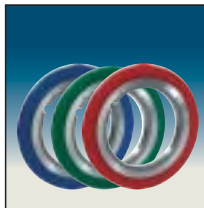




NEUENKAMP Slitting Technology

for: Steel Stainless Steel Special Alloys Aluminium Non-Ferrous Metal OEM



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Product range

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Roll Shear Knives for Slitting- and Trimming-Lines



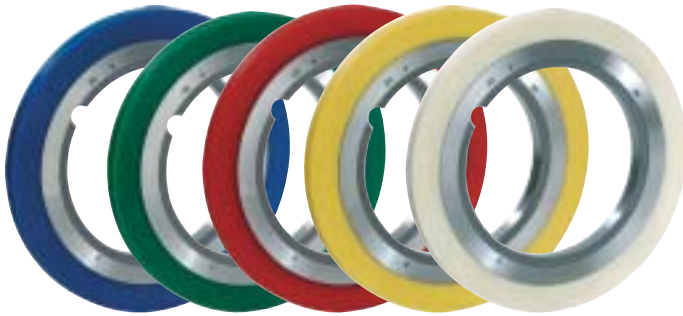
Manufactured from forged alloy tool steels, high speed steels, Neuenkamp special steels and particle metallurgical high performance steels.
Heat treated by employing monitored and process controlled equipment.
Material selection and hardness values according to the knife applications.
Precision and "Ultra Precision"
Tolerances please see table on page 18.
Surface finish: ground, lapped and polished.



Carbide Knives
Manufactured from Tungsten carbide. All Tungsten carbide grades HIP (Hot Isostatic Pressure) treated.
carbide grade and grain size according to the knife applications.
Precision and "Ultra Precision"
Tolerances please see table on page 18.

performance 	carbide	powdermetallurgical steel		high speed steel [HSS]			Neuenkamp specialty steel			high alloy tool steel		
	electrical silicon steel	high tensile steel	stainless steel	cold rolled carbon steel	galvanized pickled	hot rolled, black plate						
material type												

Stripper Rings



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. Precision and "Ultra Precision" Tolerances please see table on page 18.



Loose (Slip-On) 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.

Selection Recommendations:

● recommended

○ possible

● not recommended

Material Surface Condition	Polyurethane	Perbunan	Buna N
hot / cold rolled	○	●	●
galvanized	○	●	●
pickled / coiled / black plate	○	●	●
stainless steel	●	○	○
aluminium	●	●	●
copper / brass other non ferrous materials	●	●	●
painted surfaces	●	○	○
silicon / electrical sheets	○	●	●
zinc / aluzinc	●	○	○

Spacers



made from alloy tool steel or stainless steel for corrosion resistance. Through hardened quality. Special designs for automated setup systems. Precision and "Ultra Precision" Tolerances please see table on page 18.



Light Weight Design

considerable weight reduction due to a maximized recessed inner diameter, through hardened, up to 40% weight reduction. Material selection and tolerances identical compared to solid steel spacers.

corrosion resistant surface



Special Steel light weight design



Quick change Spacer (split design)



Spacers



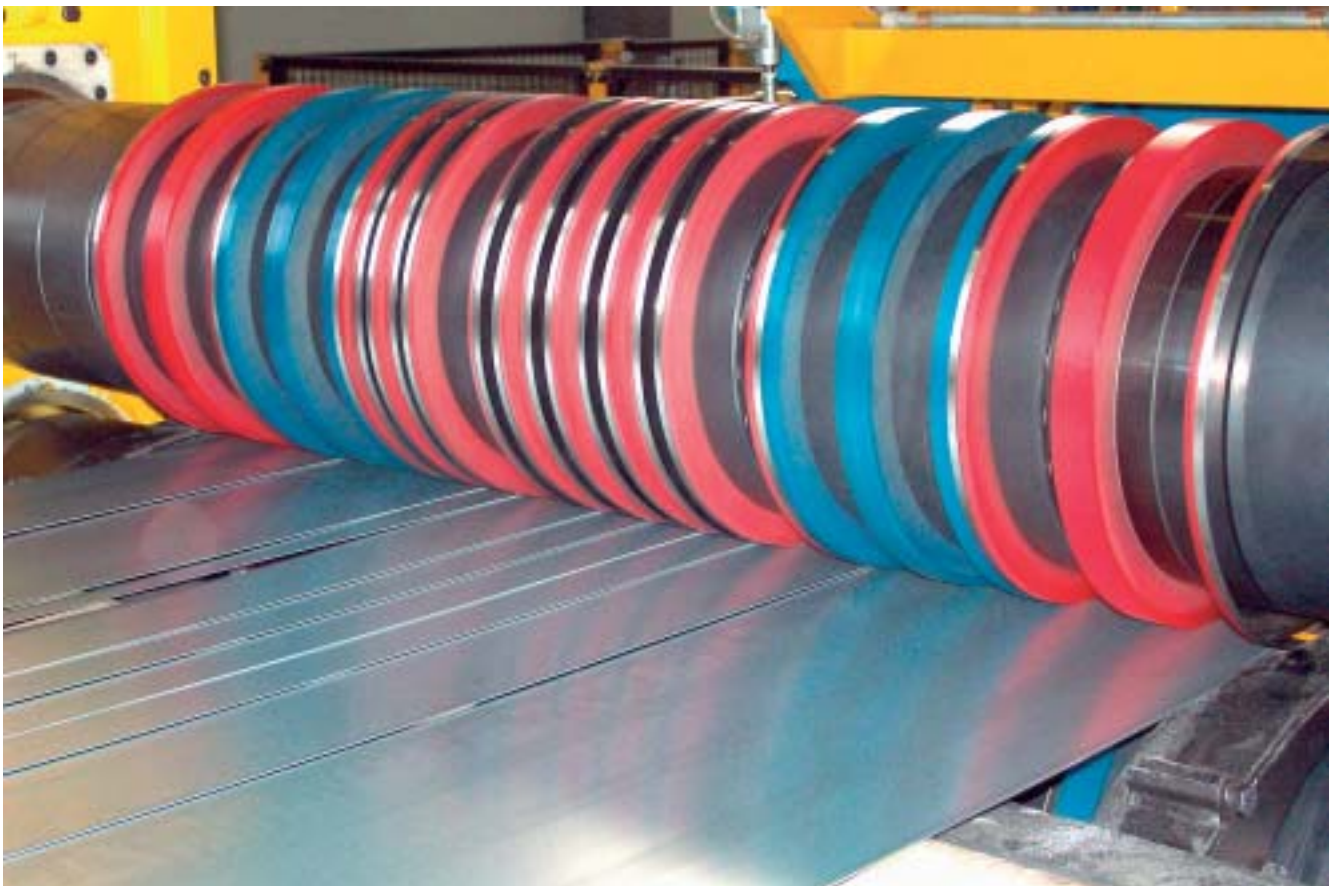
Ultra Light Weight Design

Weight reduction up to 70 %, special ultra light weight design made from Polyamide for an operator friendly, safe and easy handling of large spacers during arbor setups.

Available with a thickness tolerance of $\pm 0,001$ mm ($\pm .000040$ ")

Our technical innovation to reduce physical stress on setup personnel.

application example



Steel Stripper Rings



Made from through hardened and wear-resistant alloy tool steel, side faces ground or lapped, outside diameter ground or polished respectively.

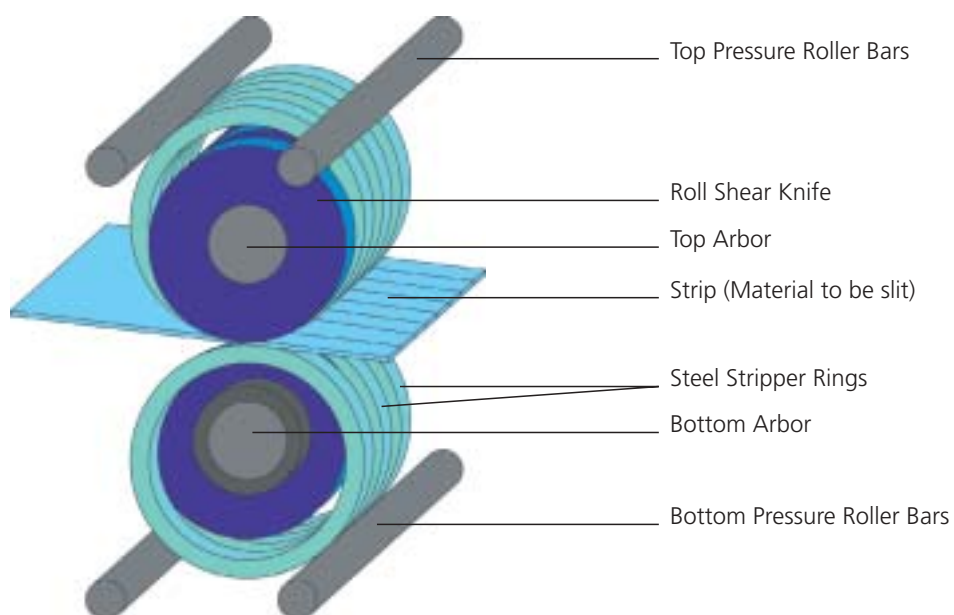
Special Steel Stripper Ring Design

Cast Polyurethane bonded steel stripper rings. Used to process surface sensitive materials.

The Steel Stripper Ring System

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. Steel stripper rings do not get placed directly onto the knife arbors. They are running against pressure roller bars and their centreline is offset from the centreline of the knives and spacers. This system allows simple adjustments according to the material thicknesses to be slit by means of adjusting the pressure roller bars.

The setup of steel stripper rings has to be adjusted exactly in accordance to the slitting application. **Neuenkamp** will gladly offer advise and assistance in helping to achieve the best possible result.



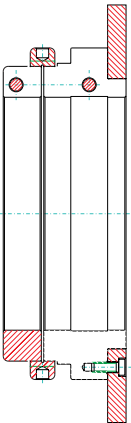
Assembled Knife Sets



Quill Sets

Complete Knife Sets for repeat slit widths, increased precision and efficiency. The integrated guide blades guarantee optimal knife spacing and clearance for constant strip width time after time.

Reduced setup time because of simple installation.



Knife Collars

Complete top and bottom collars with individual fixing for fast slit width adjustment and clearance setting. Particularly suitable for cutting wide strips and trimming operations.

Example: Application of an assembled knife set for standard strips.



Separator Tooling



Seperator 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.



Separator Spacers

made from tool steel, soft or heat treated (through hardened).

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



Bonded Plastic Separator Spacers

Core made from Aluminium or an extreme hard plastic material, bonded with Cast Polyurethane. To be used for soft and surface sensitive materials.

Pressure Equalizing Ring



The **Neuenkamp** pressure equalizing ring allows for an equal pressure distribution of all axial clamping forces along the slitter tooling arbors.

The equalizing ring absorbs uneven clamping forces on one side and transfers the clamping forces equally and precise onto each pressure point of the ring and then against the ultra precision setup. As a result possible axial runout conditions of the tooling will be drastically improved.

Slitting processes, which do require extremely accurate axial runout conditions, as well as the ever increasing number of strips slit on one head, were the basis for this new design by **Neuenkamp**.



OptiTool

**Opti - Tool
QUESTIONNAIRE**

Company: _____
Address: _____
Tel: _____

1. Slitter Details:
a.) Arbor Length:
b.) Arbor diameter:
c.) max. Coil width:
d.) number of Heads:
e.) Setup Position:

2. Material Details:
a.) material:
b.) material thickness:
c.) material tensile strength:
d.) slit width:
e.) strip width tolerance:
f.) max. number of strips per foot:

3. Recommended Hardware:
Particulars: _____
with min. resolution 800 x 600

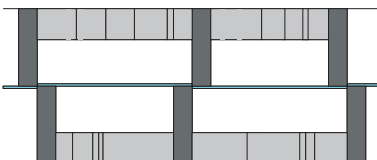
Container:
Dienes Corporation
Mt. Laurel
Spencer Corporate Park
USA, Spencer Mass. 01592
Customs No. 504008
Offer no. 0666/06-1-001
Your inquiry dated 15 Dec 2006, Customer US\$M
your name M. K. K...
Date M. K...
we acknowledge the receipt of your above mentioned enquiry and offer as follows.

For calculating the number of tools the following facts were taken into consideration:
type of assembly: No. 3
max. coil width: 14"
arbor length: 15"
width prep width: 1.500"
max. strip width: 14"
number of cutting heads: 1 (single)
number of strips: 2 (strip)
workmaterial: Every strip width can be realized with an increment of 0.0002". In order to adjust tool clearances every strip width (9.14" or minus 2x tool clearance) can be built with an increment of 0.0002". This results in tool clearances of 0.0002" (0.0002" - 0.0002" for adjustment of blades). To adjust the one strip for strip width of 1.5" to 4.75" max. 3 Double Stripper Rings and 2 Spacers will be used.

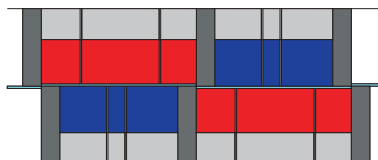
Neuenkamp offers a computer-assisted service to optimize the amount of tooling required for your individual application. The quantities and thicknesses as well as the total amount of the required tooling is calculated by the system. The basis for the precise calculation for your data is:

Input of the type of assembly Input of all slitter information and required tooling Input of needed product-measurements

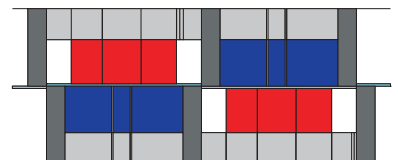
The resulting calculation will guarantee a 100% coverage of all tooling needed for all required slit widths. Because of the mathematical basis of the tooling optimization, considerable cost savings are achieved compared to conventional methods. The tooling sizes calculated by using this method are dimensioned so that plastic shims are no longer needed. By feeding in different operational data, we can calculate your tool requirements for all current slitting performances. By doing so, we can show you an additional and considerable cost advantage. By means of the mathematical statistics in our system, we work out the tooling that your really require.



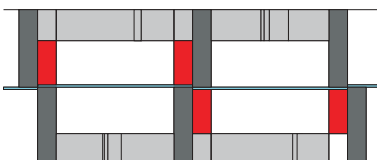
assembly 1



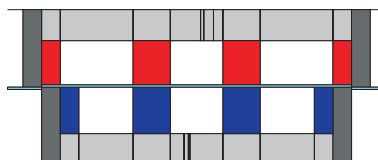
assembly 3



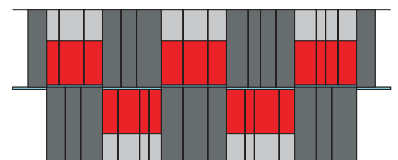
assembly 4



assembly 5



assembly 6a



assembly 8

CamB Software



Easy data input in national Language

Database function for your know how

Automation of Input Datas

Various printout options

Printouts for production and quality control

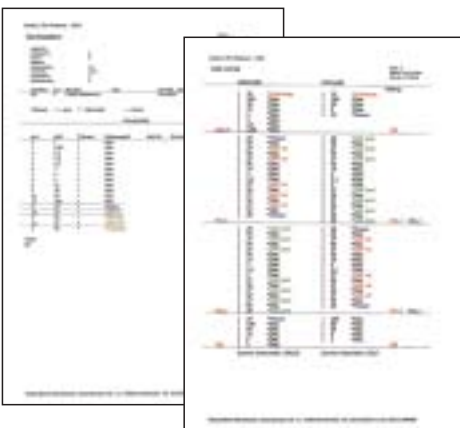
Statistical evaluation function

Our **CamB** tooling assembly software is a computer software program especially developed for the easy and accurate calculation of the tooling assemblies of the slitter arbor setups as well as the various separator shafts, such as the overarm separator shaft, tension shaft and loop doubler shaft.

It offers an easy and comfortable working environment under the Windows Operating system, utilizing WINDOWS 2000™ version or higher.

The **CamB** program offers tooling setups in various printout versions, for instance a chart or a full scale graphic printout. Setups are generated by entering all necessary data for a particular slitting operation allowing the program to calculate the required tooling to be used and to build the printout of the slitter arbors and separator shafts. Completed setups with their corresponding data can be saved under a file name and called up when needed. This feature is extremely helpful in case of repeat orders or new setups which require only minor changes to achieve a new setup.

A possible link of the **CamB** program to existing customer systems will be evaluated by our software specialists at the customer's site. The necessary integration will be programmed by our software personnel.



Reduced Setup Times

Elimination of Setup Mistakes

Increased Strip/Product Quality

Easy Operation and Industry Oriented Software

Data output in national Language

Setup Repetition of Quality Slit Results

Technical Support

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.



Regrind Service

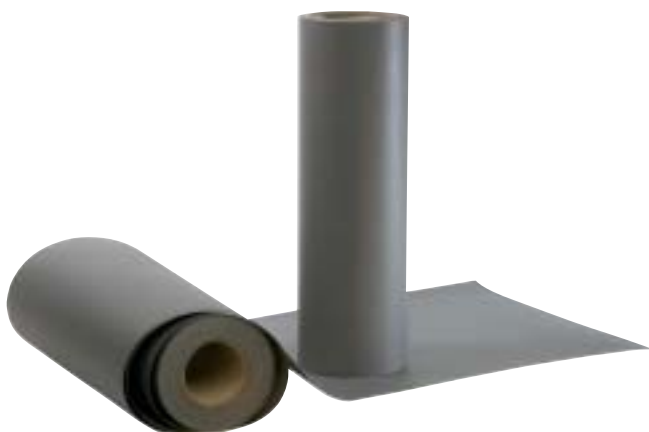
Slitter Knives and Bonded Stripper Rings. Regrinding performed by our manufacturing specialists. Benefit from our knowledge for improved wear and superior surface finish. Using the proper abrasives and grinding techniques for re-grinding slitter tooling, manufactured according to their specific slitting application, we will provide the correct finish for improved wear and prolonged tool life.

NEUENKAMP Automatic Slitter Knife Face Polishing Machine



Economically and consistently provides a mirror-like finish on rotary slitting knives, achieving 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.



Polishing Paper

The suitable polishing paper for your application guarantees optimal operating conditions in conjunction with the polishing machine. Improved abrasive paper strength and proper grain size guarantee optimized polishing results.

Accessories



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. Improved tooling placement accuracy during the clamping process, based upon an equal axial pressure distribution, causing a decrease in vibration, a balanced setup and minimizes the hazards usually involved with manual clamping nuts. Hydraulic clamping nuts can be used commonly in all slitting lines.



Plastic Shims

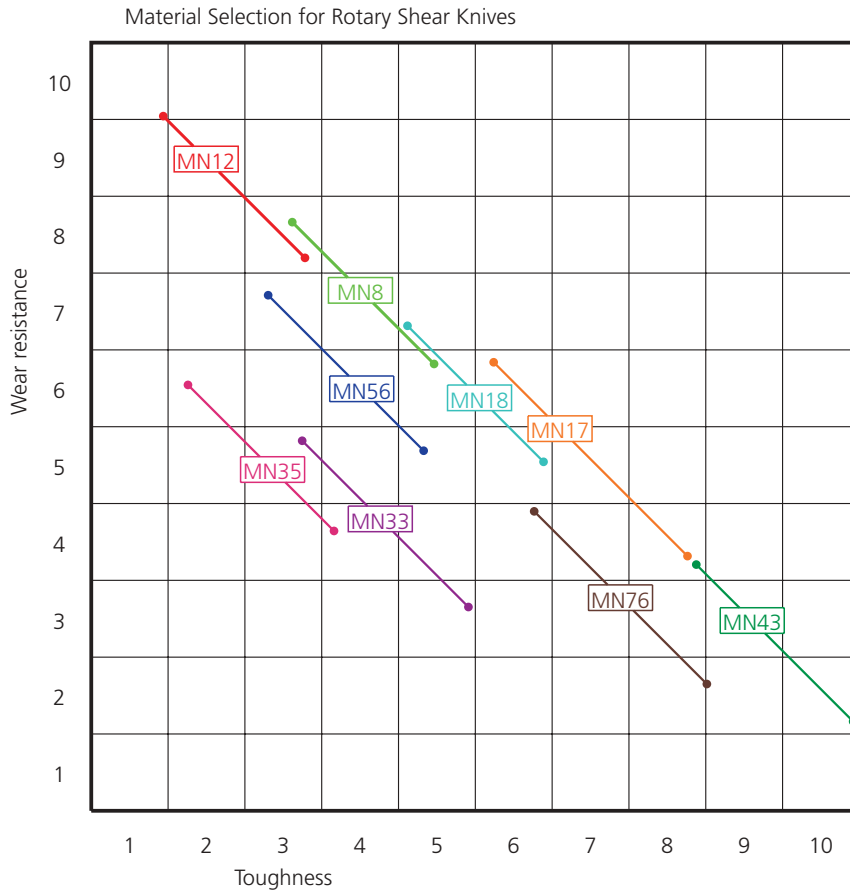
Made of special hard plastic, oil and grease resistant, moisture and water repellent, good wear resistance and thickness variations when placed under pressure. Handling and identification made easy due to a colour code. Width from 0,012 mm to 1,5 mm.



Tool Storage Systems

Offers increased 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.

Material Selection



Standard Hardness Values:

Material	Hardness range [HRC]
MN 8	61 - 64
MN 12	62 - 65
MN 17	56 - 61
MN 18	59 - 63
MN 33	56 - 60
MN 35	58 - 62
MN 43	54 - 57
MN 56	60 - 64
MN 76	55 - 59

According to the slitting application, the proper knife metallurgy and hardness is selected. The important criteria are maximum wear and adequate toughness. The graph shows for each knife material an area of use, considering the appropriate hardness value.

Material grade	Material Thickness [mm]				
	< 1,2	1,2 - 2,0	2,0 - 4,0	4,0 - 7,0	> 7,0
none ferrous	MN 35, MN 33	MN 33, MN 18	MN 33, MN 17	MN 17, MN 76	MN 17, MN 76
cold rolled carbon	MN 33, MN 18	MN 33, MN 18	MN 33, MN 17	MN 17, MN 76, MN 43	MN 17, MN 43
hot rolled			MN 17, MN 76	MN 17, MN 76, MN 43	MN 17, MN 43
stainless	MN 18, MN 56, MN 8	MN 17, MN 18	MN 17, MN 76	MN 17, MN 76, MN 43	MN 17, MN 43
silicon steel	MN 18, MN 56, MN 8	MN 18, MN 56			
heat treated	MN 56, MN 12, MN 8	MN 18, MN 56			

Quality Management



In 1996 Neuenkamp established a quality control procedure and achieved DIN ISO 9001 certification. Manufacturing processes are all subject to strict procedures, requiring a 100% inspection after each operation.

In addition quality control is performed in a climate controlled environment.

Utilizing state of the art inspection equipment and processes, guarantee meeting all customer specifications and the highest level of product quality. If desired, Neuenkamp customers are invited to inspect and qualify their products in our plant for approval and acceptance.

Inspection certificates will be provided upon request.

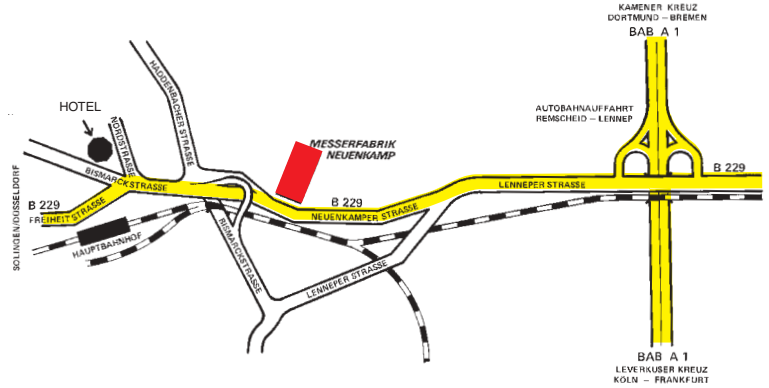
Manufacturing Tolerances for NEUENKAMP Precision and "Ultra" Precision: Rotary Shear Knives, Spacers, Stripper Rings

Outer Ø	Thickness Tolerance	Parallelism	Flatness according to Thickness [mm]				Surface Finish of Tooling Faces Ra (µm)	
			≤ 1	1 - 2	2 - 5	> 5	standard	polished
≤ 250 (10")	± 0,001 mm	0,002 mm	0,02 mm	0,005 mm	0,002 mm	0,002mm	0,2 µm	0,1 µm
	± .000040"	.000080"	.00080"	.00020"	.000080"	.000080"	8 micro inch	4 micro inch
≤ 340 (13.5")	± 0,001 mm	0,002 mm	0,03 mm	0,01 mm	0,005 mm	0,002mm	0,2 µm	0,1 µm
	± .000040"	.000080"	.00120"	.00040"	.00020"	.000080"	8 micro inch	4 micro inch
≤ 420 (16.5")	± 0,001 mm	0,002 mm	0,04 mm	0,02 mm	0,01 mm	0,002mm	0,2 µm	0,1 µm
	± .000040"	.000080"	.00160"	.00080"	.00040"	.000080"	8 micro inch	4 micro inch
≤ 550 (21.5")	± 0,003 mm	0,002 mm			0,02 mm	0,005mm	0,2 µm	
	± .000120"	.000080"			.00080"	.00020"	8 micro inch	
≤ 600 (24")	± 0,005 mm	0,005 mm				0,01mm	0,35 µm	
	± .00020"	.00020"				.00040"	15 micro inch	

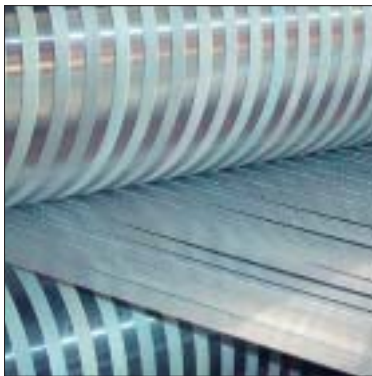
For special applications also available with "Ultra" Precision Tolerances

Outer Ø	Thickness Tolerance	Parallelism	Flatness according to Thickness [mm]				Surface Finish of Tooling Faces Ra (µm)	
			≤ 1	1 - 2	2 - 5	> 5	standard	polished
≤ 300 (12")	± 0,0005 mm	0,001mm	0,01 mm	0,003 mm	0,001 mm	0,001 mm	0,2 µm	0,05 µm
	± .000020"	.000040"	.00040"	.000120"	.000040"	.000040"	8 micro inch	2,5 micro inch

MESSERFABRIK NEUENKAMP GMBH

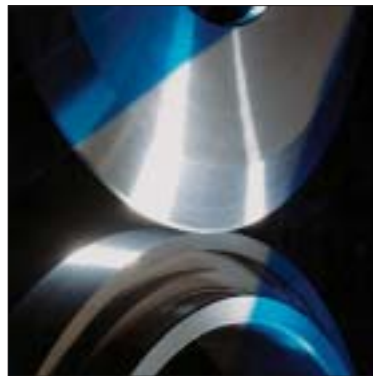


Professionally Slitting Technology



Roll Shear Knives

High precision roll shear knives for slitting and side trimming lines.



Winders

Longer knife life.
Superior slit edges.
Minimized dust.
More than 10 million knives produced.



Straight Knives

Special material treatment to increase knife life and minimized dust.



JOHANN KRUMM

DIENES CORPORATION USA

EuroKnife Bt. DIENES GERMANY HUNGARY





Dienes Germany Dienes USA EuroKnife Bt. Hungary Dienes Belgium Dienes Polska Dienes Asia

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