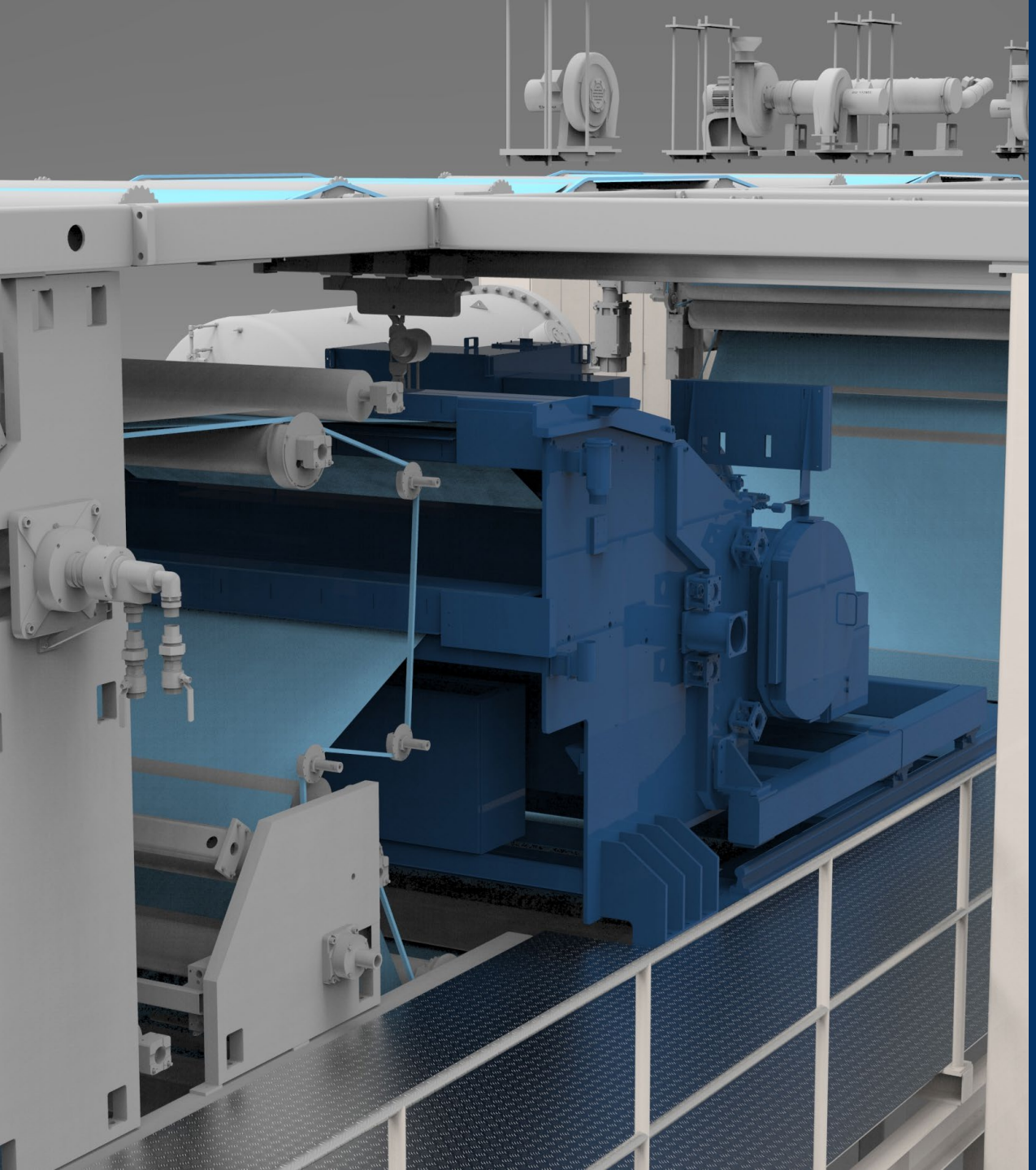


KROENERT

Machinery Concepts

for

decor and finish foils

Andrea Glawe, Michael Schmalz

26.01.2021 – EB-webinar

Agenda

1. Introduction of KROENERT
2. Technical and Technology Challenges
3. Realized Process Solutions
4. Application Technologies
5. Winding Technology
6. Web Moistening with Flatness Control
7. Examples of Coating Lines
8. Summary

Source of picture: PCT Ebeam

1.

Introduction of KROENERT

1. Introduction of KROENERT

Group of companies

ALTONAER TECHNOLOGIE HOLDING

- Foundation 2002
- 435 employees
- Located in Hamburg

KROENERT

- Foundation 1903
- 200 employees
- Located in Hamburg

DRYTEC

- Foundation 1995
- 50 employees
- Located in Norderstedt

Coatema® Coating Machinery GmbH

- Foundation 1974
- 45 employees
- Located in Dormagen

ZAE® ANTRIEBS SYSTEME

- Foundation 1919
- 140 employees
- Located in Hamburg

1. Introduction of KROENERT

Company portfolio

- Development and production of customised coating lines for processing of web materials
- Focus on production plants for commodity products and high-speed applications
- Mass-/volume markets & upscale in of production plants for new markets/niche markets

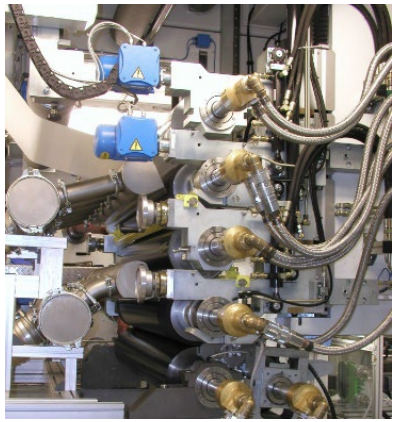
Location in Hamburg

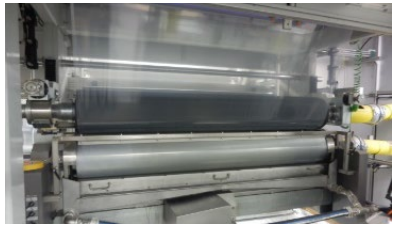
- Development & Process Engineering
- Engineering
- Production
- Assembly & Commissioning
- Technology Center
- After Sales Service

1. Introduction of KROENERT

Complete coating lines

Single coating units





Drying and curing

Winding technology

2.

Technical and Technology Challenges

Source of picture: Company Tauber - Webinar PCT

2. Technical and Technology Challenges

Customized machinery concepts

- Coating machine with custom engineered machinery design
- Versatile product requirement for the coating machine
- Differing chemistry of the recipes (chemistry, coating weight, rheology)
- Order sizes (small or big individual order size, fast reaction time)
- Short set-up times and high flexibility
- Existing space for machine installation
- Investment budget

2. Technical and Technology Challenges

Customized machinery concepts – process flexibility

- In-line with gravure / digital print followed by lacquer application
- One colour application followed by lacquer application
- In-line base coat, topcoat and surface structuring
- Pre-impregnation with EB-curing resins
- Wet lamination by coating on structured release liner
- Lacquer with structuring by PAC and Excimer
- Lacquer with structuring by engraved EB-drum

2. Technical and Technology Challenges

Machine design influenced by chemistry of recipes

- In-line coating machines with water based pigment lacquer and EB/UV-topcoat
- In-line coating machines with water based primer and EB-curing topcoat
- 100 % acylate lacquer
- Pre-coat with UV-curing and top lacquer with EB-curing

3.

Realized Process Solutions

3. Realized Process Solutions

Order sizes (small or big individual order size)

Fast change of working width

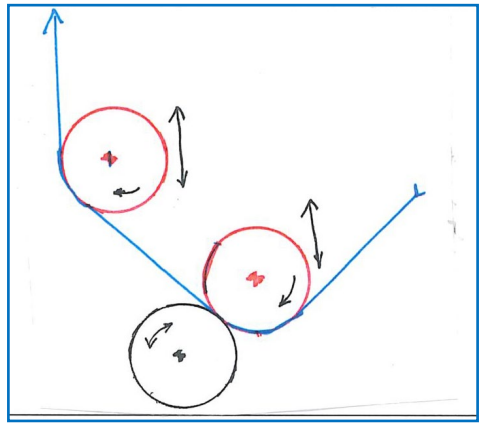
a) Sleeve technology

b) Revolver technology for fast change of the backing roller

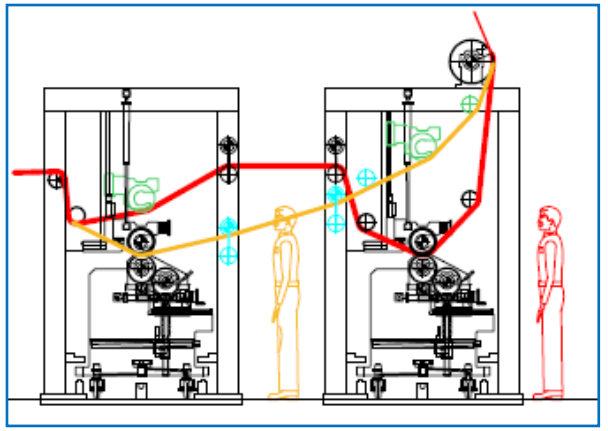
c) Double coating unit

a)

b)



c)

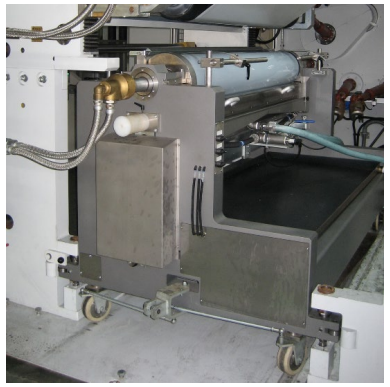


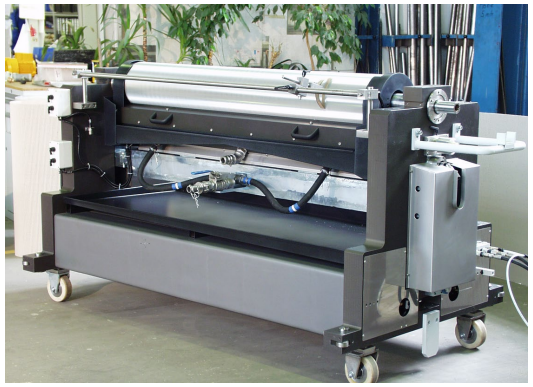
3. Realized Process Solutions

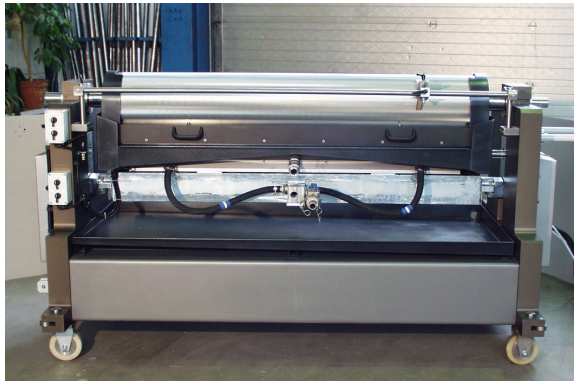
Order sizes (small or big individual order size)

Fast change of coating slurry

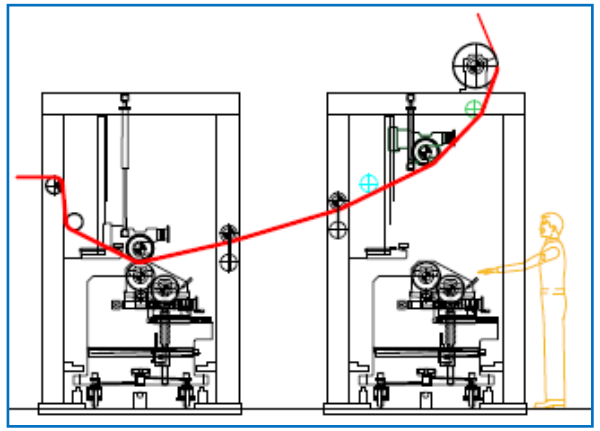
a) Trolley technology

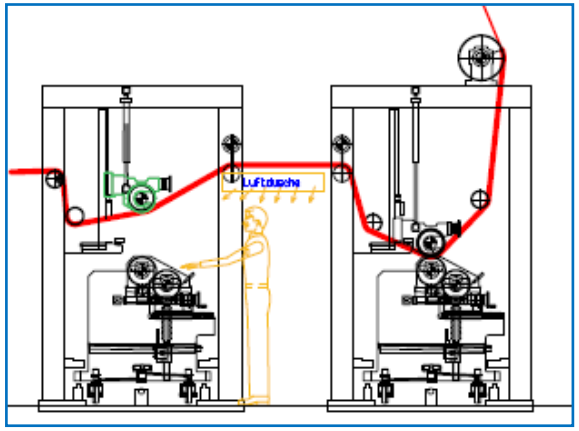






b) Double coating head





3. Realized Process Solutions

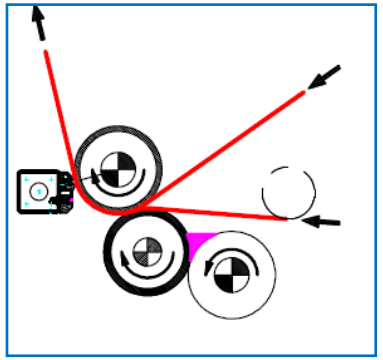
Order sizes (small or big individual order size)

Change of coating technology with short or without set-up times

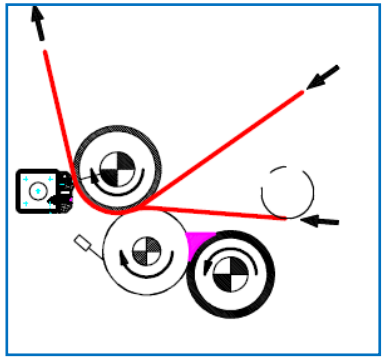
a) Coating out of nip

Reduction of cleaning time

out of the nip



Impregnation – coating roller
smooth rubber roller



Lacquering – coating roller
precise steel roller

b) Double coating head

4.

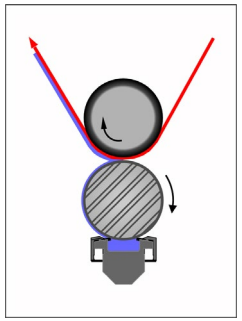
Application Technologies

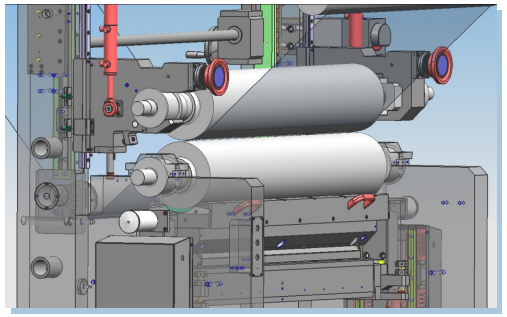
4. Application Technologies

Definition of the right coating method

Depends on

- viscosity under dynamic shear forces
- coating weight range
- chemistry data (solid content)
- working width
- productions speed





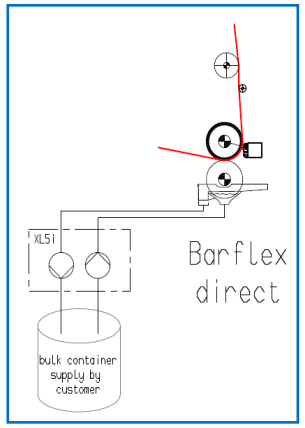
4. Application Technologies

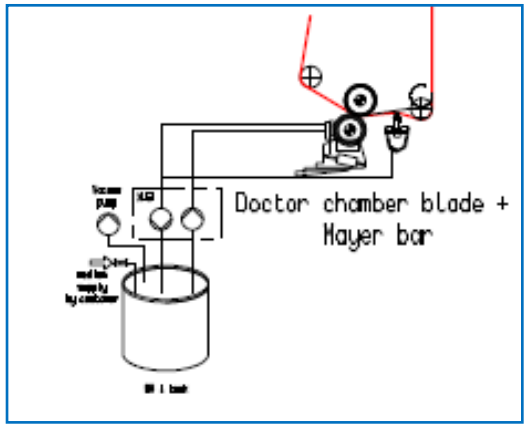
Definition of the right coating method

Selections between

Smooth roller

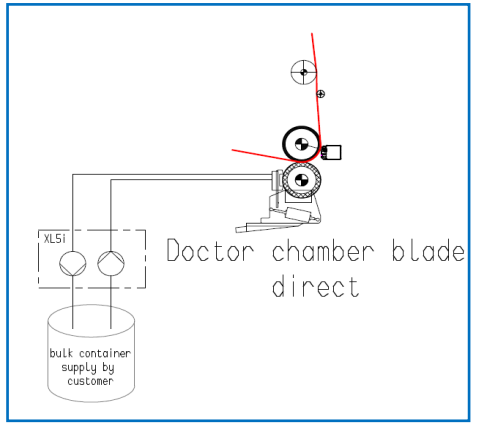
and metering with Barflex-method





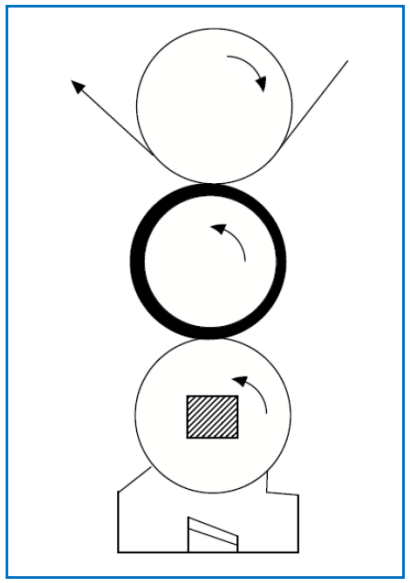
Gravure-Roller-Method with closed chamber system

and metering with Barflex-method

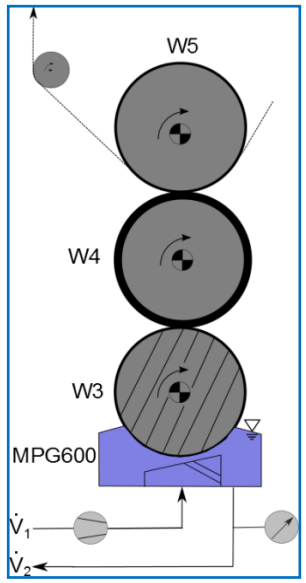


4. Application Technologies

Gravure roller technics with chamber type system



Forward run
for thin layer application

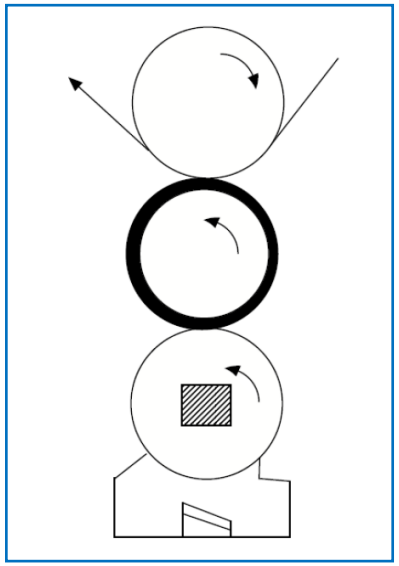


Reverse run
for thick layer application

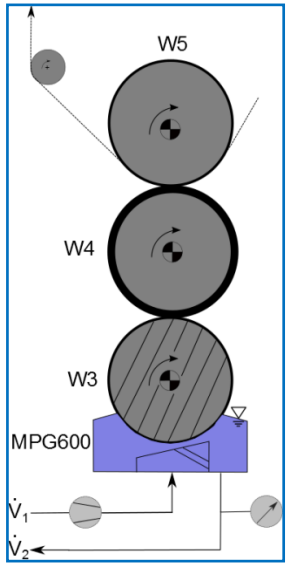
- Gravure roller and indirect application with pressurized system MPG 600 CI
- Practically realized coating weights 1 - 150 g/m² wet with water based and UV/EB 100% SF-lacquer
- Viscosity ≤ 2.000 mPas with thixotropic behavior of the coating mass or 800 - 1.000 mPas at constant flow without viscosity influence due to shear
- Pigments possible
- Foaming tendency very low
- Coating weight change only by change of the pressure in the MPG chamber, with negative blade up to 600 mbar
- Largest coating window

4. Application Technologies

Gravure roller technics with chamber type system



FORWARD



REVERSE

Practical results with gravure roller process and use of pressurized MPG 600 CI system

Speed	Coating weight
300 m/min	5 – 18 g/m2
250 m/min	40 g/m2
80 m/min	50 – 80 g/m2
50 m/min	150 g/m2

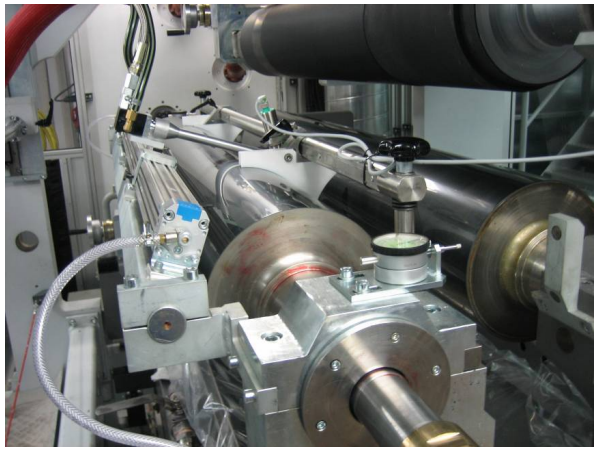
Coating weight range reached with **2 gravure roller, positive dosing blade and indirect coating with EB/UV-lacquer**

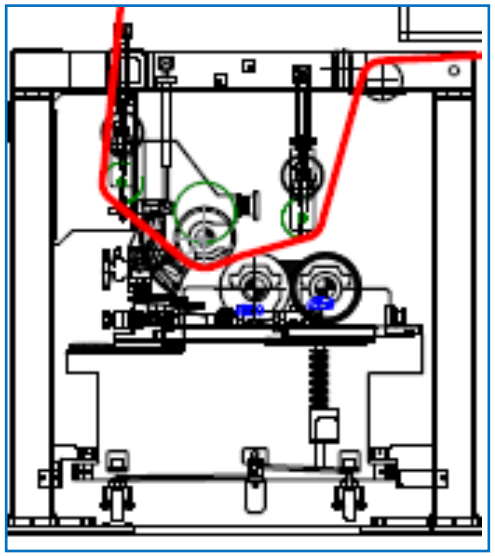
Attention:

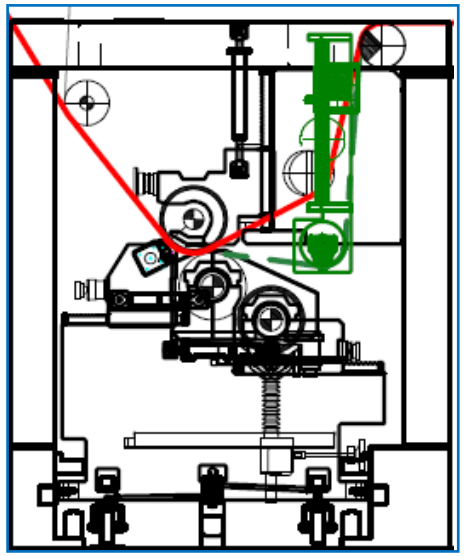
has to be tested and confirmed for each chemistry

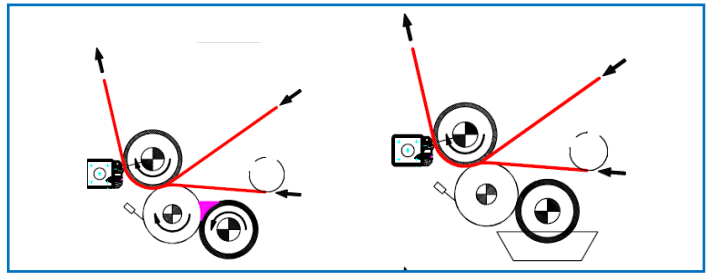
4. Application Technologies

Smooth roller coating process



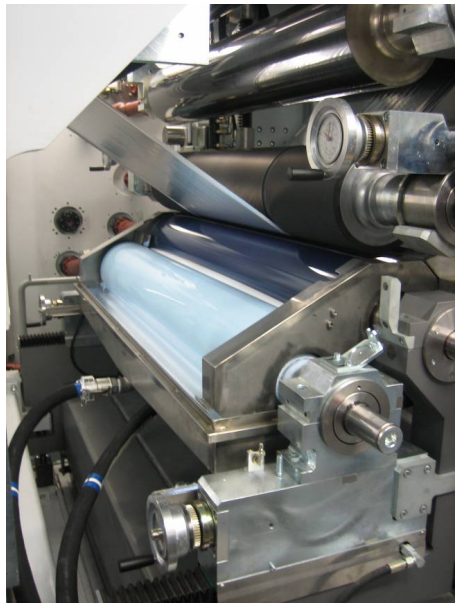






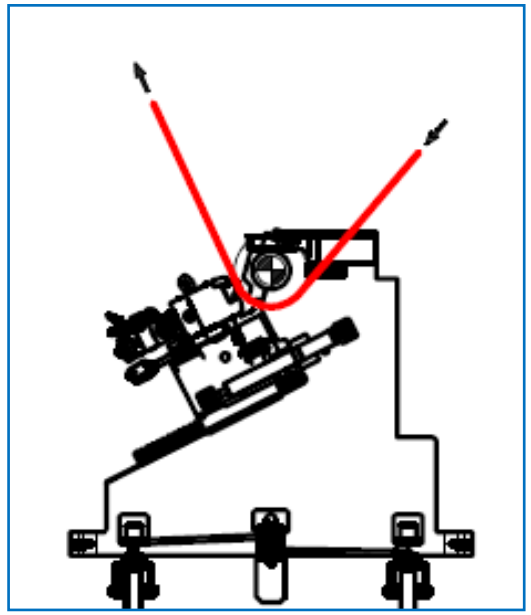
Out of the nip

Out of the pan

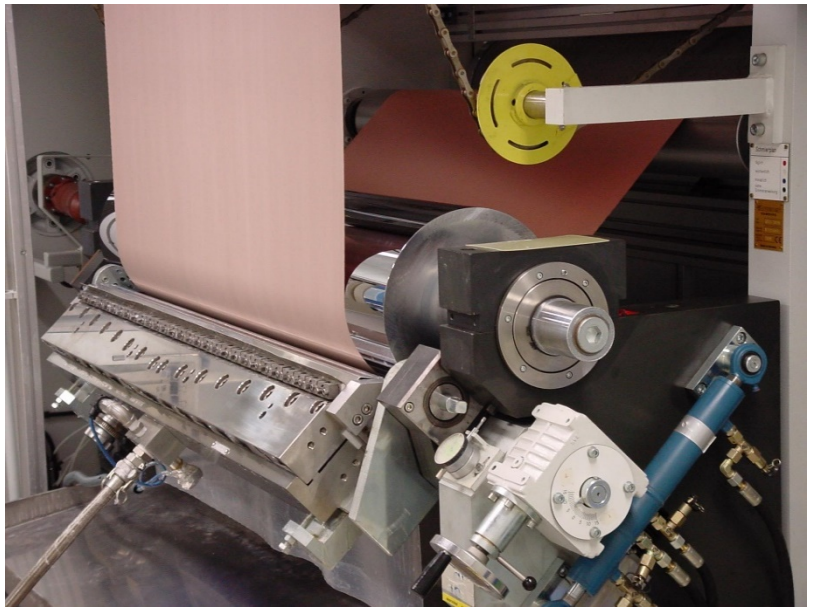


4. Application Technologies

Slot die coating technology



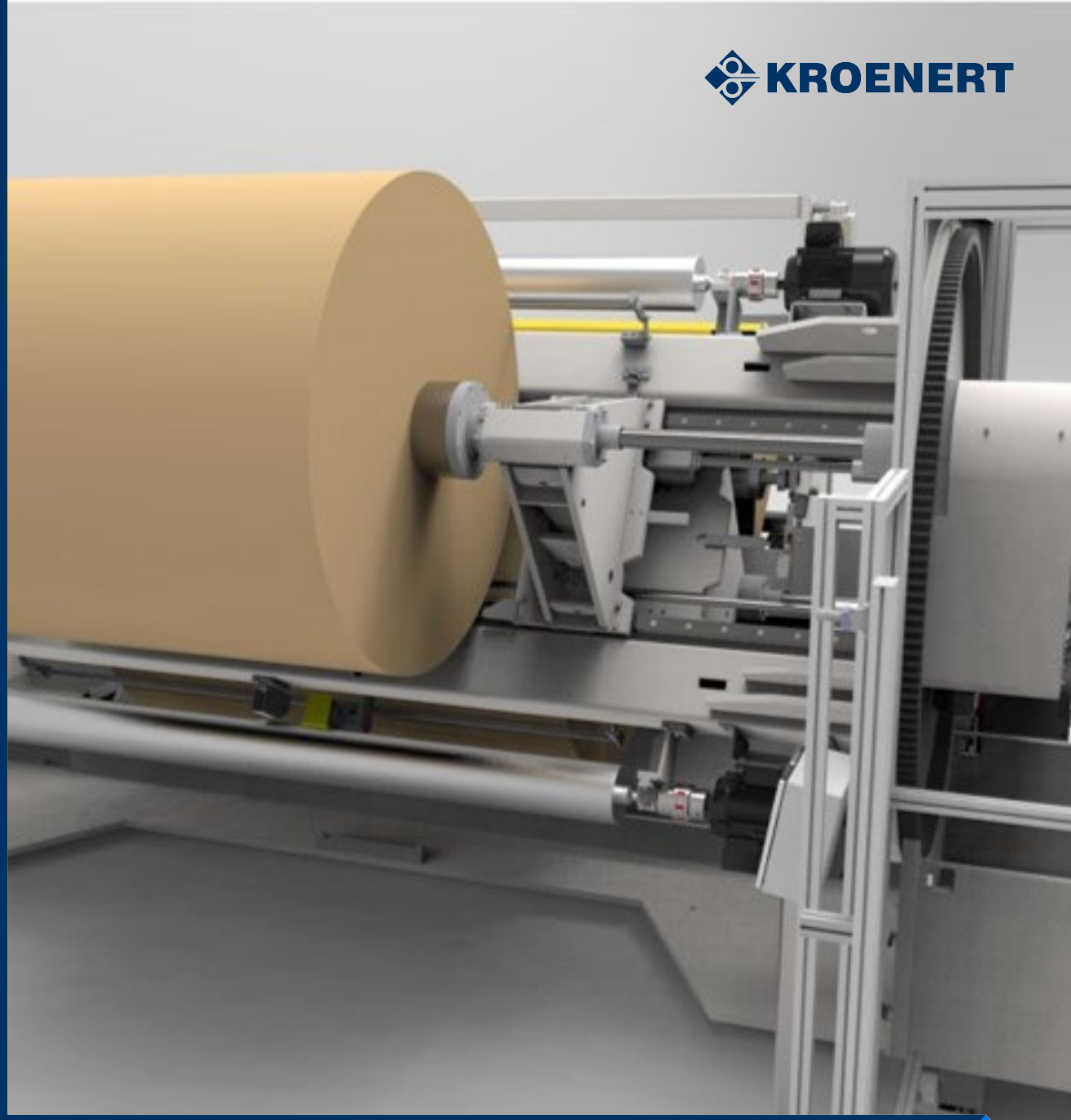
Contact process with rubber counter-pressure roller



Contactless with bead coat process and steel backing roller

5.

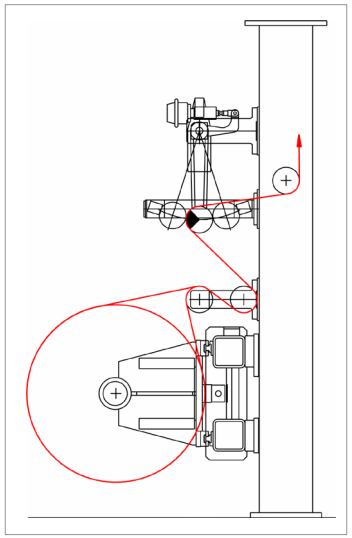
Winding Technologies



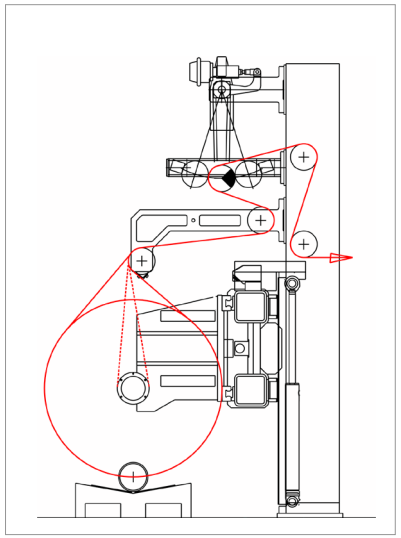
5. Winding Technologies

Single wind stand

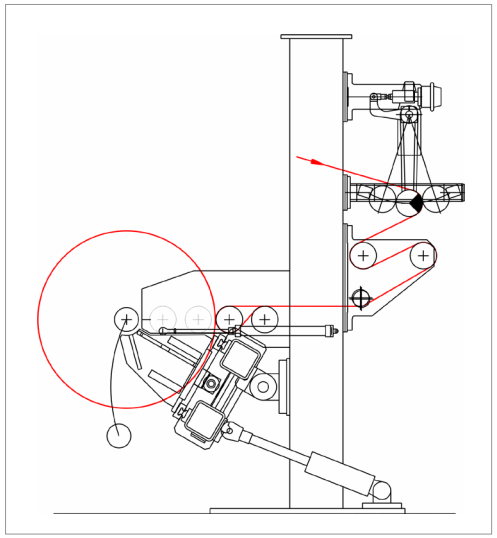
Unwinder stand with fix reel position (without roller lifting)

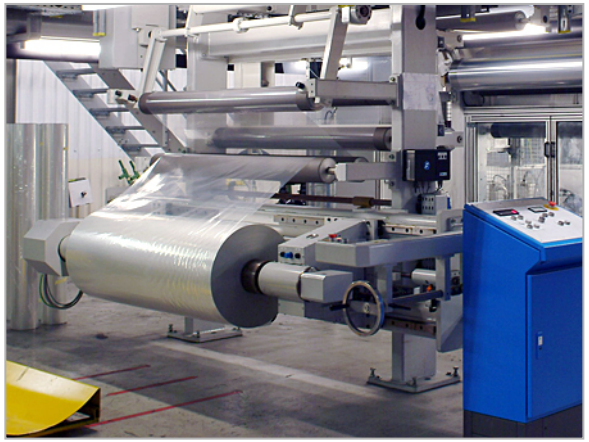


Unwinder stand with pick up reel from floor (roll liftable vertically)



Rewinder stand with lay down reel to floor (roll lay down by swiveling)

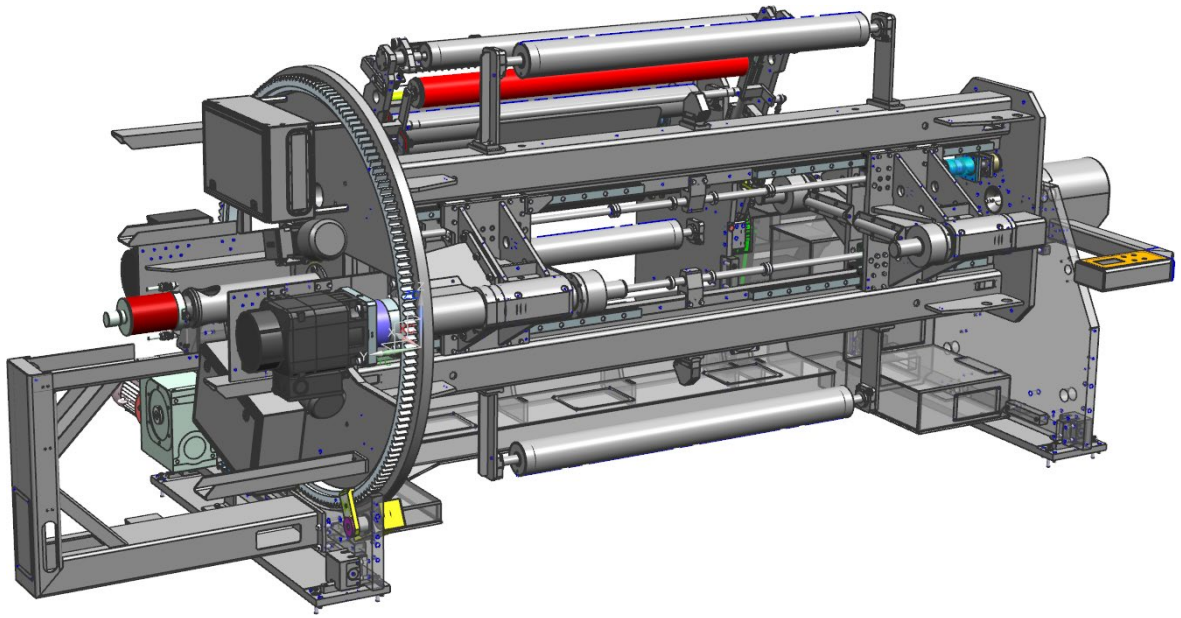


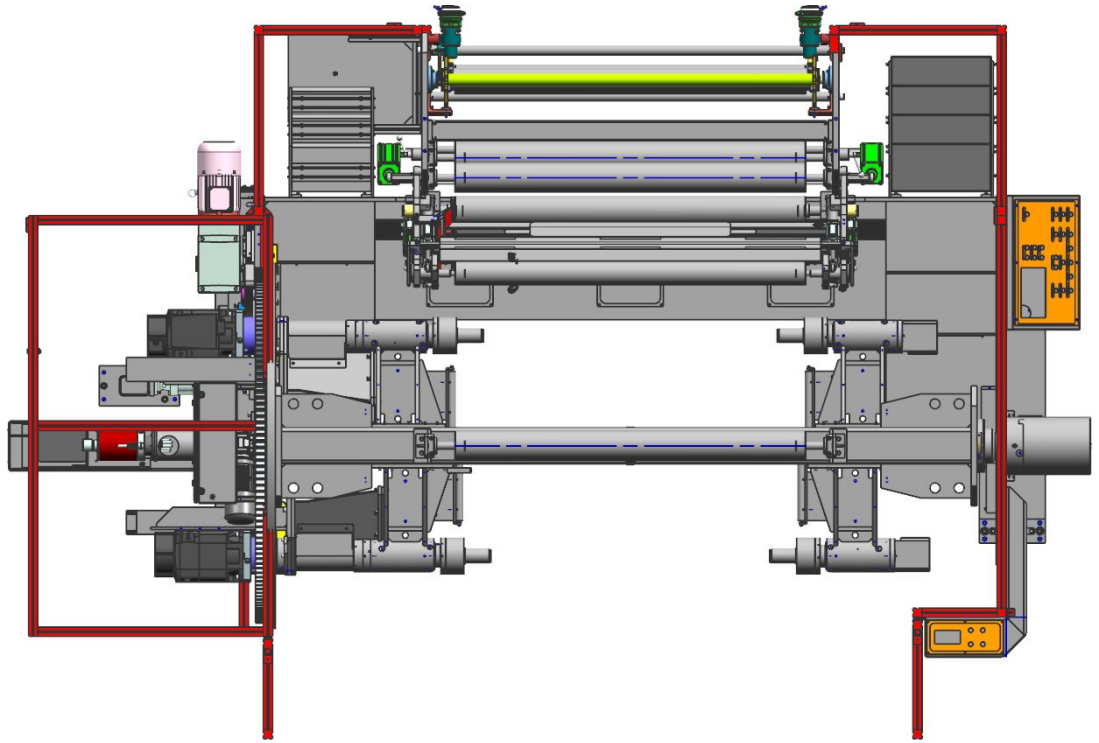


All types shaftless or with shafts

5. Winding Technologies

Turret winding technology





Shaftless or with shafts

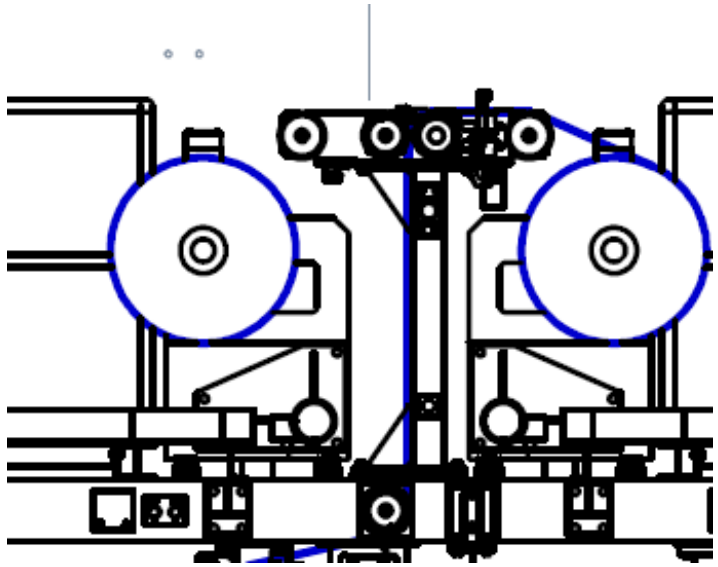
5. Winding Technologies

Turret winder (housing with control panel)

5. Winding Technologies

Double single unwinder

Unwinder with two reels on one level



- Functional and space-saving
- Roll changes at production speed with integrated web storage
- Butt splices can be carried out at a standstill

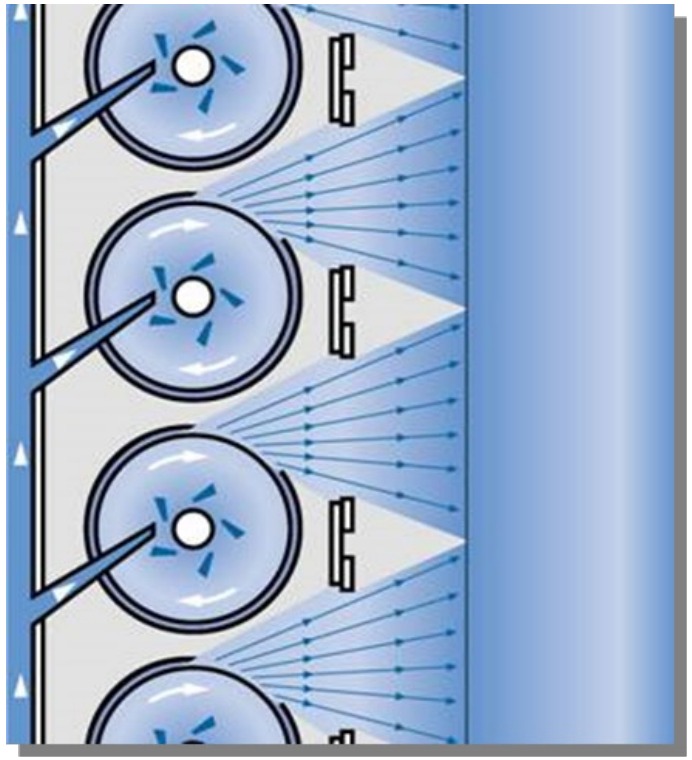
6.

Web Moistening with Flatness Control

6. Web Remoistening with Flatness Control

Remoistening with water mist

- Paper rewetting with water spray system in width and in quantity on non-coated side
- Using of finest water particles
- High rewet rate



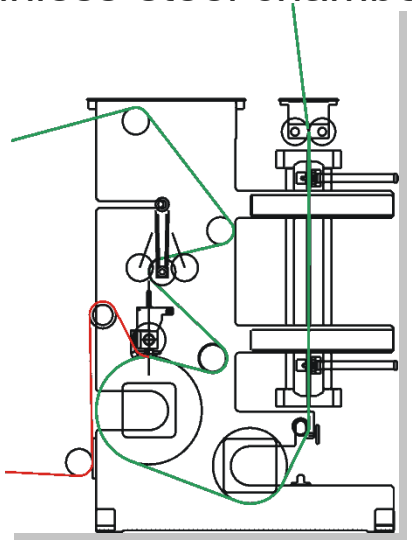
Note:
Only one version shown. Various other proven water spray systems can also be used

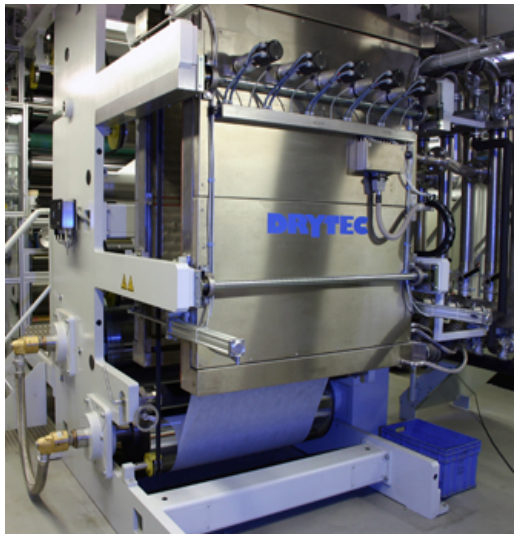
6. Web Moistening with Flatness Control

Remoistening with steam

Features of Steam Humidifier:

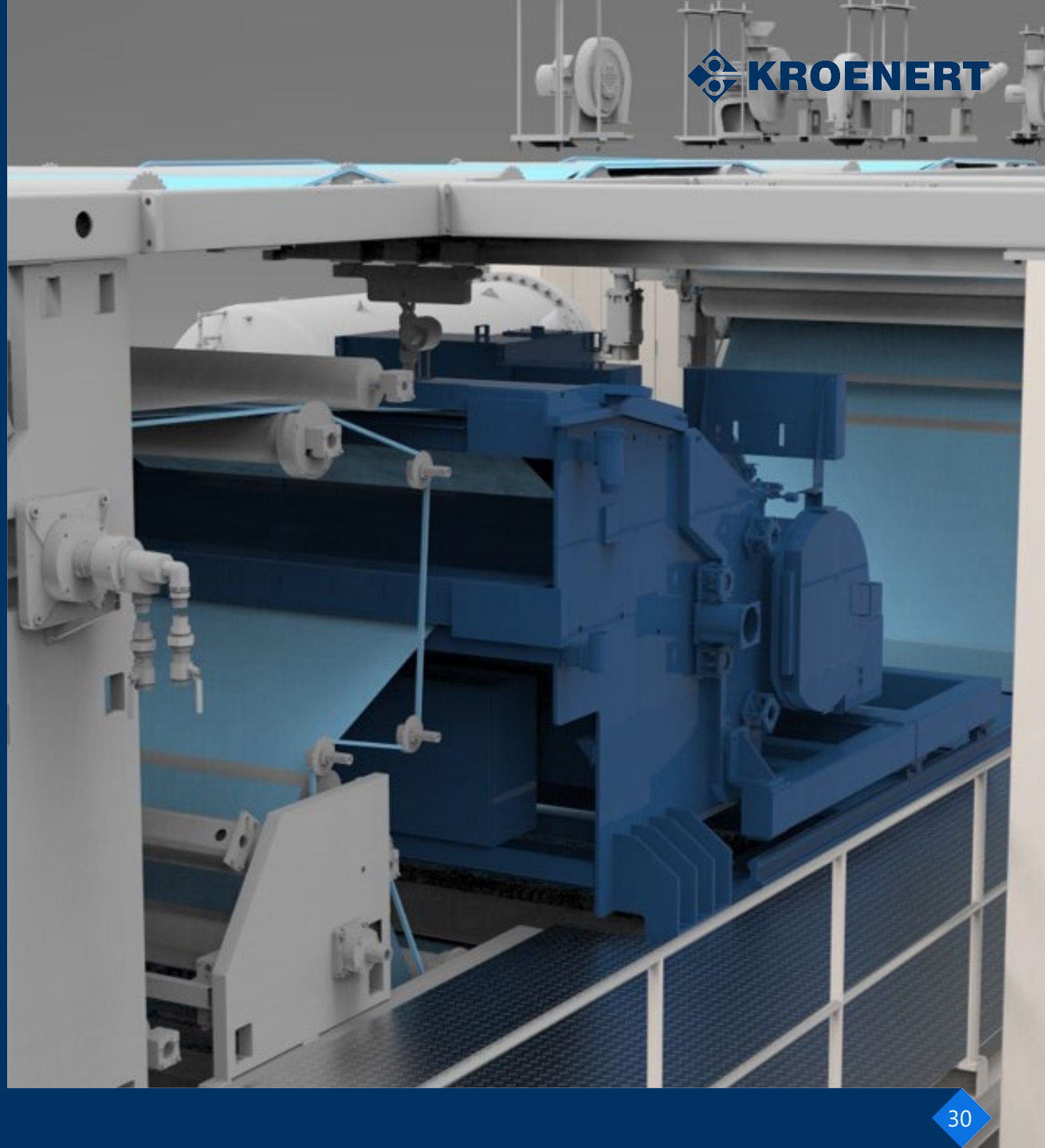
- Highest remoistening rates
- Even rehumidification profile
- Individually adjustable cross profile (remote control of valves)
- Completely enclosed and heated stainless-steel chambers
- No condensation
- One or two sided rehumidification





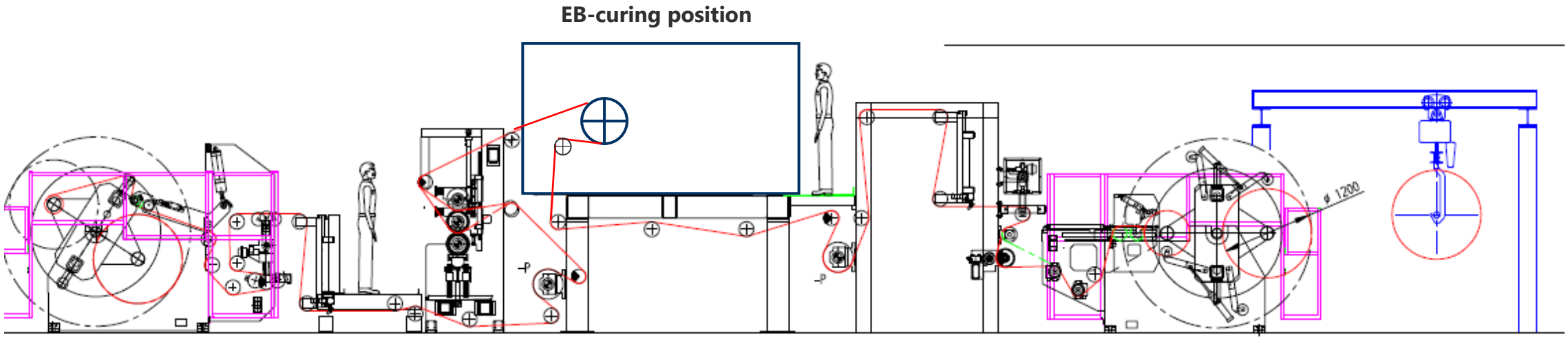
7.

Examples of Coating Lines



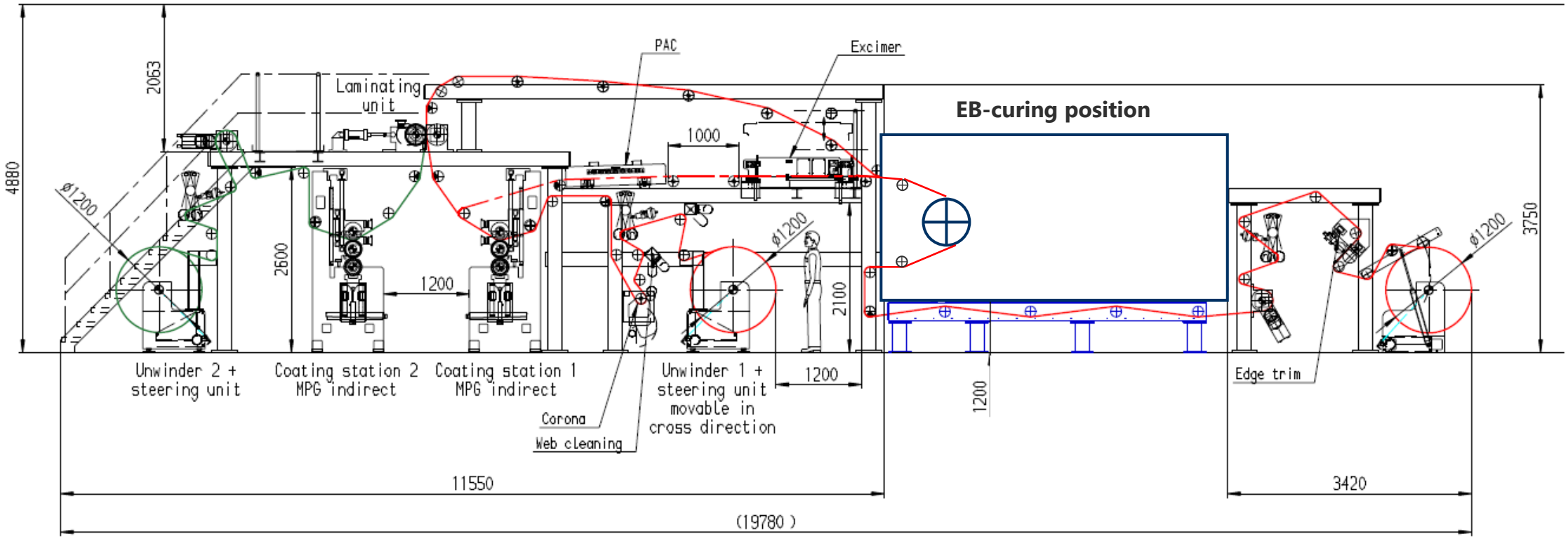
7. Examples of Coating Lines

Simple design with coating and EB-curing



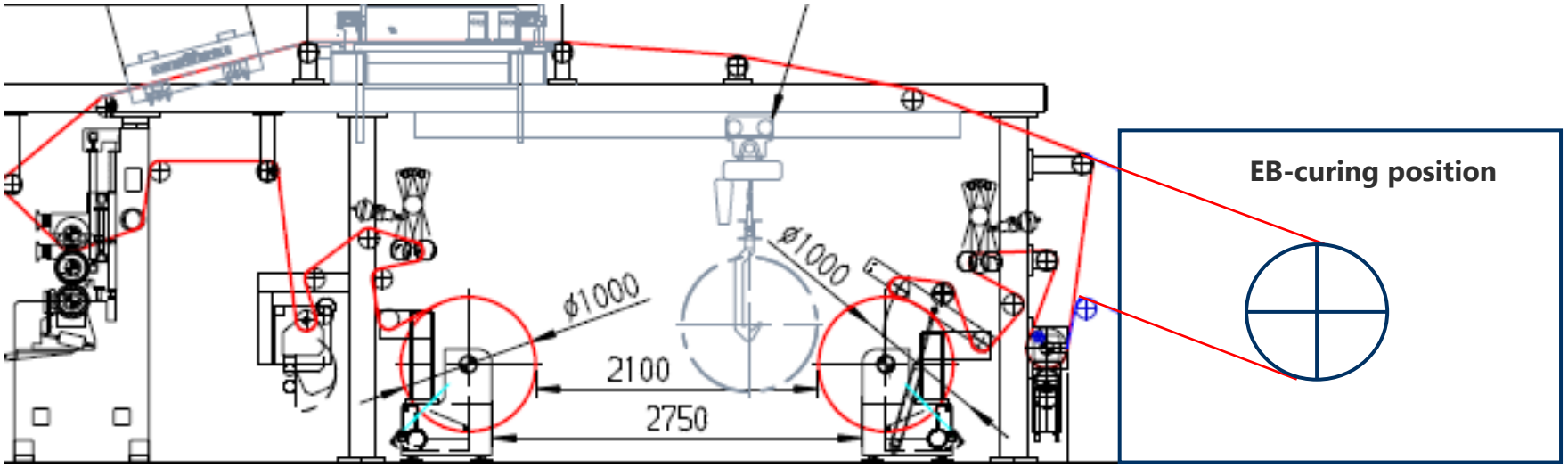
7. Examples of Coating Lines

Two coating heads and wet lamination and EB-curing



7. Examples of Coating Lines

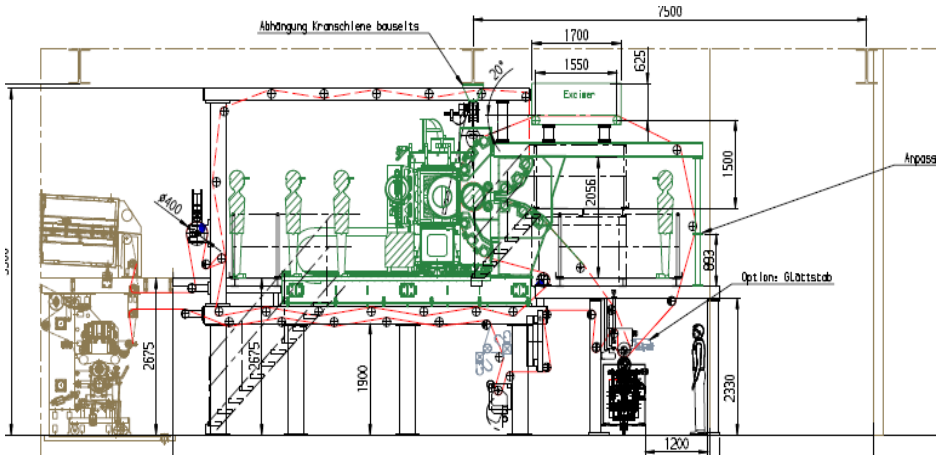
Single lacquer application and EB-curing

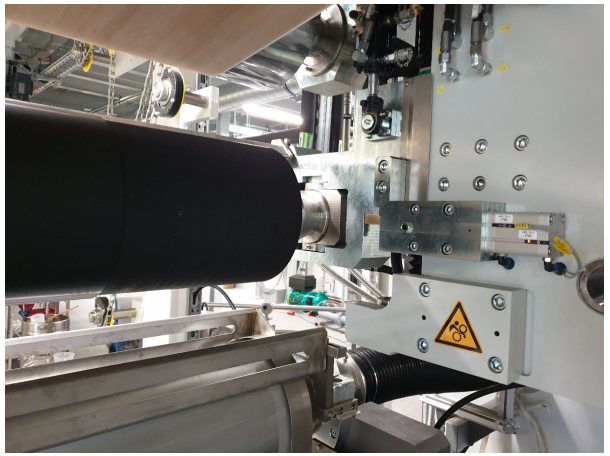


Source of picture: PCT Ebeam

7. Examples of Coating Lines

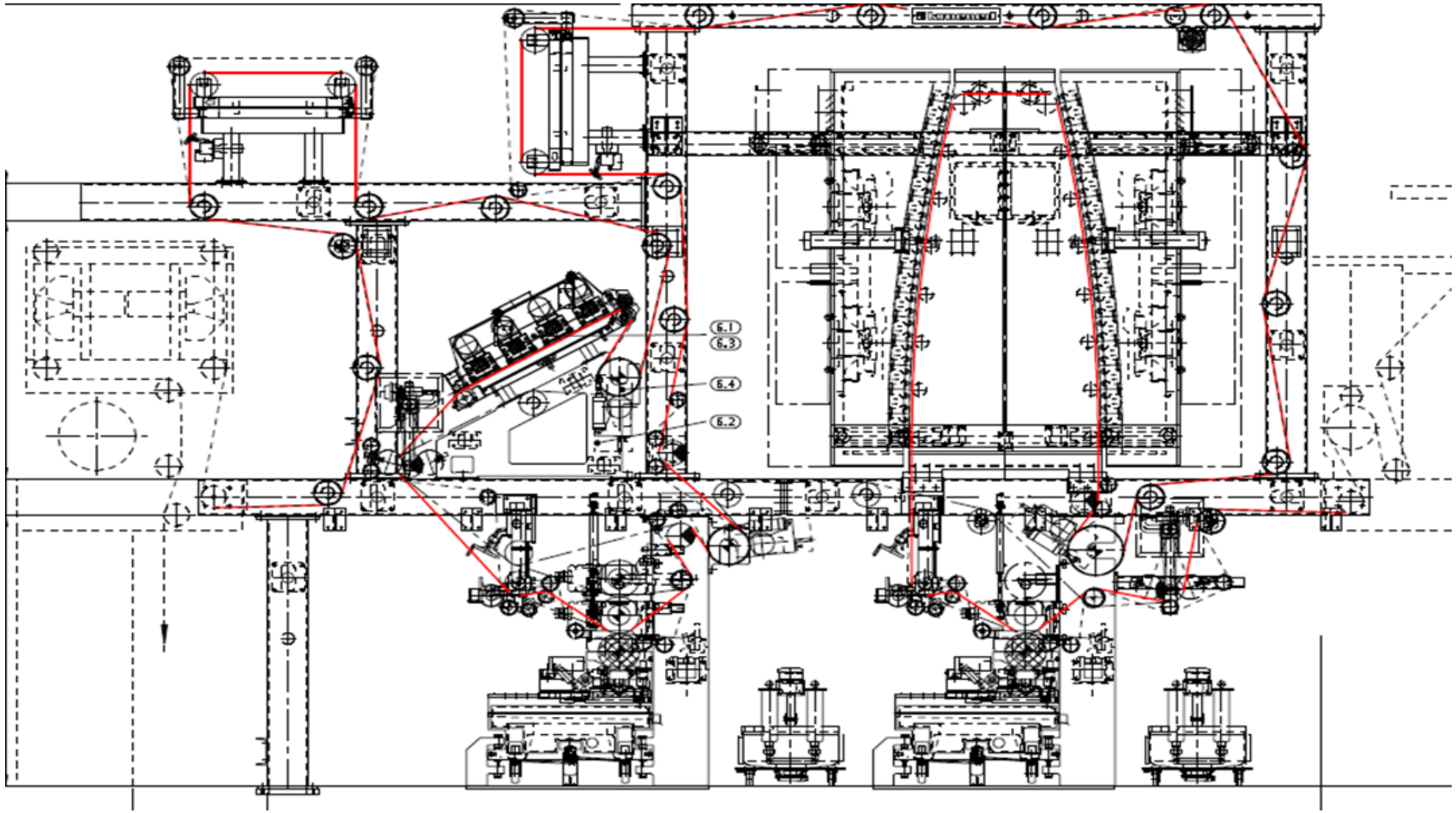
Integration in wet coating line





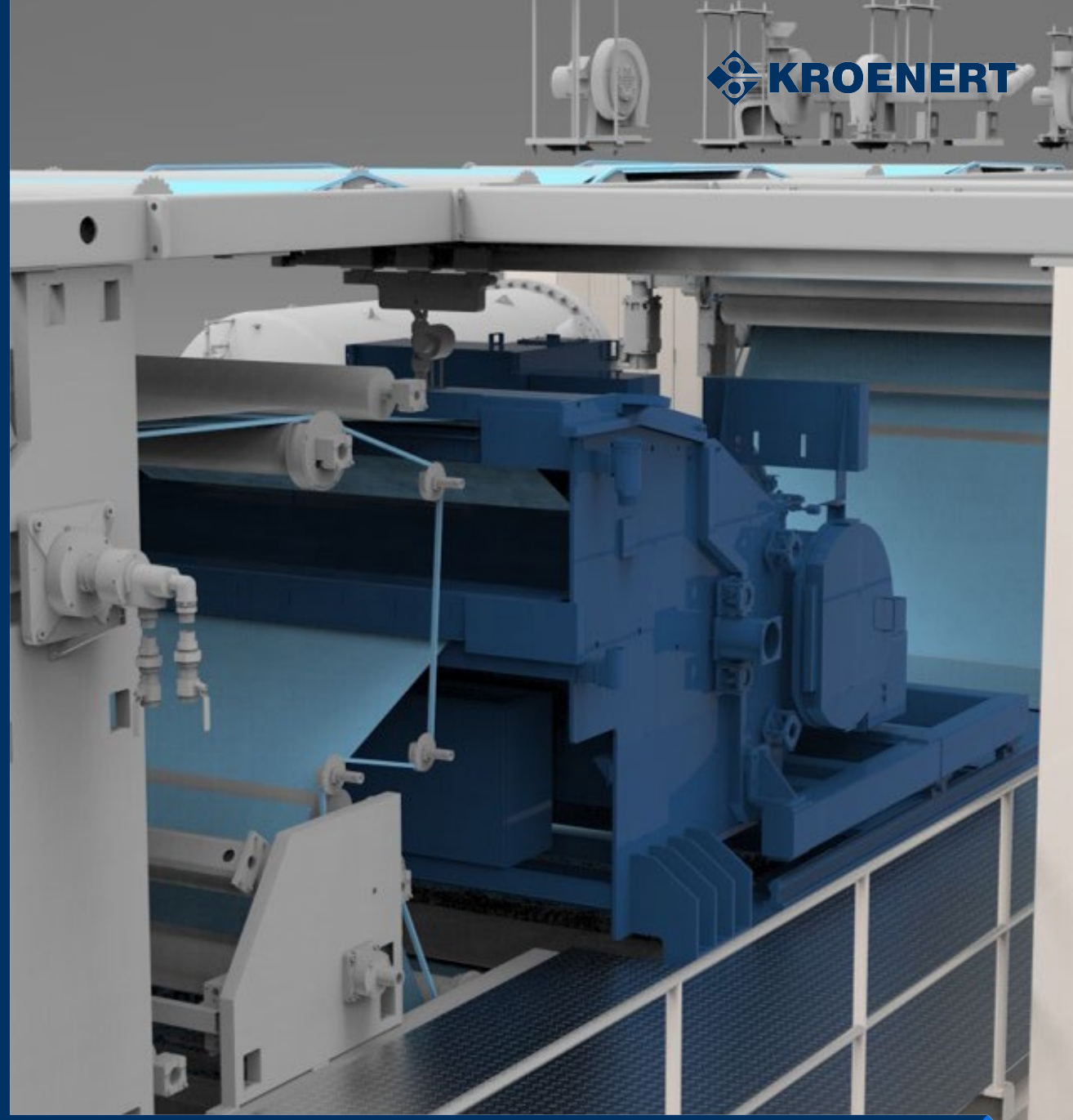
7. Examples of Coating Lines

Combination of wet coating and UV-curing



8.

Summary



8. Summary

Customized machinery concepts

- Coating machine with custom engineered machinery design
- Flexible and sustainable machinery concepts
- Process understanding necessary
- Cooperation with chemical supplier important
- New product solutions for a sustainable future
- New machinery concepts – process and energy efficient

European Unilever Headquarter in Hamburg

KROENERT

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How can we support your challenging targets?

www.kroenert.de