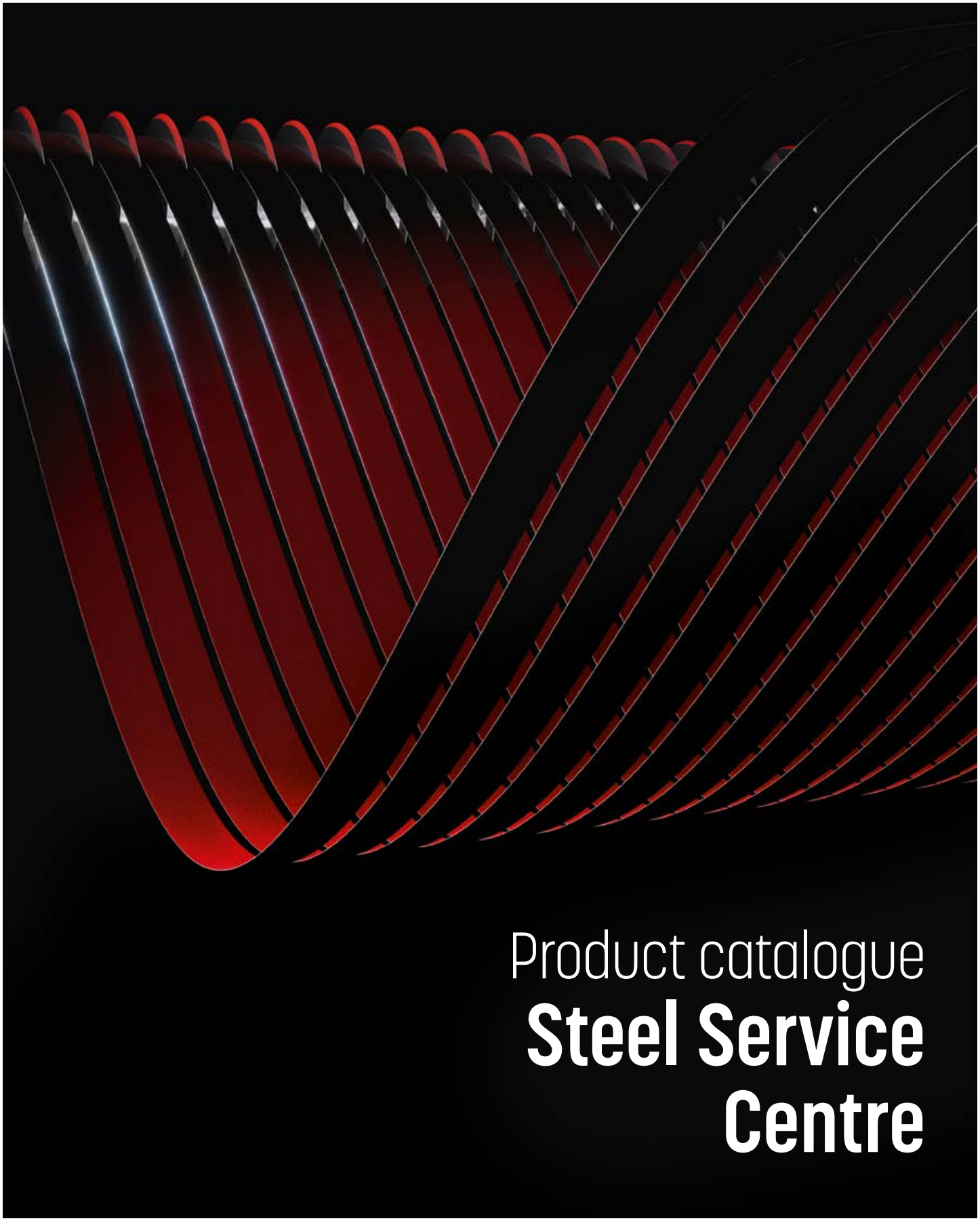

Product catalogue

Steel Service Centre

STEEL SERVICE CENTRE

VSS

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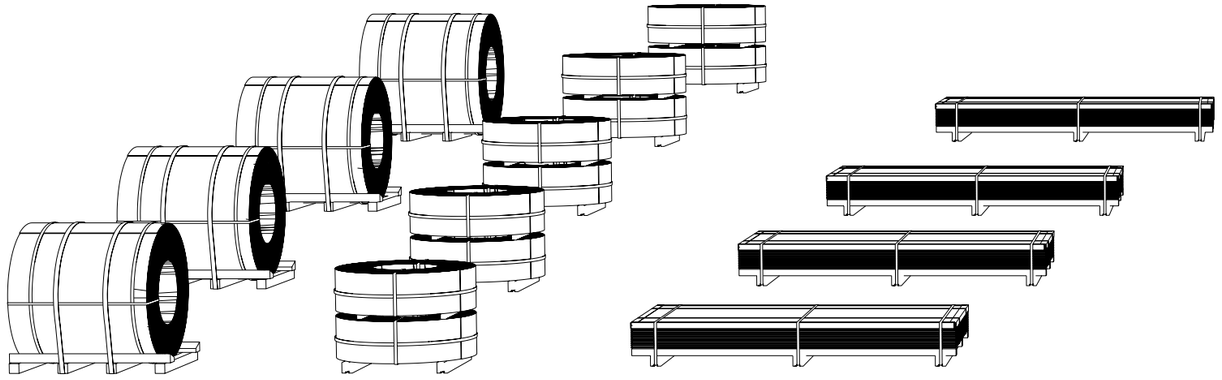
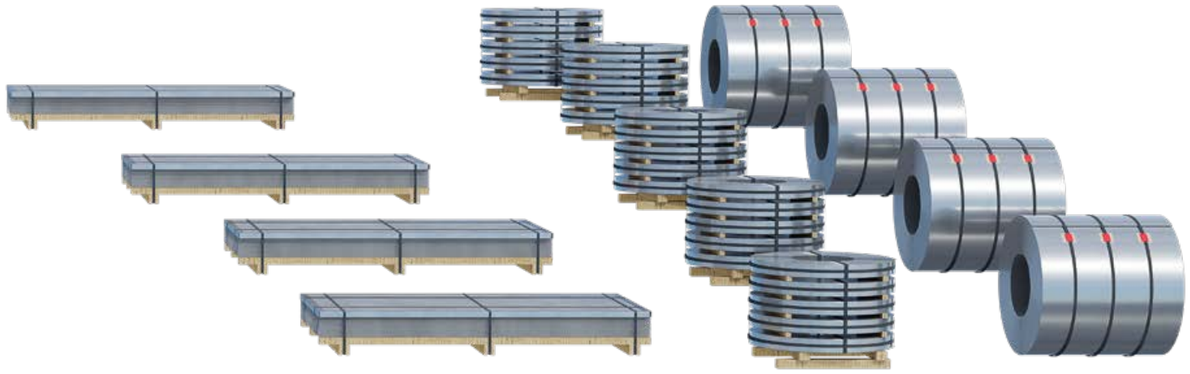




1.

Steel Service Centre

Steel
Service Centre

The Steel Service Centre (SSC) has been created for customers looking for a material with specific properties and processing levels. We ensure constant availability of a wide range of steel grades and coatings and the possibility of processing individual orders with any parameters. Processing includes recoiling, slitting and cross-cutting, as well as securing with protective film according to individual requirements.

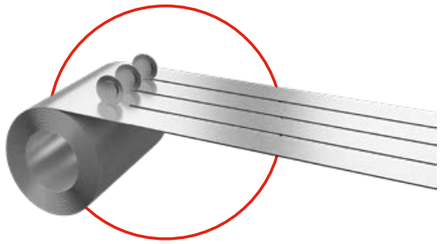
We can also accept orders using material from customers, and the high quality of our production processes allows for its optimal use.

The Steel Service Centre began operations in 2008 at the BP2 companies' Krakow headquarters. Initially, it handled small and medium-sized orders offering fast turnaround times. Subsequent investments and developments of production lines have resulted in a steady increase in production capacity and the expansion of the product range.

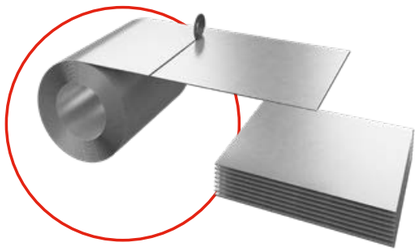
The breakthrough year for us was 2022, when the Steel Service Centre was relocated to the new VSS Košice production facility. Located in Slovakia's second largest city, the plant covers an area of 21,000 m2 and is equipped with production lines based on machinery from the renowned SALICO company. The manufacturer's solutions have been recognised by the major market players in the steel sector for years.

We have come a long way. Today, our Service Centre has reached a capacity of 200,000 t per year at a line speed of 300 m/min. We handle coils weighing up to 25 t. We have introduced mitre-cut forms and once again extended the maximum and minimum working ranges of the sheets. We offer a wide range of materials on a regular basis.

Range of offerings

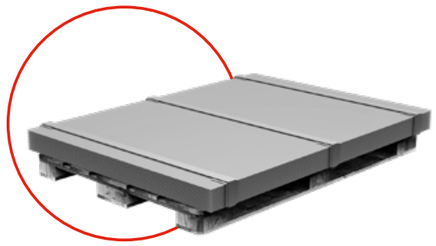


Slitting - longitudinal cutting
We supply low and highly processed steel material used in the production of a wide range of products. We have cutting and slitting lines for sheets and coils. We provide the possibility of covering the material with anti-condensation coating or protective film with individually determined parameters and properties.

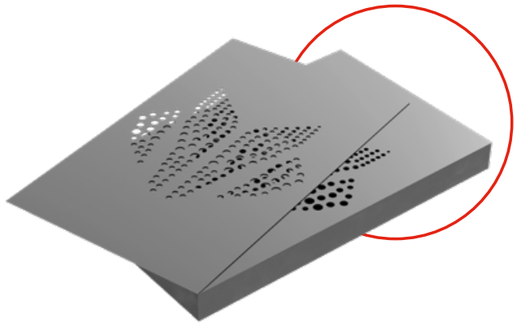


Formats - cross-cutting / trapezoid/rhombus
We offer cross-cutting into sheets and formats, as well as oblique cutting into trapezoidal and rhomboid formats. Our offer includes a wide range of sizes and shapes, cutting with increased flatness (according to individually agreed EN standards) as well as protection and packaging of the material

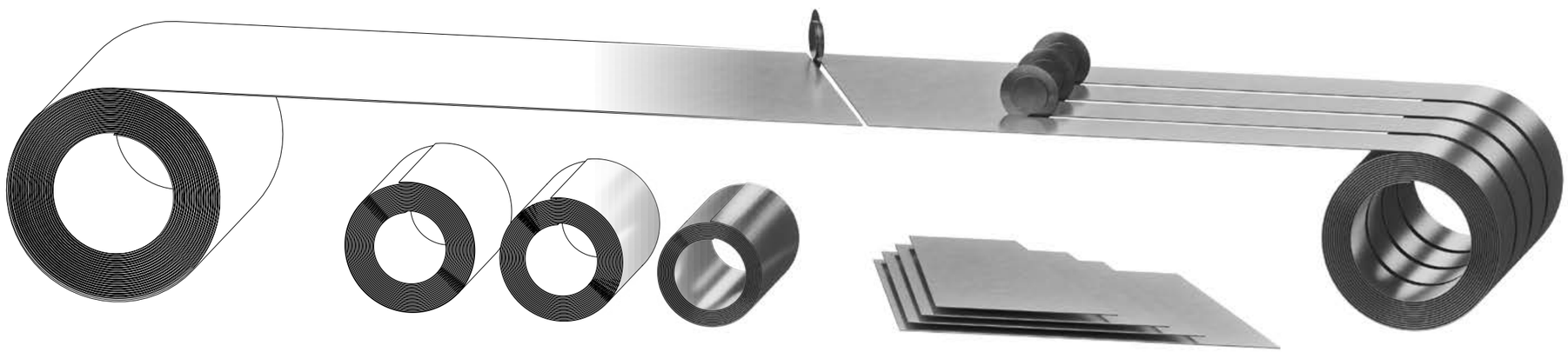
Coils rewinding
We provide rewinding services for coils weighing up to 25 t. We provide fast rewinding process and low output weights of coils. We can cover the strips with anti-condensation coating or protective film. The processed material is professionally protected and packaged.y.



Protection and packaging
The processed material is professionally secured and stored. Coils cut lengthwise are stored in the vertical axis „eye to sky" on a rack and secured appropriately for storage. In the case of formats, segregation and packaging is customized according to the order received.



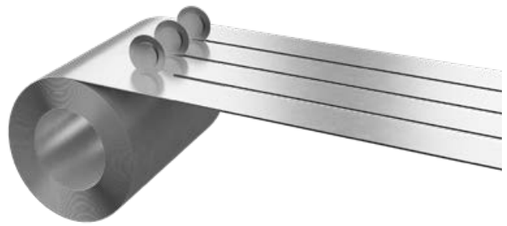
Sheet metal perforation
We perforate metal sheets up to 2 mm thick with metallic and organic coatings in a wide range of shapes and sizes. Perforated sheets can be re-profiled by us to make, for example, structural elements.



Slitting - longitudinal cutting

Slitting to strip according to individual requirements.

Technical specifications*	
Sheet thickness	0,4–4,0 mm
Loading width	400–1650 mm
Maximum coil weight	25 t
Cutting width ranges	30–1650 mm
Width tolerance of cut strip	+/- 0,2 mm
Internal diameter of cut strip	508–610 mm

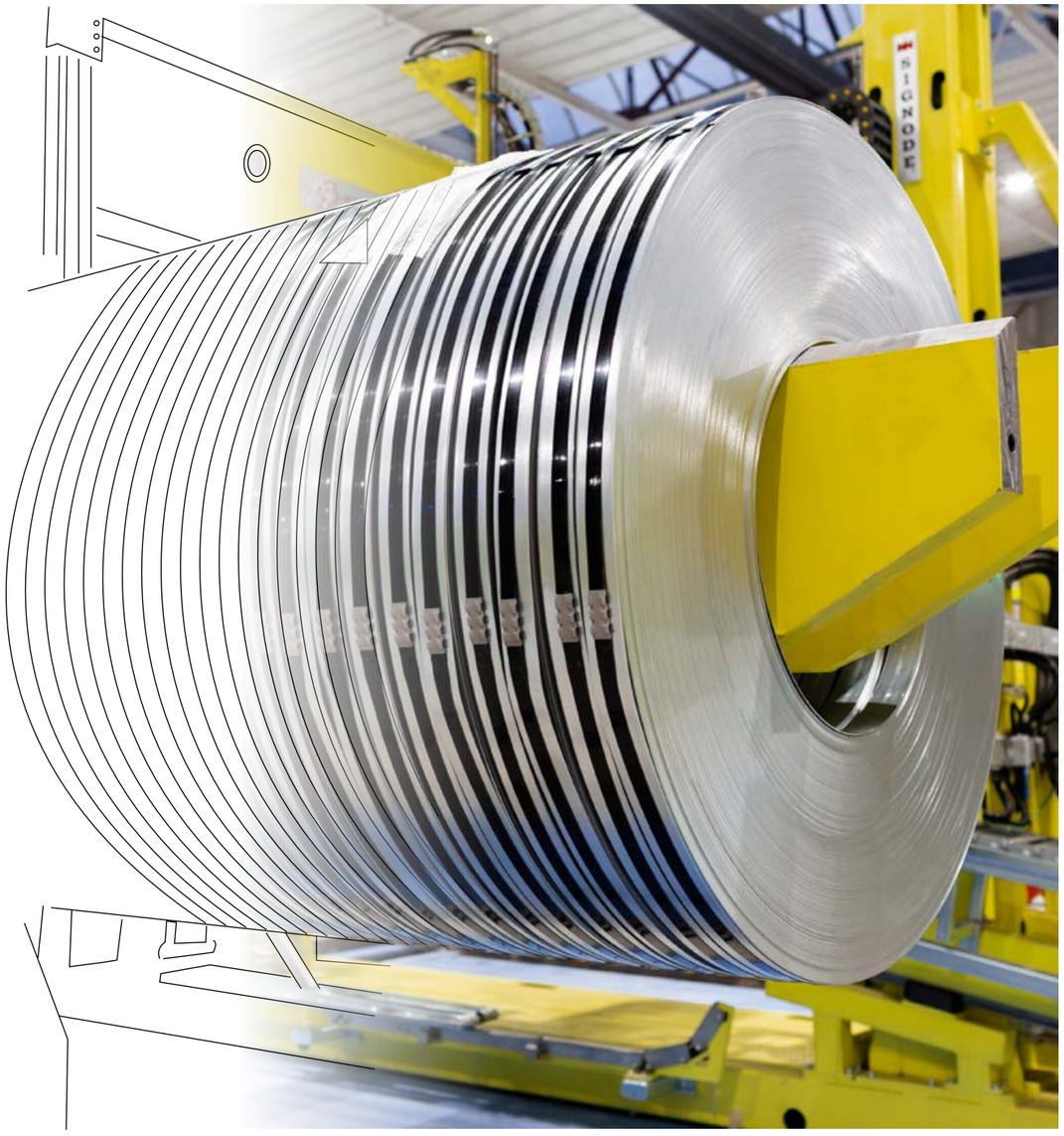


We offer a variety of packaging and sheet protection methods. See page 17 for details of how the products are packaged.

EN CE ISO

* Figures shown are for the feedstock in the VSS range. The determination of parameters for entrusted material requires consultation with the sales department. For rewinding and longitudinal cutting without interference with the batch width, the metallurgical tolerances according to the standards apply:

- EN 10143: dimensional and shape tolerances,
- EN 10326, EN 10327: metallic coatings and surface quality,
- 10169: organic coatings and surface quality EN.
- ISO 9001: 2015



Benefits

Modern machinery.

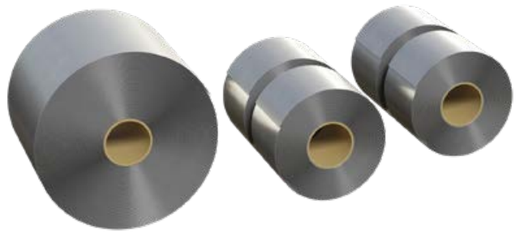
Supported material thickness range:
0.4 mm - 4.0 mm.

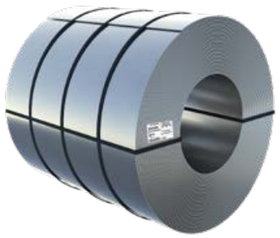
Cutting width ranges:
30 mm - 1650 mm.

Coils rewinding

Before cutting, the sheet can be covered with a protective film or an anti-condensation coating.

Base parameters	
Maximum coil weight	25 t
Maximum strip width	1650 mm
Sheet thickness	0,4–4,0 mm





We offer a variety of methods for packaging and securing coils. See page 17 for details of how the products are packaged.

EN CE ISO

* Figures shown are for the feedstock in the VSS range. The determination of parameters for entrusted material requires consultation with the sales department. For rewinding and longitudinal cutting without interference with the batch width, the metallurgical tolerances according to the standards apply:

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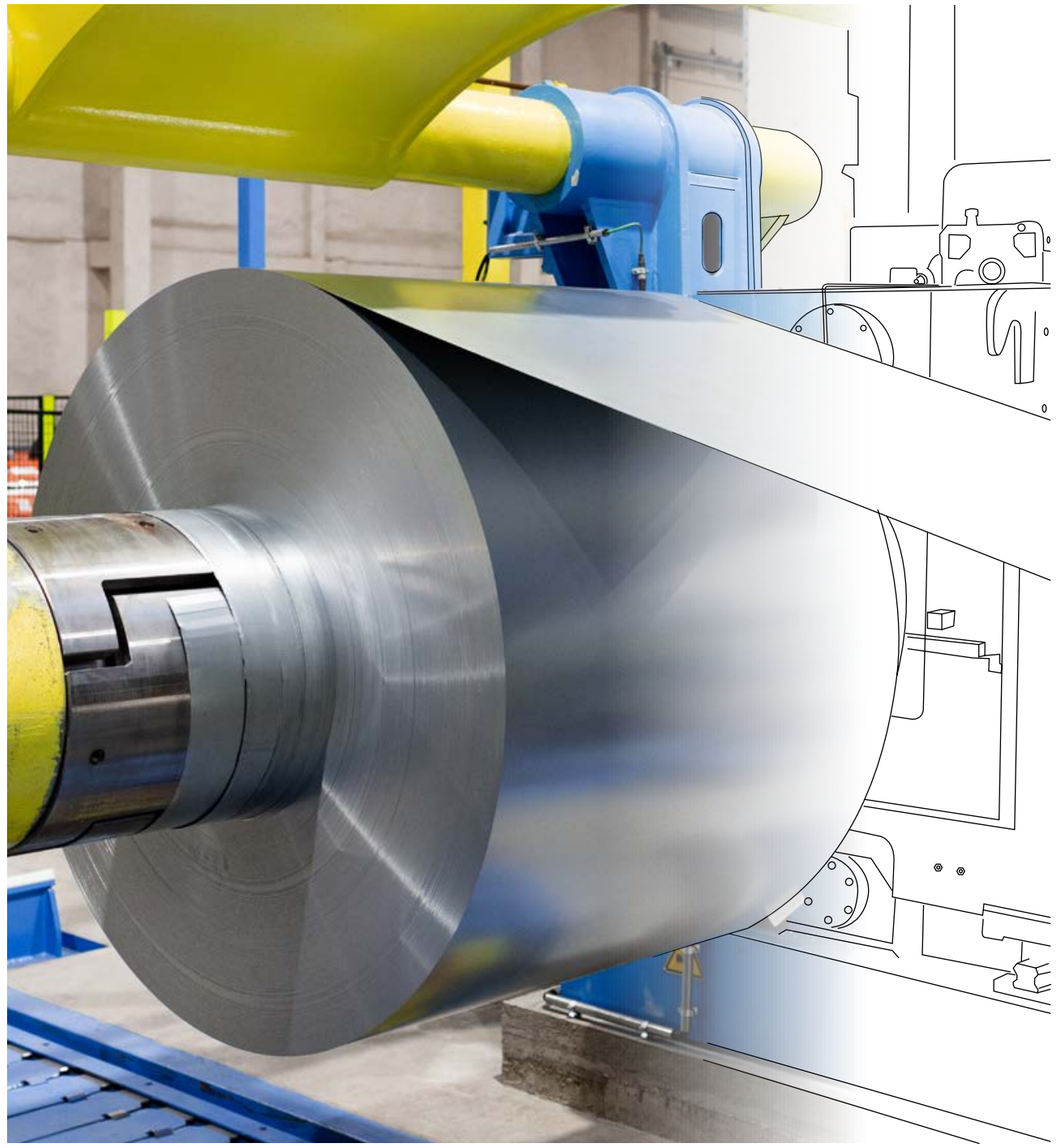


Product benefits

Fast rewinding process

Low output weights of the coils

Professional packaging

Formats - cross-cutting / trapezoid/rhombus

Cross-cutting into sheets and formats according to individual requirements.

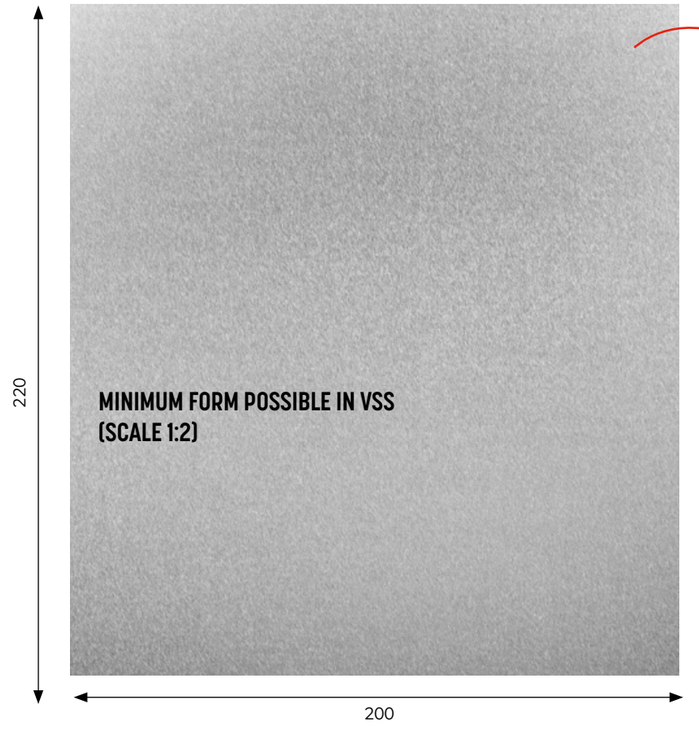
Technical specifications*	
Sheet thickness	0,4–4,0 mm
Minimum sheet size	200×220 mm
Maximum sheet size	1650×6000 mm
Shape	Trapezoid/rhombus 35° +/- 1°
Dimensional tolerance	Length tolerance: +/- 0.35 mm for sheets up to 2000 mm. In addition: +/- 0.1 mm for each running metre over 2000 mm.
Flatness of sheet	According to EN standards or individual arrangements

Examples of format shapes

EN CE ISO

* Figures shown are for the feedstock in the VSS range. The determination of parameters for entrusted material requires consultation with the sales department. For rewinding and longitudinal cutting without interference with the batch width, the metallurgical tolerances according to the standards apply:

- EN 10143: dimensional and shape tolerances,
- EN 10326, EN 10327: metallic coatings and surface quality,
- 10169: organic coatings and surface quality EN.
- ISO 9001: 2015



[mm]

We offer a variety of packaging and sheet protection methods. See page 17 for details of how the products are packaged.

Product benefits

Shape trapezoid/rhombus

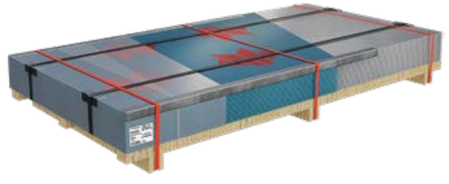
Cutting with increased flatness

Professional packaging

Protection and packaging

The processed material is professionally protected and stored.
The lengthwise cut coils are stored vertically on a rack and strapped with steel bands or protected with stretch film.

In the case of formats, sorting and packaging is customised according to the order received.



Protection - types of film

In order to protect the sheet metal on request, it is coated with a protective film. As a standard, we use a film of an individually selected composition as a result of tests for the respective sheet metal coating: the type and thickness of the adhesive layer and the film were determined in such a way as to ensure adequate adhesion and not to damage the coating during removal. We offer films with various parameters which can be individually selected, taking into account:

Adhesives

- acrylic, water - ecological, water washable,
- acrylic, solvent - not soluble in water, used for matt coatings
- rubber, solvent - not soluble in water, used for polyester coatings.

Light transmission

- opaque and transparent films.

UV resistance

- from 1 to 12 months.

Condensation of water vapour

- anti-condensation coating.

Film thickness

- 35–100µm.

Foil type

- MAT/GLOSS.

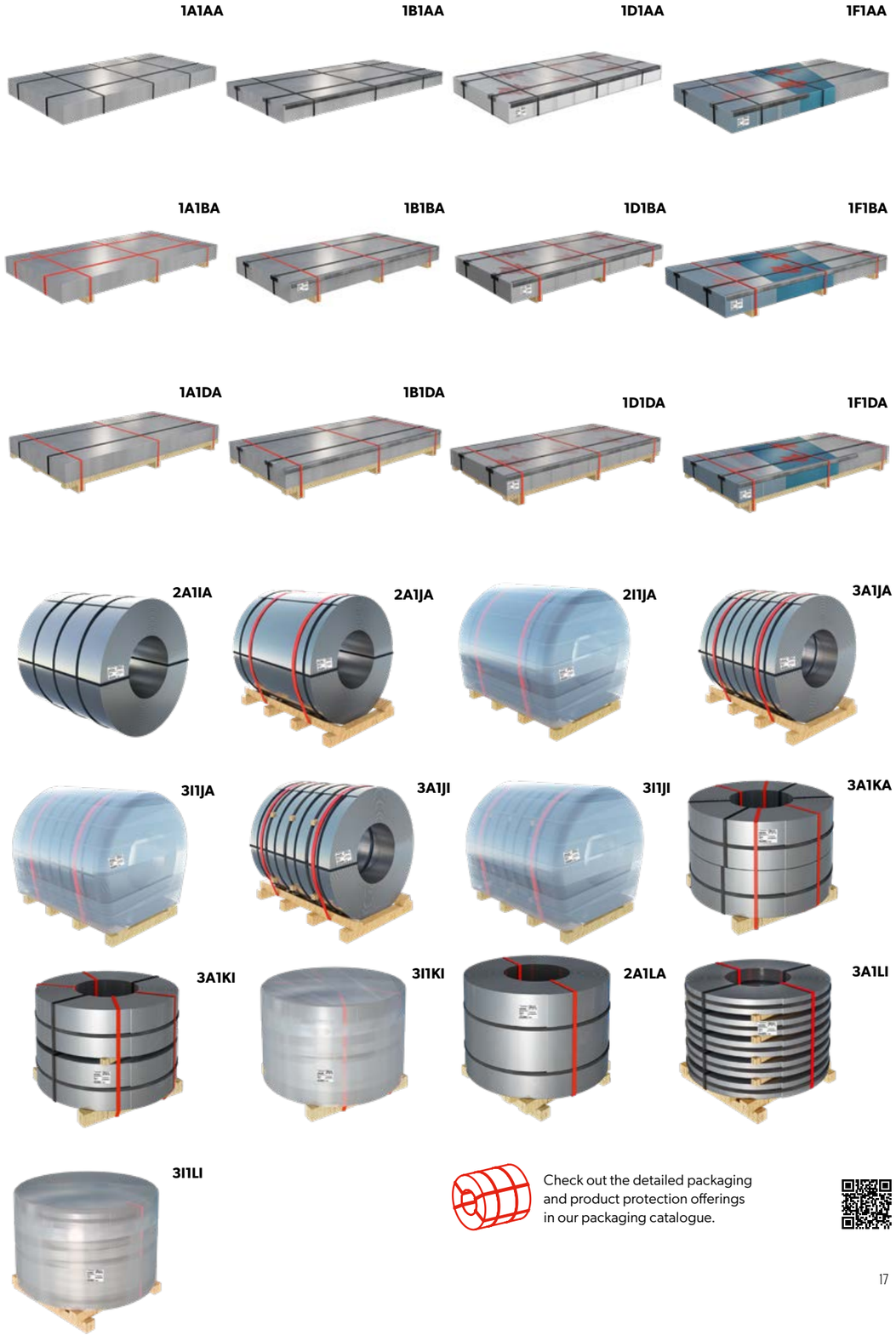
Application

- universal films, dedicated to the type of coating and special applications, such as laser cutting (Fiber).

VCI film with LDPE inhibitor

Flat sheets can be protected with VCI film with LDPE inhibitor. This is an anti-corrosion film dedicated to protecting materials exposed to corrosion or moisture during transport and storage. The film's durability is:

- antistatic properties: 9 months
- VCI inhibitor: 12 months provided that storage conditions are observed.

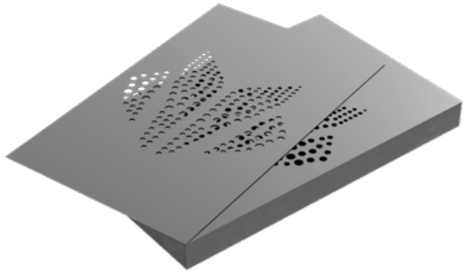


Check out the detailed packaging and product protection offerings in our packaging catalogue.

Perforation of sheets

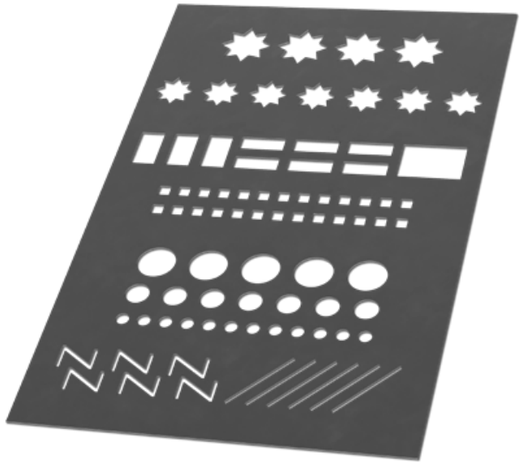
Perforated sheets are widely used to achieve the desired stylistic effect in external and internal architecture. Sheet perforation is ideal for ventilated curtain walling systems or used to illuminate the façade from the inside. Perforated sheets are used for furniture elements or household appliances. Perforation also provides soundproofing and sound absorption for production and industrial facilities.

We offer perforation of metal and organic coated sheets from our regular offer*
Perforated sheets can be re-profiled by us to make sheet metal coverings and structural elements, such as trapezoidal and corrugated sheets, wall cassettes, SKRIN cladding cassettes, LINEA cladding panels.



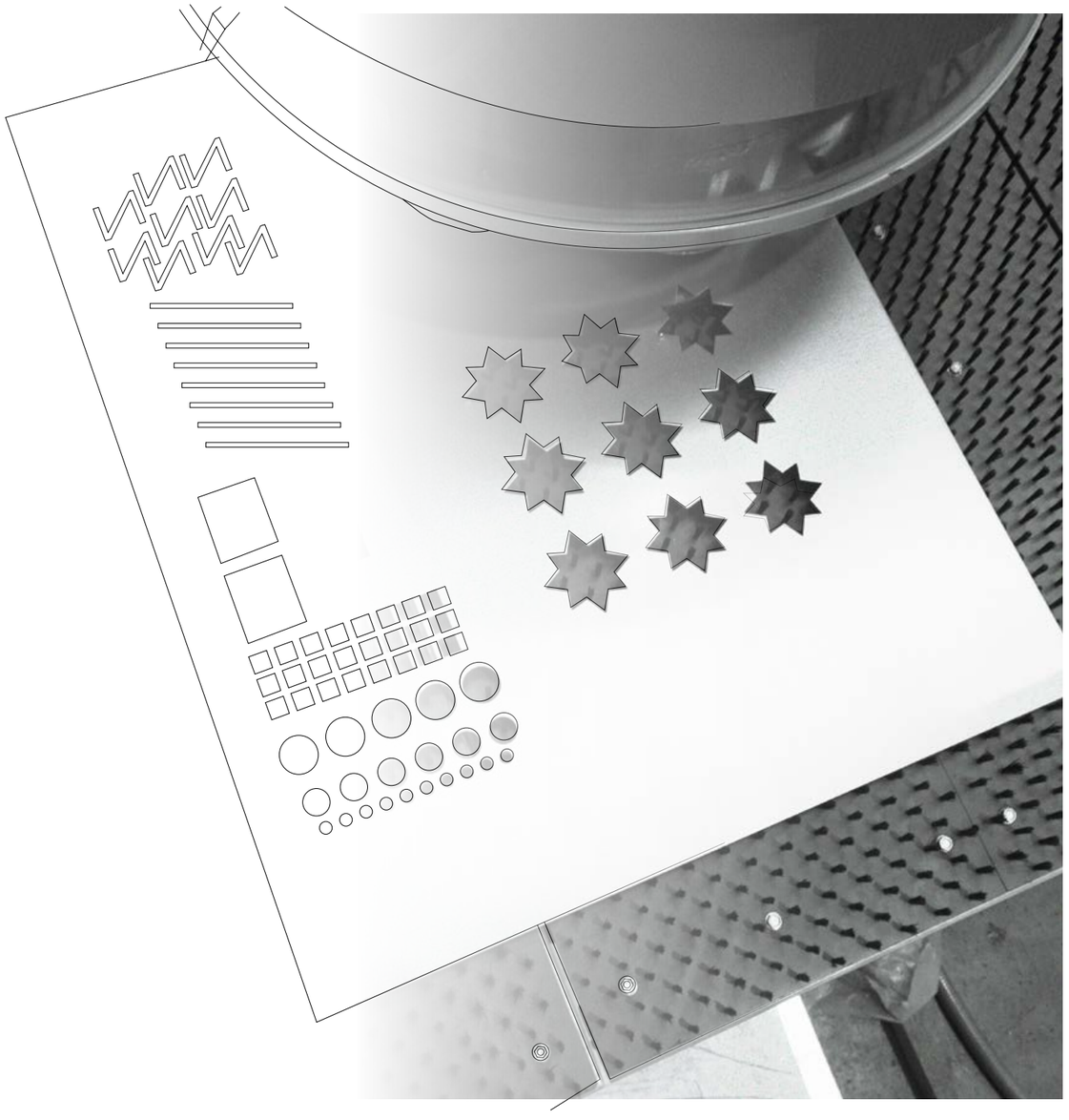
We make perforations in a wide range of sizes and shapes:

- round,
- oblong (so called beans),
- rectangular,
- hexagonal,
- stars,
- irregular.



Technical parameters	
Maximum strip width	1500 mm
Sheet thickness	0,4–2,0 mm

*Additionally, we offer perforation of entrusted material.
Details are agreed individually with the sales department.



Product benefits

Various shapes

Wide range of thicknesses

High accuracy and repeatability

2.

Material types

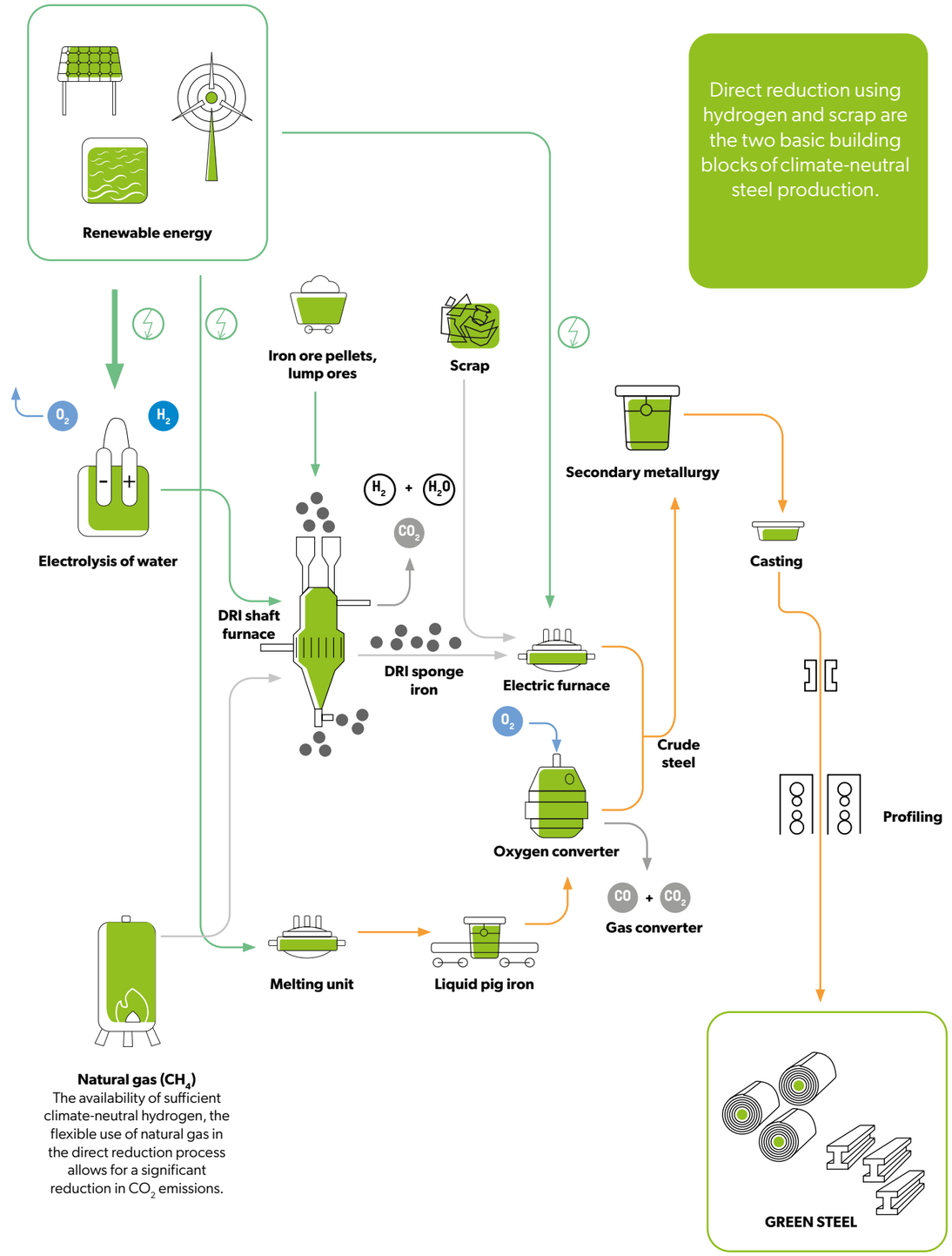
GREENSTEEL

BP2 accompanies and shapes the transition to green steel production. The steel industry is currently undergoing a comprehensive transformation towards climate-neutral crude steel production. In the future, it is highly likely that steel production will be based on sponge iron from the direct reduction (DR) process using hydrogen. This sponge iron can be used for further processing in an electric arc furnace (EAF) or to produce crude steel after melting in an oxygen converter. The subsequent refining steps remain unchanged from the current state of the art. A prerequisite for successful CO_2 reduction is the production of green hydrogen and a sufficient supply of renewable energy.

The aim is to reduce CO_2 completely or to continue to use it / manage the CO_2 cycle. The construction and creation of the necessary technical facilities and infrastructure is already in full swing. For our customers, we are happy to supply available steel grades and surface coatings for CO_2-reduced steels from established production sites and proven technologies from our product portfolio on a 1:1 basis. BP2 is and will remain fully independent of corporations and steel mills, as this gives us the freedom to purchase steel anywhere in the global market to meet individual wishes and needs. We buy green steel products tailored to your order directly from the steel mills, so we can guarantee that the percentage CO_2 reduction meets individual customer requirements. You then receive a certificate verifying the CO_2 emissions saved on the products you have ordered, subject, of course, to their availability at the smelter.

We have now set ourselves the goal of achieving climate neutrality by 2030.

Direct reduction using hydrogen and scrap are the two basic building blocks of climate-neutral steel production.



Natural gas (CH_4)
The availability of sufficient climate-neutral hydrogen, the flexible use of natural gas in the direct reduction process allows for a significant reduction in CO_2 emissions.

Hot Rolled Steel

Delivery range in mm	Coils	Slit strips	Cut-to-length sheets
Thickness	1,5 - 4	1,5 - 4	1,5 - 4
Width	400 - 1650	30 - 1650	200 - 1650
Length	N/A	N/A	220 - 6000

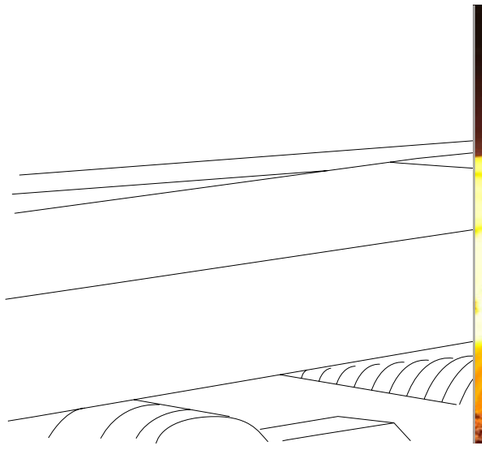
Tolerances for strips and sheets: EN 10051. Finer tolerances and special edge formation available by arrangement.

Soft grades – Continuously hot-rolled strip and sheet of soft steels for cold forming acc. to EN 10111 : 2008

Chemical composition (Melt analysis)					
Steel grade/type		C	Mn	P	S
Code	Material no.	max. %	max. %	max. %	max. %
DD11	1.0332	0.12	0.60	0.045	0.045
DD12	1.0398	0.10	0.45	0.035	0.035
DD13	1.0335	0.08	0.40	0.030	0.030
DD14	1.0389	0.08	0.35	0.025	0.025

Mechanical properties (lat.)								
Steel grade/type		R_{eL} [1]		Rm	Min. fracture elongation			
					$L_O = 80$ mm		$L_O = 5{,}65\sqrt{SO}$	
		1,0 mm ≤ e	2,0 mm ≤ e		1,0 mm ≤ e	1,5 mm ≤ e	2,0 mm ≤ e	3,0 mm ≤ e
		e < 2,0 mm	e < 4,5 mm		e < 1,5 mm	e < 2,0 mm	e < 3,0 mm	e < 4,5 mm
Code	Material no.	N/mm²	N/mm²	N/mm²	%	%	%	%
DD11	1.0332	170 – 360	170 – 340	440	22	23	24	28
DD12	1.0398	170 – 340	170 – 320	420	24	25	26	30
DD13	1.0335	170 – 330	170 – 310	400	27	28	29	33
DD14	1.0389	170 – 310	170 – 290	380	30	31	32	36

[1] If the product has no pronounced yield point, $R_{p0,2}$ must be used instead of R_{eL}.



Hot Rolled Steel

Delivery range in mm	Coils	Slit strips	Cut-to-length sheets
Thickness	1,5 - 4	1,5 - 4	1,5 - 4
Width	400 - 1650	30 - 1650	200 - 1650
Length	N/A	N/A	220 - 6000

Tolerances for strips and sheets: EN 10051. Finer tolerances and special edge formation available by arrangement.

Construction steels – Hot-rolled products of unalloyed construction steels with values for notch impact strength acc. to EN 10025 : 2019

Chemical composition after melt analysis for flat and long products made of steel types with values for notch impact strength								
Steel grade/type		C	Si	Mn	P	S	N_t	Cu
Code	Material no.	% max.	% max.	% max.	% max.	% max.	% max.	% max.
S235JR	1.0038	0.17	–	1.40	0.035	0.035	0.012	0.55
S235J0	1.0114	0.17	–	1.40	0.030	0.030	0.012	0.55
S235J2	1.0117	0.17	–	1.40	0.025	0.025	–	0.55
S275JR	1.0044	0.21	–	1.50	0.035	0.035	0.012	0.55
S275J0	1.0143	0.18	–	1.50	0.030	0.030	0.012	0.55
S275J2	1.0145	0.18	–	1.50	0.025	0.025	–	0.55
S355JR	1.0045	0.24	0.55	1.60	0.035	0.035	0.012	0.55
S355J0	1.0553	0.20	0.55	1.60	0.030	0.030	0.012	0.55
S355J2	1.0577	0.20	0.55	1.60	0.025	0.025	–	0.55
S355K2	1.0596	0.20	0.55	1.60	0.025	0.025	–	0.55

Hot Rolled Steel

Delivery range in mm	Coils	Slit strips	Cut-to-length sheets
Thickness	1,5 - 4	1,5 - 4	1,5 - 4
Width	400 - 1650	30 - 1650	200 - 1650
Length	N/A	N/A	220 - 6000

Tolerances for strips and sheets: EN 10051. Finer tolerances and special edge formation available by arrangement.

Mechanical properties																
Steel grade/type		Minimum yield point R_{eh} [1] N/mm² nominal thickness mm	Tensile strength R_m [1] N/mm²		Sample position [1]	Min. fracture elongation [1]										
						L_o = 80 mm Thickness nominalna mm					L_o = 5,65 $\sqrt{S_o}$ Thickness nominalna mm					
Code	Material no.	≤ 4	< 3	≥ 3 – ≤ 4		≤ 1	> 1.0 ≤ 1.5	> 1.5 ≤ 2.0	> 2.0 ≤ 2.5	> 2.5 ≤ 3.0	≥ 30 ≤ 40	> 40 ≤ 63	> 63 ≤ 100	> 100 ≤ 150	> 150 ≤ 250	> 250 ≤ 400
S235JR	1.0038	235	390 – 510	360 – 510	l	17	18	19	20	21	26	25	24	22	21	21
S235J0	1.0114	235	390 – 510	360 – 510	t	15	16	17	18	19	24	23	22	22	21	21
S235J2	1.0117	235	390 – 510	360 – 510	–											
S275JR	1.0044	275	430 – 580	410 – 560	–	15	16	17	18	19	23	22	21	19	18	18
S275J0	1.0143	275	430 – 580	410 – 560	l	13	14	15	16	17	21	20	19	19	18	18
S275J2	1.0145	275	430 – 580	410 – 560	t											
S355JR	1.0045	355	510 – 680	470 – 630	–	14	15	16	17	18	22	21	20	18	17	17
S355J0	1.0553	355	510 – 680	470 – 630	–	12	13	14	15	16	20	19	18	18	17	17
S355J2	1.0577	355	510 – 680	470 – 630	l											
S355K2	1.0596	355	510 – 680	470 – 630	t											

[1] *For sheet, strip and wide flats in widths > 600 mm, the direction lateral (t) means transverse to roller direction. For all other products, the values are for roller direction (l).*

Mechanical properties / Chemical composition														
Steel grade/type		Minimum yield point R_{eh} [1] N/mm² nominal thickness mm	Tensile strength R_m [1] N/mm² nominal thickness mm		Sample position [1]	Min. fracture elongation [1]								
						L_o = 80 mm Thickness nominalna mm					L_o = 5,65 $\sqrt{S_o}$			
Code	Material no.	≤ 4.5	< 3	≥ 3 – ≤ 4.5		≤ 1	> 1.0 ≤ 1.5	> 1.5 ≤ 2.0	> 2.0 ≤ 2.5	> 2.5 ≤ 3.0	≥ 3.0 ≤ 4.0	P % max.	S % max.	N % max.
S 185	1.0035	185	310 – 540	290 – 510	l t	10 8	11 9	12 10	13 11	14 12	18 16	–	–	–
E 295	1.0050	295	490 – 660	470 – 610	l t	12 10	13 11	14 12	15 13	16 14	20 18	0.045	0.045	0.012
E 335	1.0060	335	590 – 770	570 – 710	l t	8 6	9 7	10 8	11 9	12 10	16 14	0.045	0.045	0.012
E 360	1.0070	360	690 – 900	670 – 830	l t	4 3	5 4	6 5	7 6	8 7	11 10	0.045	0.045	0.012

Hot Rolled Steel

Delivery range in mm	Coils	Slit strips	Cut-to-length sheets
Thickness	1,5 - 4	1,5 - 4	1,5 - 4
Width	400 - 1650	30 - 1650	200 - 1650
Length	N/A	N/A	220 - 6000

Tolerances for strips and sheets: EN 10051. Finer tolerances and special edge formation available by arrangement.

Microalloyed grades – hot-rolled flat products of steels with high yield point for cold forming acc. to EN 10149 : 2013

Chemical composition (melt analysis) of thermo-mechanically rolled steels												
Steel grade/type		C % max.	Mn % max.	Si % max.	P % max.	S % max.	Al gesamt % max.	Nb % max.	V % max.	Ti % max.	Mo % max.	B % max.
Code	Material no.											
S315MC	1.0972	0.12	1.30	0.50	0.025	0.020	0.015	0.09 [2]	0.20 [2]	0.15 [2]	—	—
S355MC	1.0976	0.12	1.50	0.50	0.025	0.020	0.015	0.09 [2]	0.20 [2]	0.15 [2]	—	—
S420MC	1.0980	0.12	1.60	0.50	0.025	0.015	0.015	0.09 [2]	0.20 [2]	0.15 [2]	—	—
S460MC	1.0982	0.12	1.60	0.50	0.025	0.015	0.015	0.09 [2]	0.20 [2]	0.15 [2]	—	—
S500MC	1.0984	0.12	1.70	0.50	0.025	0.015	0.015	0.09 [2]	0.20 [2]	0.15 [2]	—	—
S550MC	1.0986	0.12	1.80	0.50	0.025	0.015	0.015	0.09 [2]	0.20 [2]	0.15 [2]	—	—
S600MC	1.8969	0.12	1.90	0.50	0.025	0.015	0.015	0.09 [2]	0.20 [2]	0.22 [2]	0.50	0.005
S650MC	1.8976	0.12	2.00	0.60	0.025	0.015	0.015	0.09 [2]	0.20 [2]	0.22 [2]	0.50	0.005
S700MC	1.8974	0.12	2.10	0.60	0.025	0.015	0.015	0.09 [2]	0.20 [2]	0.22 [2]	0.50	0.005
S900MC	1.8798	0.20	2.20	0.60	0.025	0.010	0.015	0.09 [2]	0.20 [2]	0.25 [2]	1.00	0.005
S960MC	1.8799	0.20	2.20	0.60	0.025	0.010	0.015	0.09 [2]	0.20 [2]	0.25 [2]	1.00	0.005

[1] The values for the tensile test are those determined for longitudinal samples.
[2] The sum of Nb, V and Ti must not exceed 0.22 %.

Mechanical properties of thermo-mechanically rolled steels (long.)					
Steel grade/type		Upper yield point R_{eH} [1] N/mm² min	Tensile strength R_m [1] N/mm²	Fracture elongation, A [1] % min. nominal thickness in mm	
Code	Material no.			< 3 L_o = 80 mm	≥ 3 L_o = 5,65 $\sqrt{S_o}$
S315MC	1.0972	315	390 – 510	20	24
S355MC	1.0976	355	430 – 550	19	23
S420MC	1.0980	420	480 – 620	16	19
S460MC	1.0982	460	520 – 670	14	17
S500MC	1.0984	500	550 – 700	12	14
S550MC	1.0986	550	600 – 760	12	14
S600MC	1.8969	600	650 – 820	11	13
S650MC	1.8976	650[3]	700 – 880	10	12
S700MC	1.8974	700[3]	750 – 950	10	12
S900MC	1.8798	900	930 – 1.200	7	8
S960MC	1.8799	960	980 – 1.250	6	7

[1] *For sheet, strip and wide flats in widths < 600 mm, the direction lateral (t) means transverse to roller direction. For all other products, the values are for roller direction (l). In the case of sheets used for the production of hot-rolled patterned sheets, the elongation applies only to the base sheet and not to the final hot rolled patterned sheets.*

Cold Rolled Steel

Delivery range in mm	Coils	Slit strips	Cut-to-length sheets
Thickness	0,4 - 3	0,4 - 3	0,4 - 3
Width	400 - 1650	30 - 1650	200 - 1650
Length	N/A	N/A	220 - 6000

Tolerances according to: EN 10131. Finer tolerances and special edge formation available by arrangement..

Mild grades – Cold-rolled flat products of mild steels for cold forming EN 10130 : 2007

Chemical composition (melt analysis)						
Steel grade/type		C max. %	P max. %	S max. %	Mn max. %	Ti max. %
Code	Material no.					
DC01	1.0330	0.12	0.045	0.045	0.60	–
DC03	1.0347	0.10	0.035	0.035	0.45	–
DC04	1.0338	0.08	0.030	0.030	0.40	–
DC05	1.0312	0.06	0.025	0.025	0.35	–
DC06	1.0873	0.02	0.020	0.020	0.25	0.3
DC07	1.0898	0.01	0.020	0.020	0.20	0.2

Mechanical properties (testing in transverse direction)						
Steel grade/type		R_e [1]	R_m	A_{80} [2]	r_{90} [3] [4]	n_{90} [3]
Code	Material no.	N/mm²	N/mm²	min. %	min.	min.
DC01	1.0330	-/280	270 – 410	28	–	–
DC03	1.0347	-/240	270 – 370	34	1.3	–
DC04	1.0338	-/210	270 – 350	38	1.6	0.180
DC05	1.0312	-/180	270 – 330	40	1.9	0.200
DC06	1.0873	-/170	270 – 330	41	2.1	0.220
DC07	1.0898	-/150	250 – 310	44	2.5	0.230

1) For products with no clear yield point, the values for the 0.2 % elongation limit (Rp0.2), are taken as those for the yield point. For other products, those for the lower yield point (R_{el}) apply. For thicknesses of ≤ 0.70 mm, but > 0.50 mm, a 20 MPa higher maximum yield point value is permissible. For thicknesses ≤ 0.50 mm, a higher maximum yield point value of 40 MPa is permissible.
2) For thicknesses of ≤ 0.70 mm, but > 0.50 mm, the minimum values for fracture elongation are reduced by 2 units, for thicknesses of ≤ 0.50 mm by 4 units.
3) The r_{90}- and n_{90}-values only apply for product thicknesses of > 0.50 mm.
4) For thickness > 2 mm, the r_{90}-value is reduced by 0.2.

Cold Rolled Steel

Delivery range in mm	Coils	Slit strips	Cut-to-length sheets
Thickness	0,4 - 3	0,4 - 3	0,4 - 3
Width	400 - 1650	30 - 1650	200 - 1650
Length	N/A	N/A	220 - 6000

Tolerances according to: EN 10131. Finer tolerances and special edge formation available by arrangement..

Enamelling grades – Cold-rolled flat products of soft steels for cold forming EN 10209 : 2013

Chemical composition (melt analysis)						
Steel grade/type		C	Ti	Mn	P	S
Code	Material no.					
DC01EK	1.0390	0.08	–	0.60	0.045	0.050
DC04EK	1.0392	0.08	–	0.50	0.030	0.050
DC05EK	1.0386	0.08	–	0.50	0.025	0.050
DC06EK	1.0869	0.02	0.30	0.50	0.020	0.050
DC03ED	1.0399	[5]	–	0.40	0.035	0.050
DC04ED	1.0394	[5]	–	0.40	0.030	0.050
DC06ED	1.0872	0.02	0.30	0.35	0.020	0.050

Mechanical properties (lat.)					
Steel grade/type		R_e [1]	R_m	A_{80} [2]	r_{90} [3] [4]
Code	Material no.	N/mm² [2] [1]	N/mm²	min.	min.
DC01EK	1.0390	270	270 – 390	30	–
DC04EK	1.0392	220 [6]	270 – 350	36	–
DC05EK	1.0386	220	270 – 350	36	1.5
DC06EK	1.0869	190	270 – 350	38	1.6
DC03ED	1.0399	240	270 – 370	34	–
DC04ED	1.0394	220 [4]	250 – 350	38	–
DC06ED	1.0872	190	250 – 350	38	1.6

1) If the yield point is not pronounced, the values apply for the 0.2 % elongation limit ($R_{p0.2}$), if pronounced, the values apply to the lower yield point (R_{el}) apply.
For thicknesses of ≤ 0.70 mm, but > 0.50 mm, a minimum value for fracture elongation of 2 units lower is permissible, and of 4 units lower for thicknesses ≤ 0.50 mm.
2) For thicknesses of ≤ 0.70 mm, but > 0.50 mm, a minimum value for fracture elongation of 2 units lower is permissible, and of 4 units lower for thicknesses ≤ 0.50 mm.
3) The r-values only apply for product thicknesses > 0.50 mm. For thicknesses > 2 mm, the r-value is reduced by 0.2.
4) For thicknesses > 0.50 mm, the yield point may only reach a maximum of 225 N/mm².
5) The steel grades DC03ED and DC04ED are usually decarburized in the solid phase. After decarburization, analysis must only show a maximum carbon content of 0.004 %.
6) If specified by the customer, steel grade DC04EK can be supplied in thicknesses of 0.7 mm to 1.5 mm with Re < 210 N/mm² and A80 ≥ 38 %. It then remains for the manufacturer to select the surface roughness values for a dull matt finish.

Cold Rolled Steel

Delivery range in mm	Coils	Slit strips	Cut-to-length sheets
Thickness	0,4 - 3	0,4 - 3	0,4 - 3
Width	400 - 1650	30 - 1650	200 - 1650
Length	N/A	N/A	220 - 6000

Tolerances according to: EN 10131. Finer tolerances and special edge formation available by arrangement..

Microalloyed grades – Cold-rolled flat products with high yield point for cold forming made of microalloyed steels EN 10268 : 2013

Chemical composition (melt analysis)									
Steel grade/type		C max. %	Si max. %	Mn max. %	P max. %	S max. %	Al max. %	Ti max. %	Nb max. %
Code	Material no.								
HC180Y	1.0922	0.01	0.3	0.7	0.06	0.025	0.01	0.12	0.09
HC180B	1.0395	0.06	0.5	0.7	0.06	0.030	0.015		
HC220Y	1.0925	0.01	0.3	0.9	0.08	0.025	0.01	0.12	0.09
HC220I	1.0346	0.07	0.5	0.6	0.05	0.025	0.015	0.05	
HC220B	1.0396	0.08	0.5	0.7	0.085	0.030	0.015		
HC260Y	1.0928	0.01	0.3	1.6	0.1	0.025	0.01	0.12	0.09
HC260I	1.0349	0.07	0.5	1.2	0.05	0.025	0.015	0.05	
HC260B	1.0400	0.10	0.5	1.0	0.1	0.030	0.015		
HC260LA	1.0480	0.10	0.5	1.0	0.030	0.025	0.015	0.15	0.09
HC300I	1.0447	0.08	0.5	0.7	0.08	0.025	0.015	0.05	
HC300B	1.0444	0.10	0.5	1.0	0.12	0.030	0.015		
HC300LA	1.0489	0.12	0.5	1.4	0.030	0.025	0.015	0.15	0.09
HC340LA	1.0548	0.12	0.5	1.5	0.030	0.025	0.015	0.15	0.09
HC380LA	1.0550	0.12	0.5	1.6	0.030	0.025	0.015	0.15	0.09
HC420LA	1.0556	0.14	0.5	1.6	0.030	0.025	0.015	0.15	0.09
HC460LA	1.0574	0.14	0.6	1.8	0.030	0.025	0.015	0.15	
HC500LA	1.0573	0.14	0.6	1.8	0.030	0.025	0.015	0.15	

1) If the yield point is not pronounced, the values apply for the 0.2 % elongation limit ($R_{p0.2}$), if pronounced, the values apply to the lower yield point (R_{eL}) apply.
For thicknesses of ≤ 0.70 mm, but > 0.50 mm, a minimum value for fracture elongation of 2 units lower is permissible, and of 4 units lower for thicknesses ≤ 0.50 mm.
2) For thicknesses of ≤ 0.70 mm, but > 0.50 mm, a minimum value for fracture elongation of 2 units lower is permissible, and of 4 units lower for thicknesses ≤ 0.50 mm.
3) The r-values only apply for product thicknesses > 0.50 mm. For thicknesses > 2 mm, the r-value is reduced by 0.2.
4) For thicknesses > 0.50 mm, the yield point may only reach a maximum of 225 N/mm².
5) The steel grades DC03ED and DC04ED are usually decarburized in the solid phase. After decarburization, analysis must only show a maximum carbon content of 0.004 %.
6) If specified by the customer, steel grade DC04EK can be supplied in thicknesses of 0.7 mm to 1.5 mm with Re < 210 N/mm² and A80 ≥ 38 %. It then remains for the manufacturer to select the surface roughness values for a dull matt finish.

Cold Rolled Steel

Delivery range in mm	Coils	Slit strips	Cut-to-length sheets
Thickness	0,4 - 3	0,4 - 3	0,4 - 3
Width	400 - 1650	30 - 1650	200 - 1650
Length	N/A	N/A	220 - 6000

Tolerances according to: EN 10131. Finer tolerances and special edge formation available by arrangement..

Mechanical properties of thermo-mechanically rolled steels (long.)								
Steel grade/type		0.2 % Elongation limit [1]	Higher yield point through heat treatment [2]	Tensile strength	Fracture elongation [3]	Vertical anisotropy	Vertical anisotropy [2][3][4]	Work hardening exponent [4]
Code	Material no.	$R_{p0.2}$ [1] N/mm²	BH_2 N/mm²	R_m N/mm²	A_{80} min. quer %	r max. quer	r min. quer	r min. quer
HC180Y	1.0922	180 – 230	35	330 – 400	35	1.4	1.7	0.19
HC180B	1.0395	180 – 230		290 – 360	34		1.6	0.17
HC220Y	1.0925	220 – 270		340 – 420	33		1.6	0.18
HC220I	1.0346	220 – 270	35	300 – 380	34	1.4		0.18
HC220B	1.0396	220 – 270		320 – 400	32		1.5	0.16
HC260Y	1.0928	260 – 320		380 – 440	31		1.4	0.17
HC260I	1.0349	260 – 310	35	320 – 400	32	1.4		0.17
HC260B	1.0400	260 – 320		360 – 440	29			
HC260LA	1.0480	260 – 330		350 – 430	26			
HC300I	1.0447	300 – 350	35	340 – 440	30			0.16
HC300B	1.0444	300 – 360		390 – 480	26			
HC300LA	1.0489	300 – 380		380 – 480	23			
HC340LA	1.0548	340 – 420		410 – 510	21			
HC380LA	1.0550	380 – 480		440 – 580	19			
HC420LA	1.0556	420 – 520		470 – 600	17			
HC460LA	1.0574	460 – 580		510 – 660	13			
HC500LA	1.0573	500 – 620		550 – 710	12			

1) If a yield point is pronounced, the values for the lower yield (R_{eL}) apply.
2) For thicknesses > 1.2 mm, special arrangements must be made.
3) For thicknesses ≤ 0.7 mm, but > 0.5 mm, minimum values for breaking elongation of two units lower are permissible. For thicknesses ≤ 0.5 mm, minimum values up to four units lower are permissible.
4) The minimum values for r (lat.) and n (lat.) only apply to product thicknesses > 0.5 mm.
5) For product thicknesses > 2 mm, the r_{90}-value is reduced by 0.2.

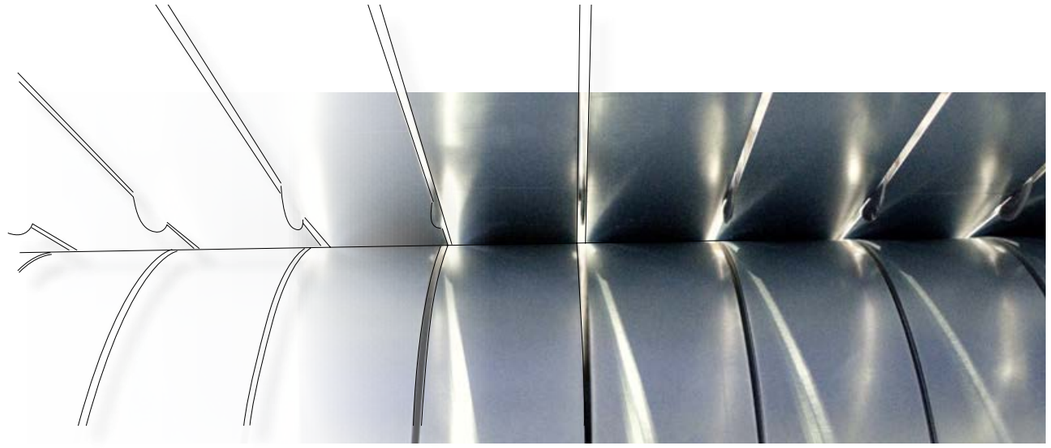
Cold Rolled Steel

Delivery range in mm	Coils	Slit strips	Cut-to-length sheets
Thickness	0,4 - 3	0,4 - 3	0,4 - 3
Width	400 - 1650	30 - 1650	200 - 1650
Length	N/A	N/A	220 - 6000

Tolerances according to: EN 10131. Finer tolerances and special edge formation available by arrangement..

Multiphase steels – Cold-rolled products made of multiphase steels for cold forming EN 10338 : 2015

Chemical composition (melt analysis)											
Steel grade/type		C max.	Si max.	Mn max.	P max.	S max.	Al total	Cr + Mo max.	Nb + Ti max.	V max.	B max.
Code	Material no.										
DP-steels											
HCT450X	1.0937	0.14	0.75	2.00	0.080	0.015	0.015 – 1	1.00	0.15	0.15	0.005
HCT490X	1.0939	0.14	0.75	2.00	0.080	0.015	0.015 – 1	1.00	0.15	0.15	0.005
HCT590X	1.0941	0.15	0.75	2.50	0.080	0.015	0.015 – 1.5	1.40	0.15		0.005
HCT780X	1.0943	0.18	0.80	2.50	0.080	0.015	0.015 – 2.0	1.40	0.15	0.20	0.005
HCT980X	1.0944	0.20	1.00	2.90	0.080	0.015	0.015 – 2.0	1.40	0.15		0.005
HCT980XG	1.0997	0.23	1.00	2.90	0.080	0.015	0.015 – 2.0	1.40	0.15	0.22	0.005
TRIP-steels											
HCT690T	1.0947	0.24	2.00	2.20	0.080	0.015	0.015 – 2.0	0.60	0.20	0.20	0.005
HCT780T	1.0948	0.25	2.00	2.20	0.080	0.015	0.015 – 2.0	0.60	0.20		0.005
CP-steels											
HCT600C	1.0953	0.18	0.80	2.20	0.080	0.015	0.015 – 2.0	1.00	0.15		0.005
HCT780C	1.0954	0.18	1.00	2.50	0.080	0.015	0.015 – 2.0	1.00	0.15		0.005
HCT980C	1.0955	0.23	1.00	2.70	0.080	0.015	0.015 – 2.0	1.00	0.15		0.005
MP-steels											
HCT1180G2	1.0969	0.23	1.20	2.90	0.080	0.015	0.015 – 1.4	1.20	0.15		0.005

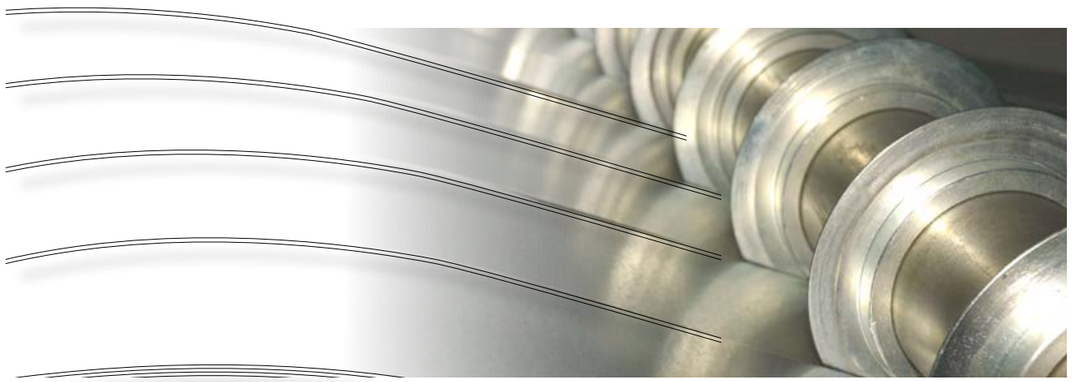


Cold Rolled Steel

Delivery range in mm	Coils	Slit strips	Cut-to-length sheets
Thickness	0,4 - 3	0,4 - 3	0,4 - 3
Width	400 - 1650	30 - 1650	200 - 1650
Length	N/A	N/A	220 - 6000

Tolerances according to: EN 10131. Finer tolerances and special edge formation available by arrangement..

Mechanical properties (lat.)						
Steel grade/type		Elongation limit[1]	Tensile strength	Elongation	Work hardening exponent	Bake hardening index
Code	Material no.	max. $R_{p0.2}$ N/mm² min.	max. R_m N/mm² min.	max. A_{80}% min.	$n_{10\text{-}UE}$ min.	BH_2 N/mm² min.
DP-steels						
HCT450X	1.0937	260 – 340	450	27	0.16	30
HCT490X	1.0939	290 – 380	490	24	0.15	30
HCT590X	1.0941	330 – 430	590	24	0.14	30
HCT780X	1.0943	440 – 550	780	14	–	30
HCT980X	1.0944	590 – 740	980	10	–	30
HCT980XG	1.0997	700 – 850	980	8	–	30
TRIP-steels						
HCT690T	1.0947	400 – 520	690	23	0.19	40
HCT780T	1.0948	450 – 570	780	21	0.16	40
CP-steels						
HCT600C	1.0953	350 – 500	600	16	–	30
HCT780C	1.0954	570 – 720	780	10	–	30
HCT980C	1.0955	780 – 950	980	6	–	30
MP-steels						
HCT1180G2	1.0969	900 – 1,150	1180	4	–	30



Hot-dip galvanized sheet

Delivery range in mm	Coils	Slit strips	Cut-to-length sheets
Thickness	0,4 - 4	0,4 - 4	0,4 - 4
Width	400 - 1650	30 - 1650	200 - 1650
Length	N/A	N/A	220 - 6000

Tolerances for straps and sheets: EN 10143. Other tolerances and special edge shapes are available by agreement.

Soft grades – Continuously hot-dip refined strip and sheet made from soft steels for cold forming EN 10346 : 2015

Chemical composition (melt analysis) of soft steels for cold forming								
Steel grade/type		Symbol for the type of surface finishing	Chemical composition Percentage by mass					
Code	Material no.		C max. %	Si max. %	Mn max. %	P max. %	S max. %	Ti max. %
DX51D	1.0917	+Z, +ZF, +ZA, +AZ, +AS, +ZM	0.18	0.5	1.20	0.12	0.045	0.30
DX52D	1.0918	+Z, +ZF, +ZA, +AZ, +AS, +ZM	0.12	0.5	0.60	0.10	0.045	0.30
DX53D	1.0951	+Z, +ZF, +ZA, +AZ, +AS, +ZM	0.12	0.5	0.60	0.10	0.045	0.30
DX54D	1.0952	+Z, +ZF, +ZA, +AZ, +AS, +ZM	0.12	0.5	0.60	0.10	0.045	0.30
DX55D	1.0962	+AS	0.12	0.5	0.60	0.10	0.045	0.30
DX56D	1.0963	+Z, +ZF, +ZA, +AS, +ZM	0.12	0.5	0.60	0.10	0.045	0.30
DX57D	1.0853	+Z, +ZF, +ZA, +AS, +ZM	0.12	0.5	0.60	0.10	0.045	0.30
Z = Hot-dip galvanized ZF = Galvannealed ZA = Galfan AZ = Galvalume AS = Hot-dip aluminized ZM = Zinc Magnesium								

Mechanical properties (lat.)							
Steel grade/type		Symbol for the type of surface finishing	Elongation limit	Tensile strength	Fracture elongation	Vertical anisotropy	Work hardening exponent
Code	Material no.		Re[1] MPa	R_m MPa	A_{80}[2] % min.	r_{90} min	n_{90} min.
DX51D	1.0917	+Z, +ZF, +ZA, +AZ, +AS, +ZM	–	270 – 500	22	–	–
DX52D	1.0918	+Z, +ZF, +ZA, +AZ, +AS, +ZM	140 – 300 3)	270 – 420	26	–	–
DX53D	1.0951	+Z, +ZF, +ZA, +AZ, +AS, +ZM	140 – 260	270 – 380	30	–	–
DX54D	1.0952	+Z, +ZA	120 – 220	260 – 350	36	1.6 [4]	0.18
DX54D	1.0952	+ZF, +ZM	120 – 220	260 – 350	34	1.4 [4]	0.18
DX54D	1.0952	+AZ	120 – 220	260 – 350	36	–	–
DX54D	1.0952	+AS	120 – 220	260 – 350	34	1.4 [4] [5]	0.18 [5]
DX55D [6]	1.0962	+AS	140 – 240	270 – 370	30	–	–
DX56D	1.0963	+Z, +ZA	120 – 180	260 – 350	39	1.9 [4]	0.21
DX56D	1.0963	+ZF, +ZM	120 – 180	260 – 350	37	1.7 [4] [5]	0.20 [5]
DX56D	1.0963	+AS, +AZ	120 – 180	260 – 350	39	1.7 [4] [5]	0.20 [5]
DX57D	1.0853	+Z, +ZA	120 – 170	260 – 350	41	2.1 [4]	0.22
DX57D	1.0853	+ZF, +ZM	120 – 170	260 – 350	39	1.9 [4] [5]	0.21 [4]
DX57D	1.0853	380 – 480	120 – 170	260 – 350	41	1.9 [4] [5]	0.21 [4]

1) If the yield point is not pronounced, the values for the 0.2 % elongation limit ($R_{p0,2}$) apply, if pronounced, the values for the lower yield point (R_{eL}) apply.
2) Reduced minimum values for fracture elongation apply for product thicknesses of: 0.50 mm < t ≤ 0.70 mm (2 units less); 0.35 mm < t ≤ 0.50 mm (minus 4 units) and t ≤ 0.35 mm (minus 7 units).
3) For class A surfaces, the maximum value for the yield point is Re = 360 MPa.
4) For 1.5 mm < t < 2 mm, the r_{90}-minimum value is reduced by 0.2. For t ≥ 2 mm, the r_{90}-minimum value is reduced by 0.4.
5) The r_{90}- minimum value is reduced for product thicknesses of: 0.50 mm < t ≤ 0.70 mm by 0.2; 0.35 mm < t ≤ 0.50 mm by 0.4 and t ≤ 0.35 mm by 0.6. The n_{90}- minimum value is reduced for product thicknesses of: 0.50 mm < t ≤ 0.70 mm by 0.01; 0.35 mm < t ≤ 0.50 mm by 0.03 and t ≤ 0.35 mm um 0.04.
6) Please note the minimum fracture elongation value for DX55D +S products, which does not follow the usual system. DX55D + AS products are marked according to the best heat resistance. (1 MPa = 1 N/mm²)

Hot-dip galvanized sheet

Delivery range in mm	Coils	Slit strips	Cut-to-length sheets
Thickness	0,4 - 4	0,4 - 4	0,4 - 4
Width	400 - 1650	30 - 1650	200 - 1650
Length	N/A	N/A	220 - 6000

Tolerances for straps and sheets: EN 10143. Other tolerances and special edge shapes are available by agreement.

Construction steels – Continuously hot-dip coated steel strip and sheet made of construction steels EN 10346 : 2015

Chemical composition (melt analysis)						
Steel grade/type		Symbol for the type of surface finishing	C max. %	Si max. %	Mn max. %	P max. %
Code	Material no.					
S220GD	1.0241	+Z, +ZF, +ZA, +AZ, +ZM	0.20	0.60	1.70	0.10
S250GD	1.0242	+Z, +ZF, +ZA, +AZ, +AS, +ZM	0.20	0.60	1.70	0.10
S280GD	1.0244	+Z, +ZF, +ZA, +AZ, +AS, +ZM	0.20	0.60	1.70	0.10
S320GD	1.0250	+Z, +ZF, +ZA, +AZ, +AS, +ZM	0.20	0.60	1.70	0.10
S350GD	1.0529	+Z, +ZF, +ZA, +AZ, +AS, +ZM	0.20	0.60	1.70	0.10
S390GD	1.0238	+Z, +ZF, +ZA, +ZM, +AZ	0.20	0.60	1.70	0.10
S420GD	1.0239	+Z, +ZF, +ZA, +ZM, +AZ	0.20	0.60	1.70	0.10
S450GD	1.0233	+Z, +ZF, +ZA, +ZM, +AZ	0.20	0.60	1.70	0.10
S550GD	1.0531	+Z, +ZF, +ZA, +AZ, +ZM	0.20	0.60	1.70	0.10

Mechanical properties (long.)					
Steel grade/type		Symbol for the type of surface finishing	Elongation limit	Tensile strength	Fracture elongation
Code	Material no.		$R_{p0,2}$[1] MPa	R_m[2] MPa	A_{80}[3] % min.
S220GD	1.0241	+Z, +ZF, +ZA, +AZ, +ZM	220	300	20
S250GD	1.0242	+Z, +ZF, +ZA, +AZ, +AS, +ZM	250	330	19
S280GD	1.0244	+Z, +ZF, +ZA, +AZ, +AS, +ZM	280	360	18
S320GD	1.0250	+Z, +ZF, +ZA, +AZ, +AS, +ZM	320	390	17
S350GD	1.0529	+Z, +ZF, +ZA, +AZ, +AS, +ZM	350	420	16
S390GD	1.0238	+Z, +ZF, +ZA, +ZM, +AZ	390	460	16
S420GD	1.0239	+Z, +ZF, +ZA, +ZM, +AZ	420	480	15
S450GD	1.0233	+Z, +ZF, +ZA, +ZM, +AZ	450	510	14
S550GD	1.0531	+Z, +ZF, +ZA, +AZ, +ZM	550	560	–

1) If the yield point is pronounced, the values for the upper yield point (R_{eH}) apply.
2) For all steel grades, with the exception of S550GD, a range of 140 MPa can be expected for tensile strength.
3) Reduced minimum values for fracture elongation apply for product thicknesses of t > 0.50 mm (4 units less) and for 0.50 mm < t ≤ 0.70 mm (2 units less).

Hot-dip galvanized sheet

Delivery range in mm	Coils	Slit strips	Cut-to-length sheets
Thickness	0,4 - 4	0,4 - 4	0,4 - 4
Width	400 - 1650	30 - 1650	200 - 1650
Length	N/A	N/A	220 - 6000

Tolerances for straps and sheets: EN 10143. Other tolerances and special edge shapes are available by agreement.

Microalloyed grades – Continuously hot-dip coated steel strip and sheet made of steels with a high yield point for cold forming acc. to EN 10346 : 2015

Chemical composition (melt analysis)

Steel grade/type		Symbol for the type of surface finishing	Chemical composition Percentage by mass							
Code	Material no.		C max. %	Si max. %	Mn max. %	P max. %	S max. %	Al_{total} min. %	Nb max. %	Ti max. %
HX160YD	1.0910		0.01	0.30	0.60	0.06	0.025	≥ 0.010	0.09	0.12
HX180YD	1.0921		0.01	0.30	0.70	0.06	0.025	≥ 0.010	0.09	0.12
HX180BD	1.0914		0.06	0.30	0.70	0.06	0.025	≥ 0.015	0.09	0.12
HX220YD	1.0923		0.01	0.30	0.90	0.08	0.025	≥ 0.010	0.09	0.12
HX220BD	1.0919		0.08	0.50	0.70	0.08	0.025	≥ 0.015	0.09	0.12
HX260YD	1.0926		0.01	0.50	1.60	0.10	0.025	≥ 0.010	0.09	0.12
HX260BD	1.0924		0.10	0.50	1.00	0.10	0.025	≥ 0.010	0.09	0.12
HX260LAD	1.0929		0.11	0.50	1.00	0.030	0.025	≥ 0.015	0.09	0.15
HX300YD	1.0927	+Z, +ZF, +ZA, +AZ, +AS, +ZM	0.015	0.30	1.60	0.10	0.025	≥ 0.010	0.09	0.12
HX300BD	1.0930		0.11	0.30	0.80	0.12	0.025	≥ 0.010	0.09	0.12
HX300LAD	1.0932		0.12	0.50	1.40	0.030	0.025	≥ 0.015	0.09	0.15
HX340BD	1.0945		0.11	0.50	0.80	0.12	0.025	≥ 0.010	0.09	0.12
HX340LAD	1.0933		0.12	0.50	1.40	0.030	0.025	≥ 0.015	0.09	0.15
HX380LAD	1.0934		0.12	0.50	1.50	0.030	0.025	≥ 0.015	0.09	0.15
HX420LAD	1.0935		0.12	0.50	1.60	0.030	0.025	≥ 0.015	0.09	0.15
HX460LAD	1.0990		0.15	0.50	1.70	0.030	0.025	≥ 0.015	0.09	0.15
HX500LAD	1.0991		0.15	0.50	1.70	0.030	0.025	≥ 0.015	0.09	0.15

1) If the yield point is pronounced, the values for the lower yield point (R_{eL}) apply
2) Reduced minimum values for fracture elongation apply for product thicknesses of: 0.50 mm < t ≤ 0.70 mm (minus 2 units) 0.35 mm < t ≤ 0.50 mm (minus 4 units) and t ≤ 0.35 mm (minus 7 units).
3) For AS-, AZ-, ZF- and ZM- coatings, the A_{80} minimum values are reduced by 2 units and the r_{90} minimum values by 0.2.
4) For product thicknesses1.5 mm < t < 1.99 mm, the r_{90}-minimum values are reduced by 0.2. For product thicknessest ≥ 2 mm, the r_{90}-minimum values are reduced by 0.4.
5) The r90- minimum value is reduced for product thicknesses of: 0.50 mm < t ≤ 0.70 mm by 0.2; 0.35 mm < t ≤ 0.50 mm by 0.4 und t ≤ 0.35 mm by 0.6. The n_{90}-minimum value is reduced for product thicknesses of: 0.50 mm < t ≤ 0.70 mm by 0.01; 0.35 mm < t ≤ 0.50 mm by 0.03 and t ≤ 0.35 mm by 0.04 (1 MPa = 1 N/mm2).
B = Bake hardening LA = Low alloy (microalloyed) Y = Interstitial free (IF steel)

Hot-dip galvanized sheet

Delivery range in mm	Coils	Slit strips	Cut-to-length sheets
Thickness	0,4 - 4	0,4 - 4	0,4 - 4
Width	400 - 1650	30 - 1650	200 - 1650
Length	N/A	N/A	220 - 6000

Tolerances for straps and sheets: EN 10143. Other tolerances and special edge shapes are available by agreement.

Mechanical properties (lat.)

Steel grade/type		Symbol for the type of surface finishing	Elongation limit 0.2 % $R_{p0,2}$ [1] N/mm²	Bake hardening index BH_2 MPa min. N/mm²	Tensile strength R_m MPa N/mm²	Fracture elongation A_{80} [2) 3)] % min. quer	Vertical anisotropy r_{90} [3) 4)] min.	Work hardening exponent n_{90} min.
Code	Material no.							
HX160YD	1.0910		160 – 220	–	300 – 360	37	1.9	0.20
HX180YD	1.0921		180 – 240	–	330 – 390	34	1.7	0.18
HX180BD	1.0914		180 – 240	30	290 – 360	34	1.5	0.16
HX220YD	1.0923		220 – 280	–	340 – 420	32	1.5	0.17
HX220BD	1.0919		220 – 280	30	320 – 400	32	1.2	0.15
HX260YD	1.0926		260 – 320	–	380 – 440	30	1.4	0.16
HX260BD	1.0924		260 – 320	30	360 – 440	28	–	–
HX260LAD	1.0929		260 – 320	–	350 – 430	26	–	–
HX300YD	1.0927	+Z, +ZF, +ZA, +AZ, +AS, +ZM	300 – 360	–	390 – 470	27	1.3	0.15
HX300BD	1.0930		300 – 360	30	400 – 480	26	–	–
HX300LAD	1.0932		300 – 380	–	380 – 480	23	–	–
HX340BD	1.0945		340 – 400	30	440 – 520	24	–	–
HX340LAD	1.0933		340 – 420	–	410 – 510	21	–	–
HX380LAD	1.0934		380 – 480	–	440 – 560	19	–	–
HX420LAD	1.0935		420 – 520	–	470 – 590	17	–	–
HX460LAD	1.0990		460 – 560	–	500 – 640	15	–	–
HX500LAD	1.0991		500 – 620	–	530 – 690	13	–	–

Hot-dip galvanized sheet

Delivery range in mm	Coils	Slit strips	Cut-to-length sheets
Thickness	0,4 - 4	0,4 - 4	0,4 - 4
Width	400 - 1650	30 - 1650	200 - 1650
Length	N/A	N/A	220 - 6000

Tolerances for straps and sheets: EN 10143. Other tolerances and special edge shapes are available by agreement.

Explanation and offer of coatings and surfaces

Coating code no.	Coating mass: Min. coating volume, on both sides (g/m²)		Theoretical reference value for coating thickness per side in µm		Density g/cm³
	Three-surface sample	Single-surface sample	Typical value [1]	Area [2]	35
Zinc coating volume (Z)					
Z100	100	85	7	5 – 12	7.1
Z140	140	120	10	7 – 15	7.1
Z200	200	170	14	10 – 20	7.1
Z225	225	195	16	11 – 22	7.1
Z275	275	235	20	13 – 27	7.1
Z350	350	300	25	17 – 33	7.1
Z450	450	385	32	22 – 42	7.1
Z600	600	510	42	29 – 55	7.1
Zinc/iron alloy coating volume (ZF)					
ZF100	100	85	7	5 – 12	7.1
ZF120	120	100	8	6 – 13	7.1
Zinc/aluminium alloy coating volume (ZA)					
ZA095	95	80	7	5 – 12	6.6
ZA130	130	110	10	7 – 15	6.6
ZA185	185	155	14	10 – 20	6.6
ZA200	200	170	15	11 – 21	6.6
ZA255	255	215	20	15 – 27	6.6
ZA300	300	255	23	17 – 31	6.6
Aluminium/zinc alloy coating volume (AZ) not for multiphase steels					
AZ100	100	85	13	9 – 19	3.8
AZ150	150	130	20	15 – 27	3.8
AZ185	185	160	25	19 – 33	3.8
Aluminium/silicon alloy coating volume (AS) not for multiphase steels					
AS060	60	45	10	7 – 15	3.0
AS080	80	60	14	10 – 20	3.0
AS100	100	75	17	12 – 23	3.0
AS120	120	90	20	15 – 27	3.0
AS150	150	115	25	19 – 33	3.0

Hot-dip galvanized sheet

Delivery range in mm	Coils	Slit strips	Cut-to-length sheets
Thickness	0,4 - 4	0,4 - 4	0,4 - 4
Width	400 - 1650	30 - 1650	200 - 1650
Length	N/A	N/A	220 - 6000

Tolerances for straps and sheets: EN 10143. Other tolerances and special edge shapes are available by agreement.

Coating code no.	Coating mass: Min. coating volume, on both sides (g/m²)		Theoretical reference value for coating thickness per side in µm		Density g/cm³
	Three-surface sample	Single-surface sample	Typical value [1]	Area [2]	35
Coating volume of zinc-magnesium alloy (ZM) 3)					
ZM060	60	50	4,5	4 – 8	6.2 – 6.6
ZM070	70	60	5,5	4 – 8	6.2 – 6.6
ZM080	80	70	6	4 – 10	6.2 – 6.6
ZM090	90	75	7	5 – 10	6.2 – 6.6
ZM100	100	85	8	5 – 11	6.2 – 6.6
ZM120	120	100	9	6 – 14	6.2 – 6.6
ZM130	130	110	10	7 – 15	6.2 – 6.6
ZM140	140	120	11	8 – 16	6.2 – 6.6
ZM150	150	130	11,5	8 – 17	6.2 – 6.6
ZM160	160	130	12	8 – 17	6.2 – 6.6
ZM175	175	145	13	9 – 18	6.2 – 6.6
ZM190	190	160	15	10 – 20	6.2 – 6.6
ZM200	200	170	15	10 – 20	6.2 – 6.6
ZM250	250	215	19	13 – 25	6.2 – 6.6
ZM300	300	255	23	17 – 30	6.2 – 6.6
ZM310	310	265	24	18 – 31	6.2 – 6.6
ZM350	350	300	27	19 – 33	6.2 – 6.6
ZM430	430	365	35	26 – 46	6.2 – 6.6

1) Layer thicknesses can be calculated from the coating volumes.
2) Users may assume that these limits will be maintained on the top and bottom sides.
3) More ZM coatings available on request.

Surfaces

Surface type
NA = Usual spangle different size with usual surface
MA = Small spangle with usual surface
MB = Re-rolled with improved surface
MC = Re-rolled with best surface
A = Usual surface
B = Improved surface
C = Best surface

Surface treatment
C = Chemical passivation (Cr-frei + Cr3+)
O = Oiled
CO = Chemical passivation with oiling
P = Phosphatized
PO = Phosphatized with oiling
S = Sealed
U = Untreated

Coating variations
+Z = Galvanized (99 % Zn)
+ZF = Zinc-iron alloy (Galvannealed)
+ZA = Zinc aluminium (Galfan, Zn + 5 % Al)
+AZ = Aluminium zinc (Galvalume 55 % Al + 1.6 % Si + Zn)
+AS = Aluminium-silicon coatings (11 % Si + Al)
+ZM = Zinc magnesium (1 – 2 % Mg + 1 – 2 % Al + Zn)*

Electrolytically galvanized sheet

Delivery range in mm	Coils	Slit strips	Cut-to-length sheets
Thickness	0,4 - 4	0,4 - 4	0,4 - 4
Width	400 - 1650	30 - 1650	200 - 1650
Length	N/A	N/A	220 - 6000

Tolerances for straps and sheets: EN 10131. Other tolerances and special edge shapes are available by agreement.

Soft grades – Electrolytically galvanizedcold-rolled flat products of steels EN 10152 : 2017

Chemical composition (melt analysis)							
Steel grade/type		Symbol for the type of surface finishing	C max. %	P max. %	S max. %	Mn max. %	Ti max. %
Code	Material no.						
DC01	1.0330	+ZE	0.12	0.045	0.045	0.60	–
DC03	1.0347	+ZE	0.10	0.035	0.035	0.45	–
DC04	1.0338	+ZE	0.08	0.030	0.030	0.40	–
DC05	1.0312	+ZE	0.06	0.025	0.025	0.35	–
DC06	1.0873	+ZE	0.02	0.020	0.020	0.25	0.3
DC07	1.0898	+ZE	0.01	0.020	0.020	0.20	0.2

Mechanical properties							
Steel grade/type		Symbol for the type of surface finishing	R_e [1]	R_m	A_{80} [2]	r_{90} [3] [4]	n_{90} [3]
Code	Material no.						
DC01	1.0330	+ZE	-/280	270 – 410	28	–	–
DC03	1.0347	+ZE	-/240	270 – 370	34	1.3	–
DC04	1.0338	+ZE	-/220	270 – 350	37	1.6	0.170
DC05	1.0312	+ZE	-/200	270 – 330	39	1.9	0.190
DC06	1.0873	+ZE	-/180	270 – 350	41	2.1	0.210
DC07	1.0898	+ZE	-/160	250 – 310	43	2.5	0.220

1) For products with no clear yield point, the values for the 0.2 % elongation limit ($R_{p0.2}$), are taken as those for the yield point. For other products, those for the lower yield point (R_{eL}) apply. For thicknesses of ≤ 0.70 mm, but > 0.50 mm, a 20 MPa higher maximum yield point value is permissible. For thicknesses ≤ 0.50 mm, a higher maximum yield point value of 40 MPa is permissible.
2) For thicknesses of ≤ 0.70 mm, but > 0.50 mm, the minimum values for fracture elongation are reduced by 2 units, for thicknesses of ≤ 0.50 mm by 4 units.
3) The r_{90}- and n_{90}-value, determined in acc. with 7.5.2.3, only apply for product thicknesses of > 0.50 mm.
4) For thickness > 2 mm, the r_{90}-value sis reduced by 0.2.

Electrolytically galvanized sheet

Delivery range in mm	Coils	Slit strips	Cut-to-length sheets
Thickness	0,4 - 4	0,4 - 4	0,4 - 4
Width	400 - 1650	30 - 1650	200 - 1650
Length	N/A	N/A	220 - 6000

Tolerances for straps and sheets: EN 10131. Other tolerances and special edge shapes are available by agreement.

Microalloyed grades – Cold-rolled flat products with high yield point for cold forming made of microalloyed steels EN 10268 : 2013.
With additional coating specifications, this standard also applies for electrolytically galvanized flat products, e.g. H240LA + ZE 75/75

Chemical composition (melt analysis)									
Steel grade/type		Chemical composition Percentage by mass							
Code	Material no.	C max. %	Si max. %	Mn max. %	P max. %	S max. %	Al_{total} min. %	Ti max. %	Nb max. %
HC180Y	1.0922	0.01	0.3	0.7	0.06	0.025	0.01	0.12	0.09
HC180B	1.0395	0.06	0.5	0.7	0.06	0.030	0.015		
HC220Y	1.0925	0.01	0.3	0.9	0.08	0.025	0.01	0.12	0.09
HC220I	1.0346	0.07	0.5	0.6	0.05	0.025	0.015	0.05	
HC220B	1.0396	0.08	0.5	0.7	0.085	0.030	0.015		
HC260Y	1.0928	0.01	0.3	1.6	0.1	0.025	0.01	0.12	0.09
HC260I	1.0349	0.07	0.5	1.2	0.05	0.025	0.015	0.05	
HC260B	1.0400	0.10	0.5	1.0	0.1	0.030	0.015		
HC260LA	1.0480	0.10	0.5	1.0	0.030	0.025	0.015	0.15	0.09
HC300I	1.0447	0.08	0.5	0.7	0.08	0.025	0.015	0.05	
HC300B	1.0444	0.10	0.5	1.0	0.12	0.030	0.015		
HC300LA	1.0489	0.12	0.5	1.4	0.030	0.025	0.015	0.15	0.09
HC340LA	1.0548	0.12	0.5	1.5	0.030	0.025	0.015	0.15	0.09
HC380LA	1.0550	0.12	0.5	1.6	0.030	0.025	0.015	0.15	0.09
HC420LA	1.0556	0.14	0.5	1.6	0.030	0.025	0.015	0.15	0.09
HC460LA	1.0574	0.14	0.6	1.8	0.030	0.025	0.015	0.15	0.05
HC500LA	1.0573	0.14	0.6	1.8	0.030	0.025	0.015	0.15	0.09

Electrolytically galvanized sheet

Delivery range in mm	Coils	Slit strips	Cut-to-length sheets
Thickness	0,4 - 4	0,4 - 4	0,4 - 4
Width	400 - 1650	30 - 1650	200 - 1650
Length	N/A	N/A	220 - 6000

Tolerances for straps and sheets: EN 10131. Other tolerances and special edge shapes are available by agreement.

Mechanical properties (lat.)								
Steel grade/type		Elongation limit 0.2 %	Higher yield point through heat treatment [2]	Tensile strength	Fracture elongation [3]	Vertical anisotropy	Vertical anisotropy [1] [2] [4]	Work hardening exponent [4]
Code	Material no.	$R_{p0,2}$ [1] N/mm²	BH_2 N/mm²	R_m N/mm²	A_{80} min. lat %	r max. lat	r max. lat	n min. lat
HC180Y	1.0922	180 – 230	35	330 – 400	35		1.7	0.19
HC180B	1.0395	180 – 230		290 – 360	34		1.6	0.17
HC220Y	1.0925	220 – 270		340 – 420	33		1.6	0.18
HC220I	1.0346	220 – 270	35	300 – 380	34	1.4		0.18
HC220B	1.0396	220 – 270		320 – 400	32		1.5	0.16
HC260Y	1.0928	260 – 320		380 – 440	31		1.4	0.17
HC260I	1.0349	260 – 310	35	320 – 400	32	1.4	–	0.17
HC260B	1.0400	260 – 320		360 – 440	29		–	
HC260LA	1.0480	260 – 330		350 – 430	26		0.15	
HC300I	1.0447	300 – 350	35	340 – 440	30	1.4	–	0.16
HC300B	1.0444	300 – 360	–	390 – 480	26		–	
HC300LA	1.0489	300 – 380	30	380 – 480	23		–	
HC340LA	1.0548	340 – 420	–	410 – 510	21		–	
HC380LA	1.0550	380 – 480	–	440 – 580	19		–	
HC420LA	1.0556	420 – 520	–	470 – 600	17		–	
HC460LA	1.0574	460 – 580	–	510 – 660	13		–	
HC500LA	1.0573	500 – 620	–	550 – 710	12		–	

1) If a yield point is pronounced, the values for the lower yield point (R_{eL}) apply.
2) For thicknesses > 1.2 mm, special arrangements must be made.
3) For thicknesses ≤ 0.7 mm, but > 0.5 mm, minimum values for breaking elongation of two units lower are permissible.
4) The minimum values for r (lat.) and n (lat.) only apply to product thicknesses > 0.5 mm.
5) For product thicknesses > 2 mm, the r_{90}-value is reduced by 0.2.

Electrolytically galvanized sheet

Delivery range in mm	Coils	Slit strips	Cut-to-length sheets
Thickness	0,4 - 4	0,4 - 4	0,4 - 4
Width	400 - 1650	30 - 1650	200 - 1650
Length	N/A	N/A	220 - 6000

Tolerances for straps and sheets: EN 10131. Other tolerances and special edge shapes are available by agreement.

Explanation and offer of coating and surfaces

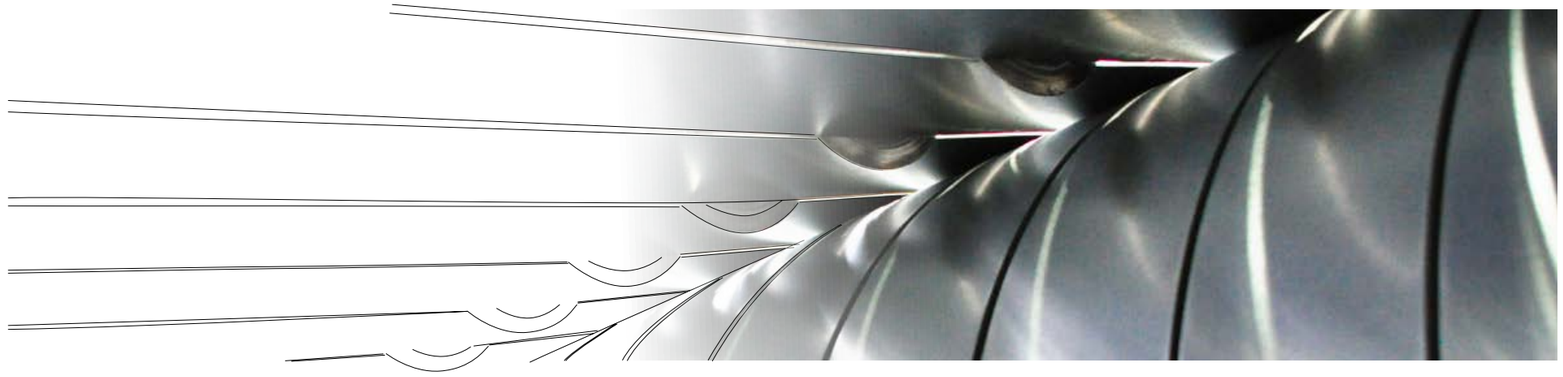
Surfaces		
03	Normal surface	A
05	Best surface	B

Subsequent processing
P = Phosphatized
PC = Phosphatized and chemically passivated
PCO = Phosphatized, chemically passivated and oiled
PO = Phosphatized and oiled
S = Sealed
C = Chemically passivated
CO = Chemically passivated and oiled
O = oiled

Coating				
Plating, zinc Description	Nominal zinc layer on each side		Minimum zinc layer on each side	
Two-sided	Thicknes µm	Weight g/m²	Thicknes µm	Weight g/m²
ZE 25/25	2.5	18	1.7	12
ZE 50/50	5.0	36	4.1	29
ZE 75/75	7.5	54	6.6	47
ZE 100/100	10.0	72	9.1	65
One-sided				
ZE 25/0	2.5	18	1.7	12
ZE 50/0	5.0	36	4.1	29
ZE 75/0	7.5	54	6.6	47
ZE 100/0	10.0	72	9.1	65

Coating type (AA)	Sheet side A	Sheet side B
.51	5 µm zinc with organic coating*	as sheet side A
.68	7,5 µm zinc with organic coating*	7.5 µm zinc without organic coating and without pre-phosphatizing

** Organic coating: GRANOCOAT ZE, GARDO PROTECT*



AUTOMOTIVE Hot-Rolled sheets, pickled

Delivery range in mm	Coils	Slit strips	Cut-to-length sheets
Thickness	1,5 - 4	1,5 - 4	1,5 - 4
Width	400 - 1650	30 - 1650	200 - 1650
Length	N/A	N/A	220 - 6000

Tolerances: hot-rolled, pickled in accordance with EN 10051, uncoated or electro-galvanised in accordance with EN 10131, hot-dip galvanised in accordance with EN 10143. Other tolerances and special edge shapes are available by agreement.

To simplify things, the Association of the Automotive Industry (Verband der Automobilindustrie / VDA) has published a recommendation for flat steel products for cold forming. The recommendation is reflected in the material sheet VDA 239-100 and includes, among other things, low- and micro-alloyed steels.

Soft grades – Flat products made of steel for cold forming acc. to VDA 239-100 : 2016

Chemical composition of hot-rolled soft steels								
Steel grade	C %	Si %	Mn %	P %	S %	Al %	Ti %	Cu %
HR0	≤ 0.13	≤ 0.50	≤ 0.60	≤ 0.035	≤ 0.030	≤ 0.015	≤ 0.30	≤ 0.20
HR2	≤ 0.10	≤ 0.50	≤ 0.50	≤ 0.025	≤ 0.030	≤ 0.015	≤ 0.30	≤ 0.20

Mechanical properties of hot-rolled soft steels (test in transverse direction)				
Steel grade	Yield point $R_{p0,2}$ MPa	Tensile strength R_m MPa	Fracture elongation	
			A %	Type 1 A_{50mm} %
HR0	240 – 350	310 – 460	≥ 28	≥ 26
HR2	180 – 290	270 – 400	≥ 34	≥ 32

AUTOMOTIVE Hot-Rolled sheets, pickled

Delivery range in mm	Coils	Slit strips	Cut-to-length sheets
Thickness	1,5 - 4	1,5 - 4	1,5 - 4
Width	400 - 1650	30 - 1650	200 - 1650
Length	N/A	N/A	220 - 6000

Tolerances: hot-rolled, pickled in accordance with EN 10051, uncoated or electro-galvanised in accordance with EN 10131, hot-dip galvanised in accordance with EN 10143. Other tolerances and special edge shapes are available by agreement.

Microalloyed grades – Flat products made of steel for cold forming acc. to VDA 239-100 : 2016

Chemical properties of hot-rolled mild steels									
Steel grade	C %	Si %	Mn %	P %	S %	Al %	Ti %	Nb %	Cu %
HR300LA	≤ 12	≤ 50	≤ 1.30	≤ 0.030	≤ 0.025	≤ 0.015	≥ 0.15	≤ 0.10	≤ 0.20
HR340LA	≤ 12	≤ 50	≤ 1.50	≤ 0.030	≤ 0.025	≤ 0.015	≥ 0.15	≤ 0.10	≤ 0.20
HR380LA	≤ 12	≤ 50	≤ 1.50	≤ 0.030	≤ 0.025	≤ 0.015	≥ 0.15	≤ 0.10	≤ 0.20
HR420LA	≤ 12	≤ 50	≤ 1.60	≤ 0.030	≤ 0.025	≤ 0.015	≥ 0.15	≤ 0.10	≤ 0.20
HR460LA	≤ 12	≤ 50	≤ 1.65	≤ 0.030	≤ 0.025	≤ 0.015	≥ 0.15	≤ 0.10	≤ 0.20
HR500LA	≤ 12	≤ 50	≤ 1.70	≤ 0.030	≤ 0.025	≤ 0.015	≥ 0.15	≤ 0.10	≤ 0.20
HR550LA	≤ 12	≤ 60	≤ 1.80	≤ 0.030	≤ 0.025	≤ 0.015	≥ 0.15	≤ 0.10	≤ 0.20
HR700LA	≤ 12	≤ 60	≤ 2.10	≤ 0.030	≤ 0.025	≤ 0.015	≥ 0.20	≤ 0.10	≤ 0.20

Mechanical properties of thermo-mechanically rolled steels (testing in transverse direction)							
Steel grade/type	Yield point R_{p02} MPa	Tensile strength R_m MPa	Fracture elongation				n 3.0 mm ≤ e n10-20/Ag
			A %	Type 1 A_{50mm} %	Type 2 A_{80mm} %	Type 3 A_{50mm} %	
HR300LA	300 – 380	380 – 500	≥ 28	≥ 26	≥ 24	≥ 26	≥ 0.14
HR340LA	340 – 440	420 – 540	≥ 26	≥ 24	≥ 22	≥ 24	≥ 0.13
HR380LA	380 – 480	450 – 570	≥ 24	≥ 22	≥ 20	≥ 22	
HR420LA	420 – 520	480 – 600	≥ 22	≥ 20	≥ 18	≥ 19	
HR460LA	460 – 560	520 – 640	≥ 20	≥ 18	≥ 16	≥ 17	
HR500LA	500 – 620	560 – 700	≥ 17	≥ 16	≥ 14	≥ 15	
HR550LA	550 – 670	610 – 750	≥ 16	≥ 14	≥ 12	≥ 13	
HR700LA	700 – 850	750 – 950	≥ 13	≥ 12	≥ 10	≥ 11	

AUTOMOTIVE Hot-Rolled sheets, pickled

Delivery range in mm	Coils	Slit strips	Cut-to-length sheets
Thickness	1,5 - 4	1,5 - 4	1,5 - 4
Width	400 - 1650	30 - 1650	200 - 1650
Length	N/A	N/A	220 - 6000

Tolerances: hot-rolled, pickled in accordance with EN 10051, uncoated or electro-galvanised in accordance with EN 10131, hot-dip galvanised in accordance with EN 10143. Other tolerances and special edge shapes are available by agreement.

Chemical properties of hot-rolled dualphase steels

Steel grade	C %	Si %	Mn %	P %	S %	Al %	Ti + Nb %	Cr + Mo %	B %	Cu %
HR330Y580T-DP	≤ 0.14	≤ 1.00	≤ 2.20	≤ 0.060	≤ 0.010	0.015 – 0.1	≤ 0.15	≤ 1.40	≤ 0.005	≤ 0.20

Mechanical properties of hot-rolled dualphase steels (testing in longitudinal direction)

Steel grade	Yield point R_{p02} MPa	Tensile strength R_m MPa	Fracture elongation				n		BH_2 MPa
			A %	Type 1 A_{50mm} %	Type 2 A_{80mm} %	Type 3 A_{50mm} %	n_{4-6}	$r_{m/20}$	
HR330Y580T-DP	330 – 450	580 – 680	≥ 23	≥ 21	≥ 19	≥ 20	≥ 0.16	≥ 0.13	≥ 30

Mechanical properties of hot-rolled complex-phase steels (testing in longitudinal direction)

Steel grade	Yield point R_{p02} MPa	Tensile strength R_m MPa	Fracture elongation				BH_2 MPa
			A %	Type 1 A_{50mm} %	Type 2 A_{80mm} %	Type 3 A_{50mm} %	
HR660Y760T-CP	660 – 820	760 – 960	≥ 13	≥ 11	≥ 10	≥ 11	≥ 30

Chemical properties of hot-rolled complex-phase steels

Steel grade	C %	Si %	Mn %	P %	S %	Al %	Ti + Nb %	Cr + Mo %	B %	Cu %
HR660Y760T-CP	≤ 0.18	≤ 1.00	≤ 2.20	≤ 0.050	≤ 0.010	0.015 – 0.12	≤ 0.25	≤ 1.00	≤ 0.005	≤ 0.20

Mechanical properties of hot-rolled martensite-phase steels (testing in longitudinal direction)

Steel grade	Yield point R_{p02} MPa	Tensile strength R_m MPa	Fracture elongation				BH_2 MPa
			A %	Type 1 A_{50mm} %	Type 2 A_{80mm} %	Type 3 A_{50mm} %	
HR900Y1180T-MS	900 – 1150	1180 – 1400	≥ 8	≥ 6	≥ 5	≥ 6	≥ 30

Chemical properties of hot-rolled martensite-phase steels

Steel grade	C %	Si %	Mn %	P %	S %	Al %	Ti + Nb %	Cr + Mo %	B %	Cu %
HR900Y1180T-MS	≤ 0.25	≤ 0.80	≤ 2.50	≤ 0.050	≤ 0.010	0.015 – 2.0	≤ 0.25	≤ 1.20	≤ 0.005	≤ 0.20

AUTOMOTIVE Hot-Rolled sheets, pickled

Delivery range in mm	Coils	Slit strips	Cut-to-length sheets
Thickness	1,5 - 4	1,5 - 4	1,5 - 4
Width	400 - 1650	30 - 1650	200 - 1650
Length	N/A	N/A	220 - 6000

Tolerances: hot-rolled, pickled in accordance with EN 10051, uncoated or electro-galvanised in accordance with EN 10131, hot-dip galvanised in accordance with EN 10143. Other tolerances and special edge shapes are available by agreement.

Mechanical properties of hot-rolled dualphase steels (testing in longitudinal direction)

Steel grade	Yield point Rp02 MPa	Tensile strength R_m MPa	Fracture elongation				BH_2 MPa
			A %	Type 1 A_{50mm} %	Type 2 A_{80mm} %	Type 3 A_{50mm} %	
HR300Y450T-FB	300 – 400	450 – 550	≥ 27	≥ 25	≥ 24	≥ 26	≥ 30
HR440Y580T-FB	440 – 600	580 – 700	≥ 17	≥ 16	≥ 15	≥ 16	≥ 30
HR600Y780T-FB	600 – 760	780 – 920	≥ 15	≥ 13	≥ 12	≥ 13	≥ 30

Chemical properties of hot-rolled ferritic-bainitic steels

Steel grade	C %	Si %	Mn %	P %	S %	Al %	Ti + Nb %	Cr + Mo %	B %	Cu %
HR300Y450T-FB	≤ 0.18	≤ 0.50	≤ 2.00	≤ 0.050	≤ 0.010	0.015 – 2.0	≤ 0.15	≤ 1.00	≤ 0.005	≤ 0.20
HR440Y580T-FB	≤ 0.18	≤ 0.50	≤ 2.00	≤ 0.050	≤ 0.010	0.015 – 2.0	≤ 0.15	≤ 1.00	≤ 0.010	≤ 0.20
HR600Y780T-FB	≤ 0.18	≤ 0.50	≤ 2.00	≤ 0.050	≤ 0.010	0.015 – 2.0	≤ 0.15	≤ 1.00	≤ 0.010	≤ 0.20

AUTOMOTIVE SHEETS - cold-rolled (coated or uncoated)

Mild grades – Flat products made of steel for cold forming acc. to VDA 239-100 : 2016

Chemical properties of cold-rolled soft steels

Steel grade	C %	Si %	Mn %	P %	S %	Al %	Ti %	Cu %
CR1	≤ 0.12	≤ 0.50	≤ 0.60	≤ 0.055	≤ 0.035	≥ 0.010	≤ 0.30	≤ 0.20
CR2	≤ 0.10	≤ 0.50	≤ 0.50	≤ 0.025	≤ 0.020	≥ 0.010	≤ 0.30	≤ 0.20
CR3	≤ 0.08	≤ 0.50	≤ 0.50	≤ 0.025	≤ 0.020	≥ 0.010	≤ 0.30	≤ 0.20
CR4	≤ 0.06	≤ 0.50	≤ 0.40	≤ 0.025	≤ 0.020	≥ 0.010	≤ 0.30	≤ 0.20
CR5	≤ 0.02	≤ 0.50	≤ 0.30	≤ 0.020	≤ 0.020	≥ 0.010	≤ 0.30	≤ 0.20

Mechanical properties of cold-rolled soft steels (testing in transverse direction)

Steel grade	Yield point Rp02 MPa	Tensile strength R_m MPa	Fracture elongation			r		n
			Type 1 A_{50mm} %	Type 2 A_{80mm} %	Type 3 A_{50mm} %	$r_{90/20}$	$r_{m/20}$	$n_{10-20/Ag}$
CR1	140 – 300	140 – 300	≥ 30	≥ 28	≥ 30	–	–	–
CR2	140 – 240	140 – 240	≥ 34	≥ 34	≥ 37	≥ 1.3	≥ 1.2	≥ 0.16
CR3	140 – 210	140 – 210	≥ 38	≥ 38	≥ 41	≥ 1.8	≥ 1.5	≥ 0.18
CR4	140 – 180	140 – 180	≥ 40	≥ 39	≥ 42	≥ 1.9	≥ 1.6	≥ 0.20
CR5	110 – 170	110 – 170	≥ 42	≥ 41	≥ 45	≥ 2.1	≥ 1.8	≥ 0.22

AUTOMOTIVE SHEETS - cold-rolled (coated or uncoated)

Delivery range in mm	Coils	Slit strips	Cut-to-length sheets
Thickness	0,4 - 4	0,4 - 4	0,4 - 4
Width	400 - 1650	30 - 1650	200 - 1650
Length	N/A	N/A	220 - 6000

Tolerances: hot-rolled, pickled in accordance with EN 10051, uncoated or electro-galvanised in accordance with EN 10131, hot-dip galvanised in accordance with EN 10143. Other tolerances and special edge shapes are available by agreement.

Microalloyed grades – Flat products made of steel for cold forming acc. to VDA 239-100 : 2016

Chemical composition of cold-rolled high-strength IF steels									
Steel grade	C %	Si %	Mn %	P %	S %	Al %	Ti %	Nb %	Cu %
CR160IF	≤ 0.01	≤ 0.30	≤ 0.60	≤ 0.060	≤ 0.025	≥ 0.010	≤ 0.12	≤ 0.09	≤ 0.20
CR180IF	≤ 0.01	≤ 0.30	≤ 0.70	≤ 0.060	≤ 0.025	≥ 0.010	≤ 0.12	≤ 0.09	≤ 0.20
CR210IF	≤ 0.01	≤ 0.30	≤ 0.90	≤ 0.080	≤ 0.025	≥ 0.010	≤ 0.12	≤ 0.09	≤ 0.20
CR240IF	≤ 0.01	≤ 0.30	≤ 1.60	≤ 0.100	≤ 0.025	≥ 0.010	≤ 0.12	≤ 0.09	≤ 0.20

Mechanical properties of cold-rolled high-strength IF steels (test in longitudinal direction)								
Steel grade	Elongation limit $R_{p0,2}$ MPa	Tensile strength R_m MPa	Fracture elongation			r		n
			Type 1 A_{50mm} %	Type 2 A_{80mm} %	Type 3 A_{50mm} %	$r_{90/20}$	$r_{m/20}$	$n_{10-20/Ag}$
CR160IF	160 – 210	280 – 340	≥ 40	≥ 38	≥ 41	≥ 1.4	≥ 1.5	≥ 0.20
CR180IF	180 – 240	320 – 400	≥ 38	≥ 35	≥ 38	≥ 1.2	≥ 1.3	≥ 0.19
CR210IF	210 – 270	340 – 420	≥ 36	≥ 33	≥ 36	≥ 1.1	≥ 1.3	≥ 0.18
CR240IF	240 – 300	360 – 440	≥ 34	≥ 31	≥ 34	≥ 1.0	≥ 1.2	≥ 0.27

The elongation at break of specimen shape 3 is informative only.

Chemical properties of cold-rolled bake-hardening steels							
Steel grade	C %	Si %	Mn %	P %	S %	Al %	Cu %
CR180BH	≤ 0.06	≤ 0.50	≤ 0.70	≤ 0.060	≤ 0.025	≥ 0.015	≤ 0.20
CR210BH	≤ 0.08	≤ 0.50	≤ 0.70	≤ 0.085	≤ 0.025	≥ 0.015	≤ 0.20
CR240BH	≤ 0.10	≤ 0.50	≤ 1.00	≤ 0.100	≤ 0.030	≥ 0.015	≤ 0.20
CR270BH	≤ 0.11	≤ 0.50	≤ 1.00	≤ 0.110	≤ 0.030	≥ 0.015	≤ 0.20

AUTOMOTIVE SHEETS - cold-rolled (coated or uncoated)

Delivery range in mm	Coils	Slit strips	Cut-to-length sheets
Thickness	0,4 - 4	0,4 - 4	0,4 - 4
Width	400 - 1650	30 - 1650	200 - 1650
Length	N/A	N/A	220 - 6000

Tolerances: hot-rolled, pickled in accordance with EN 10051, uncoated or electro-galvanised in accordance with EN 10131, hot-dip galvanised in accordance with EN 10143. Other tolerances and special edge shapes are available by agreement.

Mechanical properties of cold-rolled bake-hardening steels (test in longitudinal direction)							
Steel grade	Elongation limit $R_{p0,2}$ MPa	Tensile strength R_m MPa	Fracture elongation			r	n
			Type 1 A_{50mm} %	Type 2 A_{80mm} %	Type 3 A_{50mm} %	$r_{90/20}$	$r_{m/20}$	$n_{10-20/Ag}$
CR180BH	180 – 240	290 – 370	≥ 35	≥ 34	≥ 37	≥ 1.1	≥ 0.17	
CR210BH	210 – 270	320 – 400	≥ 34	≥ 32	≥ 35	≥ 1.1	≥ 0.16	≥ 20 / ≥ 30
CR240BH	240 – 300	340 – 440	≥ 31	≥ 29	≥ 31	≥ 1.0	≥ 0.15	
CR270BH	270 – 330	360 – 460	≥ 29	≥ 27	≥ 29	–	≥ 0.13	

The elongation at break of specimen shape 3 is informative only.

Chemical composition of cold-rolled high strength low-/microalloyed steels									
Steel grade	C %	Si %	Mn %	P %	S %	Al %	Ti %	Nb %	Cu %
CR210LA	≤ 0.10	≤ 0.50	≤ 1.00	≤ 0.080	≤ 0.030	≥ 0.015	≤ 0.15	≤ 0.10	≤ 0.20
CR240LA	≤ 0.10	≤ 0.50	≤ 1.00	≤ 0.030	≤ 0.025	≥ 0.015	≤ 0.15	≤ 0.09	≤ 0.20
CR270LA	≤ 0.12	≤ 0.50	≤ 1.00	≤ 0.030	≤ 0.025	≥ 0.015	≤ 0.15	≤ 0.09	≤ 0.20
CR300LA	≤ 0.12	≤ 0.50	≤ 1.40	≤ 0.030	≤ 0.025	≥ 0.015	≤ 0.15	≤ 0.09	≤ 0.20
CR340LA	≤ 0.12	≤ 0.50	≤ 1.50	≤ 0.030	≤ 0.025	≥ 0.015	≤ 0.15	≤ 0.09	≤ 0.20
CR380LA	≤ 0.12	≤ 0.50	≤ 1.60	≤ 0.030	≤ 0.025	≥ 0.015	≤ 0.15	≤ 0.09	≤ 0.20
CR420LA	≤ 0.12	≤ 0.50	≤ 1.65	≤ 0.030	≤ 0.025	≥ 0.015	≤ 0.15	≤ 0.09	≤ 0.20
CR460LA	≤ 0.13	≤ 0.60	≤ 1.70	≤ 0.030	≤ 0.025	≥ 0.015	≤ 0.15	≤ 0.10	≤ 0.20

Mechanical properties of cold-rolled high strength low-/microalloyed steels (test in longitudinal direction)								
Steel grade	Elongation limit $R_{p0,2}$ MPa	Tensile strength R_m MPa	Fracture elongation			r		n
			Type 1 A_{50mm} %	Type 2 A_{80mm} %	Type 3 A_{50mm} %	$r_{90/20}$	$r_{m/20}$	$n_{10-20/Ag}$
CR210LA	210 – 300	310 – 410	≥ 31	≥ 29	≥ 31	≥ 1.0	≥ 1.1	≥ 0.15
CR240LA	240 – 320	320 – 430	≥ 29	≥ 27	≥ 29	–	–	≥ 0.15
CR270LA	270 – 350	350 – 460	≥ 27	≥ 25	≥ 27	–	–	≥ 0.14
CR300LA	300 – 380	380 – 490	≥ 25	≥ 23	≥ 25	–	–	≥ 0.14
CR340LA	340 – 430	410 – 530	≥ 23	≥ 21	≥ 23	–	–	≥ 0.12
CR380LA	380 – 470	450 – 570	≥ 21	≥ 19	≥ 20	–	–	≥ 0.12
CR420LA	420 – 520	480 – 600	≥ 19	≥ 17	≥ 18	–	–	≥ 0.11
CR460LA	460 – 580	520 – 680	≥ 17	≥ 15	≥ 16	–	–	≥ 0.10

AUTOMOTIVE SHEETS - cold-rolled (coated or uncoated)

Delivery range in mm	Coils	Slit strips	Cut-to-length sheets
Thickness	0,4 - 4	0,4 - 4	0,4 - 4
Width	400 - 1650	30 - 1650	200 - 1650
Length	N/A	N/A	220 - 6000

Tolerances: hot-rolled, pickled in accordance with EN 10051, uncoated or electro-galvanised in accordance with EN 10131, hot-dip galvanised in accordance with EN 10143. Other tolerances and special edge shapes are available by agreement.

Multiphase steels – Flat products made of steel for cold forming acc. to VDA 239-100 : 2016

Chemical composition of cold-rolled dualphase steels										
Steel grade	C %	Si %	Mn %	P %	S %	Al %	Ti + Nb %	Cr + Mo %	B %	Cu %
CR290Y490T-DP	≤ 0.14	≤ 0.50	≤ 1.80	≤ 0.050	≤ 0.010	0.015 – 1.0	≤ 0.15	≤ 1.00	≤ 0.005	≤ 0.20
CR330Y590T-DP	≤ 0.15	≤ 0.80	≤ 2.50	≤ 0.050	≤ 0.010	0.015 – 1.5	≤ 0.15	≤ 1.40	≤ 0.005	≤ 0.20
CR440Y780T-DP	≤ 0.18	≤ 0.80	≤ 2.50	≤ 0.050	≤ 0.010	0.015 – 1.0	≤ 0.15	≤ 1.40	≤ 0.005	≤ 0.20
CR590Y980T-DP	≤ 0.20	≤ 1.00	≤ 2.90	≤ 0.050	≤ 0.010	0.015 – 1.0	≤ 0.15	≤ 1.40	≤ 0.005	≤ 0.20
CR700Y980T-DP	≤ 0.23	≤ 1.00	≤ 2.90	≤ 0.050	≤ 0.010	0.015 – 1.0	≤ 0.15	≤ 1.40	≤ 0.005	≤ 0.20

Mechanical properties of cold-rolled dualphase steels (test in longitudinal direction)								
Steel grade	Elongation limit $R_{p0,2}$ MPa	Tensile strength R_m MPa	Fracture elongation			n		BH_2 MPa
			Type 1 A_{50mm} %	Type 2 A_{80mm} %	Type 3 A_{50mm} %	n_{4-6}	$n_{10-20/Ag}$	
CR290Y490T-DP	290 – 380	490 – 600	≥ 26	≥ 24	≥ 26	≥ 0.19	≥ 0.15	≥ 30
CR330Y590T-DP	330 – 430	590 – 700	≥ 21	≥ 20	≥ 22	≥ 0.18	≥ 0.14	≥ 30
CR440Y780T-DP	440 – 550	780 – 900	≥ 15	≥ 14	≥ 15	≥ 0.15	≥ 0.11	≥ 30
CR590Y980T-DP	590 – 740	980 – 1130	≥ 11	≥ 10	≥ 11	–	–	≥ 30
CR700Y980T-DP	700 – 850	980 – 1130	≥ 9	≥ 8	≥ 9	–	–	≥ 30

The elongation at break of specimen shape 3 is informative only.

Chemical composition of cold-rolled TRIP-steels										
Steel grade	C %	Si %	Mn %	P %	S %	Al %	Ti + Nb %	Cr + Mo %	B %	Cu %
CR400Y690T-TR	≤ 0.24	≤ 2.00	≤ 2.20	≤ 0.050	≤ 0.010	0.015 – 2.0	≤ 0.20	≤ 0.60	≤ 0.005	≤ 0.20
CR450Y780T-TR	≤ 0.25	≤ 2.20	≤ 2.50	≤ 0.050	≤ 0.010	0.015 – 2.0	≤ 0.20	≤ 0.60	≤ 0.005	≤ 0.20

Mechanical properties of cold-rolled TRIP-steels (test in longitudinal direction)							
Steel grade	Elongation limit $R_{p0,2}$ MPa	Tensile strength R_m MPa	Fracture elongation			$n_{10-20/Ag}$	BH_2 MPa
			Type 1 A_{50mm} %	Type 2 A_{80mm} %	Type 3 A_{50mm} %		
CR400Y690T-TR	400 – 520	690 – 800	≥ 25	≥ 24	≥ 26	≥ 0.19	≥ 40
CR450Y780T-TR	450 – 570	780 – 910	≥ 22	≥ 21	≥ 23	≥ 0.16	≥ 40

AUTOMOTIVE SHEETS - cold-rolled (coated or uncoated)

Delivery range in mm	Coils	Slit strips	Cut-to-length sheets
Thickness	0,4 - 4	0,4 - 4	0,4 - 4
Width	400 - 1650	30 - 1650	200 - 1650
Length	N/A	N/A	220 - 6000

Tolerances: hot-rolled, pickled in accordance with EN 10051, uncoated or electro-galvanised in accordance with EN 10131, hot-dip galvanised in accordance with EN 10143. Other tolerances and special edge shapes are available by agreement.

Chemical composition of cold-rolled complex-phase steels										
Steel grade	C %	Si %	Mn %	P %	S %	Al %	Ti + Nb %	Cr + Mo %	B %	Cu %
CR570Y780T-CP	≤ 0.18	≤ 1.00	≤ 2.50	≤ 0.050	≤ 0.010	0.015 – 1.0	≤ 0.15	≤ 1.00	≤ 0.005	≤ 0.20
CR780Y980T-CP	≤ 0.23	≤ 1.00	≤ 2.70	≤ 0.050	≤ 0.010	0.015 – 1.0	≤ 0.15	≤ 1.00	≤ 0.005	≤ 0.20
CR900Y1180T-CP	≤ 0.23	≤ 1.00	≤ 2.90	≤ 0.050	≤ 0.010	0.015 – 1.0	≤ 0.15	≤ 1.00	≤ 0.005	≤ 0.20

Mechanical properties of cold-rolled complex-phase steels (test in longitudinal direction)						
Steel grade	Elongation limit $R_{p0,2}$ MPa	Tensile strength R_m MPa	Fracture elongation			BH_2 MPa
			Type 1 A_{50mm} %	Type 2 A_{80mm} %	Type 3 A_{50mm} %	
CR570Y780T-CP	570 – 720	780 – 920	≥ 11	≥ 10	≥ 11	≥ 30
CR780Y980T-CP	780 – 950	980 – 1140	≥ 7	≥ 6	≥ 7	≥ 30
CR900Y1180T-CP	900 – 1100	1180 – 1350	≥ 6	≥ 5	≥ 8	≥ 30

The elongation at break of specimen shape 3 is informative only.

Chemical composition of cold-rolled dualphase steels with improved formability										
Steel grade	C %	Si %	Mn %	P %	S %	Al %	Ti + Nb %	Cr + Mo %	B %	Cu %
CR440Y780T-DH	≤ 0.18	≤ 0.80	≤ 2.50	≤ 0.050	≤ 0.010	0.015 – 1.0	≤ 0.15	≤ 1.40	≤ 0.005	≤ 0.20
CR700Y980T-DH	≤ 0.23	≤ 1.80	≤ 2.90	≤ 0.050	≤ 0.010	0.015 – 1.0	≤ 0.15	≤ 1.40	≤ 0.005	≤ 0.20

Mechanical properties of cold-rolled dualphase steels with improved formability (test in longitudinal direction)								
Steel grade	Elongation limit $R_{p0,2}$ MPa	Tensile strength R_m MPa	Fracture elongation			n		BH_2 MPa
			Type 1 A_{50mm} %	Type 2 A_{80mm} %	Type 3 A_{50mm} %	n_{4-6}	$n_{10-20/Ag}$	
CR440Y780T-DH	440 – 550	780 – 900	≥ 19	≥ 18	≥ 19	≥ 0.18	≥ 0.13	≥ 30
CR700Y980T-DH	700 – 850	980 – 1180	≥ 14	≥ 13	≥ 14	–	–	≥ 30

The elongation at break of specimen shape 3 is informative only.

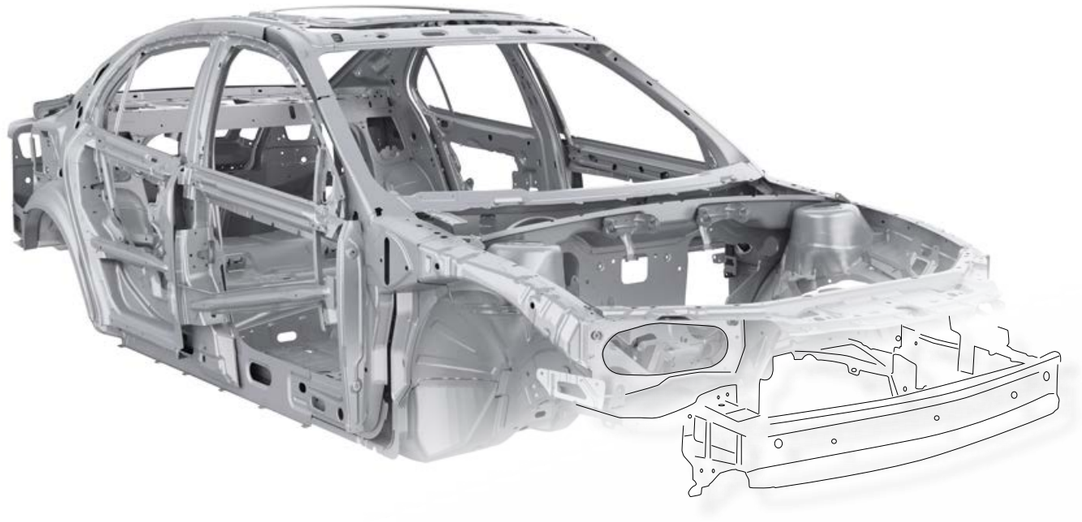
AUTOMOTIVE SHEETS - cold-rolled (coated or uncoated)

Delivery range in mm	Coils	Slit strips	Cut-to-length sheets
Thickness	0,4 - 4	0,4 - 4	0,4 - 4
Width	400 - 1650	30 - 1650	200 - 1650
Length	N/A	N/A	220 - 6000

Tolerances: hot-rolled, pickled in accordance with EN 10051, uncoated or electro-galvanised in accordance with EN 10131, hot-dip galvanised in accordance with EN 10143. Other tolerances and special edge shapes are available by agreement.

Chemical composition of cold-rolled martensite-phase steels										
Steel grade	C %	Si %	Mn %	P %	S %	Al %	Ti + Nb %	Cr + Mo %	B %	Cu %
CR860Y1100T-MS	≤ 0.13	≤ 0.50	≤ 1.20	≤ 0.020	≤ 0.025	≤ 0.010	≤ 0.15	≤ 1.00	≤ 0.010	≤ 0.20
CR1030Y1300T-MS	≤ 0.28	≤ 1.00	≤ 2.00	≤ 0.020	≤ 0.025	≤ 0.010	≤ 0.15	≤ 1.00	≤ 0.010	≤ 0.20
CR1220Y1500T-MS	≤ 0.28	≤ 1.00	≤ 2.00	≤ 0.020	≤ 0.025	≤ 0.010	≤ 0.15	≤ 1.00	≤ 0.010	≤ 0.20
CR1350Y1700T-MS	≤ 0.35	≤ 1.00	≤ 3.00	≤ 0.020	≤ 0.025	≤ 0.010	≤ 0.15	≤ 1.00	≤ 0.010	≤ 0.20

Mechanical properties of cold-rolled martensite-phase steels (test in longitudinal direction)						
Steel grade	Elongation limit $R_{p0,2}$ MPa	Tensile strength R_m MPa	Fracture elongation			BH_2 MPa
			Type 1 A_{50mm} %	Type 2 A_{80mm} %	Type 3 A_{50mm} %	
CR860Y1100T-MS	860 – 1120	1100 – 1320	≥ 3	≥ 3	≥ 3	≥ 30
CR1030Y1300T-MS	1030 – 1330	1300 – 1550	≥ 3	≥ 3	≥ 3	≥ 30
CR1220Y1500T-MS	1220 – 1520	1500 – 1750	≥ 3	≥ 3	≥ 3	≥ 30
CR1350Y1700T-MS	1350 – 1700	1700 – 2000	≥ 3	≥ 3	≥ 3	≥ 30



AUTOMOTIVE SHEETS

Delivery range in mm	Coils	Slit strips	Cut-to-length sheets
Thickness	0,4 - 4	0,4 - 4	0,4 - 4
Width	400 - 1650	30 - 1650	200 - 1650
Length	N/A	N/A	220 - 6000

Tolerances: hot-rolled, pickled in accordance with EN 10051, uncoated or electro-galvanised in accordance with EN 10131, hot-dip galvanised in accordance with EN 10143. Other tolerances and special edge shapes are available by agreement.

Explanation and offer of coating and surfaces

Type	Coating Class	Coating Mass per Side (g/m^2)	DEsignation per EN	Tickness per Side	Density (g/m^3)
EG	12	12 - 32 *	ZE25/25	1,7 - 4,5	7,1
	18	18 - 38*		2,5 - 5,4	
	29	29-49*	ZE50/50	4,1 - 6,9	
	47	47 - 61*	ZE75/75	6,6 - 8,6	
	50	50 - 70*		7,0 - 9,9	
	53	53 - 73*		7,5 - 10,3	
	60	60 - 80*		8,5 - 11,3	
	65	65 -85*	ZE100/100	9,2 - 12,0	
	70	70 - 90*		9,9 - 12,7	
GI	40	40 - 60*	Z100	5,6 - 8,5	7,1
	50	50 - 70*		7,0 - 9,9	
	60	60 - 90	Z140	8,5 - 12,7	
	70	70 - 100		9,9 - 14,1	
	85	85 - 115		12,0 - 16,2	
	115	115 - 155	Z275	16,2 - 21,8	
GA	40	40 - 60*	ZF100	5,6 - 8,5	7,1
	50	50 - 80	ZF120	7,0 - 11,3	
AS	30	30 - 65	AS80	10 - 20	3,0
	45	45 - 85	AS120	15 - 28	
ZM	30	30 - 55*	ZM70	4,4 - 8,6	6,4 - 6,8
	40	50 - 65*	ZM90	5,9 - 10,2	
	50	50 - 80	ZM120	7,4 - 12,5	

Coating Type	Coating Mass	Surface Quality	Surface Treatment (optional)
EG - Electrogalvanized zinc coating **GI -** Hot dip zinc coating **GA -** Hot dip coated with zinc-iron alloy **AS -**Hot dip coated with aluminium-silicon alloy **ZM -** Hot dip coated with zinc-magnesium alloy	**nn/mm** nn = g / m^2 Side 1 mm = g / m^2 Side 2	**U -** Unexposed **E -** Exposed **-/-** - For hot rolledmaterial without special requirements on surface quality	**P -** Prephosphated
UC - Uncoated			

** For hot - dipped (GI, GA, AS, ZM) hot rolled (HR) grades and EG - coated martensitic (MS) grades, the coating mass tolearnce is increased to 30 g / m^2 by increased the upper limit.*

ALUZINC, ZINC and MAGNELIS® coatings

ZINC [ZN]

The sheets are hot dip galvanised on both sides in a continuous process which protects the steel core against corrosion. They feature a smooth and uniform surface that meets the highest aesthetic requirements.

ALUZINC [AZ]

It is a steel sheet coated on both sides with an aluminium-zinc alloy in a process similar to hot-dip galvanising. It thus meets the most stringent requirements for sheet metal resistance to atmospheric corrosion and corrosion in humid environments. It additionally has a protective Easyfilm polymer coating which also protects the edges of the steel coils and enhances the aesthetics of the surface.

MAGNELIS® [ZM]

Magnelis® is a flat carbon steel, coated on both sides with a zinc-aluminium-magnesium alloy. It is distinguished by its excellent corrosion resistance in outdoor applications - at least three times better than galvanised steel and full protection on the cut edges, thanks to its self-healing properties. Magnelis® is used, among other things, in the construction industry for structural components, electrical equipment and infrastructure for agriculture, transport, solar structures and industry.

Sheet section

* Aluzinc only.

Coated sheets

COATED SHEETS [HC, UTK, INT, RAL]

Coated sheets are manufactured from hot-dip galvanised charge or coated with a dedicated alloy. This material, cleaned during pretreatment, undergoes passivation processes and is then multi-coated with one of the many available coatings. This provides excellent protection of the metallic layers and the steel core against atmospheric agents. Coatings can vary in thickness, colour, and surface texture.

MULTILAYER SHEET, TABLET SHEETS

SP35 Multilayer has a 40 µm thick polyester varnish with Z275 zinc or ZM120 zinc-magnesium coating. It is characterised by the structure of the wood and adequate protection against corrosion and UV radiation.

We offer metal sheets for the production of wet-erase boards **(CHALKBOARD [C])** as well as dry erase boards **(MARKERBOARD [M])** with additional film protection.

HERCULIT [HC]

POLIESTER Standard [RAL]

ULTIMAT [UTK]

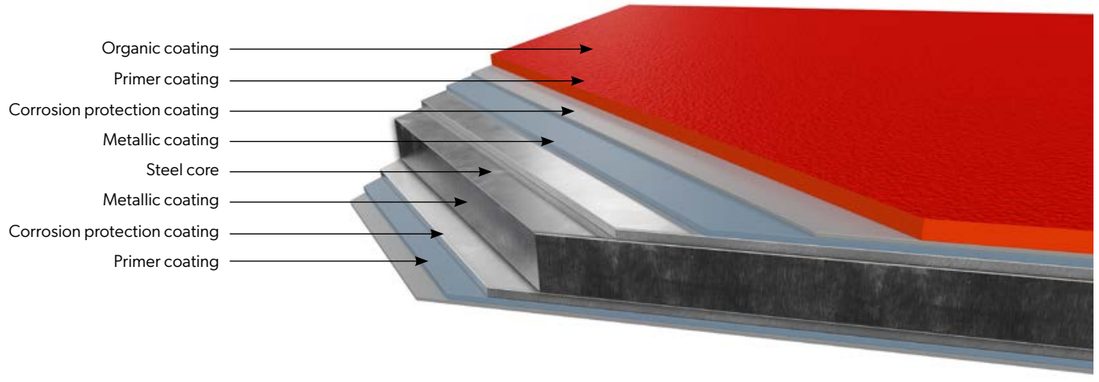
POLIESTER Interior [INT]

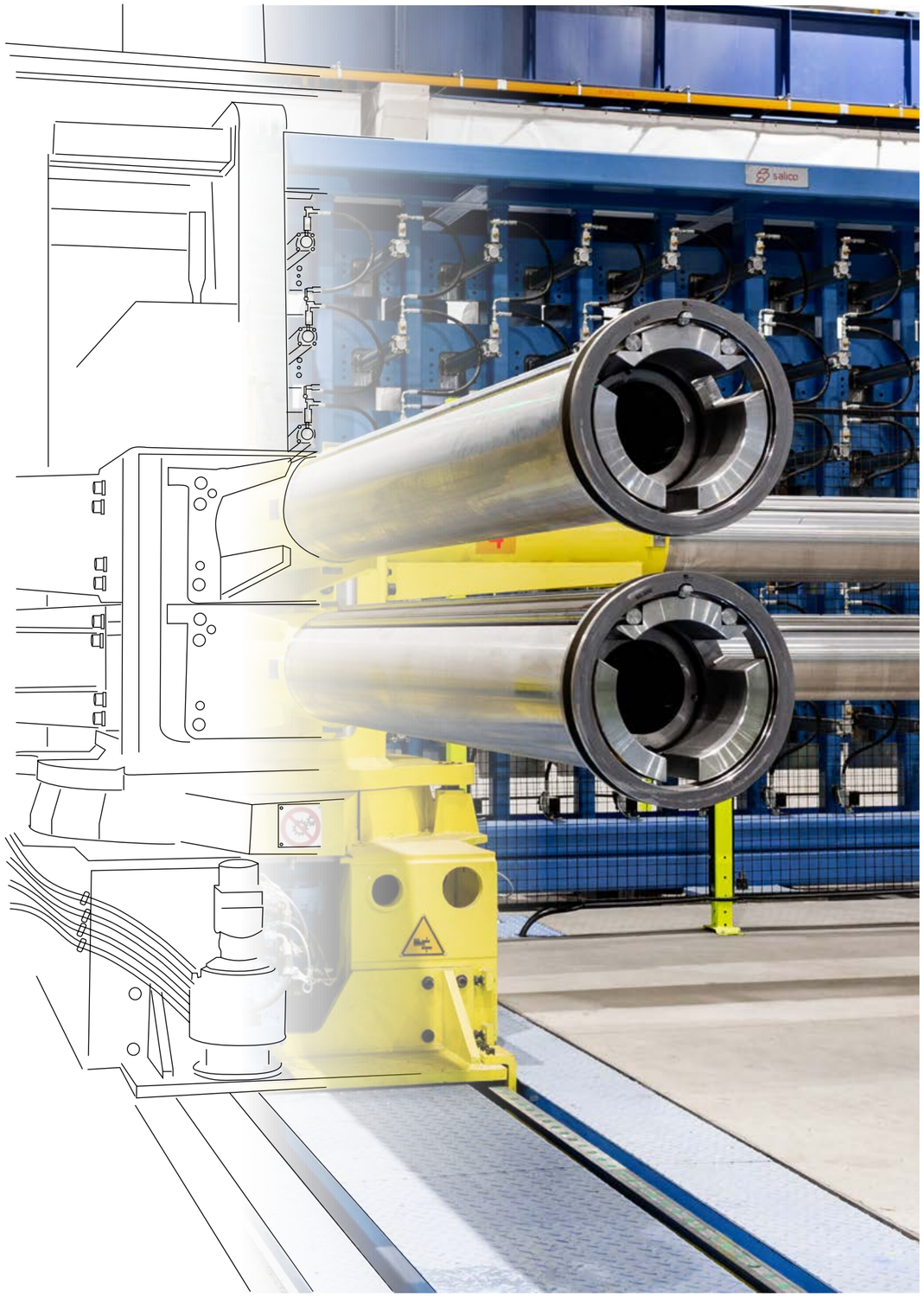
SP35 Multilayer [SP35/MULTI]

MARKERBOARD [M]

CHALKBOARD [C]

Coated sheet cross-section





Coating properties

The following overview is indicative.

Code	Coatings thickness	Corrosion resistance	UV resistance
Zinc [ZN]	200 g/m² 275 g/m²	RC2	N/A
Aluzinc [AZ 150]	150 g/m²	RC2	N/A
Magnelis® [ZM]	70-620 g/m²	C2-C5*	N/A
POLIESTER Interior [INT]	15 µm	RA2	N/A
POLIESTER Standard [RAL]	25 µm	RC3	RUV2
MULTILAYER 40 [MLT]	40 µm	RC3	RUV3
MAT 35 Standard [TK]	35 µm	C3	RUV3
ULTIMAT [UTK]	35 µm	RC4	RUV4
Aluzinc [AZ 185]	185 g/m²	RC3	N/A
HERCULIT [HC]	35 µm	RC4	RUV4

*A detailed description of the corrosion resistance of Magnelis® sheets is given in the table below.

Predicted durability of Magnelis ZM310, ZM430 and ZM620 coatings (25, 35 and 50 microns per side, respectively) calculated from ArcelorMittal field tests.

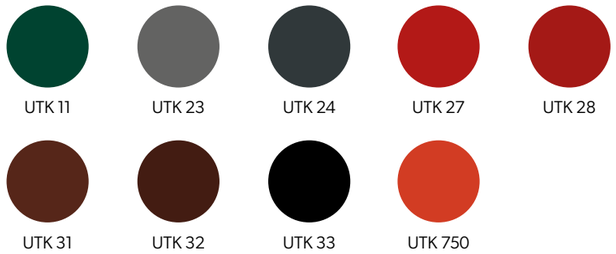
Corrosion resistance category for Zn plates according to ISO 12994-2:2017	Design life of the coating (years)		
	Magnelis® ZM310	**Magnelis® ZM430**	**Magnelis® ZM620**
C2	> 50	> 50	> 50
C3	30 to > 50	40 to > 50	> 50
C4	15 to 30	20 to > 40	30 to > 50
C5	8 to 15	10 to > 20	15 to 30

The expected design life of the coating is the average time to wear on a surface of 100% undamaged coating, exposed only to weathering. At this point, the structural integrity of the coated part is no longer assured and a major repair is required. These estimates apply to both exterior and interior applications, excluding situations where the coating is in constant contact with a moisture source such as soil or concrete. The durations given are indicative and non-binding.

Colours

HERCULIT [HC]

ULTIMAT [UTK]

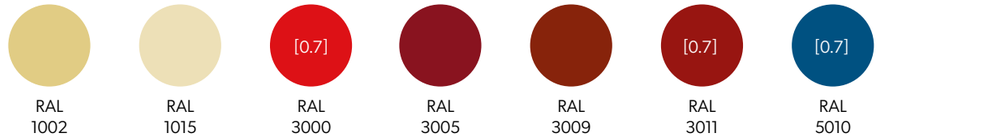


MAT 35 Standard [TK]

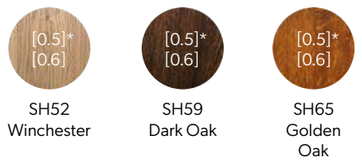
In addition, custom colours and coatings are available upon individual request, outside of the palette shown.

Printing technology does not allow for faithful colour rendition, so the colours shown are approximate and may differ from actual colours.

POLIESTER Standard [RAL]

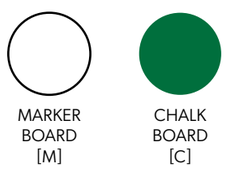


SP35 Multilayer [SP35/MULTI]



Metallic coating

Board sheets



	Standard sheet thickness is 0.5 mm
[0.6]	Material also available in 0.6 mm thickness
[0.7]	Material also available in thickness of 0.7 mm
[0.8]	Material also available in 0.8 mm thickness
[1.0]	Material also available in 1.0 mm thickness

3.

High quality

62. High quality

63. VSS laboratory

High quality

Quality

Our production halls are equipped with state-of-the-art machinery and fully automated, specialised production lines, guaranteeing reproducible achievement of the highest product quality parameters with optimal use of raw material.

Our unique quality control system covers the entire production process: from the identification of the characteristics of the raw material to the stage of multi-level control of the finished product. We process the raw material of the largest and best European and global steel producers. As a result, we can guarantee our contractors the highest precision in cutting, both in terms of accuracy and repeatability of dimensions, as well as flatness and cutting edges.

CERTIFICATE

No. 4214593

This is to certify the Quality Management System of

VSS

VSS, s.r.o.
Kmetova 26
04001 Kosice - mestska cast Stare Mesto
Slovakia

has been assessed and found to be in compliance with the Standard

ISO 9001:2015

applicable to

Production of self-supporting double skin metal faced insulating sandwich panels with a PIR core and mineral wool. Production of steel sheets in the form of sheets, strips and strips from multiple hot and cold rolled steel coils and coated hot and cold rolled steel coils. Production of modular roof steel covers, gutters and sheet metal profiles. Production of photovoltaic panels fully integrated in modular steel roofing. Scientific development and research.

The certificate has been issued under No. **4214593** for the registration period from 25 September 2023 to 24 September 2026.
The first certificate date of issue is 25 September 2023.

Approved by

Printed by

validity code **9F6B1A13-EE6**
Check the validity of this certificate using this code at **www.ii-c.info**
I.I.C. (Certification) Czech Republic a.s. / Pobřežní 620/3, 186 00 Praha 8

Innovation

Due to the constantly changing expectations of the market, we are focused in our activities on the continuous development and improvement of all stages of production and the expansion of our product range.
We see innovation as a real priority, we:
analyse the needs of the market, try to recognise and even anticipate current trends, invest in the purchase of modern machinery from renowned manufacturers, plan and implement the world's most advanced technologies, systematically improve the procedures of the quality control system, maintain high standards of the quality management system confirmed by certificates.

VSS laboratory

Quality of the products in our offer is of great importance. Our focus is made on overall aesthetics and the extremely important technical aspects, both. We have established our own professional laboratories in Poland and Romania, where our products and materials are subject to demanding tests. As a result of this solution, we provide safe and weather-resistant products to our customers.

Quality control is carried out with the use of our knowledge and the innovative testing equipment. We rely on the professional team of specialists who investigate the processes at time of coating and processing the steel from our offer. In laboratory tests, we are able to faithfully simulate conditions that reflect several decades of the exposure to various atmospheric factors.

VSS - Laboratory
Scan code and learn more!

4.

About us

Welcome to BP2 world

BP2 has been a valued manufacturer of complete solutions for residential and industrial construction since 1995. We also offer our services as part of the Steel Service Centre.

We are the creators of the SOLROOF brand and products – integrated photovoltaic roof. BP2 has three production plants in Poland (Cracow, Dąbrowa Górnicza) and Slovakia (Košice).

Why us?

We believe in what we do and we are true to our values.

We are discerned with a solid bond with customers, which is based on respect and trust. In our company, every element of a great machine must fit together perfectly. Our company is built on four pillars that are strong as steel, guarantee stability and enable continuous development. These basic assumptions guarantee high efficiency and quality, with the resultant sense of solidarity and confidence in cooperation. Therefore, you can focus on achieving your goal.

PEOPLE

The whole company and the positive relations are created by people. Everybody in the BP2 team has the respective opportunities for comfort work and the best tools for its performance.

For this purpose, we constantly improve our management processes. Our decision-making and information flow is transparent.

Similarly to a pack of wolves, we work as a team to achieve the success.

RELATIONSHIPS

At BP2, we have been building professional relationships with our customers, suppliers and affiliates for many years.

We are focused on transparent communication and dialogue. We care about our customers by offering them modern cooperation tools and marketing software support.

Our company flexibly adapts to the customer needs, because nature of the market is ever-changing.

TECHNOLOGY

We focus on innovative solutions and modern technologies ensuring constant optimization of the production, expansion of our offer, quality improvement of our products and services, while simultaneously maintaining the sustainable development and safety of employees.

QUALITY

Quality is our priority. In all BP2 production plants the complete control system has been implemented for all the processes and products, with the purpose of the highest quality in action. DVS ZERT GmbH certification unit, located in Dusseldorf, provides constant supervision over our quality-oriented internal promotion activities. Our constant care for the quality of products is proved by the Certificate issued and renewed each year. This Certificate confirms the perfect operation of the Production Control System in the plant.

Housing

BP2 manufactures modular and compact sheet metal roofing tiles and corresponding products in the form of cut-to-size sheets. We can also boast three innovative models of roof panels, as well as a wide range of trapezoidal and corrugated sheets. Our range is complemented by gutter systems and dedicated flashings and roof accessories.

Industrial building

Our offer includes a wide range of products intended for the implementation of investment tasks, i.e. production halls, outbuildings or commercial and sports facilities. We offer comprehensive solutions for industrial construction, such as structural trapezoidal sheets and corrugated SINUS sheets, wall cladding and façade coffers. Our offer also includes sandwich panels with PIR, PUR and WOOL filling. Products dedicated to industrial construction are also available in perforated versions at the customer's request. The available solutions are of the highest quality that enable them to be used in even the most demanding industrial applications.

Steel Service Centre

It was created for customers looking for materials with specific properties and degrees of processing. We ensure constant availability and a wide selection of steel grades, thicknesses and coatings recommended by BP2. We realize individual orders with any parameters. Sheet metal processing includes rewinding, longitudinal and transverse cutting as well as protection with protective foils. We make it possible to cut metal sheets into sheets or formats with dimensions indicated by the customer. We offer perforation of sheets with metallic and organic coatings. We also accept orders using entrusted material, ensuring optimal use thanks to high-quality production processes.

History

1995 LET'S GET STARTED!

Initially focused on the Polish market. The headquarters of our company is in Cracow and it is here that the heart of production is located for the first few years.

FIRST LINE 1999

We launch the first roofing production line and start creating our own products.

2007 LOGISTIC CENTRE

We are opening a modern logistics and production centre located in Cracow, thanks to which we diversify our product offer and introduce new, competitive solutions to the market.

IMPRO 2009

New directions of development led to the creation of the IMPRO brand, which belongs entirely to the BP2 capital group. The headquarters of the Romanian company looks almost identical to its prototype, i.e. BP2 in Cracow.

2009 INTO EUROPE

We create our own distribution network in Europe. Our permanent sales representatives operate in the Czech Republic, Slovakia, Lithuania, Hungary and Romania. In this way, we not only become important players on the European arena, but also have the opportunity to indicate new trends in roofing.

AUTOMATION 2011

We believe in the power of technology, which not only ensures increased production, but also allows you to increase the comfort and safety of work. In 2011, we automated manufacturing processes in the logistics and production centre in Cracow.

2015 NEW PRODUCTION PLANT

We launch an innovative, automated production hall and expand the offer of structural sheets. From now on, our production plants are located not only in Małopolska, but also in the Silesian Voivodeship in Dąbrowa Górnicza.

CLUJ NAPOCA 2016

We open a modern production hall in the Transylvanian Highlands in north-western Romania. Thus, we create new jobs for the inhabitants of Cluj Napoca.

2017 ADAM MAŁYSZ AND THE ACADEMY OF MASTERS

Adam Małysz officially becomes the Ambassador of the BP2 brand! The best ski jumper among roofers, the best roofer among ski jumpers. In the same year, we also launched an original training program as part of mobile and stationary meetings of the ACADEMY OF MASTERS. Our trainings raise the standards of roofing knowledge and allow specialists to become even more competitive on the market.

WOLF 2018

Choosing the image of a wolf for the BP2 signet ring. Wolves are herd animals whose lifestyle symbolizes the idea of teamwork that is close to our hearts

2018 INVESTMENTS

The former MARCEGAGLIA production plant in Romania was incorporated into the BP2 capital group. From now on, we start the production of sandwich panels in Romania.

IZI 2019

We introduce to our offer the original IZI flat modular tile, which is the latest trend in aesthetic and modern construction.

2020 COMPACT SERIES

We introduce COMPACT SERIES sheet metal roof tiles to our offer, manufactured on the basis of classic solutions in the form of light, two-module sheets. We have also introduced ready-made mounting holes that facilitate the installation of metal roof tiles and eliminate the risk of making a technical error.

MODERN TRAINING CENTRE 2021

In order to provide the participants of the Academy of Masters with the best possible development opportunities, we have created a training room in our production plant in Dąbrowa Górnicza. This is a special place that we have filled with the equipment necessary to expand roofing skills, raising the knowledge and practice of specialists to a different level.

2022 EXPANSION OF IMPRO ACTIVITIES

In 2022, we undertook many investment activities, including the expansion of the IMPRO production plant.
We also established the Academy of Masters operating at one of the IMPRO production plants – for this purpose, a modern training centre was created, enabling the improvement of practical skills.

SOLROOF – INTEGRATED PHOTOVOLTAIC ROOF 2023

In 2023, we launched our new brand and products SOLROOF, an integrated photovoltaic roof, which was developed in response to the growing demand for clean energy.

2023 VSS

We open a modern logistics and production centre in Košice – the largest city in eastern Slovakia. From that point on we start the production of sandwich panels in Slovakia.

CONSOLIDATION 2024

In 2024, we decided to unify our brands and take decisive steps to respond to the market situation in the entire Central and Eastern Europe. As a result, we decided to phase out the operations of both production plants in Romania, operating under the IMPRO brand, and transfer the resources invested there to sectors with the greatest potential.

Production plants

BP2 has 3 integrated production plants in Poland and Slovakia.
The plants are connected logistically and systemically, creating a uniform structure of production plants of high product specialization.

1 Production plant in Kraków

It is one of the first production plants built by BP2. It was brought to life in 2007. Its modern appearance and interior design became the starting point for subsequent BP2 investments. A well-thought-out location, located at the A4 motorway, makes our plant an ideal logistics point. In the production plant, we focus on the production of products for housing construction.

2 Production plant in Dąbrowa Górnicza

The dynamic development has opened up new opportunities for us. In 2015, a production plant in Dąbrowa Górnicza was purchased. This part of the capital group quickly began to play an important role in the global production of BP2. There is also a BP2 training centre in Dąbrowa Górnicza, where, as part of the Academy of Masters – an original practical training program conducted by the Certified Roofing Master Waldemar Piela, we enable you to gradually optimize your work and improve your qualifications.

3 Production plant in Košice

Due to our dynamic development, in 2022 we opened another production plant in Slovakia, located in the second largest city of our southern neighbours. The 21,000 m^2 plant is a state-of-the-art steel centre equipped with Salico systems and lines for the production of roof and façade sandwich panels.

FIT VOLT

2IN1 STEEL **PHOTOVOLTAIC ROOF**

Scan code or find out more at **www.solroof.eu**

What is SOLROOF?

SOLROOF is an innovative system that was created in response to the growing demand for clean energy. It is the only complete photovoltaic system on the market that is fully integrated into the steel roofing. Proprietary solutions allow for unique aesthetics of the roof and the use of various forms and shapes, which is not possible to achieve in the case of a conventional photovoltaic installation. The combination of FIT sheet metal panels and integrated FIT VOLT photovoltaic panels creates a coherent, harmonious coverage surface.

The SOLROOF integrated photovoltaic roof represents new quality that, as the first on the market, offers architects unlimited design possibilities, roofers easy and quick installation and the investor a unique visual effect, efficiency and safety of use. We achieve this by using one product, one assembly, one warranty, and one service.

THE POWER OF ROOFS | SOLROOF

6.

Contact us

VSS - Helpful links

VSS website

Login to Eprofil system

facebook.com/bp2eu

instagram.com/bp2_eu

linkedin.com/company/bp2eu

youtube.com/@BP2eu

Packaging catalogue

Customer card

Statement on leaving material

SOLROOF webside

Contact us

VSS s.r.o.
Južná Trieda 1598/82
040 17 Košice, Slovakia

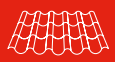
www.vss.sk

- Sales representatives
- Technical consultancy

05/2025/**EN**

Modular roofing tiles
MODULAR SERIES

Compact roofing tiles
COMPACT SERIES



Steel roofing tiles
CLASSIC SERIES

Retro roof tiles
RETRO SERIES

Roof panels
PANEL SERIES

INTEGRATED
PV PANELS

Steel roof gutter system
INGURI

TRAPEZOIDAL
SHEETS

STRUCTURAL
PROFILES

FLAT METAL
SHEETS

FLASHINGS

ACCESORIES

Roof Sandwich
PANELS

Wall Sandwich
PANELS

Facade cladding
SKRIN, LINEA

Uncoiling and slitting
SERVICES

Flat sheets and cutting
SERVICES

PERFORATION
of sheets

BP2 VSS SOLROOF