

Nipco™ Technology

PRECISE PRESSURE PROFILES



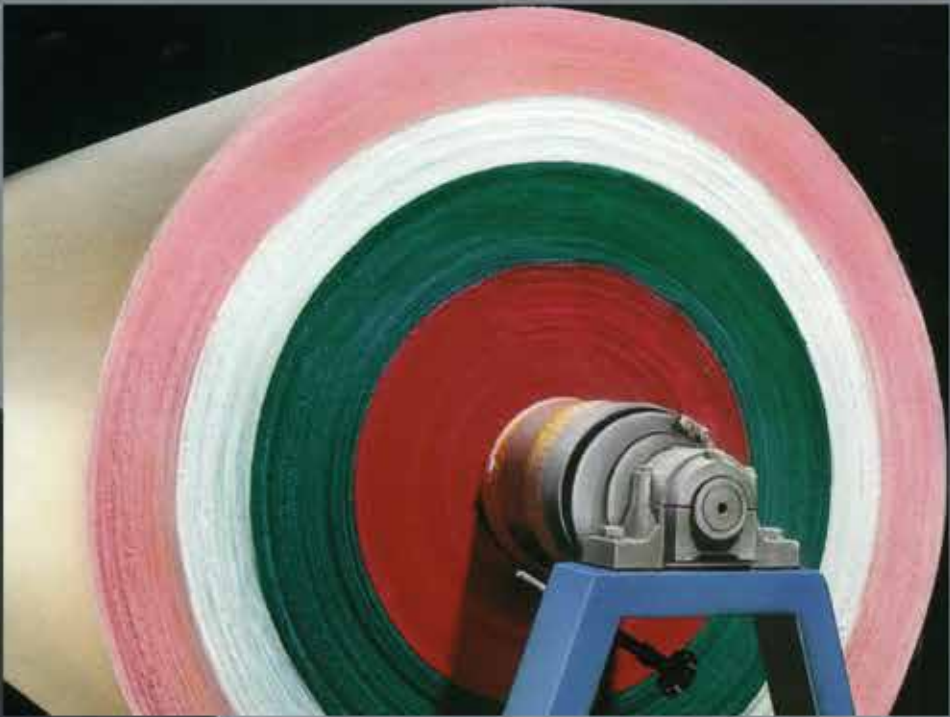
in cooperation with **VOITH**

Guarneri  **Technology™**

The Nipco™ calender

The support that Makes The Difference





Leading manufacturer worldwide in textile finishing calenders, synonymous with quality engineering and innovative development in calender technology. The specific knowledge, technology and reputation has been offered by the worldwide exclusive **Nipco™** license.

The latest development of **Nipco™ HT**, high technology, is our answer for all markets.

This new engineered calender design has been based on the extensive knowledge of the worlds most important calender manufacturer, **VOITH**.

Your competitive edge

Market economy means competition. Only those who are more efficient and more flexible than the others have the competitive edge.

Our **Nipco™** technology is offering innovation, efficiency and most flexible solutions to all of our customers demands. Amongst the most important competitive advantages of the system is the **change sleeve time** within half a shift outstanding.

The **Nipco™** sleeve is free turning around the centre shaft, there will be no need to change for reasons of slippage or glide or burning of the edges not covered by material.

Our systems are always complimented with inlet and outlet, web guiding, tension control, seam and metal detectors, cooling rollers and fully computer controlled to fully satisfy our clients requests.

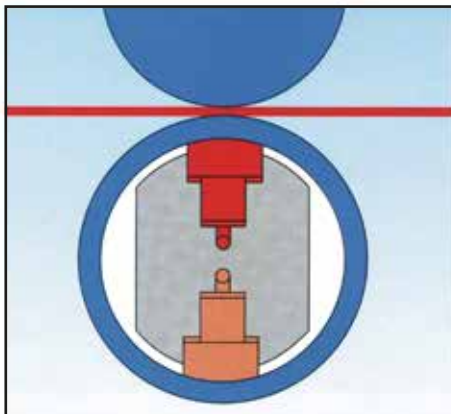
Your calender demand is our target; our customer related offer, your solution for your success in your markets.



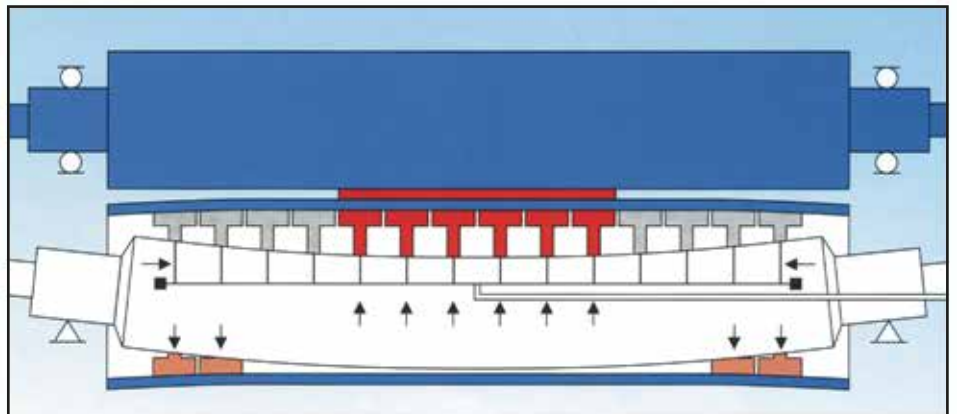
Nipco™ Technology for individual calender nips

Guarneri Technology™ is the only calender system manufacturer to offer deflection controlled **Nipco™** rolls for textile finishing and technical textiles. This calender technology is characterized by decisive design advantages such as:

- Stationary shaft and turned around sleeves
- Free rotating sleeves, **PGT6**, **TopTec3** or Steel covered by paper/cotton
- Width adjustment for various fabric widths, motorised
- Multi area pressure setting with a wide spread across the total working width
- Retracting of the sleeves, to prevent edge overheating
- Step less adjusting of area controlled pressure settings from 25-400N/mm
- Maintenance free electro hot water heating system for the Steel roll
- Alternative heating systems on demand, like Thermal Oil or Gas
- Peripheral executed Steel rolls for fast reacting on temperature adjusting or re-setting under high speed



Section of Nipco™ roll



Roll system Nipco™ roll/steel roll with narrow fabric web



Rows of support sources at the L calender



Roll retraction elements for various fabric widths



NIPCO™ roll with PGT6 sleeve

The rotating, highly elastic, homogeneous PGT6 sleeve

The sleeve, whether **PGT6**, **TopTec3** or Steel covered by paper/cotton adjusts itself to the deflection of counter rolls, all sleeves are gliding on an oil film according to the technology of one hydrostatic bearing: no sealing problem, no oil leakage!

Your advantage: maintenance free and long system life

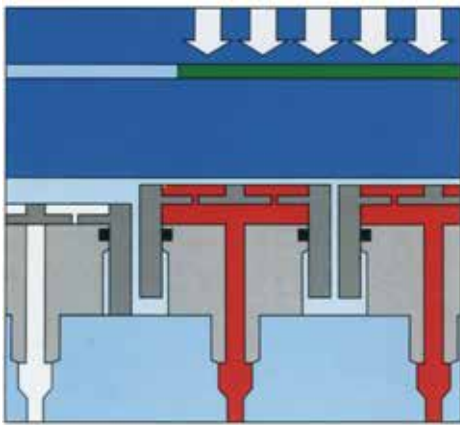


Diagram of support sources in an installed shaft

Hydrostatic retraction supports

These supports arranged on the right and left of the sleeve, ensure quick relief and protect the Thermoplast, or Duroplast sleeve from burning on the edges which are not covered.

Your advantage: Whether you work with narrow or wide fabric, you will never need to hold stand by sleeves or bowls cut to actual material widths.

Width adjustment and area controlled pressure setting

In the **Nipco™** roll the supports are arranged as individual elements side by side on the stationary shaft across the whole width.

Our stepless pressure setting between 25 and 400N/mm will guarantee the requested pressure demands.

Whenever you have to vary the pressure setting according to the material needs, i.e. elongated selvages, weaving imperfections, you will have the opportunity to set the requirements using the **Nipco™ HT** option.

Our width adjusting system is motorised offered according to your specific demands.

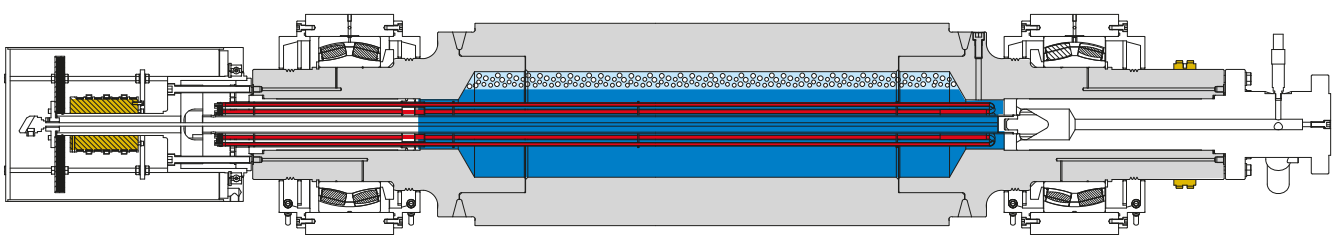
Your advantage: Nip pressure in the width where necessary. No overload at the fabric selvages, i.e. uniform effect over the fabric width without cambering of the sleeve at the fabric selvages.

Width adjustment during production

As a result of a further advance in **Nipco™** technology, this calender type offers the textile finisher an additional competitive advantage of adjusting the pressure width in the nip for rolls up to certain widths during the production process. This innovative technology offers an enormous time-saving when working with varying fabric widths in one production pass.

Your advantage: Time-saving and fabric waste minimisation when changing fabric widths during production.

ELECTRO HOT WATER SYSTEM



Maintenance free electric hot-water heating system

Guarneri Technology™ can deliver all types of bowl heating, thermal oil, gas, steam and electro hot water which acts as an immersion heater, using distilled water to generate the steam which is pressurised in the steam chamber, this gives a very even spread of heat across working width of the bowl width with a temperature accuracy of +/- 1,5°C

Your advantage: High temperature accuracy clean, space-saving and maintenance-free.



Nipco™ I calender

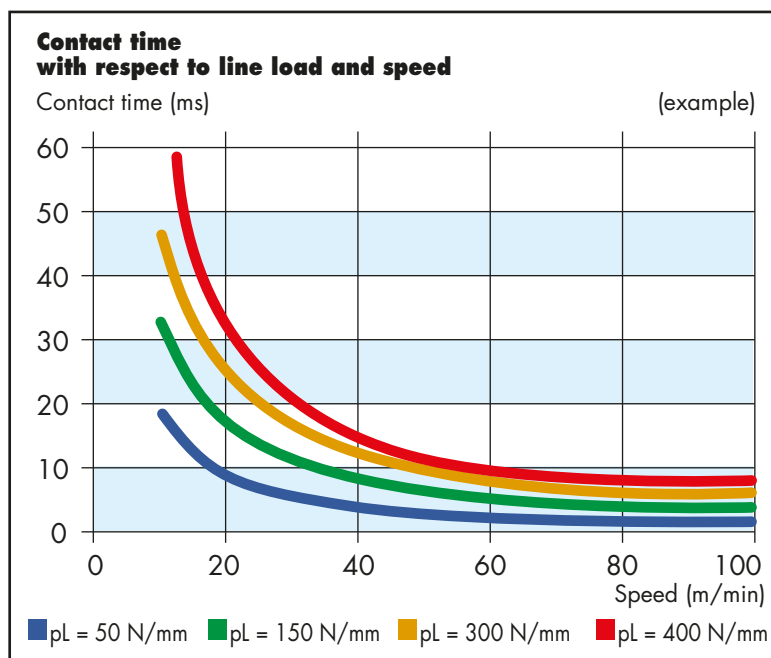
Efficiency through innovation



2 roll Nipco™ I calender

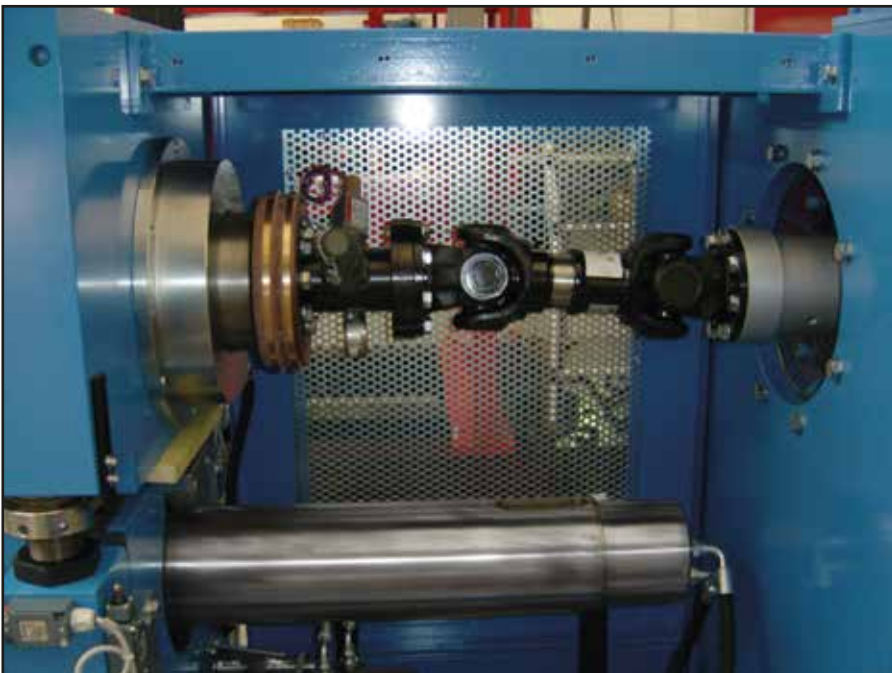


Fabric inlet





Drive

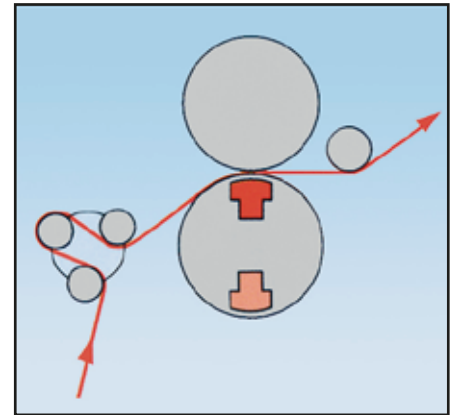


Electro hot water safety valve

The **Nipco™ I** calender is an outstanding development of flexibility and efficiency in calender processing. The combination of a free rotating sleeve, whether a **PGT6**, **TopTec3** or Steel covered by paper/cotton with our selective pressure adjustment in the width, will always prevent burning and marking of the sleeve edges. The pressure is effective in only the requested zones, no other system in the market can compete with this function. Other sleeves, when slid on, will over time start frictioning resulting in weft distortion.

Motorised width adjusting

An outstanding innovative development is the **Nipco™** system width adjustment. The motorised system will give a line pressure where it is needed, to suit the fabric width. The motorised system can be programmed to load the pressure suit the fabric width, retracting the sleeve to avoid contact between sleeve and heated roller, preventing edge damage.



Fabric passage diagram

Effects and calender types	Nipco™			Embossing calender
	I	Flex	L	
Smoothing	●	●	●	● ²
Lustre	●	●	●	● [*]
High glaze	●	●	●	-
Air permeability	●	●	●	● ²
Soft hand	-	● ¹	●	-
Silk finish	● [*]	●	● [*]	-
Flat embossing	-	●	● [*]	●

*¹) possible by changing rolls

¹) with elastic counter-roll

²) possible by changing tubes

YOUR ADVANTAGES

- Uniform line pressure distribution in the nip over the fabric width.
- Adjustable pressing width to suit change of fabric width under pressure without stopping production.
- Thermal relief of the sleeve next to the fabric by retraction forces, variable setting to prevent burning out and edge marking of the sleeve.
- Stepless selectable line pressure in the nip.
- Easy installation and change of any sleeve under consideration by our cantilever systems
- Same sleeve for the complete range of your fabrics in different widths.

DOUBLE Nipco™ I

Double independent pressure lines



Double Nipco™ I calender

The **DOUBLE Nipco™ I** Calender is one further development for Textile Finishing.

Full flexibility in calender finishing for high lustre effects, using either one or both nips.

The pressure setting in each nip is independent, and can be set between 50 and 400 N/mm.

Motorized width adjusting, automatically combined with pre-selection of retracting forces.

The pressure across the width can be automatically set to fabric width, thus allowing the pressure to be released in the non-fabric area and protecting the sleeve from burning.

Customers can select either **PGT6** Thermoplastic sleeves **TopTec3** Duroplast sleeves or Steel covered by paper/cotton.

Also the **DOUBLE Nipco™ I** in conjunction with our **Nipco™ HT** version is available for zone controlled pressure settings.

With the technical innovation of Guarneri Technology our customers can stay as a market leader in textile finishing.

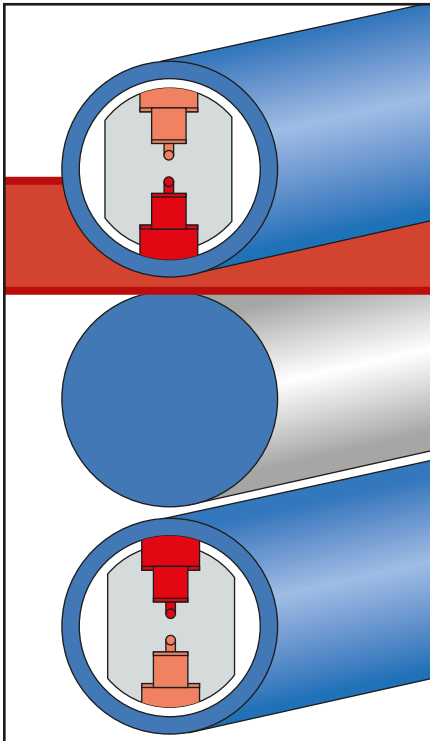
The **Nipco™** Technology does not have any limitation in terms of process and finishing effects.

Our latest development: **Your Benefit To Become Market Leader In Precision!!**

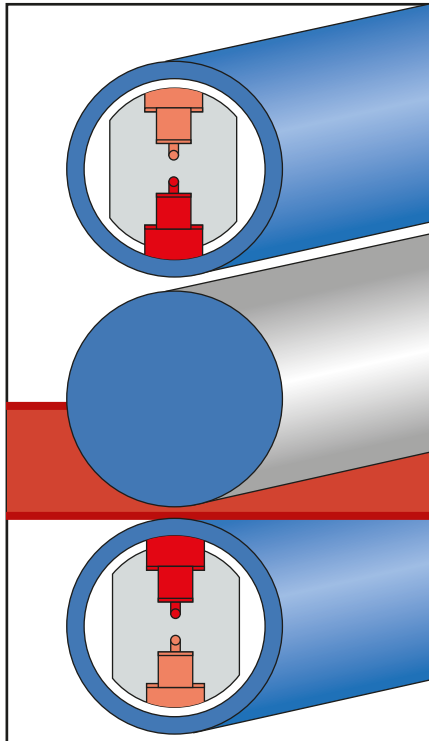




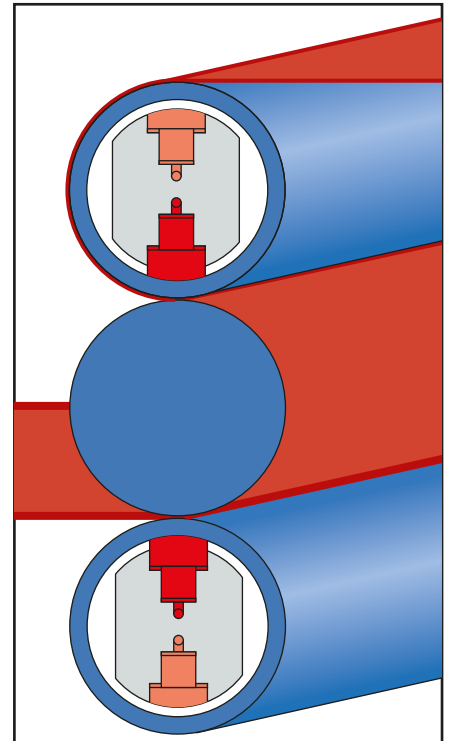
Displayed on 10,5" touch screen, all individual settings have to be retrievable in a qualified recipe management. Therefore all our calenders are equipped with Siemens S7 computer systems for recipe control, maintenance announcements, service requirements etc.



Fabric passage in the top nip



Fabric passage in the bottom nip



Fabric passage in both nips

Your advantages

- Individual zone controlled pressure setting
- Pre selecting of required pressured line profile
- Reacting on edge elongation by zone controlled pressure reducing

Nipco™ L calender

The star among calenders



Nipco™ L at working site



Nipco™ L calender



Nipco™ L under working condition

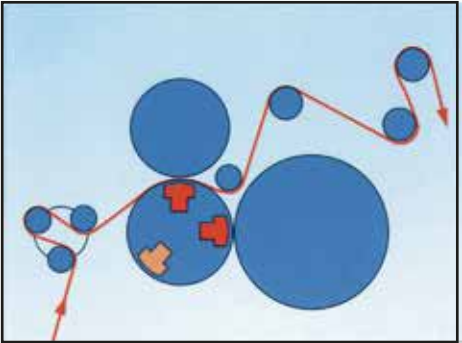
With the development of the **Nipco™ L** configuration **Guarneri Technology™** has the exclusive right to continue with the concept first introduced in the 80s. A textile finishing calender with two nips with independent pressure settings, a revolution in calender technology. The system allows you to select effects, high glazing, softness, density control and other sales requirements in one calender combined.

Whether producing shirtings, ladies fashion, underwear, bed sheets, table linen, home textiles or protective clothing, the system allows you to compete in the market. The hydrostatic support elements of our **Nipco™ L** system are independently arranged in a 90° configuration, one active against a steel bowl, one active against a cotton bowl. The stabilising force angle of 270° will at all times guarantee a free and uniform turn of the sleeve using either a Thermoplast as **PGT6** or a Duroplast as **TopTec3**.

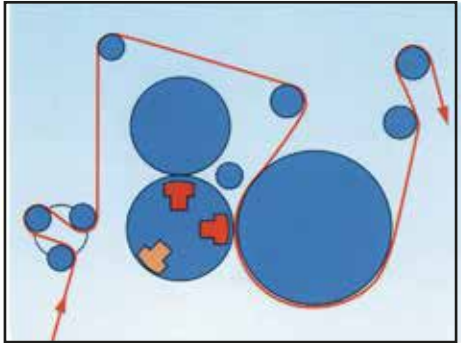
With those independent pressure lines in action you may "play" with your pressure settings. High glazing: increased pressure in the nip **Steel/Nipco™ PGT6**, same time slightly reduced glazing and softer handle, decreased pressure setting in the nip **Nipco™ PGT6/Cotton**. Elegant glazing and remarkable softness in handle: decreased pressure in the nip **Steel/NIPCO PGT6**, same time increased pressure in the nip **Nipco™ PGT6/Cotton**. Only the original **Nipco™ L** calender today offered from "**Guarneri Technology™**" controls two pressure lines completely independent based on patented development of the 80s; a development of former Escher Wyss, presently **VOITH** and licensed to "**Guarneri Technology™**" exclusively.

YOUR ADVANTAGES

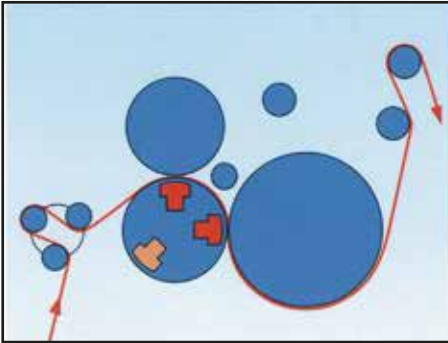
- Two completely independent pressure lines are active in one calender same time
- Uniform pressure lines in two nips with pressure lines according to market requirements'
- Two selectable pressure lines in the range of 25-400N/mm
- Width adjusting according to different fabric widths in order to protect out burning and marking of the sleeve
- No friction in the nip caused by slide on sleeves to the process bowl
- None computer supported force comparison between outer forces and inner deflection compensating forces
- Easy sleeve change by our cantilever system



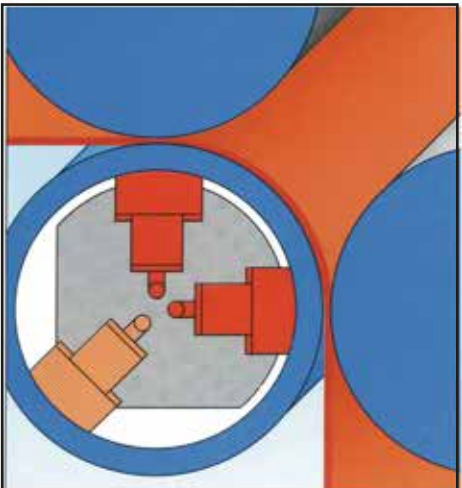
Fabric passage=reduction of air permeability, lustré



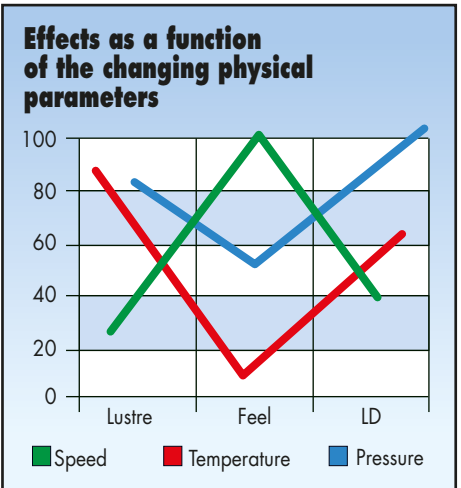
Fabric passage=soft hand



Fabric passage=combination lustré and soft hand



Arrange of the support sources



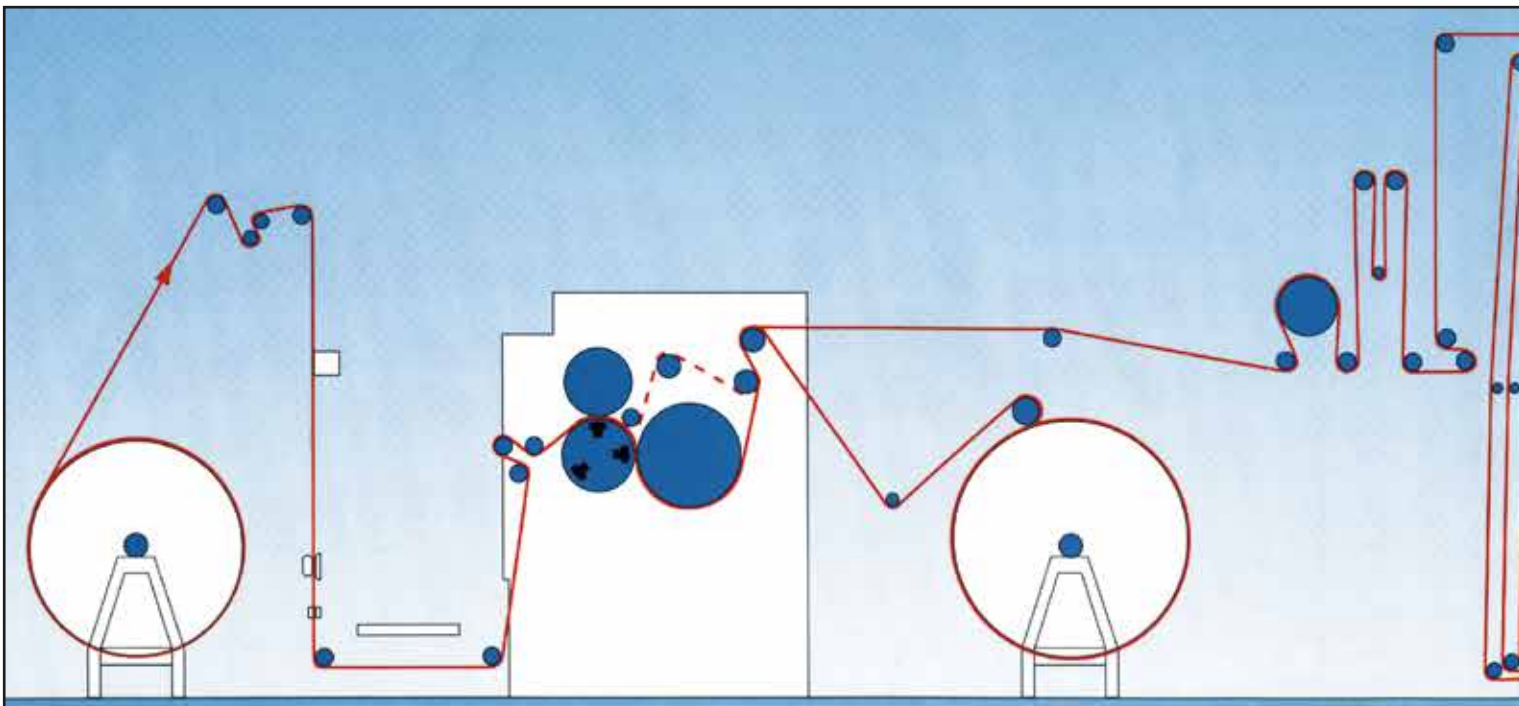
Effects and calender types	Nipco™ I	Nipco™ Flex	Nipco™ L	Embossing calender
Smoothing	•	•	•	•2
Lustré	•	•	•	•*
High glaze	•	•	•	-
Air permeability	•	•	•	•2
Soft hand	-	•1	•	-
Silk finish	•*	•	•*	-
Flat embossing	-	•	•*	•

*) possible by changing rolls
 1) with elastic counter-roll
 2) possible by changing tubes

The optimal combination Nipco™ L and Nipco™ Chaising calender



Nipco™ Chaising calender each with one Nipco™ roll in top and bottom position



Combination Nipco™ L and Nipco™ Chaising calender



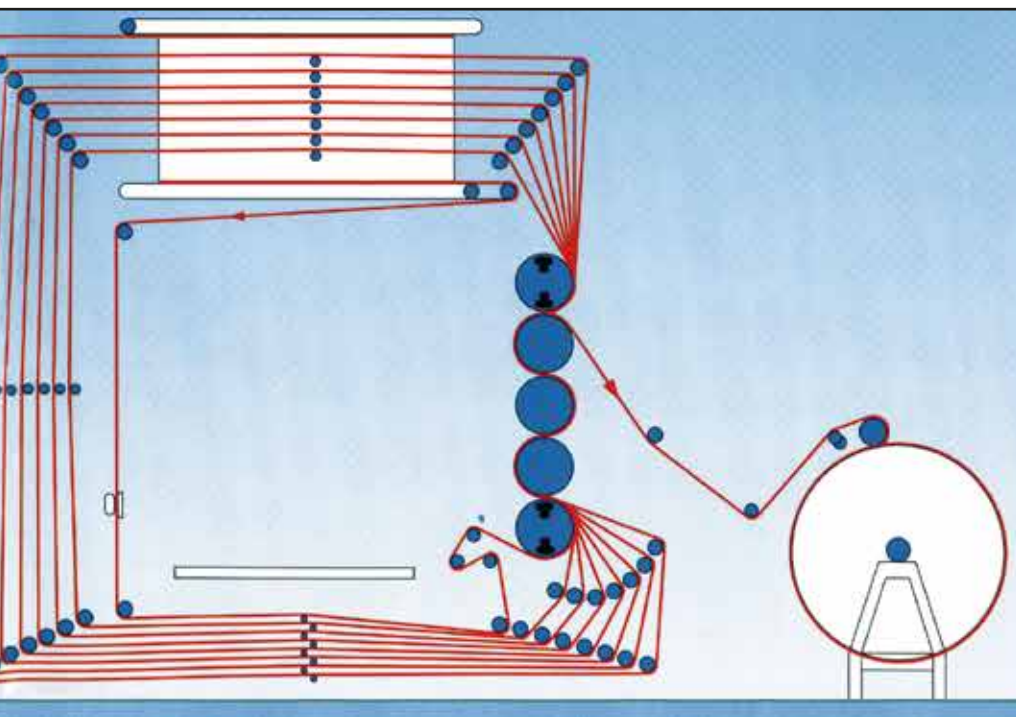
Nipco[™] Chaising calender under working condition

If in qualified markets a qualified down proof fabric is required with full and soft handle, a technology returns, which in the 50s and 60s was standard all over the world. Latest with the development of Polyamide **PGT6** bowls **Chaising Technology** was setting new standards; with developing of the **Nipco**[™] technology the full range of independent pressure settings instead of crowning the bowls has given full flexibility to this special calender finishing.

Textile fabrics out of cotton or linen, like down proof, damask, mattress drill or bed linen have been finished since many years on so called mangling or "**Bettle**" equipment, the target: soft, full handling with elegant glazing and "deep results", means not only a surface finishing, but a finishing with effect of depth!

The answer has been given by the so called "**Chaising Technology**", in which the woven cloth is packed in 5 - 7 layers from inside to outside in those 4 resp. 6 nips, one on the other. Warp and weft threads grip into each other and are not "over pressed" but ideally filled. A result, the yarn is given natural "roundness" and this means mangling and full grip. In Chaising calenders a Steel bowl is never used, only soft calender rolls like cotton or **PGT6**.

If such a Chaising unit is combined with a so called pre calender unit, like **Nipco**[™] **L** with its possibilities of independent pressure setting in two independent nips, you will reach your optimised result, which will not find any technical alternative.



**NIPCO Chaising calender:
Your advantages**

- All 5 bowls cylindrical
- **Nipco**[™] bowls in top and bottom position to avoid deflection and bowl crowning
- Pressure adjusting in accordance with the known **Nipco**[™] technology
- All rolls in same diameters which is most important to the expected result
- Unique web guiding in in feed and out feed to avoid wrinkles,
- Special web guiding to avoid any elongation, which requires a specific know how of all Engineers being involved

Nipco™ Flex Two calenders in one



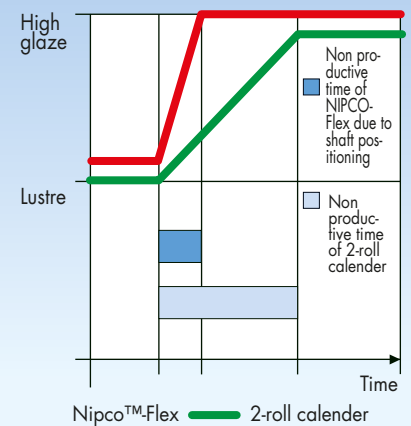
3 roll Nipco™ Flex calender



Full touch-screen control

Reduced non-productive times

Comparison of 2-roll and Nipco™ Flex calenders (with production-parallel heating of the second heating roll)



Production advantage through rapid change



Nipco™ Flex calender in production

Effects and calender types	Nipco™			Embossing calender
	I	Flex	L	
Smoothing	•	•	•	• ²
Lustre	•	•	•	•*
High glaze	•	•	•	-
Air permeability	•	•	•	• ²
Soft hand	-	• ¹	•	-
Silk finish	•*	•	•*	-
Flat embossing	-	•	•*	•

*) possible by changing rolls

¹) with elastic counter-roll

²) possible by changing tubes

The 3 roll calender **Nipco™ Flex** is characterised by a special designed feature: The electric motorised turning by 180° of the fixed **Nipco™** shaft!

Same customers in world markets would like to combine high glazing and **Schreiner** effects in one machine. Prior to this development, you had always to change the process Steel bowl, chromium plated against engraved, which means: production interruption and mechanical handling with bowl exchange.

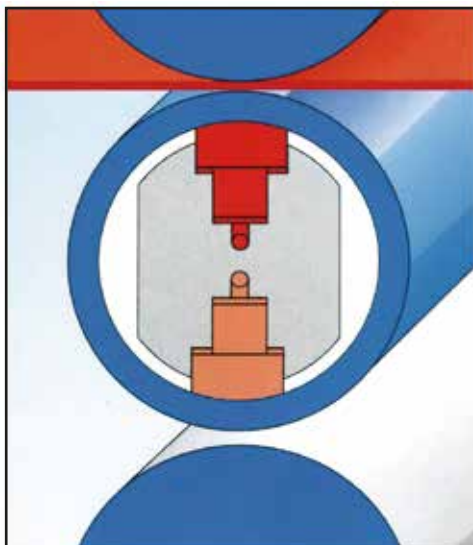
Our solution: The **Nipco™** shaft of the middle positioned process bowl is motorised turned from the top chromium plated to the lower engraved Steel roll; this takes approx.

two minutes and is considered to be the most important development based on **Nipco™** technology! Saving time means, saving money, saving money means to be superior to all of your competitors.

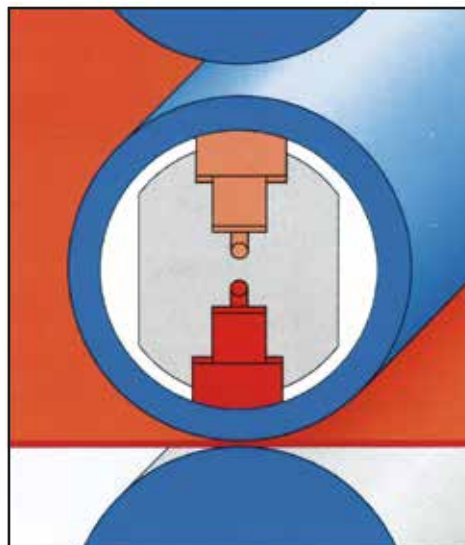
In high glazing setting, the top hydrostatic support sources are active in the nip Steel chromium plated against **Nipco™** with all its benefits in adjusting and edge protecting as former explained.

For required **Schreiner** or any different type of flat embossing you turn the process bowl with the result that now the pressure line is active against the engraved Steel roll in down position and all **Nipco™** advantages are still active.

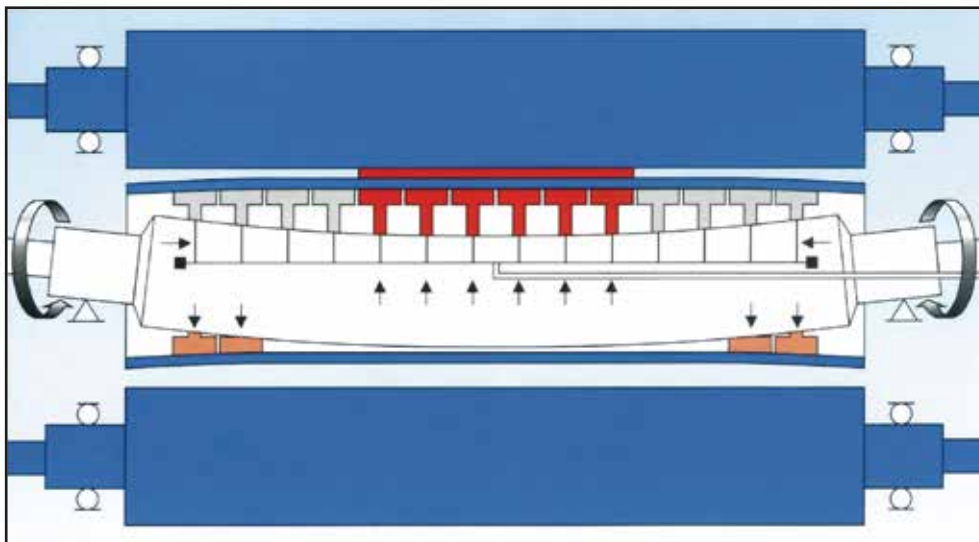
This development has confirmed again, that **Guarneri Technology™** is setting the standards in textile finishing to the benefit of our customers.



Fabric passage in the top nip



Fabric passage in the bottom nip



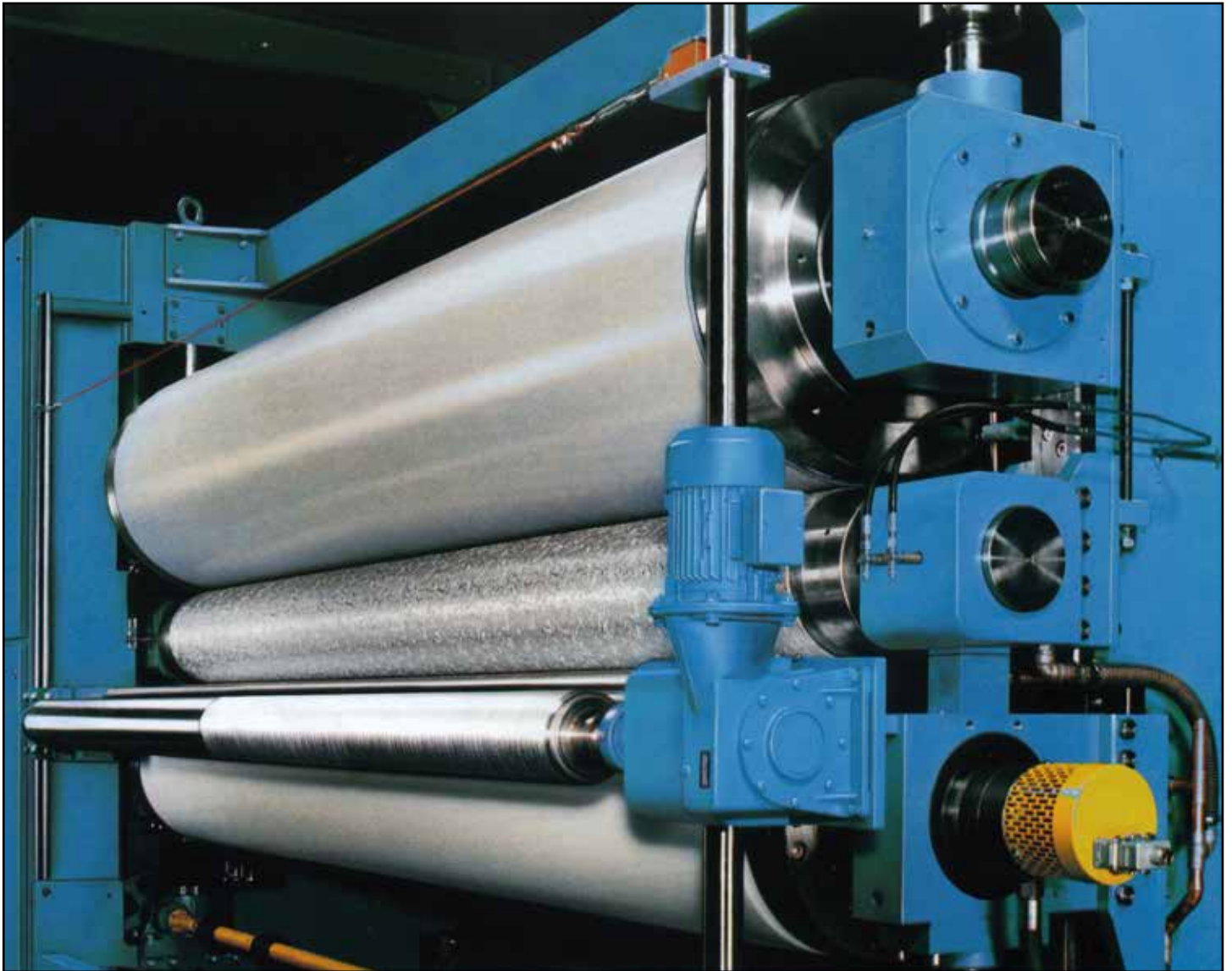
3 roll calender with electric motor-driven rotatable Nipco™ roll

YOUR ADVANTAGES

- Flexible pressure setting and width adjusting in top and bottom nip
- Combining high glazing and embossing in one calender
- Increasing production time and avoiding any production interruption by mechanical roll change
- Adjustable pressure line setting to the requirement of your woven or knitted fabrics
- in let and out let combined for woven and/or knitted fabrics according to your specific demands
- Easy sleeve change i.e. **PGT6** against **TopTec3**, Thermoplast against Duroplast, rubber coated sleeve against Steel sleeve
- No friction in the nip as the sleeve is turning free around and is not slipped on a process shaft system
- Protecting of edges against burning out and marking
- No spare system bowl required for narrow and wide fabric widths to be processed in the same calender

Nipco™ Embossing calender

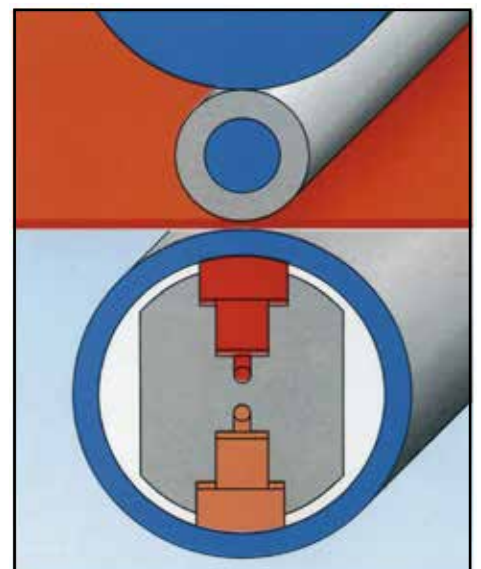
Additional effects for more flexibility



Nipco™ embossing calender

Your advantages

- Uniform line pressure distribution in the nip over the fabric width.
- Adjustable pressing width to suit change of fabric width under pressure without stopping production.
- Infinitely selectable line pressure in the nip.
- Thermal relief of the **PGT6** sleeve next to the fabric by retraction pistons to ensure a long roll sleeve life.
- Cylindrical rolls.
- Same sleeve for various fabric widths; no change of sleeve necessary.
- Relief from thick fabric selvages (Sulzer selvages) and gentle treatment of the selvages of knitted fabrics by line force adjustment in the edge zone.
- Easy installation and removal of the **PGT6** sleeve and engraving tube through shaft extension and clamp holder.
- Reduction of engraving costs through small tube diameter.



Embossing calender with mandrel and tube

In order to achieve optimal effects with different embossing designs, different calender pressures are essential. This is where the **Nipco™** embossing calender with its application advantage of providing nip compensation when using different calender pressures comes into use.

The advantage lies in the absolute assurance of nip compensation when employing various calender pressures.

The **Nipco™** embossing calender can be used as a 3 roll or 2 roll calender.

Nipco™ 3 roll embossing calender

The 3 roll calender is available in the following roll arrangements, from top to bottom:

- elastic supporting roll
- embossing tube/mandrel
- **Nipco™** roll.

The narrow, thin-walled engraving shell runs on a heated mandrel supported by the elastic and **Nipco™** roll.

This calender is optimal when the production sequence requires frequent changing of the embossing sleeve, possibly several times daily.

Further advantages of the 3 roll version are the low price of the embossing sleeve due to the small diameter and the engraving cost for the same.

The aforementioned roll arrangement enables problem-free application of all flat embossing designs. The embossing sleeve change - an important production factor - can take place in the shortest time. This is made possible by a special bearing construction, as well as the mandrel extension with clamp holder.

The sleeve is dismantled of the heated mandrel from one side. This construction obviates the necessity of changing the heating system (electric or oil heating) in the mandrel.

Deep embossings can also be achieved with the 3 roll combination, whereby the use of a special embossing belt made of an elastic material for protection of the **Nipco™** roll is necessary.

This embossing belt can be fitted or removed in the shortest time owing to the optimal machine construction. The material of the embossing belt ensures high reproducibility of the required embossings and effects and has a long life expectancy.

High glaze, lustre and compression processes can also be achieved with the same machine type when using a smooth steel tube.

Nipco™ 2 roll embossing calender

The 2 roll version of the embossing calender (type **Nipco™** Flex calender) has the following roll arrangement, from top to bottom:

- **Nipco™** roll
- engraved steel roll.

With this calender type, all flat embossing effects can easily be achieved.

Deep embossings can also be achieved by using an embossing belt for protection of the **Nipco™** roll.

This 2 roll version has a higher pressure in the basic machine, so that improved high glaze, lustre and compression effects can be achieved when using a smoothing roll.

The roll change (embossing roll/smoothing roll) is more time-consuming than with the 3 roll version.

For embossing special articles - plush or other pile fabric - these **Nipco™** embossing calenders are provided with the necessary additional equipment, such as brushes, pile layering apparatus and needle tension rolls.



Different embossing patterns

Effects and calender types	Nipco™ types			
	Nipco™ I	Nipco™ Flex	Nipco™ L	Embossing calender
Smoothing	●	●	●	● ²
Lustre	●	●	●	● [*]
High glaze	●	●	●	-
Air permeability	●	●	●	● ²
Soft hand	-	● ¹	●	-
Silk finish	● [*]	●	● [*]	-
Flat embossing	-	●	● [*]	●

*) possible by changing rolls

¹) with elastic counter-roll

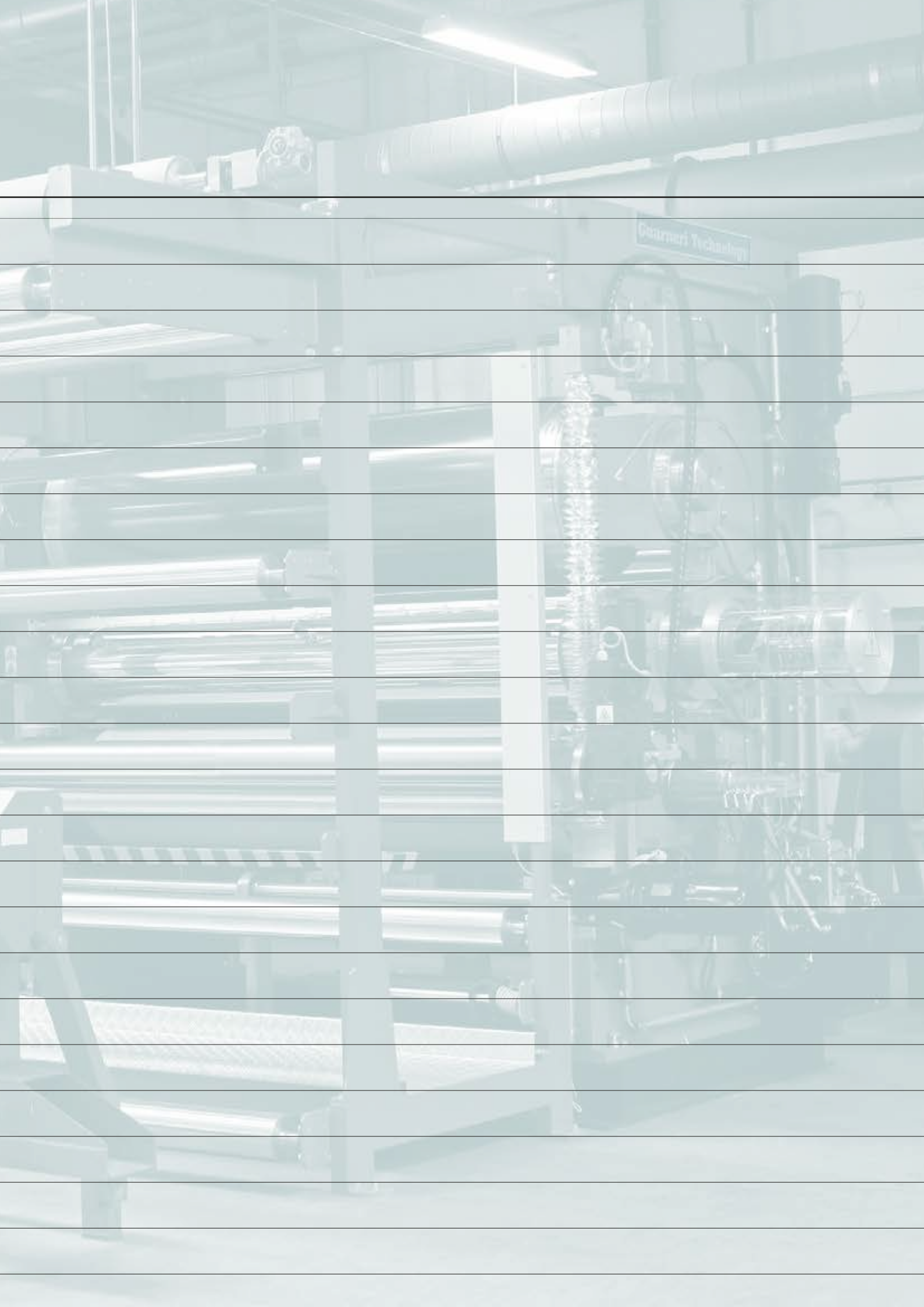
²) possible by changing tubes

Guarneri Technology™



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