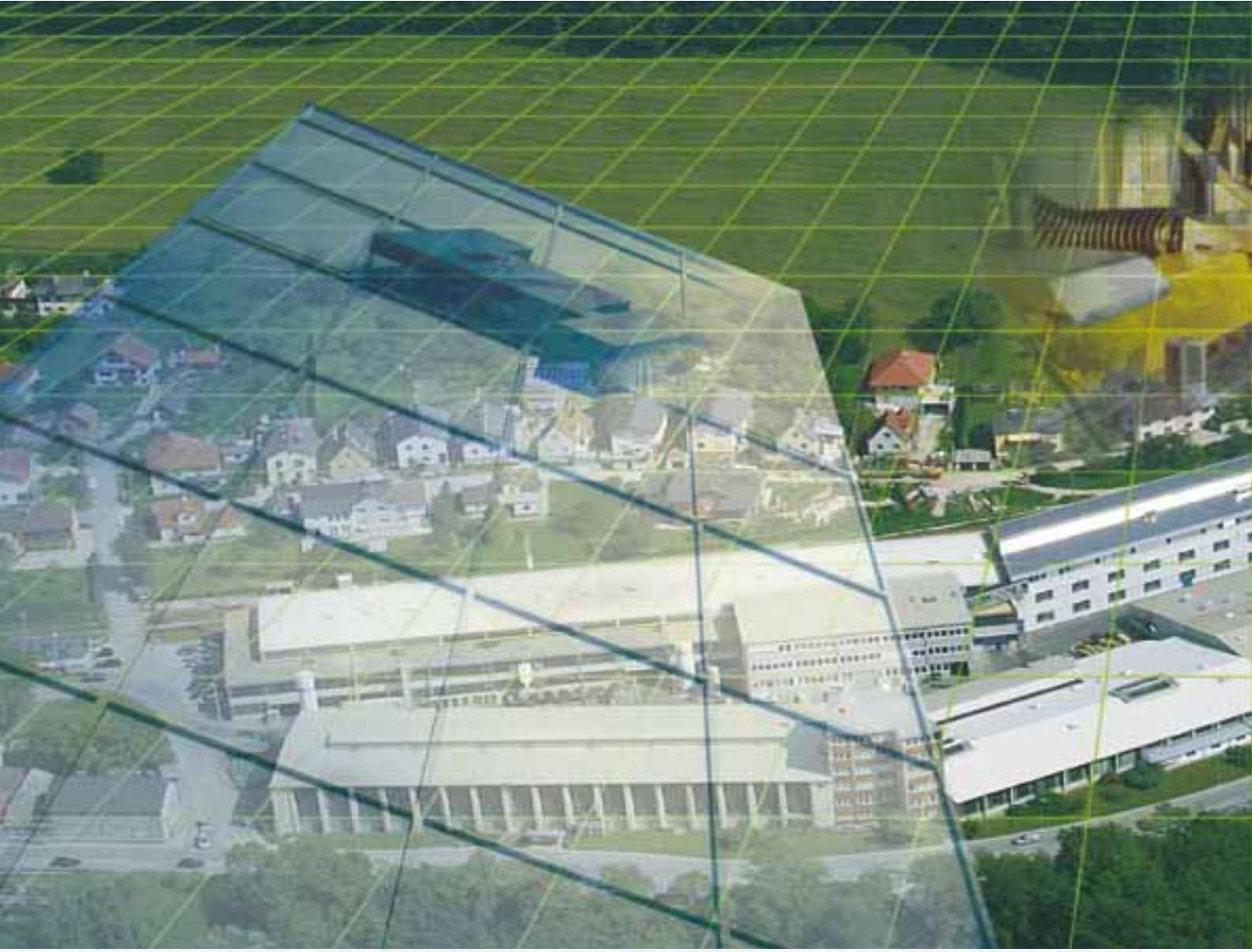


THE ULTIMATE CUTTING RULE

BÖHLER UDDEHOLM

precision *strip*



THE COMPANY

World leader

BÖHLER-UDDEHOLM Precision Strip is a 100% subsidiary of the Böhler-Uddeholm Group, which has 10,053 employees worldwide and an annual turnover of more than Euro 1.5 billion. The group is listed on the stock exchange and is internationally known to be one of the most successful producers of special steels.

The Company – a part of the Precision Strip Division – with its head office in Böhlerwerk, Lower Austria, is a world leader in the production of bimetal strips for metal saws, rule die steel for the leather and textile industry as well as high-precision steel rules for the die cutting of packaging materials.

Furthermore cold rolled special strip steel with the highest requirements for material, surface appearance and tolerances is produced.

The group guidelines are behind the philosophy and strategy of BÖHLER-UDDEHOLM Precision Strip. Important statements of our company philosophy include:

- We see ourselves globally as the competent partner in our core business and always strive towards the position of "Best in class".
- The needs and requirements of our customers build the guidelines of our corporate way of thinking.
- We promote Quality and Service. The qualification, motivation and flexibility of our staff form the basis thereof.
- Our obligation is to a clean environment.





SPECIALISTS

Our strengths

Our company has specialised in the processing of medium and high-alloy steels as well as in the special finishing of the following products:

- Cold rolled special strip steel
- Bimetal strip
- Cutting, creasing and rotary rules
- Rule die steel

Close to the final product

Furthermore we also offer strip steel shapes that are close to the final product, thus allowing our clients to economise on further processing.

Customer benefits

We see ourselves as problem solvers as our suggestions are aimed towards as much customer benefits as possible.



ROTARY DIE CUTTING

Industrial and consumer goods can only be delivered to end users and commercial enterprises in the adequate packaging.

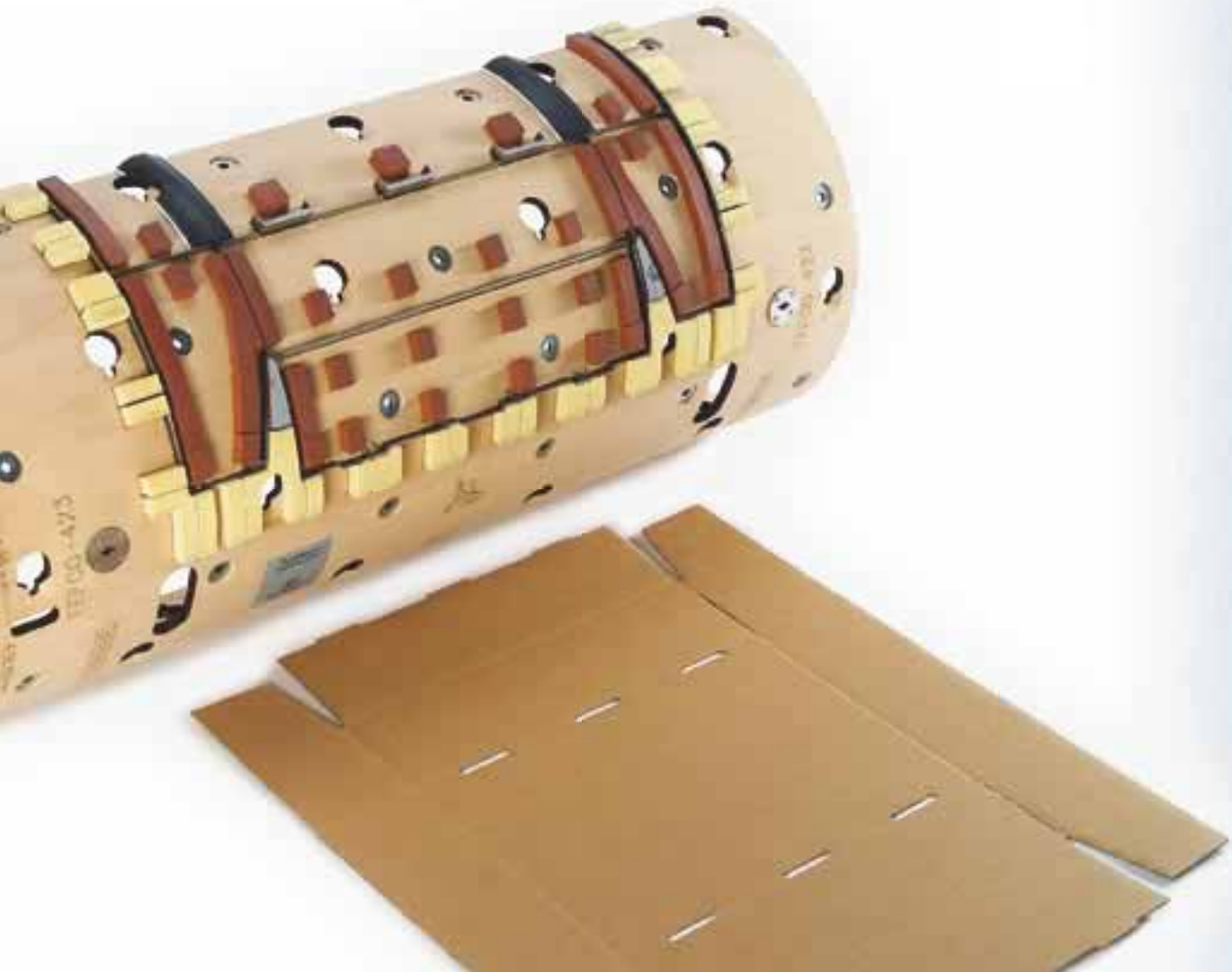
Corrugates board offers the necessary protection for the product and ensures that goods can be delivered safely around the globe. Thus allowing for intact delivery without transport damages, contamination or chemical impact.

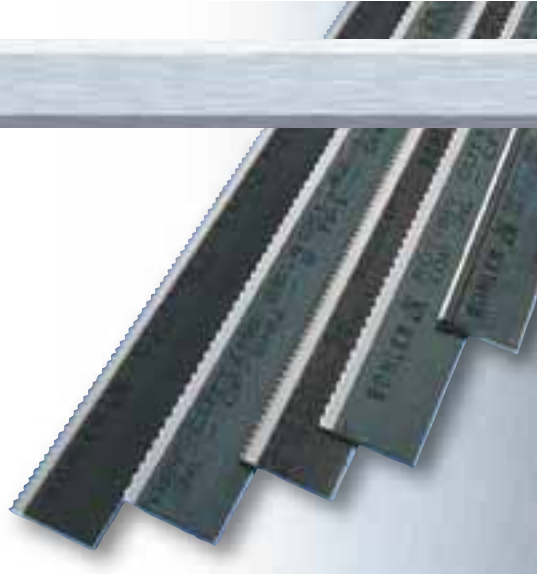
Rotary die cutting is a special form of cutting using a cylindric drum or barrel where cutting and creasing rules are inserted radial (curved) and axial (straight). Thereby allowing a continued manufacturing process.

Rotary die cutting is mainly used in the corrugated industry and when high volume packaging is required.

Typical features for this production technique are:

- serrated cutting rules for die cutting into soft anvil covers or blankets
- curved cutting rules for radial use





ROTARY CUTTING RULES

Rotary cutting rules are equipped with a toothed or serrated cutting edge to enable the easy penetration of the material to be cut in conformity with excellent cutting results. Böhler rotary rules are produced using state of the art, high precision manufacturing equipment which allows precise grinding of the various cutting bevels.
The secondary bevel lying beneath the ground teeth is drawn.

Rotary cutting rules are generally available in the following dimensions:

rule thickness s			standard height h	
[pt]	[mm]	[Zoll]	[mm]	[Zoll]
3 - 6	1,05 - 2,13	0.041″ - 0.084″	21,30 - 26,70	0.840″ - 1.050″
standard thickness: 4 pt (1,42 mm - 0.056″)			other heights on request	

For the various applications following tooth executions are available:

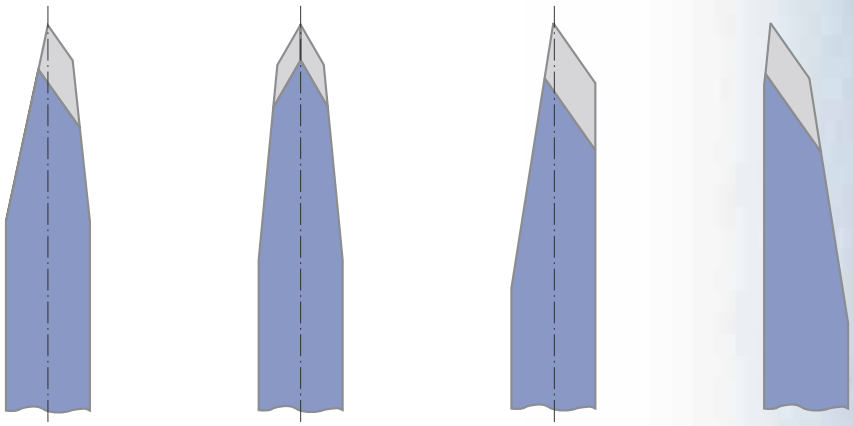
Tooth shapes:

ST sharp teeth angular gullets 8, 10, 12, (16) teeth/inch [TPI]		standard execution, can be used for all cutting applications
US extra sharp teeth round gullets 8, 10, 12, (14) teeth/inch [TPI]		special tooth geometry, very aggressive in its cutting behaviour (especially effective with symmetrical grinding)
SW round teeth round gullets 8, 10, 12 teeth/inch [TPI]		waved tooth execution for pressure reduced cutting and less exposure for the anvil covers or blankets
CC sharp teeth round gullets 8, 10, 12 teeth/inch [TPI]		aggressive tooth execution, only available with one sided (asymmetric) grinding, for easy waste separation

Profile types:

(cross section)

The tooth executions ST, US and SW are also available with both sided grinding (CF/..C), allowing for best possible cutting quality ensuring optimal usability.



CF | **CF/..C** both sided ground (symmetrically) | **CF/CC** | **SF**

Brands:

The standard quality for Böhler rotary rules is Top 36 (trough hardened) and Universal (additionally edge hardened).

Brand	Hardness		is used	
	Body	Edge	axial	radial
BÖHLER TOP 36	~ 340 HV (34 HRC)		✔	✔
BÖHLER UNIVERSAL	~ 340 HV (34 HRC)	~ 500 HV (49 HRC)	✔	✔

On request we can produce Böhler TOP resp. Universal 60, which can only be used axial (SNN) due to its high body hardness of around 450 HV.

Böhler rotary cutting rules are edge hardened after the grinding of the teeth. This ensures a continuous hardness from the tooth peak to depth.

Also on request we have the possibility to harden the cutting edge in a way to ensure a bright surface appearance (Universal B).



UNIVERSAL



TOP 36 / UNIVERSAL B

For curved rules (N1C / N2C / N7C) Böhler has developed a special manufacturing technology whose advantages shall be advised on page 9 under “curved execution”.

ROTARY CREASING RULES

Rotary creasing rules are used for embossing the folding lines of a box.

Folding box design and the precision of the final product are always becoming more demanding which underlines the significance of using high quality creasing rules.

Böhler creasing rules are adjusted in their accuracy to the Böhler cutting rules and offer:

- very smooth surface of the creasing head
- flowing transition from the curved to the side surface
- slightest center deviation
- minimum height deviation



Rotary creasing rules are available in following dimensions, whereas the height depends on the cutting rule being used and the thickness of the material to be cut.

Rule thickness s			Standard height h	
[pt]	[mm]	[Zoll]	[mm]	[Zoll]
3 - 6	1,05 - 2,13	0.041” - 0.084”	20,05 - 25,40	0.790” - 1.000”
Standard thickness: 4 pt (1,42 mm - 0.056”)			other heights on request	

Brands:

Böhler rotary creasing rules are produced using the following manufacturing technologies:

Top 36
The executions and useability are in accordance to Böhler rotary cutting rules.

Brand	Hardness	3 pt 1,05 mm	4 pt 1,42 mm	6 pt 2,13 mm
BÖHLER TOP 36	~ 340 HV (34 HRC)	✔	✔	on request
BÖHLER HT	~ 380 HV (40 HRC)	✔	–	–
BÖHLER HR	min. 265 HV (850 N/mm^2)	–	✔	✔

HT (Hardened and Tempered)
This manufacturing process ensures that rules with a smaller thickness have the necessary stability.

HR (Hard Rolled)
Special cold rolling technology ensures the necessary mechanical strength and stability for these creasing rules.

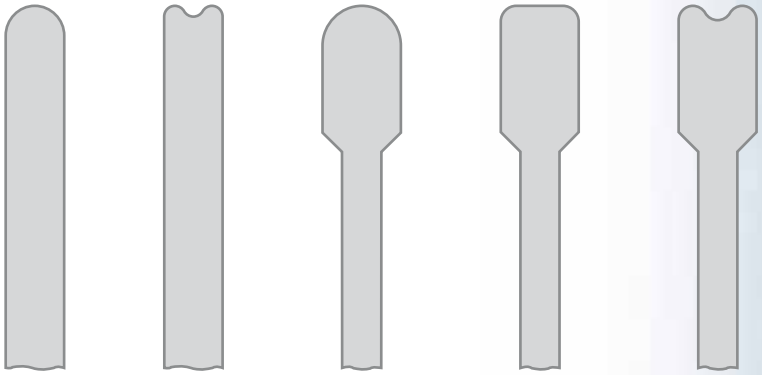
Profiles:

SR – single
TT – twin-track

Laser Crease (HT)
WRT – wide, round top
WFT – wide, flat top
WTT – wide twin-track

Advantages of Laser Crease:
- allows the use of different crease thickness without the need to change the laser slits on the wooden shells
- only by replacing the creasing rules (with a wider head) heavier board grades can be processed with the same rotary die

LASER CREASE

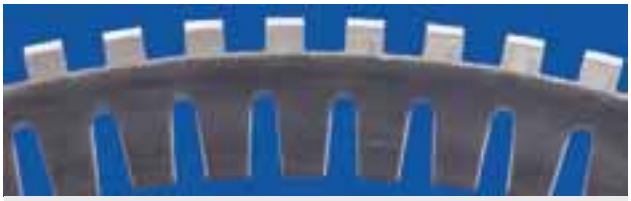


Types: 3/4, 3/6, 3/8, 4/6, 4/8 pt
Heights: 20,32 - 24,38 mm (0.800" - 0.960")

ROTARY SPECIAL RULES
Special rules for use in rotary applications are available in TOP 36 and TOP, whereas TOP is only intended for the axial use (SNN). Executions with serrated cutting bevels (CF/STC) as well as non serrated bevels (CF and CFDDB) are available in our production range.

Perforating Rules


with ground teeth, CF/STC


with CFDDB-bevel

Combination (Cut-Crease) Rules

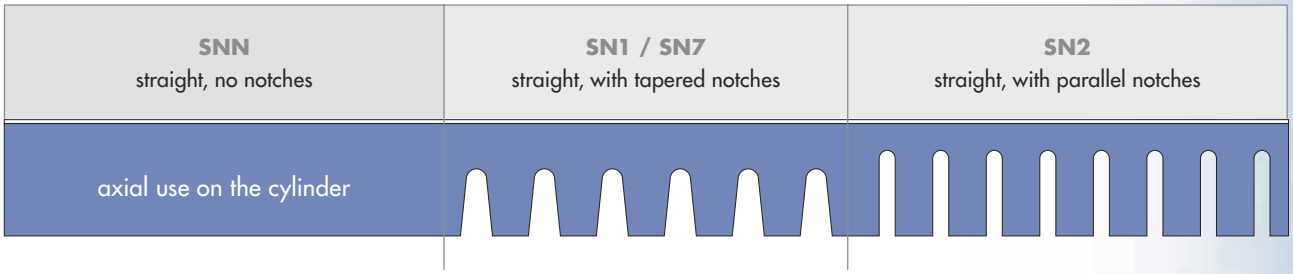


with ground teeth, CF/STC

FORMS OF DELIVERY (valid for all rotary rules)

Rotary rules are manly equipped with round back execution which allows for a easier penetration into the dieboard.

Straight Execution:



Rotary rules in straight execution are produced in cut lengths as well as in coils.

Material delivered in coils are packed in dispenser boxes or if steel strapped (radial) in corresponding coil packaging.

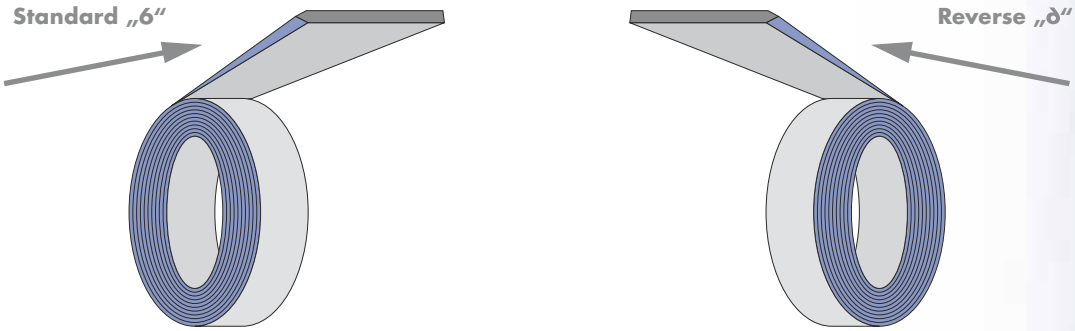
Dispenser boxes allow the practical withdraw of the rules from the box based on the exact amount of material required. The remaining material stays safely within the box protecting the sharp cutting bevel.

For the use in automatic bending machines various types of coils are required. Based on the machine type used the inner diameter and winding direction are to be specified. The standard inner diameters for this form of delivery are 356 mm and 400 mm. Further diameters are available upon request.

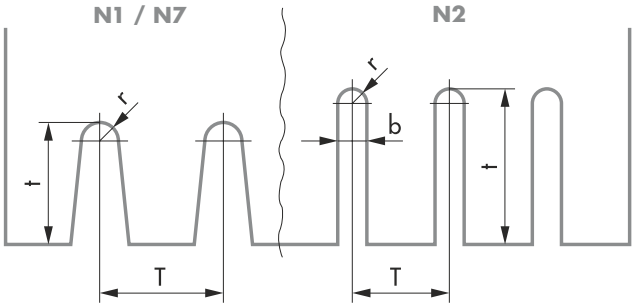
Coil Winding Directions:

- Standard winding direction: view on cutting bevel „6“
- Reverse winding direction: view on cutting bevel „ð“

If winding direction and inner diameter are not specified, we deliver in direction „6“ und Ø 400 mm by default..



Dimensions of the Notches:

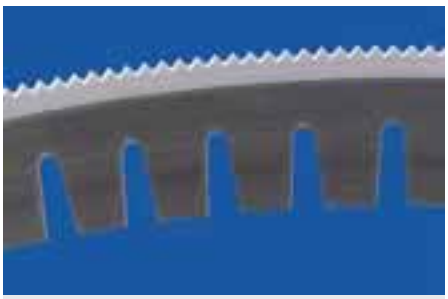


	Tapered Notches N1/N7		parallel notches N2	
	[mm]	[inch]	[mm]	[inch]
Spacing T	12,7	0.500″	10,0	0.394″
Depth t	12,2/12,7	0.480″/0.500″	16,0	0.630″
Radius r	1,9	0.075″	1,5	0.059″
Width b	–	–	3,0	0.118″

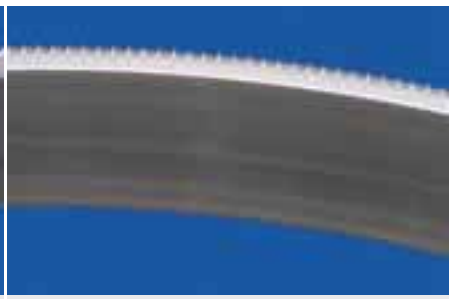
Curved Execution (Radial use):

For radial use curved rotary rules are required (Executions: N1C / N2C / N7C / NNC).

The material is delivered in screw type convoluted coils, primarily with an inner diameter of 487 mm (execution for the 66″ cylinder). Naturally all common diameters from 270 to 560 mm (11″ - 22″) for different machine sizes can be produced. Starting from Ø 487 mm (19 3/16″) we also offer curved rotary rules without any back notches on request.



N1C / N7C



NNC

Böhler has developed a special stress releasing technology for curved rotary rules.
The advantage of this method is that the tension generated during the curving process is reduced without the influence of thermal treatment. The rules are brought into a stress free state whereas the hardness is maintained within the material. In the metallurgic sense there is therefore no difference between the axial and radial execution.

An additional advantage is the high dimensional accuracy on the cylinder. To guarantee an optimal fit within the wooden shells the curved rules are delivered with an approx. 2% smaller inner diameter.





QUALITY ASSURANCE

OUR TARGET

Quality competence

Owing to more than 130 years experience in the converting of steel into components for high-grade final products we understand the value of a good partnership.
For us the first step towards an optimum solution is the grasping of the customer's special needs.



Quality is an essential part of our company culture and this is reflected in all areas of our business activities.

Close relationships with the customer, reliability and quick decision-making are essential elements of our organisation.

Many of our innovations and the corresponding solutions to any special problem are further developed in a constant manner to the benefit of our customers.

BÖHLER-UDDEHOLM Precision Strip has the most up-to-date laboratory facilities and testing technologies and is of course certified to EN ISO 9001.





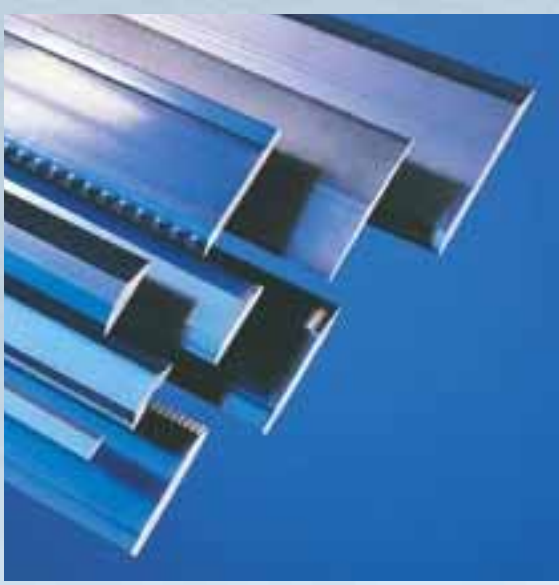
SOLVING OF PROBLEMS

YOUR REQUIREMENTS

Our Know-How

Our state of the art production technology and the know-how of our qualified employees allow us to assist you and search for solutions for any die cutting problem you may have.

Naturally we offer you this service for all strip steel products from our wide production range.



LET'S WORK TOGETHER



STRIP STEEL TECHNOLOGY SINCE 1872

BÖHLER UDDEHOLM

precision *strip*

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