



# SG-Extra

TV-alloyed, High Carbon Tool Steel

## Distinctive feature & main attribute

An alloy tool steel with chromium, vanadium and tungsten, being the most non-distorting of the water-hardened steels and characterized by high level hardness and cutting capacity, good toughness and wear resistance.

## Use & application range

This quality is suitable for many areas of application in particular with screw cutting tools, spiral drills, piercing and drawing mandrels, milling cutters, ejectors, punchers, tapes, counter-sinks, spade and reamers.

## Material No. and norms

Material No.	1.2516
DIN Abbreviation	120WV4
AFNOR	110WC20
AISI/SAE/ASTM	AISI ~ F1
ISO	
Euro Standard EN	120WV4
Others	

## Reference analysis %

C	Si	Mn	P	S	Cr	V	W	Fe
1.15	0.15	0.20	max.	max.	0.15	0.07	0.90	balance
1.25	0.30	0.35	0.035	0.035	0.25	0.12	1.10	

Sizes below 8.0mm are available with controlled content of sulfur (German no 1.2516+S)

## Execution, delivery form, standard sizes and availability

- Execution in 3 m (2 m) round bars as well as coils
- Standard size in stock: [see product range](#)
- Other sizes on request

## Tolerances

- $\varnothing < 3.00$  mm, cold drawn, polished; ISO h9
- $\varnothing \geq 3.00$  mm, cold drawn, ground, polished; ISO h8/h6; surface finish Ra 0.4 (N5)
- Tighter tolerances (up to +/- 0.002 mm) on request

## Mechanical properties

At delivery status:

- Tensile strength (Rm): ~ 750 MPa, size depending
- Hardness after tempering: 64/66 HRC

## Heat treatment

- Tempering in oil at  $\varnothing < 10.00$  mm: 810 – 830°C
- Tempering in water at  $\varnothing \geq 10.00$  mm: 790 – 810°C
- Annealing as required see charts

## Cutting rates

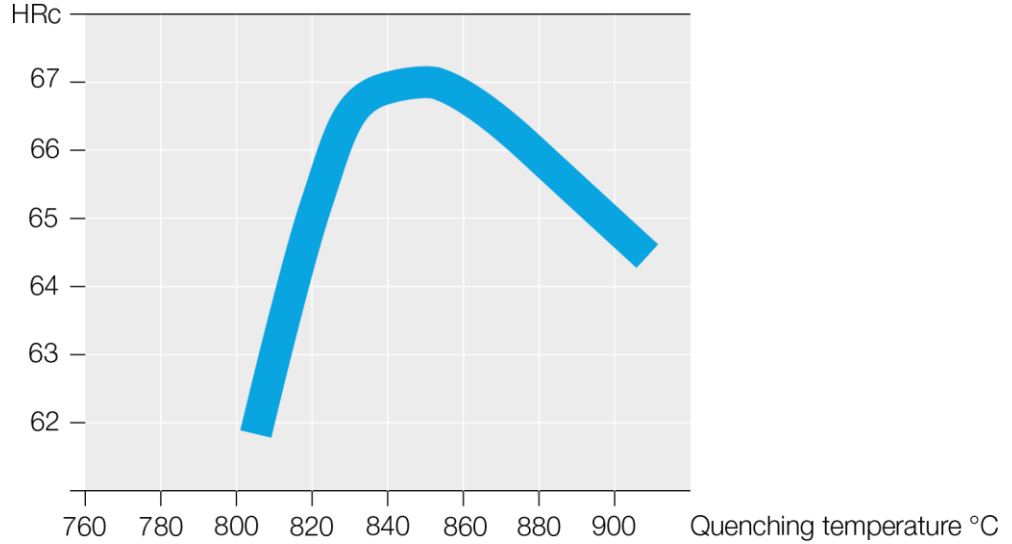
vc ~ 20 – 30 m/min, value depending on the lubrication oil, cutting tools and shape of parts.



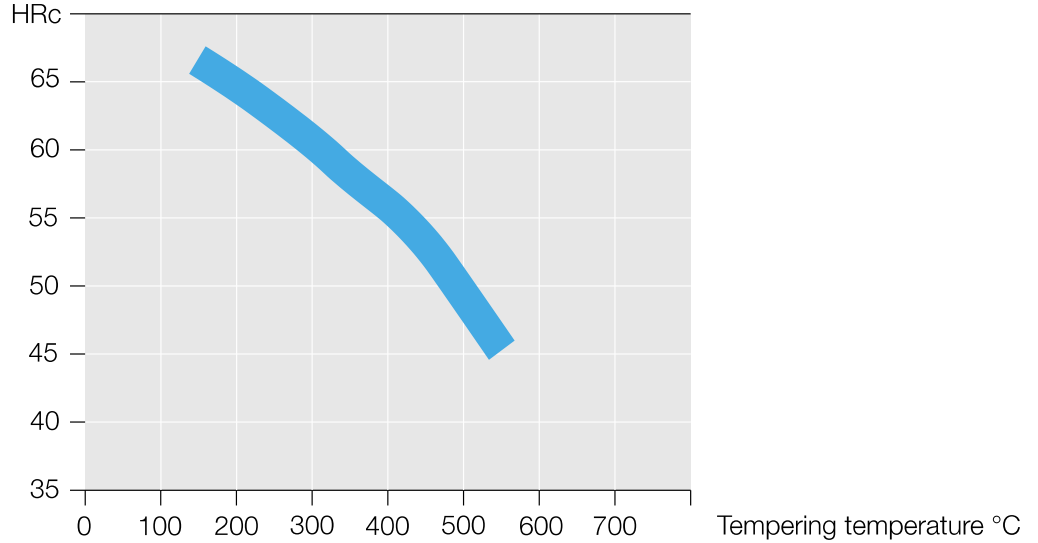
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## HARDENING CURVE



## ANNEALING CURVE 30 minutes



If your harden in oil, we recommend to not pass over the annealing temperature of 820°C to avoid cracks. The water should be pre-heated at about 50°C. The above curves indicate the results of determinate section of a curtain size of 5 mm. The result after heat treatment can be slightly different than shown on this curve, depending on the shape and size of the part.