

UDDEHOLM FORGING SOLUTION

With an increasing focus on longer production runs and lower cost per part - Uddeholm has suitable options to fight hot wear, temper back and toughness requirements.

PRODUCT OVERVIEW

Introducing Uddeholm Skolvar: A brand new product specifically designed for hot forming tools. It has the best combination of hot wear resistance, hot strength and high temper-back resistance currently available in our product portfolio, while still being weldable. This is achieved through an optimized manufacturing process and a fine-tuned chemical composition. Consider its use when dies previously required additional surface modification for hot wear resistance. Can achieve a maximum hardness of 61 HRC. *Remelted using P-ESR technology.*

Uddeholm Formvar: A strong upgrade from H13-type material because of its modified chemistry and production technique. Characterized by good toughness and ductility for a conventionally produced steel, good wear resistance, excellent temper resistance, good hot strength and excellent thermal fatigue properties.

Uddeholm Unimax: When excessive wear and cracking are both present in the failure mode in the die, Unimax shows its true abilities. At a recommended hardness of 56-58 HRC, Unimax resists both hot wear and cracking. Its very good toughness and

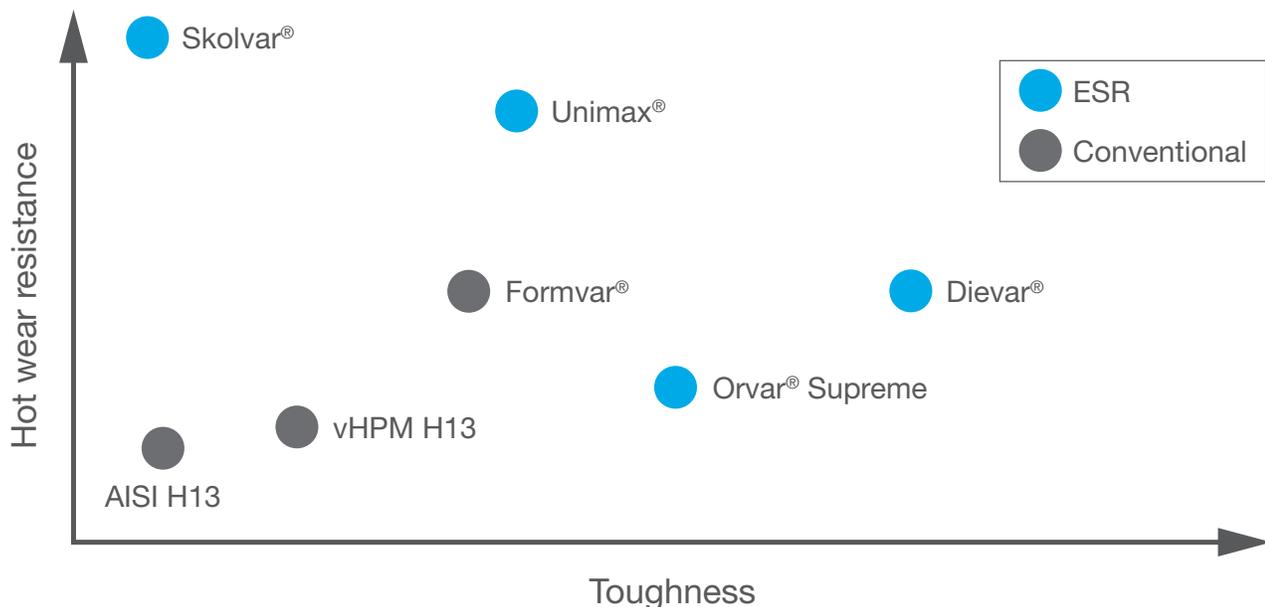
ductility at that hardness range also provides an excellent substrate for coatings when added wear resistance is needed: while improving the hot hardness of the steel substrate. *Remelting using P-ESR technology.*

Uddeholm Dievar: The unparalleled toughness and ductility of Dievar **decrease** the risk of cracks in the die. Together, with the high thermal conductivity and good hot strength, Dievar is the ideal choice for any severe forging application. *Remelted using P-ESR technology.*

Uddeholm Orvar Supreme: Excellent toughness and ductility in all directions for a superior H13; toughness rating of min/avg. 12 ft-lbs. in the delivered condition. *Remelted using P-ESR technology.*

vHPM H13: A well-rounded steel with proven qualities and balanced properties. Due to tight process parameters and stringent chemistry compositions, make vHPM H13 a valued upgrade to AISI H13.

PRODUCT POSITIONING



Please note, this positioning reflects the typical hardness range for each of the grades. The grade choice will be dependent on the application and failure mode.

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 **UDDEHOLM**
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Shaping the World - Manufacturing Solutions for Generations to Come

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TYPICAL CHEMICAL COMPOSITION %

STEEL GRADE	C	Mn	Si	Cr	Mo	V
Uddeholm Skolvar	0.70	0.45	0.20	5.00	2.25	1.60
Uddeholm Formvar & Dievar	0.35	0.50	0.20	5.00	2.30	0.60
Uddeholm Unimax	0.50	0.50	0.20	5.00	2.30	0.50
AISI H13	0.40	0.35	1.00	5.20	1.40	0.90

- Molybdenum (Mo) is increased to provide better hot wear, temper back resistance and hot yield strength
- Lower Silicon (Si) content improves toughness

PROPERTY PROFILE

STEEL GRADE	Plastic Deformation	Hot Wear	Temper Back Resistance	Cracking Resistance	Thermal Fatigue	Material Consistency
AISI 4340-2714						
AISI H13						
vHPM H13						
Uddeholm Orvar[®] Supreme						
Uddeholm Formvar[®]						
Uddeholm Dievar[®]						
Uddeholm Unimax[®]						
Uddeholm Caldie[®]						
Uddeholm Skolvar[®]						

Best
 Good
 Poor

This document is intended to provide a general guideline on material selection. For optimal performance, please consult with an Uddeholm representative.

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