

Swiss Steel Group
www.swisssteel-group.com

The „All-Stainless-Concept“

Providing special steel solutions

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Member of Swiss Steel Group

Because machining volumes of

60%

are not uncommon for mould frames, efficient machinability and dimensional stability are important criteria.

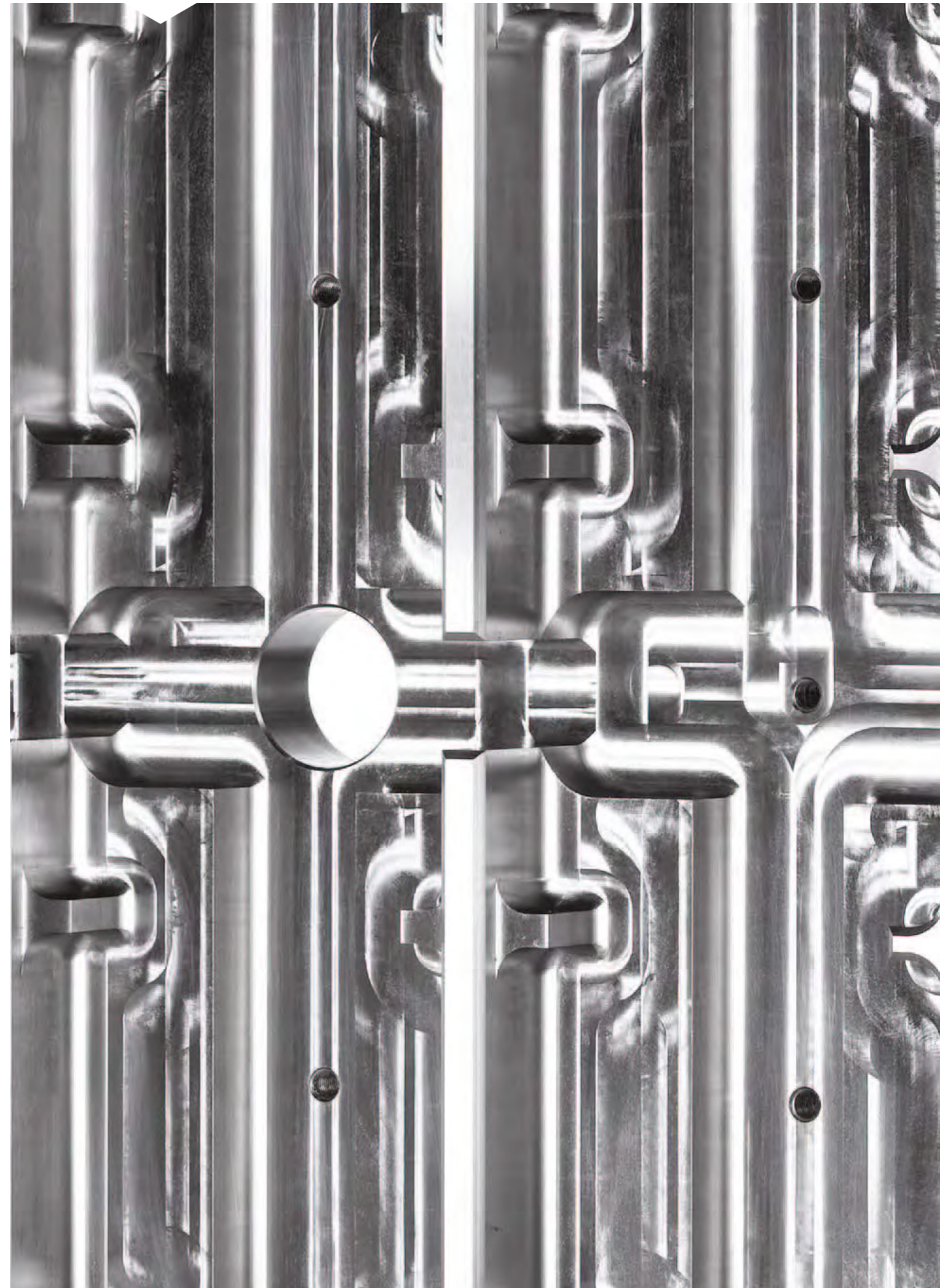
Corroplast®
Corroplast FM
Formadur 2083 Superclean
Formadur PH X Superclean

"All-stainless" mould design: The trend in plastic mould design is towards moulds which are completely composed of stainless steel.

The trend in plastic mould design is towards moulds which are completely composed of stainless steel. The reasons for this can be found, amongst other things, in their resistance to condensation and cooling water as well as in the increasing proportion of corrosive plastics such as PVC or aminoplasts which corrode tool steel during processing through acid precipitation.

One of the most important prerequisites for extending the service life of a plastic mould and fulfilling the required product warranty is therefore improved corrosion resistance. Corroded cooling ducts affect cycle times and can cause a mould to fall short of the scheduled production output and to be discarded prematurely. However, the benefits resulting for plastic part manufacturers

from the increasing use of "all-stainless" mould designs are simultaneously a problem for mould makers. The processing of all stainless steels available to date requires a great deal of machining effort. Particularly in the case of mould frames, which frequently require machining volumes of 60%, efficient machinability and dimensional stability are important criteria. For these reasons, DEUTSCHE EDELSTAHLWERKE has developed, together with tool specialists, the special steels Corroplast® and Corroplast FM, featuring unmatched machinability. The superior benefits of Corroplast® / Corroplast FM enable plastics processors to measurably increase the efficiency, productivity and quality of their products with these steels.



Corroplast® and Corroplast FM

Corroplast® and Corroplast FM are corrosion-resistant, excellently machinable plastic mould steels

The superior benefits of Corroplast® enable plastics processors to measurably increase the efficiency, productivity and quality of their products with this steel.

Corroplast®

Corroplast® features a reduced carbon content resulting in improved weldability. It is recommended for base plates, assembly parts or plastic moulds with standard requirements regarding polishability which must be resistant to condensation and cooling water. Thanks to its special manufacturing technology, Corroplast® is virtually free from residual stress and therefore extremely dimensionally stable during machining. Good thermal conductivity results in a high processing rate. The superior benefits of Corroplast® enable plastics processors to measurably increase the efficiency, productivity and quality of their products with this steel.

Supplied condition: hardened and tempered, hardness as delivered: 325 HB / 1,100 MPa

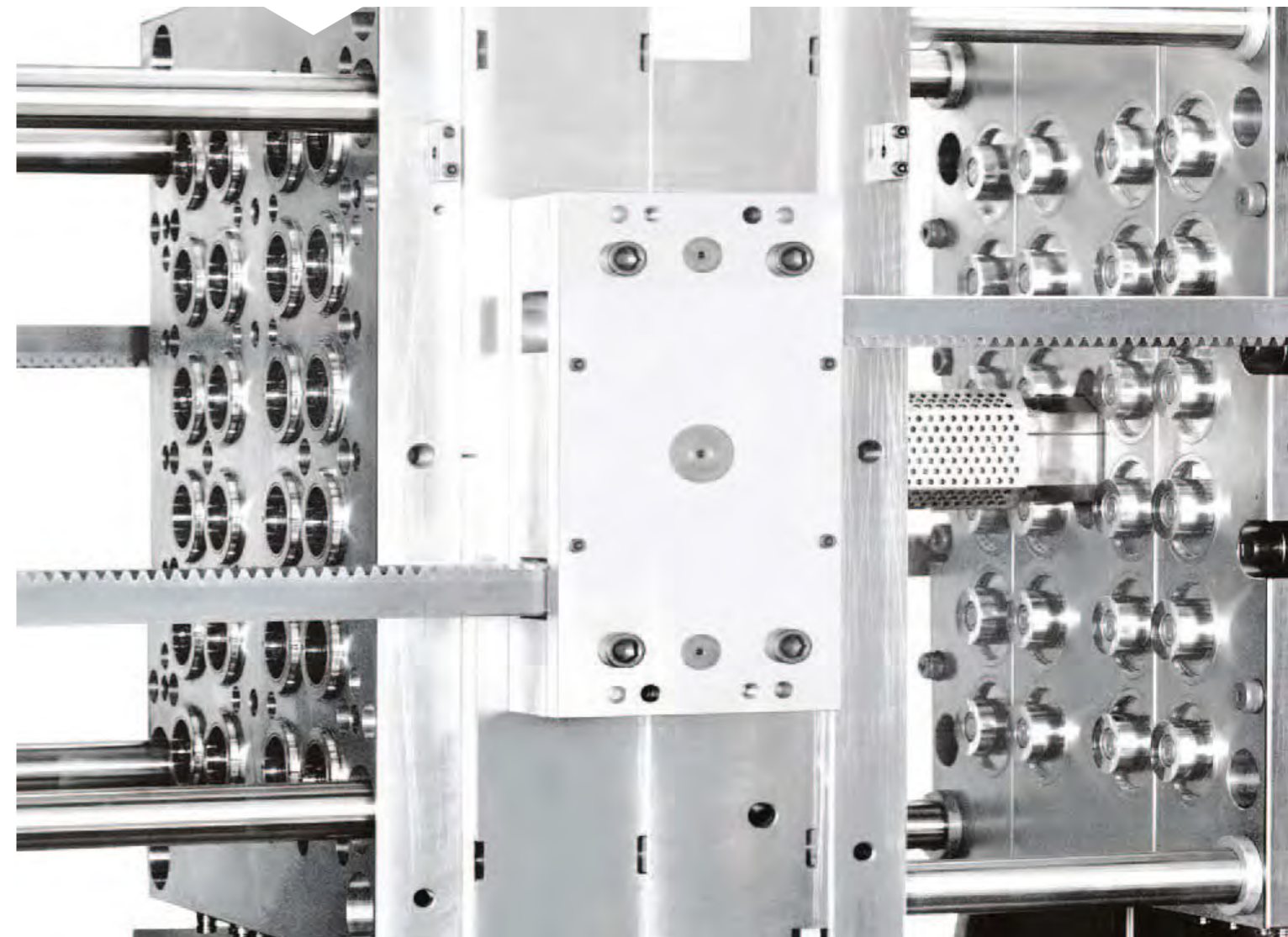
Application areas in plastics processing: Injection moulding, blow moulding, mould frames (with a great deal of machining effort).

Corroplast FM

Compared to proven plastic mould steels, Corroplast FM sets new standards with regard to its machinability with unchanged corrosion-resistance. For this reason, it is optimally suited to complex base and mounting plates, mould frames and plastic moulds with common surface finish. Good thermal conductivity results in a high processing rate. The outstanding machining properties and the stable corrosion-resistance make Corroplast FM the ideal material for complex moulds in the packaging industry. Furthermore, the Corroplast FM is also suited to the production of plastic and rubber parts within the automotive industry.

Supplied condition: hardened and tempered, hardness as delivered: 295 HB / 1,000 MPa

Application areas in plastics processing: Injection moulding, blow moulding, mould frames (with a very great deal of machining effort).





Formadur 2083 Superclean and Formadur PH X Superclean

Formadur 2083 Superclean is a corrosion-resistant, remelted plastic mould steel for high polishability requirements.

Condition as supplied: annealed, hardness approx. 230 HB. After heat treatment Formadur 2083 achieves a quench hardness of approx. 56 HRC.

Application areas in plastics processing: Injection moulds, compression moulding, extrusion moulding.

Formadur PH X Superclean is a highly corrosion-resistant, precipitation-hardening steel featuring high strength combined with excellent toughness.

Because Formadur PH X Superclean is remelted, it features outstanding polishability. Compared to Formadur 2316, it offers measurably improved corrosion resistance, increased supplied hardness and easier repair welding.

Condition as supplied: age-hardened, hardness approx. 40 HRC.

Application areas in plastics processing: Injection moulds, compression moulding, extrusion moulding, blow moulding, extrusion tools.



Chemical composition in weight-%

Grade	C	Mn	S	Cr	Ni	Cu	Nb	Additions
Corroplast®	0,05	1,30	0,150	12,50				+
Corroplast FM	0,22	1,60	0,120	12,80				+
Formadur 2083 Superclean	0,40			13,00				
Formadur PH X Superclean	0,05			15,00	4,50	3,50	+	

Comparison of properties

Grade	Wear resistance	Corrosion resistance	Toughness	Polishability	Photo-etchability	Weldability	Machinability	Nitridability
Corroplast®	+	++	++	+	+	++++	+++	++
Corroplast FM	+	++	++	+	+	++++	++++	++
Formadur 2083 Superclean	++	++	++	++	++	+	++	+
Formadur PH X Superclean	+	++++	+++	++++	+++	++++	++	+

Physical properties

Coefficient of thermal expansion at °C (10 ⁻⁶ m/(m x K))	20-100	20-150	20-200	20-250	20-300	20-350	20-400	20-450	20-500
Corroplast®	10,3	10,6	10,9	11,1	11,2	11,4	11,6	11,8	12,0
Corroplast FM	8,5		10		15,2		14,6		14,3
Formadur 2083 Superclean	11,1	11,5	11,5	11,6	12,0	12,3	12,4	12,5	12,6
Formadur PH X Superclean	10,4	10,6	10,9	11,1	11,4	11,5	11,7	11,9	12,0

Thermal conductivity at °C (W/m x K)	RT	150	300	350	400	500
Corroplast®	24,6	25,7	25,8	25,7	25,4	24,7
Corroplast FM	22,2	22,6		23,2		
Formadur 2083 Superclean	22,6	24,0	24,6	24,9	24,4	23,7
Formadur PH X Superclean	16,8	20,1	22,1	22,8	23,3	24,1