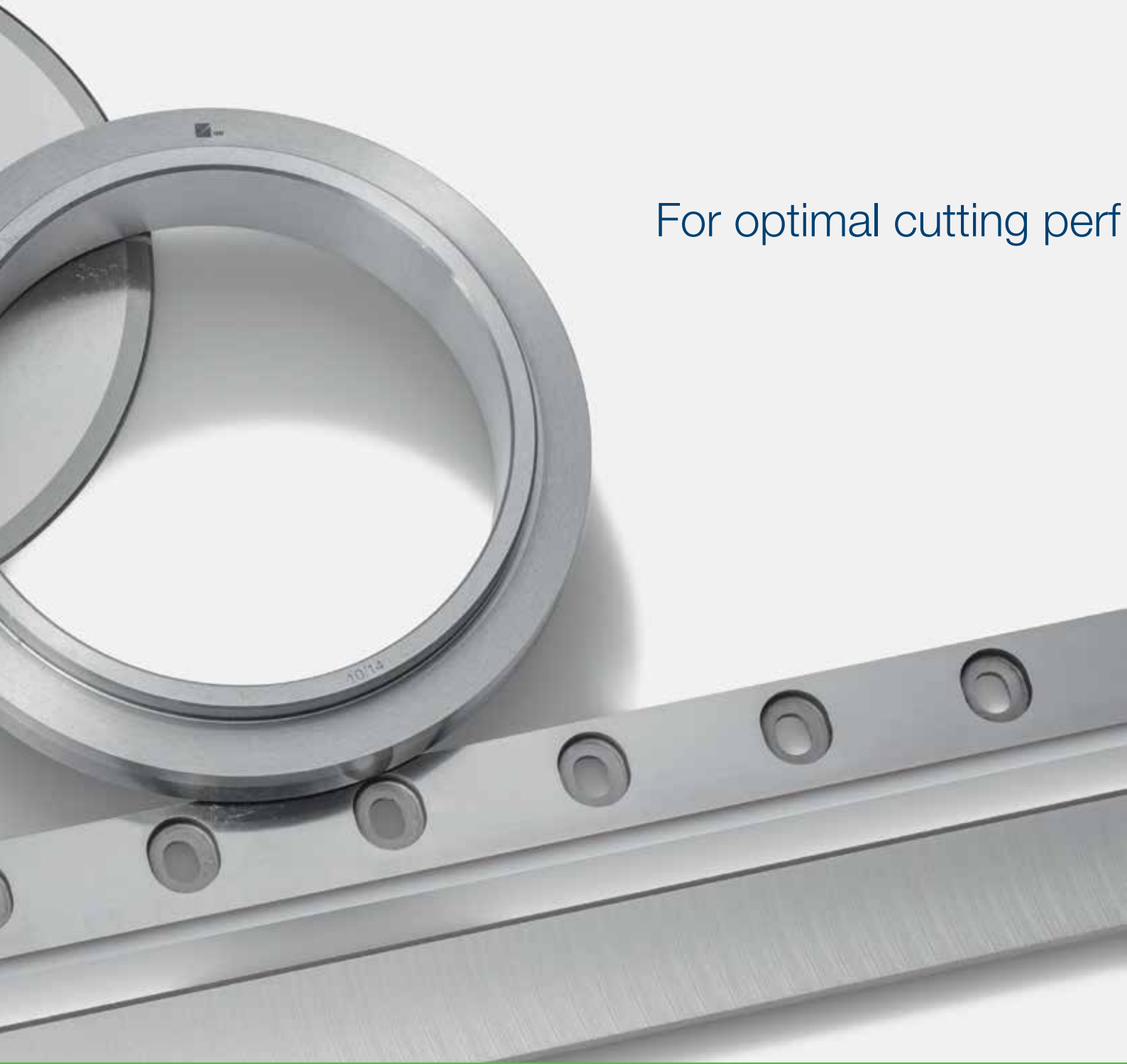




Machine Knives

for the Paper Processing Industry



Precision and Perfection:

For optimal cutting performance, surface consistency and longevity.

The foundation of our products and cutting solutions for the paper processing industry is our knowledge of “cutting” as well as an in-depth understanding of our customers’ requirements.

Whether the parts are made of tool steel, carbide, or special materials, whether coated or refined, we turn out products with state-of-the-art technology that prove their merit in precision and cutting edge retention.

Intensive dialog with our customers forms the cornerstone of our services.

Working together with you, we’ll develop the best tools and systems for optimal integration in your cutting and production processes.

Thanks to uncompromising quality management – from the procurement of raw materials to delivery – we can guarantee that absolutely no tolerance deviations will impair the performance of our cutting tools.

As a consequence, we offer customized solutions with measurable added value. **TKM, The Knife Manufacturers.**

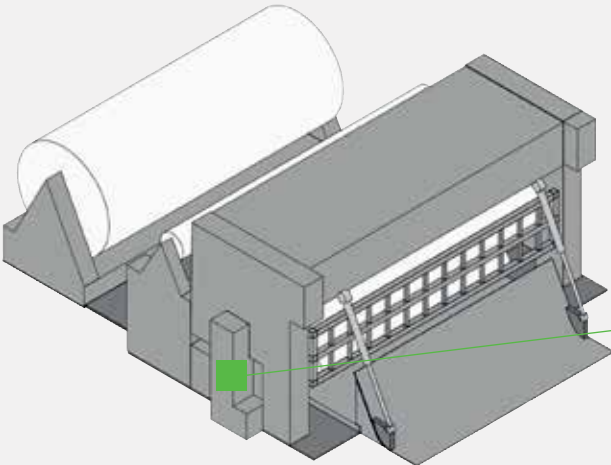
The TKM line of products

- Top splitter knives
 - Bottom splitter knives
 - Circular dished knives
 - Multi-groove knife blocks
 - Sheeter knives/cut-off knives
 - Reel split knives
- Core cutting knives
 - Chipper knives
 - Bale wire knives
 - Scraper blades
 - Doctor blades
 - Shear-cut knife holders

Contents

| | | | |
|--|----|------------------------------|----|
| Knives for slitting | 6 | Quality and material | 12 |
| Knives for cross cutting | 8 | TKM-Service | 14 |
| High-performance multi-groove knife blocks for winders | 10 | TKM worldwide | 18 |
| Circular dished knives and bottom bands | 11 | ■ Headquarters and locations | 20 |

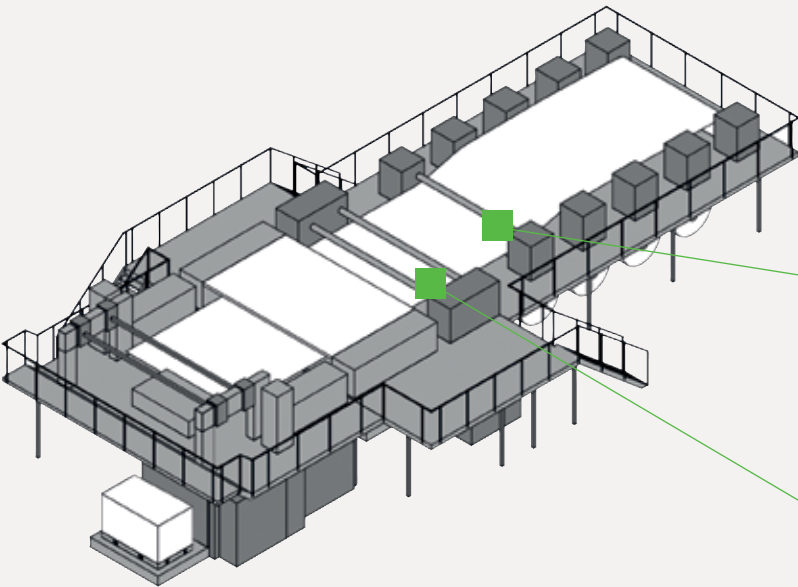
Machine Knives for the Paper Processing Industry



Top and bottom slitter knives



Multigroove knife blocks



Top and bottom slitter knives



Sheeting knives

Slitting

Jagenberg

Scoring knives

Milltex

Beloit

Metso

Tidland

Voith

Cross cutting

Surface roughness

Service

WillPemcoBielomatik

Valmet

Pasaban

Acelli

Circular dished knives

Knives for slitting

Modern state-of-the-art high-performance winder require extremely wear-resistant cutting tools and solutions.

TKM will select the most suitable knives for your cutting application.



Upper knife features

- Preliminary bevel 30°
- Main bevel 15°
- Recess bevel 3°
- Surface roughness Ra 0.03 µm /Ra 0.10 µm
- Axial runout 0.01 mm
- Radial runout 0.02 mm

Lower knife features

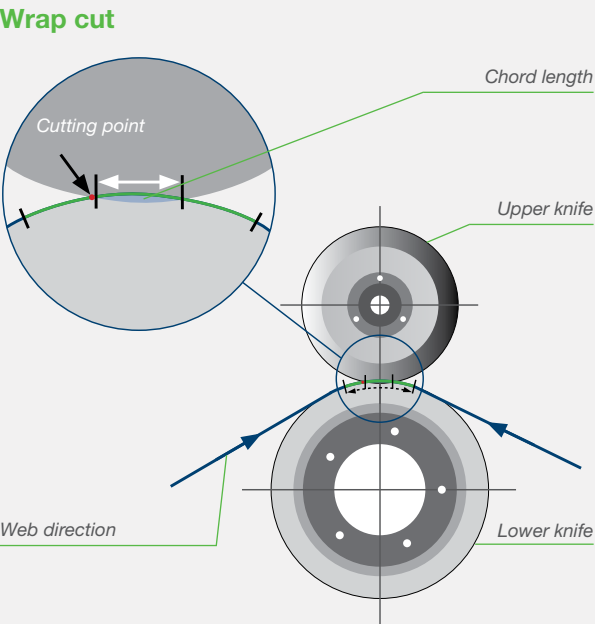
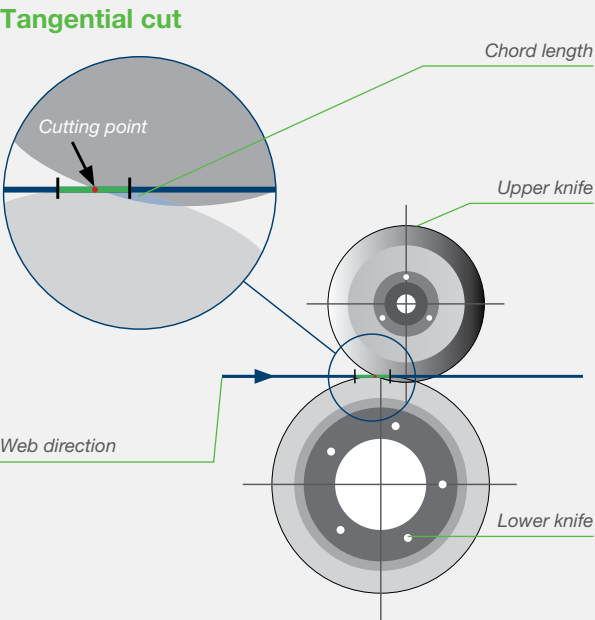
- Carbide tipped
- Solid steel (chrome steel, HSS or PM steel)
- Surface roughness Ra 0.10 µm
- Recess bevel 4°
- Axial runout 0.02 mm
- Radial runout 0.03 mm
- Parallelism 0.01 mm

Knife overlapping

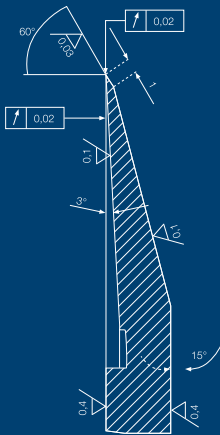
The correct adjustment and overlap between the upper and lower knife is very important for a perfect cut.

The knife overlap can be checked with the TKM setting gauge/chord tool.

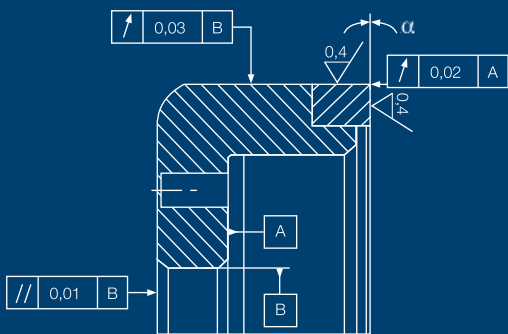
An overlap of approx. 1 mm between the upper knife and lower knife or a chord length of approx. 15 mm to 20 mm is recommended for optimal cutting results.



Upper knife



Lower knife



Setting gauge/chord tool



For optimal knife overlapping

Knife overlapping

| Lower knife | Upper knife | | | | | |
|-------------|-------------|-----|-----|-----|-----|-----|
| | 200 | 190 | 180 | 170 | 160 | 150 |
| 260 | 0.7 | 0.8 | 0.9 | 1.0 | 1.1 | 1.2 |
| 240 | 0.8 | 0.9 | 1.0 | 1.1 | 1.2 | 1.3 |
| 220 | 0.9 | 1.0 | 1.1 | 1.2 | 1.3 | 1.4 |
| 200 | 1.0 | 1.1 | 1.2 | 1.3 | 1.4 | 1.5 |

Knives for cross cutting

TKM sheeter knives are produced according to OEM and customer specifications. The surface can be ground to different values of surface roughness.

Polished knife surfaces improve the cut quality and increase knife lifetimes. Friction and dust are reduced.



Special technical features

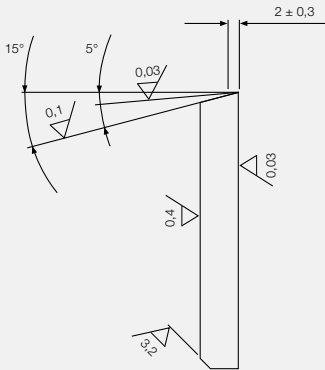
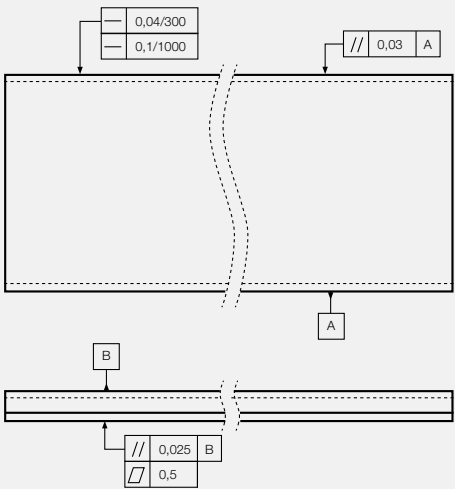
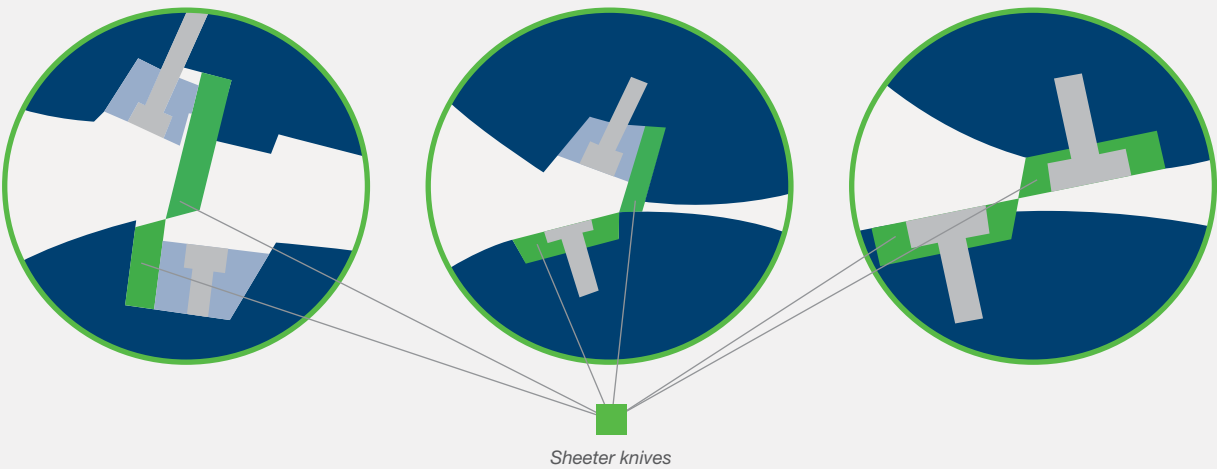
- Sheeter knives made of PM steel or other steel grades
- Carbide-tipped sheeter knives
- Straightness of cutting edge
0.1 / 1000 mm or 0.04 / 300 mm
- Parallelism across length 0.03 mm
- Parallelism across width 0.03 mm
- Parallelism across thickness 0.025 mm

Cutting principles

Cutting cylinder with radial sheeter knives

Cutting cylinder with radial and tangential sheeter knives

Cutting cylinder with tangential sheeter knives



Special technical features

- Flatness 0.5 mm
- Surface roughness
Ra 0.03 µm (micro-polished)
Ra 0.1 µm (polished)
Ra 0.4 µm (standard)
- Shims on request

High-performance multi-groove knife blocks for winders

The TKM multi-groove knife blocks are manufactured with highest possible tolerances. They can be used in all winding and slitting machines with automatic knife positioning systems.

TKM produces the knives up to an outer diameter of 500 mm with narrow tolerances in radial and axial runout.

TKM offers also a comprehensive grinding service.

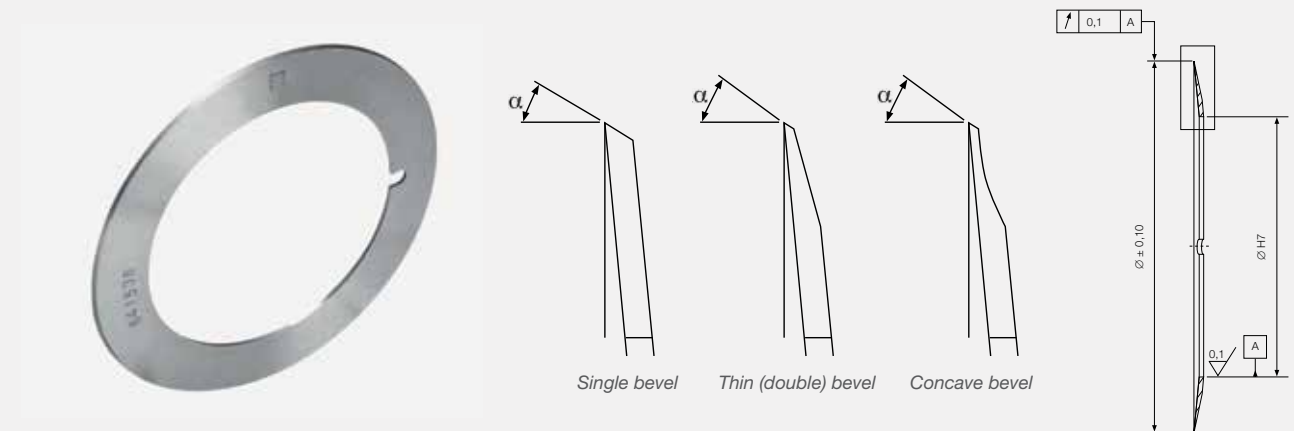


Circular dished knives and bottom bands

The product range includes also circular dished knives and bottom knives in various

executions, bevel configurations and different surface qualities.

Circular dished knives

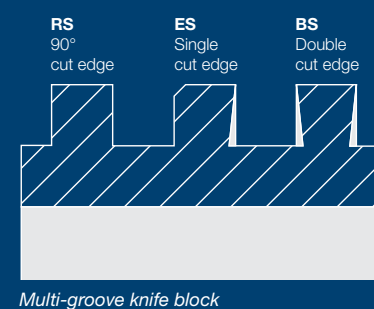


Bottom bands



Special technical features

- Different grades available (tool steel, chrome steel, etc.)
- Multi-groove knife blocks up to Ø 500 mm
- Radial runout 0.02 mm
- Axial runout 0.02 mm
- Narrow tolerances of the tooth pitch up to ± 0.01 mm possible
- Production according to OEM specification
- The TKM grinding service ensures reproducibility of the multi-groove knife block quality of the initial equipment level



Circular dished knives are available in different versions:

- Single or double bevel
- Normal bevel
- Thin bevel
- Thin bevel, concave bevel
- Standard or polished bevel

Bottom bands are available in different versions:

- Plain bore hole for axial fixing
- With ball ring fixing
- With eccentric ring fixing
- With screw fixing

Quality and material

Material qualities

All TKM qualities guarantee the longest possible lifetimes and best cutting results. The characteristic of the knives are high hardness an extreme wear resistance.

TKM knives are available in solid or inlaid steel versions.

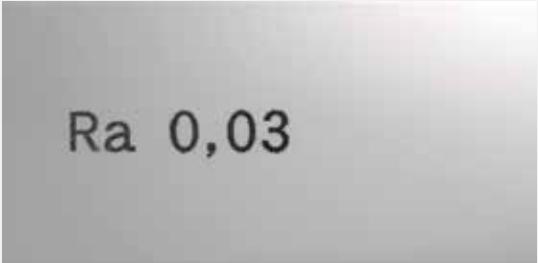
Material

| Material | Hardness in HRC | Approx. service life |
|--|----------------------|----------------------|
| Durapid Tool steel | 59 +/- 1 59 +/- 1 | 1 (basic) |
| Chromalit 12% Chrome steel | 59 +/- 1 59 +/- 1 | 1.5 |
| Duritan (HSS) | 62 +/- 1 62 +/- 1 | 2-3 |
| Duritan 23 PM steel (1st generation) | 64 +/- 1 64 +/- 1 | 4-6 |
| Duritan 53 PM steel (2nd generation) | 64 +/- 1 64 +/- 1 | 6-8 |
| Duritan 3G PM steel (3rd generation) | 66 +/- 1 66 +/- 1 | 8-10 |
| Incomet Supreme Carbide | 1250 HV10 | > 10 |

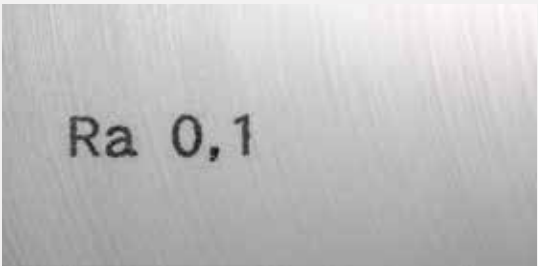
Surface roughness

TKM sheeter and circular knives are produced on modern state-of-the-art production machines. Only the use of high-quality raw materials and the careful selection of suppliers and partners can guarantee a first class product.

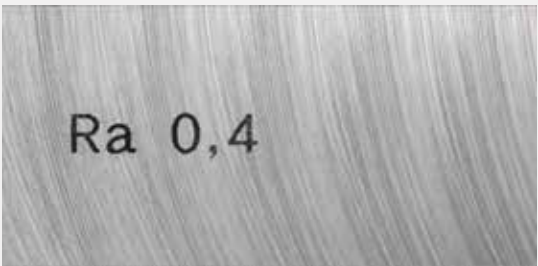
Polished surfaces reduce paper dust and extend the lifetime of the knife.



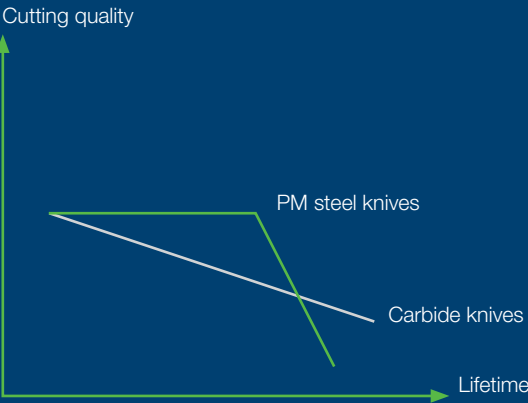
Ra 0.03 µm (micro-polished)



Ra 0.1 µm (polished)



Ra 0.4 µm (standard)



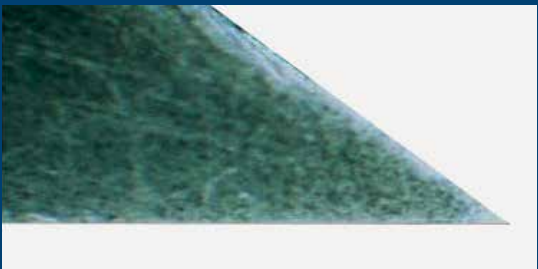
Advantages of PM steel knives

- Better cutting quality
- Better grindability
- Homogeneous material
- Solid material

Typical surface with standard edge



TKM surface finish and egde quality



For the efficient use of our tools, we always stand at the side of our customers not only as a supplier and consultant, but as a reliable partner, through all phases of their daily business.

Collaborative Thinking and Support:

Perfect consulting and accompaniment are obvious for us.

- Tool Maintenance
- Consulting
- Training

Tool maintenance

- Reproducibility
- Unique grinding qualities (e.g. Hyperhone)
- Operational reliability

“Hyperhone”

TKM offers its customers a special feature with the so-called “Hyperhone” knife quality. Hyperhone is a special lapping technique developed by the TKM Group. The cutting edge of the Hyperhone knife is slightly rounded with a micro-bevel and mirror polished surface both on the cutting as well as bevel side.

This protects the knife against micro chipping. Hyperhoned knives are automatically deburred and manual influential factors are fully eliminated.

In practical applications of the knife, dust is greatly reduced and the lifetime is extended up to four times compared with conventional grinding qualities.



Consulting and training

Consulting

- Identification of actual status and technical consulting
- Development of a service concept
- Service routing and sustainability
- Documentation, analysis, research and development

Training

- Application-specific training
- Technical cutting seminars
- Fundamentals of cutting technology
- Materials science
- Special customized topics



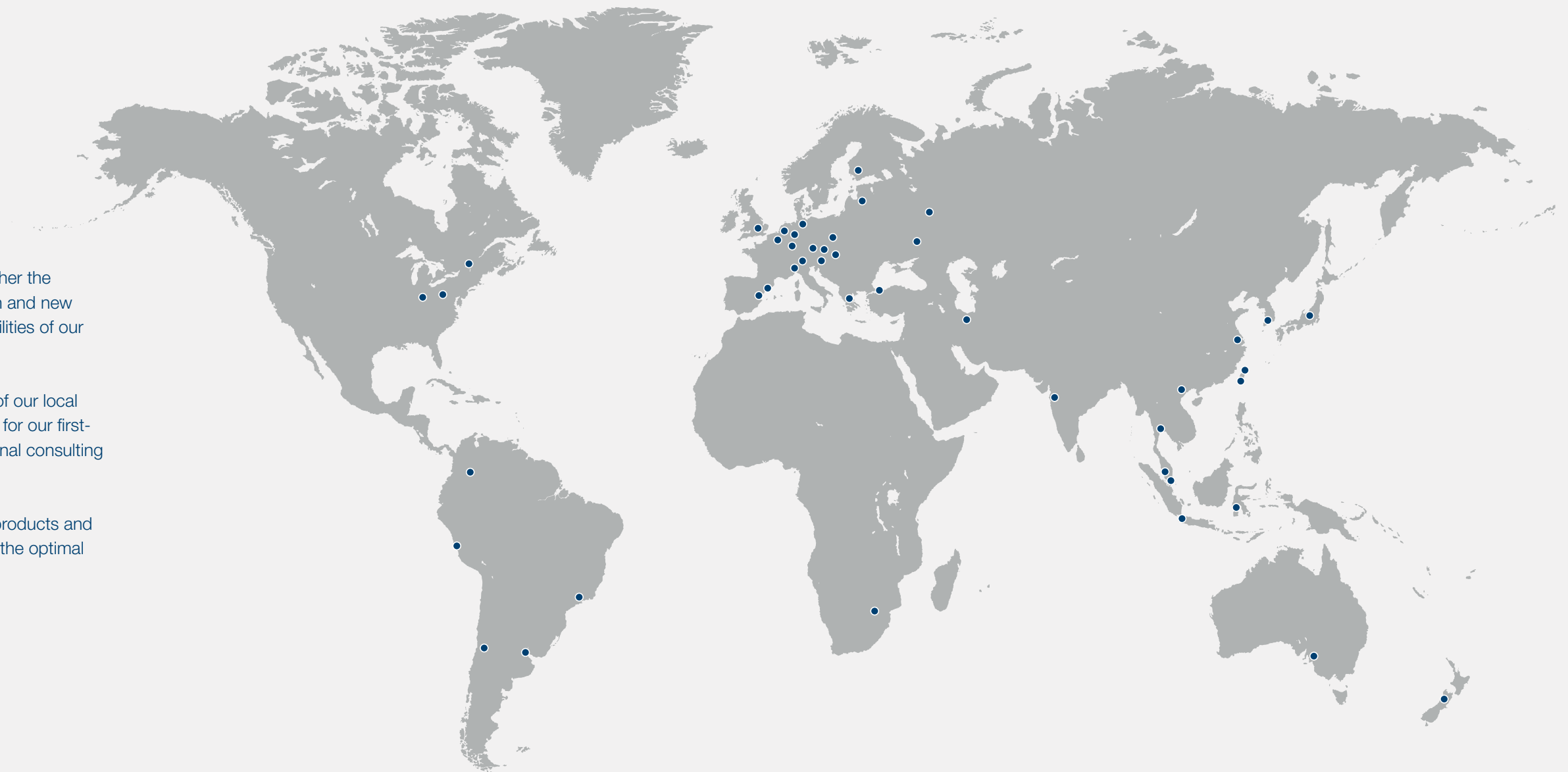
Close by – Worldwide.

The TKM group forms a system of cutting expertise. We create additional value – far beyond cutting.

Throughout the world, we share together the consistently pursued aim of innovation and new technologies, as is reflected by the abilities of our workers and employees.

As a network, we utilize the potential of our local companies, which lay the foundations for our first-class service, high flexibility and personal consulting on site.

As developers and manufacturers of products and systems, we will passionately look for the optimal solution for you.



TKM

Telephone: +49 (0) 2191 969 0
Remscheid, Germany

TKM Geringswalde

Telephone: +49 (0) 37382 846 0
Geringswalde, Germany

TKM Meyer

Telephone: +49 (0) 4532 400 0
Bargteheide, Germany

TKM Austria

Telephone: +43 (0) 7442 601 0
Böhlerwerk, Austria

TKM Diacarb

Telephone: +31 (0) 1045 999 45
Capelle aan den IJssel,
Netherlands

TKM France

Telephone: +33 (0) 328 350 800
Bondues, France

TKM TTT Finland

Telephone: +358 (0) 201 240 288
Akaa/Toijala, Finland

TKM China

Telephone: +86 (21) 5986 905 0
Shanghai, China

TKM Blades Malaysia

Telephone: +60 (3) 7875 - 7669
Singapore

TKM Singapore

Telephone: +60 3 5511 175 4
Singapore

TKM US

Telephone: +1 (859) 689 709 4
Erlanger, United States of America

TKM Canada

Telephone: +1 (450) 378 196 5
Saint-Alphonse-de-Granby,
Canada

info@tkmgroup.com
www.tkmgroup.com

TKM Headquarters, Remscheid

TKM, the internationally leading corporate group, manufactures and sells high-quality industrial knives, saws, doctor blades and precision consumable parts for industrial applications.

Our technologies, products and industrial services are applied and appreciated worldwide across many industries. As an independent family company, we have been setting the standards in quality and

innovation, technical expertise and close cooperation for over 100 years.

Reliability, integrity and commitment are the hallmarks of our collaboration. We define our claims to excellence in terms of these fundamental values by being:

Innovative, precise and close by.



TKM Diacarb

Based in Rotterdam, TKM DIACARB is the biggest service center of the TKM Group. Unique grinding technologies are trademarks of TKM Diacarb.

The combination of optimized processes and logistic performance offers you comprehensive and cost-effective repair management.



Innovative:

We strive for new technology and continuously develop products and processes, in order to produce the highest performing Industrial machine knives and cutting tools.

Precise:

Our products, services and technical ability all help benefit our customers processes, productivity and finally finished product to assist in their operational development.

Close by:

Our philosophies are sustainable and stand for a balance between environmental measures, economic development and social engagement.

No matter where you are in the world a TKM subsidiary or partner is never far away.

Profile

- Approx. 45 employees
- Production area: 2000 m²
- 23 CNC machines
- Approx. 30,000 service jobs per year

Technologies

Patented grinding technologies:

- New Wave
- Hyper Wave

TKM Geringswalde

In Geringswalde we concentrate on the development and production of tools for cutting applications in the metal and paper industries. We create customized tools and solutions for systems, machines and services over production and storage areas totaling around 6,500 m².

On the basis of innovative ideas and consistent standards around the world, we strive

for innovative development together with our customers – down to the last detail.

The high number of trainees provides an important foundation for our corporate development. By affording perspectives to young people and promoting their talents, we afford professional and international development opportunities for their future and for TKM.



TKM Geringswalde

- 135 employees, 10% trainees
- 74 tool machines (70% CNC machines)
- 6500 m² production and storage space
- Main areas of production: Metal and paper
- Production lot sizes 1 to 2500 units
- Production volume: 250,000 to 300,000 precision parts per year

TKM Austria

At our Austrian production site, in Böhlerwerk, we develop and produce products for cutting applications for the metal, paper, wood, stone, rubber and plastic industries.

In the last couple of years, we have developed the Böhlerwerk site into a competent partner for the production of complex components for mechanical engineering.

Equipped with state-of-the-art machinery, we design and deliver all industrial knives and machine elements required for the particular application. In this way, we can ensure the efficiency of your particular systems.

With our know-how and substantial in-house production depth, we find the right solutions for our customers' particular applications.



TKM Austria Böhlerwerk

- 180 employees, 10% trainees
- 75 machine tools, including:
 - 5-axis milling, precision grinding, oven-type furnaces, inductive and vacuum hardening furnaces, trueing stations
- 11,000 m² production and storage space
- Main areas of production: metal, wood, paper, machine elements, plastics/recycling
- Production lot sizes 1 to 500 units



TKM

TKM

TKM Geringswalde

TKM Meyer

TKM Diacarb

TKM France

TKM Austria

TKM TTT Finland

TKM US

TKM Canada

TKM China

TKM Blades Malaysia

TKM Singapore

Headquarters

TKM GmbH

In der Fleute 18

42897 Remscheid

Germany

Telephone: +49 2191 969-0

info@tkmgroup.com

www.tkmgroup.com