

Technical data sheet for hardened and tempered spring steel wire

VG 01 - ND/2019-02 Revision A

Scope

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

Inspection of the wire surface

The complete length of the wire will be checked by an eddy current check during the drawing process

Chemical composition (heat analysis)

	C %	Si %	Mn %	P %	S %	Cu %
min.	0,6	0,1	0,5			
max.	0,8	0,3	1,2	0,03	0,025	0,12

Mechanical properties

Dia. of wire			Tensile strength		Min. reduction of area
d mm	Tolerance mm		Rm MPa		Z %
>	≤	±	min.	max.	-
2,50	3,00	0,025	1.600	1.800	45
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	0,040	1.530	1.680	
6,50	8,00		1.500	1.650	
8,00	9,00	0,050	1.500	1.650	35
9,00	10,00		1.500	1.650	
10,00	12,00		1.470	1.630	30
12,00	14,00	1.450	1.600		
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. 60 μm eddy current checked
Partial decarburization	max. 0,5 % of the wire- \varnothing

Heat treatment - recommended values for tempering temperature

After coiling the springs	$\approx 400^{\circ}\text{C}$, 30 min.
After shot peening the springs	$\approx 220^{\circ}\text{C}$, 30 min.