

••• L-6 Special Purpose Steel

(AISI L6)



WM L-6 is an oil hardening chrome nickel tool steel recommended for any tool steel application requiring great toughness, or where intricate shapes preclude the use of water hardening steels it is also recommended for machine parts and other applications having extreme requirements of strength, toughness, and wear resistance.

Chemical Composition

Carbon	0.75*
Manganese	0.50
Silicon	0.25
Chromium	1.00
Molybdenum	0.30
Nickel	1.50

* Where strength and wear resistance must be sacrificed to gain better toughness, WM L-6 is available in the .50 Carbon range

Typical Applications

Arbors, blanking dies, clutch parts, forming dies, disc saws, drift pins, brake dies, hand stamps, hubs, lead and feed screws, machine parts, punches, pawls, pinions, shear blades, spindles, spring collets, swages.



Physical Properties

Critical temperature - (on heating) 1325°F

Specific gravity - 7.86

Coefficient of Thermal Expansion

100 - 500°F	6.10×10^{-6} in/in/°F
100 - 800°F	7.04
100 - 1000°F	7.45
100 - 1200°F	7.62



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Forging

Heating for forging must be done slowly and uniformly. Soak through at 1800-1900°F, and reheat as often as necessary, stopping work when the temperature drops below 1600°F. After forging cool slowly in lime, mica, dry ashes or furnace. **WM L-6** should always be annealed after forging.

Quenching

WM L-6 should be quenched into warm circulating oil. It should be allowed to cool until it has reached a temperature of 125-150°F, or to where it can be held in the bare hand, and tempered immediately.

Annealing

Heat slowly to 1400-1450°F, hold until the entire mass is heated through, and cool slowly in the furnace (40°F per hour) to about 1000°F, after which the cooling rate may be increased. Suitable precautions must be taken to prevent excessive carburization or decarburization.

Tempering

This grade of steel is generally tempered in the range of 300-900°F. the response to tempering after average hardening conditions is shown in the following curve:

Oil Quenched from 1525°F.	.75 C	.50 C
As Quenched	63.5 RC	57.5 RC
Tempered		
300 °F	62.5	56.0
400 °F	61.0	53.5
500 °F	59.0	51.0
600 °F	56.1	48.5
700 °F	53.4	45.5
800 °F	50.0	42.5
900 °F	46.0	39.0

Strain Relieving

When desirable to relieve the strains of machining, heat slowly to 1050-1250°F, allow to equalize, and then cool in still air.

Preheat for Hardening

Warm slightly before charging into the preheat furnace, which should be operating at about 1100-1200°F.

Hardening

If preheating is not employed, it is good practice to warm the parts on top of the furnace, or in front of the door, before charging into the furnace. The hardening temperature should be 1500-1550°F, depending on the section size.

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