

21CRMOV5-7, 1.7709, 21CRMOV5-11, 1.8070

21CrMoV5-7 alloy structural steel and its 21CrMoV5-11/(ie) 21CrMoV5-11 substitute alloy belong to the high-temperature boiler steel for energy industry. They are used to produce components/subassemblies for the power industry, small parts and large forgings at temperatures up to 550°C. The main applications of these steel grades are rotors for steam turbines, rotor blades, shaft forgings, vessels and covers for temperatures up to 550°C, nuts, pipes for temperatures up to 540°C. 21CrMoV5-7 is a steel for fasteners with specified elevated and/or low temperature properties. Imanite has been designed for nitriding, giving similar hardness distribution as case hardening. When using nitriding the distortion due to quenching after carburising can be avoided. Imanite is a M-steel version of 21CrMoV5-7. M-treatment is very beneficial when the machining is done in Q&T condition and the hardness is about 300 HBW. Chrome Molybdenum Vanadium steel 21CrMoV5-7 is used for steam and gas turbine components and also for high temperature industrial boilers, valves and oil & gas applications. Bolts, studbolts, nuts, washers, bonet bolts parts of the turbine, pumps, valves etc.

Chemical Composition

Grade	Chemical Composition WT %										
	C	Mn	Si	P	S	Cr	Ni	Mo	V	Al	Cu
PN 21HMF	0.17 - 0.25	0.3 - 0.5	0.3 - 0.6	max 0.035	max 0.035	1.2 - 1.5	max 0.6	1.0 - 1.2	0.25 - 0.35	-	-
21CrMoV5-7, 1.7709	0.17 - 0.25	0.4 - 0.8	max 0.4	max 0.025	max 0.030	1.2 - 1.5	max 0.6	0.55 - 0.80	0.20 - 0.35	max 0.3	-
25Ch1M1F, 21Kh1M1F, 25X1M1Φ	0.22 - 0.29	0.4 - 0.7	0.17 - 0.37	max 0.030	max 0.025	1.5 - 1.8	max 0.3	0.25 - 0.35	0.15 - 0.30	-	max 0.2
21CrMoV5-11, 1.8070	0.17 - 0.25	0.3 - 0.6	0.30 - 0.60	max 0.035	max 0.035	1.2 - 1.5	max 0.6	1.0 - 1.2	0.25 - 0.35	-	-
20CDV5-07, 20CDV5.07	0.17 - 0.24	0.3 - 0.6	max 0.5	max 0.015	max 0.015	1.1 - 1.5	max 0.5	0.5 - 0.8	0.15 - 0.35	-	-

Mechanical Properties

mechanical properties of 21CrMoV5-7, 1.7709 acc. to EN 10269

- Tensile strength, Rm = 700 - 850 MPa
- Yield point, Re > 550 MPa Elongation,
- A > 16% Contraction, Z > 60%
- KV 20°C > 63 J

Thermal Properties

- Softening at 650 °C with slow cooling
- Slow relief annealing at 530 °C at furnace to at least 200
- Normalizing at 950 - 980°C with cooling in calm air
- Hardening at 930 - 950°C in water, 940 - 960°C in oil
- Tempering at a temperature of 650 ° c in the air for many hours depending on the size of the material

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