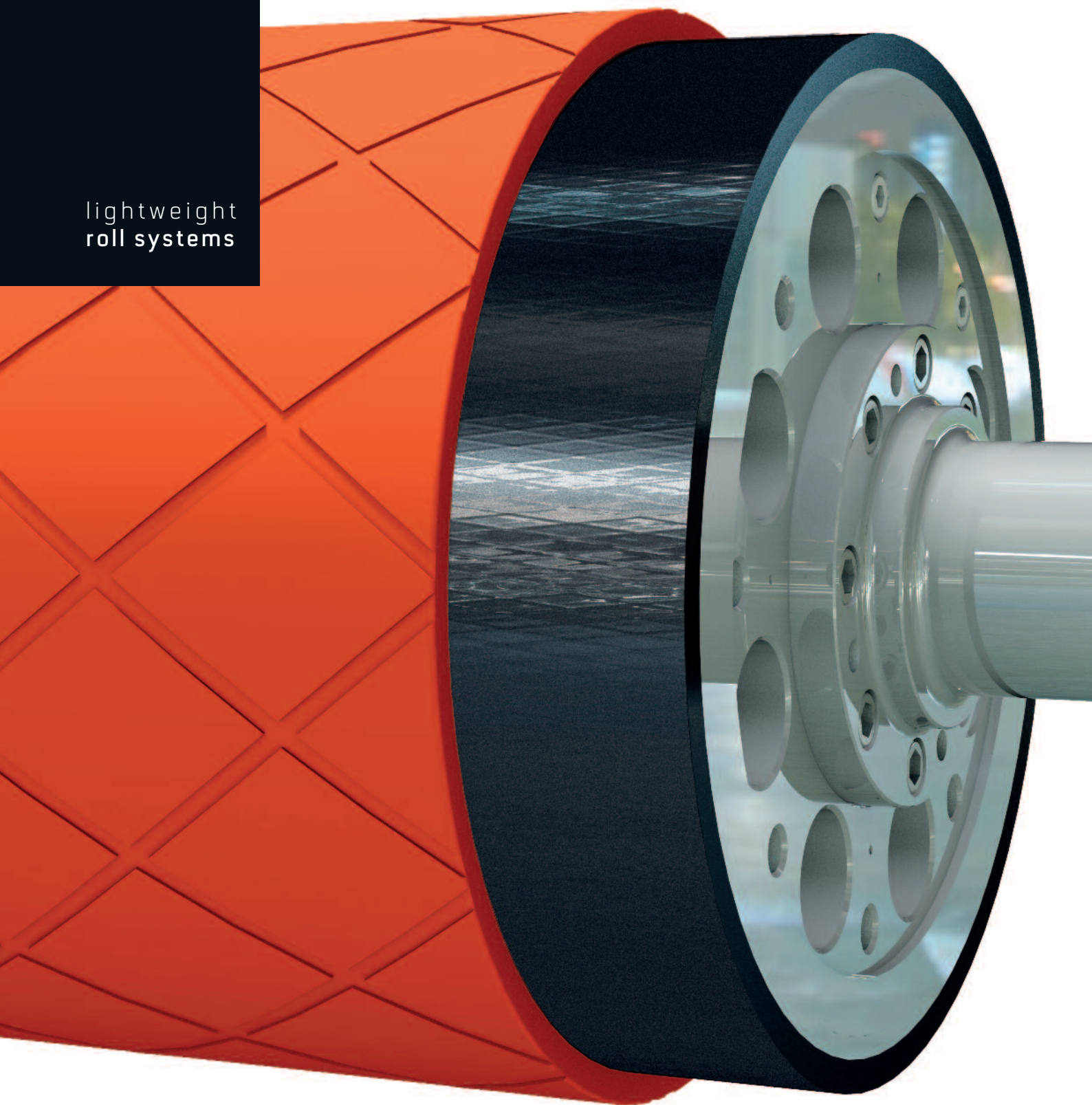


# :CCOR

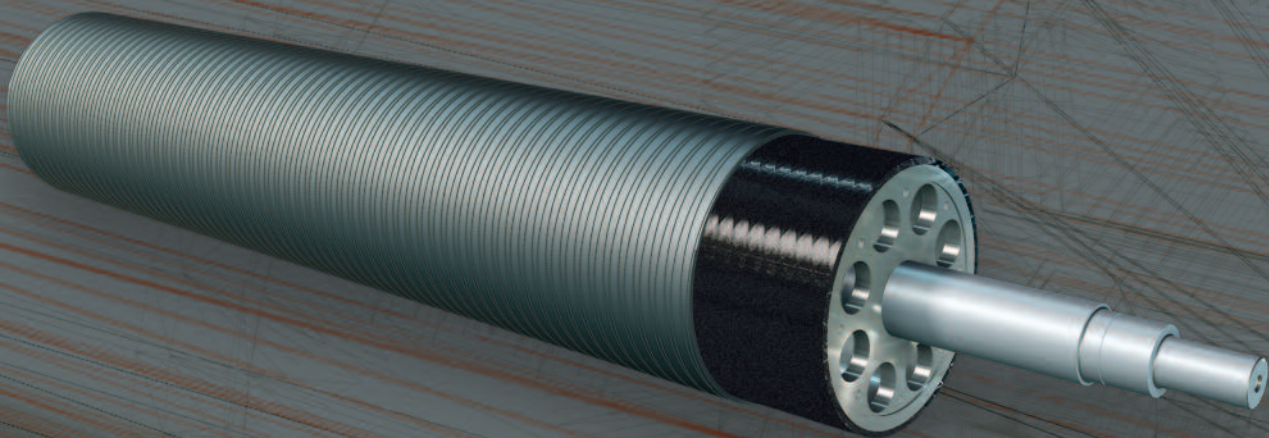
End-to-end solutions  
for lightweight  
roll systems

lightweight  
roll systems



# the shape of things to come: lightweight roll systems

in advanced composites technology.



## the :CCOR design concept for **lightweight** roll systems

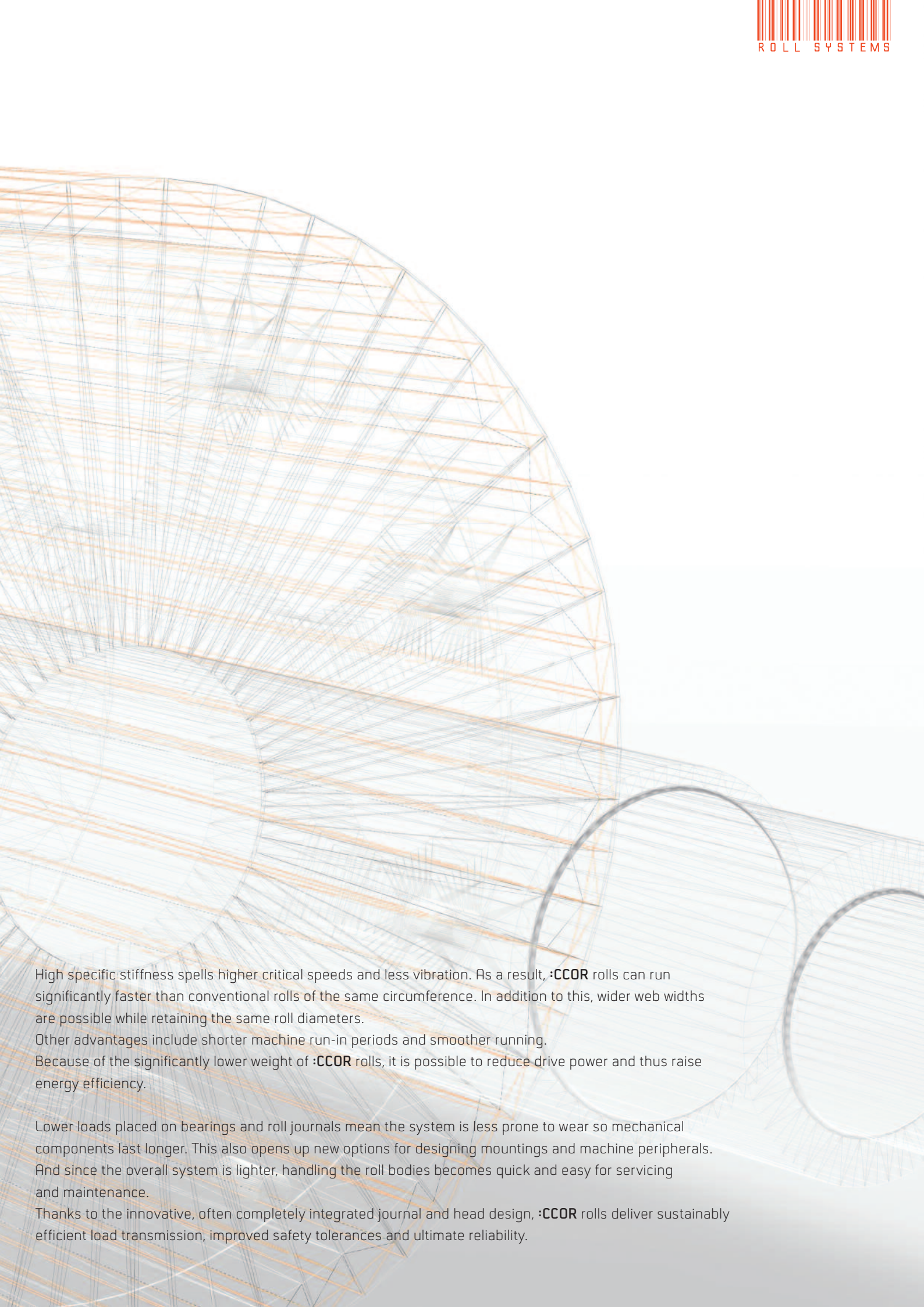
### End-to-end solutions for demanding web processing

One way to significantly improve profitability in the production of paper, films and foils, printed materials, metals and fabrics is to raise operating speeds and use broader web widths.

The problem is, sooner or later the metal roll systems installed in most manufacturing machines reach their technical limits. Especially in tight and cramped installations, machine operators typically face major challenges in terms of vibration, distortion, thermal expansion and high weights.

:CCOR roll systems are based on a fibre-reinforced composite construction, opening the door to new roll design possibilities that are not even feasible with traditional metal-based systems. The :CCOR concept draws on a treasure trove of technical know-how, a detailed understanding of the technology and potential offered by fibre-reinforced materials, a wealth of experience in mechanical engineering and design, total familiarity with technical applications and comprehensive knowledge of functional surfaces – all culminating in end-to-end roll systems whose runnability and performance can be optimised to match the specific application.

:CCOR rolls exploit the many advantages and benefits of the lightweight construction materials GFRP and CFRP: high specific stiffness, outstanding dynamic properties and a low thermal expansion coefficient – offering plenty of new design options for high-performance, fast-running roll bodies.

A large, semi-circular wireframe diagram of a roller structure, composed of numerous intersecting lines in orange and grey, creating a mesh-like appearance. The structure is shown in a perspective view, curving from the left towards the right. The background is a light, neutral tone.

High specific stiffness spells higher critical speeds and less vibration. As a result, **:CCOR** rolls can run significantly faster than conventional rolls of the same circumference. In addition to this, wider web widths are possible while retaining the same roll diameters.

Other advantages include shorter machine run-in periods and smoother running.

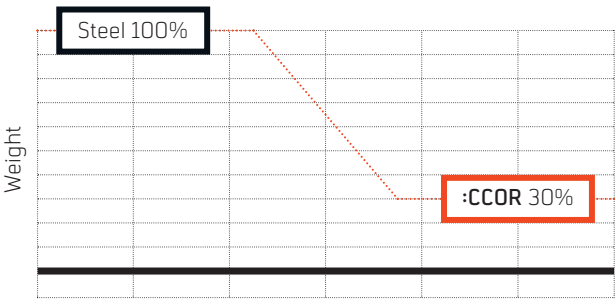
Because of the significantly lower weight of **:CCOR** rolls, it is possible to reduce drive power and thus raise energy efficiency.

Lower loads placed on bearings and roll journals mean the system is less prone to wear so mechanical components last longer. This also opens up new options for designing mountings and machine peripherals. And since the overall system is lighter, handling the roll bodies becomes quick and easy for servicing and maintenance.

Thanks to the innovative, often completely integrated journal and head design, **:CCOR** rolls deliver sustainably efficient load transmission, improved safety tolerances and ultimate reliability.

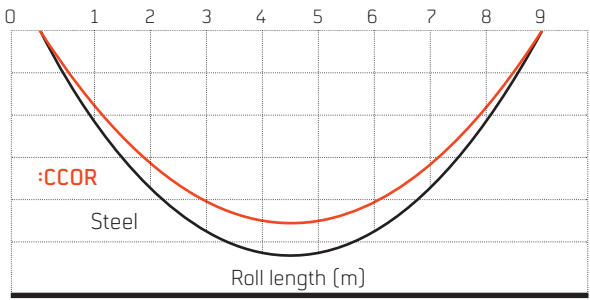
# :CCOR roll systems: features and benefits

light. stiff. fast.



## light

Weight comparison:  
Mass reduction of up to 70% compared to a steel roll of the same size.

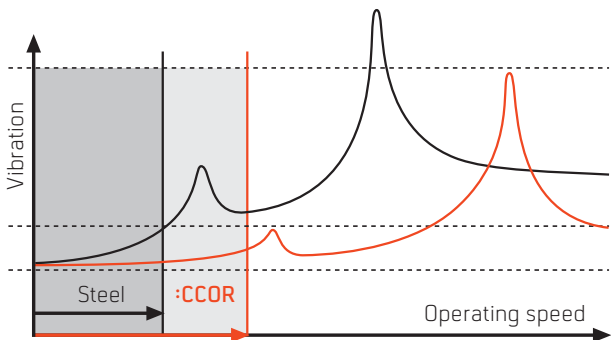


## stiff

:CCOR rolls offer low deflection under own weight, with minimal radial displacement even with higher web width.

## fast

Increase in the critical speed compared to steel.  
:CCOR rolls can operate at much higher speeds than conventional rolls of the same dimensions.



### Properties and advantages at a glance

- \*\*\*\*\*  
**significantly reduced weight**  
compared to steel rolls
- high energy efficiency**  
thanks to reduced drive power
- lower upfront investment**  
due to the use of lighter drives,  
bearings and journals
- easy handling**  
during installation and maintenance

### :ccor roll systems

- \*\*\*\*\*  
**thermal stability**  
thanks to a low thermal expansion coefficient
- fast startup**  
thanks to reduced run-in period
- wider web widths and faster machine operation**  
at the same diameters
- high operational reliability**  
thanks to fully integrated manufacturing process

:  
:  
:  
:  
:  
:  
:  
:  
:  
:

lightweight



**:CCOR**

lightweight  
roll systems

**Paper Industry**  
**Film & Foil**  
**Industry**  
**Printing Industry**  
**Textile Industry**  
**Non-Woven-**  
**Industry**  
**Metal Industry**

manufactured by  
**Schäfer MWN GmbH**  
[www.ccor.com](http://www.ccor.com)

# material, design and roll cover

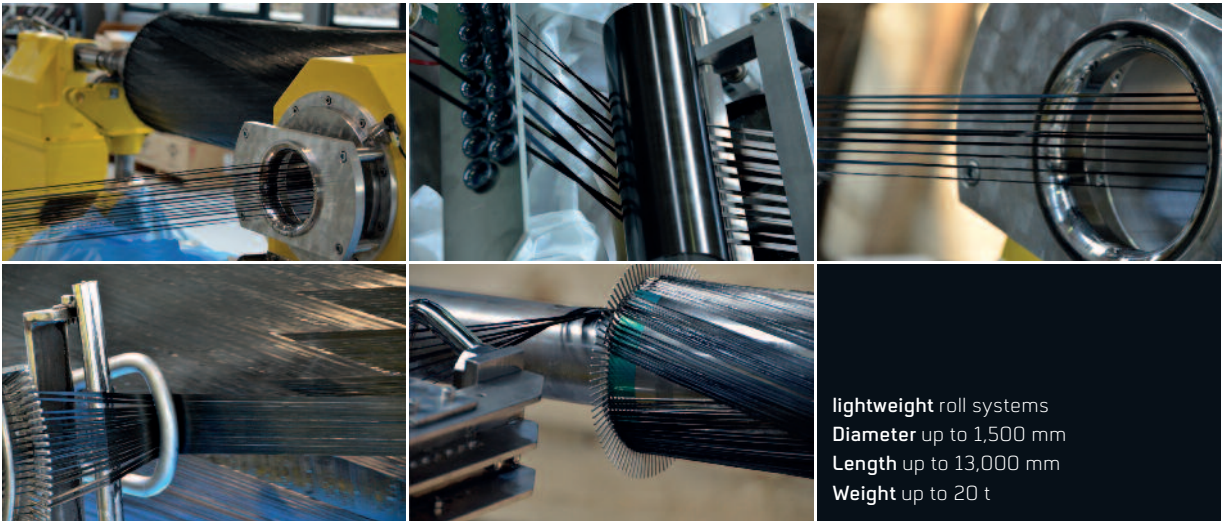
if things work together, they also work in harmony.

## roll systems in a completely new light

Developing an innovative roll body out of fibre-reinforced composites is not just about substituting conventional metal used in components – like steel or aluminium – and replacing them like-for-like with GFRP or CFRP.

Designing such sophisticated roll bodies entails going right back to the drawing board and looking at the overall system. Using a new material for a roll body means rethinking load transfer concepts, adapting journal and head designs and ensuring a reliable bonding of the surface coating.

However the system is redesigned, a roll system is only innovative if everything about the final product is 100% right – from the fundamental materials to the design to the roll surface.

|   |  |   |
|---|--|---|
| Technology  |  | :CCOR   |
| :CCOR operates state-of-the-art manufacturing equipment for the production of lightweight rolls using a filament winding process. |  |   |
|    |  | <p>lightweight roll systems</p> <p>Diameter up to 1,500 mm</p> <p>Length up to 13,000 mm</p> <p>Weight up to 20 t</p> |

## success stems from the system

The experts behind :CCOR span a variety of fields, from application technology to technical design, calculation, materials and production technology.

Their goal: to develop fundamentally new system concepts – ideally matched to your requirements.

Throughout the process, they draw on the wealth of experience and technical know-how at :CCOR's parent companies SchäferRolls, a manufacturer of high-performance roll covers made from elastomers and composites, and MWN Niefern, a specialist in metal processing, as well as mechanical design and manufacturing of roll systems.

Liaising directly with machine operators and working in close collaboration with your machine designers, the :CCOR engineers construct and simulate system concepts that bear every hallmark of coherent and systematic design. Not only does this entail the consistent use of ingeniously constructed lightweight materials, every component is optimally matched to all others. Also, the bonding between the fibre composite roll body and both the steel parts and the functional coating is made to last – and keep lasting.

# we bring function to the surface

through a detailed understanding of applications, experience and variety.



Functional coatings not only enhance the overall performance of roll systems, they also extend the range of applications for which the rolls can be used. Indeed they often play a pivotal role in improving the quality of the finished product. For example, typical requirements include scratch resistance, wear and corrosion protection, chemical resistance or non-stick properties.

Roll surface profiles such as grooving, diamond or spiral patterns play an essential part in the manufacturing process of the end product.

Sophisticated roll surface coatings of all kinds of polymer, metal, tungsten carbide and ceramic materials make :CCOR roll systems a complete solution for the most demanding web processing applications.

| surfaces   |  | :CCOR |
|--|--|-------|
| <p><b>Polymer covers:</b> rubber, polyurethane, thermoset</p> <p><b>Ceramic and hard metal coatings:</b> aluminium oxide, chromium oxide, tungsten carbides</p> <p><b>Steel and metal shells:</b> stainless steel, aluminium, copper</p> |  |       |
| <div><div><p>:CCOR offers a vast range of roll covers and coatings in all kinds of surface designs</p></div><div></div></div>  |  |       |

**Polymer covers:**

rubber, polyurethane, thermoset

**Ceramic and hard metal coatings:**

aluminium oxide, chromium oxide,  
tungsten carbides

**Steel and metal shells:**

stainless steel, aluminium, copper

# complete roll systems

solutions that are as individual as your processes.



|    |  |              |
|----|--|--------------|
| 01 | <b>web guide and carrying rolls</b>  | <b>:CCOR</b> |
|    | / paper / film & foil / print / textile & non-woven / metal /  |              |
|    | <b>Paper industry:</b> tensioning rolls, regulating rolls, wire guide rolls, felt guide rolls, dryer wire guide rolls, calender guide rolls, measuring rolls<br><b>Film &amp; foil industry:</b> guide rolls, carrying rolls, measuring rolls<br><b>Printing industry:</b> guide rolls, paster rolls<br><b>Textile &amp; non-woven industry:</b> guide rolls<br><b>Metal-processing industry:</b> deflector rolls, drive rolls |              |

**:CCOR** rolls really come into their own when they are used as web guide rolls and carrying rolls.

This is especially the case if the operating speed of the existing machinery needs to be increased but there is limited space to install a roll, there is minimal space to work between adjacent machinery, or there are restrictive adjustment tolerances.

This is where **:CCOR** rolls are guaranteed to operate without vibration, even within the same dimensions, simultaneously protecting bearings and machine frames. These lightweight systems offer a lower moment of inertia and minimal deflection.

They also perform outstandingly in terms of acceleration and braking properties, need less drive power and offer faultless web guidance even at tight wrap angles. When used as web tension or web speed measuring rolls, the readings are totally precise. Their low thermal expansion coefficient also make **:CCOR** rolls particularly well suited to use in varying temperatures. Lifting requirements during roll changes are significantly lower, thus reducing maintenance outlays and investment.

|    |  |              |
|----|--|--------------|
| 02 | <b>low deflection and adjustable bowed rolls</b>   | <b>:CCOR</b> |
|    | / paper / film & foil /  |              |
|    | <b>Paper industry:</b> spreader rolls<br><b>Film &amp; foil industry:</b> low deflection contact rolls, spreader rolls |              |

Optimised air venting and crease-free web guidance.

Depending on the application, **:CCOR** rolls can be designed with a specific stiffness and optimised vibration dampening. Pre-defined and, if necessary, adjustable deflection profiles can be set for the roll body and this offers strong benefits, especially with web winding processes where the nip width needs to be

kept uniform and nip pressure has to remain constant across the entire web so that air can be extracted. Highly uniform and freely adjustable bow heights on spreader rolls ensure continuous spreading and crease-free web guidance.

|    |   |       |
|----|---|-------|
| 03 | applicator and media transfer rolls   | :CCOR |
|    | / paper / printing /  |       |
|    | <b>Paper industry:</b> coater backing rolls<br><b>Printing industry:</b> inking rollers, dampening duct rollers, ink transfer rollers, rider rollers, dampening rollers |       |

#### Constant application and smooth running.

Application and media transfer processes are extremely demanding not only in terms of true running but also surface properties and the smooth running of the roll system. Since :CCOR rolls are so lightweight, they offer low intrinsic deflection and high stiffness. As a result, the rolls deliver outstanding shape retention even after longer storage periods. Thanks to stable

startup properties, the machine can be up and running quickly. What's more, the machines can also be run at significantly higher speeds, even below semi-critical speed. And since the functional covers applied on the rolls offer absolute homogeneity and chemical resistance, they ensure reliable and highly accurate media transfer.

|    |   |       |
|----|---|-------|
| 04 | treater rolls   | :CCOR |
|    | / film & foil /   |       |
|    | <b>Film &amp; foil industry:</b> corona treater rolls, flame treater rolls, nip rolls |       |

#### Surface treatment for the film & foil machines of the future.

Production of high-quality flexible films and foils requires ever faster production lines with increasing web widths. BOPP machines with web widths exceeding 10 metres are no exception these days. Frequently, the constraining factor in this development is the treater roll, whose function is to improve not only the adhesive strength of the foil being produced for later printing, gluing and metallisation processes. :CCOR rolls expand the boundaries of the design and technological development of treater machines, especially in terms of roll widths and operating speed. In tight spaces, existing roll diameter can be

maintained, despite faster operating speeds and larger machine widths. This helps keep time and effort for machine modification to a minimum. The low deflection, smooth operation and outstanding dimensional stability of :CCOR rolls ensure that electrodes and flames are kept safely in the correct parallel position. As a result, films are treated uniformly across the entire web, even at fast speeds.

:CCOR rolls have exceptional acceleration and braking properties, require less drive power and they are ready for operation after a minimal run-in time.

|    |  |       |
|----|--|-------|
| 05 | shaken breast rolls                        | :CCOR |
|    | / paper /                                  |       |
|    | <b>Paper industry:</b> shaken breast rolls |       |

#### Improved sheet structures hand-in-hand with enhanced energy and cost efficiency.

Because of their light weight and their low inertia, even at rapid acceleration rates, :CCOR shaken rolls play a decisive role in sheet formation in the wire section of paper, board and tissue machines. Even on more compact and less energy intensive shaking units and drives, :CCOR shaken rolls make it possible to achieve harmoniously and effective shaking, such that fibre

distribution and fibre formation central to the quality of the paper web is noticeably superior. The low level of vibration exerted on mechanical components and machine peripherals helps protect machine frames, bearings and bearing housings, significantly cutting the money and time invested in service and maintenance.

**:CCOR**

For more information,  
please contact:

Schäfer MWN GmbH  
Benzstraße 40  
71272 Renningen  
Germany

Telephone  
**+49 (7159) 806-500**

Fax  
**+49 (7159) 806-300**

[info@ccor.com](mailto:info@ccor.com)  
[www.ccor.com](http://www.ccor.com)

©SCHÄFER MWN GMBH 2014

