

SANDVIK 12C27™ STRIP STEEL

DATASHEET

Sandvik 12C27™ is a martensitic stainless chromium steel with an optimized analysis for high quality professional knife applications. After heat treatment, the composition of carbon and chromium gives a unique combination of properties including:

- Very high hardness
- Good corrosion resistance
- Very high wearresistance

Typical applications for Sandvik 12C27™ are hunting and fishing knives, pocket knives, skate blades and ice drills.

STANDARDS

- ASTM: (420), (440A)
- UNS: S42000
- W.Nr.: (1.4034), (1.4037)

In brackets, nearest corresponding grade.

CHEMICAL COMPOSITION (NOMINAL) %

Chemical composition (nominal) %

(Traf	C	@Kelins"	Sheling	Staff	Si	-110		Mn	States States	P	ne a Statue	Staling	Skellage.	green Sarene green	Staffe.	Staffer.	Status	Stating	Cr	Skeling.	Skeling.	Strai
STraff	0.6	3 Kalina	Shafin	Staff	0.4	Staffer	Skeling	0.4	Staffer Lafe	≤0.025	Staffer.	Skeller.	Skafra	≤0.010	Staffe	Staffes.	Skaling	Skelve	13.5	Stales	Shafing	Sikel

FORMS OF SUPPLY

The strips can be supplied either in coils or as straightened lengths of 0.5 - 4.0 meter (1.6 - 13.1 feet). The coil weight is max 5 kg/mm (280 ibs/in.) of strip width.

Hardening and tempering of the strip steel is needed to achieve the correct finish and to meet the properties required by the enduser.

Dimensions

Thickness	grande de Marie V	Vidth	Status et a	atronic State	per Staff	arii Ghallaarii Gh	Transis Status	or Sites from	d Safer Tree plant	STreffer and	The Tree and
mm (in.)	_{arren} n	nm (in.)	Stratus and St	etrosom Stelle	art (Staffer St	Tres and Street tress	er Steften!"	d Stafferman	Skelled and	STraTing Part
Min. Max.	Transeer Street, V	Min. garan	Sheller St	netrones States	Stall.	Max.	Trans, Ofethan	Status!	of tell training	Stales and	Starting and
1.0(0.039) 4.5 (0.177)	Trans Statement 1	10 (0.394)	Status St	ation State	Je Keil	380 (1	4.96)	Station	Station	Skelled and	Straffed and

Other sizes can be supplied to meet specific requirements.

Tolerances

The thickness and width tolerances are +/- tolerances to the nominal size. The normal tolerance classes for most of our strip products are T2 and B1. Tighter tolerances as well as other tolerance limits can be offered upon request.

Mechanical properties

As-delivered	Stration	Steller Steller	Stat.	Tensile strength MPa (ksi)	ikel Skeles	Hardness* HV	HRB
Soft annealed	Straffer	STATES	Strat"	max 700 (102)	Stration	max 215	max 94.3
Annealed	Stall.	and Starting	Stell.	750 ± 100 (109 ± 14)	Straffin	235 ±35	97.4 ± 6
Cold rolled	Stell	STATE	Sikel.	700–1000 (102–145)	Street	215–315	94.3–106.6

^{*} Hardness data is for guidance only.

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PHYSICAL PROPERTIES

The physical properties of a steel are related to a number of factors, including alloying elements, heat treatment and manufacturing route, but the data presented below can generally be used for rough calculations.

Density		
g/cm³	7.7	And the state of t
lb/in.3	0.28	Justine Andrew Justine Statement Sta

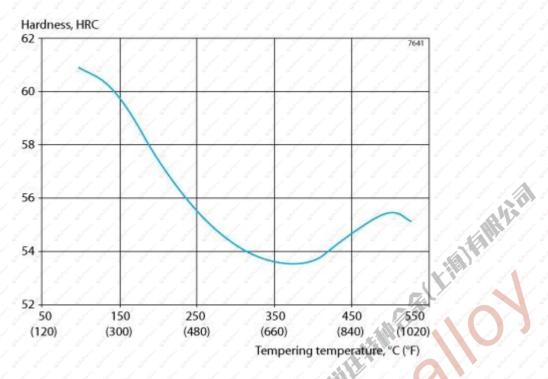
HEAT TREATMENT

Hardening data

Hardening temperature 1080°C (1975°F), holding time 5 minutes, quenching in oil.

Tempering data

Strip thickness 2.5 mm (0.098 in.), tempering time 30 minutes.



Brittleness occurs with tempering above 450°C (840°F).

Additional recommendations regarding hardening can be found in Sandvik's hardening guide.

The following figures show the importance of using the right hardening conditions to optimize the microstructure and properties.



Too high hardening temperature gives coarse structure, high austenite content (30%), few carbides. Consequence: low hardness and bad wear resistance.



Too low cooling rate after austenitizing gives carbide precipitations in the grain boundaries. Consequence: brittleness and reduced corrosion resistance.



Optimized hardening conditions give optimal austenite content (15%), many uniformly distributed carbides. Consequence: optimal combination of hardness, wear resistance, ductility and corrosion resistance.

How the hardening parameters affect the product properties

- Too high hardening temperature gives low hardness and bad wear resistance due to excessive content of retained austenite.
- A low hardening temperature gives low hardness and reduced corrosion resistance.
- Too long holding time at the optimal hardening temperature increases the amount of retained austenite and lowers the hardness.
- Too short holding time at the optimal hardening temperature has the same effect as low austenitizing temperature.
- The maximum hardness will be obtained at a retained austenite content of about 15%.
- Deep freezing, i.e. cooling to below room temperature, increases the hardness by about 1–2 HRC.
- With deep freezing, the highest possible hardness will be achieved by increasing the hardening temperature.
 Read more in the Sandvik hardening guide.
- High cooling rate after hardening is necessary to avoid brittleness and reduced corrosion resistance. 600°C
 (1112°F) should be reached within 1–2 minutes and room temperature within 30 minutes.
- Rehardening is generally not recommended as it will not give optimal product properties.

Disclaimer: Recommendations are for guidance only, and the sultability of a material for a specific application can be confirmed only when we know the actual service conditions. Continuous development may necessitate changes in technical data without notice. This datasheet is only valid for Sandvik materials.

