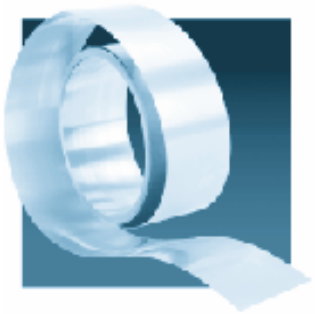


Strip steel

Cold rolled or annealed condition

Sandvik 12C27

S-3820-ENG November 2001 • Cancels all previous editions

Sandvik 12C27 is a martensitic stainless chromium steel with an optimised 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 good wear resistance*

This grade is also suitable for

- *hunting and fishing knives*
- *pocket knives*
- *skate blades and ice drills*

CHEMICAL COMPOSITION (NOMINAL), %

C	Si	Mn	P max	S max	Cr	Mo
0.60	0.40	0.40	0.025	0.010	13.5	-

STANDARDS

ASTM TP (420; 440A)
W.Nr. Comparable with 1.4034/1.4037

FORMS OF SUPPLY

The material can be supplied either in coils or as straightened lengths of 0.5 - 4.0 m (20 - 157 inches). The maximum coil weight is max 5 kg/mm (280 lbs/inch) of the strip width.

MECHANICAL PROPERTIES

As-delivered	Tensile strength MPa* (ksi)	Hardness HV	HRB
Soft-annealed	max 700 (101)	max 225	max 96
Annealed	750 ±100 (108±14)	240 ±40	98 ±14
Cold rolled	700-1000 (101-145)	240-315	98-108

** 1MPa = 1N/mm²*

Hardening and tempering of the strip steel is needed to achieve the correct finish and to meet the properties required by the end user. See “Heat treatment”.

DIMENSIONS

Thickness mm (inch)		Width mm (inch)	
Min.	Max.	Min.	Max.
1.0 (.039)	5.0 (.197)	10 (.393)	380 (15)

Other sizes can be supplied to meet specific requirements.

Tolerances

Tolerance tables are given in the brochure S-300-ENG.

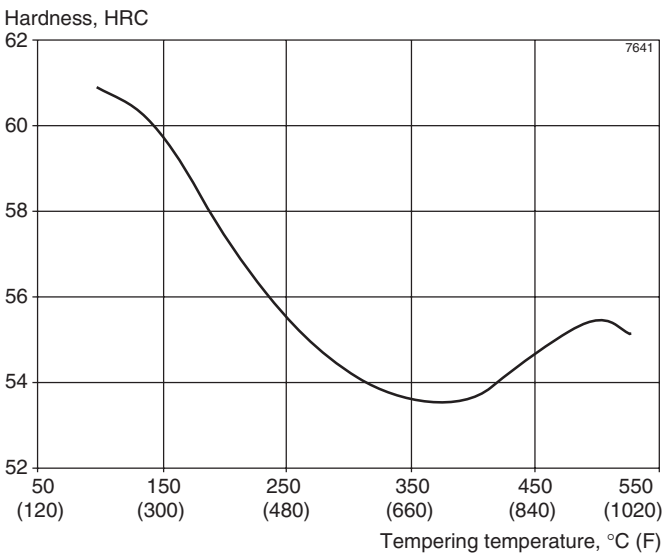
HEAT TREATMENT

Hardening data

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

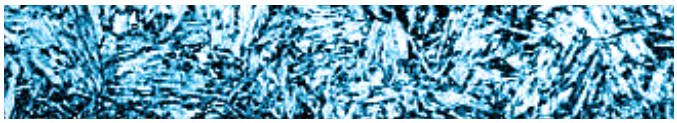
Tempering data

Strip thickness 2.5 mm (.098"), tempering time 30 minutes.

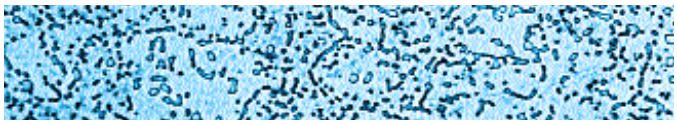


Brittleness occurs with tempering above 450° C (840°F).

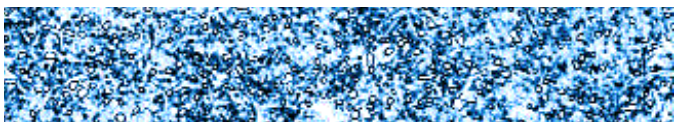
The figures show the importance of using the right hardening conditions to optimise the micro structure of the steel.



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



Too low cooling rate after austenitising gives carbide precipitations in the grain boundaries. Result: Brittleness and reduced corrosion resistance.



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

HOW THE HARDENING PARAMETERS AFFECT THE FINAL HARDENED RESULT:

- Too high austenitising temperature gives a high amount of retained austenite and low hardness.
- A low austenitising temperature gives a low amount of retained austenite and low hardness.
- Too long holding time at the optimal hardening temperature increases the amount of retained austenite and lowers the hardness.
- The maximum hardness will be acheived at a retained austenite content of about 15%.
- Cooling to below room temperature increases the hardness by about 2 HRC and improves the corrosion resistance.
- With cooling below room temperature the highest possible hardness will be achieved by increasing the austenitising tem perature above the recommended value in the hardening data.
- A high cooling rate after hardening avoids brittleness and reduced corrosion resistance, 600°C (1110 °F) should be reached 1-2 minutes after hardening.
- Re-hardening is not generally recommended, as it will not give optimal product properties.

Our datasheets and substantial technical information about our grades and products are available on the Sandvik Steel web-site www.steel.sandvik.com.
The following printed matter can be ordered via the web-site or from your nearest Sandvik office.

S-333-ENG Strip steel for edge applications
S-300-ENG Special strip steel

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