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TOOL STEEL SPECIALISTS

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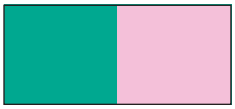
TECHNICAL BULLETIN

AISI T-15 Powdered Metal



Color Code: Green/Pink

Typical Chemistry				Physical Properties	
Carbon	1.55	Molybdenum	0.50	Specific Gravity	8.19
Sulfur	0.07	Silicon	0.30	Density	0.29 lb/in^3 *soft annealed
Chromium	4.25	Cobalt	5.00	Typical Heat Treated Hardness	64-67 HRC
Vanadium	5.00	Tungsten	12.25	Modulus of Elasticity	3.6 x 10^7 psi *hardened & tempered
Manganese	0.30			Machinability	35-40% of 1% Carbon Steel

DESCRIPTION

Lindquist Steels, Inc. T-15 Powdered Metal is an advanced AISI T-15 powdered metal high speed material. Our T-15 Powdered Metal material contains high levels of vanadium, tungsten, and cobalt which make this material an excellent choice for tooling that requires high abrasion resistance and good properties during high heat machining.

Lindquist's T-15 Powdered Metal material is well suited for broaches, taps, punches, drills, end-mills, form tools, screw machine tooling, form tooling, and much more.

Many of the benefits realized in the use of powdered metals, such as T-15 Powdered Metal, are a direct result of the refined microstructure (smaller, more uniformly distributed carbide particles and a finer grain size) and the lack of segregation in the powder metallurgy product. These advantages include ease of grinding, improved response to heat treatment, greater wear resistance, and increased toughness of the finished tool.

Typical Chemistry

Carbon	1.55
Sulfur	0.07
Chromium	4.25
Vanadium	5.00
Manganese	0.30
Molybdenum	0.50
Silicon	0.30
Cobalt	5.00
Tungsten	12.25

Supplied Condition

Soft Annealed, max 280 Brinell

Physical Properties

Density: 0.29 lb./in^3 *soft annealed
Specific Gravity: 8.19
Modulus of Elasticity: psi 3.6 x 10^7 *hardened & tempered
Machinability: 35 to 40% of 1% Carbon Steel
Typical Heat Treated Hardness: 64-67 HRC

HEAT TREATMENT

*Important Note: Always consult with your Heat Treating professional to ensure optimal results

ANNEALING

Annealing is required after hot working and before re-hardening.
Soft annealing in a protected atmosphere at 1560-1650° F for 3 hours, followed by slow cooling at 20° F per hour down to 1290° F, then air cooling.

STRESS-RELIEVING

Stress-relieve at 1110° F to 1290° F for approximately 2 hours followed by a slow cooling down to 930° F.

HARDENING

Hardening should occur in a modern protective vacuum furnace atmosphere. Pre-heat in two steps at 840-930° F and 1560-1650° F and austenitizing at a temperature suitable for the required hardness.

TEMPERING

Tempering at 1040° F three times for at least 1 full hour each time. Cooling to room temperature between temperings.

GRINDING

During the grinding process localized heating can alter the temper of the material. Caution needs to be given to avoid this. Contact your grinding wheel supplier for advice on the appropriate grinding wheel of choice.

SURFACE TREATMENTS

T-15 Powdered Metal is a very good substrate material for various surface treatments such as PVD and CVD coatings. The material also lends itself well to nitriding.

For further information regarding T-15 Powdered Metal please contact the Lindquist Steels branch nearest your location by logging on to www.lindquiststeels.com