

Material for Springs V2019-01-24

Material No.	Material Description	DIN EN ISO	SAE Grade	Density [g/cm ³]	Modulus of Rigidity G [N/mm ²]	Young's Modulus E [N/mm ²]	Tensile Strength Rm [N/mm ²]	Shear Strength [N/mm ²]	Condition as delivered	Heat Treatment	T [°C]	Duration [Hours]	Cooling	Tmax [°C]	Use
1.1200	Music Wire (Spring Steel) Type C	EN 10270-1-SH		7,85	81500	210000	1200-3400	600-1700	Spring hardened	Tempering	270	0,5	Air	-40 until +80	Patented drawn music wire (spring steel) suitable for static or quasi-static applications Wire diameter maximum d=20mm
1.1211	Music Wire (Spring Steel) Type D	EN 10270-1-DH		7,85	81500	210000	1200-3400	600-1700	Spring hardened	Tempering	270	0,5	Air	-40 until +80	Patented drawn music wire (spring steel) suitable for static or dynamic applications. Wire diameter maximum d=20mm
1.71.. ff	67SiCr5 Oteva 70 VDSiCr FDSiCr (Valve Spring Wire)	EN 10270-2		7,85	79000	200000	1670-2230	835-1040	Spring hardened	Annealing Shot peening Tempering 1 x Setting	450 270	1 10 min	Air Air	-40 until +120	Oil tempered music wire (spring steel) for highly dynamic applications valve springs, clutch springs
1.8159	51CrV4 (50CrV4)		6150	7,85	78500	206000	1350-1650	700-950	Annealed	Hardening Tempering	850±10 450	xxx 1	Oil Air	-40 until +80	Hardenable music wire (spring steel) for applications in large wire sizes also suitable for highly dynamic applications chassis springs, turbines
1.1231	Ck67 (C67S)		1070	7,85	81500	210000			Soft oder hardened	Hardening Tempering	850 350-420	0,083 (5min)	Oil	-40 until +80	Cold-rolled music wire (spring steel) for standard applications disc springs, wave spring washers, leaf springs
1.1248	Ck75 (C75S)		1075	7,85	81500	210000			Soft oder hardened	Hardening Tempering	850 350-420	0,083 (5min)	Oil	-40 until +80	
1.1269	Ck85 (C85S)		1085	7,85	81500	210000			Soft oder hardened	Hardening Tempering	850 350-420	0,083 (5min)	Oil	-40 until +80	
1.4310	X10CrNi18-8 (V2A)	EN 10270-3	302	7,90	73000	187500	1300-2600	650-1300	Spring hardened	Tempering	380	0,5	Air	-200 until +250	Stainless steel for the most common applications suitable for a humid environment, but not seawater resistant slightly magnetic due to work hardening

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1.4568	X7CrNiAl17-7 (V4A)	EN 10270-3	17/7PH	7,98	78000	200000	1150-2000	575-1000	Spring hardened	Hardening	450-480	0,5-1,0	Air	-200 until +350	Precipitation-hardenable chromium-nickel steel for dynamic loads has excellent corrosion resistance aerospace, food industry
1.4571	X6CrNiMoTi17-12-2 (V4A)		316Ti	7,98	71000	185000	1200-2100	600-1050	Spring hardened	Hardening	450-480	0,5-1,0	Air	-200 until +350	Precipitation-hardenable chromium-nickel steel resistant to seawater - high operating temperature shipping, aviation and aerospace, food industry
2.1020	CuSn6 Phosphor Bronze			8,82	39000	118000	950	550	R980	Tempering	165-190	1	Air	-250 until +100	Copper alloy with low strength, but very good conductivity and solderability, can also be used in a vacuum. Electrical industry, apparatus engineering, vacuum technology, ship building
2.1247	CuBe2 (BeCu25)			8,30	47000	120000	1310-1520	733	950-1150	Hardening	315	2	Air	-250 until +200	Low allow copper-beryllium copper with high strength
							950-1150	525	950-1150	Tempering	200	0,5	Air	-250 until +200	
2.4610	NiMo16Cr15Fe6 W4 Hastelloy C4			8,64	81200	212400	1400-1700	784	Spring hardened	Annealing	400-450	2	Air	-200 until +400	High-alloy nickel-chromium steel with extreme resistance to chemicals and very good heat resistance Chemical industry, fertilizer production, valve technology
2.4632	NiCr20Co18Ti Nimonic 90			8,18	82500	227000	1500-1800	812	Spring hardened	Hardening	650	4	Air	+350	High-alloy nickel-chromium steel with high resistance to chemicals and good heat resistance suitable for both static and dynamic applications Aerospace, heating technology, research and development
2.4669	NiCr15Fe7TiAl Inconel X-750			8,28	75800	218000	1350-1750	675	Spring hardened	Hardening	650	4	Air	+370	Music wire (spring steel) made of a nickel-chromium alloy which, when properly heat treated, exhibits outstanding high temperature strength with reduced tensile strength used in reactor technology because of the almost missing cobalt, but not completely non-magnetic. Reactor technology, valve technology, high temperature applications Compression springs, tension springs, disc springs
							1100-1250	550	Spring hardened	Annealing Stabili. Hardening	1150 843 704	2 24 20	Air Air Air	+550	