



## KNIFE STEELS

# FOCUSED ON FLEXIBILITY & QUALITY



SHEETS &  
PLATES

## OUR MATERIAL COMPETENCE AND CAREFUL ADAPTATION TO THE DEMANDS OF THE CLIENT GIVES YOU A BIGGER CUT.

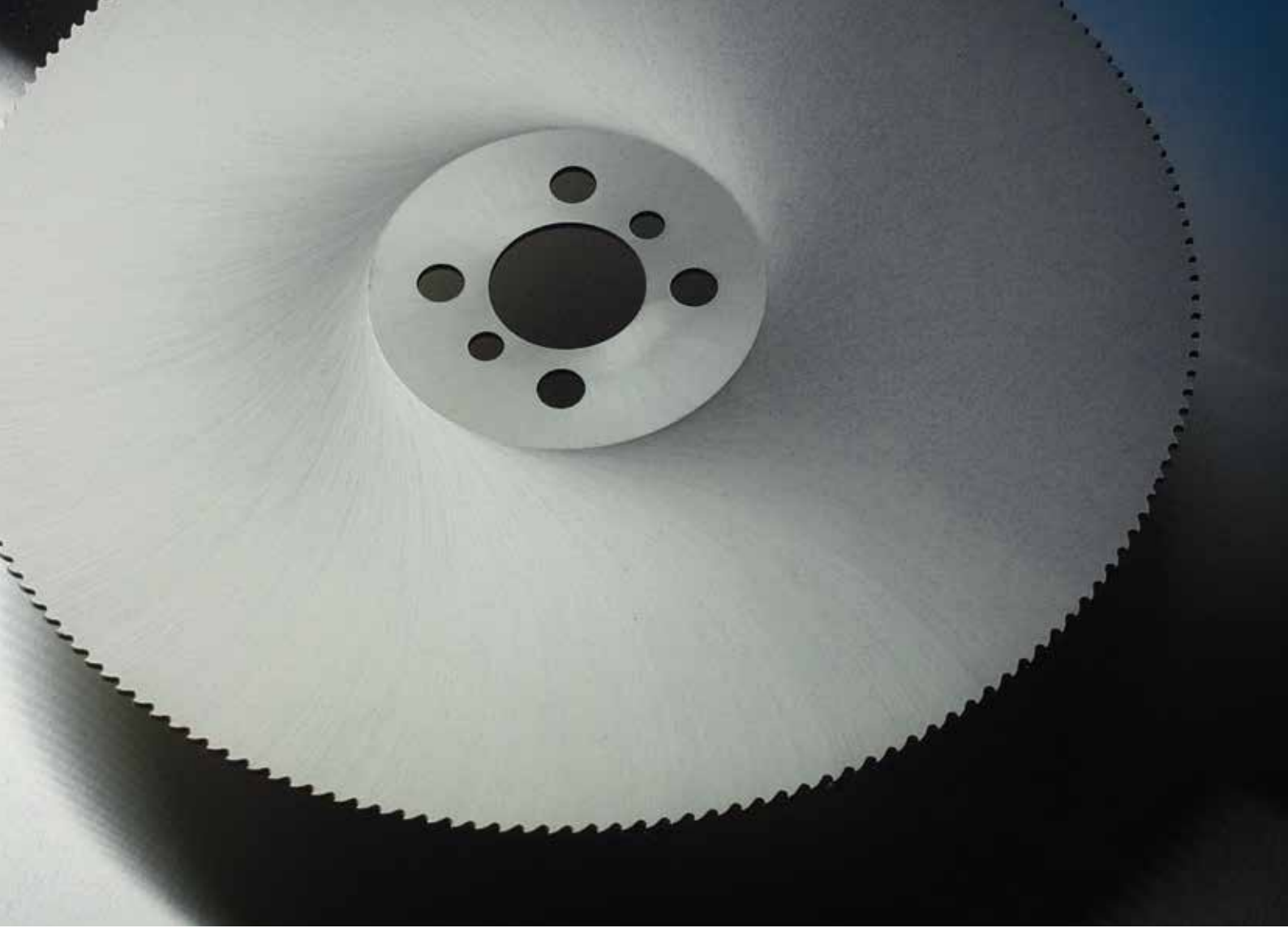
voestalpine BÖHLER Bleche is fully committed to maximising the client's benefit. This is confirmed by our extremely small machining allowances and our cut-to-order service including the most different types of cut such as laser cutting, cold sawing, shearing, plasma cutting or waterjet cutting. High quality knife steels are needed in the cardboard and paper industry, in metal processing, in the textile industry, in the food processing industry and in plastic processing. Secure your technological edge by relying on a high performance partner!

### **Your advantage, our skills – the whole supply chain is in our hands.**

voestalpine BÖHLER covers all technical melting and remelting processes with state of the art equipments e.g.

- » EAF / AOD
- » VID
- » ESR / P-ESR
- » Microclean

In combination with our cross-rolling technology, we are able to support you with a homogeneous product having excellent material properties concerning mechanical and physical characteristics.



#### **We offer the total solution**

- » Individual sheet & plate sizes
- » Tailor-made surface finish – from shot-blasted to polished
- » Different cutting edge finishes (laser cut, cold sawn, plasma cut, shear cut, waterjet cut)
- » Individual technical support

#### **Tailor-made sheets / plates for:**

- » Cutter knives / knives for meat and sausage processing
- » Knives for industrial fish processing
- » High-quality applications, e.g. hunting knives and kitchen knives
- » Knives for the cardboard and paper industry
- » Knives for textile industry
- » Knives for metal and plastic processing



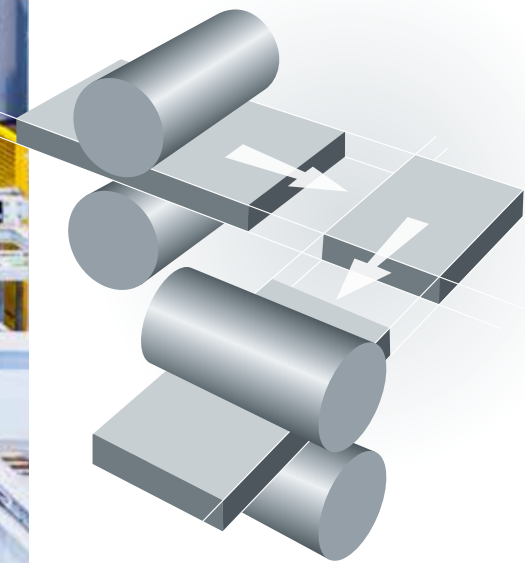
# THE CROSS-ROLLING TECHNOLOGY PUTS YOU IN POLE POSITION

**OUR CROSS-ROLLING TECHNOLOGY IS SYNONYMOUS WITH SUPERIOR MACHINING QUALITY AND INCREASED USER SAFETY.**

voestalpine BÖHLER Bleche manufactures quality knife steels that combine a constantly high standard with premium machining properties. The cross-rolling technology and state-of-the-art production facilities offer uniform material properties and minimum machining allowances, thus satisfying the most stringent demands in the production and use of industrial knives. Prompt availability and technical support translate into crucial benefits for our clients, such as the ability to respond faster to new challenges.

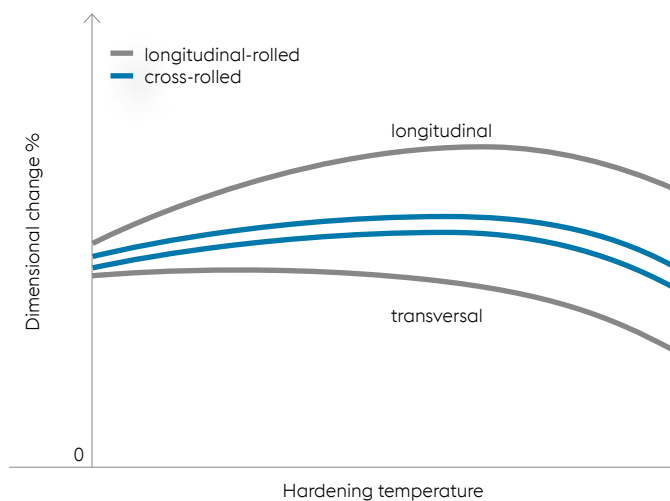
**Your advantage by using plates – in processing and practical service compared to conventional rolled material:**

- » Optimized output
- » Higher safety in production
- » Improved processing properties
- » Tight machining allowances
- » Less distortion

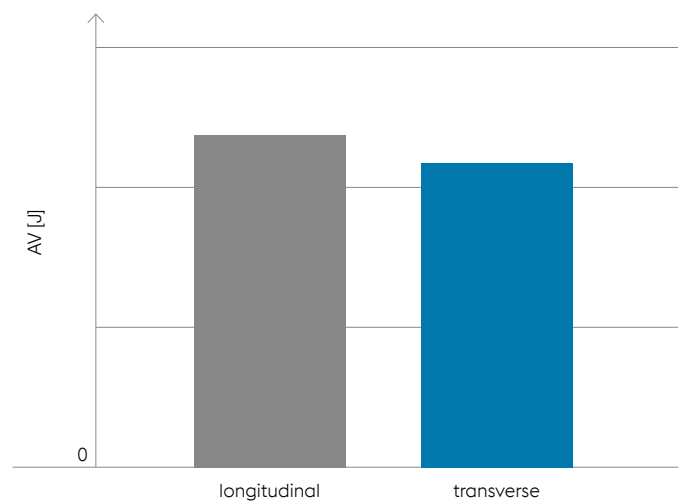


**COLD WORK STEELS, HOT WORK STEELS, HIGH SPEED STEELS, CORROSION RESISTANT KNIFE STEELS AND HEAT TREATABLE STEELS ARE OUR STRENGTH.**

#### Dimensional change during heat treatment



#### Impact energy for unnotched specimens [J] acc. SEP 1314



Dimension: max. 2,000 x 6,000 mm [78.740 x 236.220 inch] (width x length)  
 Thickness: 0.8 - 110 mm [0.031 - 4.330 inch]  
 Unit of trading: minimum order quantity 800 kg [1.763 lb]

The cross-rolling technology - homogeneous properties over the whole sheet / plate in longitudinal and transverse direction.



# PROGRESS BASED ON SUPERIOR TECHNOLOGY

## Knife steels

BÖHLER grade		Chemical composition (average %)								
		C	Si	Mn	Cr	Mo	V	W	Co	Others
<b>BÖHLER K110</b>	1.2379 / D2	1.55	0.30	0.30	11.30	0.75	0.75	-	-	-
<b>BÖHLER K294</b> <b>MICROCLEAN</b>	A11	2.45	0.90	0.50	5.20	1.30	9.60	-	-	-
<b>BÖHLER K340</b>	-	1.10	0.90	0.40	8.25	2.10	0.50	-	-	Nb, Al
<b>BÖHLER K390</b> <b>MICROCLEAN</b>	-	2.45	0.50	0.40	4.20	3.75	9.00	1.00	2.00	-
<b>BÖHLER S290</b> <b>MICROCLEAN</b>	-	2.00	0.50	0.30	3.80	2.50	5.10	14.30	11.00	-
<b>BÖHLER S390</b> <b>MICROCLEAN</b>	~T15	1.60	0.50	0.30	4.75	2.00	4.80	10.40	8.00	-
<b>BÖHLER S393</b> <b>MICROCLEAN</b>	T15	1.55	0.30	0.30	4.50	-	4.80	12.50	5.00	-
<b>BÖHLER S600</b>	1.3343 / M2	0.90	0.30	0.30	4.00	5.00	1.75	6.20	-	-
<b>BÖHLER S630</b>	1.3330	0.95	-	-	4.00	4.00	2.00	4.00	-	Al 0.50
<b>BÖHLER S693</b> <b>MICROCLEAN</b>	M4	1.35	0.30	0.30	4.00	5,25	4.00	5.75	-	-
<b>BÖHLER S790</b> <b>MICROCLEAN</b>	1.3345 / M3	1.30	0.60	0.30	4.20	5.00	3.00	6.30	-	-



## Corrosion resistant knife steels

BÖHLER grade		Chemical composition (average %)									
		C	Si	Mn	Cr	Mo	V	W	Co	Others	
BÖHLER N360	*	1.4108	0.30	0.60	0.40	15.00	1.00	-	-	-	N 0.40
BÖHLER N540		1.4034	0.46	0.40	0.40	13.00	-	-	-	-	-
BÖHLER N676		B-Cut	0.70	0.50	0.45	14.50	1.90	0.60	-	-	Nb 0.80
BÖHLER N678		1.4153	0.80	0.40	0.40	13.50	0.45	1.85	-	-	-
BÖHLER N679		M92	0.80	0.40	0.40	13.00	1.30	0.85	-	-	Nb 0.80
BÖHLER N680		-	0.55	0.40	0.40	17.30	1.10	0.10	-	-	N 0.20
BÖHLER N685		1.4112	0.90	0.40	0.40	17.50	1.10	0.10	-	-	-
BÖHLER N690		1.4528	1.08	0.40	0.40	17.30	1.10	0.10	-	1.50	-
BÖHLER N695		1.4125	1.05	0.40	0.40	16.70	0.50	-	-	-	-
BÖHLER M368 MICROCLEAN		-	0.55	0.40	0.40	17.30	1.10	0.10	-	-	-
BÖHLER M390 MICROCLEAN		-	1.90	0.70	0.30	20.00	1.00	4.00	0.60	-	-

\* DESU

# BEST PROPERTIES

## Hardness in the delivered condition (annealed / Brinell)

BÖHLER grade		Hardness (HB)	BÖHLER grade		Hardness (HB)
<b>BÖHLER K110</b>	1.2379 / D2	max. 250	<b>BÖHLER N360</b> *	1.4108	max. 250
<b>BÖHLER K294</b> <b>MICROCLEAN</b>	A11	max. 280	<b>BÖHLER N540</b>	1.4034	max. 245
<b>BÖHLER K340</b>	-	max. 250	<b>BÖHLER N676</b>	B-Cut	max. 260
<b>BÖHLER K390</b> <b>MICROCLEAN</b>	-	max. 280	<b>BÖHLER N678</b>	1.4153	max. 260
<b>BÖHLER S290</b> <b>MICROCLEAN</b>	-	max. 350	<b>BÖHLER N679</b>	M92	max. 260
<b>BÖHLER S390</b> <b>MICROCLEAN</b>	~T15	max. 300	<b>BÖHLER N680</b>	-	max. 260
<b>BÖHLER S393</b> <b>MICROCLEAN</b>	T15	max. 300	<b>BÖHLER N685</b>	1.4112	max. 265
<b>BÖHLER S600</b>	1.3343 / M2	max. 280	<b>BÖHLER N690</b>	1.4528	max. 285
<b>BÖHLER S630</b>	1.3330	max. 280	<b>BÖHLER N695</b>	1.4125	max. 285
<b>BÖHLER S693</b> <b>MICROCLEAN</b>	M4	max. 280	<b>BÖHLER M368</b> <b>MICROCLEAN</b>	-	max. 280
<b>BÖHLER S790</b> <b>MICROCLEAN</b>	1.3345 / M3	max. 280	<b>BÖHLER M390</b> <b>MICROCLEAN</b>	-	max. 280

\* DESU

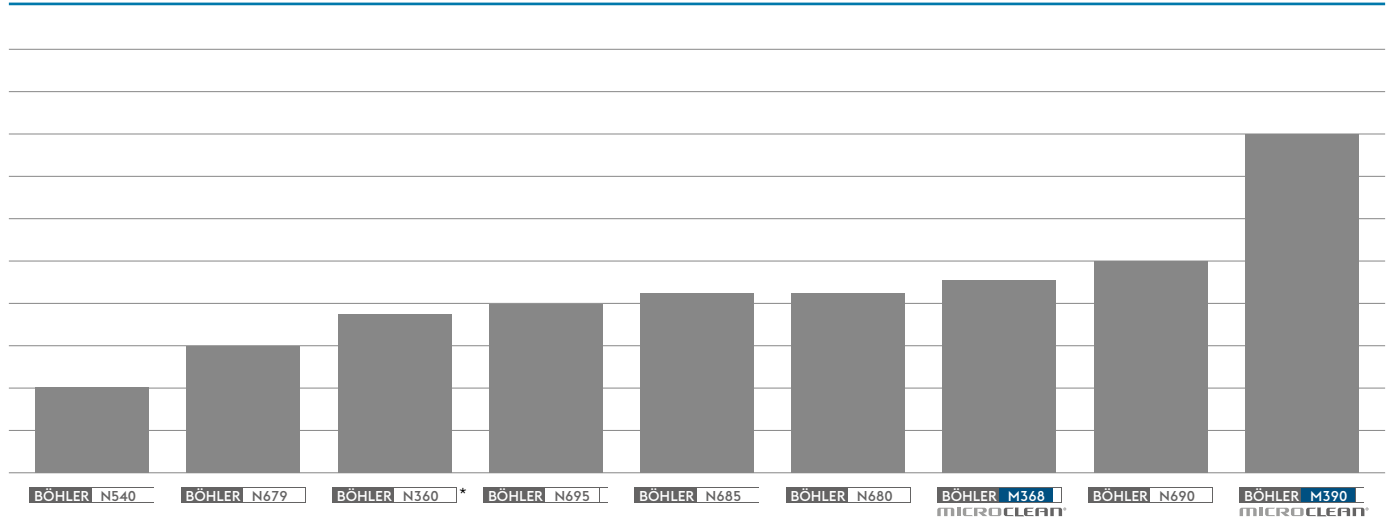
## Corrosion resistant knife steels – recommended hardness range (hardened and tempered condition / Rockwell C)

BÖHLER grade		Hardening temperature °C [°F]	Tempering temperature °C [°F]	Hardness HRC
<b>BÖHLER N360</b> *	1.4108	1,000 – 1,050 [1,832 – 1,922]	150 – 300 [302 – 572]	55 – 60
<b>BÖHLER N540</b>	1.4034	980 – 1,030 [1,796 – 1,886]	150 – 250 [302 – 482]	52 – 55
<b>BÖHLER N676</b>	B-Cut	1,000 – 1,050 [1,832 – 1,922]	150 – 300 [302 – 572]	54 – 60
<b>BÖHLER N678</b>	1.4153	1,000 – 1,050 [1,832 – 1,922]	150 – 300 [302 – 572]	54 – 60
<b>BÖHLER N679</b>	M92	1,000 – 1,050 [1,832 – 1,922]	150 – 300 [302 – 572]	54 – 60
<b>BÖHLER N680</b>	-	980 – 1,020 [1,796 – 1,868]	150 – 300 [302 – 572]	54 – 58
<b>BÖHLER N685</b>	1.4112	1,000 – 1,050 [1,832 – 1,922]	150 – 250 [302 – 482]	55 – 59
<b>BÖHLER N690</b>	1.4528	1,030 – 1,080 [1,886 – 1,976]	150 – 300 [302 – 572]	55 – 60
<b>BÖHLER N695</b>	1.4125	1,000 – 1,050 [1,832 – 1,922]	150 – 250 [302 – 482]	55 – 59
<b>BÖHLER M368</b> <b>MICROCLEAN</b>	-	980 – 1,020 [1,796 – 1,868]	150 – 300 [302 – 572]	54 – 58
<b>BÖHLER M390</b> <b>MICROCLEAN</b>	-	1,100 – 1,180 [2,012 – 2,156]	200 – 300 [392 – 572]	56 – 61

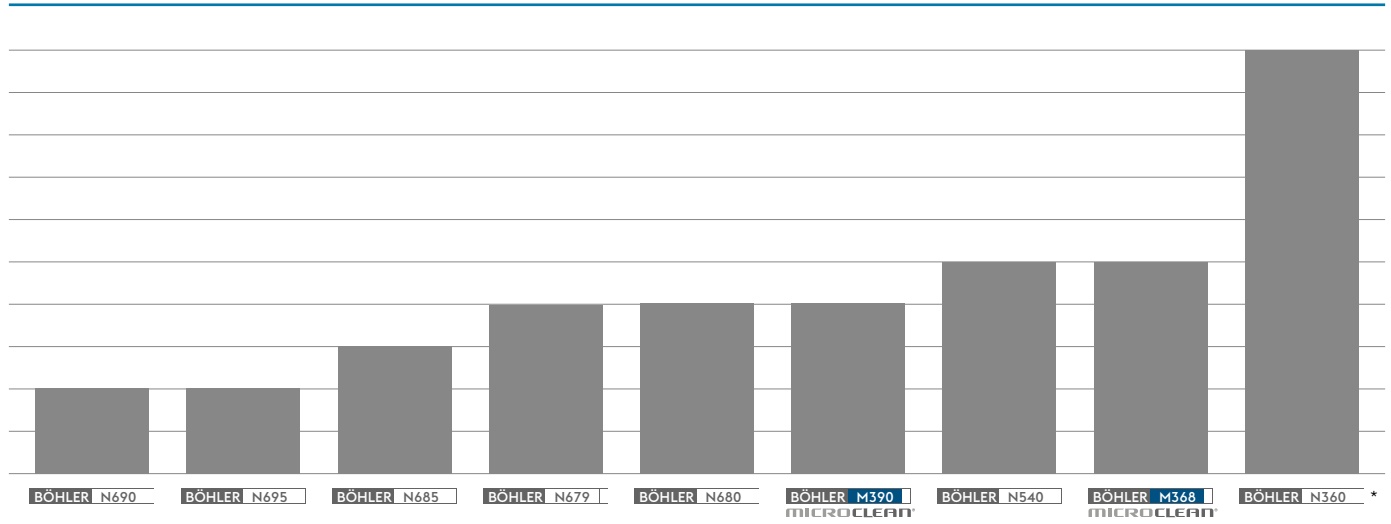
\* After austenitising we recommend a sub zero treatment in order to remove the retained austenite!  
Above mentioned details should be seen as information only.



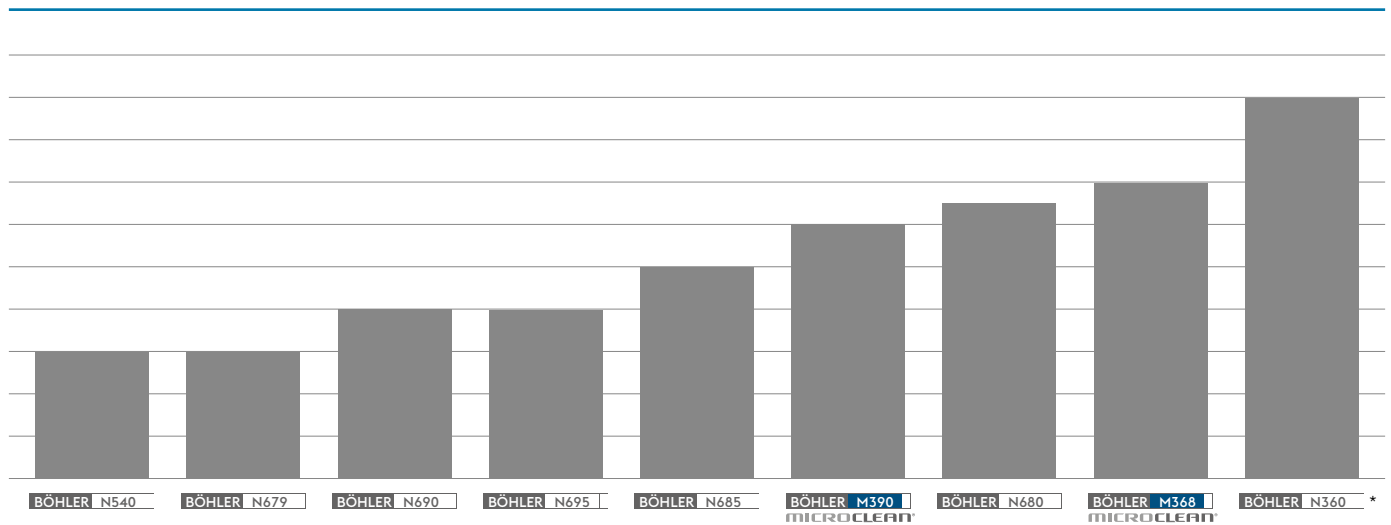
## Wear



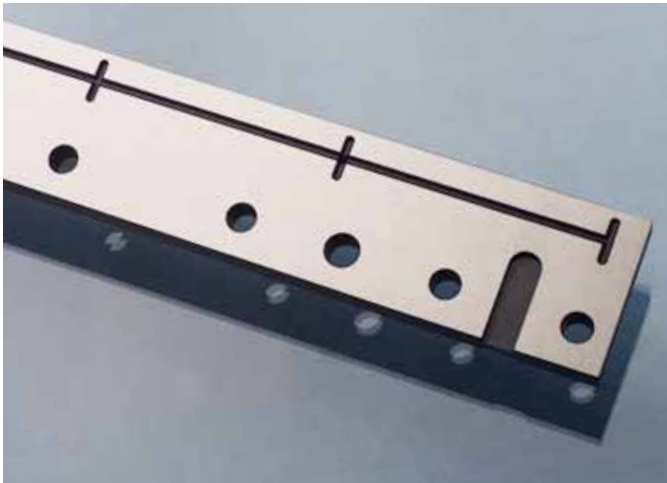
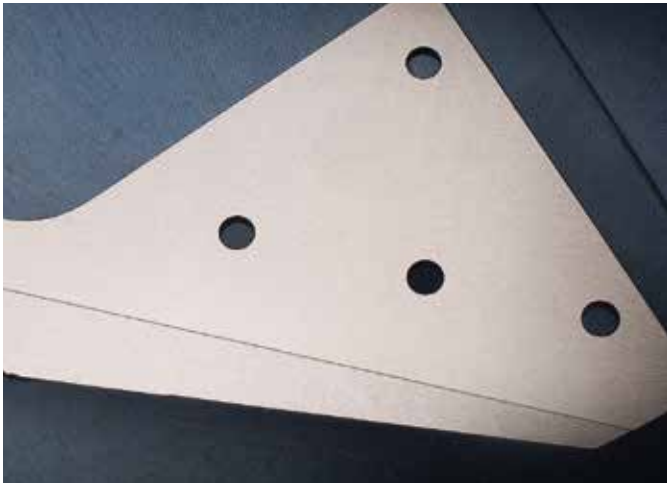
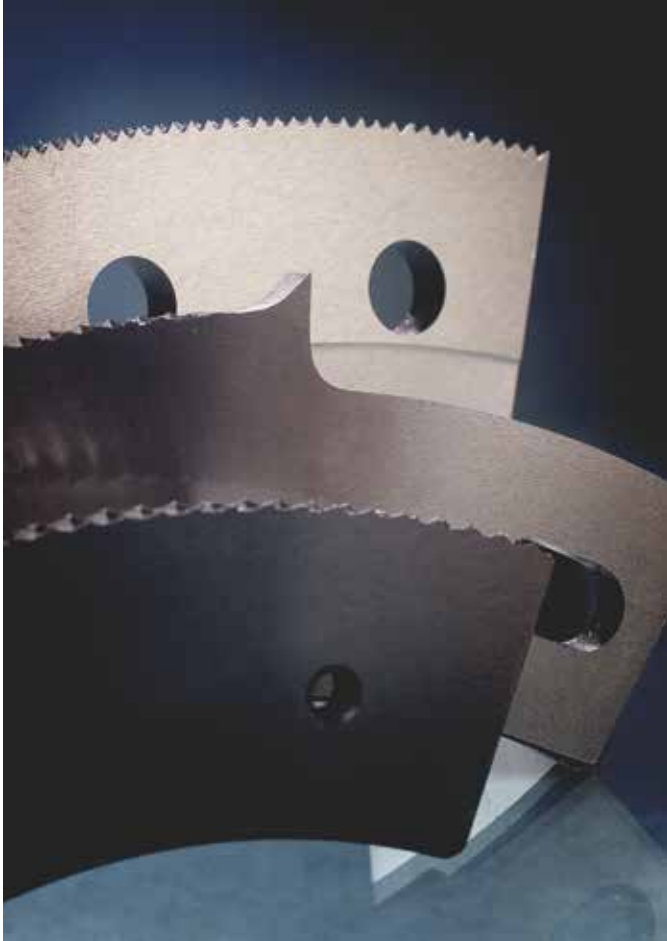
## Toughness



## Corrosion resistance



\* DESU



# WIDE VARIETY

**Finish**

- » hot-rolled, cross-rolled, annealed, shot-blasted, stress relieved
- » hot-rolled, cross-rolled, annealed, pickled

**Delivery forms**

- » Sheets and plates
- » Stripes
- » Laser-cut discs and blanks

Other thicknesses upon request

Ordered thickness (mm) [inch]	Tolerance on thickness (mm) [inch]
2.0 – 2.49 [0.078 – 0.098]	± 0.12 [0.004]
2.5 – 2.99 [0.098 – 0.117]	± 0.16 [0.006]
3.0 – 3.99 [0.118 – 0.157]	± 0.18 [0.007]
4.0 – 4.99 [0.157 – 0.196]	± 0.20 [0.008]
5.0 – 5.99 [0.196 – 0.235]	± 0.22 [0.009]
6.0 – 7.99 [0.236 – 0.314]	± 0.25 [0.010]
8.0 – 9.99 [0.314 – 0.393]	± 0.30 [0.012]
10.0 – 12.0 [0.393 – 0.472]	± 0.35 [0.014]



## Dimensions and formats

Thickness (mm) [inch]	maximum length (mm) [inch]	maximum width (mm) [inch]	Size tolerance, shear-cut (mm) [inch]		Laser-cut shapes (mm) [inch]
			Lenght	Width	
2.0 – 2.99 [0.098 – 0.117]	3,000 [118.110]	1,100 – 1,200 [43.307 – 47.244]	-0 / +20 [0.787]	-0 / +20 [0.787]	up to Ø 500 [19.685]
3.0 – 5.49 [0.118 – 0.216]	4,000 [157.480]	1,300 – 1,400 [51.181 – 55.118]	-0 / +30 [1.181]	-0 / +20 [0.787]	± 0.1 [0.004]
5.5 – 5.99 [0.217 – 0.235]	5,000 [196.850]	1,400 [55.118]	-0 / +30 [1.181]	-0 / +20 [0.787]	Ø 500 – 1,500 [19.685 – 59.055]
6.0 – 12.0 [0.236 – 0.472]	6,000 [236.220]	1,400 [55.118]	-0 / +30 [1.181]	-0 / +20 [0.787]	± 0.2 [0.008]

Sizes for higher thicknesses and different cutting edge finishes upon request.

## Disc program

Thickness (mm) [inch]	Disc (mm) [inch] Diameter	Disc (mm) [inch] Tolerance	Centre hole (mm) [inch] Tolerance on diameter	Centre hole (mm) [inch] Eccentricity
	>500 – 1,000 [19.685 – 39.370]	± 0.2 [0.008]		
>4.5 – 14.0 [0.177 – 0.551]	5 – 500 [0.196 – 19.685]	± 0.3 [0.012]	± 0.3 [0.012]	max. 0.2 [0.008]
	>500 – 1,000 [19.685 – 39.370]	± 0.5 [0.020]		

Sizes for higher thicknesses and different cutting edge finishes upon request.



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BL 010 E - 11.2018 - 500

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ONE STEP AHEAD.