



*Injection moulding machine made of 2738 mod. TS (HH)*

## Large die for the bumper of the new BMW 7 Series Strong mould for lightweights

As a specialist in high-grade plastic mould steels, Buderus Edelstahl is a valued partner of the motor industry. The steel for the mould that makes the bumpers for the new BMW 7 Series also comes from Wetzlar: 2738 mod. Thruhard Supreme® – a mould steel of excellent quality.

Modern cars like the new BMW 7 Series provide outstanding ride comfort, premium design, and innovative product technology, as well as component and system solutions ideally adapted to economic aspects. Plastics play a decisive role – they are the multi-functional lightweights essential to modern automotive engineering concepts. Their advantages are manifest – new scope for design, improved safety, better aerodynamics, and lower weight – all resulting in better performance and greater ride comfort.

### **THRUHARD SUPREME® for high mould stresses**

Vehicle components like the bumper of the new BMW 7 Series, known in the industry jargon as the front and rear bumper cladding, are produced in industrial moulds made of heat-treated mould steel that has to satisfy particular criteria. Buderus Edelstahl supplies Thruhard Supreme®, a material particularly adapted to the increasing demands especially in industrial mould-making, not only because of its superior thermal conductivity. "Traditional mould

steels are mostly designed to satisfy the requirement of the mould surface in contact with the plastic. This often downplays the steel properties that are important for the engineering design of moulds", says Peter Vetter, Tool Steel Quality Planning Manager at Buderus Edelstahl. "Our decades of ex-

*Heavy ingot on the 55 MN press*





Core and mould side in the production cycle

perience in industrial mould making show that the stresses on moulds are frequently underestimated. This is also confirmed by the constantly increasing use of finite element (FE) analysis for purposes such as predicting mechanical stresses as the basis of mould design." Thruhard Supreme® has a specially balanced alloying and heat treatment concept that achieves significantly enhanced hardness capability and hardness retention throughout the billet cross-section.

The result is an outstandingly uniform steel microstructure that ensures key properties such as good polishability and uniform etch-grainability, as well as having a beneficial effect on the mechanical properties of Thruhard Supreme®. Even the High Hard variant of this steel developed and patented by Buderus Edelstahl combines higher toughness potential with enhanced

Planning the production process



strength properties compared to traditional standard materials.

#### A tool made of 100 tonnes of best steel

The Buderus Edelstahl Sales and Quality functions define the production sequence and the size of ingot to be melted for customer orders, depending on the particular

Plastic injection moulded part before coating



requirements. Large dies such as that for producing the BMW 7 Series bumper, require 100 tonne ingots. These ingots have precisely the chemical composition the steel needs for its subsequent use as an industrial die. In order to achieve final dimensions such as 1145 x 1100 x 2600 mm, the rough ingot has to be upset and hammered in several heats during the forging process. The subsequent heat-treatment stage involves hardening and tempering processes especially adapted to the material and forging dimension.

The final stage is the finishing and in-



Removing the plastic product

spection work such as descaling the surface and ultrasonic testing. "Even for these large dimensions, Buderus Edelstahl holds stock in order to be able to supply our customers as quickly as possible", says Domestic Tool Steel Sales Manager, Oliver Schaub. Reliable planning parameters, professionalism, and high quality are the decisive considera-

tions for Buderus Edelstahl customers. They also value the various services provided. "If the customer wants, we will provide profile sawing and pre-machining of the die", says Oliver Schaub. This process is undertaken by our specialists at Buderus Edelstahl Zerspanungstechnik in their high-performance steel service centre in Bischoffen-Niederweidbach."

The die illustrated produces a new plastic bumper every 55 to 56 seconds. The innovative material Thruhard Supreme® ensures the highest product quality.