

# ACORROSION-RESISTANT ALL-ROUNDER

## BÖHLER M380 ISOPLAST®

**BÖHLER M380 ISOPLAST:**  
A new generation of  
electroslag remelted stainless tool steel

Customers are often faced with difficult decisions when choosing the right tool steel. Maximum hardness? Or rather toughness and corrosion resistance? BÖHLER M380 ISOPLAST makes these decisions easy because this innovative plastic mould steel is a genuine all-rounder among corrosion-resistant plastic mould steels. It combines all the properties that the heart of any mould maker and user could desire: a high degree of hardness, toughness and corrosion-resistance, suitability for high-gloss polishing and additional good wear resistance. The all-in-one solution.

Customers and the market have been hoping for this for a long time: a material in proven BÖHLER quality, with optimum properties for tool steel applications even under the highest loads. Numerous applications in the plastics (including medical equipment and in the pharmaceutical area), food processing and mechanical engineering industries require high-quality stainless tool steel. The material needs to withstand not only the highest mechanical stresses, but also abrasive and corrosive environments. And for special surface finishes, excellent polishability is also a must. Reason enough for the BÖHLER team to develop a suitable addition to its existing portfolio. An adaptation of the proven BÖHLER N360PESR a special material for the automotive and aerospace industries, seemed promising. And yet the road to creating the plastic mould steel all-rounder BÖHLER M380 ISOPLAST proved to be quite a challenge. The larger dimensions alone made it necessary to rethink the production process. "Developing such an all-rounder was something we didn't think possible at first. But the first positive test of a forged M380 ISOPLAST variant showed us that the material was also suitable for these dimensions," recalls Ronald Münzer, Product

& Process Engineer for Plastic Mould Steels, looking back on this breakthrough moment. The result is a material that covers a wide range of applications for which traditional materials are not suitable.

### THE GENERALIST

Metallurgy sets natural limits on the development of materials. Materials often fail due to the high stresses encountered in tool steel applications. As a result, they have only a very limited service life, or can't be used at all in these types of application. With its specific properties, BÖHLER M380 ISOPLAST offers a balanced mix for a wide range of applications. This highly nitrogen-alloyed martensitic plastic mould steel combines the fundamental advantages of all worlds, making it one of the top players in this field of materials. The most important properties of this multi-purpose tool steel are:

### BÖHLER M380 ISOPLAST®

- » A very high degree of hardness and good wear resistance
- » Excellent toughness and corrosion-resistance
- » Highly polishable surface and good machinability
- » Good suitability for PVD coating
- » Low distortion, good dimensional stability

### PRESSURE CREATES DIAMONDS...

...and BÖHLER M380 ISOPLAST too. Our own high-pressure remelting plant produces a material that is manufactured entirely in-house to the highest possible process standards. The special PESR (pressurised electroslag remelting) technology enables remelting in an air-tight system with a nitrogen atmosphere, under the exclusion of oxygen. The high nitrogen content achieved in this way results in a homogeneous structure with finely distributed carbonitrides and an excellent degree of purity. This results in a steel with improved corrosion resistance, polishability, photoetchability and spark erosion properties. Customers thus benefit from the best component quality, a longer tool life, less maintenance and lower production costs per part.

PESR  
Pressure Electro Slag Remelting



### IN USE

BÖHLER M 380 ISOPLAST offers incredible versatility in practice, making it universally applicable: from plastic injection moulds, including glass-fibre reinforced plastics, to moulds with highly polished surfaces, screws and non-return valves for injection moulding machines, and hot runner sprue parts. So you could call the material a corrosion-resistant all-in-one solution, as a few examples here will illustrate:

#### » FOOD INDUSTRY

In the food industry, maximum hardness and abrasion resistance are the most important qualities. Under no circumstances may any parts of the material come loose during operation. Materials are therefore subject to strict regulations and must be tested and certified using standardised test methods. BÖHLER M380 ISOPLAST has a certificate and declaration of conformity according to EU Regulation No. 1935 (aqueous and acidic).

#### » PLASTIC INJECTION MOULDING

Coarse carbides in a material can quickly cause parts of the material to break away during plastic injection moulding. These surface defects are then transferred directly to the product, and entire batches may need to be scrapped. With its fine structure and finely distributed carbonitrides combined with a high degree of toughness, BÖHLER M380 ISOPLAST reduces these losses and increases productivity. It is also used, for example, in the manufacture of components for charging systems for electric cars, where flame retardants often have a very corrosive effect on materials.

#### » HIGH-GLOSS POLISHING APPLICATIONS

Due to the material's lack of primary carbides, BÖHLER M380 ISOPLAST counts as a matrix material. With its high degree of hardness and outstanding homogeneity, it demonstrates excellent polishing properties. This makes it ideal for the production of smartphone lenses, for example. Cost savings can also be achieved thanks to the significantly reduced effort required for high-gloss polishing.

#### » MEDICAL EQUIPMENT

In plastic injection moulding for medical equipment (such as syringes, incubators and ventilation masks), the highest priority is biocompatibility, which means that high-purity plastics are required. If metal particles become detached from the mould, the molten plastic may be contaminated and must then be rejected. Thanks to its excellent material properties, BÖHLER M380 ISOPLAST puts a stop to this cost driver.

#### » NOT APPROVED APPLICATIONS

M380 ISOPLAST must not be used for aerospace and automotive components such as bearings, ball threads or wear-resistant components for use in aircraft. Also, it must not be used for medical applications used on humans, such as implants or medical instruments!

### BÖHLER M380 ISOPLAST® Characteristics at a glance

Corrosion-resistant, versatile useable plastic mold steel with:

- » high corrosion-resistance
- » excellent hardness and good toughness
- » high-gloss polishability with additional high wear resistance

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### Product positioning

