

UDDEHOLM SKOLVAR®

Premium Hot Work Tool Steel

Heat Treatment Recommendation

	Vacuum	Atmosphere Furnace Muffle Furnace / Packed
Preheating Temperature	1. Bring up to 1200°F, equalize 2. Heat up to 1500°F, equalize	1. Bring up to 1200°F, equalize 2. Heat up to 1500°F, equalize
	3. For cross section larger than 8" thick use a 1510°F second preheat and a third preheat at 1700°F.	
Hardening Temperature (Austenitizing)	Typically 1920°F and 2050°F: use 1920°F for higher ductility and 2050°F for higher heat resistance. Holding time after the tool or part has fully heated through at the hardening temperature: 15-30 minutes, alternatively hold 20 minutes for first 1" and then 15 minutes for each additional inch of wall thickness.	
Quenching *	Alt. 1 Inert gas, positive pressure Alt. 2 Back-filled pressurized gas to 1050°F, then equalize center and surface. Continue to 600°F and equalize. Then cool in circulating air.	Alt. 1 Circulated inert gas Alt. 2 Circulated air
	*Cooling rate must be adequate to avoid any transformation products, with decreased properties as a result. However, also consider the risk of excessive distortion from very fast cooling.	
Tempering (Minimum two times) Temper immediately after quenching when the complete tool reaches 150°F	Tempering Temperatures (°F) 1040 1080 1100 1120	Hardening Temperature 1920°F 2050°F* 54-56 HRC 57-59 HRC 51-53 HRC 54-56 HRC 50-52 HRC 53-55 HRC 48-50 HRC 51-53 HRC
	Tempering Times: 1 hour per inch of wall thickness or hold at temperature a minimum of 2 hours. Check hardness after first temper and modify second and third tempers as needed to achieve hardness. *Add a third temper when using the higher hardening temperature. Modify temperature as needed to achieve the recommended hardness.	
Stress Temper performed on hardened tools after EDM, welding or during preventative maintenance	Temperature: Shall be 50°F (25°C) below the lowest tempering temperature. Time: Soak 2 hours once tool comes to temperature. Cool in still air. Caution: Stress tempering in an unprotected atmosphere will oxidize the tool. For hot work applications, this can prove beneficial to protect the tooling surface during operation. However, in other applications where surface finish condition is a concern, consult your heat treater on options for protective atmospheres or finish the surface after stress tempering.	
Dimensional Stability	Average size change as a result of hardening and tempering may not exceed 0.003 inch/inch/maximum dimension if the tool has been stress-relieved before finish machining. If stress relieving is not performed as recommended, dimensional stability may be inconsistent and cannot be guaranteed.	
UDDEHOLM SKOLVAR® High Hardness Hot Work Tool Steel		
	<ul style="list-style-type: none"> • Excellent temper resistance • High hot wear resistance • Good toughness and ductility • Good weldability 	

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. It is your responsibility to confirm you have the latest revision of this document (verify on our website) and that you forward to your Heat Treatment service provider. Failure to do so may result in inferior material properties.



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