITIES AND MANUFACTURED UNITS

## ELECTROGALVANIZED STEEL AS WIDE STRIP (COIL)

- » The minimum order quantity per line item is one coil production unit (depending on the steel grade, between approx. 18 kg/mm and approx. 20 kg/mm strip width) and/or its multiple.
- » It is possible to subdivide these coil units into smaller coils.
- » The target is fulfillment of customer orders with respect to the requested coil weight. It is permissible to fall below the ordered coil weight by up to a maximum of 30%.
- » The weight tolerance of line items whose ordered weight exceeds 100 tons is plus/minus a typical coil production unit typical for this item.

## ELECTROGALVANIZED STEEL AS SLIT STRIP OR CUT SHEETS

- » The minimum order quantity per line item is one coil production unit, which ranges roughly between approx. 18 kg/mm and approx. 20 kg/mm strip width and/or its multiple, depending on the steel grade.
- » This coil production unit can be subdivided.
  - » Possible in small coils for slit strip, e.g. 18, 9, 4.5 kg/mm
  - » Cut sheets and tailored blank packages can be divided into units  $\leq$  10 tons.
- » Overdelivery and underdelivery is permitted up to  $\pm$ 10%.

## WEIGHTS

- » The maximum weight of steel strip is 32 tons per coil.
- » The maximum weight per package of cut sheets is 6 tons.

All available steel grades and dimensions can generally be supplied with a specific coil weight of between approx. 18 and approx. 20 kg/mm strip width.

# AVAILABLE DIMENSIONS

With regard to geometric properties, the tolerances of all electrogalvanized steel strips produced by voestalpine are subject to the provisions of **EN 10131** and **VDA 239-100**. Limited tolerances and other parameters not contained in the standard are subject to special agreement between the customer and voestalpine and must be included in written form in the order. To the extent not agreed otherwise, the ordered thickness includes symmetrical thickness tolerances.

Please find more detailed information about available dimensions in the product data sheets of the respective steel grade group or use the following link to access the product information portal: [www.voestalpine.com/pro](http://www.voestalpine.com/pro)

## ELECTROGALVANIZED STEEL AS WIDE STRIP (COIL)

Product variant	Thickness [mm]	Width max. [mm]	Outer diameter max. [mm]	Inner diameter [mm]
Electrogalvanized Steel Strip	0.40–2.50	1600	approx. 2000	approx. 600 *

Available combinations of widths and thicknesses vary depending on the steel grade.  
\* Indicated references are standard values.

## ELECTROGALVANIZED STEEL IN SLIT STRIPS

Product variant	Thickness [mm]	Strip width max. [mm]	Outer diameter max. [mm]	Inner diameter [mm]
Electrogalvanized Steel Strip	0.40–2.50	10–1600	approx. 700–2200	approx. 500/600 *

Available combinations of widths and thicknesses vary depending on the steel grade.  
\* Indicated references are standard values.

## ELECTROGALVANIZED STEEL AS CUT-TO-LENGTH SHEETS

Product variant	Thickness [mm]	Width max. [mm]	Length max. [mm]	Package weight max. [t]
Electrogalvanized Steel Strip	0.40–2.50	210–1600	approx. 200–6700	6

Available combinations of widths and thicknesses vary depending on the steel grade.

# INSPECTIONS

## MATERIAL INSPECTION

Material test certificates must be requested at the time of the order in accordance with the provisions of **EN 10204**. With respect to test units, sampling and the performance of inspection tests, the stipulations contained in the respective order standards shall apply. Specific requests are subject to special agreement between the customer and voestalpine and must be included in written form in the order.

## ZINC COATING MASS INSPECTION

The zinc layer is generally determined as the strip moves continuously by means of x-ray fluorescence analysis. The layer is determined gravimetrically for special testing purposes or in cases of arbitration. The provisions of **EN 10152** apply (Appendix A).

# LABELING

Standard labeling consists of a tag per package unit and indicates the following:

- » Supplier
- » Recipient
- » Order number
- » Strip number (identification number)
- » Heat number
- » Part or package number
- » Steel grade
- » Dimension
- » Number of units
- » Weights
- » Date of production

Additional data or marking directly on the material (coil or package marking) is subject to agreement.

# TECHNICAL INSPECTION OF INQUIRIES AND ORDERS

## **ORDERS BASED ON INTERNATIONAL STANDARDS**

The customer shall specify all applicable standards (such as EN10152 and EN10131) in the inquiry or order. The parallel specification of several standards (such as **EN10152** and **VDA 239**) is expressly excluded. All order details set forth in these voestalpine Technical Terms of Delivery shall be provided in full by the customer. In the event that the required order details are not provided in full by the customer, the standard values set forth in these Technical Terms of Delivery, e.g. surface roughness, oiling, thickness tolerances etc., shall be applied to the order. Any limitations pertaining to an international standard shall be subject to prior special agreement between the customer and voestalpine and shall be included in the order in written form.

## **ORDERS BASED ON A CUSTOMER STANDARD OR CUSTOMER SPECIFICATION**

The customer specifies all pertinent standards and specifications at the time of the inquiry or order and provides the sheet metal data card for the required dimensions. Parallel specification of a customer standard AND an international standard is expressly excluded. The customer shall be informed by voestalpine of any restrictions or objections that arise during the technical review of requested standards. The customer shall sign and return the technical review, including any restrictions and objections, to voestalpine in the event of customer acceptance. Should the customer reject the technical review in part or in full, it will be necessary for the customer and voestalpine to negotiate a standard acceptable to both parties. In the event that the customer does not expressly reject the technical opinion and takes further steps (material order, request for trial sample etc.), the technical opinion shall be deemed as accepted by the customer and voestalpine shall not accept any subsequent complaint nor recognize any claim of deviation from the customer specification.

# ADDITIONAL INFORMATION

Supply as **electrogalvanized hot-rolled strip** is possible to the extent that this is not excluded or clearly agreed.

## PROCESSING INFORMATION

Electrogalvanized steel strip can be processed in the same way as uncoated cold-rolled steel strip. In practical application, chemical-physical peculiarities of the zinc coating result in additional factors that must be taken into careful consideration during forming, joining and coating.

In the event that recurrent defects become apparent during the unwinding of a coil or a slit coil, suggesting that the entire coil or slit coil will result in greatly increased scrap during processing, the processor shall discontinue use of the coil and notify the supplier immediately.

Steel strip absorbs tension when it is coiled, and this can lead to deviations in strip flatness when it is uncoiled (roll bending, chuck bending etc.). These deviations usually do not interfere with strip processing. Customers who require completely flat strip must employ a tension leveler that is suitable for the respective material.

## FORMING

Materials are selected in accordance with forming demands and component-specific requirements. The changed slipping behavior of a zinc-coated surface may make it necessary to adjust forming parameters, such as an increase in hold-down force. Phosphating as a subsequent treatment improves formability and leads to a reduction in increased cold weldability of the zinc surface.

## JOINING

Conventional thermal and mechanical joining technologies and adhesive technologies can be used as methods of joining. Mechanical joining technologies such as screwing, riveting, crimping, flanging or clinching are preferred to preserve the anticorrosive characteristics of the zinc coating. Conventional welding methods such as soft and hard soldering are also viable methods. The adjustment of welding parameters that take into account the zinc coating is necessary during resistance welding (spot, projection or stitch welding). The effect of subsequent phosphate treatment on welding parameters must also be taken into account.

Metal gluing, sometimes in combination with other methods of joining, is increasing in significance as a technology that preserves the surface. High-strength connections are achievable with modern adhesives, even between oiled products. An examination of the surface systems, possible treatment processes and the adhesives themselves is advisable. Metal bonding is generally facilitated by phosphating. It is necessary to consider the possibility of contact corrosion when different materials are joined.

## CLEANING AND COATING

Electrogalvanized steel strip is a suitable surface for organic coatings. Commercial degreasing agents in a pH range between 5 and 9 are suitable for cleaning before coating. Pretreatment methods that specifically take electrogalvanized surfaces into account are recommended when bonding organic coatings. In case of phosphating (P, PO, PC or PCO), the chemical conversion treatment can be forgone because this treatment is performed by the manufacturer.

## MARKING

voestalpine reserves the right to deliver marked or unmarked material in the event that the customer when placing the order does not provide any explicit information with respect to marking.

## PACKAGING

The initial inner and final outer coil windings are considered to be packaging and are not representative of the properties in the remaining windings of the coil.

The desired packaging type, package or coil weight and additional requests with respect to packaging, labeling and loading are subject to special agreement between the customer and voestalpine and must be included in written form in the order.

## TRANSPORT AND STORAGE

- » Transport in dry condition
- » Store in a dry environment and protected from the weather, preferably indoors in a suitable warehouse
- » Protect against condensation (avoid excessive temperature differences)
- » Use proper supports
- » Avoid local pressure loads
- » Keep storage times short

The material must be protected against any corrosion from salts, acids, alkaline fluids or other substances containing such.

A loose, matt gray to reddish material called white rust forms on the surface when electrogalvanized steel strip is subject to humidity for a longer period of time with reduced ventilation. The formation of condensate on the coil surface is the main reason for white rust growth and must be avoided. All electrogalvanized coils are packaged for transport in order to minimize the risk of white rust formation. Proper transport procedures and correct storage until the coils are unpacked are also measures that must be taken to avoid the formation of white rust. Temperature changes during transportation and storage are critical. Coils take approximately four days to completely assume a new ambient temperature. During this time they are subject to the risk of condensate formation. The lowest risk is reached as soon as the coils have completely assumed the new temperature.

Dark spots may appear where coil windings rub against each other and cause friction on the zinc surface. These spots affect the appearance but do not adversely affect the quality of the corrosion protection.

Electrogalvanized steel strip is generally intended for short-term processing. The degree of surface darkening may vary when these grades are stored for a longer period of time. This only has an effect on the appearance.

In the event that the customer discovers that packaging has become wet, the coil shall be immediately unpacked and wiped dry. Quick action is required in such a case. Before it is processed, the material shall be stored in a dry and well ventilated environment. In every such case, the responsible technical specialist at voestalpine shall be contacted immediately in order to be able to initiate appropriate measures.

The supplied material, including packaging, shall be checked for product quality (identification, packaging and product condition) by the recipient of the material upon arrival. In the event that material damage or any inadmissible characteristic is discovered in the material at the time it is inspected upon arrival, this shall be documented as accurately as possible in the corresponding freight documentation:

- » Trucks: CMR
- » Railway CIM: Assessment of current condition by responsible railway company
- » Waterborne vessels: Bill of lading/deletion log

Anomalies encountered on the means of transport or in the course of unloading the material shall be documented using photographs sent to the responsible contact person at voestalpine. Such documentation excludes the possibility of the material being damaged by the consignee in the warehouse and provides evidence that the delivered material was damaged before it arrived.

Temporary surface protection (oil, phosphating or chemical passivation) is applied to electrogalvanized steel strip at the end of the production line. The customer is responsible for verifying suitability of the respective surface protection for each application. This protection is only temporary. A maximum warranty period of three months shall apply to all methods used to protect surfaces from corrosion and shall be subject to proper storage, transport, loading and packaging in accordance with VDEh Data Sheet 114 and VDEh Data Sheet 130. (The material shipment date ex works shall apply.) Warranties shall not apply to any corrosion on non-surface-protected material.

The actual duration of protection depends on atmospheric conditions (particularly those in the warehouse). The surface protection applied in the production line may have an effect on subsequent processes such as painting or phosphating. The customer is responsible for verifying suitability of the respective surface protection for each application.

## GENERAL TERMS OF SALE

To the extent that individual technical properties and specifications are not specifically defined by the customer, e.g. by means of meaningful measurements and limit values, such properties and specifications shall merely serve as technical guidelines and non-binding target values unless otherwise agreed. voestalpine shall not grant any warranty nor be held liable for properties and/or specifications other than those explicitly agreed upon. This also applies to the suitability and applicability of electrogalvanized steel strip for certain applications as well as to the further processing of materials. All application risks and suitability risks are borne by the customer.

Please use the following link to find the applicable **general terms of sale for goods and services of the voestalpine Steel Division**: [www.voestalpine.com/stahl/en/The-Steel-Division/General-Terms-of-Sale](http://www.voestalpine.com/stahl/en/The-Steel-Division/General-Terms-of-Sale)

# ORDER DATA

The following information is required in each order:

- » Steel grades as defined by standards or explicit specifications
- » Dimensions, tolerances
- » Edge condition
- » Material test certificates, if desired; acceptance conditions upon request
- » Order quantity
- » Coating type, surface type and surface finish
- » Preservation
- » For coils and slit strip
  - » Inner diameter
  - » Min./max. outer diameter
  - » With or without weld seam
  - » Min./max. coil/ring weight or min/max. kg/mm strip width
  - » Max. unit weight (packing unit)
  - » Max. unit width
- » For cut sheets
  - » Max. package weight
  - » Max. package height (with or without pallets)
- » Packaging
- » Labeling, marking, stamping
- » Type of transport, forwarder, customs forwarder
- » Type of truck or railcar
- » Mode of unloading, means of unloading and possible restrictions
- » Desired delivery date
- » Destination
- » Terms of delivery (Incoterms)
- » Material application

# STANDARDS, REGULATIONS AND TECHNICAL LITERATURE

The following information includes applicable product standards and references to other information provided by the Steel Information Center. References are made to these guidelines and standards, and compliance with these recommendations and specifications is mandatory (unless explicitly stated otherwise in these Technical Terms of Delivery).

## PRODUCT STANDARDS

### **DIN EN 10131**

Cold-rolled flat products without any coating or with electrolytic zinc or zinc-nickel coatings on mild steels and steels with higher yield strength for cold forming, limit deviations and form tolerances

### **DIN EN 10204**

Metallic products, types of inspection documents

### **DIN EN 10152**

Electrogalvanized cold-rolled flat steel products for cold forming, technical delivery conditions

### **DIN 1623**

Cold rolled strip and sheet, technical delivery conditions, general structural steels

### **DIN EN 10268**

Cold-rolled flat steel products with high yield strength for cold forming, technical delivery conditions

### **DIN EN 10338**

Cold-rolled and hot-rolled flat products without any coating on multiphase steels for cold forming, technical delivery conditions

## PUBLICATIONS OF THE GERMAN STEEL FEDERATION

### **REFERENCE SHEET 114**

Packaging, storage and transport of uncoated and coated steel strip and sheet

### **REFERENCE SHEET 127**

Oiling on thin strips and thin cut sheets

09/2019

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ONE STEP AHEAD.