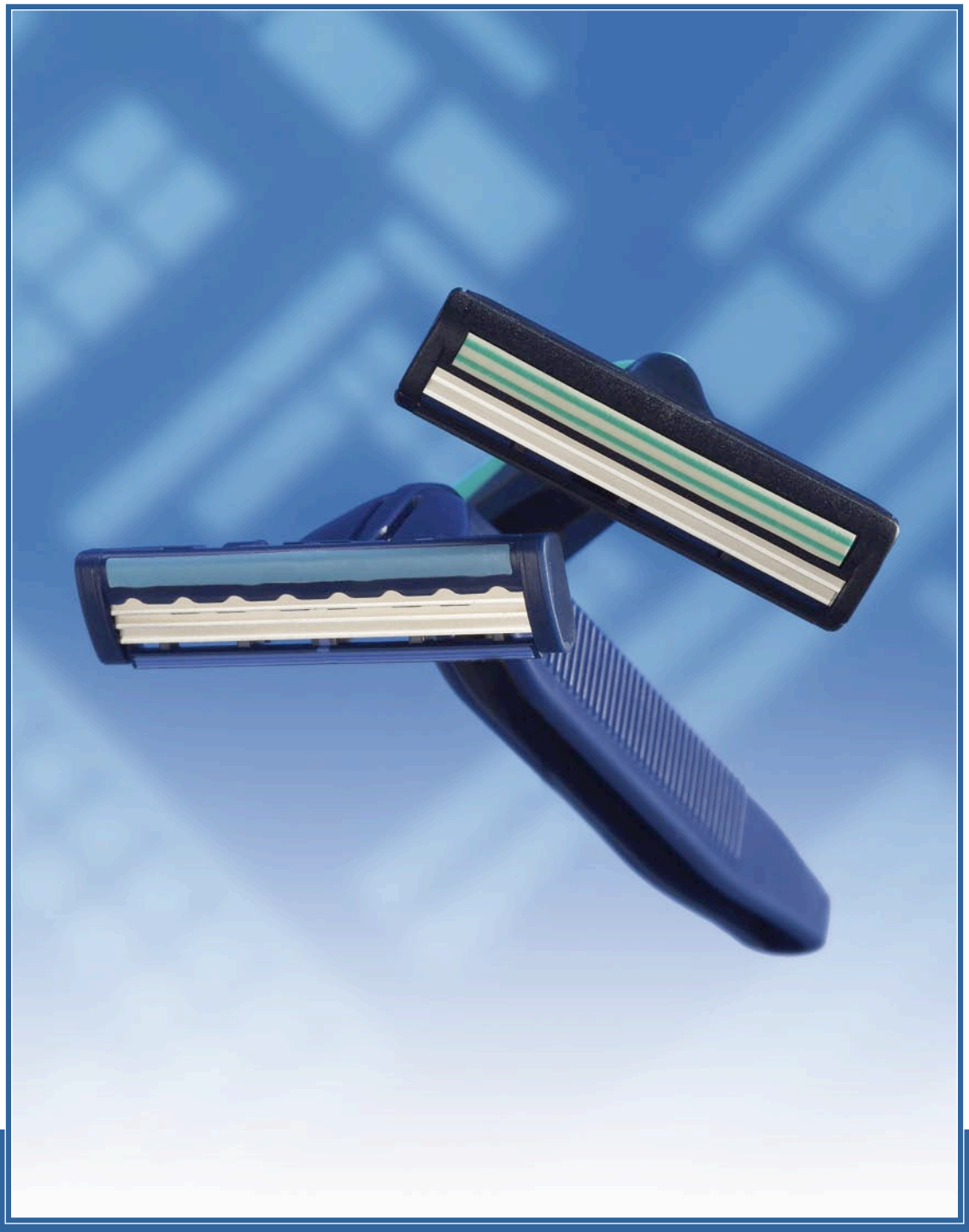
Razor Blade Steel



Razor Blade Steel

BÖHLER UDDEHOLM
precision *strip*

BÖHLER-UDDEHOLM Precision Strip AB is one of the world's leading manufacturers of high quality strip steel. More than a century's experience of cold rolling has given us a unique competence in precision strip steel production. We are specialized in advanced combinations of properties and close tolerances.

Quality, reliability and service are the keynotes of our operations. Our extensive experience and know-how makes it possible for us to supply a comprehensive array of technical- and customer services. BÖHLER-UDDEHOLM Precision Strip AB is continuously developing new materials and products in close co-operation with the customers involving product engineers and designers in a variety of fields. In addition to razor blade steel our product range includes steel for saws, springs, scalpels , printing doctor blades, coater blades and for many other precision strip steel applications in accordance with our customers' requirements.

BÖHLER-UDDEHOLM Precision Strip AB is represented worldwide. Since 1992 the company is a wholly owned subsidiary of Böhler-Uddeholm AG. Apart from our direct sales we are represented by Böhler-Uddeholm subsidiaries globally. We export about 90% of our production and work closely with our subsidiaries to ensure that we fulfil our customers' desires.

Management Systems

CERTIFIED QUALITY MANAGEMENT SYSTEM ISO/TS 16949:2002

DNV

DNV

SWEDAC ACKREDITERING
1053
EN 45012/EMS

SS-EN ISO 9001
SS-EN ISO 14001

Razor Blade Steel

Meeting the demands

The demands on razor blade steel are high. The risk for edge tear-outs must be minimized. A flat and fine surface is important in order to ensure a smooth and comfortable shaving. The thin edge has to have good strength and high sharpness in order to achieve the best shaving result.

Due to the contact with water it is also important that the steel is corrosion resistant. The consumer expects the manufacturer of razorblades to meet all these demands, hence when producing a razor blade you need to have corrosion resistant strip steel of a uniform quality that you can always rely on.

Our basic material is very clean and free from harmful inclusions which could cause irregularities of the cutting edge. The narrow size tolerances and fine microstructure make the manufacturing of the strip material an extremely delicate procedure. Equipped with advanced machinery and know-how we are able to produce steel that has the characteristics that meet the following demands:

- Appropriate tensile strength for the best blanking result
- Good and uniform hardenability to allow a sharp and durable edge
- Narrow width and thickness tolerances that facilitate faultless grinding

History

Our company has a long history in the production of razor blade steel.

The first deliveries of carbon razor blade steel were made in 1905 for Gillette in USA.

Uddeholm was the first company that obtained the patent for stainless razor blade steel (the AEB-steel grade) in 1928.

Manufacturing

UHB AEB-L Stainless Razor Blade Steel is a special martensitic stainless steel with good punching properties, good hardenability and toughness. These material properties and narrow tolerances in width, thickness, flatness and straightness allow efficient processing in the final production lines as well as extraordinary consumer comfort.

Uddeholm cold rolled razor blade steel is rolled in mills especially designed for this purpose. Modern heat treatment equipment and automatic gauge controls allow us to produce faultless products according to the required specifications.

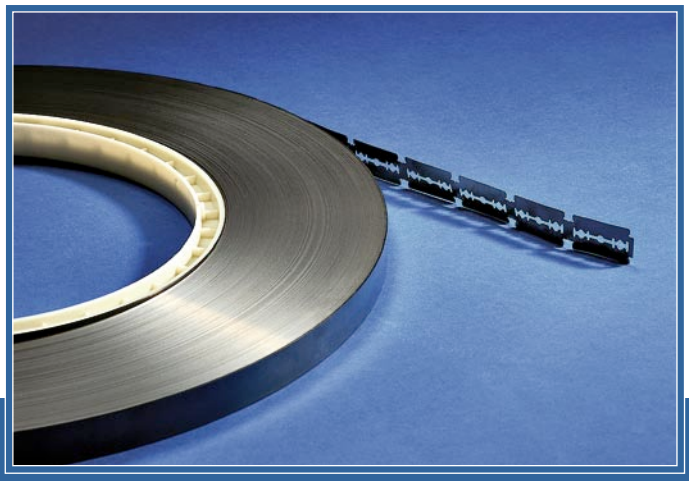
Some major razor blade manufacturing steps are:

- **Blanking**
- **Degreasing**
- **Hardening and tempering**
- **Grinding**
- **Sputtering / PFTE-coating**

Distribution and packaging

As one of today's word-leading producers of cold rolled precision strip steel, our products are appreciated world-wide. The sensitive surface of the strip steel puts high demands on packaging.

Factors such as coil-size, destination and special customer demands are taken into consideration before the choice of packaging is made. Our packaging protects the strip steel from corrosion as well as damage during the transport.



Specification

Description

Unhardened martensitic stainless strip steel specially manufactured to meet the highest requirements for the manufacturing of razor blades and other thin blades.

Steel grade

UHB Stainless AEB-L

AEB-L	Chemical composition, nominal [in weight %]					
	C	Si	Mn	P max	S max	Cr
	0,67	0,40	0,60	0,025	0,015	13,0

Micro structure

Cold rolled stainless steel with finely dispersed carbides in a matrix of ferrite.

Primary carbides:

Almost free from primary carbides larger than 3 micron.

Secondary carbides:

≥ 55 per 100 sq micron at 1000x magnification.

Decarburization

No decarburization is allowed.

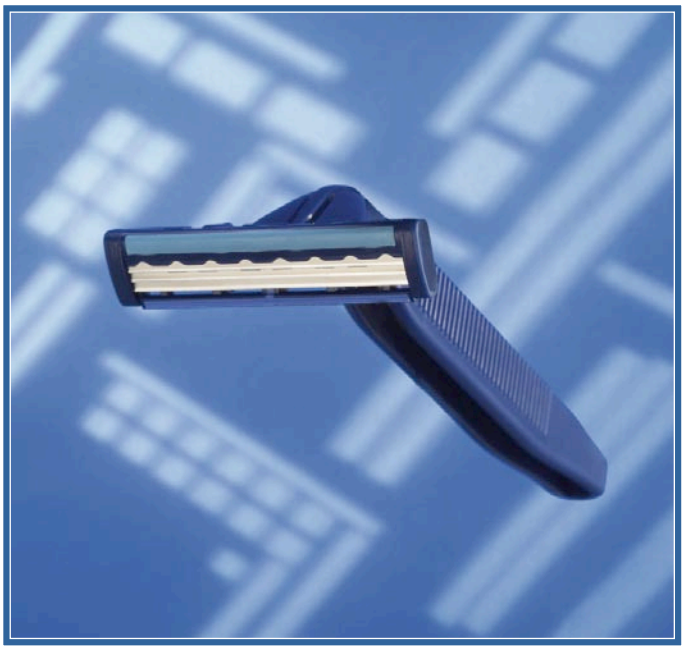
Non-metallic inclusions

Non-metallic inclusions of the harmful type (oxides) are kept at lowest possible level in order to avoid edge tear-outs. The maximum content is according to DIN 50602, K1-oxide < 10, OG 8 max RR2.

Specification

Mechanical properties

Ultimate tensile strength 1070 +/- 100 N/mm2
Approximative Vickers hardness: 280 – 340 HV



Surface

Bright semi-matt, Ra ≤ 0,08 micron.

The surface finish shall be measured with a suitable instrument of skid-type. Any burrs shall be excluded.

Edge finish

Slit edges. Burr height max 0,005 mm.

Size range

Thickness: 0.05 – 0.20 mm / Width: 5 – 25 mm

Other sizes can be supplied on request.

Width tolerance

+/- 0,025 mm (tolerance B9)

Thickness tolerance

+/- 0,005 mm (tolerance T2 for thickness 0,100 mm)

Flatness

The flatness deviation across the rolling direction is max 0.2 % of the strip width, P3.

The flatness deviation along the rolling direction, i.e. along the strip, is max. 0.2 % of the measuring length. Maximum measuring length = the strip width.

In case of local flatness deviation the 0.2 % is based upon the width of the unflat part.

The flatness is measured with the strip lying on a flat surface.

Residual stresses from slitting shall be excluded.

Specification

Straightness

Accurate straightness, tolerance class R3.

Tolerance class	Strip width					
	< 8 mm		8 – (20) mm		20 – (50) mm	
	Measuring length					
	1 m	3 m	1 m	3 m	1 m	3 m
	Maximum allowed straightness deviation [mm]					
R3	2	18	1.5	13.5	1	9

Delivery form

Coils with standard inside diameter of 280 mm.

Rust protection

A thin layer of anti-corrosion oil is applied.

Marking

Labels on the coils and on the packaging show information about the material; e.g. steel grade, size, net- and gross weight, order number, batch number, coil number, strand number.

Master sample

Master sample strands are packed in separate boxes marked “master sample” or “MS”.

Packing

The coils are properly packed in wooden boxes with a center support core and an anti-corrosion system.

Documentation

Upon request a material certificate can be supplied. Normally, the heat analysis and the tensile strength is stated.

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