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Characteristics for grade 10kp (10кп).

Grade :	10кп (10кп)
Substitute:	08кп, 15кп, 10
Classification :	High quality structural carbon steel
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Chemical composition in % for grade 10kp (10кп)

C	Si	Mn	Ni	S	P	Cr	Cu	As
0.07 - 0.14	max 0.07	0.25 - 0.5	max 0.3	max 0.04	max 0.035	max 0.15	max 0.3	max 0.08

Temperature of critical points for grade 10kp (10кп).

$$Ac_1 = 732, \quad Ac_3(Ac_m) = 870, \quad Ar_3(Arc_m) = 854, \quad Ar_1 = 680$$

Mechanical properties under T=20°C for grade 10kp (10кп)

Assortment	Dimension	Direct.	σ_B	σ_T	δ_5	ψ	KCU	Heat treatment
-	mm	-	MPa	MPa	%	%	kJ / m ²	-
Sheet heat-treatment, GOST 4041-71	4 - 14		270-410		32			
Pipe, GOST 10705-80			314	196	25			
Steel cold-draw n , GOST 10702-78			372		8	55		
Strip, GOST 1577-93	6 - 60		310	185	33	55		Normalizing

Brinell hardness for	10kp (10кп) (cold-drawn, cold-worked) ,	GOST 10702-78	HB 10 ⁻¹ = 179 MPa
Brinell hardness for	10kp (10кп) ,	Sheet GOST 4041-71	HB 10 ⁻¹ = 114 MPa
Brinell hardness for	10kp (10кп) (annealing) ,	Sheet trick GOST 1577-93	HB 10 ⁻¹ = 137 MPa

Technological properties for grade 10kp (10кп)

Weldability:	without limitations.
Flakes :	not predisposed
Temper brittleness:	not predisposed

Physical properties for grade 10kp (10кп)

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	1.86			7856		
100		12.4	58	7832	466	190
200		13.2	54	7800	479	263
300		13.9	49	7765		352
400		14.5	45	7730	512	458
500		14.9	40	7692		584
600		15.1	36	7653	567	734
700		15.3	32	7613		905
800		12.1	29	7582		1081
900		14.8	27	7594		1130
1000		12.6				
T	E 10 ⁻⁵	α 10 ⁶	λ	ρ	C	R 10 ⁹

Equivalent steels for grade 10kp (10кп)

Warning! Indicated both exact and nearest equivalents.

USA	Germany	Japan	France	England	Italy	Spain	China	Czechia
-	DIN, WNr	JIS	AFNOR	BS	UNI	UNE	GB	CSN
1008	1.0334	SPH2A	1C	040A10	FeP12	AP12	10F	12010
1010	DD11	SPHD	2C	14HR			ML10	
1012	StW22	SPHE	FB10	3HR				
A621	UStW23	SWRCH10R	FR10					
		SWRCH12R	XC10					

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 ia annealing

Database of steels and alloys (Marochnik) contains information about chemical composition and properties more then 2500 steels and alloys (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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