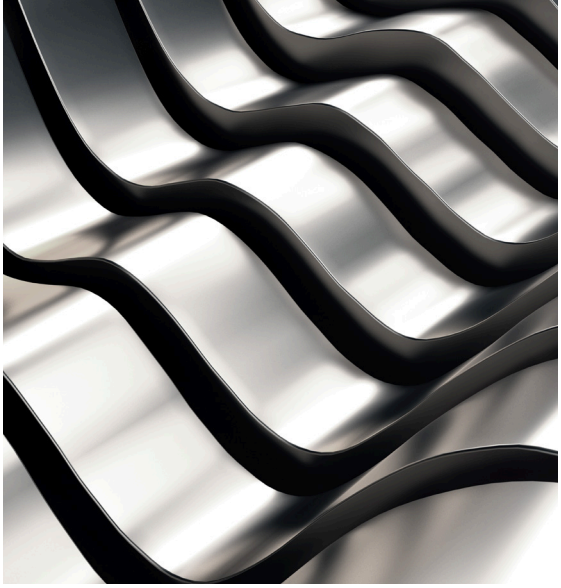
High performance steels

Uddeholm

MEDICAL INDUSTRY SOLUTIONS

UDDEHOLM
a voestalpine company




UDDEHOLM

THE PERFECT PARTNER

SHAPING THE WORLD

Uddeholm is the world's leading provider of tool steel, with business and operations in over 90 countries. Since the beginning, our promise and foundational business idea is to deliver a tool and die solution that enhances competitiveness and creates added value for our customers.

By applying our experience and expertise of raw material and metallurgy to innovative technology, we are forcing new challenges in the industry to adjust to our ever-present and indispensable rule: choose the right material for the job.

It is a simple way of developing advanced tool steel and delivering solutions that make a difference for our customers. Quality and global traceability is key.

Some say we are leaders, and that makes us proud. Because when it comes to tool steel, we aim to be the one leading the way. And we do so by always delivering more than tool steel.

We add value and we enhance competitiveness. That is what makes Uddeholm the world's leading provider of tool steel solutions. And it will be for the next 350 years too. Shaping the world for generations to come.

50% REDUCED NO_x

25% REDUCED CO_2

70% REDUCED SULPHUR

100% SUSTAINABLE STEEL

<70% EMISSIONS TO WATER

HOT WORK

HIGH DEMAND APPLICATIONS

Medical forgings are typically formed from material grades such as Cobalt-Chrome, Stainless Steels and Titanium alloys due to the benefits they offer.

Beneficial though these properties may be in offering medical implants and other components they can present issues in production.

Forging dies often measure tool outputs in double digit figures before re-cutting.

Uddeholm high performance tool steels can increase tool life in these high demand applications and solve serious failure issues such as gross cracking by offering superior toughness.

QUALITATIVE COMPARISON OF RESISTANCE OF BASIC PROPERTIES

UDDEHOLM TOOL STEEL	HOT WEAR	PLASTIC DEFORMATION	PREMATURE CRACKING	HEAT CHECKING
Dievar				
Unimax				
Orvar 2 Microdized				
Orvar Supreme				
Vidar Superior				
QRO 90 Supreme				
Formvar				

The longer the bar, the better.

PLASTIC

STEEL SOLUTIONS FOR PLASTIC PRODUCTION

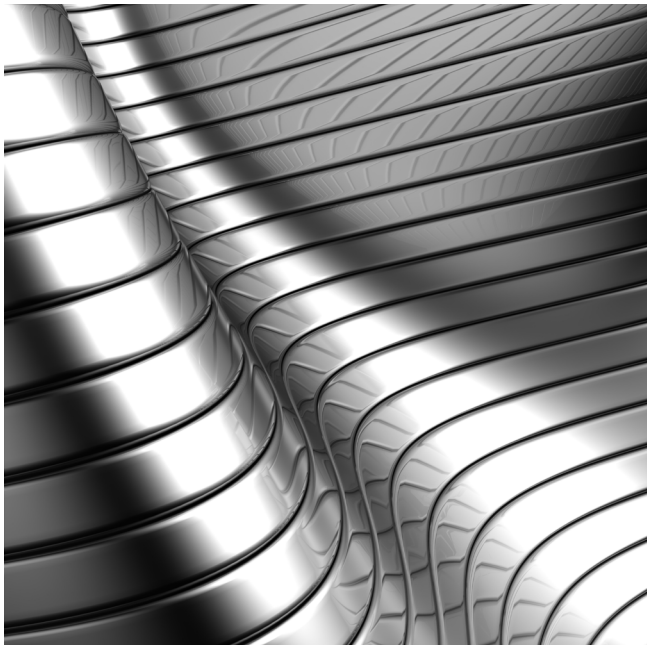
Polymer technology has advanced to a stage where conventional tool steels struggle to cope with increased demands placed on the tooling by advanced polymers. Increased wear and high temperature injection and curing can lead to a reduction in tool life. Corrosive gasses produced as a byproduct of production can also seriously damage the tool steel leading to premature failure.

A common challenge in high volume plastic production is getting the best part quality out from the tool. Thermal hot spots can present a serious issue for high volume production, slowing down parts produced and causing distortion. When cycle times are measured every second counts.

Uddeholm's mould steel programme has the answers to these demands. Whether its higher abrasive wear resistance, increased toughness, better resistance to corrosion or conformally cooled inserts using additive manufacturing, uddeholm is here to offer a technical solution.

PROPERTY	Corrax	Stavax ESR	Mirrax ESR	Tyrax ESR	Elmax SuperClean	Vanax SuperClean
Normal hardness HRC (HB)	46	52	52	57	58	60
Wear resistance	3	5	5	6	8	7
Toughness	4	5	6	6	3	4
Compressive strength	6	7	7	8	9	9
Corrosion resistance	9	7	8	7	5	10
Machinability**	4	8	7	7	3	4
Polishability	7	9	9	10	8	8
Weldability	6	4	4	4	2	-
Nitriding ability	-	-	-	-	-	-
Etchability	8*	8*	8*	8*	8*	8*

**Special process required for corrosion resistant steel grades*



AUTOMATION

FOR EFFICIENT PRODUCTION

The automation of process within the medical sector can present a multitude of challenges.

Productivity is key in high volume production. Reliable steel selection can ensure downtime; maintenance and related costs are kept to a minimum.

Guide rails, location pins and loading components can often be overlooked as sacrificial elements, this doesn't need to be the case.

Speak to your Uddeholm technical expert about your process and they will assess any potential improvements in steel selection. We see a plethora of wide ranging and ingenious solutions every day and can help improve your process, reducing downtime and saving you money.

Improved machinability, increased stability in heat treatment and providing a good substrate for coatings can all offer reduced total tooling costs and improved productivity.

RELATIVE COMPARISON OF THE RESISTANCE TO FAILURE MECHANISMS

Uddeholm Grade	Hardness/ Resistance to plastic deformation	Machina-bility	Grindability	Dimension Stability	Resistance to		Fatigue cracking resistance	
					Abrasive wear	Adhesive wear	Ductility/ resistance to chipping	Toughness/ gross cracking
Arne								
Calmax								
Caldie (ESR)								
Rigor								
Sleipner								
Sverker 21								
Sverker 3								
Vanadis 4 Extra								
Vanadis 8								
Vanadis 23								
Vancron								

The longer the bar, the better the resistance.
The Vancron and Vanadis steels mentioned in the table are Uddeholm PM SuperClean tool steels.

PILL MANUFACTURE

PRECISION AND RELIABILITY

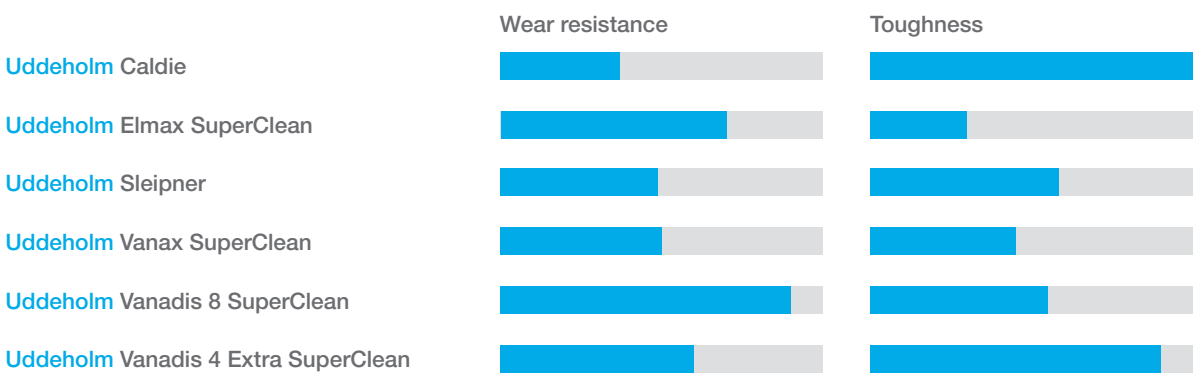
High volume production requires consistency and reliability. Minutes of downtime can result in major cost implications to production lines.

When the stakes are so high Powder Metallurgy grades are the best option. Our 3rd generation SuperClean PM steels offer superior resistance to wear, chipping and plastic deformation compared to conventional standard grades used in this application such as D2 and A2.

At Uddeholm, we pride ourselves on the quality of our steel and the subsequent benefits this offers to our customers. Responding to evolving market demand through close contact with our customer base, we are developing new steel grades and fine-tuning existing grades to provide solutions, which can deliver optimum results.

Increasing tool life, decreasing maintenance periods and removing post processing such as coatings can deliver significant savings to our customers.

PROPERTY COMPARISON



ADDITIVE MANUFACTURING

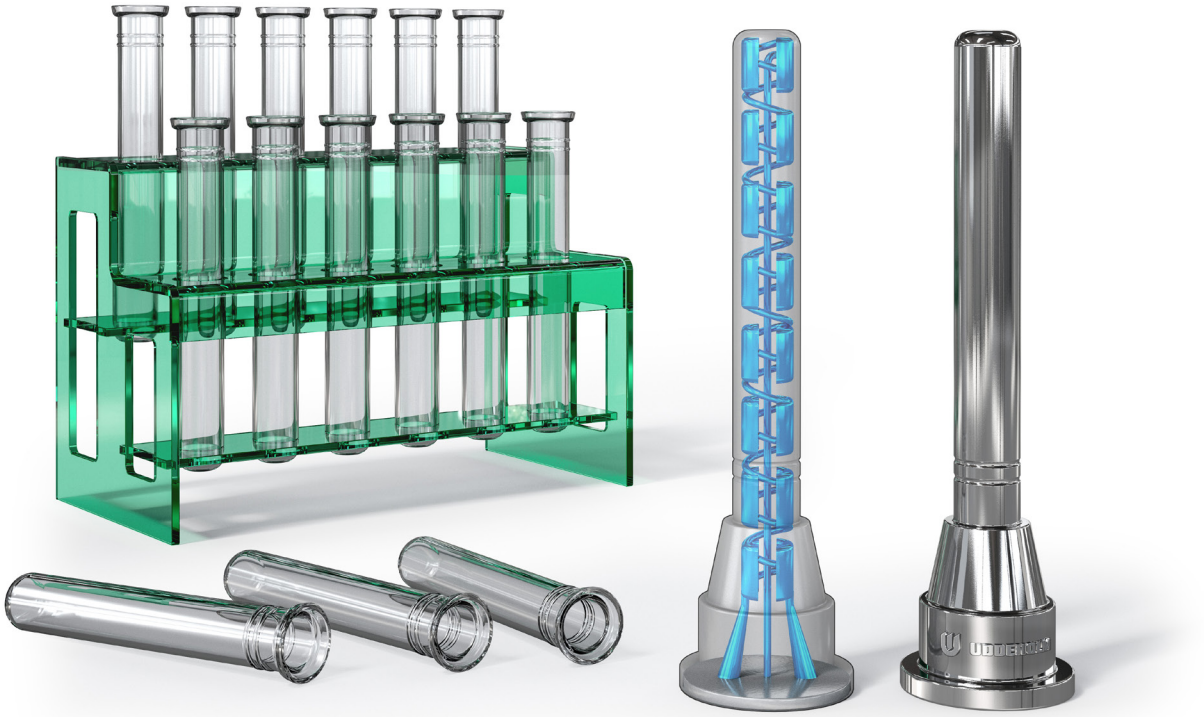
MADE FOR TOOLING

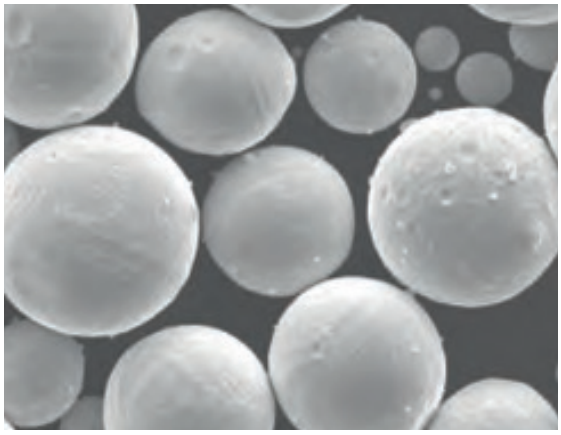
Additive Manufacturing (AM), popularly known as 3D metal printing, is one of the most innovative and revolutionary manufacturing methods we see today.

Sometimes the design of a component cannot change to facilitate tool design issues. The intricate nature of many medical components can lead to issues with hot spots in tools which cannot be easily dealt with.

Additive manufacture opens up a world of possibilities which were previously not possible using conventional methods.

High thermal coefficient materials can often be banned for medical use. Corrax AM is our solution, offering medical grade stainless steel which can be hardened to 51HRC, ensuring the highest possible wear resistance.





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.

Classified according to EU Directive 1999/45/EC
For further information see our “Material Safety Data Sheets”.

Edition 1

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.

UDDEHOLM
a voestalpine company