saarstahl Gruppe

DRAHTWERK KÖLN

Technical data sheet for hardened and tempered spring steel wire

VG 01 - N/2019-02 Revision A

Scope

This technical data sheet covers hardened and tempered spring steel wires produced from **unalloyed** steel grades.

Chemical composition (heat analysis)

	C %	Si %	Mn %	P %	S %	Cu %
min.	0,60	0,10	0,50			
max.	0,80	0,30	1,20	0,030	0,025	0,12

Mechanical properties

Dia. of wire d mm		Tolerance mm	Tensile strength Rm MPa		Min. reduction of area Z %
>	≤	±	min.	max.	-
0,70	1,00	0,020	1.900	2.150	--
1,00	1,20		1.850	2.050	45
1,20	1,50		1.800	1.950	
1,50	2,00		1.700	1.900	
2,00	2,50	0,025	1.700	1.850	
2,50	3,00		1.600	1.800	
3,00	3,50	0,030	1.600	1.750	
3,50	4,00		1.550	1.700	
4,00	5,00		1.550	1.700	
5,00	6,50		1.530	1.680	40
6,50	8,00	0,040	1.500	1.650	
8,00	9,00		1.500	1.650	
9,00	10,00		1.500	1.650	35
10,00	12,00	0,050	1.470	1.630	
12,00	14,00		1.450	1.600	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-∅
Partial decarburization	

Heat treatment - recommended values for tempering temperature

After coiling the springs	≈ 400°C, 30 min.
After shot peening the springs	≈ 220°C, 30 min.