

**Uddeholm Orvar Supreme**  
**High Sustainability & low CO<sub>2</sub>**  
**footprint**

## Uddeholm Orvar Supreme High Sustainability & low CO<sub>2</sub> footprint

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Manufacturing solutions for generations to come

# SHAPING THE WORLD®

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This is very important for products such as Uddeholm Orvar Supreme where the material has to have multiple melt & heating processes to achieve its high quality. The EAF (Electric Arc Furnace) uses ~656kWh per ton of tool steel manufactured and the ESR (Electric Slag Remelting) uses ~1000kWh per ton of tool steel manufactured.

This is a massive amount of electricity and today 100% of this electricity used at Uddeholm has a zero CO<sub>2</sub> footprint from 3 fossil-free sources.

- Nuclear Power (51,2%)
- Hydro Electric Power (46,3%)
- Wind & Solar (2,5%)

In addition, the capability of Uddeholm to recycle high percentages of its tool steel is very impressive, if we take Uddeholm Orvar Supreme as an example, ~91% of this product is from recycled scrap sources. The major source of scrap (>50%) is from our own Uddeholm Orvar material either reused in production or returned as bought scrap. The rest of the scrap and alloys used are sourced from recycled and sustainable sources. What is not recycled are the small amount (<10%) of other alloys and slag formers.



If you are a car manufacturer why go to all the trouble and effort to develop a cleaner hybrid car or fossil-free electric car - only to have its parts made in tooling using tool steel from highly polluting energy sources?

You do not have to! Use Uddeholm Orvar Supreme with its high sustainability & low CO<sub>2</sub> footprint.

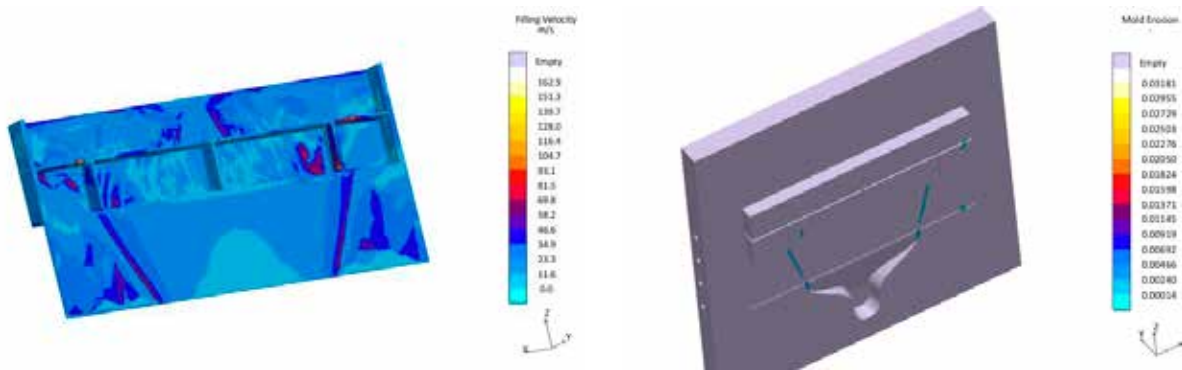


Figure 2. Left image show critical areas for high melt velocity in dark blue /red which is correlated as erosion damage on right image of a die

## Die material

The selection of die material can be decided based on history, availability or solution based in order to achieve long production series.

W-Nr/AISI	C	Mn	Si	Cr	Ni	Mo	V
1.2344/H13	0.40	0.35	1.00	5.20	-	1.50	0.90
1.2343/H11	0.36	0.30	1.00	5.00	-	1.30	0.50

Figure 3 shows a chart that compares chemistry of current tool steels, with most dating from before 1940's. But are H13 and H11 any better than modern tool steels from Uddeholm?

The answer for the main problem of heat checking, the chemistries of 1.2344 (also known as H13) and 1.2343 (also known as H11) are lacking in this area, or they have compromises. AISI H11 & H13 are cheap, easy to buy and they work OK. However, is just OK really what you want? How do these steels compare to modern special chemistry die steels, like some Uddeholms AB can offer?

From the chart shown below two key properties had been taken into account, hot wear resistance that can be directed to erosion resistance and toughness that can be directed to crack resistance. Comparison clearly shows the improved quality by using Uddeholm steel, even if it is a standard grade like Uddeholm Orvar Supreme that corresponds to H13 and Vidar Superior H11. The main improvement is in toughness. The reason is thanks to the high cleanliness level received through controlled and modern production technology. Two grades sticks out from the crowd, Uddeholm Unimax and Uddeholm Dievar. To fight hot wear or erosion, Uddeholm Unimax is the most suitable grade and if cracking is an issue Uddeholm Dievar is superior.

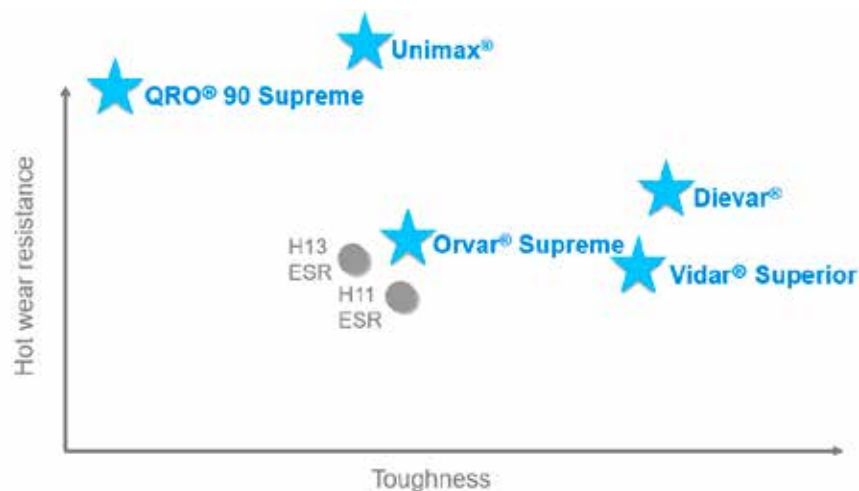


Figure 4. Chart of die material placement based on hot wear and toughness This article

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# SHAPING THE WORLD®

We are shaping the world together with the global manufacturing industry. Uddeholm manufactures steel that shapes products used in our every day life. We do it sustainably, fair to people and the environment. Enabling us to continue shaping the world – today and for generations to come.