

Database of Steel and Alloy (Marochnik)

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Characteristics for grade 60S2A (60C2A).

Grade :	60S2A (60C2A)
Substitute:	60C2H2A, 60C2Г, 50XΦA
Classification :	Spring structural steel
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Chemical composition in % for grade 60S2A (60C2A)

C	Si	Mn	Ni	S	P	Cr	Cu
0.58 - 0.63	1.6 - 2	0.6 - 0.9	max 0.25	max 0.025	max 0.025	max 0.3	max 0.2

Temperature of critical points for grade 60S2A (60C2A).

$$Ac_1 = 770, \quad Ac_3(Ac_m) = 820, \quad Ar_3(Arc_m) = 770, \quad Ar_1 = 700, \quad Mn = 305$$

Mechanical properties under T=20°C for grade 60S2A (60C2A)

Assortment	Dimension	Direct.	σ_B	σ_T	δ_5	ψ	KCU	Heat treatment
-	mm	-	MPa	MPa	%	%	kJ / m ²	-
Rolled stock, GOST 14959-79			1570	1375	6	20		Guenching 870°C, oil, Drawing 420°C,
Band annealed , GOST 2283-79	0.1 - 4		880		8			
Band cold-w orked , GOST 2283-79	0.1 - 4		780-1180					

Brinell hardness for 60S2A (60C2A) (annealing), GOST 14959-79	HB 10 ⁻¹ = 269 MPa
Brinell hardness for 60S2A (60C2A) (without heat treatment), GOST 14959	HB 10 ⁻¹ = 302 MPa

Technological properties for grade 60S2A (60C2A)

Weldability:	is not used.
Flakes :	not predisposed
Temper brittleness:	not predisposed

Physical properties for grade 60S2A (60C2A)

Physical properties for grade 00000 (00000)						

T	E 10 ⁻⁵	α 10 ⁶	λ	ρ	C	R 10 ⁹
Grade	MPa	1/Grade	Watt/(m·Grade)	kg/m ³	J/(kg·Grade)	Ohm·m
20	2.12		28	7680		
100	2.06	11.8	29	7660	510	
200	1.98	12.7	29	7630	510	
300	1.92	13.3	30	7590	520	
400	1.81	13.7	30	7570	535	
500	1.78	14.1	30	7520	565	
600	1.58	14.5	29		585	
700	1.44	14.4	29		620	
800	1.34	12.2	28		700	
T	E 10 ⁻⁵	α 10 ⁶	λ	ρ	C	R 10 ⁹

Equivalent steels for grade 60S2A (60C2A)

Warning! Indicated both exact and nearest equivalents.

USA	Germany	Japan	France	England	China	Bulgaria	Poland
-	DIN,WNr	JIS	AFNOR	BS	GB	BDS	PN
9260 G92600	60MnSiCr4 60SiCr7 65Si7	SUP6 SUP7	61SiCr7	251H60	60Si2Mn	60S2A	60S2A

Specification :

Mechanical properties :

- σ_B - Tensile strength , [MPa]
- σ_T - Yield stress , [MPa]
- δ_5 - Specific elongation at fracture , [%]
- ψ - Reduction of area , [%]
- KCU** - Impact strength , [kJ / m²]
- HB** - Brinell hardness , [MPa]

Physical properties :

- T** - Test temperature , [Grade]
- E** - Young modulus , [MPa]
- α - Coefficient of linear expansion (range 20° - T) , [1/Grade]
- λ - Thermal (heat) condition coefficient , [Watt/(m·Grade)]
- ρ - Density , [kg/m³]
- C** - Specific heat (range 20° - T) , [J/(kg·Grade)]
- R** - Electrical resistance , [Ohm·m]

Weldability :

- without limitations** - welding is done without heating and subsequent heat treating
- limited weldability** - welding is possible under heating up to 100-120 grade and subsequent heat treating
- hard weldability** - obtaining the quality welding needs the additional operations: heating up to 200-300 grade; the heat treating is annealing

(stainless steel, alloy steel, carbone steel, structural steel, tool steel,
cast iron, aluminum alloy, titanium alloy, copper alloy, nickel alloy, magnesium alloy and others).
Helpfull for specialists in grade technology, structural engineer, mechanical engineer, metallurgy and metal trader

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