SIQUAL 1221 Steel

Designation by Standards

Brand Name	Ravne	Mat. No.	DIN	EN	AISI/SAE
SIQUAL 1221	CK60	1.1221	Ck60 †	C60E	1060

Chemical Composition (in weight %)

C	Si	Mn	Cr	Mo	Ni	V	W	Others
0.61	max. 0.40	0.75	max. 0.40	max. 0.10	max. 0.40	-	-	(Cr+Mo+Ni) = max. 0.63

Description
SIQUAL 1221 is one of the higher carbon content (0.60%) steels. It is more difficult to fabricate than the lower carbon grades.

Applications
Shafts, bushings, connecting rods, mechanical engineering components, agricultural hand tools, large forgings, springs, cold rolled strips.

Physical properties (average values) at ambient temperature
Modulus of elasticity [10^3 x N/mm^2]: 210
Density [g/cm^3]: 7.85

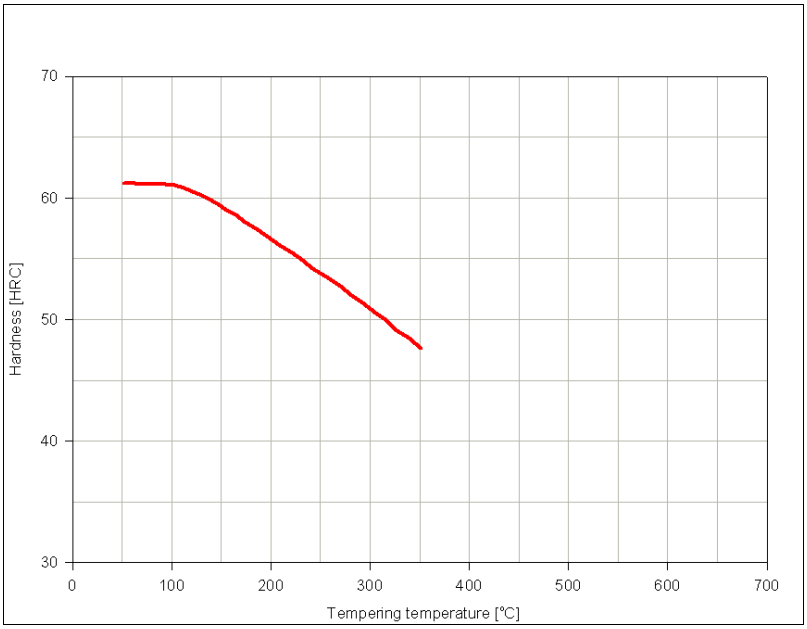
Soft Annealing
Heat to 650-700^{o}C, cool slowly in furnace. This will produce a maximum Brinell hardness of 241.

Normalizing
Normalizing temperature: 820-850^{o}C.

Hardening
Harden from a temperature of 800-830^{o}C, 810-840^{o}C followed by water or oil quenching.

Tempering
Tempering temperature: 540-680^{o}C.

Tempering Diagram



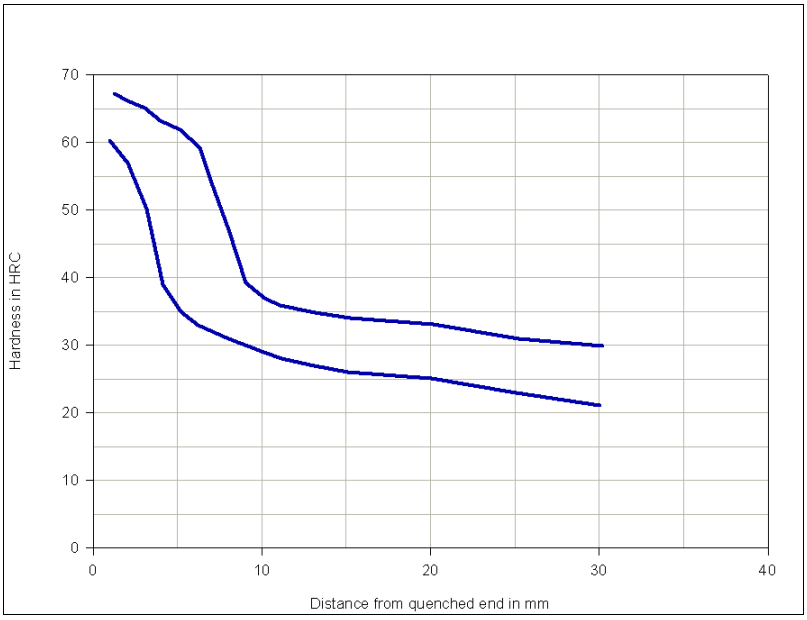
Mechanical Properties in Normalized Condition

Diameter (mm)	0.2 % proof stress (N/mm^2)	Tensile strength (N/mm^2)	Elongation (%)
up to 16	380	710	10
17-40	340	670	11
41-100	340	670	11
101-160	310	650	11
161-250	310	650	11

Mechanical Properties in Quenched and Tempered Condition

Diameter (mm)	0.2 % proof stress (N/mm^2)	Tensile strength (N/mm^2)	Elongation (%)	Reduction (%)	Impact strength (J)
up to 16	580	850-1000	11	25	-
17-40	520	800-950	13	30	-
41-100	450	750-900	14	35	-
101-160	-	-	-	-	-
161-250	-	-	-	-	-

Hardenability Diagram



Forging

Hot forming temperature: 1100-850^{o}C.

Machinability

Machinability of SIQUAL 1221 and all of the higher carbon steels is relatively poor. SIQUAL 1221 rates at 55 to 60 % that of the AISI 1112 steel which is considered 100% machinable.

Corrosion Resistance

This steel is not corrosion resistant. it will rust unless protected.

Welding

SIQUAL 1221 steel is weldable by all of the welding methods. However with its higher carbon content it is important to use both pre-heat at 150 to 260^{o}C and post-heat at 590 to 650^{o}C practice per an approved welding procedure.

Cold working

Cold working is difficult even in the annealed condition although it may be done by conventional methods but requires greater force than the lower carbon steels.

Forms manufactured: Please see the Dimensional Sales Program.

Disclaimer

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