

## Material specification sheet

### Saarstahl - 54SiCrV6

Material No.:	German standard:	International steel grades:
1.8152	DIN EN 10089	SAE: ~92V54 JIS:

**Material group:** Hot rolled steel for quenched and tempered springs

<b>Chemical composition:</b> (typical analysis at Saarstahl in %)	<b>C</b>	<b>Si</b>	<b>Mn</b>	<b>P</b>	<b>S</b>	<b>Cr</b>	<b>V</b>
	0,56	1,45	0,70	<0,01	<0,01	0,65	0,16
Deviation in chemical composition on request							

**Application:** Si-Cr-V alloyed quenched and tempered steel for production of springs with extraordinary small sag tendency, especially of valve and high-stressed automotive suspension springs, produced by cold and hot forming

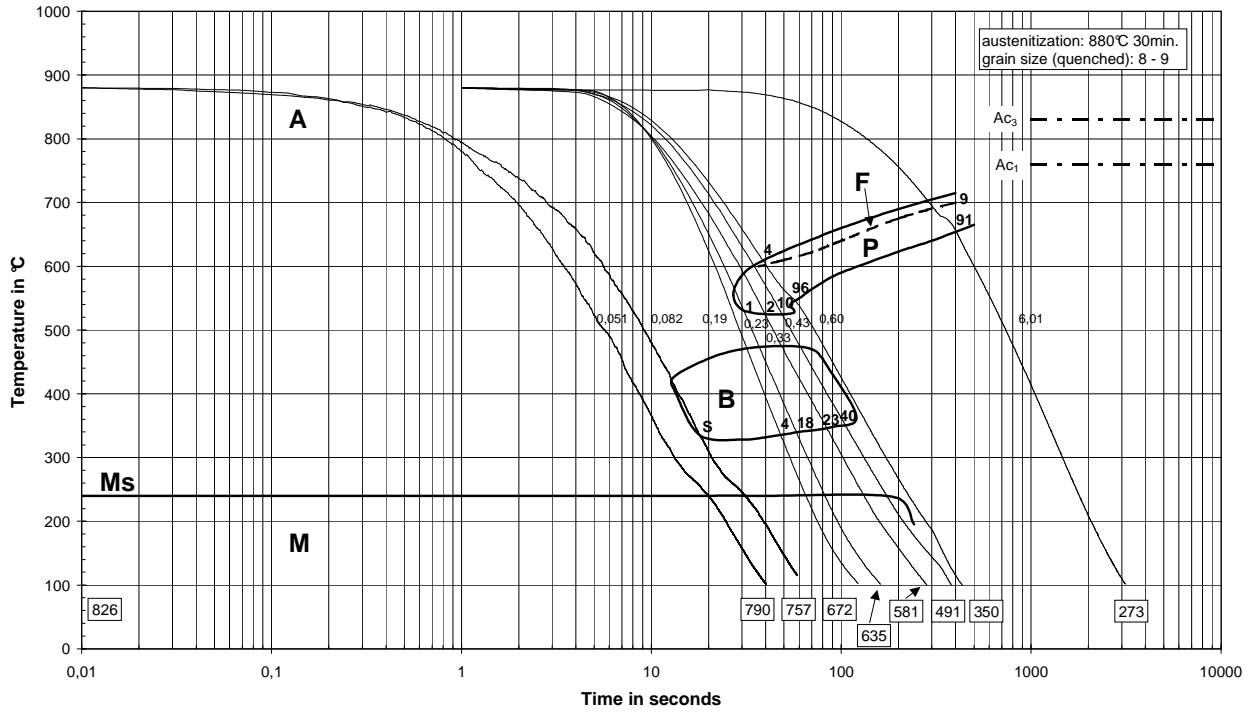
<b>Hot forming and heat treatment:</b>	Hot rolling:	1050 - 850°C
	Hot forming to springs:	940 - 840°C
	Normalising:	850 - 880°C/air
	Soft annealing:	640 - 680°C/furnace
	Hardening:	min. 840°C/oil
	Tempering:	375 - 500°C/air

<b>Mechanical properties:</b>	Treated for cold shearability (+S):	max. 280 HB
	Soft annealed (+A):	max. 248 HB
	Spheroidized annealed (+AC):	max. 230 HB

Hardened and tempered (+QT), tempering temperature 375-500°C

<b>0,2% proof stress <math>R_{p0,2}</math> [N/mm<sup>2</sup>]</b>	min. 1600
<b>Tensile strength <math>R_m</math> [N/mm<sup>2</sup>]</b>	1650 - 2150
<b>Fracture elongation <math>A_5</math> [%]</b>	min. 5
<b>Reduction of area <math>Z</math> [%]</b>	min. 35
<b>Notch impact energy ISO-V [J]</b>	min. 8

### Time-temperature-transformation diagram for continuous cooling



A = austenite  
F = ferrite  
P = pearlite

B = bainite  
M = martensite  
□ = Vickers-Hardness

0,051-6,01 = cooling parameter  
1 - 96 = microstructure in %  
S = traces

$\lambda$ <sup>1)</sup>  
<sup>1)</sup>  $\lambda$  = cooling time from  
800 to 500°C in sec.  $\times 10^{-2}$

### Tempering diagram

