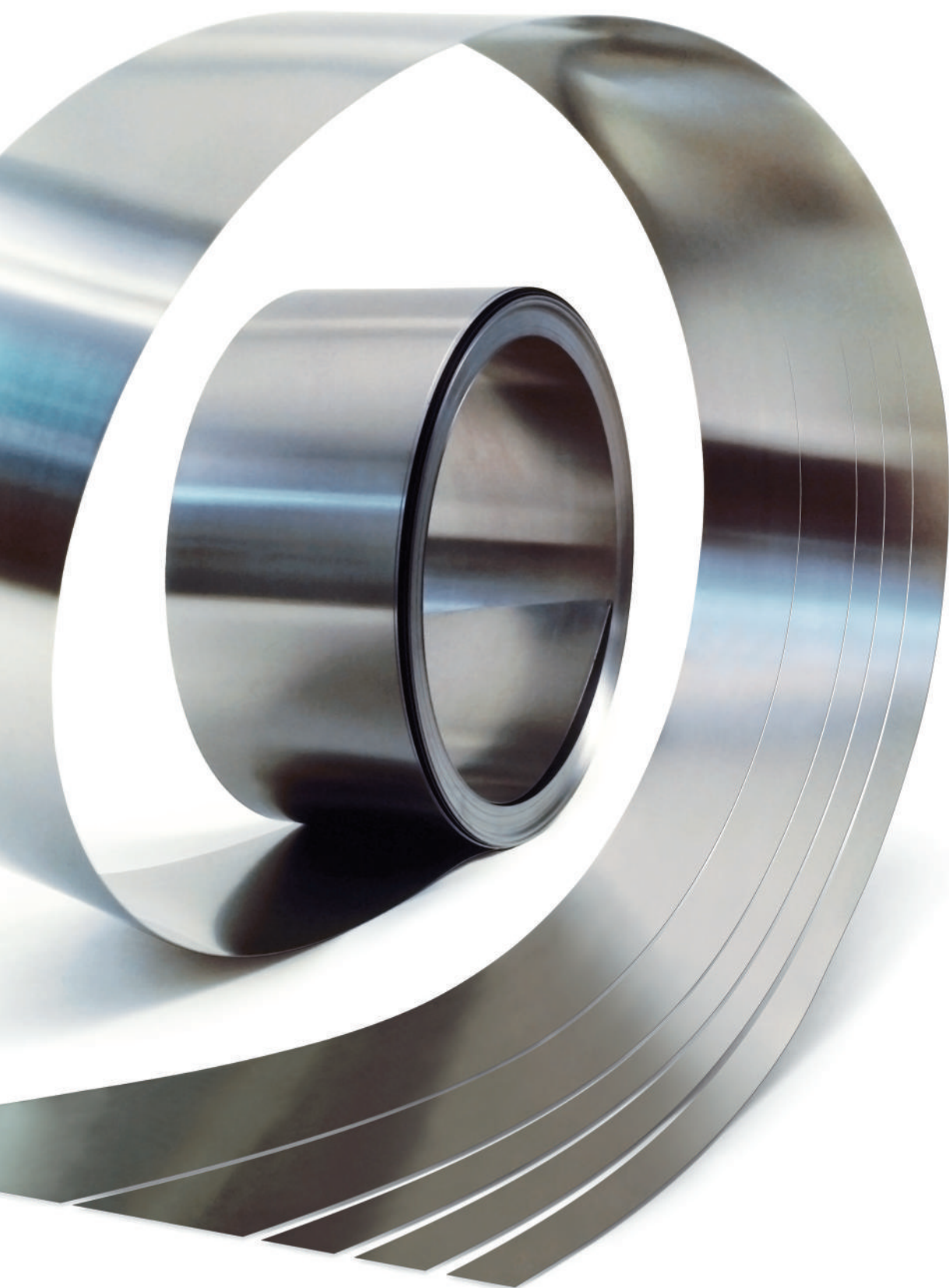


Sandvik
precision strip steel





Sandvik precision strip steel meets industry demands

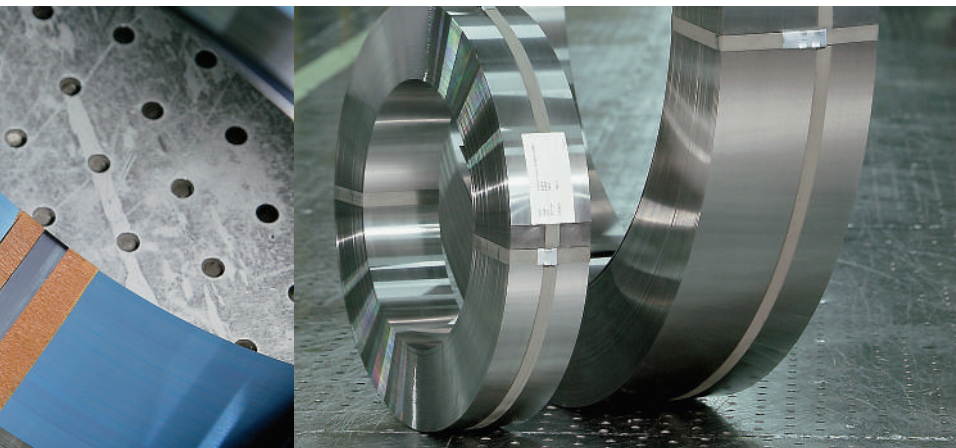
Sandvik has manufactured precision strip steel for more than a century. The knowledge and experience, which we have gained, are invested in active and ongoing product and process development for the benefit of a broad range of industries around the world. With full control of metallurgy and our own strip production, we manage the whole production process from steel melt to the finished product, using the most modern and proven technology.

Today, Sandvik is a world-leading manufacturer of high quality stainless, carbon and high alloy steels, with production facilities located in strategic markets worldwide.

Sandvik strip steel is produced in a wide range of steel grades with excellent properties in terms of corrosion resistance, strength, workability, suitability for use at high temperatures, etc. Where special steel properties are called for, we can tailor our products to meet specific customer demands. Our cold rolling mills can produce strip in thicknesses down to 0.015 mm (0.0006 in.), with tolerances down to ± 0.001 mm (0.00004 in.). The fully integrated manufacturing processes mean that we can guarantee the close controls that will ensure high quality and product reliability.

Sandvik also produces and supplies several steel grades as flat rolled wire.





Sandvik – your productivity partner for precision strip steel

With Sandvik as a partner you will be able to increase your productivity in several areas.

Technical expertise

Support and advice are always available from our technical specialists. If you have any questions about material selection, processing or our product program, please contact us through our sales units or via our website.

Tailor-made products

We have a wide range of material grades and sizes – many of which have been specially developed to meet particular demands and applications. Close cooperation with customers to meet individual needs has always been part of the Sandvik way of working.

Consistent material properties

Products with consistent and reliable quality in every delivery are the result of full quality assurance and control throughout the whole manufacturing process. Sandvik offers just that!

Easy access for you to reach us

It is easy for you to reach us via our worldwide local network of sales units and our website

www.smt.sandvik.com/strip



THE SANDVIK GROUP

Sandvik is a high-technology engineering group with advanced products and a world-leading position within selected areas. The Sandvik Group has about 47,000 employees and worldwide business activities are conducted through representation in more than 130 countries.

SANDVIK MATERIALS TECHNOLOGY

Sandvik Materials Technology is a world-leading developer and manufacturer of products in advanced stainless steels and special alloys for the most demanding environments, as well as products and systems for industrial heating.

RESEARCH AND DEVELOPMENT

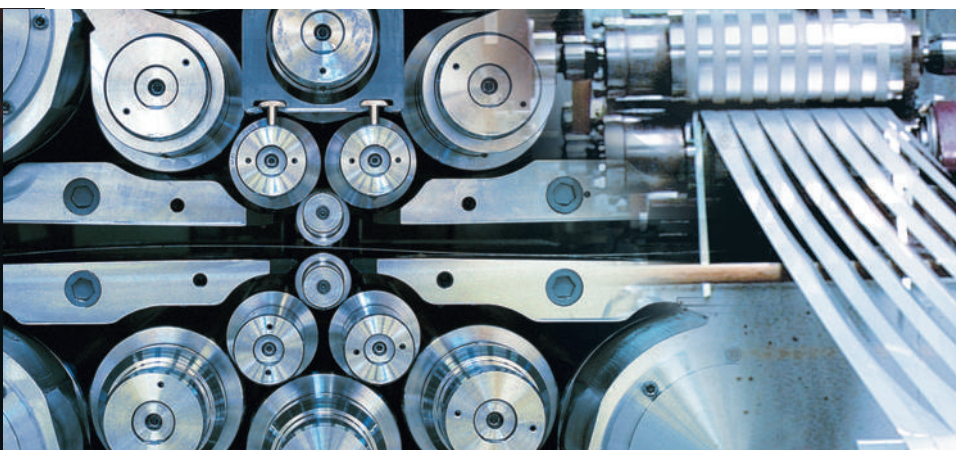
Sandvik has one of the largest steel research centers in Europe. New materials are constantly being developed and existing materials and production processes improved. In addition, we have a comprehensive program of liaison and cooperation with universities, research institutions and specialized companies that possess particular expertise.

QUALITY ASSURANCE

Sandvik Materials Technology has Quality Management Systems approved by internationally recognized organizations. We hold for example: the ASME Quality System Certificate as a Materials Organization and approval to ISO 9001 as a materials manufacturer.

ENVIRONMENT

Environmental awareness is an integral part of our business and is at the forefront of all activities within our operation. We hold ISO 14001 approval.





Valves for compressors and shock absorbers

A compressor valve must function perfectly, day after day, year after year, under conditions of very high stress. This calls for steel of the very highest quality. A special operation in our metallurgical process enables us to achieve the high degree of purity required for valve steel.

Strip is available in the hardened and tempered condition, both in stainless chromium steel and in unalloyed carbon steel.

Sandvik grade	Tensile strength, MPa (ksi)	Thickness, mm (in.)
Martensitic stainless chromium steel		
Hiflex	1900 (276)	0.102–1.0 (0.004–0.039)
7C27Mo2	1800 (261)	0.102–1.2 (0.004–0.047)
Carbon steel		
20C*	1600–2100 (232–305)	0.102–1.2 (0.004–0.047)

* Depending on thickness

Our strip steel for valves has a high degree of:

- Bending and impact fatigue strength
- Flatness
- Surface quality
- Wear resistance
- Purity
- Blanking properties

Valves manufactured from Sandvik strip steel are used in many kinds of compressor applications, for example:

- Refrigeration and freezing
- Air conditioning

As well as in:

- Heat pumps
- Air brake compressors
- Valves in two-stroke engines
- Industrial compressors

Further information

S-343 Strip steel for flapper valves, S-3847 Sandvik Hiflex, S-3845 Sandvik 7C27Mo2, S-3651 Sandvik 20C for flapper valves, S-3852 Sandvik 20C for shock absorbers

Edge and shaving applications

One of our long established products is martensitic stainless chromium steel for the manufacture of razor blades. The fine grained homogeneous and decarburization free structure of the steel provides optimum hardening properties, essential for a sharp and corrosion resistant edge.

We have several different types of hardenable stainless chromium steel in our standard range of products. Each of these has its own particular combination of hardness and corrosion resistance properties.

In addition to its use for razor blades, our strip is used for different kinds of kitchen knives, butchers' knives, hunting, fishing and hobby knives, industrial knives, cutting heads in electric shavers, scissors, ice-skate blades and much more.

We also supply carbon strip steel, e.g. for the production of leather splitting and tannery knives.

Sandvik grade	Tensile strength, MPa (ksi)	Thickness, mm (in.)	Data sheet
Precipitation hardenable steels			
Nanoflex	950–1850 (138–268)	0.015–2 (.0006–.08)	S-3830
Martensitic stainless chromium steels			
6C27	600–1000 (87–145)	0.1–2.5 (0.004–0.098)	S-3824
7C27Mo2	700–1000 (123–145)	0.1–4.5 (0.004–0.177)	S-3825
12C27M	700–1000 (102–145)	≥1.00–4.5 (0.04–0.177)	S-3821
12C27	700–1000 (102–145)	≥1.00–4.5 (0.04–0.177)	S-3820
13C26	700–1100 (102–145)	0.1–3.00 (0.004–0.118)	S-3822
19C27	700–1100 (102–145)	0.1–3.00 (0.004–0.118)	S-3823
14C28N	700–1000 (102–145)	0.1–4.5 (0.004–0.177)	14C28N

Further information

S-333 Strip steel for edge applications, S-3331 Recommendations for sharpening stainless steel skate blades, S-3332 Stainless chromium steel for razor blades



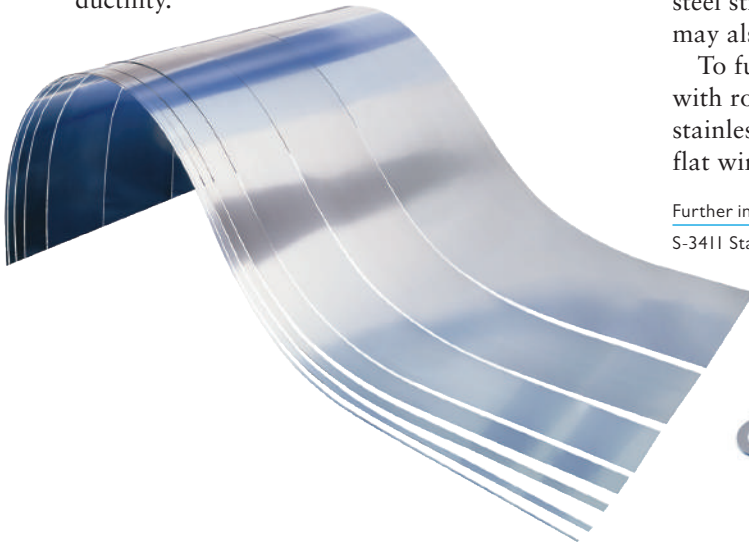
Spring applications

A spring has to meet many challenging requirements. First of all, it must provide the required spring force. It also has to function reliably during a long service life, even if its working environment is corrosive or demanding in other ways. Furthermore, it is an advantage if the spring is easy to manufacture. Therefore, formability of the material is very important.

Sandvik Materials Technology offers a wide range of strip steel in both stainless and carbon steel grades for the manufacture of coiled and formed springs.

Austenitic and duplex stainless steels

Our product program comprises many different grades, performance capabilities and dimensions for all types of demanding applications with different requirements on strength, relaxation resistance, fatigue strength, corrosion resistance and ductility.



We specialize in the production of extremely thin strip (down to 0.015 mm, 0.0006 in.) with high strength (up to 2050 MPa, 297 ksi) and very close thickness tolerances (down to ± 0.0015 mm, 0.00004 in.).

For spring manufacturing involving severe forming and/or requirements with a low spring-back, we can deliver strip in a relatively soft condition to assist forming.

A simple tempering heat treatment increases strength by 50-800 MPa (7-116 ksi) depending on grade and the initial tensile strength.

Martensitic stainless chromium steel and carbon steels

Hardened and tempered stainless chromium steel is used mainly for springs for which a very high degree of flatness is required. For purposes where resistance to corrosion is not important, carbon steel strip in the hardened and tempered condition may also be an alternative.

To further improve fatigue life, we offer strip with rounded edges. Sandvik also manufactures stainless steel for springs in the form of round and flat wire.

Further information

S-3411 Stainless steels for springs and other demanding applications



Sandvik grade	Tensile strength, MPa (ksi)	Width, mm (in.)	Thickness, mm (in.)
Austenitic stainless steels			
12R11	800–1900 (116–276)	2–345 (0.08–13.6)	0.015–3 (.0006–.12)
11R51	1700–2050 (247–297)	2–345 (0.08–13.6)	0.015–1.5 (.0006–.06)
13RM19	850–1600 (123–232)	2–345 (0.08–13.6)	0.015–3 (.0006–.12)
3R12	600–1300 (87–189)	2–325 (0.08–12.8)	0.015–2 (.0006–.08)
Precipitation hardenable steels			
9RU10	1200–1700 (174–247)	2–360 (0.08–14.2)	0.015–3 (.0006–.12)
Nanoflex	950–1850 (138–268)	2–330 (0.08–13)	0.015–2 (.0006–.08)
1RK95	1050–1450 (152–254)	2–350 (0.08–13.8)	0.015–3.5 (.0006–.14)
Duplex stainless steels			
SAF 2205	1100–1700 (160–239)	2–300 (0.08–12)	0.03–3.5 (.0012–.14)
SAF 2507	900–1600 (131–232)	2–300 (0.08–11.8)	0.015–4 (.0006–.16)
Ni-base alloy			
Sanicro 75X	750–1350 (109–196)	2–200 (0.08–7.9)	0.015–4 (.0006–.16)
Martensitic stainless chromium steel			
Chromflex	1700 or 1800 (247 or 261)	2–350 (0.08–13.8)	0.08–1.5 (.002–.06)
7C27Mo2			
Carbon steels			
15LM	1500–1950 (218–283)	2–360 (0.08–14.2)	0.076–1.4 (.003–.06)
20C	1600–2100 (232–305)	2–360 (0.08–14.2)	0.076–1.4 (.003–.06)

Medical applications

Sandvik supplies advanced strip steel for medical applications. Our product offering includes a wide range of stainless steels to meet the tough requirements called for in the medical field. This is not our only strength. We also offer service benefits that give medical device manufacturers the competitive edge needed to satisfy their customers and build business.



The martensitic stainless chromium steel Sandvik Bioline 7C27Mo2 is a strip steel with very high corrosion resistance, toughness and fatigue properties. It is ideal for use in medical instruments that have tough requirements to meet. It can be supplied either hardened and tempered or annealed, depending on customer requirements. Sandvik Bioline 13C26 is the natural choice for applications like surgical blades where high hardness, edge retention and corrosion resistance are needed. Sandvik Bioline 316LVM is specially tailored for implant applications. The vacuum re-melting process together with strict chemical control produces a high purity product with good mechanical properties and resistance to corrosion.

Further information

- S-006 Adding strength to strength (Sandvik Bioline)
- S-333 Strip steel for edge applications
- S-3822 Sandvik 13C26 (Cold rolled or annealed)
- S-3825 Sandvik 7C27Mo2 (Cold rolled or annealed)

Sandvik grade

Austenitic and duplex stainless steels and Ni-base alloys

12R11, 11R51, 13RM19, 3R12, 316LVM, 9RU10, Nanoflex
Sandvik SAF 2507
Sanicro 75X

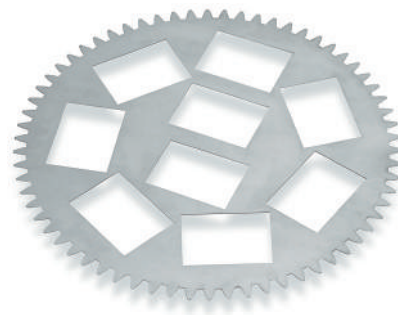
Alloyed non-stainless steels and carbon steels

11L, 13C, 15LM, 15N2
20C, 20C2

Martensitic stainless chromium steels

Chromflex, 6C27, 7C27Mo2, 12C27, 13C26

The size ranges appear on the graphs on page 14.



Other applications for thin precision strip

Austenitic and duplex stainless steels

Our modern and technically advanced cold rolling mills, with automatic thickness controls, enable us to manufacture cold rolled strip that meets very tight thickness tolerances. In addition to our standard austenitic steels, we have a wide range of special grades, each with specific properties, e.g. non-magnetic, very high corrosion resistance or excellent formability. Examples of applications for thin precision strip include parts in mobile phones or in printers, gaskets for electromagnetic shielding and expansion bellows in thermostats.

Martensitic stainless chromium steels

The proportion of carbon to chromium in the steel is carefully controlled to give the steel good hardening and tempering properties. Sandvik Chromflex™ is a family of martensitic, stainless chromium strip steels with a unique combination of very good properties; tensile strength, shape, resistance to wear and fatigue strength. An example of end use is sealing strip in pneumatic cylinders. It is also suitable for photochemical machining, laser and water jet cutting of components for the electrical and medical industries.

Further information

- S-3411 Stainless steels for springs and other demanding applications



Industrial blade applications

Sandvik's leading metallurgy enables us to produce strip steel with optimum and consistent properties. The materials, which we produce for blades in the printing and food processing industries, have been tailored to achieve the highest precision and best possible performance.

Cold rolling provides the basis

Our modern cold rolling mills produce strip steel with close thickness tolerances and excellent straightness. A perfect shape is produced in the strip in order to achieve the desired straightness.

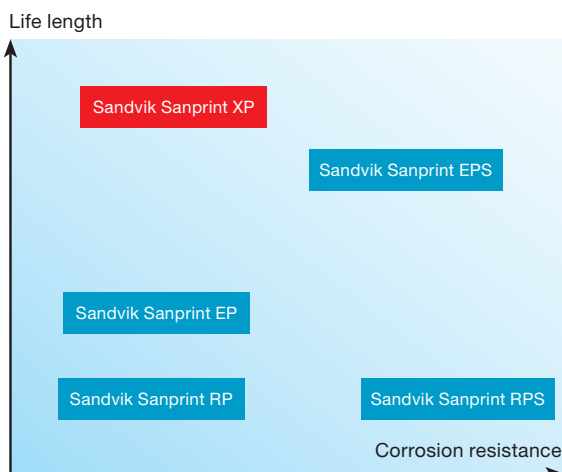
The hardening process is the key

In the hardening and tempering process the final microstructure, mechanical properties and flatness of the strip products are set. Through in-line polishing the surface execution is obtained as well.

Blades for customers' requirements

Straightness, wear resistance, microstructure and strength have to meet very high standards as a prerequisite for smooth, problem free manufacturing and perfect processing. The edge execution is of utmost importance and we can tailor a variety of edges to fit our customers' demands.

To the printing industry Sandvik offers a wide product portfolio for doctor blades that matches the requirements of the segment.



A complete portfolio

Whether it is long print life or corrosion resistance that customers require, Sandvik has doctor blade steels for every need.

Further information

S-346 How quality printers can profit from quality doctor blade steel

Sandvik	Tensile strength, MPa (ksi)	Width, mm (in.)	Thickness, mm (in.)
Carbon steels			
15LM	1500–1950 (218–283)	8–320 (0.32–12.6)	0.15–1.4 (0.006–0.06)
20C	1600–2100 (232–305)	8–320 (0.32–12.6)	0.076–1.27 (0.0030–0.05)
20C2	1900–2100 (276–305)	8–320 (0.32–12.6)	0.102–0.305 (0.0040–0.012)
Stainless steels			
7C27Mo2	1700–2000 (247–290)	8–340 (0.32–13.4)	0.076–1.5 (0.0030–0.06)
13C26	1800–2100 (261–305)	8–310 (0.32–12.2)	0.076–0.203 (0.0030–0.0080)

Surfaces

Surface finish

Sandvik strip steel can be delivered in several different surface finishes. To describe a surface appearance correctly, one has to indicate both its appearance and its roughness.

Surface appearance

In the table, surface appearance is defined in terms of brightness and color. Stainless steels are not usually color tempered and are, therefore, not delivered in codes 6 and 7.

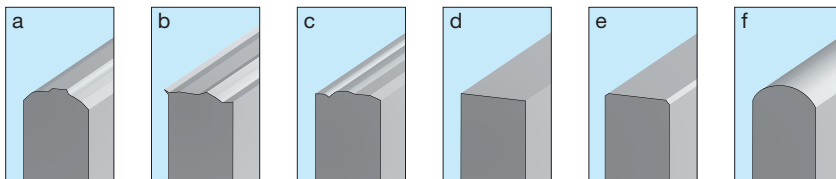
Surface roughness

Surface roughness is measured with a special trailing-stylus instrument. The relevant terminology and measuring methods can be found in EN ISO 4287 and EN ISO 4288.



Surface roughness		
Class	Class limit Ra, μm ($\mu\text{in.}$)	Class mean Ra μm ($\mu\text{in.}$)
Y2	3.2–8 (126–315)	5.0 (197)
Y3	1.6–4 (63–157)	2.5 (98)
Y4	0.8–2 (31–79)	1.25 (49)
Y5	0.4–1 (16–39)	0.63 (25)
Y6	0.2–0.5 (8–20)	0.32 (13)
Y7	0.1–0.25 (4–10)	0.16 (6)
Y8	0.05–0.125 (2–5)	0.08 (3)

Surface appearance		
Code	Surface	Definition
0	No requirements	Normally an oxidized surface for which there are no appearance requirements.
2	Dull	Dull smooth surface.
3	Bright	Normal bright smooth surface.
4	Very bright	Mirror surface meeting very stringent requirements on uniform appearance.
6	Yellow	Yellow, oxidized surface with uniform color.
7	Blue	Blue, oxidized surface with uniform color.
8	White	Surface free from oxide discoloration and with uniform color.
9	Special	Surface as specified by customer.



Edges

Sandvik strip steel can be delivered with a variety of edge finishes, to suit customer requirements. The choice of edge finish depends on the application; however, the availability of finishes is dependent on steel grade, size and tolerance. Here only standard profiles are shown, but other finishes are also available, e.g. bevelled edge.

a) Mill edge

Untreated edge, generally with a somewhat uneven contour. No width tolerance is normally stated.

b) Slit edge

Edge with the shearing burr left on. This edge is obtained by slitting with a circular shear.

c) Deburred edge

Slit edge from which the burr has been removed.

d) Square edge

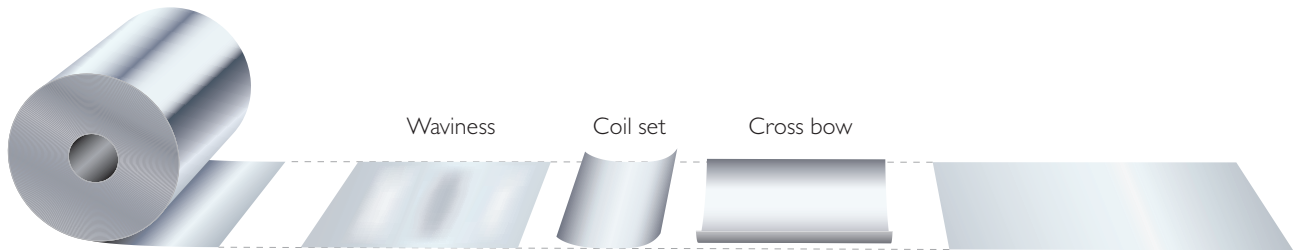
Sharp cornered square edge. Obtainable in widths up to 150 mm. Some hardened grades can be supplied with this edge in widths up to 430 mm.

e) Square edge with rounded corners

Widths up to 150 mm.

f) Round edge

Edge completely rounded. Obtainable in widths up to 150 mm.



Shape

To ensure the dimensional accuracy of products, our cold rolling mills are equipped with automatic gauge control and roll gap symmetry systems. Any deviations in shape characteristics are measured to guarantee the dimensions of the products delivered.

The important characteristics for strip products are typically thickness, flatness and straightness.

Deviations from flatness could be in the form of waviness (like edge waves or internal buckles), coil set and cross bow. Standards for deviations in coil set and cross bow according to different tolerance classes are given in the tables.

Tolerance class	Cross bow, % of width	
	H/T condition	Cold rolled condition
P0	No requirements	No requirements
P1	0.4	0.6
P2	0.3	0.4
P3	0.2	0.3
P9	Acc. to requirements	Acc. to requirements

Hardened and tempered strip (H/T), in all tensile strengths and cold rolled strip in tensile strengths below 1100 MPa. Max. values for entire width range.

Tolerance class	Width < 20 mm (.8 in.)		Width 20–50 mm (.8–2 in.)		Width > 50 mm (> 2 in.)	
	Cross bow % of width	Coil set mm/300 mm (in./11.8 in.)	Cross bow % of width	Coil set mm/300 mm (in./11.8 in.)	Cross bow % of width	Coil set mm/300 mm (in./11.8 in.)
P1	0.6	35 (1.38)	0.8	35 (1.38)	–	35 (1.38)
P2	0.4	20 (0.79)	0.6	20 (0.79)	–	20 (0.79)
P3	0.3	10 (0.39)	0.4	10 (0.39)	–	10 (0.39)

Cold rolled condition in tensile strengths of 1100 MPa and above. Maximum values.

Straightness

The figure below shows how deviation from straightness is defined.

The values in the table give the deviation from straightness for the length of 1 metre. Deviations from straightness can be determined for other lengths using the formula:

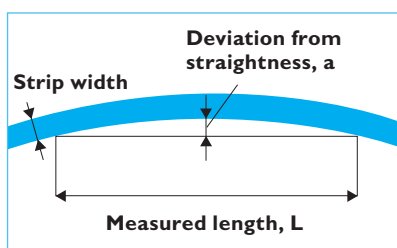
$a = b \times L^2$, where

a = the required deviation from straightness in mm for a given length, in m.

b = deviation from straightness according to the table.

Conversion between two lengths,

$$\frac{a_1}{a_2} = \left(\frac{L_1}{L_2} \right)^2$$



Width mm (in.)	Max out-of-straightness, mm (in.). Length 1 m (3 feet)			
	Tolerance class I)			
	R1	R2	R3	R4

Hardened and tempered condition

All tensile strengths, MPa (ksi)

8 – < 20 (0.31–0.79)	5 (0.2)	2 (0.079)	1.5 (0.059)	1 (0.039)
20 – < 50 (0.79–1.97)	3.5 (0.14)	1.5 (0.059)	1 (0.039)	0.7 (0.028)
50 – < 125 (1.97–4.92)	2.5 (0.098)	1.25 (0.049)	0.8 (0.031)	0.5 (0.02)
125 – (4.92)	2 (0.079)	1 (0.039)	0.5 (0.02)	0.3 (0.02)

Cold rolled condition

Tensile strength < 1100 MPa

8 – < 20 (0.31–0.79)	5 (0.2)	2 (0.079)	1.5 (0.059)	1 (0.039)
20 – < 50 (0.79–1.97)	3.5 (0.14)	1.5 (0.059)	1 (0.039)	0.7 (0.028)
50 – < 125 (1.97–4.92)	2.5 (0.098)	1.25 (0.049)	0.8 (0.031)	0.5 (0.02)
125 – (4.92)	2 (0.079)	1 (0.039)	0.5 (0.02)	0.3 (0.02)

Tensile strength 1100–1800 MPa

– < 8 (– 0.31)	7 (0.28)	4 (0.16)	2.5 (0.098)	–
8 – < 20 (0.31–0.79)	5 (0.2)	3 (0.12)	2 (0.079)	–
20 – < 50 (0.79–1.97)	4 (0.16)	2.5 (0.098)	1.5 (0.059)	–
50 – < 125 (1.97–4.92)	2.5 (0.098)	1.5 (0.06)	1.25 (0.049)	–
125 – (4.92)	2 (0.079)	1 (0.039)	1 (0.039)	–

Tensile strength > 1800 MPa

– < 8 (– 0.31)	8 (0.31)	5 (0.2)	3 (0.12)	–
8 – < 20 (0.31–0.79)	6 (0.24)	4 (0.16)	2.5 (0.098)	–
20 – < 50 (0.79–1.97)	5 (0.2)	3 (0.12)	2 (0.079)	–
50 – < 125 (1.97–4.92)	3 (0.12)	2 (0.079)	1.5 (0.059)	–
125 – (4.92)	2 (0.079)	1.5 (0.059)	1 (0.039)	–

¹⁾ R0 = no requirements

R9 = according to customer's specification

Steel grades

Sandvik grade	Standard	Chemical composition ¹⁾ %	Tensile strength ²⁾ MPa ^a (ksi)	Distinguishing property	Examples of applications
Alloyed non-stainless steels and carbon steels					
15LM	ASTM 1074 W.-Nr. 1.1248 SS 1770	C 0.75 Si 0.2 Mn 0.7	H 1350–1950 (196–283)*		Leather slitting, knives, springs
20C	ASTM 1095 W.-Nr. 1.1274 SS 1870	C 1.00 Si 0.3 Mn 0.4	H 1600–2100 (232–305) C 600–800 (87–116)	Fatigue strength	Valves for compressors and shock absorbers, blanked and formed parts, springs, doctor blades, tannery knives, butcher bandsaws
20C2	SS 2258	C 1.00 Si 0.3 Mn 0.3 Cr 1.4	H 1600–2100 (232–305)	Fatigue strength Wear resistance	Doctor blades

*) Can also be supplied in the cold rolled condition

Martensitic stainless chromium steel

6C27	ASTM 420 EN 1.4028 W.-Nr. 1.4007 SS 2304	C 0.32 Cr 13.7	C 600–1000 (87–145) H 1500–1600 (218–232)		Components in electric shavers, crêping blades
7C27Mo2		C 0.38 Cr 13.5 Mo 1.0	C 700–1000 (123–145) H 1700–2000 (247–290)	Fatigue strength	Compressor valves, components in electric shavers, print belts, meat saws, doctor blades, springs, surgical cutting tools
12C27M	EN (1.4034)	C 0.52 Cr 14.5	C 700–1000 (102–145)		Kitchen knives, scissors
12C27		C 0.60 Cr 13.5	C 700–1000 (102–145) H 1800–2100 (261–305)		Knives, scissors, skate blades
13C26		C 0.68 Cr 13	C 700–1100 (102–145) H 1800–2000 (261–290)		Razor blades, scalpels, industrial knives doctor blades
19C27		C 0.95 Cr 13.5	C 700–1100 (102–145)		Industrial knives for plastic/ synthetic fibres, paper etc.
14C28N		C 0.62 Si 0.2 Cr 14 Mn 0.6	C 700–1100 (102–145) H 1800–2000 (261–290)		Knives

Alloyed non-stainless steels and carbon steels

These steels when cold rolled have very good properties in terms of forming, blanking and machining. Subsequent hardening and tempering makes the steel hard, tough, resistant to wear and suitable for use as springs and other high strength applications.

Martensitic stainless chromium steels

These steels have excellent properties for forming and grinding sharp edges and, after hardening and tempering, also good resistance to corrosion. Sandvik 6C27, 7C27Mo2, 12C27 and 13C26 in the hardened and tempered versions are supplied under the trade name Sandvik Chromflex™. Their special characteristics include good resistance to wear, high fatigue strength and very good flatness, as well as uniform mechanical properties along and across the rolling direction (isotropic properties).

Austenitic stainless steels

These steels have superior qualities in respect of resistance to corrosion combined with very good spring properties, low relaxation and high fatigue strength. The strength in these grades is achieved by cold rolling, which makes them available in a wide range of dimensions and mechanical properties. A further increase in strength can be obtained by a simple heat treatment in the temperature range 350–480°C depending on grade.

Duplex stainless steels (austenitic-ferritic)

The modern duplex steels have excellent corrosion properties. They are not as sensitive to stress corrosion cracking as austenitic steels. Thermal expansion is lower than for austenitic steels, which can offer design advantages in certain cases.

Steel grades

Sandvik grade	Standard	Chemical composition ¹⁾ %	Tensile strength ²⁾ MPa ³⁾ (ksi)	Distinguishing property	Examples of applications
Austenitic stainless steels					
12R11	ASTM (301) EN 1.4310 W.-Nr. 1.4310 SS 2331	C 0.10 Si 1.2 Cr 16.5 Ni 7	C 800–1900 (116–276)		Springs and other formed parts for e.g. diaphragms and electrical connectors
11R51	ASTM (301) EN 1.4310 W.-Nr. 1.4310 SS 2331	C 0.09 Si 1.2 Cr 16.5 Ni 7.5 Mo 0.7	C 1700–2050 (247–297)	Fatigue strength Relaxation resistance	Springs and other formed parts for e.g. hinges, thermostats and gaskets for electromagnetic shielding
13RM19	EN 1.4369	C 0.11 Mn 6.0 Cr 18.5 Ni 7 N 0.25	C 850–1600 (123–232)	Non-magnetic	Springs and other formed parts for non-magnetic applications
3R12	ASTM 304L EN 1.4306 W.-Nr. 1.4306 SS 2352	C ≤0.030 Cr 18.5 Ni 10	C 600–1300 (87–189)	Formability	Deep drawn parts
316LVM	ASTM F139 EN 1.4441 ISO 5832-1	Si 0.6 Mn 1.7 Cr 17.5 Ni 14 Mo 2.8	C 650–1300 (95–189)	Corrosion resistance Cleanliness of non metallic inclusions	
Precipitation hardenable steels					
9RU10	ASTM 631 EN 1.4568 W.-Nr. 1.4568 SS 2388	C 0.08 Cr 16.5 Ni 7.5 Al 1.0	C 1200–1700 (174–247)	Tempering effect Relaxation resistance at elevated temperatures	Springs and parts with very complicated forms for e.g. hinges, couplings, washers and thermostats
Nanoflex		C ≤0.02 Cr 12 Ni 9 Mo 4 Ti 0.9 Cu 2.0 Al 0.4	C 950–1850 (138–268)	Tempering effect Relaxation resistance at elevated temperatures Formability	Parts with very complicated forms for e.g. components in electric shavers
1RK95		C 0.01 Cr 11.5 Ni 8.5 Cu 2.2 Ti 1.2	C 1050–1750 (152–254)	Aging effect Very high strength	Disc Springs
Duplex stainless steels (austenitic-ferritic)					
SAF 2507	UNS S32750 EN 1.4410	C ≤0.030 Cr 25 Ni 7 Mo 4	C 900–1600 (131–232)	Very high strength and stress corrosion cracking resistance in chloride containing environments	Springs e.g. in seawater service, marine environments, pulp and paper industry. Strip for welded tubes, cable and flexible tubing
SAF 2205	EN 1.4462 UNS S32205, S31803	C ≤0.030 Cr 22 Ni 5.5 Mo 3.2	C 1100–1700 (160–239)	As above (Sandvik SAF 2507™)	As above (Sandvik SAF 2507™)
Nickel-base alloy					
Sanicro 75X	UNS N07750	C ≤0.020 Ni 72 Cr 16 Ti 2.5 Al 0.7 Nb 0.8	C 750–1350 (109–196)	Mechanical properties at elevated temperatures up to 800°C. Resistance to gas corrosion at high temperatures. Spring properties up to 600°C.	Positioner devices in nuclear power fuel assemblies. Springs and other parts exposed to high temperatures and/or a very corrosive environment. Low cobalt composition makes it especially suitable for nuclear applications
¹⁾ Nominal value for main alloying elements. ²⁾ C= cold rolled H = hardened and tempered			³⁾ R _m 1 MPa = 1 N/mm ²		
			Sandvik, Sandvik Chromflex™, Sandvik Nanoflex™, Sandvik Springflex™, SAF 2507™ and Sanicro™ are trademarks owned by Sandvik AB.		

Size tolerances

In the standard finish, the tolerance is symmetrical, half above and half below the nominal size. Other tolerance dispositions can be discussed. The normal width tolerance class is B1, but slit strip can be supplied with B2 or

B3 tolerances on request. Closer tolerances require special edge treatment. For austenitic and duplex stainless steels other width tolerances are applicable according to EN 10258, see brochure S-3411.

Thick- ness mm	Width mm	Thickness tolerance, mm ± Tolerance class			
		T1	T2	T3	T4
<0.025	–250	0.003	0.002	0.0015	0.001
	>250–400	0.004	0.003	0.002	0.0015
0.025–	–250	0.004	0.003	0.002	0.0015
<0.04	>250–400	0.005	0.004	0.003	0.002
0.04–	–250	0.005	0.004	0.003	0.002
<0.063	>250–400	0.006	0.005	0.004	0.003
0.063–	–250	0.006	0.005	0.004	0.003
<0.1	>250–400	0.007	0.006	0.005	0.004
0.1–	–250	0.007	0.005	0.004	0.003
<0.125	>250–400	0.008	0.006	0.005	0.004
0.125–	–250	0.009	0.006	0.005	0.004
<0.16	>250–400	0.01	0.007	0.006	0.005
0.16–	–250	0.01	0.007	0.005	0.004
<0.2	>250–400	0.011	0.008	0.006	0.005
0.2–	–250	0.011	0.008	0.006	0.004
<0.25	>250–400	0.013	0.009	0.007	0.006
	>400–600	0.014	0.010	0.008	0.007
0.25–	–250	0.013	0.009	0.007	0.005
<0.315	>250–400	0.015	0.011	0.008	0.006
	>400–600	0.017	0.012	0.009	0.007
0.315–	–250	0.015	0.011	0.008	0.006
<0.4	>250–400	0.017	0.012	0.009	0.006
	>400–600	0.020	0.014	0.010	0.008
0.4–	–250	0.017	0.012	0.009	0.006
<0.5	>250–400	0.020	0.014	0.010	0.007
	>400–600	0.023	0.017	0.012	0.009
0.5–	–250	0.020	0.014	0.010	0.007
<0.63	>250–400	0.024	0.017	0.012	0.009
	>400–600	0.028	0.020	0.014	0.010
0.63–	–250	0.023	0.017	0.012	0.008
<0.8	>250–400	0.027	0.020	0.014	0.010
	>400–600	0.032	0.023	0.016	0.012
0.8–	–250	0.027	0.019	0.013	0.009
<1	>250–400	0.032	0.023	0.016	0.012
	>400–600	0.037	0.027	0.019	0.014
1–	–250	0.034	0.024	0.017	0.012
<1.25	>250–400	0.036	0.026	0.018	0.013
	>400–600	0.042	0.029	0.021	0.015
1.25–	–250	0.039	0.028	0.020	0.014
<1.6	>250–400	0.044	0.032	0.022	0.016
	>400–600	0.050	0.038	0.026	0.019
1.6–	–250	0.046	0.033	0.023	0.017
<2	>250–400	0.050	0.038	0.026	0.019
	>400–600	0.060	0.042	0.029	0.021
2–	–250	0.050	0.035	0.025	0.017
<2.5	>250–400	0.055	0.040	0.028	0.020
	>400–600	0.065	0.050	0.033	0.024
2.5–	–250	0.056	0.040	0.028	0.020
<3.15	>250–400	0.060	0.043	0.030	0.022
	>400–600	0.070	0.050	0.035	0.025
3.15–	–250	0.063	0.045	0.032	0.022
5	>250–400	0.065	0.050	0.034	0.024
	>400–600	0.080	0.060	0.040	0.029

Thick- ness mm	Width mm	Width tolerance, mm ± Tolerance class			
		B1	B2	B3	B4
<0.25	–< 20	0.07	0.05	0.03	0.02
	20–< 50	0.10	0.07	0.05	0.035
	50–< 125	0.15	0.11	0.07	0.05
	125–< 250	0.20	0.15	0.10	0.07
	250–< 400	0.30	0.20	0.15	0.10
	400–< 600	0.40	0.30	0.20	–
	600–< 800	0.60	0.40	0.30	–
0.25–	–< 20	0.10	0.07	0.05	0.03
<0.50	20–< 50	0.15	0.11	0.07	0.05
	50–< 125	0.20	0.15	0.10	0.07
	125–< 250	0.25	0.20	0.15	0.10
	250–< 400	0.35	0.30	0.20	0.15
	400–< 600	0.50	0.35	0.25	–
	600–< 800	0.70	0.50	0.35	–
0.50–	–< 20	0.15	0.11	0.07	0.05
<1.00	20–< 50	0.20	0.15	0.10	0.07
	50–< 125	0.25	0.20	0.15	0.10
	125–< 250	0.30	0.25	0.15	0.10
	250–< 400	0.40	0.30	0.20	0.15
	400–< 600	0.60	0.40	0.30	–
	600–< 800	0.80	0.60	0.40	–
1.00–	–< 20	0.20	0.15	0.10	0.07
<1.60	20–< 50	0.25	0.20	0.15	0.10
	50–< 125	0.30	0.25	0.15	0.10
	125–< 250	0.35	0.25	0.20	0.15
	250–< 400	0.45	0.35	0.25	0.20
	400–< 600	0.70	0.50	0.35	–
	600–< 800	0.90	0.60	0.40	–
1.60–	–< 20	0.25	0.20	0.15	0.10
<2.00	20–< 50	0.30	0.20	0.15	0.10
	50–< 125	0.35	0.30	0.20	0.15
	125–< 250	0.40	0.30	0.20	0.15
	250–< 400	0.50	0.35	0.25	0.20
	400–< 600	0.70	0.50	0.35	–
	600–< 800	0.90	0.60	0.40	–
2.00–	–< 20	0.35	0.25	0.20	0.15
<2.50	20–< 50	0.35	0.25	0.20	0.15
	50–< 125	0.40	0.30	0.20	0.15
	125–< 250	0.45	0.35	0.25	0.20
	250–< 400	0.55	0.40	0.30	0.25
	400–< 600	0.80	0.60	0.40	–
	600–< 800	1.00	0.70	0.50	–
2.50–	–< 20	–	–	–	–
<4.00	20–< 50	0.40	0.30	0.20	0.15
	50–< 125	0.45	0.30	0.20	0.15
	125–< 250	0.50	0.35	0.25	0.20
	250–< 400	0.60	0.40	0.30	0.25
	400–< 600	0.80	0.60	0.40	–
	600–< 800	1.00	0.70	0.50	–

If required thicknesses 4 mm and above can be discussed.

Thick- ness inch	Width inch	Thickness tolerance, inch ± Tolerance class			
		T1	T2	T3	T4
-<.0010	-9.8	.00012	.00008	.00006	.00004
	>9.8-15.7	.00016	.00012	.00008	.00006
.0010-<.0016	-9.8	.00016	.00012	.00008	.00006
	>9.8-15.7	.00020	.00016	.00012	.00008
.0016-<.0025	-9.8	.00020	.00016	.00012	.00008
	>9.8-15.7	.00024	.00020	.00016	.00012
.0025-<.0039	-9.8	.00024	.00020	.00016	.0001
	>9.8-15.7	.00028	.00024	.00020	.00016
.0039-<.0049	-9.8	.00028	.00020	.00016	.00012
	>9.8-15.7	.00031	.00024	.00020	.00016
.0049-<.0063	-9.8	.00035	.00024	.00020	.00016
	>9.8-15.7	.00039	.00028	.00024	.00020
.0063-<.0079	-9.8	.00039	.00028	.00020	.00016
	>9.8-15.7	.00043	.00031	.00024	.00020
.0079-<.0098	-9.8	.00043	.00031	.00024	.00016
	>9.8-15.7	.00051	.00035	.00028	.00024
	>15.7-23.6	.00055	.00039	.00031	.00028
.0098-<.0124	-9.8	.00051	.00035	.00028	.00020
	>9.8-15.7	.00059	.00043	.00031	.00024
	>15.7-23.6	.00067	.00047	.00035	.00028
.0124-<.0157	-9.8	.00059	.00043	.00031	.00024
	>9.8-15.7	.00067	.00047	.00035	.00024
	>15.7-23.6	.00079	.00055	.00039	.00031
.0157-<.0197	-9.8	.00067	.00047	.00035	.00024
	>9.8-15.7	.00079	.00055	.00039	.00028
	>15.7-23.6	.00091	.00067	.00047	.00035
.0197-<.0248	-9.8	.00079	.00055	.00039	.00028
	>9.8-15.7	.00094	.00067	.00047	.00035
	>15.7-23.6	.00110	.00079	.00055	.00039
.0248-<.0315	-9.8	.00091	.00067	.00047	.00031
	>9.8-15.7	.00106	.00079	.00055	.00039
	>15.7-23.6	.00126	.00091	.00063	.00047
.0315-<.0394	-9.8	.00106	.00075	.00051	.00035
	>9.8-15.7	.00126	.00091	.00063	.00047
	>15.7-23.6	.00146	.00106	.00075	.00055
.0394-<.0492	-9.8	.00134	.00094	.00067	.00047
	>9.8-15.7	.00142	.00102	.00071	.00051
	>15.7-23.6	.00165	.00114	.00083	.00059
.0492-<.0630	-9.8	.00153	.00110	.00079	.00055
	>9.8-15.7	.00173	.00126	.00087	.00063
	>15.7-23.6	.00197	.00150	.00102	.00075
.0630-<.0787	-9.8	.00181	.00130	.00091	.00067
	>9.8-15.7	.00197	.00150	.00102	.00075
	>15.7-23.6	.00236	.00165	.00114	.00083
.0787-<.0984	-9.8	.00197	.00138	.00098	.00067
	>9.8-15.7	.00216	.00157	.00110	.00079
	>15.7-23.6	.00256	.00197	.00130	.00094
.0984-<.1240	-9.8	.00220	.00157	.00110	.00079
	>9.8-15.7	.00236	.00169	.00018	.00087
	>15.7-23.6	.00276	.00197	.00138	.00098
.1240-<.1969	-9.8	.00248	.00177	.00126	.00087
	>9.8-15.7	.00256	.00197	.00134	.00094
	>15.7-23.6	.00315	.00236	.00157	.00114

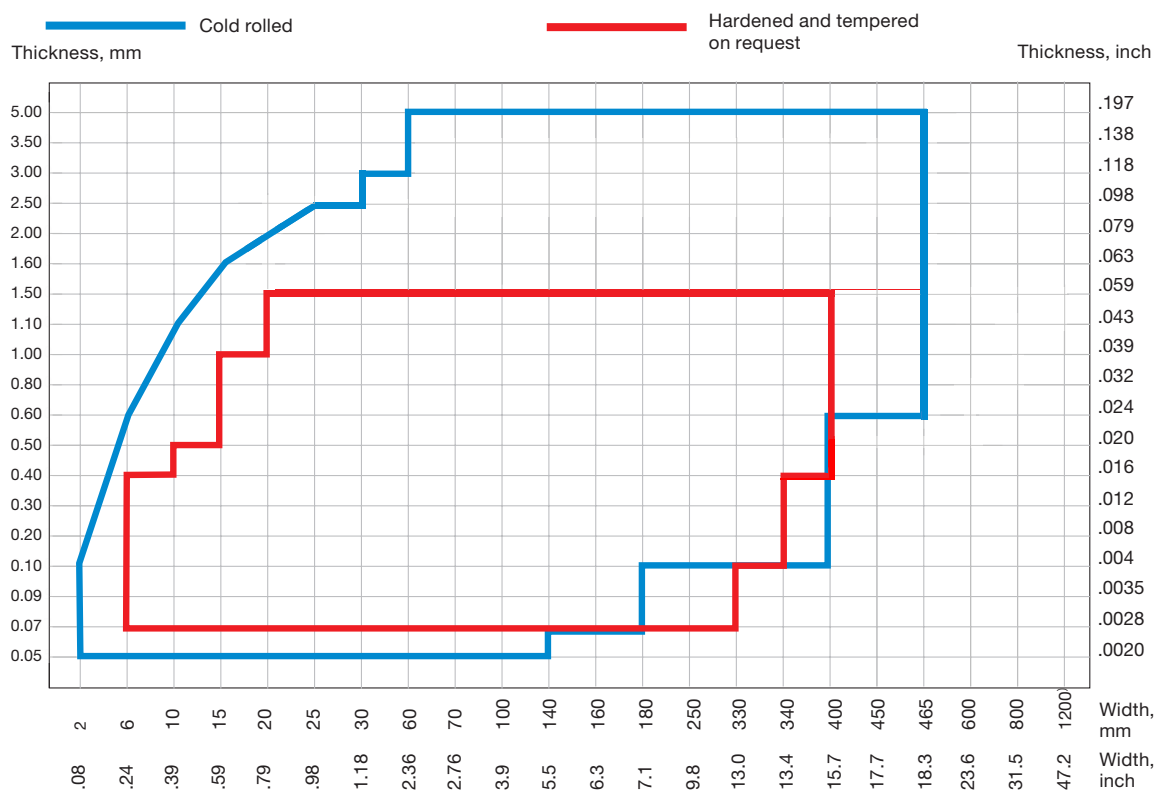
Thick- ness inch	Width inch	Width tolerance, inch ± Tolerance class			
		B1	B2	B3	B4
-<.0098	-< .79	.0028	.0020	.0012	.0008
	.79-< 1.97	.0039	.0028	.0020	.0014
	1.97-< 4.9	.0059	.0043	.0028	.0020
	4.9 -< 9.8	.0079	.0059	.0039	.0028
	9.8 -<15.7	.0118	.0079	.0059	.0039
	15.7 -<23.6	.0157	.0118	.0079	-
	23.6 -<31.5	.0236	.0157	.0118	-
.0098-<.0197	-< .79	.0039	.0028	.0020	.0012
	.79-< 1.97	.0059	.0043	.0028	.0020
	1.97-< 4.9	.0079	.0059	.0039	.0028
	4.9 -< 9.8	.0098	.0079	.0059	.0039
	9.8 -<15.7	.0138	.0118	.0079	.0059
	15.7 -<23.6	.0197	.0138	.0098	-
	23.6 -<31.5	.0276	.0197	.0138	-
.0197-<.0394	-< .79	.0059	.0043	.0028	.0020
	.79-< 1.97	.0079	.0059	.0039	.0028
	1.97-< 4.9	.0098	.0079	.0059	.0039
	4.9 -< 9.8	.0118	.0098	.0059	.0039
	9.8 -<15.7	.0157	.0118	.0079	.0059
	15.7 -<23.6	.0236	.0157	.0118	-
	23.6 -<31.5	.0315	.0236	.0157	-
.0394-<.0630	-< .79	.0079	.0059	.0039	.0028
	.79-< 1.97	.0098	.0079	.0059	.0039
	1.97-< 4.9	.0118	.0098	.0059	.0039
	4.9 -< 9.8	.0138	.0098	.0079	.0059
	9.8 -<15.7	.0177	.0138	.0098	.0079
	15.7 -<23.6	.0276	.0197	.0138	-
	23.6 -<31.5	.0354	.0236	.0157	-
.0630-<.0787	-< .79	.0098	.0079	.0059	.0039
	.79-< 1.97	.0118	.0079	.0059	.0039
	1.97-< 4.9	.0138	.0118	.0079	.0059
	4.9 -< 9.8	.0157	.0118	.0079	.0059
	9.8 -<15.7	.0197	.0138	.0098	.0079
	15.7 -<23.6	.0276	.0197	.0138	-
	23.6 -<31.5	.0354	.0236	.0157	-
.0787-<.0984	-< .79	.0138	.0098	.0079	.0059
	.79-< 1.97	.0138	.0098	.0079	.0059
	1.97-< 4.9	.0157	.0118	.0079	.0059
	4.9 -< 9.8	.0177	.0138	.0098	.0079
	9.8 -<15.7	.0217	.0157	.0118	.0098
	15.7 -<23.6	.0315	.0236	.0157	-
	23.6 -<31.5	.0394	.0276	.0197	-
.0984-<.1575	-< .79	-	-	-	-
	.79-< 1.97	.0157	.0118	.0079	.0059
	1.97-< 4.9	.0177	.0118	.0079	.0059
	4.9 -< 9.8	.0197	.0138	.0098	.0079
	9.8 -<15.7	.0236	.0157	.0118	.0098
	15.7 -<23.6	.0315	.0236	.0157	-
	23.6 -<31.5	.0394	.0276	.0197	-

If required, thicknesses 4 mm and above can be discussed.

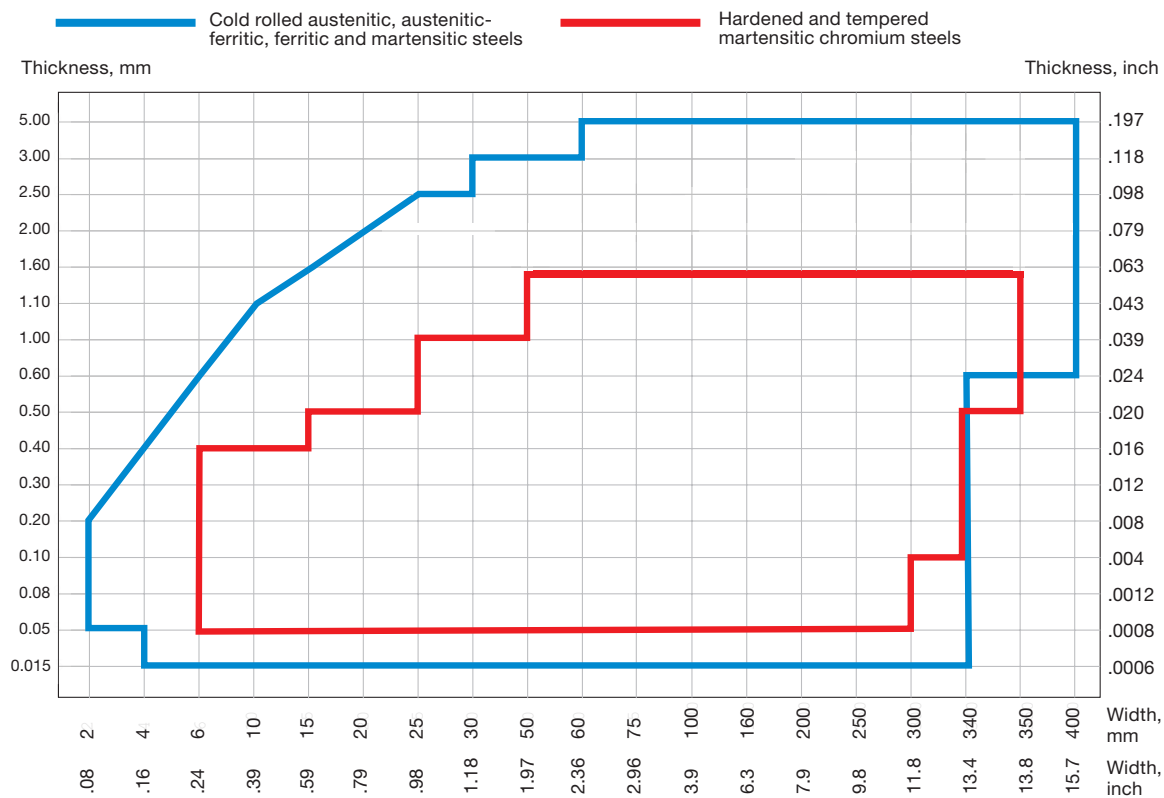
Sizes

We offer strip steel in the following size ranges.

Alloyed non-stainless steels and carbon steels



Stainless steel



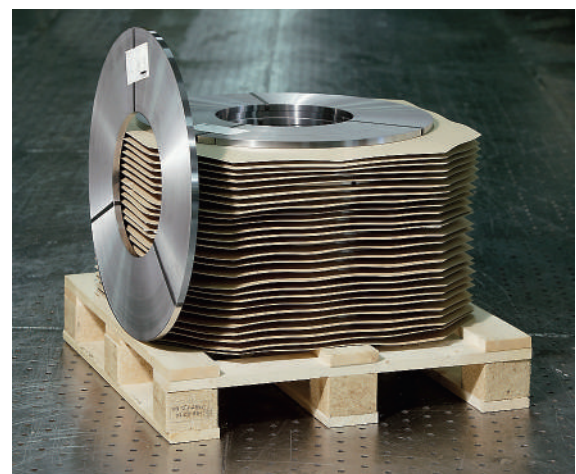


We are where you need us to be

An important measure of our capability in world-wide sales and distribution is global availability. Prompt and efficient communications make Sandvik Materials Technology an effective partner to do business with. Around the clock, an advanced, global network of IT systems links our salesmen, order clerks, stock controllers, marketing support personnel and distributors.

Our distribution is geared to a variety of customer needs. Top delivery performance is our goal regardless of where our customers are located. Product availability is being improved continuously by shortening manufacturing lead times and we can offer immediate delivery of some orders from a number of different stock locations.

The world is our home market but at the same time the workplace of our 7000 employees in five continents. We all work to serve you and we are where you need us to be.



Forms of supply

Strip steel can be delivered in the following forms:

- Coils: Widths 12 mm and wider
- Pancake coils: Less than 12 mm wide
- Bundles oscillated with welded strands
- Plastic spools oscillated with welded strands
- Lengths

Materials with very high quality surfaces are protected with interleaving paper and especially thin strip is supplied on a plastic or cardboard core. Anti-corrosive paper can be used for packing as an additional protective measure. For further details about packing, please refer to our "Packing guide" on our website

www.smt.sandvik.com/strip





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