

MATERIAL OVERVIEW

This overview contains only standard spring materials. German and English standards refer to the closest comparable qualities.

Terms: T = wire, S = rod, B = strip

Material type	SS-ref or works ref.	Equivalent standard		Form	Operating temp. range °C	Description
Standard	SS1774-04	EN 10270-1-SM	DIN 17223 B	T	-40 – +120	Standard spring steel wire.
	SS1774-05	EN 10270-1-SH	DIN 17223 C	T	-40 – +120	Music wire.
	SS1774-06	EN 10270-1-DH	DIN 17223 D	T	-40 – +120	Piano wire with increased tensile strength.
	SS1770	1.1231 CK 67	BS 5770 CSHT	B	-40 – +120	Standard material.
	SS2090		DIN 17221 67SiCr5	T S B	-40 – +150	Standard spring steel alloy.
	SS2230	EN 10089 51CrV4	DIN 17221 50CrV4	T S B	-40 – +225	Alloy material for higher temp. and stresses. Good relaxation limit.
Oil hardened	Oteva 60	EN 10270-2-VDCrV	17223 T2 VD CrV	T	-60 – +200	Standard valve spring wire.
	Stato 70	EN 10270-2-FDSiCr	17223 T2 FD SiCr	T	-60 – +250	High-class spring wire.
	Oteva 70	EN 10270-2-VDSiCr	17223 T2 VD SiCr	T	-60 – +250	High-class ultrasonic checked valve spring steel.
Stainless steel	SS2331	EN 10270-3-1.4310	W 1.4310 X12CrNi177	T B	-150 – +250	Standard stainless steel spring material. Allows extra high loads $D_t < 2.0$ mm
	11R51	EN 10270-3-1.4310-HS		T B	-150 – +300	Stainless material with increased tensile strength and relaxation properties. "Semi" acid-proof.
	SS2388	EN 10270-3-1.4568	W 1.4568 X7CrNiAl177	T B	-200 – +350	Stainless material for high stress with excellent relaxation resistance.
Acid-proof	SS2347-04	EN 10270-3-1.4401	W 1.4401 X5CrNiMo1810	T B	-200 – +300	Acid-proof standard material.
	Titanium alloys			T S B	-200 – +150	High corrosion resistant lightweight material.
Non-magnetic acid-proof	SS5428-07	2.1020 CuSn 6	BS 2870 Pb 103	T B	-200 – +80	Phosphor bronze. Non-magnetic and corrosion resistant. For low loads.
	Beryllium copper	2.1247 CuBe	BS 2873/ 2870 CB101	T B	-200 – +150	Beryllium copper. Non-magnetic and corrosion resistant with excellent spring characteristics.
Heat resistant acid	Hastelloy C276			T S B	-100 – +500	High corrosion/temperature/resistant material.
	Inconel X-750, Spring Temper			T S B	-200 – +370	High temperature material with good corrosion resistance.
	Inconel X-750, Temper No 1			T S B	-200 – +540	High temperature material with good corrosion resistance.
	Nimonic 90			T B	-100 – +550	High temperature material with good corrosion resistance.
	Inconel 718			T B	-200 – +550	High temperature material with good corrosion resistance.
	MP 35 N			T B	-200 – +315	Exceptionally good corrosion resistance and tensile strength.

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Name



Chemical analysis %

SS standard Works ref. Others	C	Si	Mn	P<	S<	Cr	Mo	Ni	V	Al	Ti	Cu	Co	Fe
EN 10270	0,70	0,25	0,75	0,03	0,03	-	-	-	-	-	-	-	-	-
1.1231 (CK 67)	0,69	0,25	0,75	0,03	0,03	-	-	-	-	-	-	-	-	-
67SiCr5	0,55	1,75	0,80	0,03	0,03	0,30	-	-	-	-	-	-	-	-
EN 10089	0,51	0,28	0,90	0,03	0,03	1,05	-	-	0,15	-	-	-	-	-
EN270-2-VDCrV	0,70	0,25	0,75	0,03	0,02	0,50	-	-	0,10	-	-	-	-	-
EN270-2-FDSiCr	0,55	1,40	0,75	0,03	0,03	0,70	-	-	-	-	-	-	-	-
EN270-2-VDSiCr	0,55	1,40	0,70	0,03	0,03	0,70	-	-	-	-	-	-	-	-
EN 10270-3-1.14310	<0,1	<1,0	<2,0	0,04	0,03	17,0	-	8,0	-	-	-	-	-	-
EN 10270-3-1.14310-HS	<0,1	<1,0	<2,0	0,04	0,03	17,0	0,7	8,0	-	-	-	-	-	-
EN 10270-3-1.4568	<0,1	<1,0	<1,0	0,04	0,03	17,0	-	7,1	-	1,13	-	-	-	-
EN 10270-3-1.4401	<0,07	<1,0	<2,0	0,04	0,03	17,5	2,25	12,0	-	-	-	-	-	-
Hastelloy C	<0,02	<0,08	<1,0	0,04	0,03	15,5	16,0	57,0	0,03	-	-	-	<2,5	5,0 W 4,0
2.020 (CuSn6)	-	-	-	0,40	-	-	-	-	-	-	-	Rest	-	Sn 7,0
2.1247	-	-	-	-	-	-	-	>0,2	-	-	-	Rest	0,2	Be 1,95
Inco X750	<0,08	<0,5	<1,0	-	-	15,5	-	<70	-	0,70	2,5	<0,5	-	7,0 Nb 0,95
Inco 718	-	-	-	-	-	18,0	3,0	<70	-	0,50	0,9	-	-	Rest Nb 5,0
Nimonic 90	0,09	<1,0	<1,0	-	0,015	19,5	-	Rest	-	1,40	2,35	-	15-21%	16,5 <2,0
Titanleg.	-	-	-	-	-	-	-	-	4,0	6,20	Rest	-	-	<0,3 -
MP 35 N	-	-	-	-	-	20	10	35	-	-	<1,0	-	35	<1,0 -

Other technical information

The values for modules E and G apply at 20 °C. The majority of the materials mentioned below can also be obtained with square or rectangular cross sections. However, stock is limited, which is why it is usually necessary to have large quantities to make production possible.

SS-ref or works ref lengths	Elast. modulus (E)N/mm ²	Shearing (G)N/mm ²	Density kg/dm ³	Size range Wire Ø	Strip t	Straight Ø
EN 10270-1-SM	208 500	80 400	7,85	0,1-14,0		
EN 10270-1-SH	208 500	80 400	7,85	0,1-12,0		
EN 10270-1-DH	208 500	80 400	7,85	0,1-10,0		
1.1231 (CK 67)	208 500	80 400	7,85		0,1-10,0	
67SiCr5	208 500	80 400	7,85	8,0-20,0	5,0-15,0	10-30
EN 10089	208 500	80 400	7,85	8,0-20,0	1,0-10,0	10-65
EN270-2-VDCrV	206 000	81 500	7,85	0,5- 9,0		
EN270-2-FDSiCr	206 000	81 500	7,85	0,5- 9,0		
EN270-2-VDSiCr	206 000	81 500	7,85	0,5- 9,0		
EN 10270-3-1.4310	190 000	73 000	7,9	0,1-12,0	0,10- 3,0	
EN 10270-3-1.4310-HS	190 000	73 000	7,9	0,1-10,0	0,10- 1,5	
EN 10270-3-1.4568	195 000	75 000	7,9	0,1- 8,0	0,10- 3,0	
EN 10270-3-1.4401	185 000	71 000	8	0,1-10,0		
Hastelloy C	205 000	73 300	8,89	0,1-10,0	0,10-10,0	6-150
2.1020 (CuSn6)	106 000	41 000	8,9	0,2- 7,0	0,10- 3,5	
2.1247	135 000	47 000	8,9	0,5-1,30	0,15- 3,0	
Inconel X750	215 000	80 000	8,25	0,5- 9,0	0,50- 4,0	10-150
Nimonic 90	213 000	82 700	8,28	0,5- 6,0	0,20- 3,0	15-150
Titanleg.	106 000	40 000	4,45	0,1-10,0	0,10-10,0	6-150
Inco 718	204 900	77 200	8,22	0,5-15,0	0,50-10,0	
MP 35 N	234 000	80 700	8,57	0,2-10,0	0,20- 3,0	