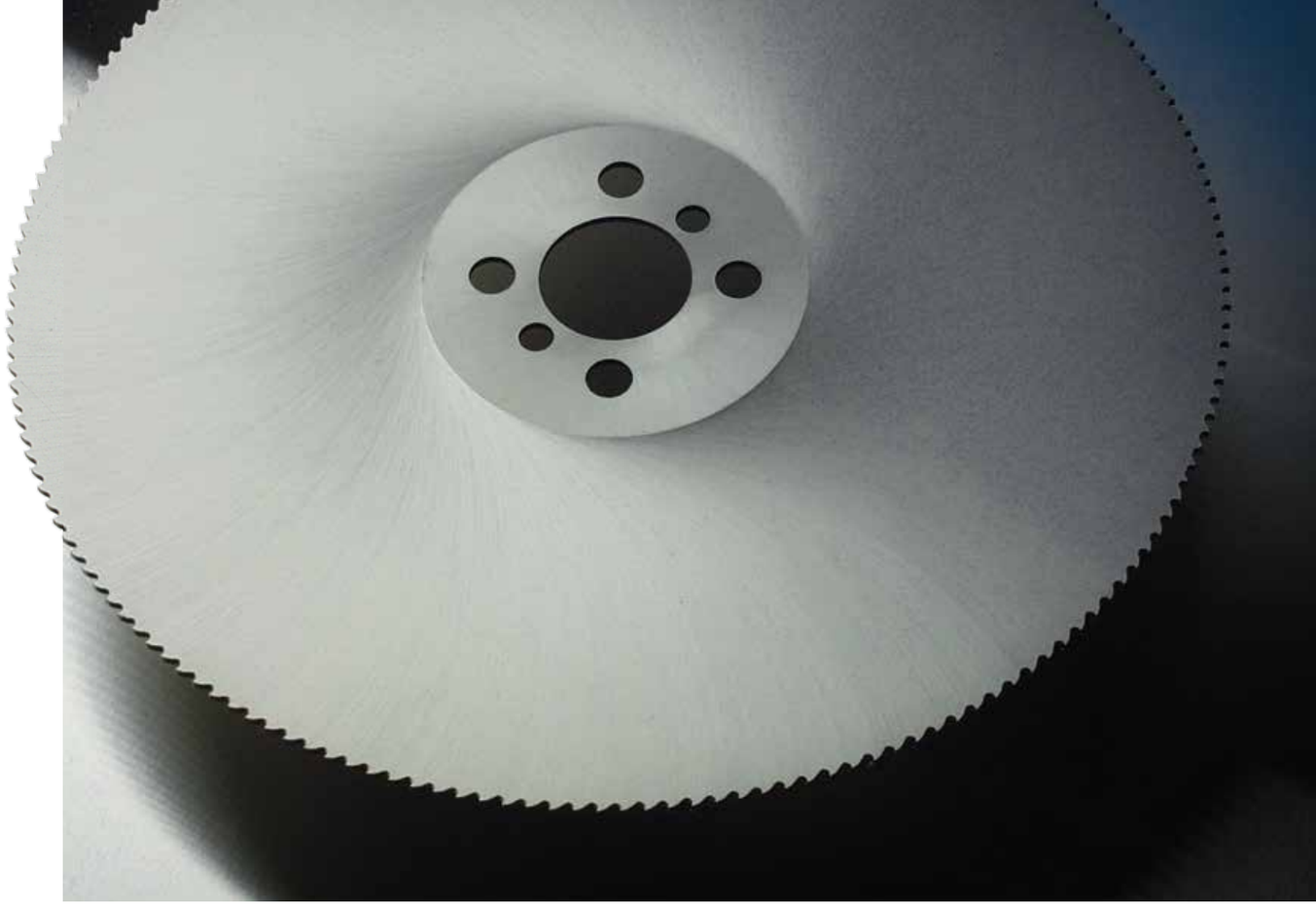
BÖHLER

KNIFE STEELS

voestalpine BÖHLER Bleche GmbH & Co KG
www.voestalpine.com/bohler-bleche

voestalpine
ONE STEP AHEAD.

FOCUSED ON
FLEXIBILITY & QUALITY



SHEETS & PLATES

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

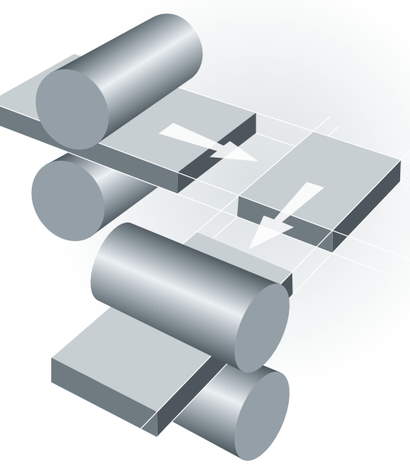
voestalpine BÖHLER Bleche is fully committed to maximising the client's benefit. This is confirmed by our extremely small machining allowances and our cut-to-order service including the most different types of cut such as laser cutting, cold sawing, shearing, plasma cutting or waterjet cutting. High 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



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

THE CROSS-ROLLING TECHNOLOGY PUTS YOU IN POLE POSITION

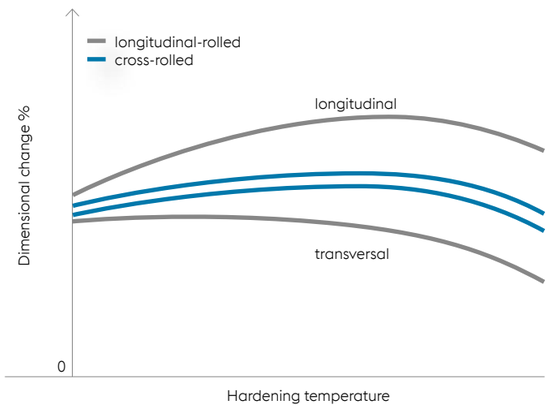
OUR CROSS-ROLLING TECHNOLOGY IS SYNONYMOUS WITH SUPERIOR MACHINING QUALITY AND INCREASED USER SAFETY.

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.

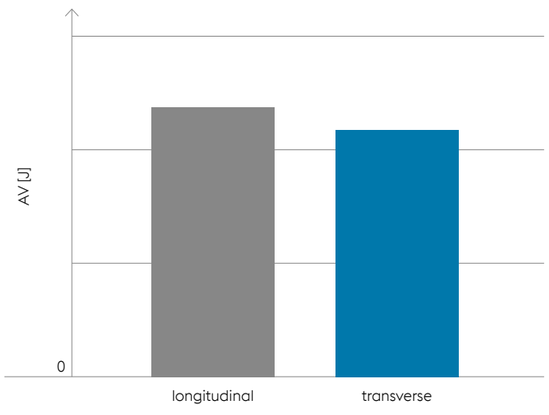
Your advantage by using plates – in processing and practical service compared to conventional rolled material:

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

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
BÖHLER K110	1.2379 / D2	1.55	0.30	0.30	11.30	0.75	0.75	–	–	–
BÖHLER K294 MICROCLEAN	A11	2.45	0.90	0.50	5.20	1.30	9.60	–	–	–
BÖHLER K340	–	1.10	0.90	0.40	8.25	2.10	0.50	–	–	Nb, Al
BÖHLER K390 MICROCLEAN	–	2.45	0.50	0.40	4.20	3.75	9.00	1.00	2.00	–
BÖHLER S290PM MICROCLEAN	–	2.00	0.50	0.30	3.80	2.50	5.10	14.30	11.00	–
BÖHLER S390 MICROCLEAN	~T15	1.60	0.50	0.30	4.75	2.00	4.80	10.40	8.00	–
BÖHLER S393 MICROCLEAN	T15	1.55	0.30	0.30	4.50	–	4.80	12.50	5.00	–
BÖHLER S600	1.3343 / M2	0.90	0.30	0.30	4.00	5.00	1.75	6.20	–	–
BÖHLER S630	1.3330	0.95	–	–	4.00	4.00	2.00	4.00	–	Al 0.50
BÖHLER S693 MICROCLEAN	M4	1.35	0.30	0.30	4.00	5,25	4.00	5.75	–	–
BÖHLER S790 MICROCLEAN	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
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	–	–
BÖHLER M398 MICROCLEAN	–	2.70	0.50	0.50	20.00	1.00	7.20	0.70	–	–

* DESU

BEST PROPERTIES

Hardness in the delivered condition (annealed / Brinell)

BÖHLER grade		Hardness (HB)
BÖHLER K110	1.2379 / D2	max. 250
BÖHLER K294 MICROCLEAN	A11	max. 280
BÖHLER K340	–	max. 250
BÖHLER K390 MICROCLEAN	–	max. 280
BÖHLER S290PM MICROCLEAN	–	max. 350
BÖHLER S390 MICROCLEAN	~T15	max. 300
BÖHLER S393 MICROCLEAN	T15	max. 300
BÖHLER S600	1.3343 / M2	max. 280
BÖHLER S630	1.3330	max. 280
BÖHLER S693 MICROCLEAN	M4	max. 280
BÖHLER S790 MICROCLEAN	1.3345 / M3	max. 280

BÖHLER grade		Hardness (HB)
BÖHLER N360 *	1.4108	max. 250
BÖHLER N540	1.4034	max. 245
BÖHLER N676	B-Cut	max. 260
BÖHLER N678	1.4153	max. 260
BÖHLER N679	M92	max. 260
BÖHLER N680	–	max. 260
BÖHLER N685	1.4112	max. 265
BÖHLER N690	1.4528	max. 285
BÖHLER N695	1.4125	max. 285
BÖHLER M368 MICROCLEAN	–	max. 280
BÖHLER M390 MICROCLEAN	–	max. 300
BÖHLER M398 MICROCLEAN	–	max. 330

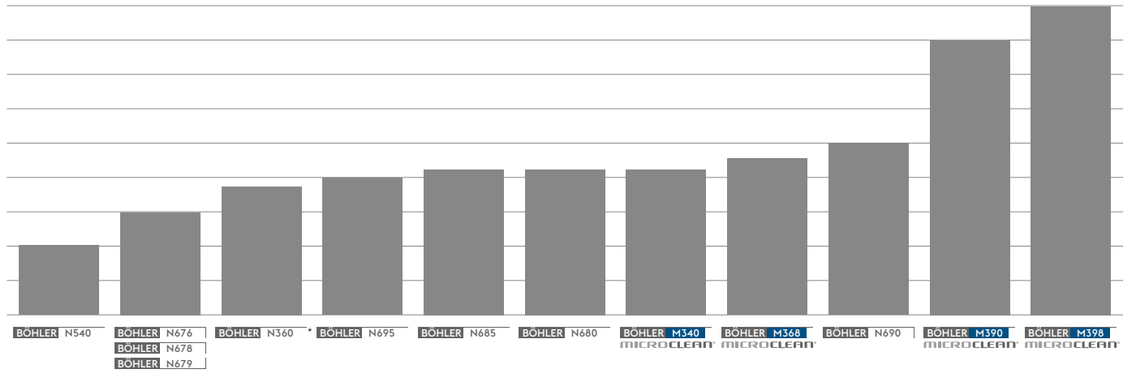
* DESU

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

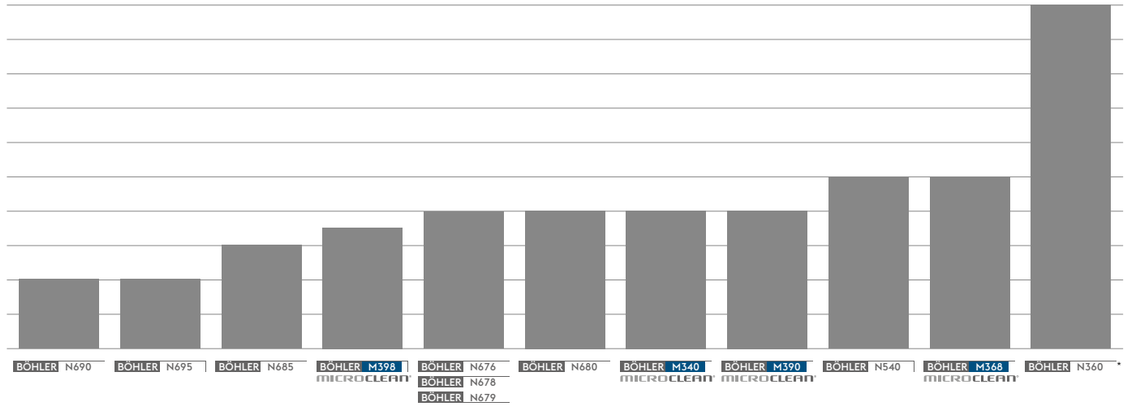
BÖHLER grade		Hardening temperature °C [°F]	Tempering temperature °C [°F]	Hardness HRC
BÖHLER N360 *	1.4108	1,000 – 1,050 [1,832 – 1,922]	150 – 300 [302 – 572]	55 – 60
BÖHLER N540	1.4034	980 – 1,030 [1,796 – 1,886]	150 – 250 [302 – 482]	52 – 55
BÖHLER N676	B-Cut	1,000 – 1,050 [1,832 – 1,922]	150 – 300 [302 – 572]	54 – 60
BÖHLER N678	1.4153	1,000 – 1,050 [1,832 – 1,922]	150 – 300 [302 – 572]	54 – 60
BÖHLER N679	M92	1,000 – 1,050 [1,832 – 1,922]	150 – 300 [302 – 572]	54 – 60
BÖHLER N680	–	980 – 1,020 [1,796 – 1,868]	150 – 300 [302 – 572]	54 – 58
BÖHLER N685	1.4112	1,000 – 1,050 [1,832 – 1,922]	150 – 250 [302 – 482]	55 – 59
BÖHLER N690	1.4528	1,030 – 1,080 [1,886 – 1,976]	150 – 300 [302 – 572]	55 – 60
BÖHLER N695	1.4125	1,000 – 1,050 [1,832 – 1,922]	150 – 250 [302 – 482]	55 – 59
BÖHLER M368 MICROCLEAN	–	980 – 1,020 [1,796 – 1,868]	150 – 300 [302 – 572]	54 – 58
BÖHLER M390 MICROCLEAN	–	1,100 – 1,180 [2,012 – 2,156]	200 – 300 [392 – 572]	56 – 61
BÖHLER M398 MICROCLEAN	–	1,120 – 1,150 [2,048 – 2,102]	200 – 300 [392 – 572]	58 – 62

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

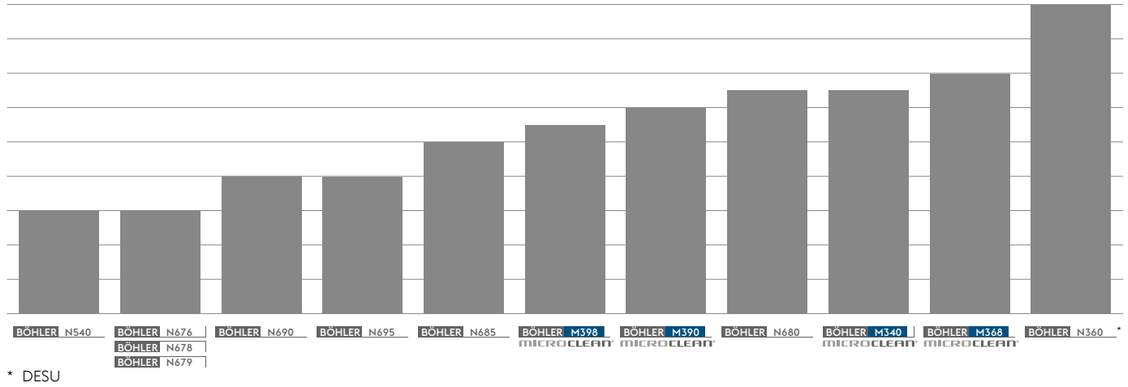
Wear



Toughness



Corrosion resistance



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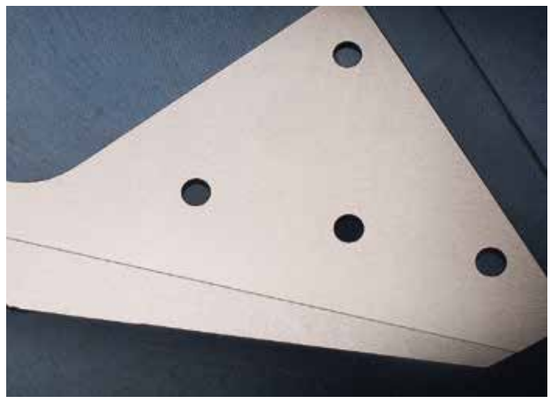

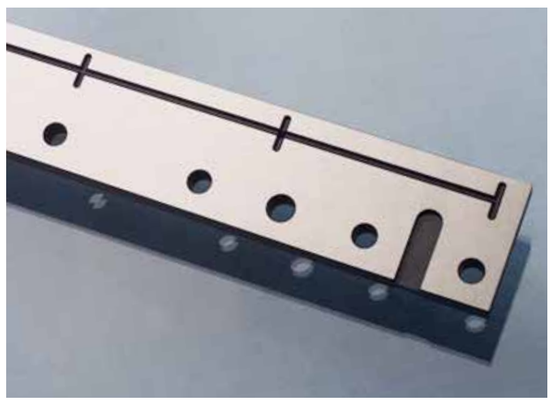

WIDE VARIETY

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] Lenght	Width	Laser-cut shapes (mm) [inch]
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
0.8 – 4.5 [0.031 – 0.177]	5 – 500 [0.196 – 19.685]	± 0.1 [0.004]	± 0.1 [0.004]	max. 0.2 [0.008]
	>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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