CERADIA®
MADE FOR EXPERTS

CERADIA®-CREPING BLADES

for tissue manufacturing

COMPLEX TASK

SOFT RESULT

WHAT CHARACTERISES A CREP

A good creping blade performs two key tasks: On one hand it reaches the longest possible lifetime and thus provides the maximum productivity. On the other hand it improves the tissue quality.

No Scratches or Streaks

Full focus on creping blades

Clouth Sprenger is fully focused on development, manufacturing and sales of creping blades for the tissue industry. For us this product isn't a by-product but the absolute core business. Surely a reason why, with high-quality wear resistant layers, our Ceradia®-creping blades have a leading market position.

Clouth Sprenger GmbH – A Clouth Group Member

Clouth Sprenger GmbH, a member of the Clouth Group, is a medium-sized company founded in 2003 acting as a supplier of special tools for the paper industry. At the production site in Moers, coating blades and creping blades with high-quality wear protection coatings are made.

Technical service providing real advantages

Our tradition and market experience provide our customers with the best help and support. The result is competent and practical support focused on optimizing your production and improving efficiencies. But we do not only explain what is possible; we let you experience it yourself live: On-site trials in your production facility with different blade options gives you the security to use the optimal product that safely improves your productivity.

PING BLADE?

GRADE-SPECIFIC CREPING BLADES

The quality of tissue is determined by many parameters. This starts at 'A' for 'appropriate' raw material fiber to 'Y' for 'Yankee Dryer'. Also, the creping blade and blade holder have a significant influence on the production process – particularly in the case of efficiency and quality:

- **Wear resistance**
- **Material properties**
- **Geometry**
- **Correct blade holder setup**

Solutions for any production process

Our Ceradia®-creping blades consist of a carbon base steel and have highly wear resistant ceramic or carbide coatings. In combination with different tip geometries and designs, this provides the widest possible range of variations. In other words: There is a Ceradia®-creping blade which is perfect for your production needs.

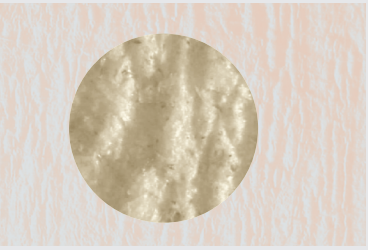
Avoid chatter marks

As our goal is always to find the best solution for your application, we are always working to develop new technologies. A highlight of our innovation program is the GALENO creping blade holder. GALENO avoids unwanted creping blade vibrations and so eliminates chatter mark damage to the Yankee dryer.

Quality Control at our Factory in Moers

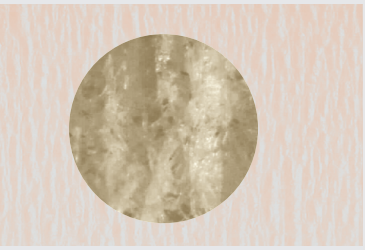
HOW SOFT IS SOFT?

Whether its toilet paper, handkerchiefs or facial grades, tissue papers are mainly rated by one criteria: softness. But what is this in detail? There are mainly three factors that play a role:



ROUGHER

SOFTER



Their combination determines the haptic perception of softness. In parallel the engineering part has to develop each of these criteria in a way that is appropriate for the final product. Again, in this context Ceradia®-blades play an important role.

WHAT ARE THE RELEVANT FACTORS?

Fibre quality
Long, thin cellulose fibres without lignin have high flexibility.

Virgin fibres
Due to its lower lignin content chemical pulp is preferred to TMP or CTMP.

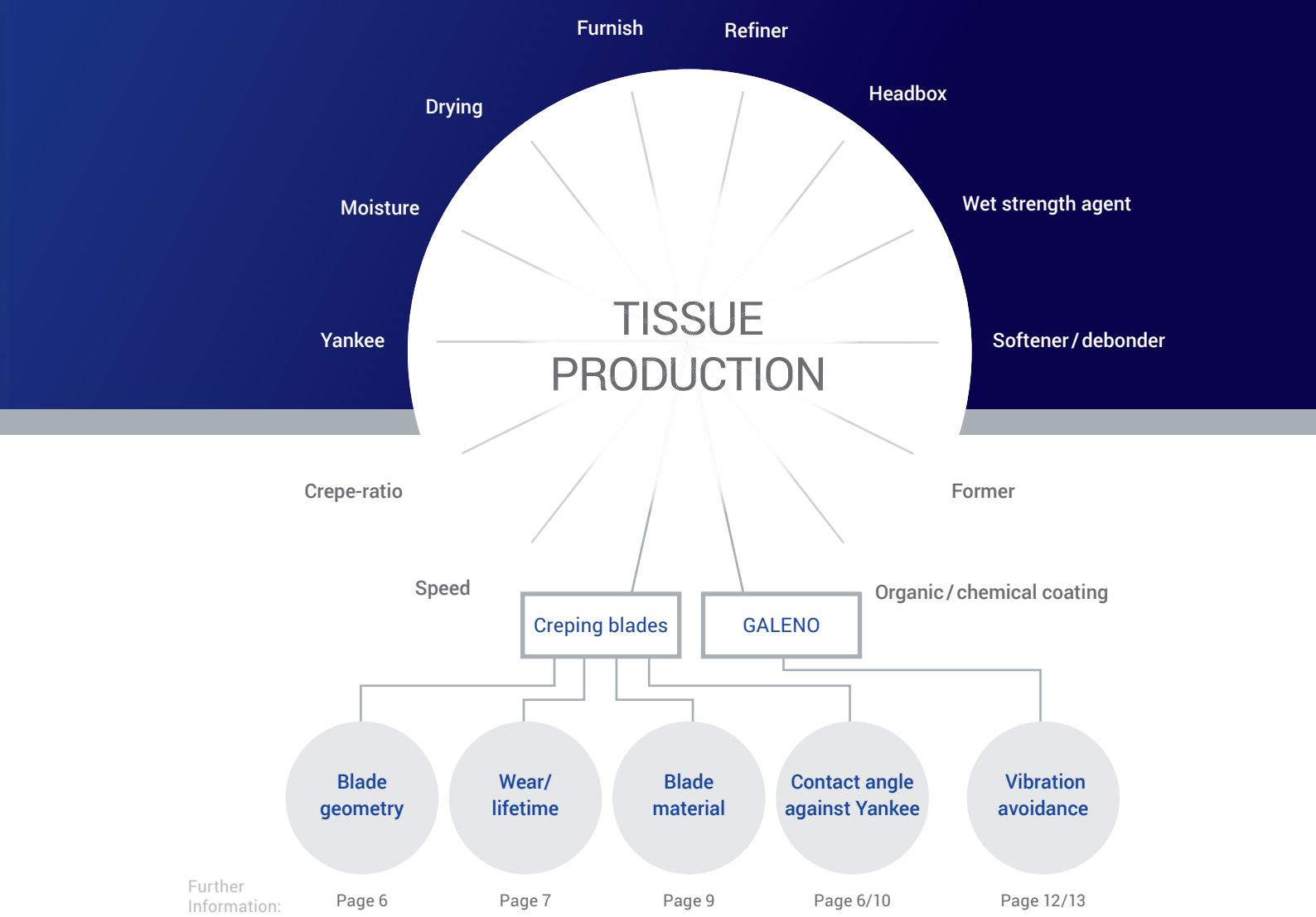
Fillers
Some papers, such as news-print or magazines have a high amount of fillers (reduces water absorption and fibre content) and contain TMP or CTMP (reduces flexibility) which influences the final product negatively in tissue grades.

Sheet density
A low sheet density, e.g. like TAD tissue, enables higher bulk and more compressibility. The fibres are free to move on the TAD cylinders and are not compressed by a press roll against the Yankee.

Formation
Good formation leads to better fiber bonding and reduces the necessity of strengthen aids, which increase the tension strength but tend to make the tissue more dense and reduce the flexibility.

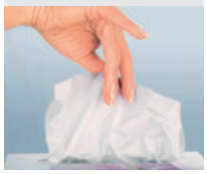
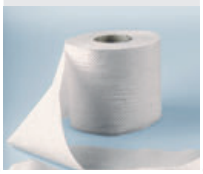
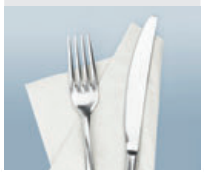
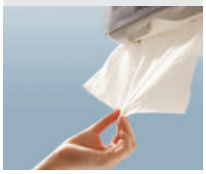
Creping structure
Benefits of a fine creping structure are good and even adhesion onto the Yankee and the possibility to use a blade geometry which creates a micro instead of a macro creping structure.

Surface smoothness
High surface smoothness leads to optimal preconditions for the following calendaring without bulk loss.



Creping blades have an essential influence on the tissue production. They enable significant control over the final product quality. This is true for light tissue grades, such as facial, but also for tissue with higher grammage (e.g. towels).

Tissue-grade

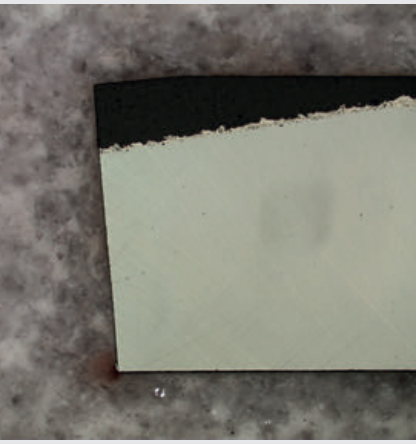
Facial tissue	Handkerchiefs	Toilet paper	Napkins	Kitchen rolls	Towels
					

Grammage

13 -14 g/m²	14 -16 g/m²	15 -18 g/m²	16 - 20 g/m²	18- 22 g/m²	> 22 g/m²

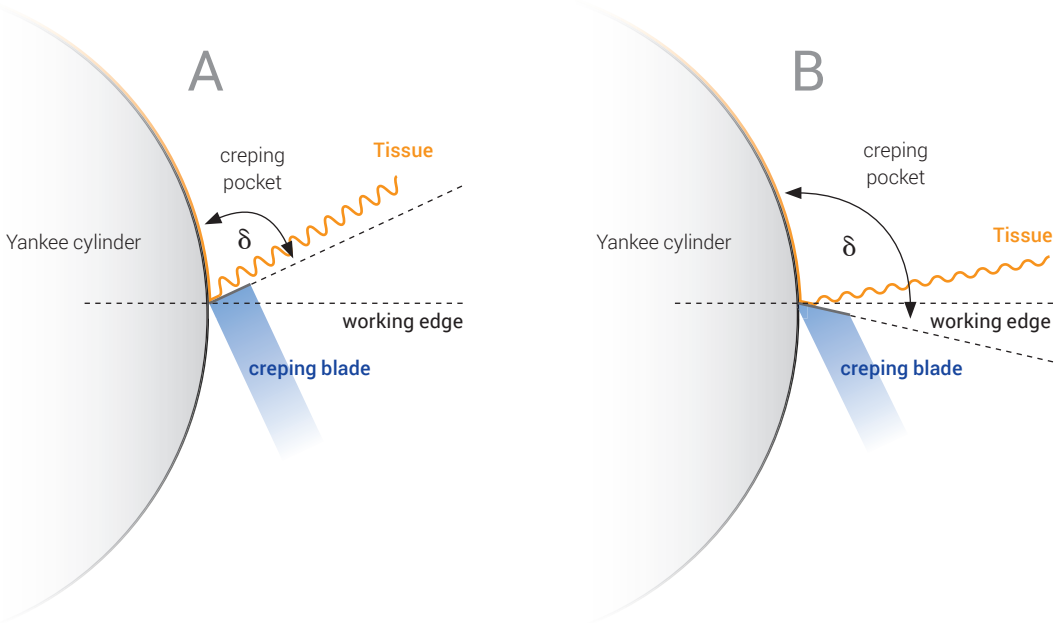
THE OPTIMAL CREPING ANGLE

Indicator for quality



For continuous quality control blade samples are analyzed and archived in the lab at Clouth Sprenger. Here one can also identify the details of custom made blade geometries under a microscope.

The function of the creping blade during the creping process is clearly defined: It has to create the bulk, the stretch, the softness and the strength of the tissue in repeatable quality over a long period of time. Different blade geometries have significant influence on all these parameters.



Bulkier or softer?

Simplified, the impact of the blade geometry on the tissue can be summarized as:
The smaller the creping pocket the rougher and thicker the crepe. Or vice versa: the bigger the creping pocket the finer the creping quality. This creping angle can be adjusted be either the contact angle of the creping blade against the Yankee dryer or by the blade tip angle, which can be designed in a negative, positive or square angle. This is one of the most important parameters for each particular tissue quality.

For example:

A (Low creping pocket δ)	B (High creping pocket δ)
Rough crepe	Fine crepe
Bulky	Soft

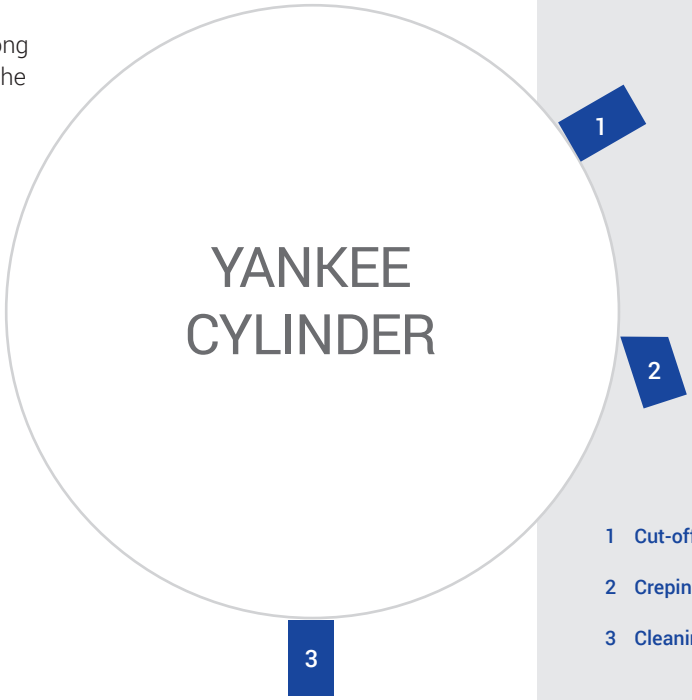
BLADE TYPES

Correct choice and usage

Cleaning and cut-off blades

Cleaning and cut-off blades are often run for too long and not changed frequently enough. Here as well the use of ceramic coated blades is a good option: At the cleaning blade the sharpness and thus the cleaning efficiency stays for longer, at the cut off position the used creping blade can be reinstalled, assuming the contact angle here is at minimum 2° higher than in the creping position. This saves costs for additional steel blades.

In general the use of ceramic tipped blades is recommended in ALL Yankee positions, and is particularly recommended on metalized surfaces as using steel blades on these surfaces may result in micro-welding and thus uneven roughness over the Yankee surface due to high friction.



1 Cut-off blade

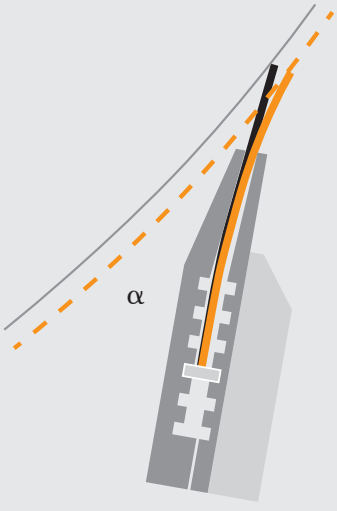
2 Creping blade

3 Cleaning blade

FIND THE RIGHT DIMENSION

The dimension of a creping blade is defined by its length, thickness and free extension from the blade holder (stick-out). The appropriate combination of these parameters is different for each customer. Generally speaking the following has always to be considered:

Blade length	Blade thickness	Stick-out
Blade length should be the width of the ground Yankee surface plus one oscillation stroke. Centering the blades avoids having excessive overhangs and minimises the risk of vibrations. A blade which is too short may cause uneven wear to the Yankee surface which over time may lead to different wear patterns on the surface. A blade which is too long and hangs over at the edge may increase blade vibration.	A thick blade is inflexible. A thin blade can adapt better to the surface of the Yankee cylinder.	The stick-out should be a maximum of one third of the total blade width- A higher stick-out leads to high flexibility of the blade (chattering) and may be dangerous during blade changes ("banana effect").



Cleaning blade α
Increasing stick-out or reducing blade thickness leads to higher deflection and thus to lower α.

REDUCED BLADE WEAR

Improve lifetime significantly

STEEL: ESTABLISHED BUT PRONE TO WEAR

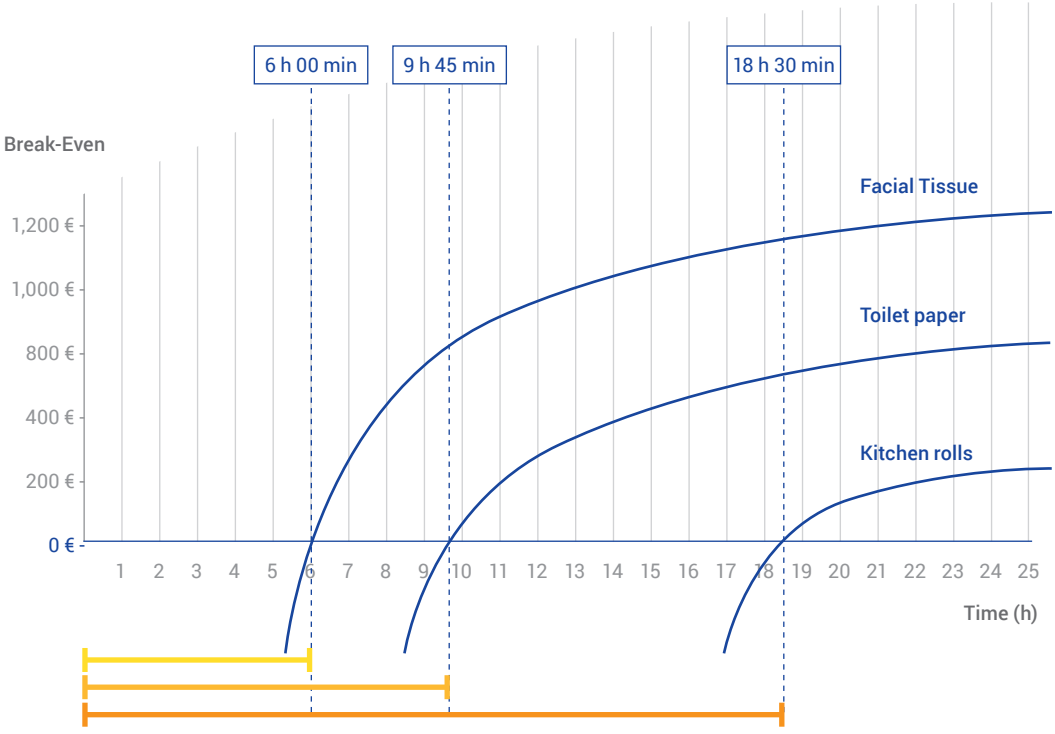
Steel blades wear faster which leads to a rougher and thicker tissue quality. In contrast the Ceradia®-creping blades keep their original factory geometry for a long time and enable longer production runs without reducing tissue quality.

The example on the right shows some typical operational parameters of a steel bade during production of different tissues. The lifetime of the blade is between 4 and 12 hours depending on the grade produced. Applying these operation parameters to the example of facial tissue the higher purchase price for a Ceradia®-blade is already amortized after 6 hours.

Production parameters		Facial Tissue	Toilet paper	Kitchen rolls
Machine speed	[m/min]	1600	1400	1500
Crepe-ratio	[%]	15	15	20
Sheet width	[mm]	3500	3500	5500
Grammage	[gsm]	13.5	15	20
Productivity	[%]	95	95	90
Production rate	[kg/h]	7,128	3,561	3,663
Blade length	[mm]	4000	4000	6000
Steel blade lifetime	[h]	4.0	6.0	12.0
Duration of blade change	[min]	5	5	5
Steel blade consumption per day		6.00	4.00	2.00
Price per reel	[€/t]	800.00	700.00	600.00
Amortization Ceradia®-creping blade	[h.min]	6.00	9.45	18.30

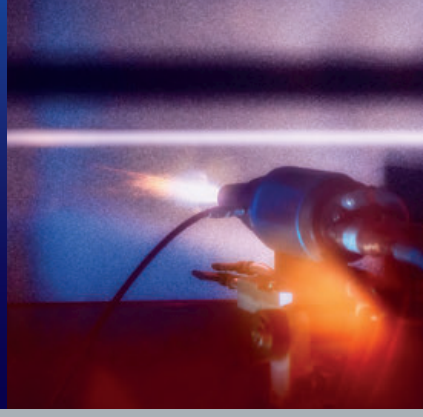
CERADIA®: FAST AMORTIZATION

A further plus of Ceradia®-blades: The tissue quality stays consistently high for a longer period.



MORE PRODUCTIVITY

From thermal ceramic coating



STEEL, CERAMIC OR CARBIDE?

Steel creping blades are cheaper to buy than Ceradia®-blades. However, it is not only the product purchase price which is important when considering the most economical solution. In addition, one has to consider the advantages or disadvantages of both materials during the whole lifetime of the creping blade.

Steel blades

The steel blade is the traditional solution that has proved itself over a long time. Its biggest disadvantage is the short lifetime which makes it difficult to produce stable tissue quality.

Ceramic sprayed Ceradia®-creping blades

Ceradia®-creping blades with an aluminum oxide base already have very good material and wear characteristics. The best results in terms of tissue production are however achieved with a chrome oxide base, which is even more wear resistant than aluminum oxide.

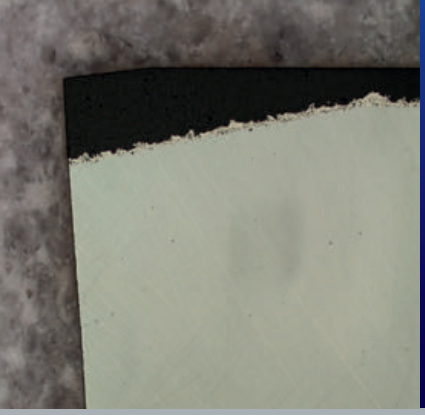
Carbide sprayed Ceradia®-blades

Carbide based Ceradia®-creping blades have excellent performance. They are even more wear resistant than ceramic tipped blades. Carbide blades are used in TAD machines (Thru-Air-Drying) or applications where the maximum wear resistance (hard and thick coating layer) is necessary. In these cases the production environment places the highest performance demands upon the creping blade.

Steel	Ceramic/Tungsten carbide
Quick alteration of blade contact surface	Stability of blade tip geometry
Only compromise possible	Stability and control of blade design helps to optimize blade tip
Short lifetime	Long service time
Quick wear of key blade surfaces	Low wear and so even quality over a longer time
High stress on Yankee due to frequent blade changes	Gentle on Yankee surface material because of fewer blade changes
Limited optimization of coating (frequent cleaning intervals)	Gentle on coating layer (blade application pressure not too high, not too stiff)
Higher risk of injury (~ 10 times more handling)	Reduced risk of operator's injury (less handling)

Steel, ceramic or carbide

For every application and operation there is the ideal Clouth Sprenger blade. Besides conventional steel creping blades, the Clouth Sprenger Group also offers Ceradia®-creping blades with ceramic or carbide sprayed tips.



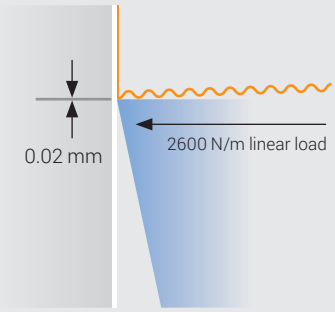
HIGH PERFORMANCE REQUIREMENTS

Challenging task, long lifetime

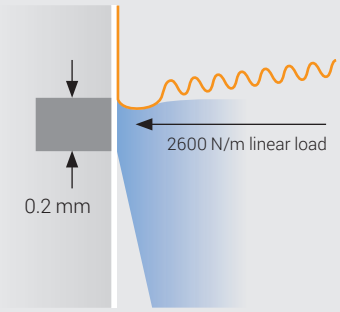
Linear load and wear
With higher frictional wear the linear loading force/unit area is reduced as the blade gets dull. The creping and cleaning efficiency drop as well which leads to a rougher crepe and higher bulk. Both make a blade change essential.

The requirements for a high-tech creping blade are various. It must:

- Overcome the adhesion between web and Yankee
- Create the creping structure with the ideal blade geometry
- Provide long service time with wear resistant material
- Keep sheet quality stable due to low wear
- Be gentle on the Yankee surface having a low friction coefficient
- Be gentle to the chemical coating using optimal pressure and correct loading
- Be easy to handle during transport and installation
- Minimise the risk of injury



New blade with 0.02 mm contact surface has a linear load of **130 N/mm²**



Worn blade with 0.2 mm contact surface has only **13 N/mm²** linear load left, due to the wider surface

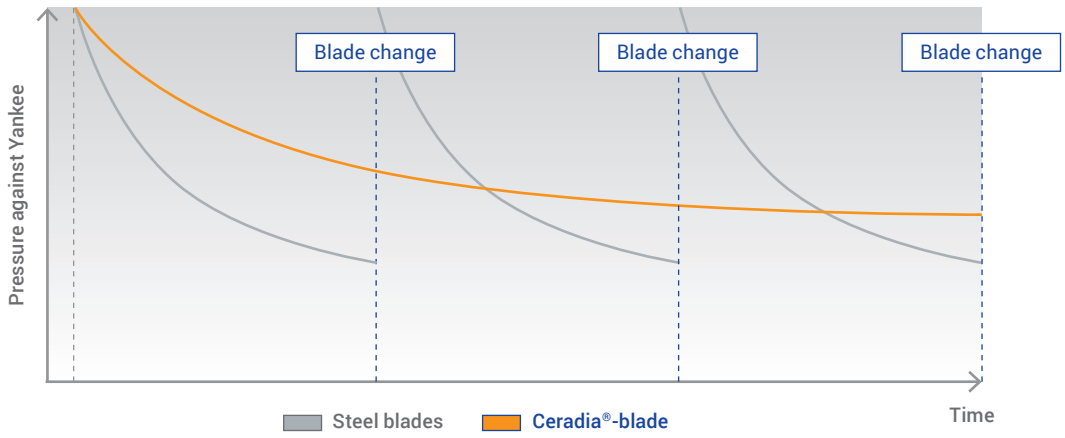
BLADE WEAR AND ITS RESULTS

Blade wear leads inevitably to reduced softness and increasing bulk. Both phenomena are mainly caused by reduced cleaning and take-off efficiency as well as reduced fibre cracking.

The wear related plastic deformation of the blade influences the product quality as well: Due to the creping pocket becoming smaller, the bulk of the tissue increases whilst the softness decreases.

In addition there may be a loss in strength. The wear can be completely uneven across the blade length. This could be due to an uneven coating layer, uneven sheet properties or a bad holder profile.

Linear load and blade life
In compari s more even.



WIDE PRODUCT RANGE

Ceradia®-creping blades from Clouth Sprenger

CERADIA®- CREPING BLADES: DECISIVE FOR PRODUCT QUALITY

A powerful creping blade performs two key tasks: On the one hand it reaches the longest possible lifetime and thus provides the maximum productivity. On the other hand it improves the tissue quality.

OUR CERADIA®- BLADES AT A GLANCE

CERADIA® RAPID	Very fast run-in time
CERADIA® OMNIA	All-rounder with high wear resistance and long service life
CERADIA® OMNIA+	All-rounder with further increased wear resistance and service life
CERADIA® EXTRA	Designed for particularly demanding positions
CERADIA® SPEZIAL	Designed for special applications
CERADIA® DURAVOL	Specialist in maximum volume with reduced fibre usage

BLADES FOR CLEANING

CERADIA® OPTIMUS	Specifically designed for the cleaning blade position

FOR ALL PRODUCTS

Standard dimension* **Thickness:** mm (inch)	**Width:** mm (inch)	**Key features**	**Suitable holders**
0,6 (0.024)	100 (4), 110 (4.33), 116 (4.57), 120 (4.75)	Continuous length to individual specification	Ready to install for all holder systems
0,889 (0.035)		Hardened, tempered, straight adjustet	
1 (0.039)		Individual angle on customer requirement	
1,20 (0.050)		Straightness tolerance max. 0.2 mm over 1000 mm	
Crepe angle: 70° to 100°			

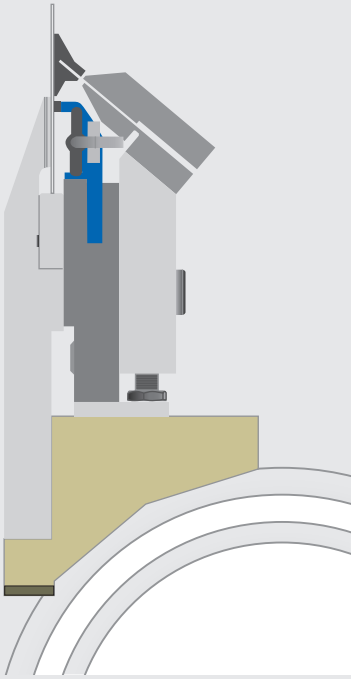
* other widths and thicknesses available on request

DOCTOR HOLDER INSPECTION CARRIED OUT BY A CLOUTH SPRENGER EXPERT

For common doctor holders in the field of the Yankee Cylinder: Our experts aim to help ensure production runs smoothly. That's why Clouth Sprenger GmbH focuses not only on CERADIA® creping blades, ideal for modern tissue manufacture, but also on the performance of the creping blade holders. For this, in addition to our V-Guard web-based vibration monitoring system and the low-vibration Galeno creping doctor system, we also offer service and maintenance of doctor holders. Machine inspections help to ensure that the performance of creping and cleaning blades is optimal. This helps to reduce interruptions in production and unplanned machine downtime. For you, this means an increased production and improved machine efficiency.

GALENO – CREPING BLA

Your Creping Blade has never run so smoothly!



Profile of the blade support

Pneumatic control

VIBRATIONS – THE NATURAL ENEMY OF THE YANKEE DRYER

As we understand the challenges of tissue making we do not only focus on blade deliveries.

We look at the whole production process. At the heart of the tissue production is without doubt the Yankee cylinder and the biggest danger for its lifetime are definitely uncontrolled blade vibrations. In the worst case they lead to chatter marks in the Yankee surface.

The consequences are insufficient product quality and high maintenance and downtime costs created by re-metalizing and regrinding the Yankee cylinder. As blade vibrations can originate from many different sources we have focused on a solution which avoids the blade vibrations directly at the blade, independently of their external origin.

THE TIME IS NOW – FOR THE MECHANICAL SOLUTION FROM THE CREPING DOCTOR SPECIALIST

After comprehensive vibration testing, the course of the best approach is now clear: What can help a heavy, rigid support bar when the most important component, the creeping blade, is vibrating freely in the blade pocket?

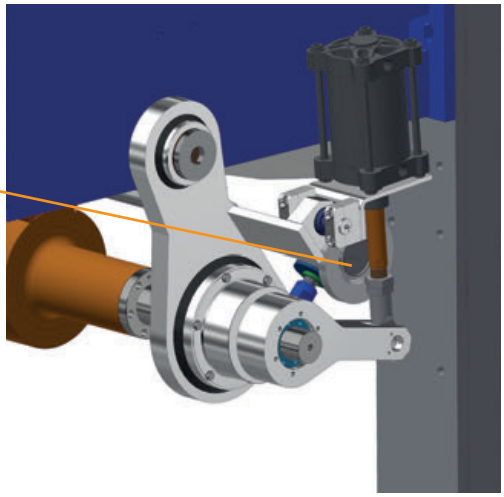
The Galeno creping doctor system delivers vibration-free creping – for the safest, most efficient creping.

DAMPING – PRECISELY WHERE IT MAKES A DIFFERENCE!

The innovative damping of the creping blade in the holder via a pneumatically pre-stressed hose provides effective vibration damping where it matters most: directly at the blade.

A Vulkollan 'shoe' is used to brace the creping blade, damping vibration at the Yankee

ANGLE ADJUSTMENT



VIDEO
Galeno in action

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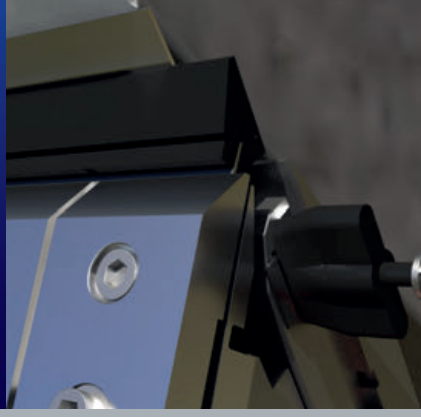


AUTOMATION ONLY WHERE NECESSARY

As far as possible, fragile sensor systems and electro-mechanical devices have been omitted, which has helped to ensure a low-maintenance and maintenance-friendly system.

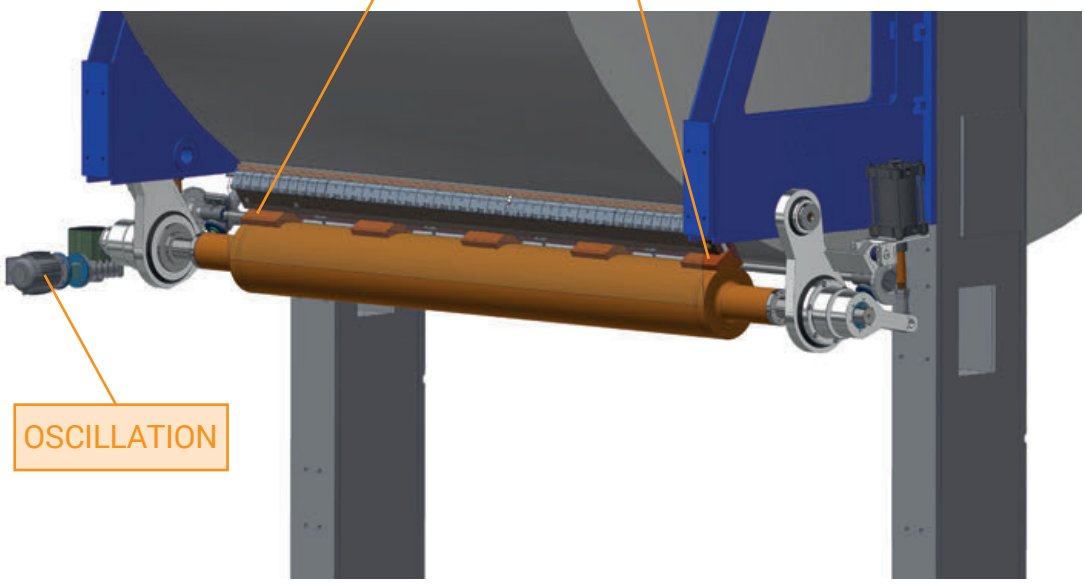
Nevertheless, the creping angle can be adjusted during operation. If required, the creping holder can be upgraded to include a PLC-control system

THERMALLY-INDUCED WARPING

On the one hand, the hot Yankee, on the other, the ambient temperature – if there is temperature difference of approx. 100 °C (212 °F), any creping holder may distort along the line of contact between the creping blade and the Yankee face.

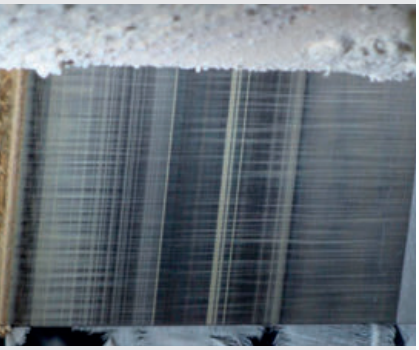
The Galeno doctor beam features thermo-stabilisation – the temperature of the doctor beam is equalised, so avoiding any deflection due to temperature differences in different areas of the tissue machine.

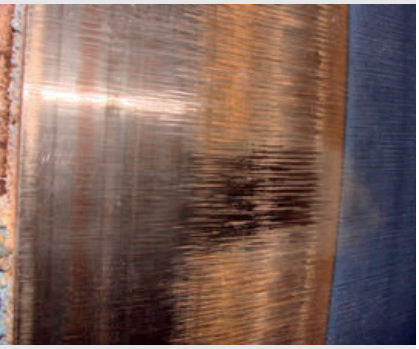
Integrated V-GUARD:
Accelerometers on the creeping doctor support work to monitor harmful vibration



V-GUARD – VIBRATIONMO

For improved process safety





Chatter marks and their causes
A Yankee surface destroyed by chatter marks (see above) shuts down the production. The appearance of chatter marks is often caused by edge deposits on both Yankee edges. They cause the creping blade to vibrate.

FOCUS ON MAXIMUM EFFICIENCY

Our aim is to guarantee an end-to-end service to make your production even more efficient. In addition to our Ceradia® creping blades, which are designed to meet the special requirements of tissue production, and our innovative Galeno creping holder, our work also focuses on monitoring vibrations.

INCREASED UP-TIME

Our V-GUARD offers a system for monitoring vibration and for preventing this damaging the Yankee cylinder. This helps to avoid unplanned machine downtime

OPTIMUM USE OF RESOURCES

The V-GUARD system is customised to individual customer requirements, offering you the protection you need.

SIMPLE HANDLING

The V-GUARD system offers the option to install up to four vibration monitoring sensors. Installation points can be specified individually. The sensors are small and do not interfere in the production process.

RELIABLE – SIMPLE – EXPANDABLE

The V-GUARD system is a stand-alone system. Measurements are displayed and downloaded for analysis in an intuitive and customisable interface. As a result, warnings/ signs of failure can be interpreted and, if necessary, transferred to an add-on of the V-GUARD software.

VIDEO

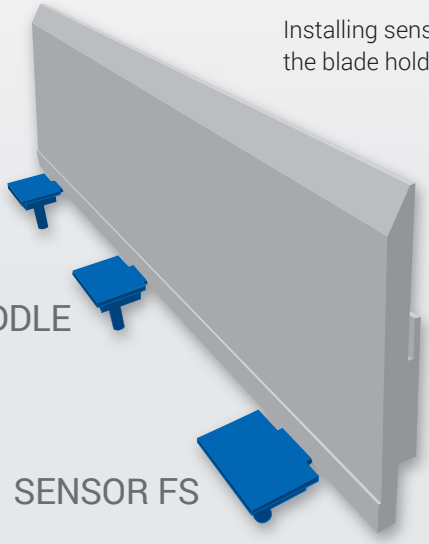
NITORING SYSTEM

SYSTEM DESIGN

Software programming
by our experts

Viewing data via
a monitor

Installing sensors on
the blade holder



Connecting sensors with
the integrated V-GUARD
system hardware

MADE-TO-MEASURE EQUIPMENT

Higher safety and efficiency

Additional accessory program:

CLOUTH DOCTOR-PULL®

CLOUTH® DOCTOR BLADE Adjusting Gauge

CLOUTH DOCTOR-GAUGE®

CLOUTH FELT-CLIP

CLOUTH DOCTOR-CUT®

CLOUTH DOCTOR-CLEAN® II

CLOUTH DOCTOR-CLEAN® II Plus

Together with our Ceradia®-creping blades we offer a comprehensive range of accessories. Some of the range is shown here, the complete portfolio at **www.clouth-group.com**.

ARRIVING SAFELY AT THE CUSTOMER

Custom made packaging

As well as the high quality of our products, we have developed high quality tailor-made packaging systems to ensure that all our creping blades arrive with the customer in perfect condition. All creping blades are packed with edge-protection which protects the ceramic layer from damage as well as the operator's hands from sharp edges. The specially developed cardboard boxes are designed so that no pressure is placed on the blades by stacking or during transportation.

Stabilizing element inside the packaging

Edge protection for coiled CERADIA®-creping blades

PULLS ALL THE TIME: CLOUTH DOCTOR-PULL®

Blade removal tool

While pulling used blades from the machine one has to consider two things: Easy handling and above all, safety. Our blade removal tool CLOUTH DOCTOR-PULL®, does both. Its ergonomic design makes pulling blades out easy and protects the hands of the user at the same time. Thanks to different gripping jaws it can be used for blades of 0.8 up to 6.0 mm thickness.

BIG AT MAKING SMALL: CLOUTH DOCTOR-CUT®

Cutting device for blades

Our cutting device for composite and metal blades, CLOUTH DOCTOR-CUT®, worn blades to a size of 250 mm at a speed of 500 mm/s. It is easy and safe to use without removing pins or rivets.

Clouth Sprenger GmbH,
Moers, Germany

Joh. Clouth GmbH,
Hückeswagen, Germany
Head office of the Clouth Group

WE ARE HERE FOR YOU - WORLDWIDE

Locations and branch offices

INTO THE FUTURE WITH TAILOR-MADE SOLUTIONS

Product development at Clouth Sprenger completely is focused on satisfying the individual needs and wants of our customers. Its goal always is to make progress in various core areas. In doing so, priority – to the same extent – is given to both, the realization of new customer requirements and a further improvement of line pattern quality as well as the achievement of longer running times in order to save costs.
Company-internal our department of research and development is well connected to both, the application technology department and the quality lab and moreover – with regards to latest developments in the industry – we are always on the pulse of time. Our application engineers at the same time are experts for the Clouth Sprenger range of products as well as the customers' individual needs. Customers can rely on their product recommendation.

In their test series the application technology department and the quality lab precisely and individually adapt the blades to the customer's application conditions which is to meet the challenges in everyday operation – for no coater ever looks like the other!
In addition, the application technology department and the quality lab provide the customers with support regarding to process optimization. Here again, blade analyses provide valuable insights to achieve an efficiency enhancement and a quality increase with respect to the creping process. Moreover, our CERADIA R& D Team also contributes to the individual product adaption and development. In close contact with customers, universities and additional cooperation partners we are constantly doing research on the optimization of wear-resistant coating.

Find your contact person
You can find our production, sales and service locations in your region simply at **www.clouth-group.com** and we will reply to your enquiry in your own language.

NOTES

CERADIA®
MADE FOR EXPERTS

QUESTIONS?
WE ARE PLEASED TO ANSWER!

If you have any questions about our company,
please don't hesitate to contact us.
Our experienced staff are here to help you!

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