

TOOL STEEL  
FOR HOT STAMPING

# PURE LIGHTNESS

THE CAREFUL AND DELIBERATE USE OF RESOURCES MINIMIZES THE BURDEN ON ENVIRONMENT AND MAINTAINS THE CAPACITY TO REGENERATE, MEANING THAT NATURAL SYSTEMS WILL REMAIN AT OUR DISPOSAL FOR THE LONG TERM. ENERGY EFFICIENCY PLAYS A SIGNIFICANT ROLE IN MANY SECTORS. FASTER, LIGHTER, MORE ECONOMICAL ARE THE DEMANDS THAT NEED TO BE MET HERE.

Concepts for mobility demand weight to be saved in road traffic. Along with the high safety standards called for, the demands in automotive manufacturing are shifting towards thinner yet even higher strength sheets. One process for shaping these sheets is hot stamping.

BÖHLER has recognized this trend and has developed a series of tool steels for the hot stamping process.





Intelligent bodywork concepts require tool materials with the highest performance characteristics.

# HOT STAMPING – INDIRECT PROCESS



Hot stamping is a process to manufacture components from high-tensile and super high strength sheets (22MnB5 or the like). The high strength is achieved by the martensitic transformation in cooled tools during quenching.

Two processes for this have taken hold of the market.

WITH INDIRECT HOT STAMPING

THE SHEET IS SHAPED TO A COMPONENT IN A SOFT, COLD STATE, SUBSEQUENTLY AUSTENITIZED AND QUENCHED BETWEEN COOLED TOOLS.



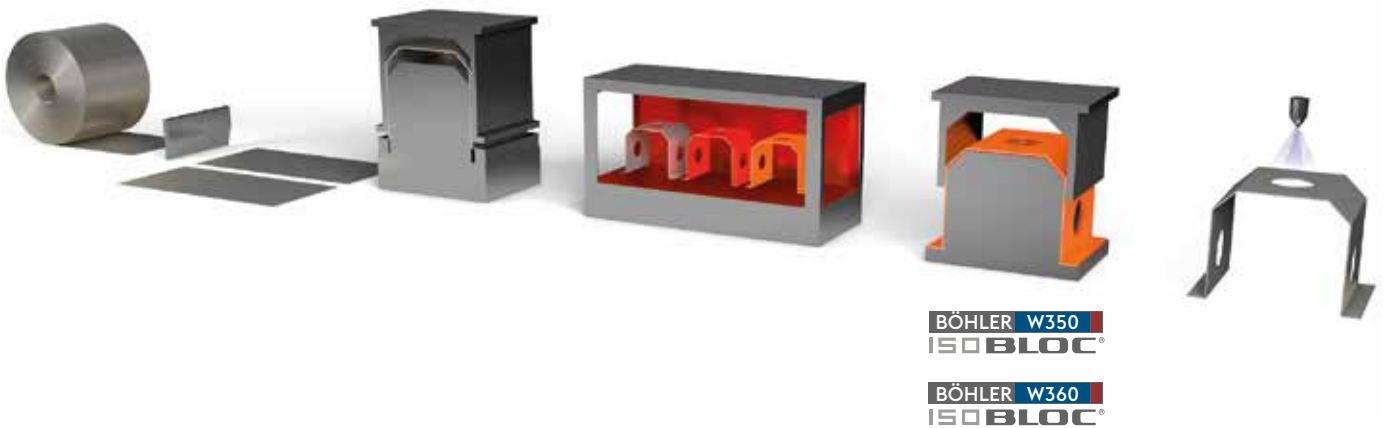
## INDIRECT PROCESS

Cold forming and trimming

Austenitisation

Hot stamping

Surface conditioning



# HOT STAMPING – DIRECT PROCESS

WITH DIRECT HOT STAMPING THE SHAPING AND QUENCHING OF THE PREVIOUSLY AUSTENITIZED SHEET TAKES PLACE IN ONE WORK STEP. AFTER QUENCHING THE COMPONENTS ARE CUT AND SHAPED TO THEIR FINAL CONTOUR. IF REQUIRED THE COMPONENT SURFACE MAY ALSO BE CONDITIONED.

---

## DIRECT PROCESS

---

Cold forming and trimming

Austenitisation

Hot stamping

Trimming

Surface conditioning





# REQUIREMENTS ON TOOL STEELS



- » High thermal conductivity (short cycle time)
- » Sufficient wear resistance (abrasion / adhesion)
- » Sufficient compression strength
- » Hardness level up to 42 – 60 HRC
- » Vacuum heat treatment
- » Good weldability

The required combination of material properties results from the applied hot stamping process.

**BÖHLER K353**

Direct process: Highest abrasive wear resistance

**BÖHLER W350**  
**ISO BLOC®**

For both processes: Big tools and segments, improved toughness and thermal conductivity

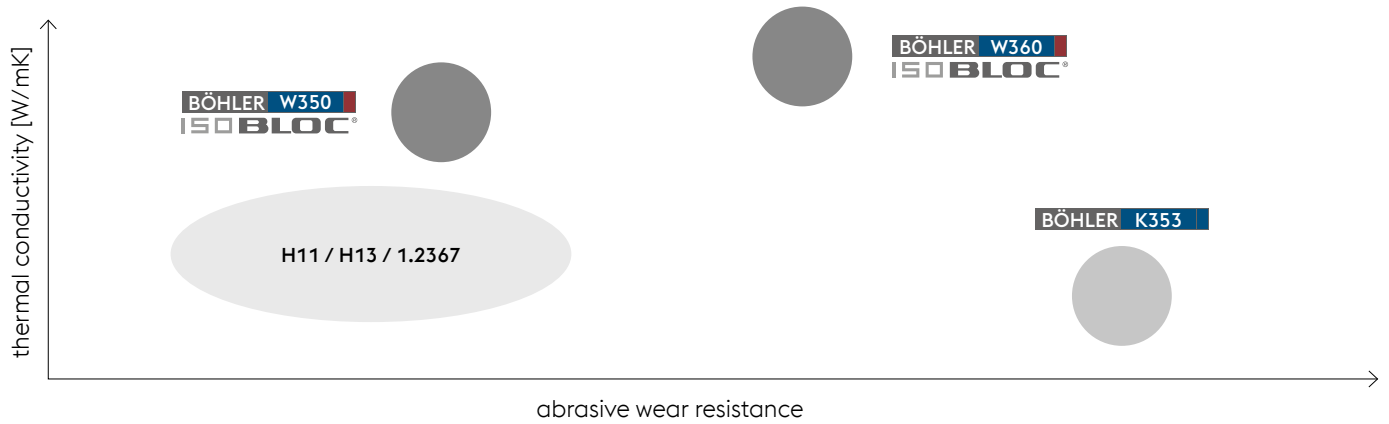
**BÖHLER W360**  
**ISO BLOC®**

For both processes: Complex geometries, excellent strength – toughness relation, improved thermal conductivity





## BÖHLER grades for hot stamping



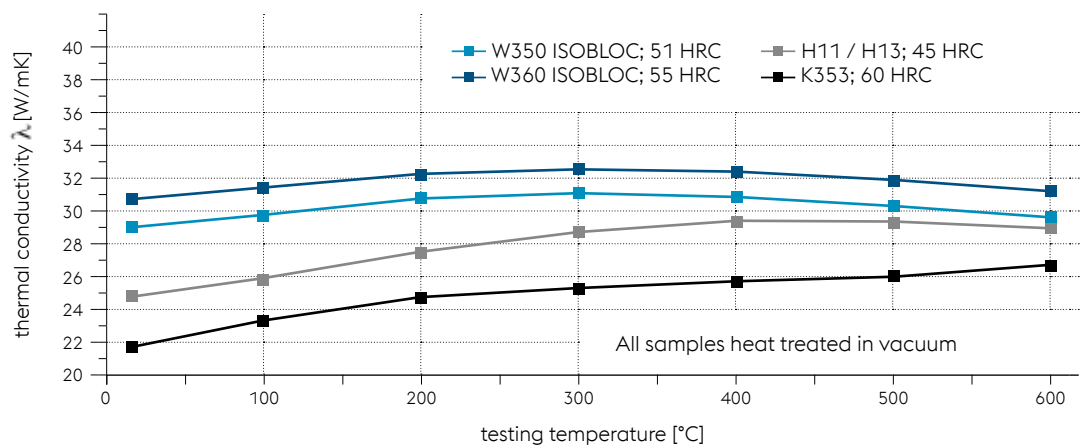


BÖHLER Grade DIN / EN	AISI	Thermal conductivity	High temperature wear resistance	High temperature toughness	Machinability
<b>BÖHLER K353</b>	-	★★	★★★★★	★★	★★★★
<b>BÖHLER W350</b> <b>ISO BLOC®</b>	-	★★★	★★★★	★★★★★	★★★★★
<b>BÖHLER W360</b> <b>ISO BLOC®</b>	-	★★★★	★★★★★	★★★★	★★★★★
< 1.2343 > X38CrMoV5-1	H11	★★	★★	★★★★	★★★★★
< 1.2344 > X40CrMoV5-1	H13	★★	★★★	★★★★	★★★★★

# FACTS



## Thermal conductivity



BÖHLER Grade DIN / EN	AISI	C	Si	Mn	Cr	Mo	V	Al
<b>BÖHLER K353</b>	-	0.82	0.70	0.40	8.00	1.60	0.60	+
<b>BÖHLER W350</b> <b>ISOBLOC®</b>	-	0.38	0.20	0.55	5.00	1.75	0.55	-
<b>BÖHLER W360</b> <b>ISOBLOC®</b>	-	0.50	0.20	0.25	4.50	3.00	0.55	-
< 1.2343 > X38CrMoV5-1	H11	0.38	1.10	0.40	5.00	1.30	0.40	-
< 1.2344 > X40CrMoV5-1	H13	0.39	1.10	0.40	5.20	1.40	0.95	-

The data contained in this brochure is merely for general information and therefore shall not be binding on the company. We may be bound only through a contract explicitly stipulating such data as binding. The manufacture of our products does not involve the use of substances detrimental to health or to the ozone layer.

**voestalpine BÖHLER Edelstahl GmbH & Co KG**

Mariazeller Straße 25

8605 Kapfenberg, Austria

T. +43/3862/20-7181

F. +43/3862/20-7576

E. [info@bohler-edelstahl.at](mailto:info@bohler-edelstahl.at)

[www.voestalpine.com/bohler-edelstahl](http://www.voestalpine.com/bohler-edelstahl)

BW 065 En 02.18 - 1000 CD

**voestalpine**

ONE STEP AHEAD.