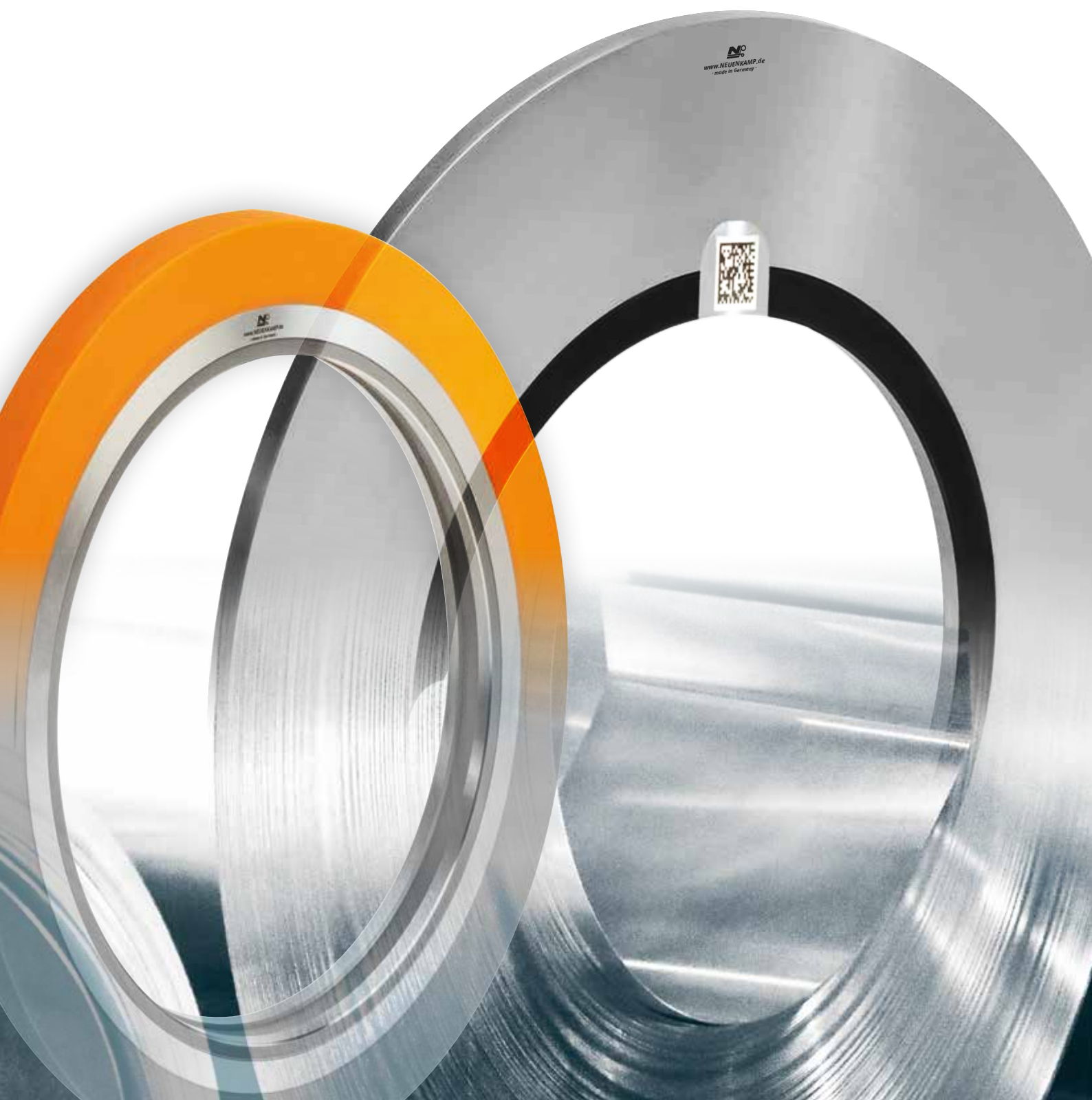


PROFESSIONAL
CUTTING TECHNOLOGY.
HIGHEST DURABILITY.
PERFECT CUTTING EDGE.



CUTTING PROFESSIONALS. FOR OVER 90 YEARS. // MESSERFABRIK NEUENKAMP.

- > We produce high-precision tools for slitting and trimming systems for the processing industry of steel and non-ferrous materials since 1925.
- > Rotary shear cutting tools from Neuenkamp are known with best tolerance accuracy up to +/- 0.001 mm. For special requirements the accuracy of +/- 0.0005 mm is available as well.
- > Equipped with the newest manufacturing technology, we are able to put even the most complex customer requests into practice with absolute precision.
- > As a member of the DIENES group, Neuenkamp today represents the role of a leading global specialist. The company is represented by agencies in around thirty countries.
- > Since 1996 Neuenkamp follows a strict quality control procedure and achieved DIN EN ISO 9001 certification constantly.



THE DIENES GROUP:

DIENES GERMANY

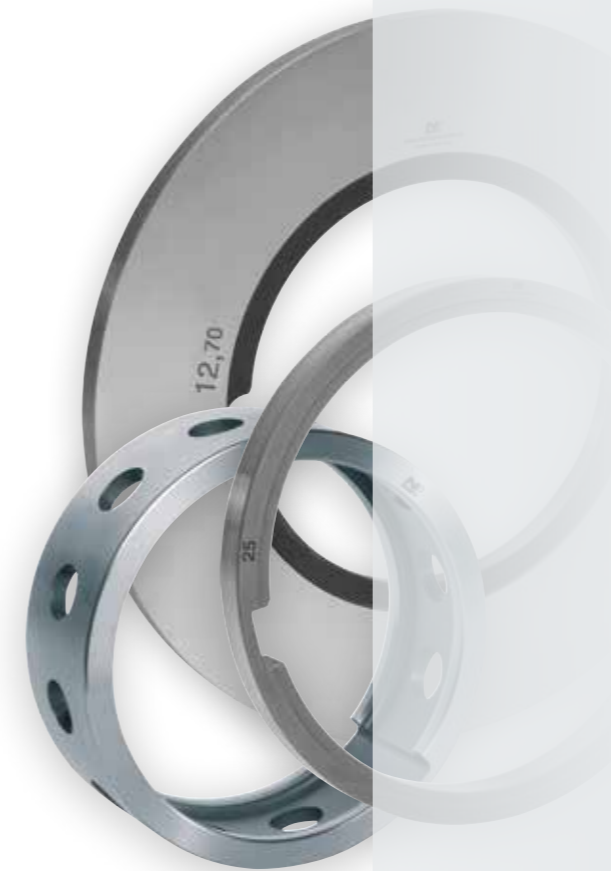
DIENES USA

NEUENKAMP GERMANY

EURO KNIFE BT. HUNGARY

DIENES BELGIUM

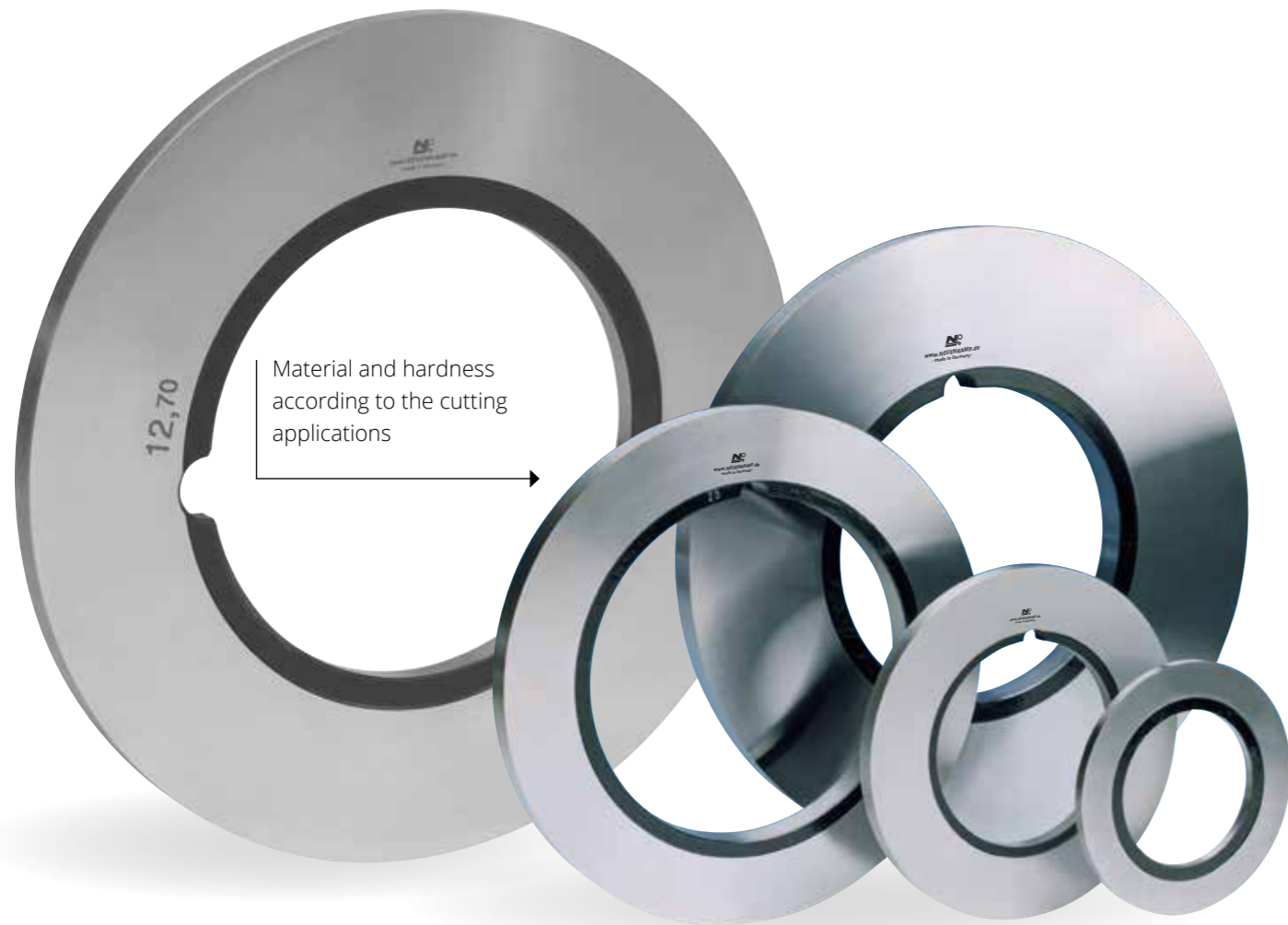
DIENES POLAND



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PRODUCTS. MADE IN GERMANY.

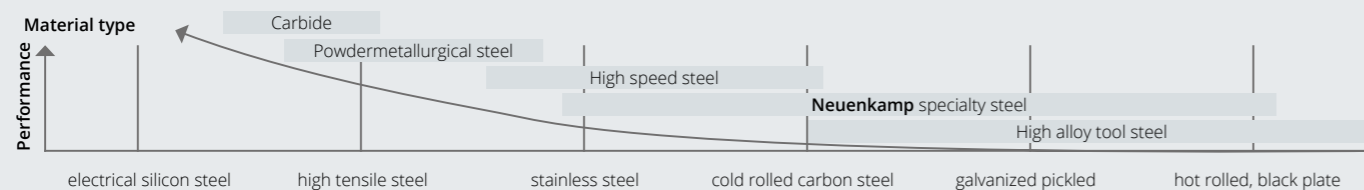
SLITTER KNIVES. STRIPPER RINGS.



SLITTER KNIVES FOR SLITTING AND TRIMMING LINES.

> **Slitter knives** Manufactured from forged alloy tool steels, high speed steels, Neuenkamp special steels and particle metallurgical high performance steels. Heat treated by employing monitored and process controlled equipment. Material selection and hardness values according to the cutting applications. Surface finish: ground, lapped and polished.

> **Carbide slitter knives** Manufactured from tungsten carbide. All tungsten carbide grades HIP (Hot Isostatic Pressure) treated. Carbide grade and grain size according to the cutting applications.



STRIPPER RINGS. BONDED. UNBONDED (LOOSE).

- > **Bonded stripper rings** Steel core made from alloy tool steel or stainless steel for corrosion resistance. Steel core through hardened. Bonded with oil- and abrasion resistant material. Shore hardness and quality to suit the applications.
- > **Loose stripper rings** made from oil- and abrasion resistant material. Shore hardness and quality to suit the applications. Available in 'Single Durometer' or 'Dual Durometer' design.

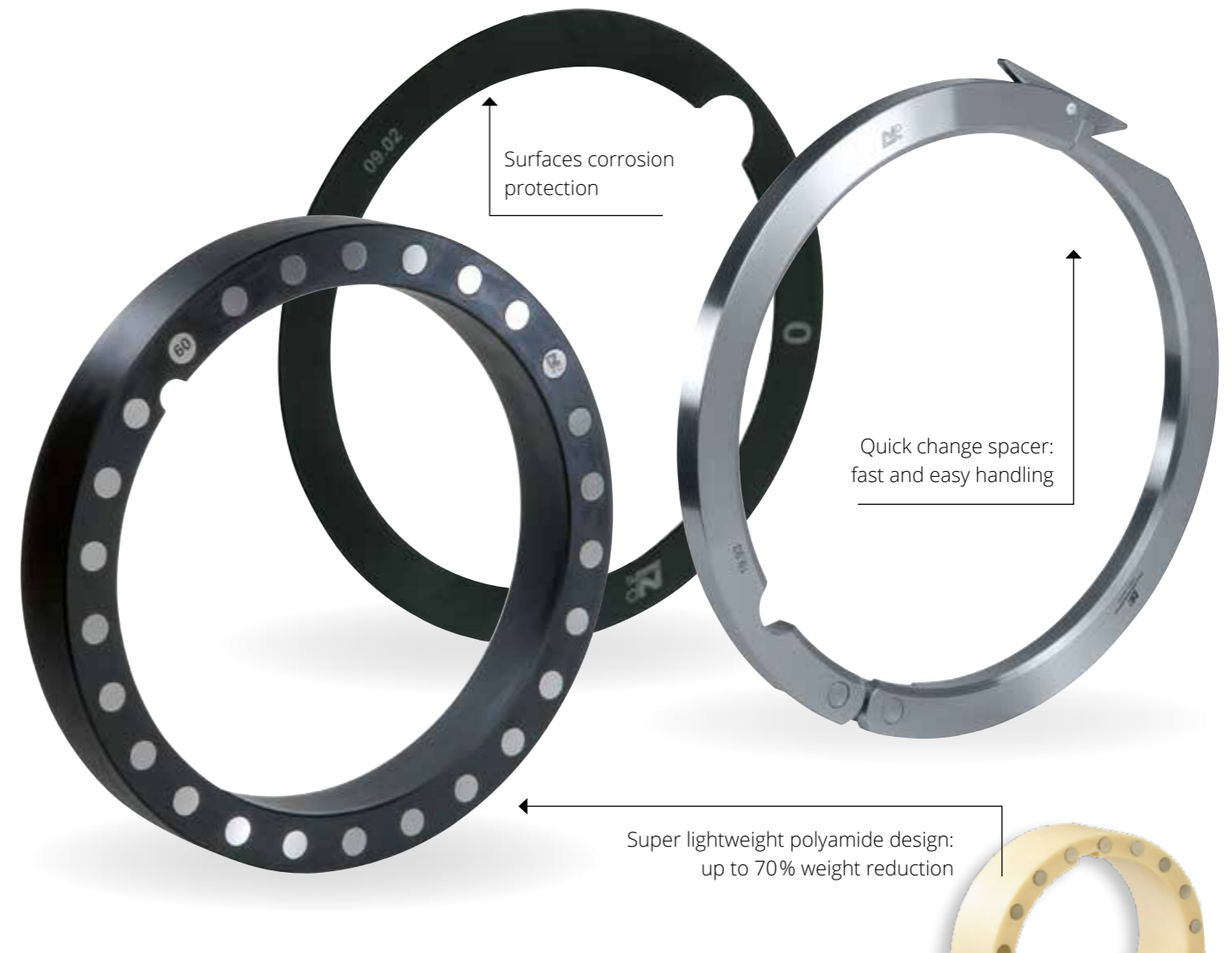
✓ recommended ≈ possible ✗ not recommended

Material Condition Surface Condition	Polyurethane	Perbunan / Buna N
Cold- / warmrolled	≈	✓
Galvanized	≈	✓
Pickled / coiled / black pate	≈	✓
Stainless steel	✓	≈
Aluminium	✓	✗
Copper / Brass / other non-ferrous materials	✓	✗
Painted surfaces	✓	≈
Silicon / Electrical sheets	≈	✓
Zinc / Aluzinc	✓	≈

SPACERS. QUICK-CHANGE SPACERS. //



Standard tolerances of +/- 0.001 mm
Weight reduction due to lightweight construction



Surfaces corrosion protection

Quick change spacer: fast and easy handling

Super lightweight polyamide design: up to 70% weight reduction

FROM STANDARD TO LIGHTWEIGHT DESIGN - FITTED TO ALL PRODUCTION PROCESSES.

- > **Standard design** Made from alloy tool steel or stainless steel for corrosion resistance. Through hardened quality. Special designs for automated setup systems. Flexible combination for all strip dimensions and clearances.
- > **Lightweight design** This design achieves up to 35% weight reduction due to maximized recessed inner diameter. Material selection and tolerances identical compared to solid steel spacers.

- > **Special lightweight design** The same applies here as for the lightweight design. In addition, holes are used to enable a weight reduction of up to 55%.

SPACER MODIFICATIONS. DIVIDED. PROTECTED. ULTRA LIGHT.

- > **Ultra lightweight design** This special ultra lightweight design achieves up to 70% weight reduction. Made from polyamide and equipped with steel pins. High precision tolerances as for steel design.
- > **Quick-change spacers** to reduce setup times. Our innovative development for high productivity with fast and easy handling for your operators.

Innovative: Magnetic closure for quick assembly

Classic fixation with snap lock



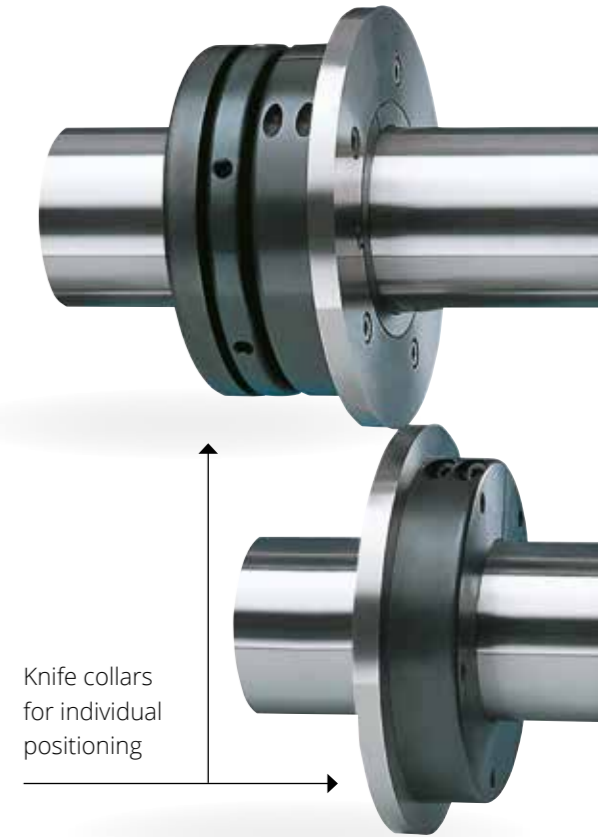
STEEL STRIPPER RINGS.



ASSEMBLED KNIFE SETS.

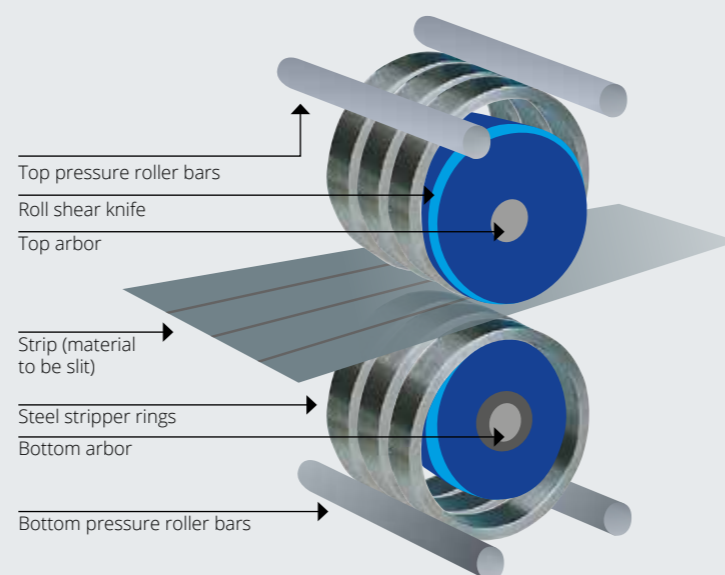


Fix mounted quill sets with sleeve



THE STEEL STRIPPER RING SYSTEM – FOR VERY NARROW STRIP WIDTHS.

- > Using steel stripper rings is a method to put pressure onto the strips. Hence, the strip is guided and ejected. This system is commonly used for very thin materials, because bonded stripper rings having a width of less than 2.5 mm do not offer the required stability to effectively guide and eject the slit material.
- > The setup of steel stripper rings has to be adjusted exactly in accordance to the slitting application. Neuenkamp will gladly offer advice and assistance in helping to achieve the best possible result.



ASSEMBLED KNIFE SETS. FOR SLITTING LINES.

- > **Complete quill sets** for repeat slit widths, increased precision and efficiency.
- > Repeatable strip accuracies at all times.
- > Reduced setup time expenses due to simple assembly.
- > **Knife collars** Complete top and bottom collars with individual fixing for fast slit width adjustment.
- > Particularly suitable for cutting wide strips and trimming operations.



STRAIGHT KNIVES. SHEAR BLADES. SCRAP CHOPPER BLADES.



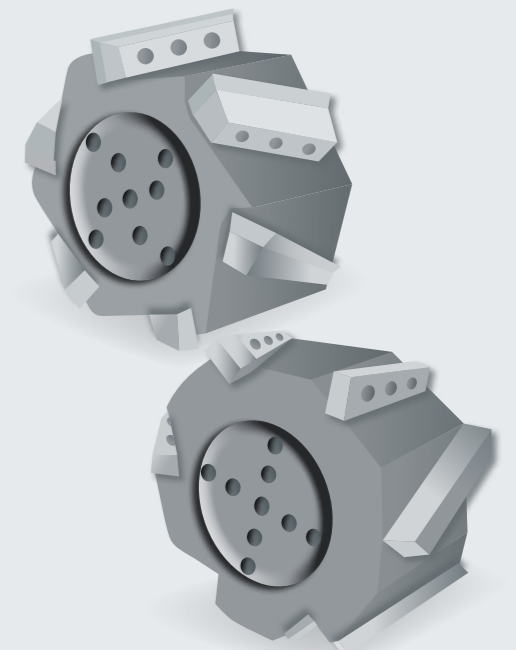
KNIVES AND BLADES FOR CUT-TO-LENGTH LINES TO CUT METAL, NON-FERROUS METAL, ETC.

- > **Straight knives and shear blades from Neuenkamp** offer various solutions and are primarily used in the steel industry. Our product range includes a wide choice of shear blades, scrap chopper blades, cross cutting knives or customer-specific straight knives with a length of up to 6,000 mm.
- > Our knives are made of high alloy tool steel, powder metallurgical steel, or Neuenkamp special knife materials and guarantee a perfect cutting process. Whether for precision applications, in the thin strip area or for heavy gauge slitting up to a material thickness of 20.0 mm in combination with different material strengths, our tools will be tailored for the particular slitting application.

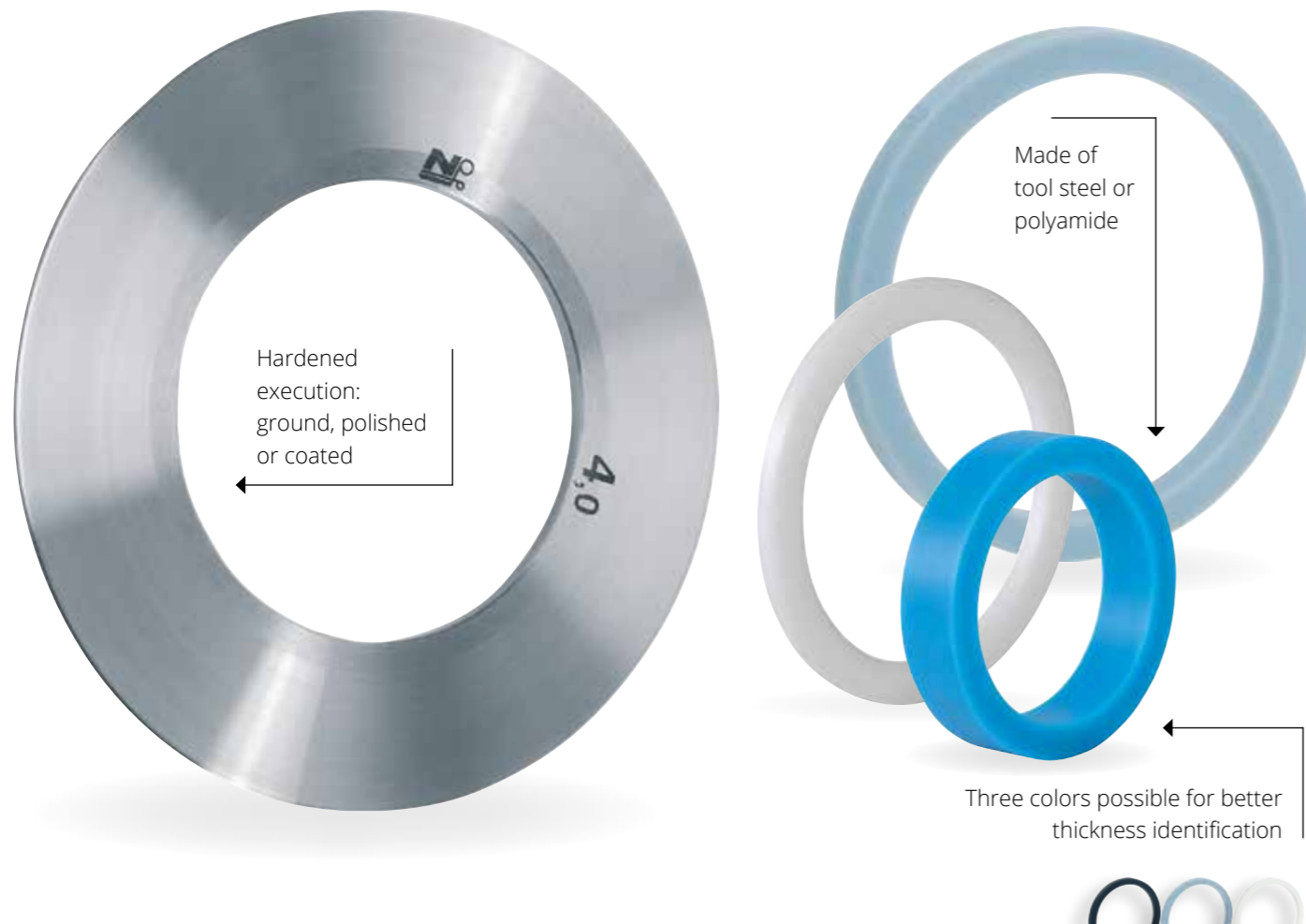
- > Through many years of experience and knowledgeable technical advice, we help our customers to achieve a continuous and trouble free production process by using our tools.

SCRAP CHOPPER-BLADES FOR SLITTING AND CUT-TO-LENGTH LINES.

- > Our products are made of high-alloy tool steel, powder metallurgy steel, or special materials and guarantee a continuous cutting process.
- > In straight design or ground with radius.
- > Special knife material for high performance and highest reliability to avoid knife cracking during use.



SEPARATOR TOOLING. SEPARATOR SPACERS.



ACCESSORIES. NUTS. RINGS.

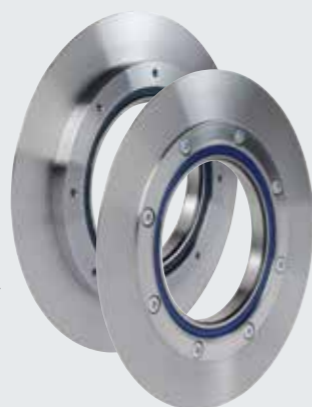


SEPARATOR TOOLING FOR SLITTING LINES.

> Separator discs

> Made from alloy tool steel, through hardened design, with polished or coated surfaces. For soft and sensitive materials made from polyamide or fibre glass reinforced material.

> Version as mounted separating unit - see 'Industrie 4.0'



> Separator spacers

> Made from tool steel, through hardened or soft version.

> For easy handling and weight reduction made from polyamide, in different colours for easier thickness identification.

ACCURATE TOOL CLAMPING WITH HYDRAULIC QUICK LOCKING SYSTEMS.

> **Hydraulic nuts** applied to obtain a defined and uniform clamping pressure, necessary to lock tooling properly onto the slitter arbors.

Reduced setup times, due to an easy and quick locking and unlocking mechanism.

> The improved dimensional accuracy significantly reduces the risk of accidents. Hydraulic clamping nuts can be used on all standard slitting lines.

> **High pressure pump / Grease** The perfect complement for hydraulic nuts. The correct pump with grease will guarantee a proper usage of the clamping unit.

> **Plastic shims** made of special hard plastic for good pressure resistance. Consistent against oil and grease. Easy handling with color code identification. Varying widths also available in steel. Widths from 0.012 mm up to 1.5 mm.

POLISHING MACHINE.



POLISHING PAPER

The suitable polishing paper for your application guarantees optimal operating conditions in conjunction with the polishing machine.

Important: Improved abrasive paper strength and proper grain size guarantee optimized polishing results.

TOOL STORAGE. NK PROTECT.



NEUENKAMP POLISHING MACHINE.

- > **Slitter knife polishing machine** economically and consistently provides a mirror-like finish on rotary slitting knives. By selecting suitable polishing papers, mirror-bright surfaces can be achieved easily and quickly.
- > The advantage: a better quality cut and extended knife life.
- > Typically, companies slitting aluminium, brass, copper and other soft metals experience a knife edge build-up which progressively and adversely affects the knife's cutting abilities and its dimensional characteristics. This automatic polisher restores the fine edge with no real change in the thickness of the original blade.

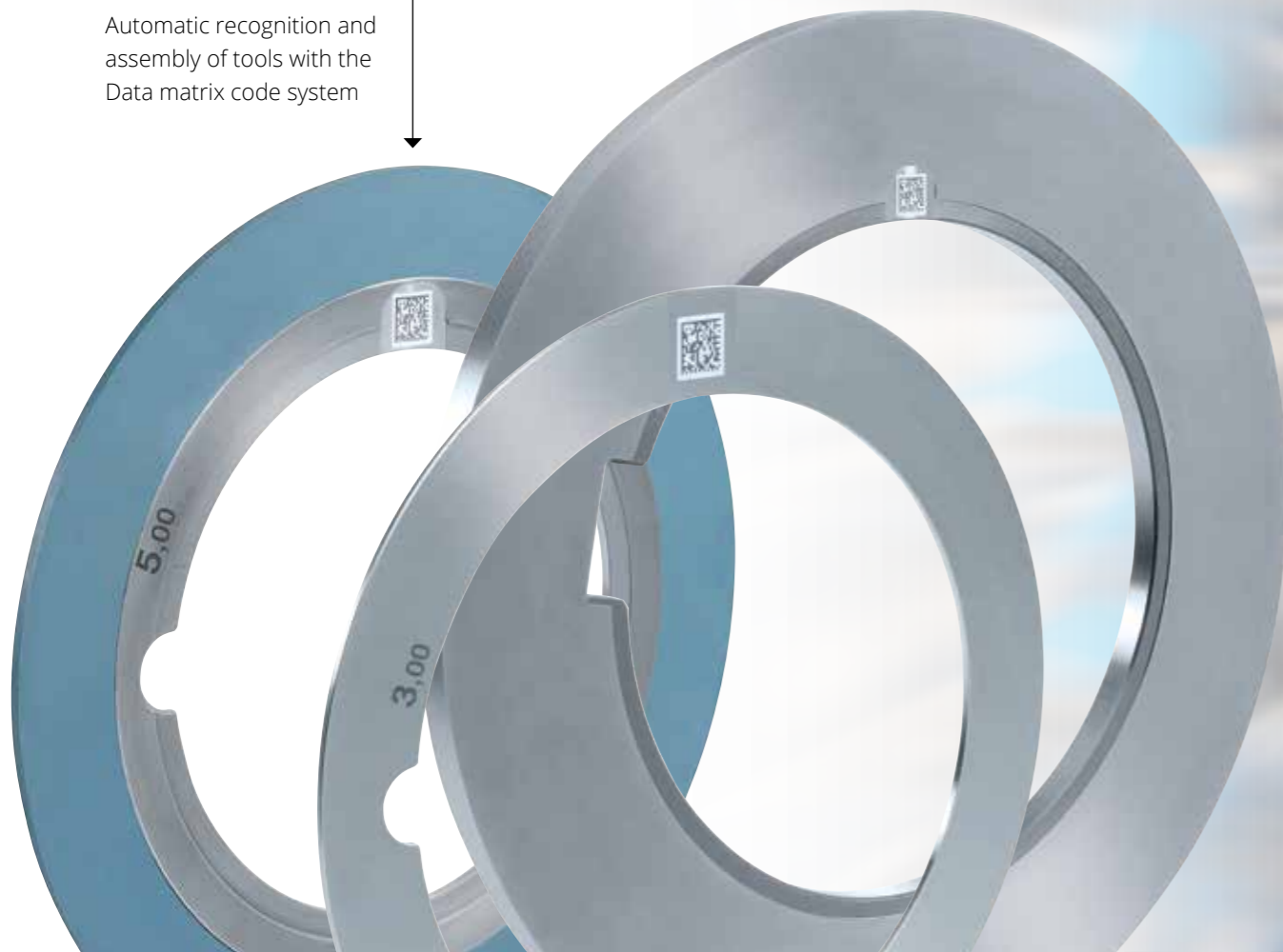
TOOL STORAGE SYSTEMS. CLEAN STORAGE. PROPER HANDLING.

- > **Tool storage system** Provides flexibility in storing slitter tooling. Protects tooling from possible damage and decreases possible dirt buildup, ease of tooling handling, reducing the setup times resulting in increased productivity. The compact tool storage systems offer sufficient space for the tooling, PC work station and additional storage areas for setup accessories, with minimal floor space requirements in mind. Individually tailored to meet the customer's requirement in terms of the tooling inventory and floor space availability.
- > **Our tool maintenance oil NK-Protect** is a special protection oil that was specifically developed for cleaning and maintaining precision slitting tools. It protects against defects such as rust and corrosion on the surfaces (which are caused by moisture and hand perspiration). Regular use of this maintenance oil acts as a protective shield for your valuable tools.

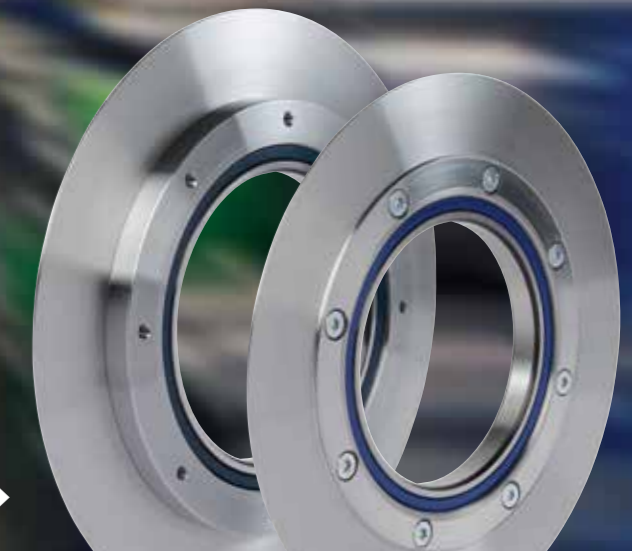
TOOL AUTOMATION. INDUSTRY 4.0



Automatic recognition and assembly of tools with the Data matrix code system



Separating unit for automatic setup



Factory image: NLT Norderlagertechnik

PRODUCTION AUTOMATION. INTELLIGENT AUTOMATIC SETUP SYSTEMS (ROBOTIC SYSTEM).

> Production automation systems

- > However, this innovation demands special design requirements on the tool set, which we develop and accompany.
- > Special tool designs suitable for handling in automatic setup systems (robotic system).
- > Special tool marking, numeric or as data matrix code.

> **Neuenkamp** has taken this task and is today a leading supplier of automatic setup systems. Our experience for your benefit in new technologies.

> Data matrix code system

- > For automatic identification of tools and mounting them on the slitter shaft.
- > Marking in precise laser quality, for new tools and subsequently for existing existing tool sets possible.
- > Individually coordinated with the customer and the robot manufacturer.

SEPARATING UNITS.

- > For automatic strip separators with pneumatic expanding shaft.
- > The separator discs are mounted on special holders with ball bearings inside to guarantee a smooth rotation.
- > For straight strip guidance and a good winding result, very low friction on the separating discs, which means that the cutted strip edge will not be damaged.





REGRINDING SERVICE BY THE MANUFACTURER.

> **Regrinding service** for roll slitter knives and bonded stripper rings, performed by the specialist. Use our know-how for the best tool life and surface treatment.

By using grinding materials and working cycles that are specially matched to the material, your knives get slitting edges with the lowest risk of chipping and the longest possible lifetime.



also sideface polishing possible

REBOUNDING AND TOOL MARKING SERVICE BY THE MANUFACTURER.

> **Rebounding** of the rubber stripper rings, carried out directly by the manufacturer.

The rebounding happens as follows:

- > Cleaning the tools
- > Removing the old rubber
- > Rebounding
- > Recessing the bounding per side
- > Cylindrical grinding (see regrinding)

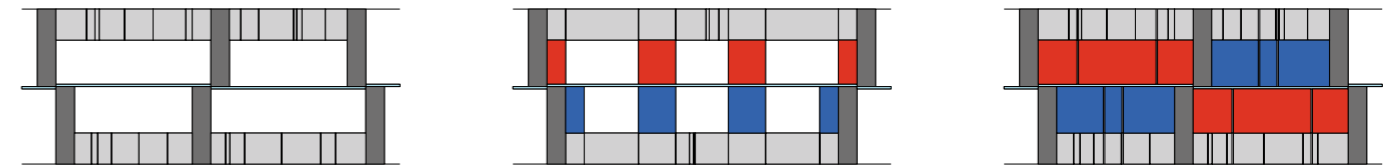
> **Marking of tools**

We provide a marking service for older and strongly used tool sets. New marking with chemical etching or laser marking without any build up.

For a long lifetime during use.



EXAMPLES OF SETUP ASSEMBLIES METHODS FOR OPTI-TOOL:



TECHNICAL SUPPORT AND SLITTING SEMINARS TAILORED TO YOUR SLITTING APPLICATION.

- › **Our engineers offer extensive** support for your slitting requirements:
 - › Complete tooling packages for new and existing sitting lines.
 - › Optimizing existing tooling packages, to match the customer's new slitting parameters.
 - › Tooling care and maintenance.

- › **Slitting seminars** To be prepared and meeting today's market challenges, it is imperative to acquire new technologies and to apply them properly. Neuenkamp offers the needed support by providing training and technical slitting seminars to be held at the customer's site. In addition to training and teaching nowadays slitting technology by employing a comprehensive technical presentation, our sales engineers will also look at customer specific applications. Each seminar will end with an open discussion of slitting related topics. Please contact us at your earliest convenience to schedule an in house seminar.

CALCULATION OF AN OPTIMIZED TOOL SET. ENORMOUS COST ADVANTAGE.

- › **Neuenkamp** offers a computer-assisted service to optimize the required tooling for your individual application. The quantities and thicknesses as well as the total amount of the required tooling is calculated by our system.

The basis for the precise calculation of your data is:

- › **Input of the type of assembly**
- › **Input of all slitter information and required tooling**
- › **Input of needed product specification**

- › The results will guarantee a 100% coverage of all tooling necessary for all required slit widths. Due to the mathematical basis of the tooling optimization; considerable cost savings are achieved when compared to conventional methods. The tooling sizes calculated by using this method are dimensioned so that plastic shims are no longer required. By inputting different operational data, we can calculate your tooling requirements for all current slitting setups. By doing so, we can provide a considerable cost advantage.

INTERNATIONAL NETWORK.



MATERIAL/TOLERANCE SELECTION.



MANUFACTURING TOLERANCES FOR NEUENKAMP PRECISION: SLITTER KNIVES - SPACERS - BONDED STRIPPER RINGS

Ground	Application	max. outer Ø	Thickness tolerance
1. Ultra high precision	High amount of strips (>40 strips), thinnest and sensible materials	≤ 300 mm (12")	± 0.0005 mm ± .000020"
2. High precision	Steel service center / all other common steel or non ferrous slitting applications	≤ 420 mm (16.5")	± 0.001 mm ± .000040"
3. Premium precision	Side trimming and cut-to-length lines (1 up to 3 strips)	≤ 500 mm (20")	± 0.0025 mm ± .0001"
4. Normal precision	Hot rolled and heavy gauge slitting applications	≤ 600 mm (24")	± 0.005 mm ± .0002"

Flatness and parallelism is directly linked to each of the above listed groups. The general rule is, that the tighter the thickness tolerance, the tighter the specifications for flatness as well as parallelism and vice versa.

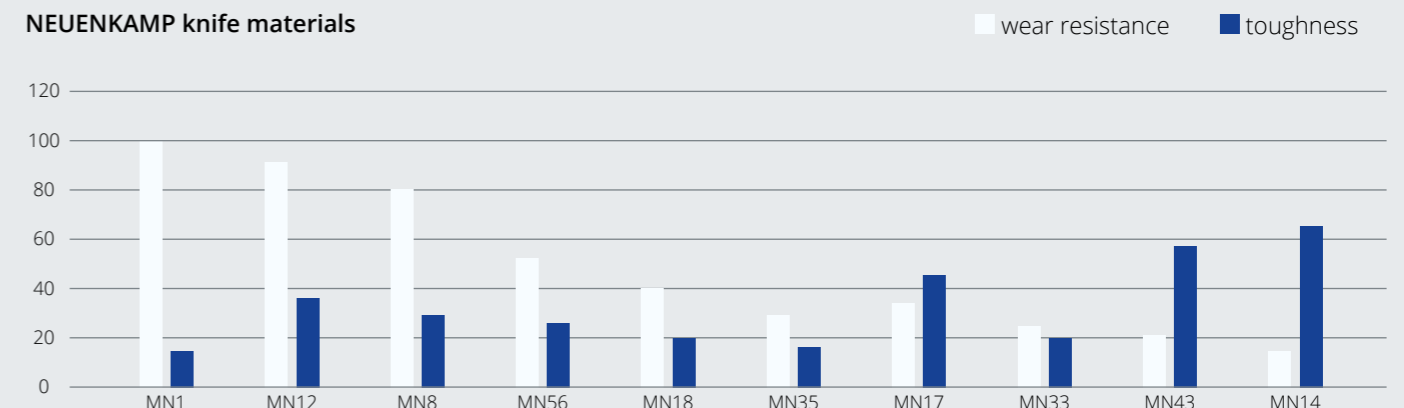


NEUENKAMP WORLDWIDE SERVICE FOR OUR CUSTOMERS.

With our long experience as a tool manufacturer, we set standards in quality and innovation, technical know-how and a future-oriented cooperation.

- > **Expertise and service** from our representatives in many countries.
- > **Our international network** provides the basis for first-class service, high flexibility and individual consulting, at every time worldwide.
- > **Regrinding service** within the Dienes Group is offered in Germany, Russia, Poland, China, USA, Brazil and Italy.

NEUENKAMP knife materials



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HIGH PRECISION
CUTTING TOOLS. //