

TECHNICAL BULLETIN

AISI-A6 Air Hardening Tool Steel ^{Annealed}

Typical Analysis:	Carbon	Chromium	Mang.	Silicon	Moly.
	0.70	1.00	2.00	0.25	1.25

HEAT TREATMENT

- Forging** 2175°F, stop at 1800°F and cool slowly.
- Normalizing** Do not normalize.
- Annealing** 1400°F, furnace-cool at 20°F/hr to 1290°F; cool at 10°F/hr to 1100°F; air cool to room temperature — 229 HB, max.
- Hardening** 1500 °F, air quench.
- Tempering** 400°F, average hardness after heat treatment — ROCKWELL C 59.
- Machinability** — A-6 has a machinability rating of 70 when compared to a rating of 100 for a 1.00% carbon tool steel.

Critical Points — The following critical points were determined by heating a dilatometer specimen at 100°F/hr and cooling at 50°F/hr.

Heating — Ac range 1360 to 1420°F
Cooling—Ar range 1240 to 1190°F

Dimensional Stability — When quenched in air from the proper hardening temperature, A-6 can be expected to expand no more than 0.001 in./in. of cross section or have a volume increase of no more than 0.3% from the annealed condition to the quenched and tempered condition.

GENERAL INSTRUCTIONS

Hardening — Heat to an austenitizing temperature of 1550°F, holding at temperature for one hour per inch of greatest thickness. After air quenching, the piece should be tempered without delay upon reaching 150°F.

Tempering — A-6 tool steel is normally tempered for two hours per inch of greatest cross section. For most applications, a tempering temperature of 400°F is usually specified. If a given application requires higher toughness, a higher tempering temperature should be specified.

Specimens 1 in. square by 3 in. long were air hardened from 1550°F and tempered at various temperatures for two hours. The resulting hardnesses are listed below.

Tempering Temperature-°F	Rockwell C
300	62
350	60
400	59
500	58
600	56
700	54
800	52
900	51
1000	49
1100	47
1200	41



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