

INNOVATION.  
SLITTING TECH  
AND VALVES.  
PRECISION.



## PAPER PRODUCTION

REQUIRES PROFESSIONAL DETAIL. SAME WITH PAPER CUTTING.

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| PAPER . LABEL . TAPE . FILM/FOIL . NON WOVEN . ALUMINUM . STEEL . OEM |

» AUTOMATIC SLITTING SYSTEMS . DIENES QUALITY: PAPER

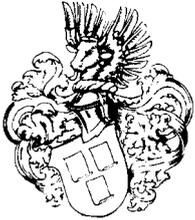
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## ABOUT THE ART OF PRODUCTION AND PROCESSING

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“Paper won't blush” — even the ancient Egyptians knew that this saying applies only to the content of what is written or printed on paper, as they were already using papyrus in 3500 B.C.

By 102 AD the Chinese had described the production of paper, but it was not until 1390 that the first paper mill was built in Germany by merchant and council-man Ulman Stromer in Nuremberg.

Since that time, the fine art of paper production and processing has resulted in an abundance of paper grades that are of superior quality and perfectly matched to any particular application.

The slitting characteristics for these various paper grades must be known to provide the best choice of slitter tooling and geometric relationships for obtaining optimum cutting performance.

The numerous patents held by DIENES as well as their application worldwide did not come solely from the ambition to manufacture the highest quality slitting systems. Intensive research has resulted in a firm understanding of many different types of paper during the slitting process.

Not to be overlooked are the many conversations with customers and cooperative field problem solving.

This has definitely played a role in making DIENES the international leader in providing slitting systems with precision, reliability, long life, and short set-up time.

DIENES quality, precisely.



DIN EN ISO 9001 Rev. 2000



DIENES | The World of Knives the World Over

IPEX, Birmingham | Interpack, Düsseldorf | Asian Paper, Singapur | SPCI, Stockholm | Pack Expo, Chicago | Tappi, USA | Zellcheming, Baden-Baden | Exfor, Montreal

## ABOUT THE ART OF SLITTING

Each type of paper may demand different slitting requirements according to the application.

### Slitting Machines

- Two Drum Winders
- Turret Winders
- Center Winders
- Calenders

### Sheeters

- Small-scale sheeter
- Large-scale sheeter
- Dual longitudinal slitter/sheeter
- Single longitudinal slitter/sheeter

### A-G

- ▼
- Air Cushioning Paper
- Anti Counterfeit Paper
- AP-Papers
- Aquarelle Paper
- Art Paper
- 
- Bible Paper
- Book Printing Paper
- 
- Car Body Component Paperboard
- Carbon Paper
- Carbonless Paper
- Cardboard
- Carton
- Cellulose
- Chlorine Free Paper
- Chromo Corrugated Paper
- Chromo Paper
- Cigarette Paper
- Coloured Paper
- Copy Paper
- Core Paper
- Corrugated Cardboard
- Corrugated Paperboard, 2- (or 3-) Layer
- Craft Paper
- Currency Paper
- 
- Document Paper
- Drafting Paper
- Drying Paper
- 
- Electric Insulating Paper
- Endless Printing Paper
- Envelope Paper
- 
- Fibre Materials
- Filter Paper
- Fine Paper
- Fire Retardent Paper
- Folding Carton Paper
- 
- Greaseproof Paper
- Glue Laminated Paper
- Grey Carton
- Grey Cardboard

### H-P

- ▼
- Hard Postal Paper
- High Gloss Paper
- Hygiene Paper
- 
- Illustrations Printing Paper
- Impregnated Paper
- 
- Japanese Paper
- 
- Label Paper
- Letter Envelope Paper
- LWC-Paper
- 
- Machine Board
- Magazine Paper
- Marble Paper
- Metallized Paper
- Mylar Paper
- 
- NCR-Paper
- News Print
- Note Pad Paper
- 
- Offset Paper
- 
- Packaging Paper
- Parchment Paper
- Photo Paper
- Picture Printing Paper
- Postcard Paper
- Poster Paper
- Printing Paper
- Pulp Paper

### R-Z

- ▼
- Raw Paper
- Real Parchment Paper
- Recycled Paper
- Roofing Felt
- Rust Preventative Paper
- 
- Sanitized Paper
- Shoe Stuffing Paper
- Silicon Paper
- Silk Paper
- Soft Cardboard
- Surface Laminated Paper
- 
- Teabag Paper
- Thermo Paper
- Tissue-Hygiene Paper
- Triplex Cardboard
- 
- Wallpaper Tube Paper
- Wax Paper
- Wood Free Paper
- Wood Paper
- Wrapping Paper
-

## GIVE US THE TASK. WE HAVE THE TECHNOLOGY.

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In 1913 slitting paper was a laborious task. The challenge to Karl Rudolf Dienes was to take the problems of the producers and processors at that time and develop knives and systems that reduced labor and improved slit quality.

With over 500 employees, the DIENES Group is currently the world's leading provider of precision slitting systems. At the company headquarters alone, located in the vicinity of Cologne, knives and systems are produced on 25.000 m<sup>2</sup> of floor space.

Over 85,000 knives and several hundred knife holders are in stock at all times, so that our customers' emergency needs can be handled immediately.

Our services include a 48-hour turn-around regrinding service performed by trained specialists, as well as our own slitting laboratory in which we test all applications and options for improvement in the interest of our customers.

### We offer the following:

#### ■ DIENES Circular Knives

Maximum service life | Optimal cutting edge | Minimum dust

#### ■ DIENES Straight Knives

Refinements to extend the service life and reduce cutting dust

#### ■ DIENES Pneumatic Knife Holders

Flawless handling | Sensor calibrated | Integrated vibration damping | Ease of retrofit | Cutting widths starting at 16 mm

#### ■ DIENES Automatic Slitting Systems

Modular installation for automatic slitting systems | All quality parts can be installed or retrofitted in all types of machines

#### ■ DIENES 48-Hour Service

Skilled service | CNC/NC precision grinding | Pickup and delivery service

#### ■ Dienes Kaizen Analysis and Slitting Seminars

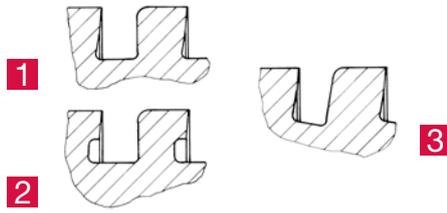
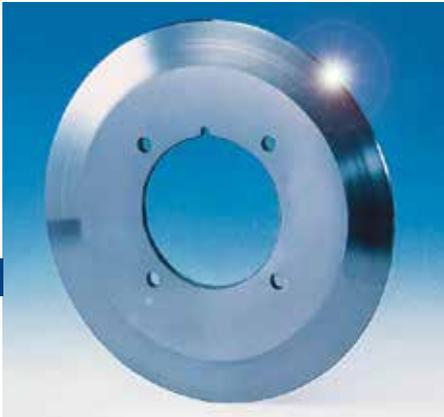
Intensive research | Finite Element Method (FEM) analyses | Drastic reduction in costs | Troubleshooting





### DIENES on Reliability

Every second of machine down time costs money. In its own slitting laboratory, DIENES applies its expert knowledge and extensive research in the intensive testing of all its knives and systems for all applications. This results in longer knife service life and perfect matching to every machine. DIENES quality, precisely.

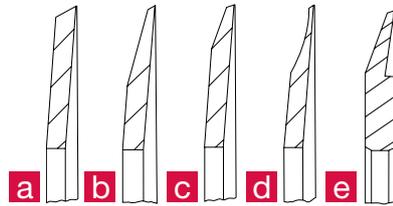


**Cutting Edges Cross Sections**

- 1** Angle turned knife edge
- 2** Recessed turned knife edge
- 3** Plunge turned knife edge



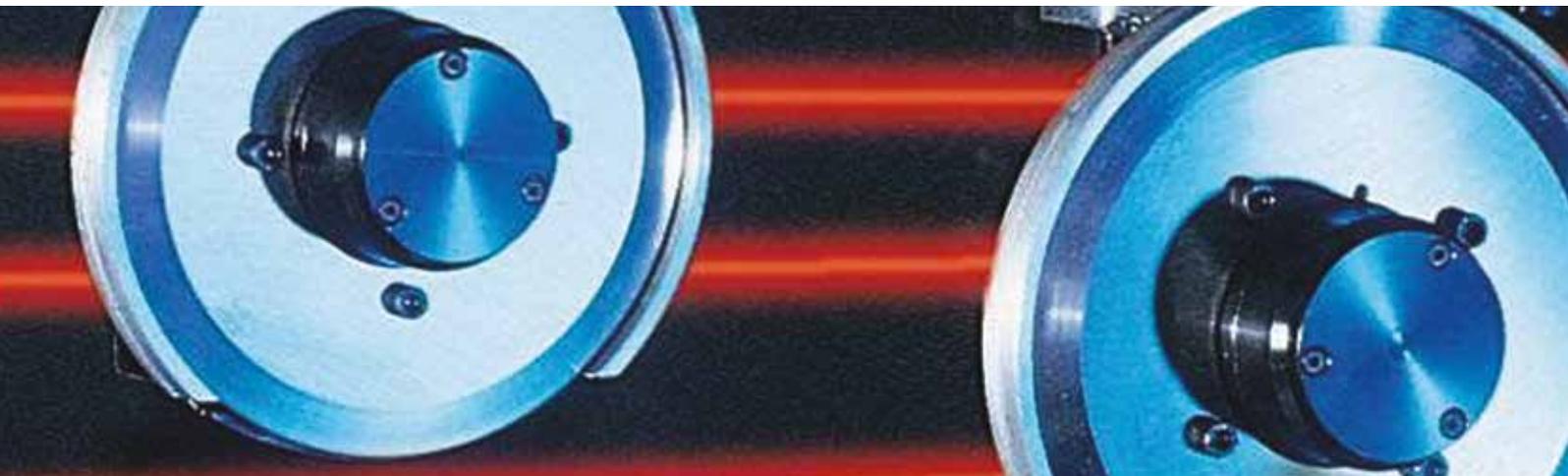
Up to 40 manufacturing operations are necessary for a knife to receive the DIENES seal of quality. Even the slightest tolerance deviation from specification will fail the DIENES stringent quality requirements. Less than specification leads to accelerated knife wear and increased dust levels.



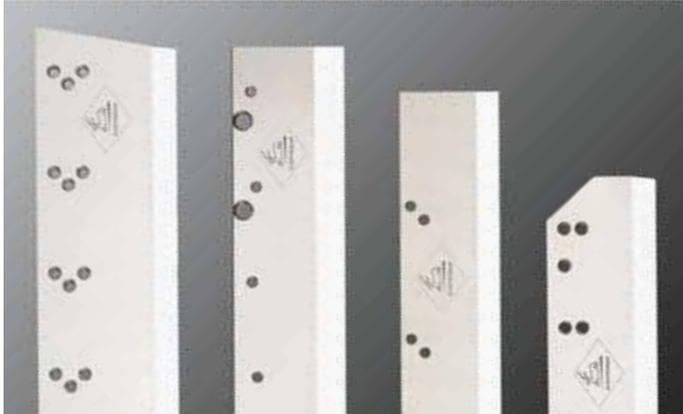
**Bevel Cross Sections**

- a** Normal bevel
- b** Double bevel
- c** Special bevel
- d** Double hollow bevel
- e** Custom bevel

The precision and quality of the multiple knife blocks are just as important for the end result as the top knife itself. The two-part multiple knife block, which has a supporting ring or hook lock-up (Duo-Ring), enables easy, precise knife installation (typical of DIENES MKB's) and also allows knives to be quickly replaced when numerous multiple knife blocks are mounted onto one shaft, without disassembling the shaft.



STRAIGHT KNIVES FROM STEEL, REFINED, DPM, CARBIDE AND CERAMIC UP TO 6.000 MM



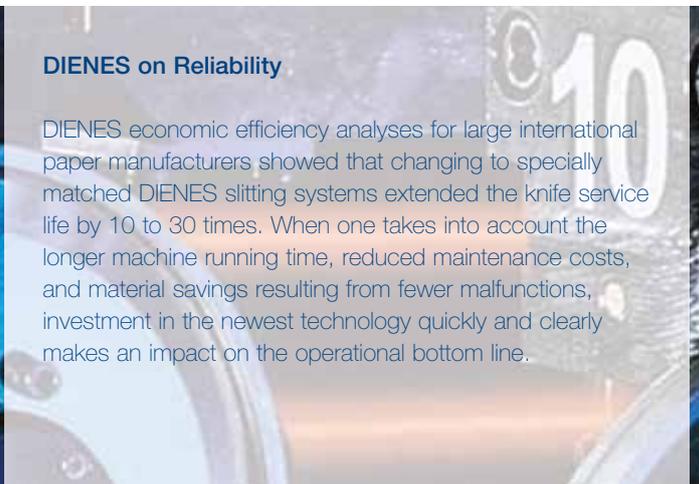
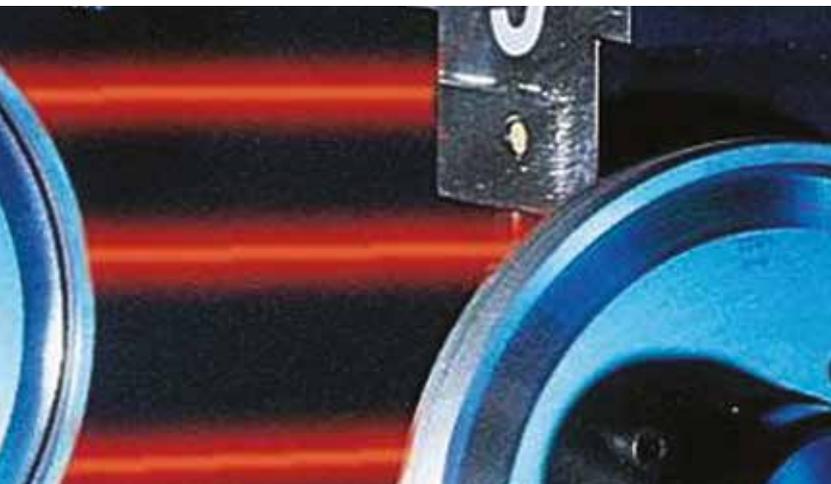
“Longlife” stands for the small but fine distinction in the professional use of paper knives. “Longlife” is a technologically unique method for improving slitting tools. This innovation has significantly reduced cutting dust and increased knife wear resistance.



In the choice of knife materials, shear blades are precisely matched to the production materials to be processed and speeds of operation. DIENES uses only the highest grade alloy steels available from leading steel mills. It goes without saying that the most stringent quality requirements are placed on DPM, carbide, and ceramic materials.

The DIENES quality program also naturally includes cutting sticks which are precisely matched to the knife design.

DIENES Quality Brands:



**DIENES on Reliability**

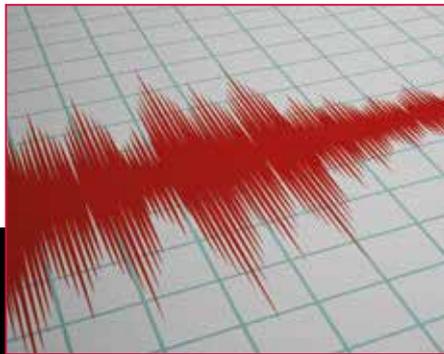
DIENES economic efficiency analyses for large international paper manufacturers showed that changing to specially matched DIENES slitting systems extended the knife service life by 10 to 30 times. When one takes into account the longer machine running time, reduced maintenance costs, and material savings resulting from fewer malfunctions, investment in the newest technology quickly and clearly makes an impact on the operational bottom line.

## PNEUMATIC KNIFE HOLDERS FOR SHEETERS, WINDERS, AND NARROW STRIP SLITTING LINES AS WELL AS LARGE SLITTING LINES.



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The absolutely precise guiding of knives to achieve long service times requires considerable expertise in the development and design of knife holders for winders starting at a strip width of 16 mm, sheeters up to 1,000 g/m<sup>2</sup>, and slitting lines operating up to 3,000 m/min.



DIENES' long-standing research efforts have led to the DF family of knife holders. Preloaded, caged ball bearing sets, with zero clearance, support both the vertical and horizontal stroke travel of the holders. Dual caged ball bearing sets on the vertical stroke prevent torsion, or side twist of the knife blade lower head. A preloaded, caged ball bearing supports the knife blade on the lower housing also stopping blade twist.

- 1 Precise adjustment of knife depth.
- 2 Reliable and exact positioning of the knife with integrated 360° knife guard.

### DIENES Knife Pilot Easy Set (ES Tab) Simply brilliant – brilliantly simple. Patent Protected

- 3 The positioning aid is so simple and brilliant that it is protected by patent. The DIENES Knife Pilot Easy Set (ES Tab): low cost, high precision. The worldwide standard for manual systems.

The bearing cage guided knife holder shafts, manufactured to the highest level of precision, do guarantee a torsional free and vibration dampening operation, compared to less complex solutions. This allows the user to experience the DIENES high precision slitting technology to its utmost extent.



AUTOMATIC SLITTING SYSTEMS FOR SHEETER, WINDERS, AND NARROW STRIP SLITTING LINES AS WELL AS LARGE SLITTING LINES.



Flexibility in problem solving is also found in the

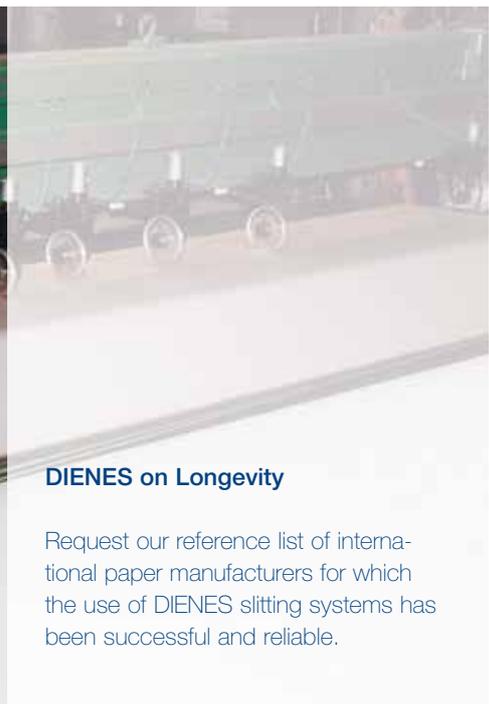
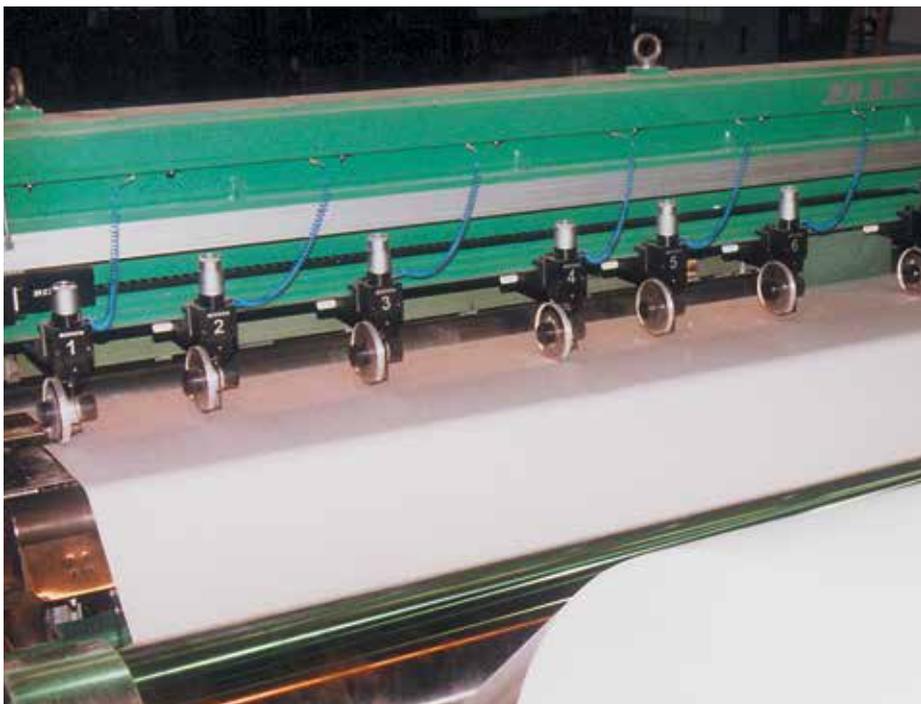
**DIENES Modular System**

Whether your interest is for a complete “turn-key” system that’s precisely tailored to individual requirements, a complete cassette (drop-in) system supplied to your preferred OEM, or, a slitting system to be retrofitted into your existing machinery, you can computer simulate the operational functions of complete units by using the DIENES software system. Available, of course, with all customary interfaces and bus systems.



An example of a Jagenberg sheeter from 1977 shows how modernization results in significant cost savings. It was possible to reduce the setup times by more than 70% by means of installing a fully automatic slitting system.

The knife life of the top and bottom knives was increased almost ten times.



**DIENES on Longevity**

Request our reference list of international paper manufacturers for which the use of DIENES slitting systems has been successful and reliable.

# DIENES B2B KNIFE MANAGEMENT SYSTEM, KAIZEN ANALYSIS, AND REGRINDING SERVICE

Even the best knives must eventually be replaced. DIENES has made this operation faster and safer by its well-designed replacement system, with optimal protection from injuries.

The 48-hour regrinding service which operates the newest generation of CNC machines is performed under the same strict quality criteria that you expect from the DIENES Group.

In addition to seminars and in-house training sessions, the regrinding service is an important component among the various services provided by DIENES.

Knife management is also becoming increasingly important.

You receive flawless support not only from new registration, inspection, and ordering systems, but also from the well-designed storage and shipping boxes.

In addition DIENES offers a comprehensive KAIZEN analysis to the customer's application. Test knife holders verify improvement-potential in slitting quality, adjustability, handling, increased service life, and process safety.



## DIENES B2B Knife Management System

- Inventory and status control
- OPTI-Tool tool calculation
- Optimized knife requirements
- Internet knife display
- Electronic key system
- Installation logistics
- Just-in-time replacement
- Paperless transactions
- Cost control
- Cost reduction

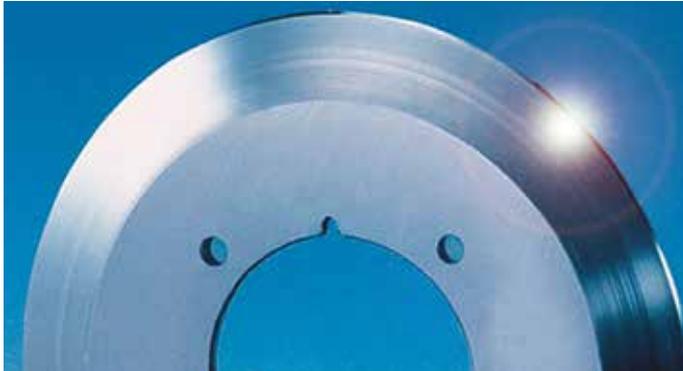
## DIENES Kaizen Analysis

- Planned/actual comparisons
- Cutting force
- Knife overlap
- Surface quality
- Regrinding quality
- Web entrance/Cant angle
- Knife head torsional play/  
Knife head bearing play
- Analysis of cutting edge
- Evaluation
- Troubleshooting

## DIENES Regrind Service

- Hotline (optional)
- Pickup
- Cleaning
- Precision measurement
- Group classification
- 2-phase CNC/NC precision grinding
- (ADS) Anti-dust surface (optional)
- Inspection
- Specifications, test report (optional)
- Shipping

DIENES – WE CAN BE IMITATED, BUT OUR QUALITY CANNOT BE SURPASSED.



**DIENES Knives**  
**Quality means reduced cost.**

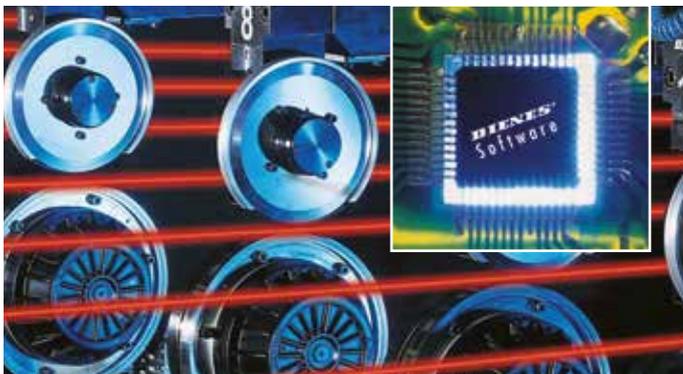
DIENES knives and holders have become the benchmark for highest quality, optimal service life and minimized dust production.

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**DIENES Complete Units**  
**The system provider for machine design.**

From stepwise automation to modular units, DIENES offers you slitting know-how based on over 85 years of experience. Many applications that are currently taken for granted in the paper industry go back to DIENES patents.



**DIENES Automation Technology**  
**Ready-to-use software and systems.**

Before the first screw is put in, you see the complete application on your computer screen. The reliability and compatibility of laser-controlled, program-monitored slitting applications have been demonstrated numerous times on the international level.



**DIENES Service and Analysis**  
**We are here for you, around the world.**

Service must be quick but also qualified. Our service personnel are continuously trained in our own slitting laboratory, and are well-acquainted with any given system.

At DIENES, attention to quality does not end after delivery.

| GERMANY . BELGIUM . CHINA . FRANCE . HUNGARY . POLAND . RUSSIA . USA |