

VANADIS[®] 23,30,60

SUPERCLEAN

Powder Metallurgy Tool Steels

Heat Treatment Recommendations

General Applications

	Salt Bath	Vacuum	Muffle Furnace Using 2 Furnaces and Stainless Foil Wrap**
Preheating	1st 1000°F 2nd 1550°F 3rd 1850°F *Large tools/High austenitizing temperature only	1. Bring up to 840-930°F, equalize 2. Bring up to 1500-1600°F, equalize	1st furnace heat slowly to 1550°F, equalize
Hardness after Tempering (+/- 1 HRC)	***Austenitizing Temp. °F/time in minutes		
VANADIS		Increase to Aust. Temp. Rapidly	2nd Furnace Set at Temp. Below
23 30 60			
62 64 66	2000°F 10*min	2025°F 20†min	2025°F 20†min
64 65 67	2075°F 8*min	2100°F 15†min	2100°F 15†min
66 67 68	2150°F 6*min	2175°F 10†min	2175°F 10†min
*Immersion time after preheating (min. per inch) ***For tools with a wall thickness of 1-1/2" or greater, use an austenitizing temperature higher than indicated in chart to achieve the stated hardness.		†Holding time after tool has fully heated through **Super hi-foil wrap - Type 310 for temperature up to 2240°F	
Quenching	Alt. 1 Step quench in salt bath (1000°F) equalize and cool in air Alt. 2 Interrupted oil quench for larger tools to 1000°F; then cool in air Alt. 3 Air	Alt. 1 Pressurized inert gas Assure sufficient cooling Alt. 2 Interrupted oil quench Oil quench - Handle with extra care	Alt. 1 Step quench in oil (150°F) with wrapping, once black, remove foil and cool in air Alt. 2 Circulated inert gas Alt. 3 Circulated air
Tempering Temper immediately, after quenching when tool or part reaches 150°F.	Triple temper at 1040°F for minimum 1 hour per temper. cool to room temp. between tempers		
Stress Tempering: (After EDM'ing/grinding)	1000°F for 1 hour in protective atmosphere or steam-homo, air cool.		
Average size change as a result of hardening and tempering should not exceed 0.3% overall (0.0015 inches per inch side) if the tool has been stress relieved before finish machining.			

VANADIS[®] SUPERCLEAN...the new generation of P/M tool steels

- Better Production Economy because you produce each part for less.
- Longer production runs because you get more wear resistant tools.
- More consistent tool life because you tools will be tougher and less prone to chipping.

This information is based on our present state of knowledge and is intended to provide general notes on our products and their uses. It should not therefore be construed as a warranty of specific properties of the products described or a warranty for fitness for a particular purpose.



U.S.A and Canada: 1-800-833-4656
 Mexico: (5) 576-5422
 Web site: www.uddeholmtooling.com
 e-mail: info@uddeholmtooling.com