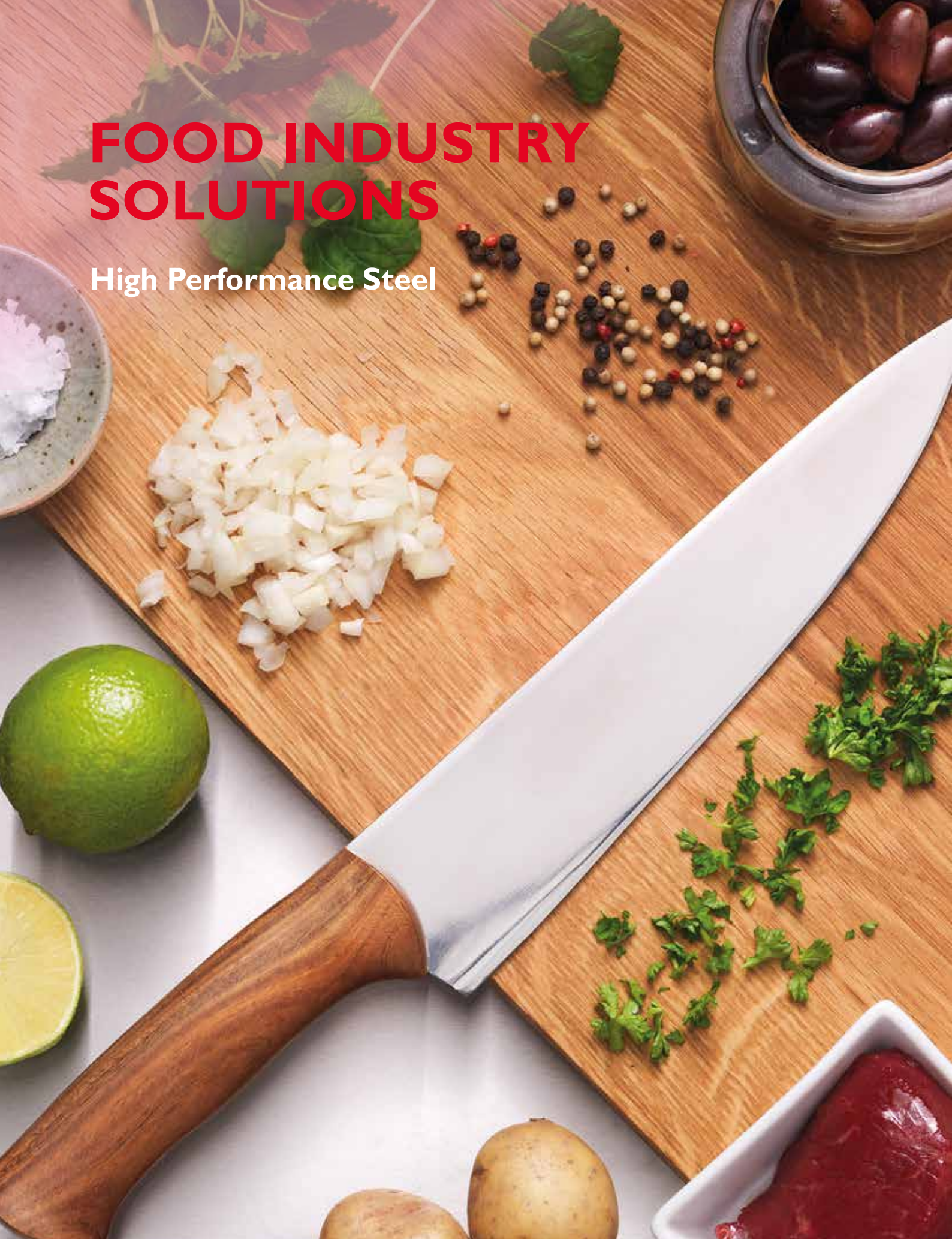


FOOD INDUSTRY SOLUTIONS

High Performance Steel



COMPONENT BUSINESS

INNOVATION DELIVERS EFFICIENCY

Established in 1945, ASSAB has been active in marketing high quality tool steel from Sweden. Anchoring the distribution network for Uddeholm in Asia, ASSAB provides one-stop integrated tooling solutions that include a full range of tool steel for components together with a full suite of services.

IMPROVED PROFITABILITY WITH ASSAB SPECIAL STEEL

ASSAB Component Business offers a first class tool steel solution for applications where conventional engineering steel is insufficient. Choosing the most suitable steel grade is an important decision to make when designing products subjected to heavy loads, heavy wear, corrosive or high temperatures. The qualities of ASSAB special steel contribute to an optimised design, increased performance, less maintenance cost and the best total tooling economy.

Our team of specialists can take your existing components for test and in return provide an optimal solution using one of our High Performance Steel grades which deliver greater efficiency and cost savings for your application.



PROPERTIES

ASSAB steel grade	Delivery Hardness ~ HB	Recommended Hardness HRC	Yield Strength R _{p0.2} (MPa)	Tensile Strength (MPa)
NIMAX ¹⁾	380	40	785	1265
MIRRAX ESR	250	50	1290	1780
MIRRAX40 ¹⁾	380	40	1020	1150
ELMAX SUPERCLEAN	250	58	2200	2900
CORRAX	330	46	1400	1500
STAVAX ESR	190	50	1460	1780
ASSAB 8407 SUPREME	180	48	1350	1600
DIEVAR	160	50	1470	1770
UNIMAX	185	56	1780	2150
CALDIE	215	60	2350 ²⁾	-
ASSAB 88	235	60	2350 ²⁾	-
VANADIS 4 EXTRA SUPERCLEAN	230	62	2530 ²⁾	-
VANADIS 8 SUPERCLEAN	<270	62	2600 ²⁾	-
VANAX SUPERCLEAN	260	60	1920	2240
TYRAX ESR	190	58	1460	2260

¹⁾ Prehardened

²⁾ Compressive strength

"ASSAB" and the logo are trademark registered. The information contained herein is based on our present state of knowledge and is intended to provide general notes on our products and their uses. Therefore, it should not be construed as a warranty of specific properties of the products described or a warranty for fitness for a particular purpose. Each user of ASSAB products is responsible for making its own determination as to the suitability of ASSAB products and services.

UNIQUE PRODUCTS

ENDORSED FOR THE F&B INDUSTRY

ASSAB STEEL GRADES CERTIFIED BY NORMPACK

You can be confident relevant steel grades from ASSAB are certified in accordance to the European Union legislation (1935/2004). This ensures materials can be used in the following areas:

- Dry food
- Acid food
- Alcoholic food
- Fatty food



FOOD INDUSTRY

Safe, efficient production with minimal downtime is paramount in the international food processing industry. A demand that ASSAB's unique product offering can meet.

As the world's leading manufacturer of tool steel, our high performance materials have been specifically tested for the food industry. We work closely with our customers in the most demanding applications.

Food processing companies, which have previously sacrificed wear resistance for corrosion resistance or vice versa, no longer have to settle for just one of these properties. With the products in the ASSAB Stainless Concept, there is a solution for the most demanding working materials.

These steel grades are all certified by Normpack for the requirements in the food industry, according to European Union legislation (1935/2004). They all meet the requirements for materials that come into contact with food. Examples of relevant components are various types of knives, rolls, screws, screw segments and barrels for the extrusion of food, hole plates for mincing meat, and pellet dies for the production of animal feed.

Achieving the best results takes time and dedication. It all boils down to selecting the right materials during every step of the production process and in every single

Food type	Food simulants
Aqueous foods (pH>4.5)	Distilled water
Acidulous foods (pH<4.5)	3% acetic acid
Alcoholic foods	10% ethanol
Fatty foods	Refined olive oil
Dry foods	N/A

component. We work as your partner throughout the whole process – from initial concept to the finished product. Our high performance steel can be supplied as finished components via our ASSAB Component Business concept; delivering you advanced performance solutions with better results and a longer life span, keeping your production running.

ASSAB steel grade	Dry	Aqueous	Acid	Alcohol	Fatty
CALDIE	●	●	●	●	●
CORRAX	●	●	●	●	●
ELMAX * Low Tempered	●	●	●	●	●
MIRRAX 40	●	●	●	●	●
MIRRAX ESR Low Tempered	●	●	●	●	●
ASSAB 88	●	●	●	●	●
UNIMAX	●	●	●	●	●
VANADIS 4 EXTRA *	●	●	●	●	●
VANADIS 8 *	●	●	●	●	●
VANAX *	●	●	●	●	●
TYRAX ESR Low Tempered	●	●	●	●	●

* SUPERCLEAN range

MEAT PRODUCTION

LONGER BETTER PRODUCTION RUNS

PORK MINCE PRODUCTION

Previously only 6-7 hours of pork mince production was achieved before all five components required regrinding. Our solution was to replace the holeplate component with Vanadis 4 Extra SuperClean coated with PVD Variantic to achieve greater wear resistance. Unimax was chosen for the knife component for greater ductility and once again resulted in much higher wear resistance.

The coated parts have been in production for one year, without any sign of wear. A production run of 150 days can be achieved with regrinding required on only two of the knives every 15th day. Fewer machine adjustments is delivering higher production safety. Additionally, a significant improvement in the meat quality has been achieved as pieces are now more uniform.



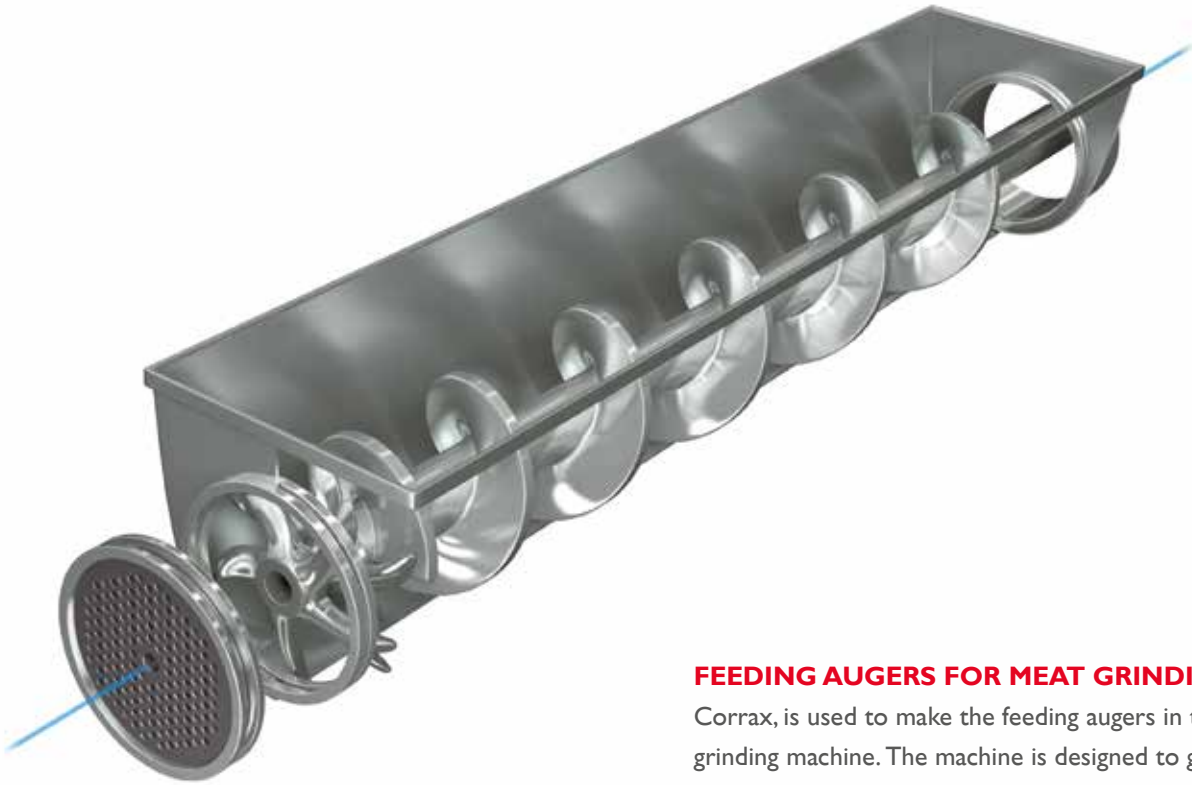
RESULT

- Operating expenses on component parts reduced by 80%
- Metal residues in the meat reduced by 90%
- Drying time reduced by 12-14%
- Electricity consumption reduced by 8-10%
- Uniform and better meat quality
- High production safety – fewer adjustments

MEAT PRODUCTION

CLEANER CUTS LESS WASTAGE

CASE
STUDY



FEEDING AUGERS FOR MEAT GRINDING

Corrax, is used to make the feeding augers in this meat grinding machine. The machine is designed to grind both fresh and frozen meat down to -20°C . Corrax is part of the ASSAB Stainless Concept, designed to deliver better performing alternatives to the conventional steels used in the food processing industry.

Corrax is a precipitation hardening steel which offers exceptional corrosion resistance, excellent dimensional stability during hardening, good wear resistance and is easy to heat treat.



RESULT

It pays to invest in high performance steels. Corrosion resistant dimensionally stable knives ensure cleaner premium cuts of meat which have a higher value and result in less overall wastage.

FOOD PACKAGING

LONGER PRODUCTION LIFE



AN EDGE ABOVE THE REST

The collaboration between Uddeholm and Precision Edge Ltd offers the best in performance for machine knives and blades when combining High Performance Tool Steel with quality manufacturing and tight process control the resulting components are an “edge above the rest”.

Precision Edge is a specialist manufacturer of quality industrial blades and machine knives. With over 25 years’ experience in producing blades and knives, gaining a reputation for supplying machine knives of the highest quality and industrial blades suitable for the most demanding applications such as food processing and packaging lines.

RESULT

“We found that by using Uddeholm High Performance Steels and their knowledge of application-based materials, the components we supply have significantly out-performed our customers production expectations. Our components now last longer as they retain their edge for longer during production, resulting in minimising our customers downtime.

A great example of the Uddeholm Total Tooling Economy ethos.”

FOOD PACKAGING

SPECIALIST APPLICATIONS

CASE STUDY

Stellar Technik has grown to become one of the leading manufacturers and suppliers of food packaging tooling worldwide. Capabilities range from punch and dies for food packaging, as well as thermo form tooling for both the food and pharmaceutical industries, to extruders and special applications for cheese production and packaging. The industry demands competitive prices, the highest quality and delivery on time.

The NEW deep 'V' punch and die manufactured from Uddeholm Stainless Steel was launched at the 2018 UK Processing and Packaging Machinery Event. The new die has been specially developed for use in environments where hygiene requirements are critical.



www.stellartechnik.com

RESULT

“Using Uddeholm steel results in dramatically improved corrosion resistance, improved tool life and reduced maintenance costs. The new die has been developed for use in environments where hygiene requirements are critical. Designed and manufactured in the UK by Stellar Technik to fulfil specific customer demand.”

ANIMAL FEED

INCREASED ENERGY EFFICIENCY



**HOWARD
RAMSDEN
(DIESPEC)
LIMITED**

Since 1993 Howard Ramsden (Diespec) Limited has brought-to-market high quality gun drilled dies, manufactured and heat treated to suit individual needs. All dies are fully run-in to our special running in compound.

Modern technology computerised die specifications have increased life and maximised performance giving increased throughputs with the unique parallel hole pattern adapted by Howard Ramsden in 2000.

Working in partnership since 2010, the new high performance die made from Uddeholm material has delivered over £20.4k worth of savings on every 155 tons of material produced. The new die is a culmination of the industry knowhow of the team at Howard Ramsden and the materials and technical understanding at Uddeholm.

It pays to use higher performing materials, Howard Ramsden (Diespec) Limited now use just one die instead of three dies in a 155 ton production run. This has resulted in 21% saving in electricity.

COST COMPARISON ON 155 TON PRODUCTION RUN

	Fixed Cost	Electricity Cost	Total Cost
Previous Die	£6,782	£115,193	£121,975
Uddeholm Die	£10,600	£90,968	£101,568

RESULT

Saving: £20,407

CEREAL PRODUCTION

REDUCE MAINTENANCE COSTS

CASE STUDY

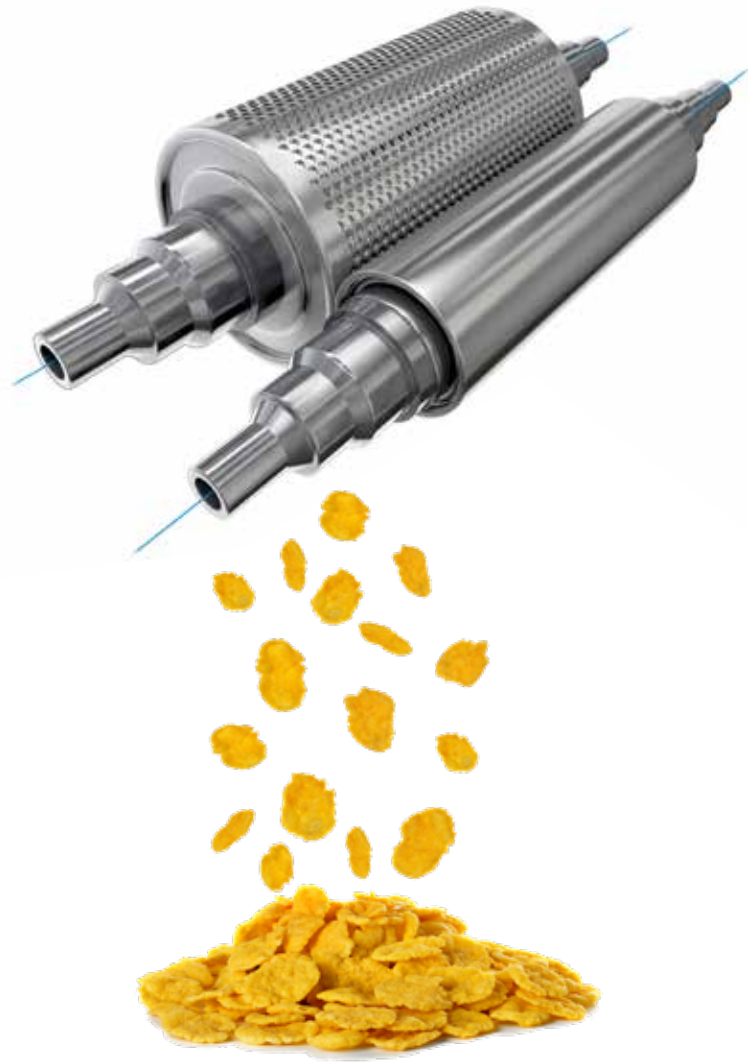
BUSINESS ECONOMY FOR CEREAL PRODUCTION

DRB has a long standing relationship with Uddeholm to deliver improved efficiency to their customer base. An example of this was using Caldie to manufacture rolls for cereal production. The end result was lower production and maintenance costs.

Their customer was using a standard A2 material for their production rolls. This resulted in 500 production hours and eight production stops per year. Changing their material to Caldie increased their production time to 1800 hours whilst reducing maintenance stops to only two per year.

Selecting Uddeholm tool steel really does result in the best production economy. Caldie is an electro slag remelted (ESR) tool steel grade particularly well suited for rolls used to form and size multigrain substances in the production of corn and wheat. Thanks to its hardness of up to 62 HRC in combination with high ductility and toughness, Caldie is an excellent choice for components with high demands on chipping/cracking resistance and compressive strength.

ASSAB also offers suitable materials for other components such as shafts and machine parts where conventional engineering steel or stainless steel are insufficient.



EFFICIENCY COMPARISON OVER ONE YEAR

	Material	Production Hours	Maintenance Stops
Previous Grade	AISI A2	500	8
UDDEHOLM / ASSAB Solution	CALDIE	1800	2

RESULT

260% improvement in production hours. 75% reduction in maintenance stops.

SCREWS & BARRELS

A SOLUTION FOR EVERY NEED

PROVIDING NEW POSSIBILITIES

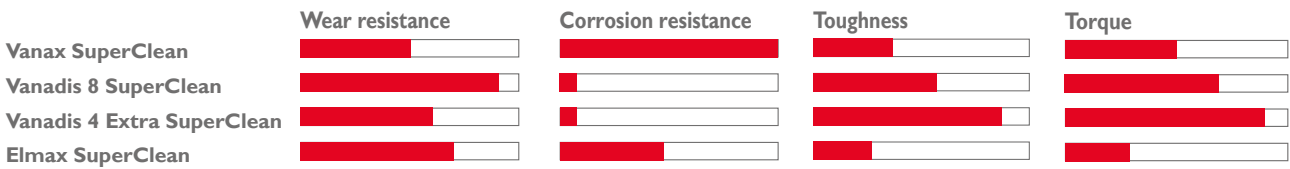
Both technology and raw material are key factors when selecting the optimal steel grade for screws. We know that the quality and performance of the screw are crucial, because its durability and efficiency have an economic impact for the manufacturers.



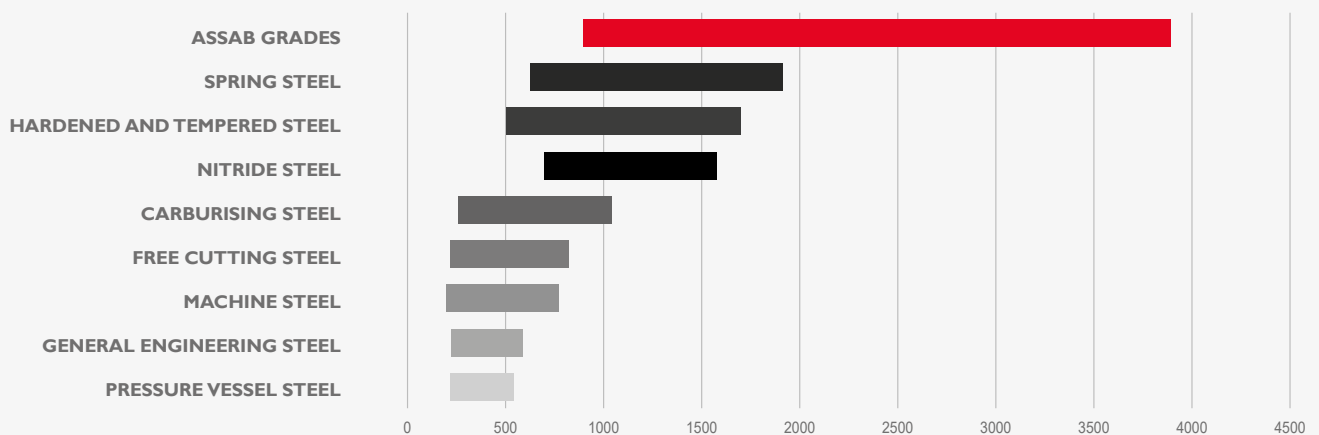
With market leading metallurgy and production technology we develop the intelligent high performance steel that your complex shapes and challenging conditions require.

These four premium PM-steel products for high performance screws are selected for their unique high resistance to wear and corrosion.

PROPERTY COMPARISON



YIELD POINT MPa



STAINLESS CONCEPT

RUST NEVER SLEEPS

Stainless Concept is our own system of metallurgically balanced stainless grades that have been specially developed and continually refined to meet the needs of an evolving industry.

Aware that standard stainless steel grades have relatively low wear resistance and strength, we developed Stainless Concept to offer a unique combination of corrosion resistance, wear resistance and high strength.

These sought-after mechanical properties make steel grades from Stainless Concept perfect not only in traditional tooling applications, but also for manufacturing components with high demands.



Our focus grades are:

ELMAX SUPERCLEAN

Characterised by a combination of very good wear resistance, corrosion resistance and dimensional stability, Elmax SuperClean is recommended for long production runs of smaller and complicated shapes and/or reinforced plastics.

TYRAX ESR

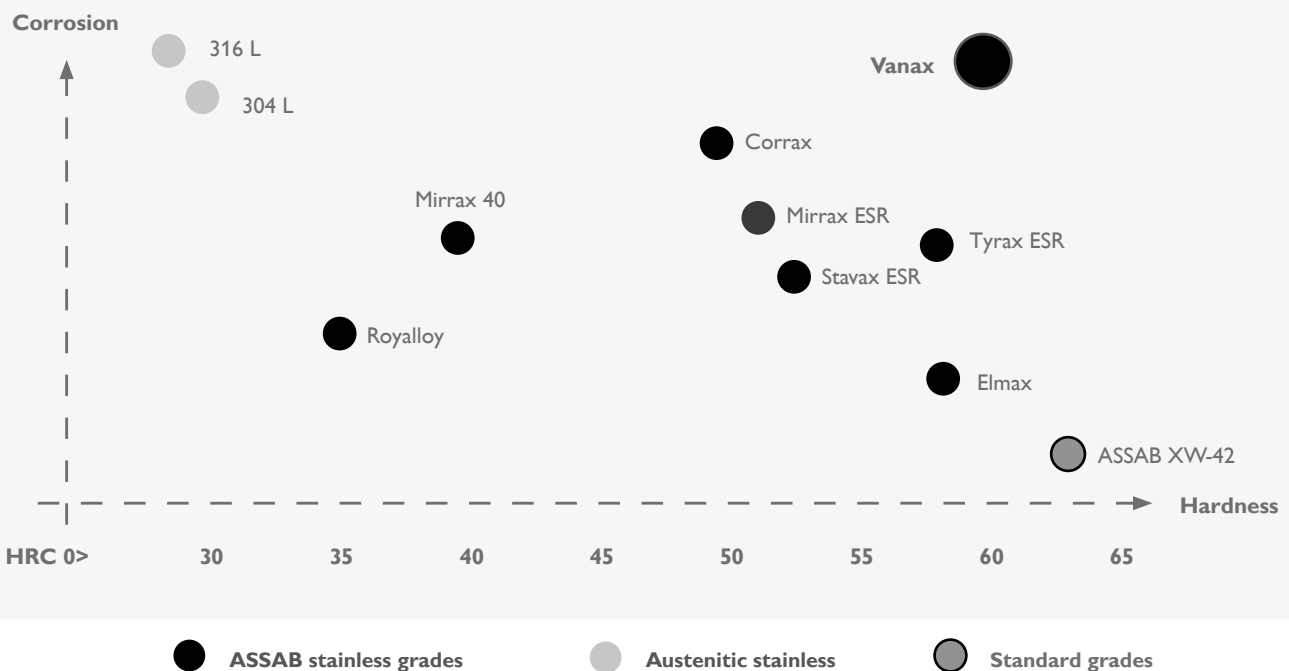
Tyrax ESR is a premium high hardness and corrosion resistant plastic mould steel designed to be very easy and fast to polish to the highest surface finish levels.

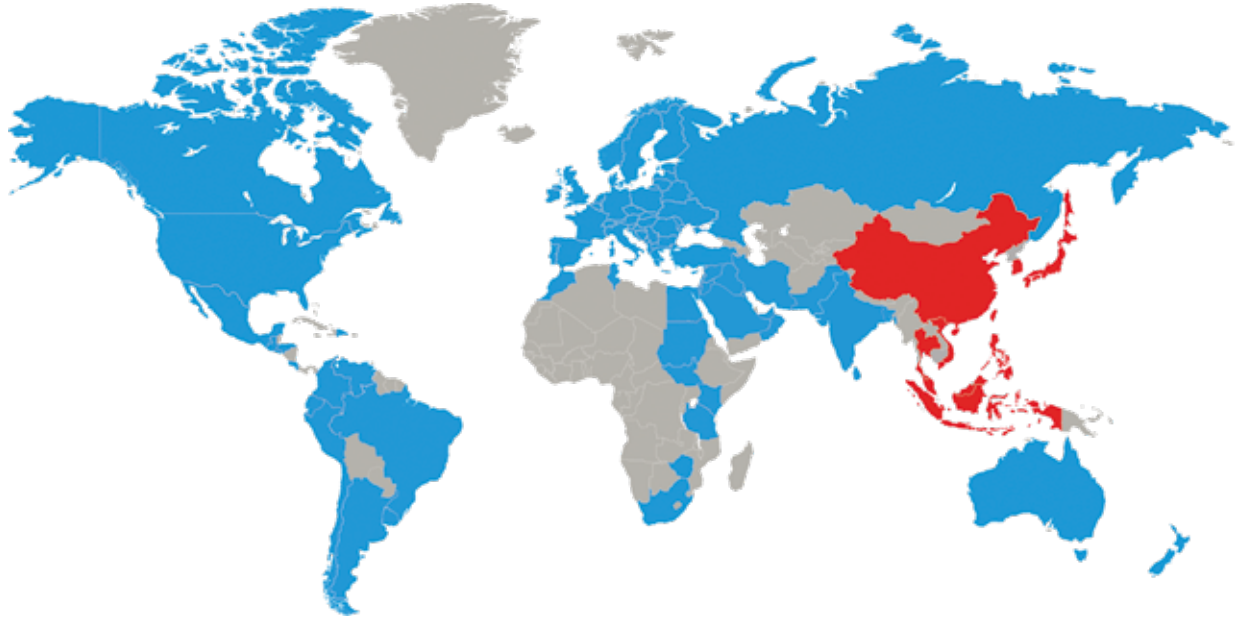
VANAX SUPERCLEAN

This steel grade offers resistance in the most corrosive environment possible. From start to finish, it provides reliable performance in the most extreme conditions and for the most demanding working materials.

CORRAX

Corrax is a precipitation hardening steel with extremely good corrosion resistance and easy to heat treat, making it an ideal choice for components that require extreme stability after hardening.





Choosing the right steel is of vital importance. ASSAB engineers and metallurgists are always ready to assist you in your choice of the optimum steel grade and the best treatment for each application. ASSAB not only supplies steel products with superior quality, we offer state-of-the-art machining, heat treatment and surface treatment services to enhance steel properties to meet your requirement in the shortest lead time. Using a holistic approach as a one-stop solution provider, we are more than just another tool steel supplier.

ASSAB and Uddeholm are present on every continent. This ensures you that high quality tool steel and local support are available wherever you are. Together we secure our position as the world's leading supplier of tooling materials.

For more information, please visit
www.assab.com

