



PREMIUM QUALITY  
WITH REDUCED  
CARBON FOOTPRINT

## STEEL STRIP FOR THE HOUSEHOLD- APPLIANCE INDUSTRY

Your partner for innovative solutions



# MORE THAN JUST CUSTOMER SOLUTIONS



## Broad range of products

Functional alternative to Galfan? An aesthetic alternative to stainless steel? Or a directly enamelable forming aid in order to save processing costs? voestalpine offers solutions for each area of application along the entire value chain.



## High level of process expertise

The technical specialists at voestalpine who focus their entire energy on the household industry provide concrete input in the interest of optimizing processes and improving final products.



## Solutions of tomorrow

voestalpine stands for innovation. Product developers devoted exclusively to the household-appliance industry work continuously on solutions that clearly differentiate us from other suppliers.



## 60 years of experience

The many years of experience of voestalpine are the foundation for our expertise in this market. The customers of voestalpine profit directly from the experience of voestalpine and are the beneficiaries of established and highly functional solutions.



## Research and development

As a research-intensive and innovative company in the steelmaking industry, we set new standards in collaboration with our customers.



To find out more about our solutions for the household-appliance industry by visiting us at [www.voestalpine.com/stahl/en/Segments/House-industry2](http://www.voestalpine.com/stahl/en/Segments/House-industry2)



**eva - enjoy voestalpine**

The voestalpine eva dashboard bundles all online services in the voestalpine Steel Division and provides a wide range of digital applications in various modules.



Learn more at  
[eva-steel.voestalpine.com](http://eva-steel.voestalpine.com)

**... BECAUSE  
WE CARE**



Stella Sustainable will keep you informed of greentec steel products, environmental protection and sustainability in the voestalpine Steel Division. [www.voestalpine.com/stella](http://www.voestalpine.com/stella)

# SEE FOR YOURSELF WHAT OUR PRODUCTS CAN DO!

## Steel strip for the household-appliance industry



**The household-appliance industry has always been a market segment of strategic relevance to voestalpine.** Many renowned manufacturers have enjoyed much more than a sixty-year partnership with voestalpine.

Highly skilled technical and market experts at voestalpine continue to work very closely with customers on high-quality and efficient solutions that are setting the market standards of tomorrow. Sophisticated service and logistics solutions are combined with a highly professional overall package that has proven to be effective for many manufacturers. Convince yourself!

voestalpine supplies solutions to the following areas in the household-appliance industry:

- » Cooling
- » Dishwashing
- » Laundry
- » Cooking



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# PRODUCT OVERVIEW

**The demands on steel are great.** The range of voestalpine steel strips is even greater. voestalpine offers steel strips in a wide variety of grades and qualities. As an innovative technology enterprise, voestalpine combines its high level of technical expertise with cutting-edge production systems. The companies of voestalpine share this expertise with external companies in a wide range of technical services.



## **colofer® – Organic-coated steel strip**

colofer® HOME, the organic-pre-coated steel strip for the household-appliance industry, optimally meets individualized customer requirements with perfect surface properties. Our products have been completely free from chromate since 1998.

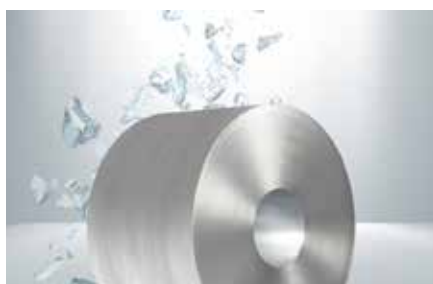
» Page 9-12



## **isovac® – Electrical steel**

As a European market leader, voestalpine has just the right product for every customer that requires non-grain-oriented electrical steel. The range of products includes fully processed and semi-processed electrical steel.

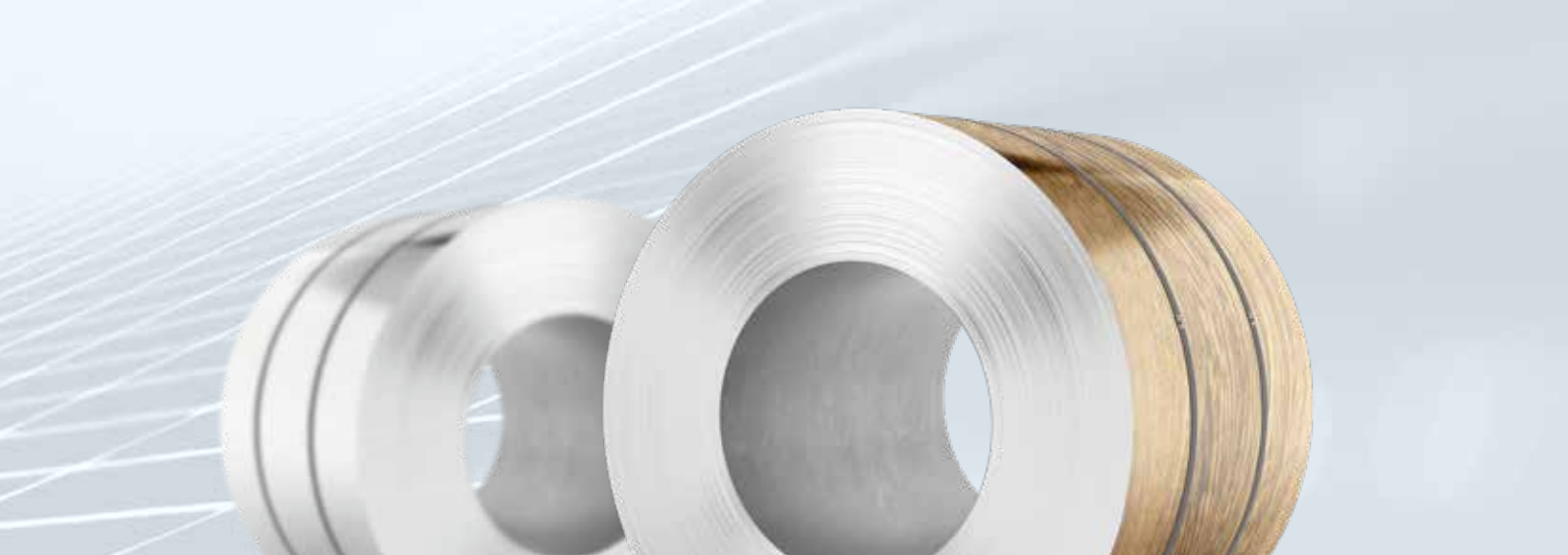
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## **Cold-rolled steel strip**

Cold-rolled steel strip made by voestalpine feature best surface quality, excellent processability and a high level of consistency in mechanical properties.

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#### **Hot-rolled steel strip**

Hot-rolled steels are supplied in a wide range of grades and qualities. A variety of alloys and rolling programs provide our customers with just the right steel for their specific applications.

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#### **Enamenable steel strip**

The special chemical composition permits fields of application ranging from simple structural components to complex pressed parts that meet the highest forming requirements. Enamenable steel strip is available in hot-rolled or cold-rolled condition.

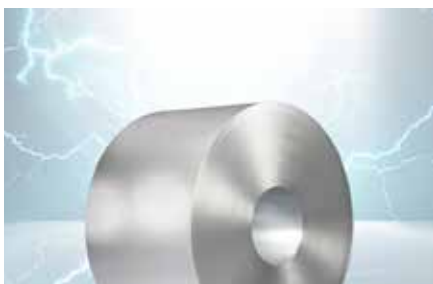
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#### **Hot-dip galvanized steel strip**

The range of products includes classical hot-dip galvanized steel strip (Z), hot-dip galvanized steel strip Galvannealed with a zinc-iron coating (ZF) and corrender (ZM) hot-dip galvanized steel strip with a zinc-magnesium-aluminum coating.

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#### **Electrogalvanized steel strip**

The product spectrum of electrogalvanized steel strip ranges from ultra-mild to ultra-high-strength steel grades. Electrogalvanized steel strip can be zinc-coated on one or both sides.

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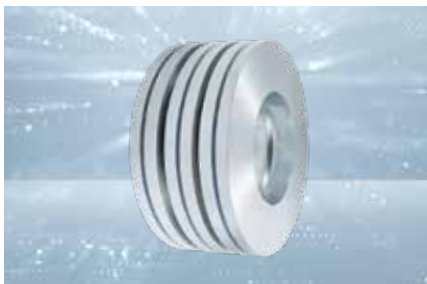
# SURFACE TREATMENTS & FURTHER PROCESSING



## **clearcover®—environmentally sustainable and compatible passivation**

clearcover® is the passivation coating without chromium or chromium compounds. The passivation is also free of other heavy metals. The less than one  $\mu\text{m}$  thick inorganic coating on galvanized steel strip provides good storage and corrosion protection during transport and supports formability and bondability in customer processes. Customer requirements are flexible. To meet these, voestalpine operates state-of-the-art facilities that guarantee the tightest tolerances and offer a wide range of products. Facts that significantly increase efficiency in downstream processing.

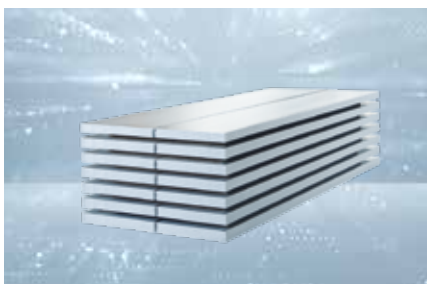
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## **Slit strip**

Our three ultra-modern slitting lines produce high-quality slit strip precisely to customer specification. The continuous technical and qualitative further development of our production lines forms the foundation for perfect final products.

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## **Cut sheets**

State-of-the-art multi-blanking lines precisely cut sheets with various surface finishes to dimensions specified by the customer.

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# PRODUCT- OVERVIEW

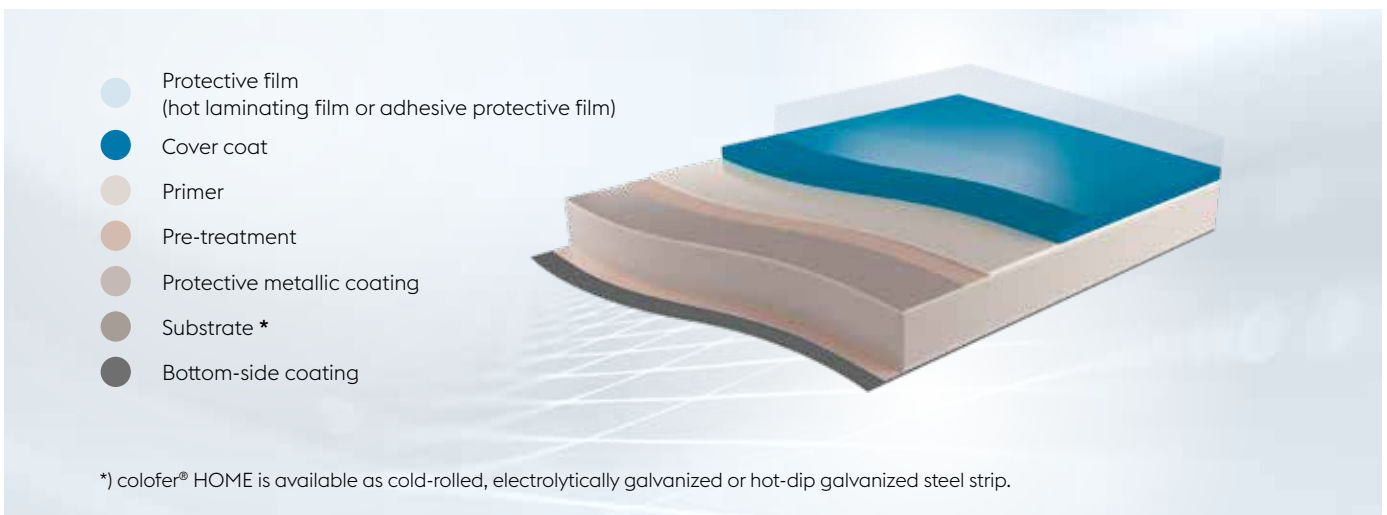
## colofer® – MORE THAN JUST ORGANIC COATED STEEL STRIP



**colofer®** is an inspiring product that creates added value for customers, which translates into superior quality and performance along the entire value chain.

Continual research and further development, inline quality control and optimized production systems ensure that voestalpine provides only the best product quality to its customers. The colofer® production facilities have been free of chromates since 1998, long before the current RoHS directive came into effect.

Competent technical specialists have been working closely together since 1992 with renowned household-appliance manufacturers and can point to numerous success stories. Our Steel Service Center will be happy to provide you with support with comprehensive possibilities of further processing, for example of cut sheets or slit strip. colofer® home provides unique solutions and sets new standards in the field of household appliances, and voestalpine is your reliable partner.



Our **technical support** consists of a large pool of experts who will be happy to assist you with all your inquiries.



### colofer® HOME ILLUSION

Phantasy knows no bounds.

Impressively genuine! A wide variety of different surfaces are made impressively true to life by colofer® HOME ILLUSION, for example slate stone, stainless steel, brushed aluminum or carbon. At the same time, the product is highly flexible in function and boasts the highest levels of material quality.



### colofer® HOME SILVER

Diversity in glittering silver.

Trendy and timeless are not contradictory terms! colofer® HOME SILVER provides a highly modern design and elegant appearance. With a nearly inexhaustible selection of various silver shades, colofer® HOME SILVER makes it possible to meet the most individual customer requirements.



### colofer® HOME CLASSIC

Classical design in white.

In the areas of washing, refrigerating or drying, colofer® HOME CLASSIC is convincing in every application with continuously high product quality and can be adapted precisely to individual customer requirements in shades of white, degrees of gloss and many other details. You can choose between smooth and structured surfaces.



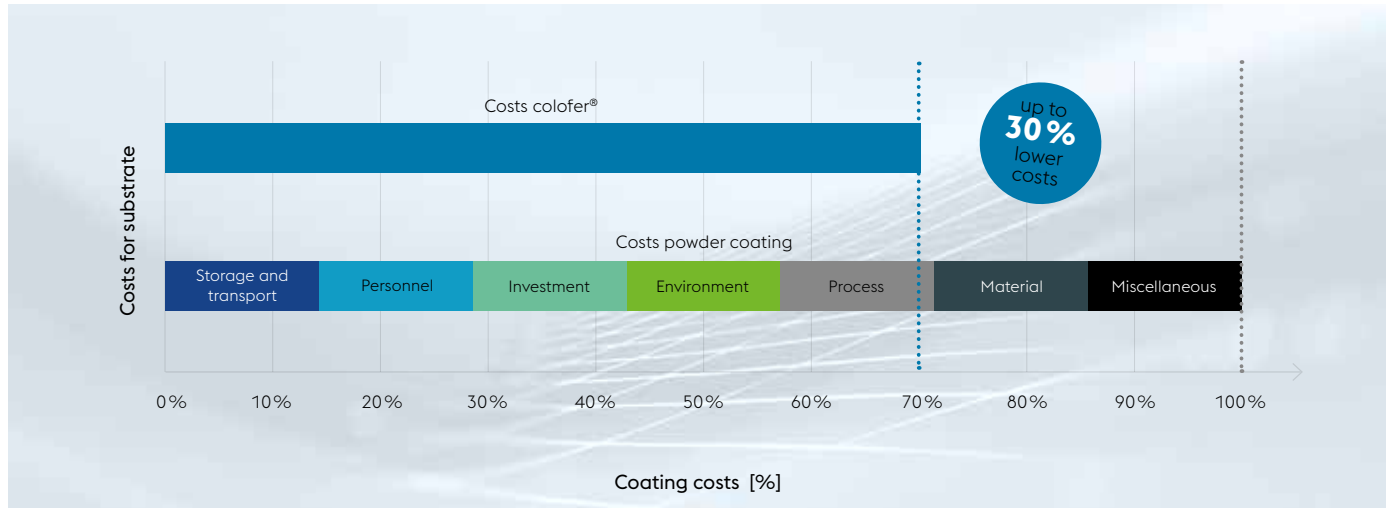
### colofer® HOME COLOR

Cool design shows its colors.

colofer® HOME COLOR provide a very personal touch with refined color accents. colofer® offers you an extremely wide range of standard and metallic colors that can be used to differentiate yourself from the competition and give a very personal touch to your final products.

## colofer® OR POWDER COATING? COST ADVANTAGES OF UP TO 30%

With colofer®, you not only increase quality, you also save costs! Analyses show potential savings of up to 30%.



### The advantages of colofer® as compared to powder coating technology

- » Availability of various designs
- » Flexible support amidst changing requirements, avoidance of bottlenecks
- » Compliance with RoHs regulations, REACH requirements and environmental management standards
- » Excellent corrosion resistance
- » Logistics simplified through bundling of all required steel products
- » Flexibility in meeting requirements such as new dimensions, components or product series

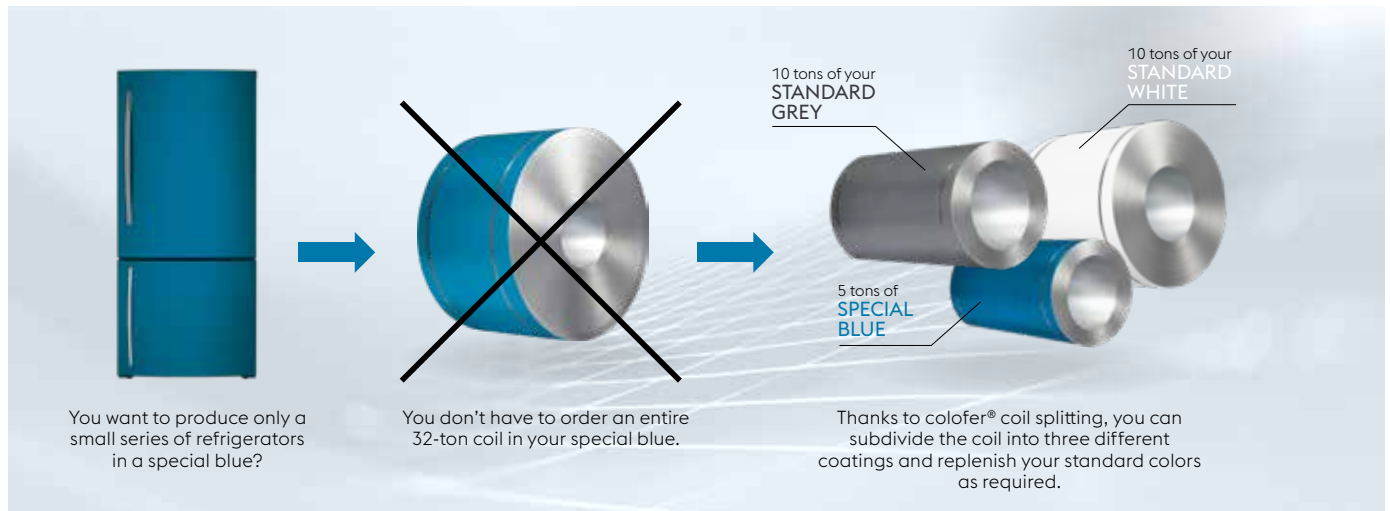


Datasheets and much more information are available at [www.voestalpine.com/stella/en/Downloads](http://www.voestalpine.com/stella/en/Downloads)



## colofer® COILSPLITTING: UP TO THREE COATINGS PER COIL

**Flexible and aesthetic like no other product!** Did you know that thanks to colofer® coil splitting almost all desired colors can be displayed, even in small quantities? This means that even the smallest of customer requirements can be realized.



## 2030 OUTLOOK FOR colofer®

**As an eco-pioneer, voestalpine lives sustainability and provides answers to the core questions customers in the house industry.** Our focus is on the ecology and development of new coating systems and energy savings as well as quantitative and qualitative increases in performance. We focus primarily on the implementation of meaningful digitalization in order to more effectively meet customer needs and market requirements. Intensive efforts are being made in the development of premium services and logistics packages that further intensify partnerships with our customers. We proactively meet the increasing demand for individualization.



colofer® is comprehensively certified.  
[www.voestalpine.com/colofer/en/Why-colofer-R/Certificates-and-more](http://www.voestalpine.com/colofer/en/Why-colofer-R/Certificates-and-more)

Intensive work is being done on developing premium service and logistics packages to further deepen customer cooperation. Increasing customer demand for individualization is being proactively and increasingly taken into account.

# isovac® – ELECTRICAL STEEL STRIP



**More than just electrical steel.** Energy efficiency is the decisive success factor of the future. Electrical steel of the highest is required for the production of household electrical appliances with the highest degree of efficiency. Make your dreams come true with innovative isovac® electrical steel made by voestalpine for household appliances that meet the highest standards.

Because of the excellent property profile, isovac is a leading product worldwide in the field of semi-finished and full-finished grades.



## **Fully processed electric steel strip (EN 10106)**

Fully processed electrical steel can be stamped and assembled into stacks without any further treatment because the desired properties are fully developed once the final production steps have been completed in the steel works.

The manufactured packages are the heart of your electrical device and contribute significantly to efficiency.



## **Semi-processed electrical steel strips (EN 10341)**

In the case of semi-processed electrical steel, the magnetic properties are preset after the final production process in the steelmaking plant. After being stamped, components must be re-annealed to obtain the optimum magnetic properties. As a result, any stress introduced by stamping is completely eliminated, and the material now possesses optimized magnetic properties.



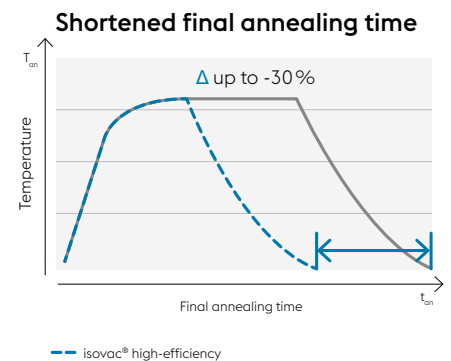
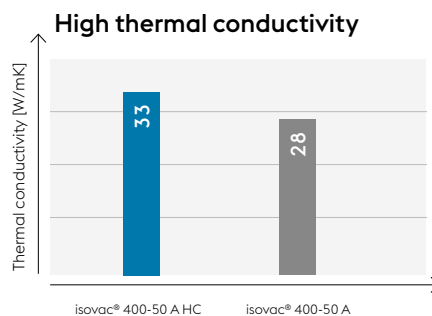
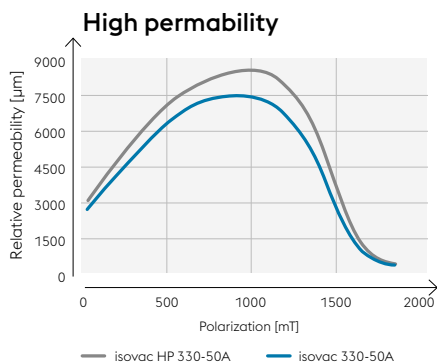
Find out more about isovac® and visit us at:  
[www.voestalpine.com/isovac](http://www.voestalpine.com/isovac)





## MOST EFFICIENT APPLIANCES AND COST SAVINGS THROUGH INNOVATION

Using isovac® not only enables customers to develop and produce household appliances with the highest energy efficiency. Excellent processability and our worldwide customer service provide you with the best overall package.



### isovac® HP (high-perm)

The specialist with the highest permeability

- » Increased performance achieved by increasing torque based on higher magnetizability
- » Cost savings from reduced material usage
- » Weight reduction and reduced space requirements are achieved through downsizing while maintaining the same power output

### isovac® HC (high-conductivity)

The specialist in high thermal conductivity

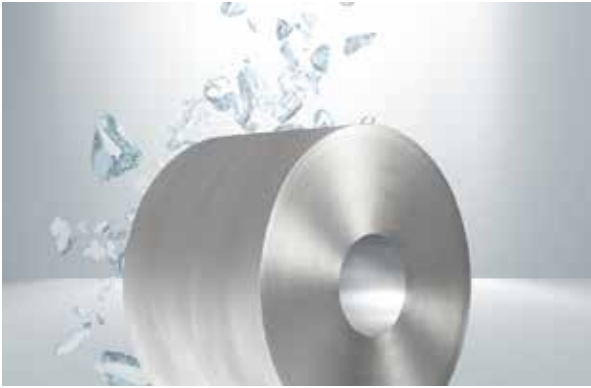
- » Cost savings through scrap avoidance with alternative engine construction concepts
- » Increased thermal conductivity thanks to less cooling

### isovac® HE (high-efficiency)

The specialist for shorter final annealing times

- » Cost savings from shortened final annealing times by up to 30%
- » Productivity hikes based on increased material throughput
- » Lower emissions based on shorter final annealing time

## COLD-ROLLED STEEL STRIP



**The excellent surface appearance of cold-rolled steels is convincing.** Our continuous production process and modern H2 annealing technology allow the manufacturing of high-quality steel strip with narrow thickness tolerances.

The comprehensive steel grade program makes cold-rolled steel strip a genuine all-rounder. These materials are used in applications ranging from simple sections to complex deep-drawn parts. Cold-rolled steels are used in the household-appliance industry for appliances such as washing machines, dishwashers, clothes dryers, refrigerators, stoves and hot water tanks.

- » Excellent surface quality
- » Excellent cold formability
- » Highly uniform mechanical properties
- » Narrow thickness tolerances thanks to modern production systems

## HOT-ROLLED STEEL STRIP

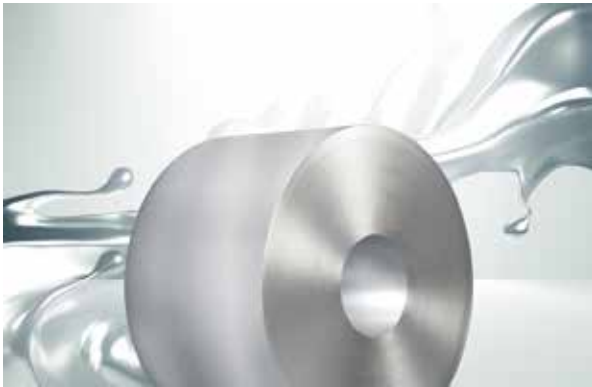


**Hot-rolled steel strip made by voestalpine is characterized by high product quality** and is a true all-rounder. It is as versatile as its many applications.

Hot-rolled steel strip to meet every customer requirement Our products are available in both pickled and unpickled condition, as slit or wide strip in coils. Even slit steel strip or cut shapes are possible. Hot-rolled steels are supplied in a wide range of grades and qualities. A variety of alloys and rolling programs provide our customers with just the right steel for their specific applications.

- » Available in pickled and unpickled condition
- » Excellent suitability to forming processes
- » Excellent weldability
- » Customer-specific fulfillment of mechanical properties
- » Narrowest thickness and width tolerances guaranteed
- » Surface roughness adjustable in exact compliance with customer requirements

# ENAMELABLE STEEL STRIP

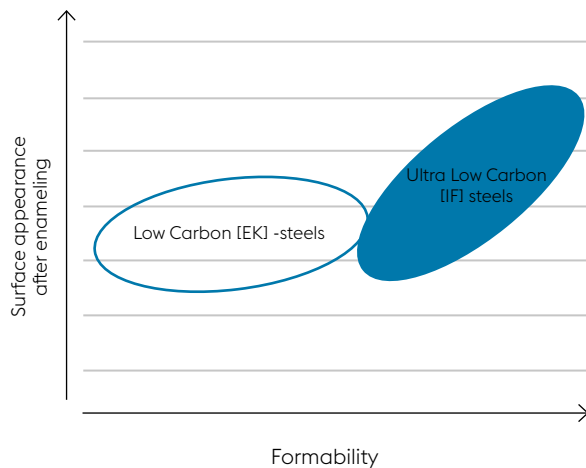


## Perfect enameling of cold-rolled and hot-rolled steels.

Following fundamental assessment of processing, application and surface requirements, the customer may select either a hot-rolled or cold-rolled enamelable steel grade.

### Cold-rolled enamelable steels

As a result of specially adapted enameling processes, cold-rolled enamelable steels made by voestalpine can be enameled in a high-quality process on both sides. Depending on the degree of forming and the enameling method used by the customer, classical AL-killed steels or enamelable IF steels can be recommended for different applications. Enamels can be applied in wet or powder form. Our directly enamelable forming coating for powder enamels, direct-e®, saves costs based on a reduction of process steps.



- Low Carbon [EK] steels from voestalpine  
DC01EK | DC04EK | DC05EK
- Ultra Low Carbon [IF] steels from voestalpine  
DC03ED TiVac | DC04ED TiVAC | DC06EK | DC07EK

### Hot-rolled enamelable steels

These special construction steels made by voestalpine are suitable for one-sided enameling based on their composition analysis and finely tuned hot-rolling parameters. Steel grades S355CCE and S380CCE are also suitable for two-sided enameling. Enamels can be applied in wet or powder form.

- » Narrow analysis tolerances
- » Wide strength spectrum with low amount of scatter.
- » Suitable for high surface requirements
- » Excellent fish scale resistance



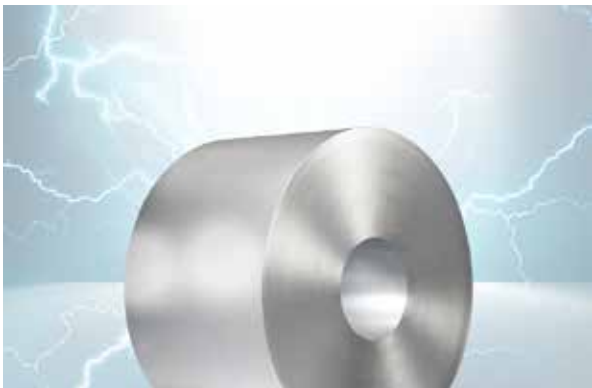
# HOT-DIP GALVANIZED STEEL STRIP



**Not visible, but of enormous importance.** The range of products includes classical hot-dip galvanized steel strip (Z), hot-dip galvanized steel strip Galvannealed with a zinc-iron coating (ZF) and corrender (ZM) hot-dip galvanized steel strip with a zinc-magnesium-aluminum coating.

- » Outstanding protection
- » Reduced coating layer thickness
- » Lower zinc abrasion
- » Larger processing window during deep drawing.
- » Reduction of forming aids
- » Energy savings
- » Lower noise level
- » Reduced abrasion in component manufacturing
- » No change in processing procedures

# ELECTROGALVANIZED STEEL STRIP



**Electrogalvanized steel strip is a product with the highest level of surface quality** and offers high corrosion protection and excellent workability in spite of low zinc layer thickness. The product spectrum of electrogalvanized steel strip ranges from ultra-mild to ultra-high-strength steel grades. Our grades are characterized by excellent appearance and highest-quality exposed panels. The mechanical properties are very similar to those of cold-rolled sheet. Electrogalvanized steel strip can be zinc-coated on one or both sides.

- » High-quality surface properties
- » Excellent forming behavior
- » Zinc coating on one side is possible
- » Best paintability
- » High degree of corrosion protection
- » Excellent welding and bonding properties

# SURFACE TREATMENTS

For a multifaceted plus in the functionality and quality of the steel strip surface

## clearcover® IS THE SUSTAINABLE AND ENVIRONMENTALLY FRIENDLY PASSIVATION COATING FOR HOT-DIP GALVANIZED STEEL STRIP

Do you need a sustainable passivation coating with excellent corrosion protection properties and very good processing characteristics? Then clearcover® is the product of your choice.



clearcover® is the new, sustainable and environmentally friendly passivation coating without chromium or chromium compounds. The passivation is also free of other heavy metals. The less than one  $\mu\text{m}$  thick inorganic coating on galvanized steel strip provides good storage and corrosion protection during transport and supports formability and bondability in customer processes.

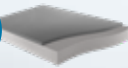






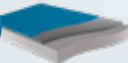










## CORROSION PROTECTION

clearcover® surfaces show a resistance to white rust after more than 72 hours of neutral salt spray testing pursuant to DIN EN ISO 9227 and over 50 cycles in alternating humidity and climate change testing (DIN EN ISO 6270-2 AHT). Setting new standards at voestalpine.

### Comperative tests with Hot-dip galvanized steel

NEUTRAL SALT SPRAY TEST according to DIN EN ISO 9227	Corrosions patterns					
	0 h	24 h	48 h	72 h	96 h <sup>1</sup>	168 h
<b>FVB Z100MB</b> 7,0 µm  <ul style="list-style-type: none"> <li>Zinc layer 5–30 µm</li> <li>thickness 0,45–4,0 mm</li> </ul>						
<b>FVB Z100MB + clearcover®</b>  <ul style="list-style-type: none"> <li>clearcover®</li> <li>Zinc layer 3–20 µm</li> <li>thickness 0,45–4,0 mm</li> </ul>						

<sup>1</sup>) No White rust even after 96 h of salt spray testing..

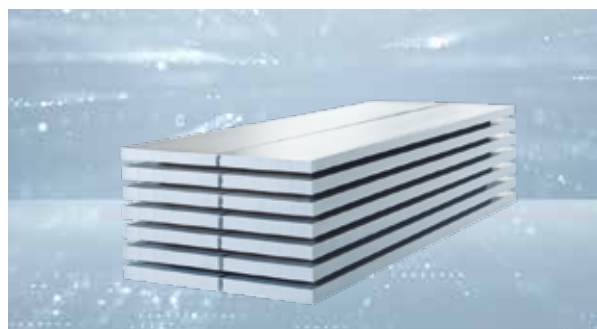
## PROCESSING PROPERTIES

clearcover® surfaces are ideally suitable for sheet metal working processes such as cutting, slitting and profiling. The new chromium-free passivation exhibits very good joining properties in spot welding, bonding and foam adhesion clearcover® boasts good compatibility with forming emulsions and can be coated directly with a powder coating or cathodic-dip coating. This eliminates degreasing or other pre-treatment processes and energy-intensive drying steps at the customer. The result is a high level of environmental compatibility with constant or improved performance in terms of paint adhesion and corrosion protection.

# FURTHER PROCESSING

## High-precision cutting

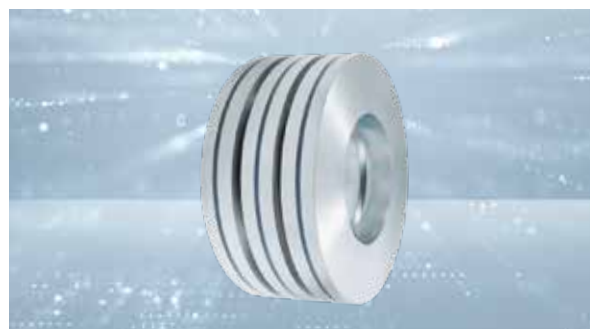
### CUT SHEETS



Eight slitting lines and six cut-to-length lines allow targeted solutions to meet the most specific product requirements such as especially difficult surfaces produced using specially adjusted and serviced production equipment.

THE voestalpine Steel & Service Center GROUP IS THE CENTER OF COMPETENCE FOR STEEL STRIP AND CUT PLATES IN THE voestalpine Steel Division.

### SLIT STRIP



**Higher product quality and even more possibilities.** With superslit, the most modern hot-rolled-strip slitting line in Europe, voestalpine can now supply its entire range of grades as slit strip. The enormously powerful system can slit sheet thicknesses up to 12 mm and strengths up to 1,500 MPa without any problem.

	max. Width [mm]	Thickness [mm]	clearcover®	Slit strip		Cut sheets		
				Strip width [mm]	Thickness [mm]	Width [mm]	Length [mm]	Thickness [mm]
Organic-coated steel strip (colofer®)	1,730	0.45 – 2.50		19 – 1,650	0.45 – 2.50	210 – 1,730	200 – 6,000	0.45 – 2.50
Electrical steel (isovac®)	1,600	0.25 – 1.00		19 – 1,600	0.25 – 1.00	300 – 1,550	300 – 5,000	0.25 – 1.00
Electrogalvanized steel strip	1,600	0.40 – 2.50	☑	10 – 1,600	0.40 – 2.50	210 – 1,600	200 – 6,700	0.40 – 2.50
Hot-dip galvanized steel strip	1,730	0.45 – 4.00	☑	10 – 1,730	0.45 – 4.00	210 – 1,730	200 – 6,700	0.45 – 4.00
Hot-dip galvanized steel strip (corrender)	1,730	0.45 – 2.30	☑	10 – 1,730	0.45 – 2.30	210 – 1,730	200 – 6,700	0.45 – 2.30
Enamenable cold-rolled steel strip	1,600	0.50 – 3.00		10 – 1,600	0.50 – 3.00	210 – 1,600	200 – 6,000	0.50 – 3.00
Cold-rolled steel strip	1,600	0.40 – 3.00		10 – 1,600	0.40 – 3.00	210 – 1,600	200 – 6,700	0.40 – 3.00
Enamenable hot-rolled steel strip	1,750	1.80 – 10.00		50 – 1,750	1.80 – 10.00	600 – 1,750	1,250 – 18,000	2.00 – 10.00
Hot-rolled steel strip	1,750	1.50 – 20.00		50 – 1,750	1.50 – 12.00	600 – 1,750	1,250 – 18,000	2.00 – 20.00

# WE ARE HERE FOR YOU WORLDWIDE.

**Always close to you.** The headquarters of the voestalpine Steel & Service Center Group is located adjacent to one of the most modern steel mills of Europe, voestalpine Stahl GmbH in Linz Austria. Further production locations guarantee proximity to our customers: Tychy in Poland, Giurgiu in Romania and our subsidiaries in Cittadella, Italy.

OUR voestalpine SALES AND  
DISTRIBUTION OFFICES IN  
20 COUNTRIES ARE AT YOUR  
SERVICE.



# ENVIRONMENTAL PRODUCT DECLARATION

## A healthy green conscience

EPDs provide a comprehensive view of the environmental impact that looks at much more than the carbon footprint (global warming potential) of a specific product. This enables consumers and business owners to better understand the environmental impact of products and make informed decisions.

EPDs also make the selection process easier because the calculation rules for EPDs are standardized pursuant EN 15804+A2 in order to guarantee the best possible comparability between products. This allows consumers and companies to select products that have a lower environmental impact in the respective application.



Amendment 2 (+A2) meets the requirements of EN 15804 with respect to the Product Environmental Footprint (PEF) of the European Commission. EPDs make it possible to meet the future requirements of the European Commission.

### EPDs are currently available for the following products:

- » Hot-dip galvanized steel strip
- » Electrogalvanized steel strip
- » Hot-rolled steel strip
- » Cold-rolled steel strip
- » colofer® organic-coated steel strip
- » isovac® fully processed electrical steel
- » isovac® semi-processed electrical steel



All EPDs can be downloaded here:  
[www.voestalpine.com/stella/en/Downloads](http://www.voestalpine.com/stella/en/Downloads)



# OUR WAY INTO A GREENER FUTURE

## Premium products in the greentec steel Edition

With greentec steel, voestalpine is pursuing an ambitious step-by-step plan in the long-term decarbonization of steel production. The declared objective is to achieve carbon-neutral production by 2050, and the initial steps have already been taken. Process-optimized production operations already prevent 10% of direct CO<sub>2</sub> emissions at the Linz site. The material and processing properties of the steel are not affected in any way in this production route. Each voestalpine steel strip product is available in premium quality in the greentec steel edition with a reduced carbon footprint and unique benefits.



Premium quality with reduced CO<sub>2</sub>-Footprint

colofer® – Organic-coated steel strip – greentec steel Edition

Max. CO<sub>2</sub>-Footprint 2.23 kg CO<sub>2</sub>e/kg steel <sup>1)</sup>

isovac® – Semi-processed electrical steel – greentec steel Edition

Max. CO<sub>2</sub>-Footprint 2.12 kg CO<sub>2</sub>e/kg steel <sup>1)</sup>

isovac® – Fully-processed electrical steel – greentec steel Edition

Max. CO<sub>2</sub>-Footprint 2.30 kg CO<sub>2</sub>e/kg steel <sup>1)</sup>

Cold-rolled steel strip – greentec steel Edition

Max. CO<sub>2</sub>-Footprint 1.97 kg CO<sub>2</sub>e/kg steel <sup>1)</sup>

Warm-rolled steel strip – greentec steel Edition

Max. CO<sub>2</sub>-Footprint 1.95 kg CO<sub>2</sub>e/kg steel <sup>1)</sup>

Hot-dipped galvanized steel strip – greentec steel Edition

Max. CO<sub>2</sub>-Footprint 2.13 kg CO<sub>2</sub>e/kg steel <sup>1)</sup>

Electrogalvanized steel strip – greentec steel Edition

Max. CO<sub>2</sub>-Footprint 2.19 kg CO<sub>2</sub>e/kg steel <sup>1)</sup>

<sup>1)</sup> per EN 15804+A2 (EPD methodology) cradle to gate, upon customer request also possible per worldsteel CML 2001-2016 (system expansion).

All products, dimensions and steel grades listed in each voestalpine supply range are available as greentec steel Edition.



Please find out more about greentec steel at [www.voestalpine.com/greentecsteel](http://www.voestalpine.com/greentecsteel)

**voestalpine Steel Division**

voestalpine-Straße 3

4020 Linz, Austria

productmanagement@voestalpine.com

[www.voestalpine.com/stahl/en/Segments/House-industry2](http://www.voestalpine.com/stahl/en/Segments/House-industry2)

**voestalpine**

ONE STEP AHEAD.