

Formadur 320

DEUTSCHE EDELSTAHLWERKE

Providing special steel solutions



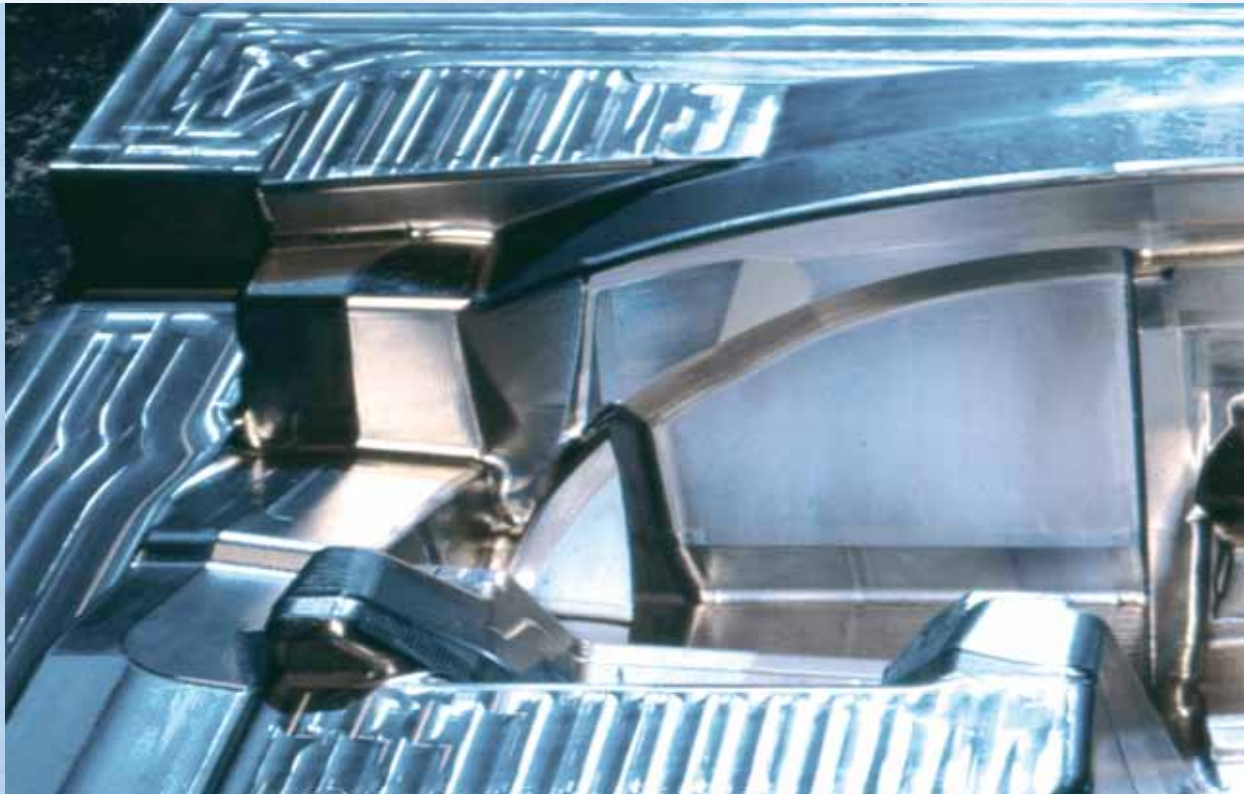
The new high-performance steel for plastic moulds

The requirements made on the mould making and the plastics industries are constantly growing – especially for larger components, more complex moulds and ever more demanding surfaces.

To meet these rising needs, a high-hardness steel is needed which can nevertheless be easily processed.

Formadur 320, the innovative high-performance steel manufactured by DEUTSCHE EDELSTAHLWERKE, is such a steel. It has been specifically developed to meet the heightened demands in plastic mould making. Formadur 320 opens up completely new dimensions in design, quality and economic efficiency.

Thanks to our ability to supply two different hardness levels, Formadur 320 is the ideal choice for large and complex plastic moulds.



Formadur 320 is DEUTSCHE EDELSTAHLWERKE's new high-tech steel, which has been specially developed as a derivative of Formadur 2311 and Formadur 2738 to fulfil today's increased demands. Deliberate modifications of the grade's components as well as additional smelting and secondary metallurgy provide Formadur 320 with its outstanding properties, which to date no other steel can boast.

Formadur 320 stands for excellent product quality and production reliability, offering substantial improvements particularly for the manufacturing of larger and complex moulds in the form of:

- highly improved quenching and tempering properties
- consistent hardness through to the core
- good machinability
- prime polishability and texturing properties

In comparison to previous commonly used grades, this new steel shows considerably improved weldability and significantly raised thermal conductivity.

Not only does Formadur 320 facilitate new dimensions in size, design and product quality, it also exhibits greater production reliability and cost effectiveness. This makes Formadur 320 the optimal steel solution for nearly every mould, including mould frames needed in the injection moulding industry.



Advantages for the toolmaker

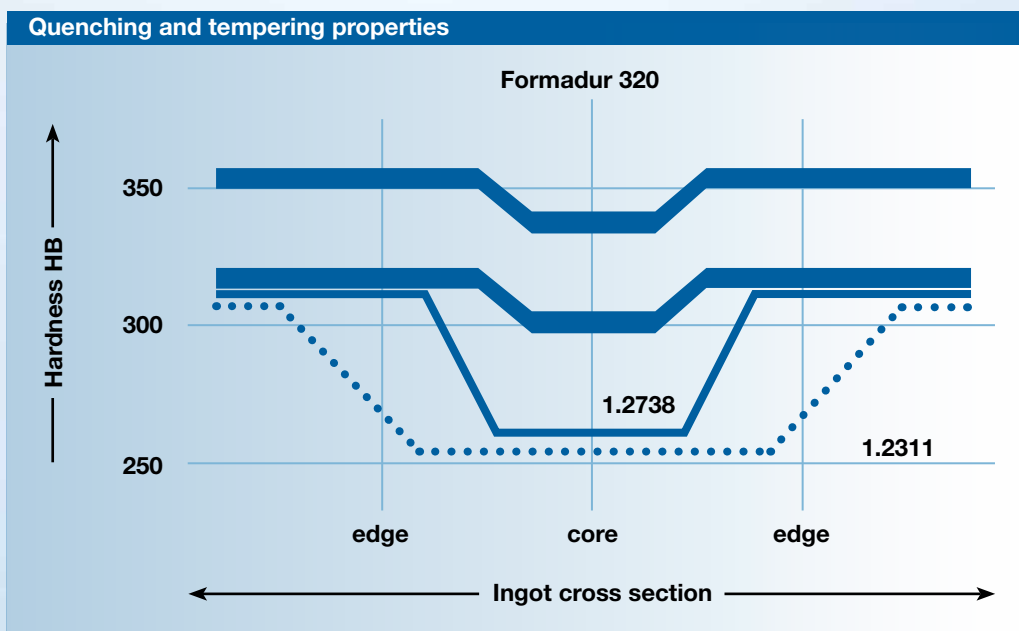
- a steel for almost every mould
- good machinability
- best polishability and texturing properties
- improved weldability

Advantages for the plastics processing industry

- consistent hardness through to the core resulting in better resistance at the parting lines
- superior product quality through enhanced polishability and texturing properties
- better wear resistance through hardness supplied up to 355 HB
- improved repair weldability
- longer exposure times through consistent hardness through to the core
- supplied in two different hardness levels

	1.2738 (SEL)	Formadur 320
Hardness	+	++
Quenching and tempering properties	+	+++
Toughness	+	++
Polishability, weldability, texturing properties	+	++

Chemical composition (typical analysis in %)				
C	Mn	Cr	Ni	Mo
0.34	0.80	1.70	+	0.40



Formadur 320

C 0.34 Mn 0.80 Cr 1.70 Ni + Mo 0.40

Steel properties in brief

Heat-treated mould steel with improved quenching and tempering properties in comparison to 1.2738. Good machinability, polishable, weldable and can easily be textured. Formadur 320 is either available at a hardness of 280 – 325 HB or 310 – 355 HB. This grade offers substantial improvements, especially for building larger and complex moulds. Specific modifications of the grade's components as well as additional smelting and secondary metallurgy ensure Formadur 320's outstanding properties.

Physical properties

Coefficient of thermal expansion

at °C	20 – 100	20 – 200	20 – 300	20 – 400	20 – 500	20 – 600	20 – 700
$10^{-6} \text{ m}/(\text{m} \cdot \text{K})$	11.1	12.9	13.4	13.5	13.8	14.1	14.3

Thermal conductivity

at °C	20	350	700
$\text{W}/(\text{m} \cdot \text{K})$	36.0	37.4	33.0

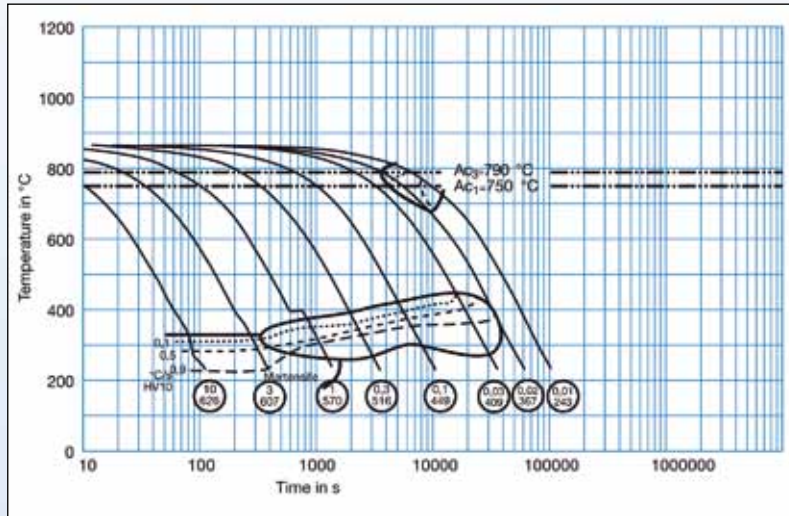
Main applications

Formadur 320 is highly suitable for large-format plastic injection and extrusion moulds with deep engraving and high demands on core strength, such as with bumpers, tailgates, fenders, spoilers, instrument panels and TV housings to name a few. At a supplied hardness of 310 – 355 HB, maximum wear resistance is guaranteed.

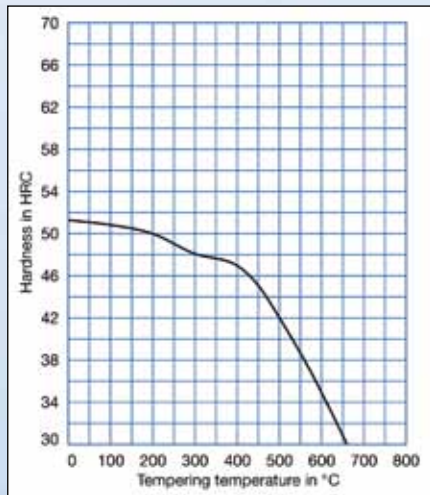
Heat treatment

Soft annealing °C 710 – 740	Soft annealing Furnace	Hardness HB Max. 235					
Hardening °C 820 – 850	Quenching Polymer or oil	Hardness after quenching HRC 51					
Tempering °C	100	200	300	400	500	600	700
HRC	51	50	48	47	42	35	28

Time-temperature-transformation diagram



Tempering diagram



General note (liability)

All statements regarding the properties or utilization of the materials or products mentioned are for the purpose of description only.

Guarantees regarding the existence of certain properties or a certain utilization are only ever valid if agreed upon in writing. No responsibility is taken for the correctness of this information.

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