NESSteel Inc.

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Oil-Hardening Steel AISI O-6

O-6 is an oil-hardening steel with very good nondeforming properties, toughness, and wear resistance. Typical analysis is shown in the chart below:

Carbon	Manganese	Phosphorus	Sulphur	Silicon	Chromium	Molybdenum
1.25%-1.55%	0.30%-1.10%	0.3% Max	0.3% Max	0.55%-1.50%	.30% Max	0.20%-0.30%

O-6 is used primarily in stamping and cold forming of parts. The steel contains free graphie, which gives excellent lubricity. Hard carbides in conjunction with the free graphite provides excellent wear resistance.
Typical applications include:

- Punches
- Dies
- Trim Dies
- Blanking Dies
- Forming Dies
- Stamping Dies
- Jigs & Fixtures
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Heat Treatment

Forging:
- Preheat steel to 1300º F
- Increase furnace temperature to 2000˚F.
- DO NOT forge below 1700˚ F.
- Cool slowly. Do not normalize.

Annealing
- Heat to 1450º, hold steel for 2 hours.
- Cool slowly in furnace at a rate of 50˚F/hour to 1100˚F.
- Air cool. Brinell hardness approximately 217.

Hardening:
- Pre-heat steel to 1250ºF, soak thoroughly.
- Increase furnace temperature to 1450˚F-1500˚F, hold one hour/inch thickness.
- Oil quench to 150˚F, temper immediately.

Tempering
- Temper between 350˚F/450˚F for 2 hours (pieces over 2", temper 1 hour per inch/thickness.

Tempering Temperature, ˚F	Hardness, Rockwell C
As Hardened	64 - 66
250	63 - 65
300	62 - 64
350	61 - 63
400	60 - 62
450	59 - 61
500	58 - 60
600	57 - 59

Test pieces were oil quenched from 1475˚F, tempered 2 hours.

Machinability

O-6 has a machinability rating between 55% - 65% of annealed 1.00% carbon tool steel based on average cutting speeds for turning, boring, drilling, slab milling and end turning.

Weldability

Preheat temperature:
Annealed...300/500˚F
Hardened...275/400˚F
Postheat temperature:
Annealed...Reanneal
Hardened...350/450˚F