

Uddeholm Vanax SuperClean

Technical article

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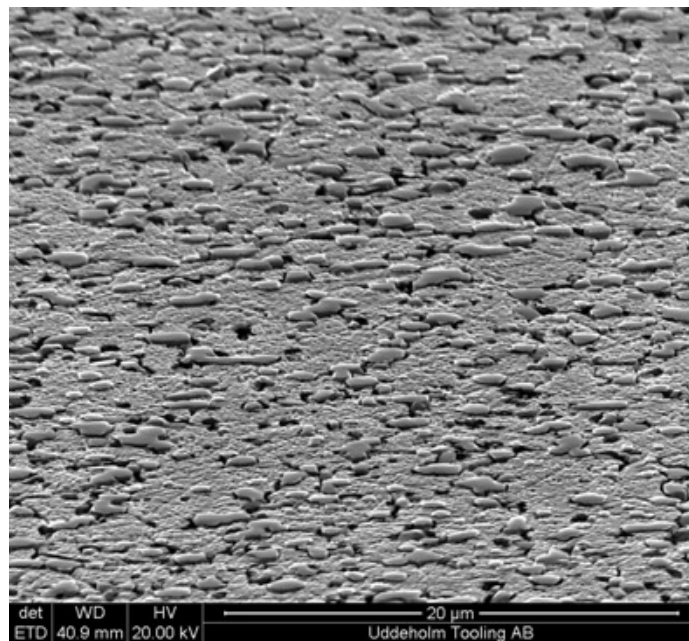
Imagine a product that can solve the previously unsolvable problem and break the laws of nature. Imagine a steel grade that can provide the industry with the best of two worlds; stainless properties of an austenitic stainless steel in combination with a high wear resistance and high strength of a 60 HRC powder metallurgical steel. The icing on the cake is good toughness, anti-sliding properties, erosion and cavitation resistance as well as damping properties outside of the ordinary. You probably say it is not possible. Well for a long time it was not, but due to the thorough product development and production process development that Uddeholm has undertaken, we are now happy to introduce the groundbreaking performance and stainless stamina of Uddeholm Vanax SuperClean.

Uddeholm launches the groundbreaking stainless steel Uddeholm Vanax SuperClean

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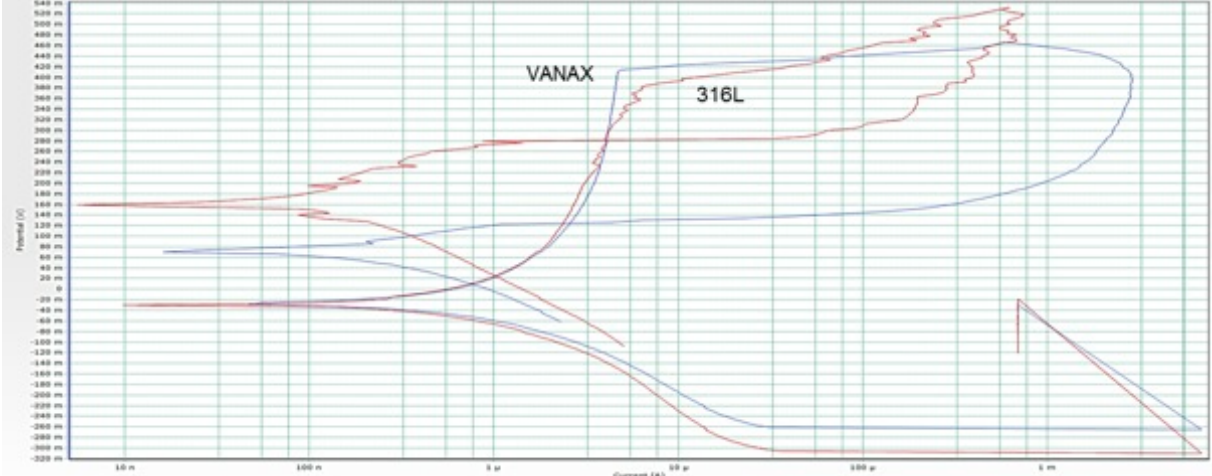
How is it even possible? Well, we like to call this a radical production process and material development innovation, which has taken us more than 10 years to develop. The chemical composition in itself with a very high nitrogen content (1.55%) has forced us to develop several new production processes. No other competing grade exceeds 0.5% nitrogen, which is the maximum nitrogen content that can be achieved using previously available techniques. Due to the high nitrogen content, we have been able to lower the carbon content, while still keeping the desired hardness. Due to the low carbon content, out of which also a majority goes into the matrix during the hardening dissolving negative carbides, we are able to at the same time get the stainless properties sought after. The nitrogen forms nitrides and carbo-nitrides throughout the material, which enhance both the wear resistance and strength as well as lower the friction on the surface.

The field of application for this steel grade is for highly exposed components where nothing else works. We like to mention marine environments, high pressures, corrosive working materials such as flame retardants, mass production in humid environments and where rules and regulations dictate the use of a stainless steel.



Favorable anti-friction topography of Uddeholm Vanax

Uddeholm Vanax SuperClean is a powder metallurgically produced steel grade, which is nitrided, HIPed as well as forged and/or rolled to round and flat bars and sheet material in thicknesses mainly matching for hand knives. Uddeholm Vanax SuperClean is a martensitic stainless steel grade with the wear resistance and strength qualities of a martensitic steel at the same time as it has the corrosion resistance in parity with or better than the austenitic AISI 316L. This has been proven in several trials in-house, at customers and at independent institutes. The diagram below shows a comparison between Uddeholm Vanax SuperClean and AISI 316L using a cyclic polarization test (0.1M NaCl). The results show that the break-through potential of Uddeholm Vanax SuperClean is higher than that of AISI 316L. When making several comparisons between the steel grades, the results of Uddeholm Vanax SuperClean have also been very stable whereas the AISI 316L results have been much more varied.



Cyclic polarization test

The chemical composition of Uddeholm Vanax SuperClean is as follows:

C	Si	MN	Cr	N	Mo	V
0.35	0.30	0.30	18.2	1.55	1.1	3.5

We are introducing a stainless solution that lasts longer, that is a high-class problem solver using pioneering product development and production processes. This can give our customers unprecedented solutions for special demands.

Manufacturing solutions for generations to come

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.