



SIQUAL 7335 Steel

Designation by Standards

Brand Name	Ravne	Mat. No.	DIN	EN	AISI/SAE
SIQUAL 7335	13CRMO44	1.7335	13CrMo4-4 †	13CrMo4-5	A 182 Grade F11

Chemical Composition (in weight %)

C	Si	Mn	Cr	Mo	Ni	V	W	Others
0.14	max. 0.40	0.55	0.98	0.60	-	-	-	max. Cu = 0.30

Description

Alloy special structural steels. Cr-Mo-steels with > 0.35% Mo.

Applications

High-temperature structural steel: Collectors, water boiler and super heater tubes (530°C).

Physical properties (average values) at ambient temperature

Modulus of elasticity [$10^3 \times \text{N/mm}^2$]: 210

Density [g/cm^3]: 7.85

Soft Annealing

Heat to 680-720°C, cool slowly in furnace.

Hardening

Harden from a temperature of 910-940°C followed by oil or air quenching.

Tempering

Tempering temperature: 650-720°C.

Mechanical Properties in Hardened and Tempered Condition

Diameter in mm	0.2 % proof stress (N/mm^2)	Tensile strength (N/mm^2)	Elongation (%)	Impact strength (J)
up to 60	295	440-590	20	44
61-90	285	440-590	20	44
91-150	275	440-590	20	44

0.2 % Proof Stress (N/mm²) vs. Temperature

100°C	150°C	200°C	250°C	300°C	350°C	400°C	450°C	500°C
260	245	240	230	215	200	190	180	175
250	240	230	220	205	190	180	170	165
250	235	220	210	195	180	170	160	155

1 % Creep Limit (N/mm²) vs. Temperature (°C)

Hours	450°C	460°C	480°C	500°C	520°C	540°C	560°C
10 000	245	228	193	157	122	90	64
100 000	191	172	133	98	70	46	30

Creep Rapture Strength (N/mm²) vs. Temperature (°C)

Hours	450°C	460°C	480°C	500°C	520°C	540°C	560°C
10 000	370	348	304	239	179	129	91
100 000	285	251	190	137	94	61	40
200 000	260	226	167	115	76	50	32

Forging

Hot forming temperature: 1100-850°C.

Machinability

No data.

Forms manufactured: Please see the [Dimensional Sales Program](#).

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