saarstahl Gruppe

DRAHTWERK KÖLN

Technical data sheet for hardened and tempered spring steel wire

VG 04 - N/2019-02 Revision A

Scope

This technical data sheet covers hardened and tempered spring steel wires in **SiCr alloyed** steel grades with **normal tensile** strengths.

Chemical composition (heat analysis)

	C %	Si %	Mn %	P %	S %	Cu %	Cr %
min.	0,50	1,20	0,50				0,50
max.	0,60	1,60	0,90	0,030	0,025	0,12	0,80

Mechanical properties

Dia. of wire			Tensile strength		Min. reduction of area
d mm		Tolerance mm	Rm MPa		Z %
>	≤	±	min.	max.	-
0,70	1,00	0,020	2.100	2.300	--
1,00	1,50		2.050	2.250	45
1,20	2,00		2.000	2.200	
2,00	2,50	0,025	1.950	2.150	
2,50	3,00		1.900	2.100	
3,00	4,00		1.880	2.050	
4,00	5,00	0,030	1.860	2.000	
5,00	6,00		1.830	1.950	40
6,00	7,00	0,035	1.810	1.920	
7,00	8,00		1.780	1.900	
8,00	8,50		1.760	1.880	
8,50	10,00	0,040	1.730	1.850	
10,00	12,00		1.700	1.820	35
12,00	14,00	0,050	1.670	1.800	
14,00	18,50		1.650	1.780	30
The out of roundness shall not be more than 50% of the total diameter tolerance.			The tensile strength within one coil can scatter by max. 50 MPa, within one delivery by max. 70 MPa.		

Physical properties

Modulus of elasticity	E [GPa]	206
Shear modulus	**τ [GPa]**	79,5
Yield strength 0,2%	$R_{p0,2}$	min. 0,9 x tensile strength of the wire

Surface finish

Permissible depth of surface defects	max. 1% of the wire-∅, max. 0,1 mm
Partial decarburization	max. 0,5 % of the wire-∅

Heat treatment - recommended values for tempering temperature

After coiling the springs	≈ 400°C, 30 min.
After shot peening the springs	≈ 250°C, 30 min.