



# LET'S ROLL!

ROLL COVERS AND SERVICES  
FOR THE PAPER INDUSTRY

**At Hannecard Group, you are guaranteed a top-notch service thanks to:**

# 120 YEARS OF EXPERIENCE

## **TOP-QUALITY, HIGH-TECH PRODUCTS AND SERVICES**

Hannecard boasts 120 years of experience and has become one of Europe's leading suppliers of rubber, polyurethane, composite and carbide coverings for rolls used in various industries, from paper to steel, plastic, wood, board, textile and food & beverage production.

We also develop elastomer specialties (surface protection, moulded parts & extruded profiles) for a range of industrial applications.

# SOLID EXPERT KNOW-HOW

## **AN EXPERIENCED TEAM**

Our highly skilled and experienced team relies on extensive expertise and know-how, and is driven to get the most out of all our customers' requests, not only in Europe, but worldwide. Through excellent resources, modern equipment and an open-minded approach, our teams at our three laboratories develop new rubber, polyurethane, composite and carbide compounds to meet the fast-changing needs of our customers. A specialised team looks into the broader functioning of rolls, resulting in total-concept solutions that create value.

We can produce any type of roll cover for all industries.

# A RELIABLE PARTNER FROM A TO Z

## AN EXTENSIVE NETWORK

Hannecard has multiple production units across Europe, as well as various joint ventures and licensees worldwide.

All of our sites meet the same strict quality standards, ensuring a reliable partner is never far away.

WHO  
WE  
ARE



**HANNECARD**  
YOUR ROLLER EXPERT

# HANNECARD GROUP

## FACTS & FIGURES

# 120

years of experience

# +20

production sites

# +900

employees



#### HANNECARD sites

- Ronse - BELGIUM
- La Flèche - FRANCE
- La Flèche - FRANCE (PAPER DIVISION)
- Dettwiller - FRANCE
- Bourgoin-Jallieu - FRANCE
- Rüti - SWITZERLAND
- Krakow - POLAND
- Cherepovets - RUSSIA
- Kursk - RUSSIA
- Ohio - USA
- California - USA
- Pietermaritzburg - SOUTH AFRICA (PAPER DIVISION)



#### FOCUS ON:

• **A customer-oriented approach**

• **High-quality R&D thanks to our in-house lab**

• **Innovative solutions and services**

# 100.000

roll coverings a year

# 1.500

tonnes of covers a year

#### HANNECARD Joint Ventures

- GOMPLAST - SPAIN
- GOMPLAST - CHINA
- MHP - GERMANY
- HMSU Rollers - INDIA
- TECNORULLI - ITALY
- HANNECARD - TUNISIA
- HANNECARD - ALGERIA
- HAMICO - BRASIL

#### PRODUCTION SITES FOR THE PAPER INDUSTRY

- **Hannecard France:** production of up to 32 tonnes/12 metres (length) by 2.4 metres (diameter)
- **Hannecard Russia:** production of up to 25 tonnes/12 meter (length) by 1.6 metres (diameter)





# HANNECARD PAPER

## A COMPLETE, CUSTOM SERVICE, FROM A TO Z

As a division of the Hannecard Group, we offer a complete service, from pulp production to converting, from **new rolls and roll repairs** to **roll coverings** and **technical support**. All backed by a strong global network and highly experienced teams.

You can count on us for **the sale and engineering of new rolls and repairs**, but also for the **development of custom cost-reduction oriented solutions**. A few examples? Nip profile optimisation, low-energy absorption covers and efficient dewatering solutions, such as the Surface Manager software, which allows you to optimize the cover surface design in order to lower the nip draining time. We can also perform a roll audit, both during operation and machine shutdown, provide any type of roll body and covers, and even assist you with your start-up. In a nutshell, Hannecard Paper is your trusted partner, from A to Z, for **TCO** (Total Cost of Ownership) solutions.

### A CUSTOMER-ORIENTED APPROACH, INNOVATION AND QUALITY

Hannecard Paper can count on a highly specialised team of technical experts and collaborations with leading paper institutes. That allows us to offer a wide range of custom solutions and services, including the development of specific covers.

**Innovation and quality** lie at the heart of our activities. We constantly monitor technological developments to **improve the efficiency** of paper machines and to push the limits of our covers. Our in-house R&D laboratory is equipped to take charge of quality control during the production process. We also have the equipment and expertise required for the measurement of the dynamical, mechanical, thermal, tribological, chemical and surface properties of our covers. We can optimise cover bonding resistance in the nip vs. nip load, speed, temperature and chemicals, in both wet and dry environments. Last but not least, we comply with strict industry standards and regulations. We have ISO 9001 Quality certification, our compound measurement tolerances are in line with ISO 6123 standards and we respect the 'REACH' standards, i.e. the European Union Regulation on the Registration, Evaluation, Authorisation and Restriction of Chemicals.



•  
**NEW ROLLS  
AND ROLL REPAIRS**

•  
**ROLL COVERINGS**

•  
**TECHNICAL SUPPORT**



HANNECARD PAPER

# OUR SERVICES

We offer a wide range of services for the paper industry, from the repair of used rolls to the replacement or delivery of new rolls, and the development of roll covers and coatings for all types of paper production.

**Our priorities?** Listening to our clients to find the solutions that best meet their needs and **optimise: maintenance costs, machine efficiency and paper quality.**

## 1 ROLL COVERING

- New covering or recovering, in any position of the paper mill, from pulp preparation to converting:
  - at our workshop: polyurethanes, composites, rubbers and carbides
  - on site: carbides
- Grinding (drilling and/or grooving)
  - at our workshop: all types of covers
  - on site: cylindrical grinding on metallic or carbide-covered rolls
- Inspection & expertise
- Repair & cleaning
- Optimisation

## 2 MECHANICAL ROLL SERVICES

- Complete overhaul (including cleaning, washing and spare parts replacement according to the needs identified during disassembly & inspection) of:
  - suction press rolls, suction couch rolls
  - crown-controlled rolls such as Kusters, CCRolls and Nipco, including a test run with a hydraulic bench
- Spreader rolls overhaul, all brands (*Mount Hope, Wittler, Plastex, Robec, Irga, Finbow, Tuvasa, Gorostidi, Kickert, Technomec, Hansen, Tevo, ...*)
- Journal replacement
- Bearing seat repairs
- Non-destructive tests (crack tests): upon request, we can conduct ultrasonic, magnetic particle and colour tests in order to check for cracks on rolls and journals, so as to limit the risk of major mechanical failures
- Dynamical balancing at machine speed
- Cleaning and Painting




### 3 ROLL BODIES

- New rolls (cores, shells and spreader rolls)
- Inspection & expertise
- Repair & cleaning
- Optimisation

### 4 VARIOUS SERVICES

- Paper machine audit
- Rolls & doctoring inspections during machine shutdown
- Profile measurements
- Thermographic analysis
- Creation of roll drawings from 3D geometrical controls
- Chemical resistance optimisation
- Start-up assistance
- NIP optimisation: to verify the performance of the grinding profile, we can make nip impressions (static and dynamic) in machines and conduct a wear-profile analysis
- New transport boxes



*optimise:  
maintenance costs  
machine efficiency  
paper quality*



# OUR PRODUCTS

Hannecard has over a century of experience in a range of demanding industries & applications. We always strive to boost the eco-efficiency of our cover solutions and we are proud to say our products guarantee the lowest heat build-up and energy absorption in the nip.

## 1 HARD & SOFT POLYURETHANE COVERS



### THE INDESTRUCTIBLE DAMPER

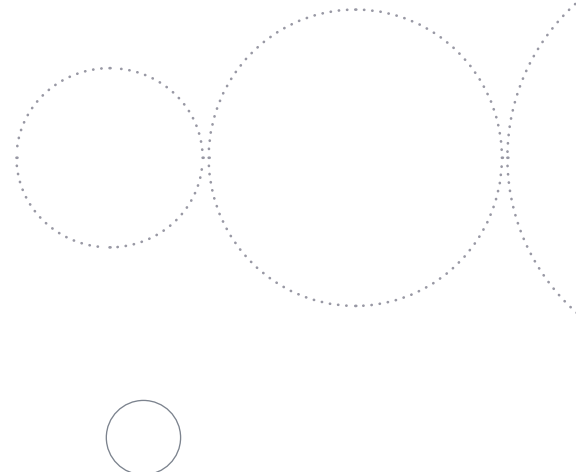
- Optimal resistance to hydrolysis, temperature and abrasion
- The ideal solution for the most demanding press-roll applications
- Fine-tuned surface design with possible combination of suction drilling, blind drilling and grooving
- Multilayer bonding system, with proven safety recorded in more than 200 applications
- Lowest energy and highest vibration absorption

## 2 HARD & SOFT RUBBER COVERS



### THE ALL-TERRAIN SPECIALIST

- We develop and mix our own formulations
- Internal rubber mixing unit set up and sized in order to ensure:
  - the best homogeneity for all our covers
  - a constant repeatability of our production
  - a controlled rubber quality dispatch to all our production sites worldwide
- Statistical analysis of all batches produced
- Predictive simulation software to ensure an optimal vulcanisation of the most complex rolls







### 3 COMPOSITE COVERS



#### THE AVANT-GARDIST

- Optimal surface release behaviour
- Highest shock absorption and energy dissipation
- Best abrasion and barring resistance
- Outmost profile stability and surface doctorability
- Excellent geometrical stability in high-temperature environments

### 4 TUNGSTEN & CHROMIUM CARBIDE COVERS



#### THE SURFACE MASTER

- Outstanding level of quality and reliability based on technology from the aeronautic industry
- Best resistance against corrosion in aqueous & acid environments
- Optimum resistance against oxidation at high temperatures
- Resistance against abrasion, erosion, cavitation and fretting
- Depending on the requested coating characteristics, we provide different thermal spray coating technologies, including HVOF M3, HVOF and electric arc for the production of tungsten and chromium carbides, nickel chromium and different metal coatings
- The latest technology available on the market: HVOF M3 gun for carbide covers providing the highest performance & homogeneity, the lowest porosity level (<0.5%) and the best adhesive strength on the metal core (> 70 MPa)
- Coatings can be applied on site or at our workshop

### 5 CLUPAK BLANKETS



The '8000 series' rubber blankets, used in Clupak machine sections, allow for paper extensibility through elongation in the nip.

Characteristics:

- Superior crack resistance
- Excellent flexing & elongation characteristics
- Extended lifetime
- Optimal on-site grindability

### 6 SPREADER ROLLS (PIKOASUR BRAND)

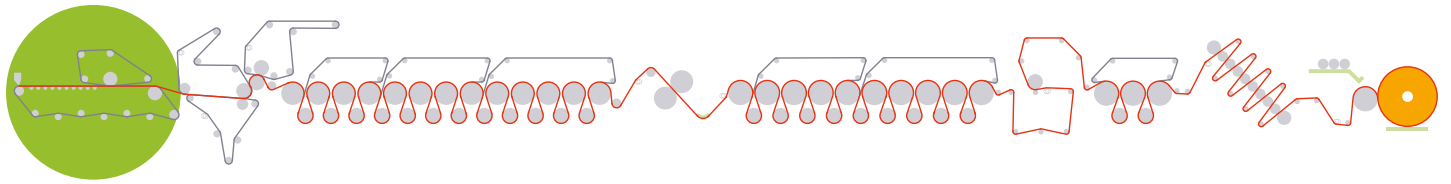


- Production of new spreader rolls since 2000
- Overhaul of existing spreader rolls (> 100 pcs / year)
- Offering solutions with rubber sleeves or metallic surface (steel, hard chromium, CarburFlon, PikoSpread)
- Optimization of unefficient design
- Experience on wide (> 9 m) and fast (> 2000 m/min) paper machines (*StoraEnso, UPM, SmurfitKappa, Burgo, DS Smith, ArjoWiggins, Ahlstrom-Munksjö, Lectä; ...*)

*covers  
top-notch  
quality  
guaranteed*

## Roll covers overview

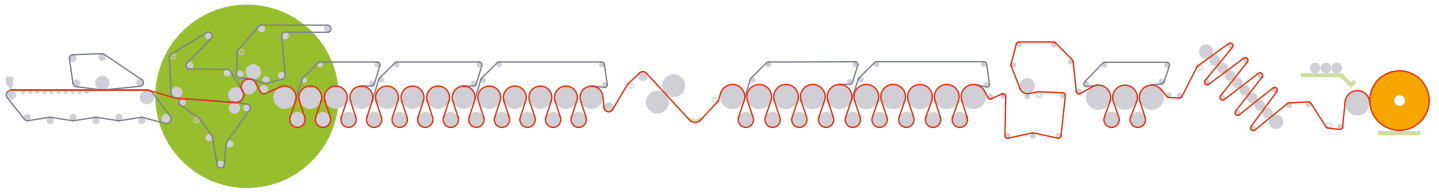
# FORMING SECTION



| BREAST ROLL, FORMING ROLL          |                  |                     |                       |               |                |
|------------------------------------|------------------|---------------------|-----------------------|---------------|----------------|
| Quality                            | Compound         | Abrasion resistance | Anti-adhesive surface | Doctorability | Eco efficiency |
| <b>Neostone</b>                    | Rubber           | ●●○○                | ●●○○                  | ●●○○          | ●●○○           |
| <b>Titan</b>                       | Composite        | ●●●○                | ●●○○                  | ●●●○          | ●●●○           |
| <b>Centaur</b>                     | Composite        | ●●●●                | ●●●○                  | ●●●●          | ●●●○           |
| <b>HanneSpray-Cr Plus</b>          | Chromium Carbide | ●●●●                | ●●●●                  | ●●●○          | ●●●●           |
| WIRE ROLL, TABLE ROLL              |                  |                     |                       |               |                |
| Quality                            | Compound         | Abrasion resistance | Anti-adhesive surface | Doctorability | Eco efficiency |
| <b>Neostone</b>                    | Rubber           | ●●○○                | ●●○○                  | ●●○○          | ●●○○           |
| <b>Titan</b>                       | Composite        | ●●●○                | ●●○○                  | ●●●○          | ●●●○           |
| <b>Centaur</b>                     | Composite        | ●●●○                | ●●●○                  | ●●●●          | ●●●○           |
| <b>HanneSpray-Cr Plus</b>          | Chromium Carbide | ●●●●                | ●●●●                  | ●●●○          | ●●●●           |
| <b>Carburflon NG</b>               | Tungsten carbide | ●●●●                | ●●●●                  | ●●●●          | ●●●●           |
| SUCTION COUCH CYLINDER, MILLSPAUGH |                  |                     |                       |               |                |
| Quality                            | Compound         | Abrasion resistance | Anti-adhesive surface | Doctorability | Eco efficiency |
| <b>HanneDrive</b>                  | Rubber           | ●●○○                | ●●○○                  | ●●●●          | ●●○○           |
| <b>FlexoDrive</b>                  | Polyurethane     | ●●●○                | ●●●○                  | ●●●○          | ●●●○           |
| <b>HanneSpray-W</b>                | Tungsten carbide | ●●●●                | ●●●○                  | ●●○○          | ●●●●           |
| LUMPBREAKER                        |                  |                     |                       |               |                |
| Quality                            | Compound         | Abrasion resistance | Anti-adhesive surface | Doctorability | Eco efficiency |
| <b>HanneLump</b>                   | Rubber           | ●●●○                | ●●●○                  | ●●●○          | ●●●○           |
| <b>HanneLump HT</b>                | Rubber           | ●●●○                | ●●●○                  | ●●●●          | ●●●○           |
| HELPER, WIRE DRIVING ROLL          |                  |                     |                       |               |                |
| Quality                            | Compound         | Abrasion resistance | Anti-adhesive surface | Doctorability | Eco efficiency |
| <b>HanneDrive</b>                  | Rubber           | ●●○○                | ●●○○                  | ●●●●          | ●●○○           |
| <b>FlexoDrive</b>                  | Polyurethane     | ●●●○                | ●●●○                  | ●●●○          | ●●●○           |

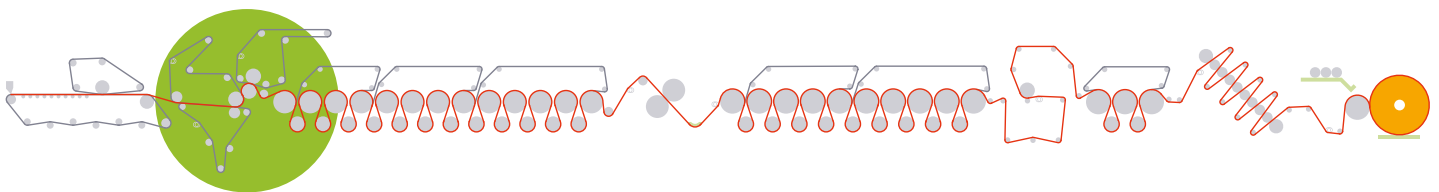


## PRESS SECTION - 1 - in contact with paper



| HARD PRESS ROLL, CENTER PRESS ROLL, HARD SMOOTHING PRESS |                  |                     |               |               |                |
|--|------------------|---------------------|---------------|---------------|----------------|
| Quality  | Compound         | Abrasion resistance | Doctorability | Sheet release | Eco efficiency |
| <b>HanneRock</b>   | Rubber           | ●●○○                | ●●○○          | ●●○○          | ●●○○           |
| <b>Sirius</b>  | Composite        | ●●●○                | ●●●○          | ●●●○          | ●●●○           |
| <b>Vega</b>  | Composite        | ●●●●                | ●●●●          | ●●●●          | ●●●○           |
| SOFT PRESS ROLL  |                  |                     |               |               |                |
| Quality  | Compound         | Abrasion resistance | Doctorability | Sheet release | Eco efficiency |
| <b>HannePress Plus</b>                                   | Rubber           | ●●●○                | ●●●○          | ●●●○          | ●●●○           |
| SOFT SMOOTHING PRESS                                     |                  |                     |               |               |                |
| Quality  | Compound         | Abrasion resistance | Doctorability | Sheet release | Eco efficiency |
| <b>HannePress</b>  | Rubber           | ●●●○                | ●●●○          | ●●●●          | ●●●○           |
| <b>Visiomat II</b>                                       | Composite        | ●●●●                | ●●●○          | ●●●●          | ●●●○           |
| PAPER-TOUCHED ROLL, PAPER GUIDE ROLL                     |                  |                     |               |               |                |
| Quality  | Compound         | Abrasion resistance | Doctorability | Sheet release | Eco efficiency |
| <b>Titan</b>   | Composite        | ●●●○                | ●●○○          | ●●○○          | ●●●○           |
| <b>Centaur</b>   | Composite        | ●●●○                | ●●●○          | ●●●○          | ●●●○           |
| <b>Carburflon NG</b>                                     | Tungsten carbide | ●●●●                | ●●●●          | ●●●●          | ●●●●           |

## PRESS SECTION - 2 - in contact with felts



| SUCTION PRESS ROLL, PICK UP PRESS ROLL           |              |                     |                    |                       |                      |                |
|--|--------------|---------------------|--------------------|-----------------------|----------------------|----------------|
| Quality  | Compound     | Abrasion resistance | Hardness stability | Dewatering efficiency | Vibration absorption | Eco efficiency |
| <b>Alveomat</b>                                  | Rubber       | ●●●○                | ●●●○               | ●●○○                  | ●●○○                 | ●●○○           |
| <b>Flexolys</b>                                  | Polyurethane | ●●●●                | ●●●●               | ●●●○                  | ●●●○                 | ●●●○           |
| <b>NeoFlex</b>                                   | Polyurethane | ●●●●                | ●●●●               | ●●●●                  | ●●●●                 | ●●●●           |
| PRESS ROLL (PLAIN, BLIND DRILLED AND/OR GROOVED) |              |                     |                    |                       |                      |                |
| Quality  | Compound     | Abrasion resistance | Hardness stability | Dewatering efficiency | Vibration absorption | Eco efficiency |
| <b>HannePress</b>                                | Rubber       | ●●●○                | ●●●○               | ●●○○                  | ●●○○                 | ●●○○           |
| <b>Flexolys</b>                                  | Polyurethane | ●●●●                | ●●●●               | ●●●○                  | ●●●○                 | ●●●○           |
| <b>NeoFlex</b>                                   | Polyurethane | ●●●●                | ●●●●               | ●●●●                  | ●●●●                 | ●●●○           |



## Roll covers overview

| JUMBO PRESS ROLL (HLP, ENP) |          |                     |                    |                       |                |  |
|-----------------------------|----------|---------------------|--------------------|-----------------------|----------------|--|
| Quality                     | Compound | Abrasion resistance | Hardness stability | Dewatering efficiency | Eco efficiency |  |
| <b>HannePress HP</b>        | Rubber   | ● ● ● ○             | ● ● ● ○            | ● ● ● ○               | ● ● ● ○        |  |

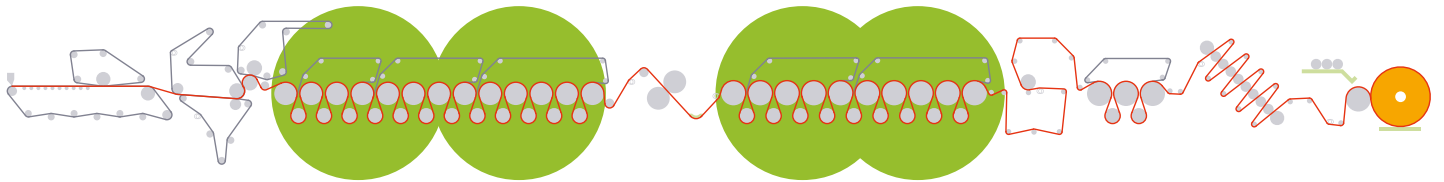
  

| FELT ROLL, FELT GUIDE ROLL |                  |                     |                   |                |  |
|----------------------------|------------------|---------------------|-------------------|----------------|--|
| Quality                    | Compound         | Abrasion resistance | Ageing resistance | Eco efficiency |  |
| <b>Neostone</b>            | Rubber           | ● ● ○ ○             | ● ● ○ ○           | ● ● ○ ○        |  |
| <b>Titan</b>               | Composite        | ● ● ● ○             | ● ● ○ ○           | ● ● ● ○        |  |
| <b>Centaur</b>             | Composite        | ● ● ● ○             | ● ● ● ○           | ● ● ● ○        |  |
| <b>Carburflon NG</b>       | Tungsten carbide | ● ● ● ●             | ● ● ● ●           | ● ● ● ●        |  |

| SPREADING FELT ROLL  |          |                     |                  |                |  |
|----------------------|----------|---------------------|------------------|----------------|--|
| Quality              | Compound | Abrasion resistance | Spreading effect | Eco efficiency |  |
| <b>Neostone G</b>    | Rubber   | ● ● ● ○             | ● ● ● ●          | ● ● ● ○        |  |
| <b>HanneSpread G</b> | Rubber   | ● ● ● ●             | ● ● ● ○          | ● ● ● ○        |  |

## DRYING SECTION



| DRYER CYLINDER, CAN DRYER |                  |                     |                       |               |                |
|---------------------------|------------------|---------------------|-----------------------|---------------|----------------|
| Quality                   | Compound         | Abrasion resistance | Anti-adhesive surface | Doctorability | Eco efficiency |
| <b>CarburFlon NG</b>      | Tungsten carbide | ● ● ● ●             | ● ● ● ●               | ● ● ● ●       | ● ● ● ●        |

| DRYING FELT ROLL, DRYING WIRE ROLL |                  |                     |                       |                |
|------------------------------------|------------------|---------------------|-----------------------|----------------|
| Quality                            | Compound         | Abrasion resistance | Anti-adhesive surface | Eco efficiency |
| <b>Titan</b>                       | Composite        | ● ● ● ○             | ● ● ○ ○               | ● ● ● ○        |
| <b>Centaur</b>                     | Composite        | ● ● ● ●             | ● ● ● ○               | ● ● ● ○        |
| <b>Carburflon NG</b>               | Tungsten carbide | ● ● ● ●             | ● ● ● ●               | ● ● ● ●        |

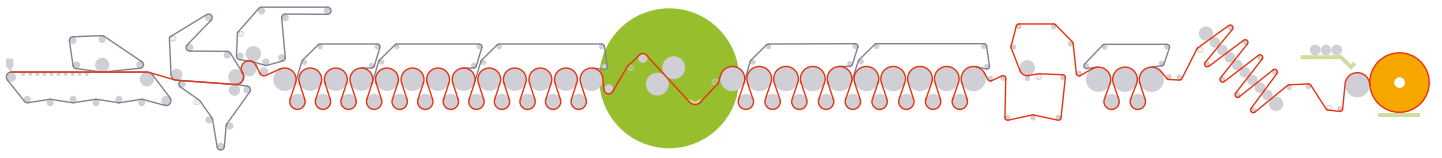
| PAPER-TOUCHED ROLL, PAPER GUIDE ROLL |                  |                     |                       |                      |                       |                |
|--------------------------------------|------------------|---------------------|-----------------------|----------------------|-----------------------|----------------|
| Quality                              | Compound         | Abrasion resistance | Anti-adhesive surface | Friction coefficient | Antistatic properties | Eco efficiency |
| <b>Titan</b>                         | Composite        | ● ● ● ○             | ● ● ○ ○               | ● ● ● ●              | ● ○ ○ ○               | ● ● ● ○        |
| <b>Titan AS II</b>                   | Composite        | ● ● ● ○             | ● ● ● ○               | ● ● ● ○              | ● ● ● ●               | ● ● ● ○        |
| <b>Centaur</b>                       | Composite        | ● ● ● ●             | ● ● ● ○               | ● ● ● ○              | ● ○ ○ ○               | ● ● ● ○        |
| <b>Carburflon NG</b>                 | Tungsten carbide | ● ● ● ●             | ● ● ● ●               | ● ● ○ ○              | ● ● ○ ○               | ● ● ● ●        |

| VACROLL, DRYING FELT / WIRE SUCTION CYLINDER |                  |                     |                       |                      |                |
|--|------------------|---------------------|-----------------------|----------------------|----------------|
| Quality                                      | Compound         | Abrasion resistance | Anti-adhesive surface | Corrosion resistance | Eco efficiency |
| <b>HanneSpray-W</b>                          | Tungsten carbide | ● ● ● ●             | ● ● ● ●               | ● ● ● ●              | ● ● ● ●        |



# SIZING



## HARD SIZE PRESS

| Quality          | Compound  | Abrasion resistance | Hardness stability vs T° | Eco efficiency |
|------------------|-----------|---------------------|--------------------------|----------------|
| <b>HelioRock</b> | Rubber    | ●●○○                | ●●●○                     | ●●●○           |
| <b>Sirius SP</b> | Composite | ●●●●                | ●●●●                     | ●●●●           |

## SOFT SIZE PRESS

| Quality               | Compound | Abrasion resistance | Hardness stability vs T° | Eco efficiency |
|-----------------------|----------|---------------------|--------------------------|----------------|
| <b>TactiSize</b>      | Rubber   | ●●○○                | ●●○○                     | ●●●○           |
| <b>TactiSize Plus</b> | Rubber   | ●●●○                | ●●●○                     | ●●●○           |
| <b>XperSize</b>       | Rubber   | ●●●●                | ●●●○                     | ●●●●           |

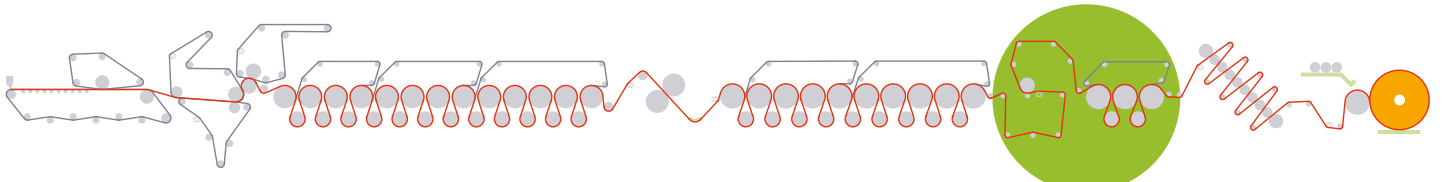
## FILM PRESS, SIZER PRESS ROLL

| Quality               | Compound     | Abrasion resistance | Ageing resistance | Vibration absorption | Film transfer | Eco efficiency |
|-----------------------|--------------|---------------------|-------------------|----------------------|---------------|----------------|
| <b>TactiSize Plus</b> | Rubber       | ●●○○                | ●●●○              | ●●●○                 | ●●●○          | ●●●○           |
| <b>XperSize</b>       | Rubber       | ●●●○                | ●●●○              | ●●●○                 | ●●●●          | ●●●●           |
| <b>ExoSize</b>        | Polyurethane | ●●●●                | ●●●●              | ●●●●                 | ●●●●          | ●●●●           |

## PAPER-TOUCHED ROLL, PAPER GUIDE ROLL

| Quality              | Compound         | Abrasion resistance | Anti-adhesive surface | Friction coefficient | Eco efficiency |
|----------------------|------------------|---------------------|-----------------------|----------------------|----------------|
| <b>Titan R</b>       | Composite        | ●●○○                | ●●○○                  | ●●●●                 | ●●○○           |
| <b>Centaur</b>       | Composite        | ●●●○                | ●●●○                  | ●●●○                 | ●●●○           |
| <b>Carburflon NG</b> | Tungsten carbide | ●●●●                | ●●●●                  | ●●○○                 | ●●●●           |

# COATING



## BACKING ROLL, APPLICATOR ROLL

| Quality          | Compound | Abrasion resistance | Hardness stability | Ageing resistance | Eco efficiency |
|------------------|----------|---------------------|--------------------|-------------------|----------------|
| <b>TactiCoat</b> | Rubber   | ●●○○                | ●●●●               | ●●●○              | ●●●○           |
| <b>StarCoat</b>  | Rubber   | ●●●○                | ●●●○               | ●●●○              | ●●●○           |

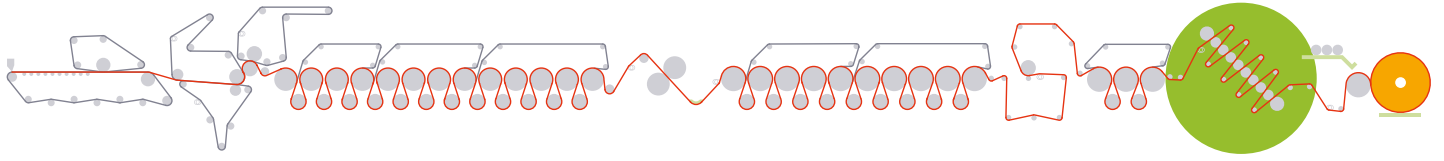
## SPLICING ROLL

| Quality             | Compound | Abrasion resistance | Hardness stability | Ageing resistance | Eco efficiency |
|---------------------|----------|---------------------|--------------------|-------------------|----------------|
| <b>HanneDrum SR</b> | Rubber   | ●●●○                | ●●●○               | ●●●○              | ●●●○           |



Roll covers overview

# CALENDERING



## SOFT CALENDER ROLL

| Quality             | Compound  | Abrasion resistance | Anti-adhesive surface | Doctorability | Impact resistance | Temperature resistance | Eco efficiency |
|---------------------|-----------|---------------------|-----------------------|---------------|-------------------|------------------------|----------------|
| <b>Visiomat II</b>  | Rubber    | ● ● ○ ○             | ● ● ○ ○               | ● ● ○ ○       | ● ● ○ ○           | ● ● ○ ○                | ● ● ○ ○        |
| <b>Diamantal</b>    | Composite | ● ● ● ○             | ● ● ● ○               | ● ● ● ○       | ● ● ● ○           | ● ● ● ○                | ● ● ● ●        |
| <b>Diamantal NG</b> | Composite | ● ● ● ●             | ● ● ● ●               | ● ● ● ●       | ● ● ● ●           | ● ● ● ○                | ● ● ● ●        |
| <b>Diamantal HT</b> | Composite | ● ● ● ○             | ● ● ● ●               | ● ● ● ○       | ● ● ● ○           | ● ● ● ●                | ● ● ● ●        |

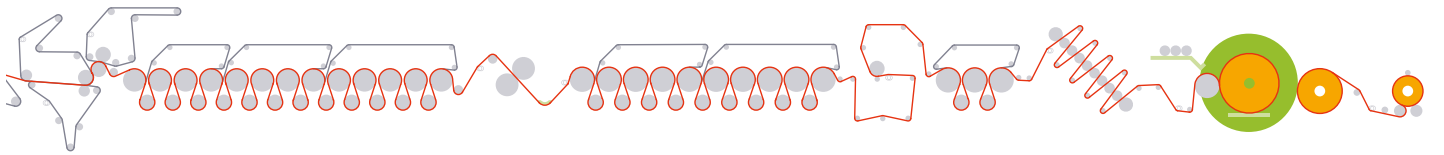
## HARD CALENDER ROLL

| Quality                  | Compound         | Abrasion resistance | Anti-adhesive surface | Doctorability | Impact resistance | Temperature resistance | Eco efficiency |
|--------------------------|------------------|---------------------|-----------------------|---------------|-------------------|------------------------|----------------|
| <b>HanneSpray-W</b>      | Tungsten carbide | ● ● ● ○             | ● ● ● ●               | ● ● ● ○       | ● ● ● ○           | ● ● ● ●                | ● ● ● ●        |
| <b>HanneSpray-W Plus</b> | Tungsten carbide | ● ● ● ●             | ● ● ● ●               | ● ● ● ●       | ● ● ● ●           | ● ● ● ●                | ● ● ● ●        |

## MARKING PRESS (CIGARETTE PAPER)

| Quality           | Compound     | Abrasion resistance | Anti-adhesive surface | Impact resistance | Temperature resistance | Eco efficiency |
|-------------------|--------------|---------------------|-----------------------|-------------------|------------------------|----------------|
| <b>FlexoPrint</b> | Polyurethane | ● ● ● ●             | ● ● ● ○               | ● ● ● ●           | ● ● ● ○                | ● ● ● ○        |

# REELING



## REEL SPOOL

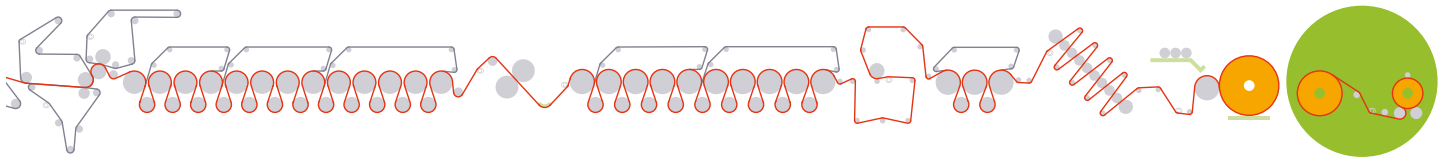
| Quality                     | Compound     | Abrasion resistance | Impact resistance | Temperature resistance | Antistatic properties | Eco efficiency |
|-----------------------------|--------------|---------------------|-------------------|------------------------|-----------------------|----------------|
| <b>Protectthane Plus</b>    | Polyurethane | ● ● ● ○             | ● ● ● ●           | ● ● ● ○                | ● ● ○ ○               | ● ● ● ○        |
| <b>Protectthane Plus AS</b> | Polyurethane | ● ● ● ○             | ● ● ● ●           | ● ● ● ○                | ● ● ● ●               | ● ● ● ○        |

## REEL DRUM, POPE REEL

| Quality             | Compound         | Abrasion resistance | Impact resistance | Temperature resistance | Eco efficiency |
|---------------------|------------------|---------------------|-------------------|------------------------|----------------|
| <b>HanneDrum SR</b> | Rubber           | ● ● ● ○             | ● ● ○ ○           | ● ● ● ○                | ● ● ● ○        |
| <b>HanneSpray-W</b> | Tungsten carbide | ● ● ● ●             | ● ● ● ●           | ● ● ● ●                | ● ● ● ●        |



# WINDING



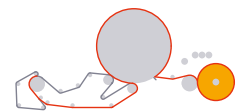
## DRUM ROLL

| Quality              | Compound         | Abrasion resistance | Impact resistance | Dampening efficiency | Friction coefficient | Friction coeff. stability | Eco efficiency |
|----------------------|------------------|---------------------|-------------------|----------------------|----------------------|---------------------------|----------------|
| <b>HannePrene AS</b> | Rubber           | ●●○○                | ●●○○              | ●●○○                 | ●●●○                 | ●●○○                      | ●●○○           |
| <b>Flexolys Foam</b> | Polyurethane     | ●●●○                | ●●●○              | ●●●●                 | ●●●●                 | ●●●○                      | ●●●○           |
| <b>HanneSpray-W</b>  | Tungsten carbide | ●●●●                | ●●●●              | ○○○○                 | ●●●○                 | ●●●●                      | ●●●●           |

## RIDER ROLL

| Quality              | Compound         | Abrasion resistance | Impact resistance | Dampening efficiency | Friction coefficient | Friction coeff. stability | Eco efficiency |
|----------------------|------------------|---------------------|-------------------|----------------------|----------------------|---------------------------|----------------|
| <b>HanneRide</b>     | Rubber           | ●●●○                | ●●○○              | ●●○○                 | ●●●○                 | ●●○○                      | ●●○○           |
| <b>Flexolys Foam</b> | Polyurethane     | ●●●○                | ●●●○              | ●●●●                 | ●●●●                 | ●●●○                      | ●●●○           |
| <b>HanneSpray-W</b>  | Tungsten carbide | ●●●●                | ●●●●              | ○○○○                 | ●●●○                 | ●●●●                      | ●●●●           |

# TISSUE



## SUCTION PRESSURE ROLL

| Quality           | Compound     | Abrasion resistance | Hardness stability | Dewatering efficiency | Vibration absorption | Eco efficiency |
|-------------------|--------------|---------------------|--------------------|-----------------------|----------------------|----------------|
| <b>TissuPress</b> | Rubber       | ●●○○                | ●○○○               | ●●○○                  | ●●○○                 | ●●○○           |
| <b>TissuStar</b>  | Rubber       | ●●●○                | ●●●○               | ●●●○                  | ●●●○                 | ●●●○           |
| <b>NeoFlex T</b>  | Polyurethane | ●●●●                | ●●●●               | ●●●●                  | ●●●●                 | ●●●●           |

## PRESSURE ROLL (PLAIN, BLIND DRILLED AND/OR GROOVED)

| Quality             | Compound     | Abrasion resistance | Hardness stability | Dewatering efficiency | Vibration absorption | Eco efficiency |
|---------------------|--------------|---------------------|--------------------|-----------------------|----------------------|----------------|
| <b>TissuPress</b>   | Rubber       | ●●○○                | ●○○○               | ●●○○                  | ●●○○                 | ●●○○           |
| <b>TissuStar</b>    | Rubber       | ●●●○                | ●●●○               | ●●●○                  | ●●●○                 | ●●●○           |
| <b>StarPress II</b> | Rubber       | ●●●●                | ●●●○               | ●●●○                  | ●●●○                 | ●●●○           |
| <b>NeoFlex T</b>    | Polyurethane | ●●●●                | ●●●●               | ●●●●                  | ●●●●                 | ●●●●           |

## YANKEE CYLINDER WITH CYLINDRICAL PROFILE

| Quality                   | Compound         | Abrasion resistance | Doctorability | Heat Transfer | Creping process | Eco efficiency |
|---------------------------|------------------|---------------------|---------------|---------------|-----------------|----------------|
| <b>HanneSpray-Cr</b>      | Chromium Carbide | ●●●○                | ●●●○          | ●●●○          | ●●●○            | ●●●○           |
| <b>HanneSpray-Cr Plus</b> | Chromium Carbide | ●●●●                | ●●●●          | ●●●●          | ●●●●            | ●●●●           |



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