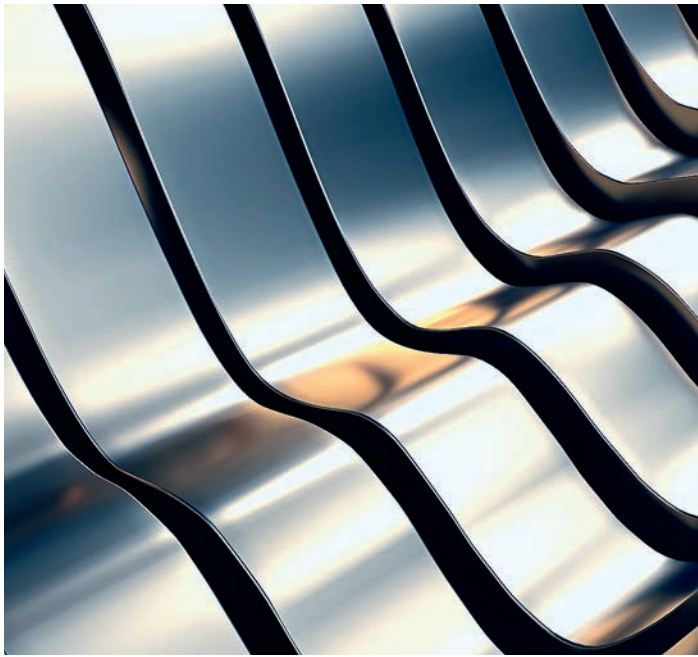


Uddeholm Tyrax® ESR

# THE SURFACE MIRRORS YOUR NEEDS

Longer tool life and easy polishing for reliable  
production of high performance plastic parts







# THE FUTURE FOR PLASTICS

## THE ENEMY WITHIN?

Plastic materials are constantly evolving to meet the increasing demands for high strength and low flammability. These plastic compounds are frequently reinforced with glass fibres and mixed with halogenfree flame retardants. In addition, environmentallyfriendly materials like wood-fiber composites

are replacing traditional plastics. These new materials are very aggressive on the tool steel, which in turn can lead to defects in the manufactured plastic parts. To avoid this, you need tool steel that is resistant to corrosion and abrasive wear.



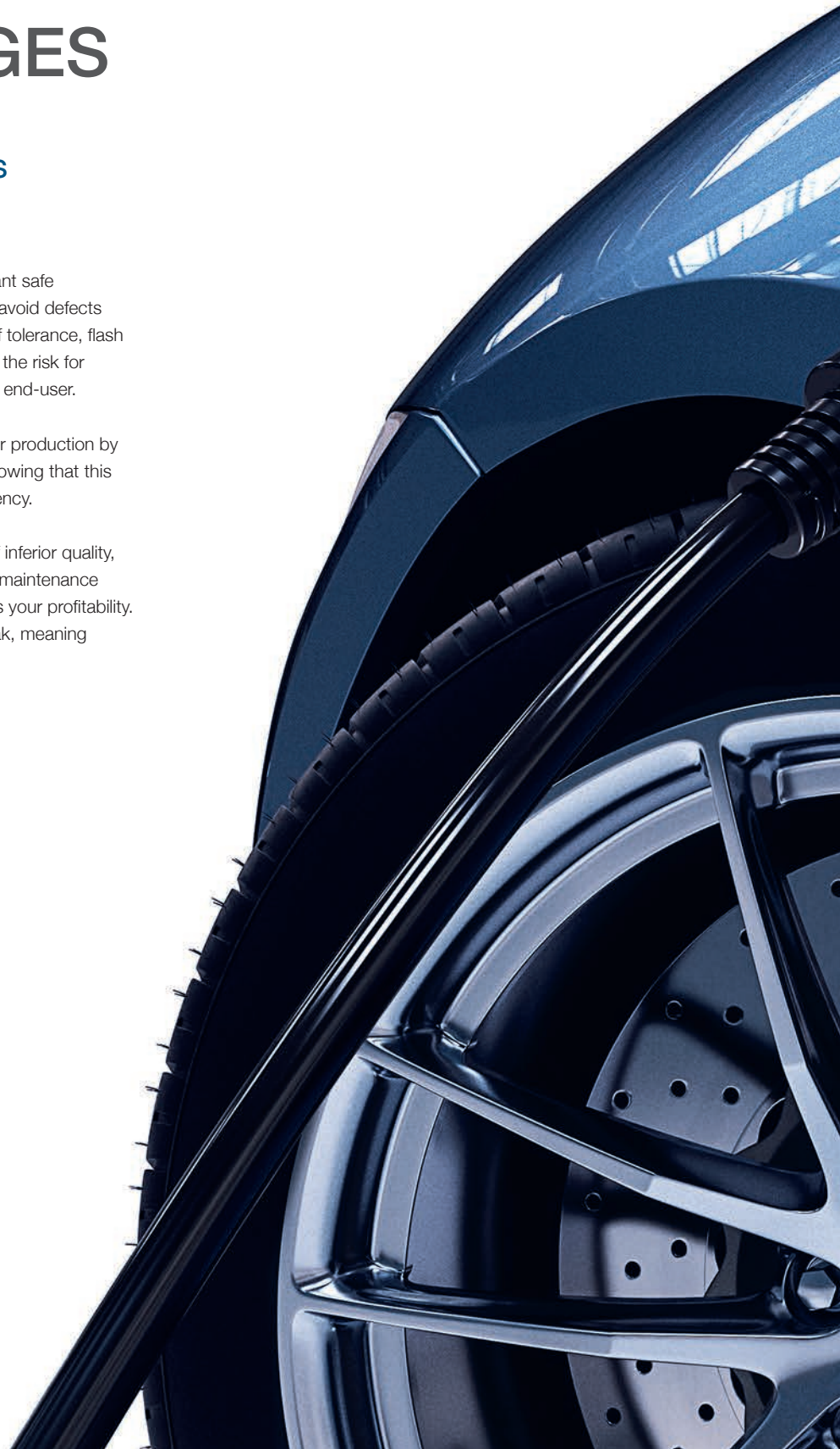
# KNOWING YOUR CHALLENGES

## RELIABLE PRODUCTION, REDUCED REJECTION RATES AND LONGER TOOL LIFE

At the end of the day, you, as a tool user, want safe production and certainty. You are looking to avoid defects such as scratches, dull surfaces, parts out of tolerance, flash formations and cracks. You want to mitigate the risk for potential rejection of your plastic parts by an end-user.

More and more tool users are achieving safer production by specifying the tool steel for their moulds, knowing that this will reduce uncertainty and increase consistency.

If you compromise and choose tool steels of inferior quality, you will have inconsistent results. Increased maintenance costs time and money, which in turn reduces your profitability. In a worst case scenario, the tool might break, meaning several weeks of production downtime.







 **UDDEHOLM**  
a voestalpine company









# PROMISING BETTER BUSINESS

## WHEN PLASTIC PART QUALITY IS TOP PRIORITY

Don't compromise on tool steel and risk production problems when part quality is your priority. For aggressive plastic materials, there is Uddeholm Tyrax ESR with its winning combination of corrosion and wear resistance. Enjoy the certainty of safe

and consistent production of aggressive plastics without sacrificing the surface finish. With Uddeholm Tyrax ESR you don't have to make any compromises since the polishability is best in class.



# UDDEHOLM TYRAX<sup>®</sup> ESR

## EASY AND SPEEDY

In many applications, high-gloss surface finishes are required on the mould. Unfortunately, many tool steels are not optimised for the polishing process. Their carbide distribution or high amount of impurities make it difficult to achieve a high gloss.

We specifically designed Uddeholm Tyrax ESR to help you overcome these difficulties, offering easy and fast polishing with good etchability. Our electro slag remelting (ESR)

process enables superior cleanliness by removing almost all inclusions that interfere with the polishing process and in the end, the final surface finish. Uddeholm Tyrax ESR is designed with a matrix-based microstructure that facilitates ease of polishing, saving you time and avoiding unexpected production stops – regardless of the application.









# APPLICATION AREAS

## THE MOST DEMANDING INDUSTRIES NEED SUPERIOR TOOL LIFE

The medical, electronics, and automotive industries have extreme demands on tool reliability. They require safe production with a minimum of maintenance and delays. Minimising these risks is of utmost importance to you, as a tool user.

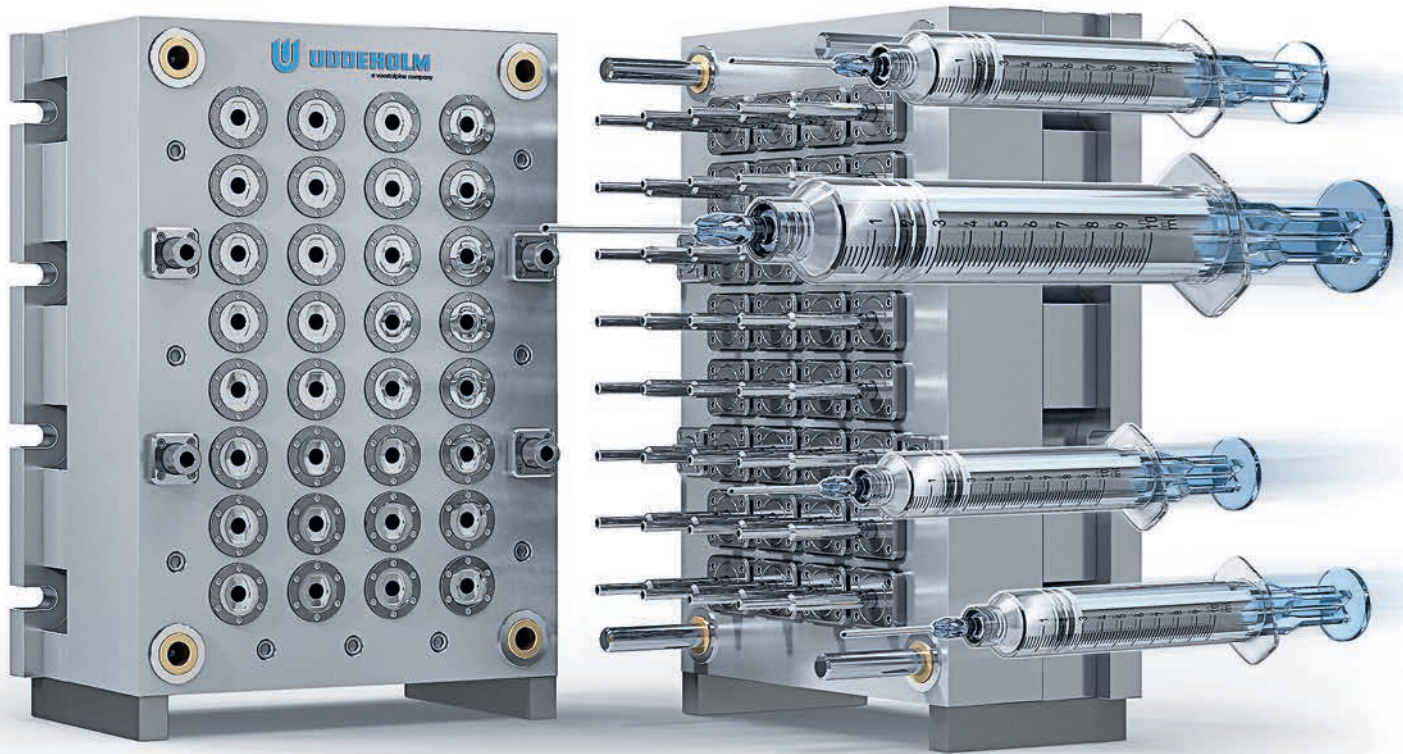
The production conditions in these industries are unforgiving, with highly corrosive materials and composites, longrun

productions, and humidity. You need reliability, consistency, speed and ease. That is why we offer Uddeholm Tyrax ESR that will allow you to achieve productivity not possible with other tool steels.









# SUPERIOR TOOL LIFE AND EASY POLISHING

## TYPICAL ANALYSIS %

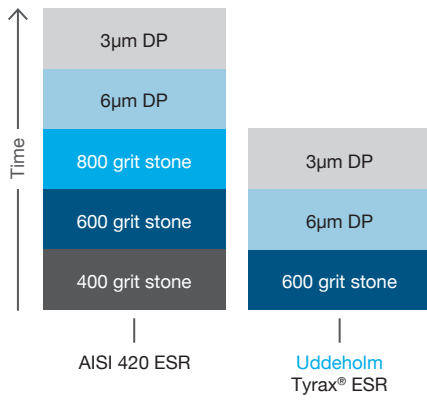
C	Si	Mn	Cr	Mo	V	N
0.4	0.2	0.5	12.0	2.3	0.5	+

## POLISHABILITY

The matrix-based microstructure of Uddeholm Tyrax ESR is designed to achieve a high-gloss surface by only a few polishing steps, dramatically reducing the tool lead time and enabling production of top-quality plastic parts.







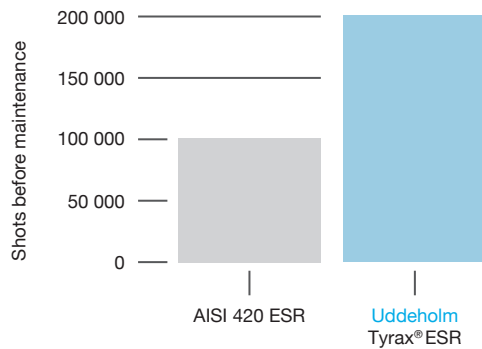
You are able to achieve a high-gloss surface (SPI A1) in three easy polishing steps, resulting in 40-50% less polishing time compared to standard tool steels such as AISI 420 ESR.



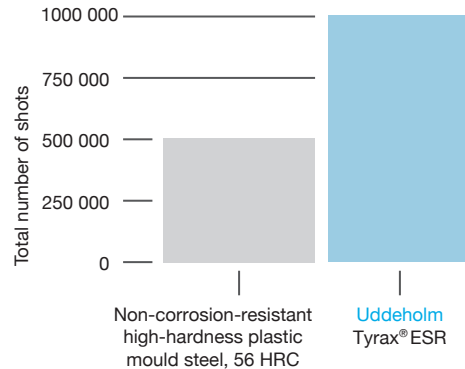
## LESS MAINTENANCE AND SUPERIOR TOOL LIFE

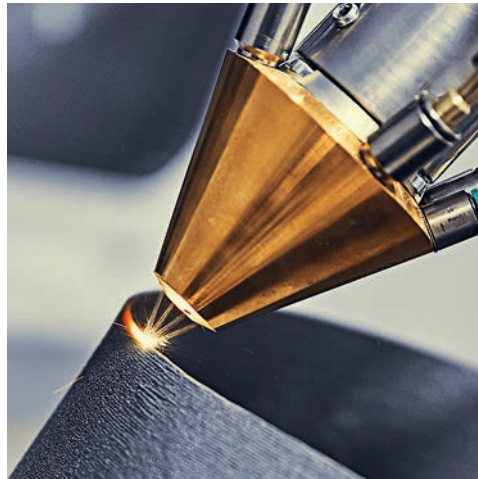
Independent production tests have shown that tool life increases by up to 100% in injection moulding of glass-filled and corrosive plastics compared to standard AISI 420 ESR and other non-corrosion-resistant high-hardness grades.

30% glass-fibre reinforced PA66, UL94 V0



10% glass-fibre reinforced PP, UL94 V0





# INCREASED TOOL PERFORMANCE IN EVERY DETAIL

Uddeholm Tyrax® for additive manufacturing is your AM solution to applications that require corrosion resistance and superior toughness.

The AM process introduces you to the ability of placing cooling channels where they are needed to maximise thermal regulation. Uddeholm Tyrax® for additive manufacturing, increase your tool performance through the AM process combined with corrosion and abrasive wear resistance, superior toughness, and mirror polished surface.

The flexibility of AM can also be a better alternative to traditional manufacturing of tool steels from a sustainability perspective. The value chain is shorter, waste of material is reduced, and less energy is needed to produce the finished part.

Uddeholm Tyrax® for AM is available in powder fraction, for Laser Powder Bed Fusion (LPBF) and Laser Metal Deposition (LMD).



© UDDEHOLMS AB

No part of this publication may be reproduced or transmitted for commercial purposes without permission of the copyright holder.

---

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 2 June 2024  
SKU 646



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.