



# DOCTORING SYSTEMS ACTIVITIES

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## SUMMARY

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## ABOUT US

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According to 25 years of experience in doctoring systems of its technicians, Polimek is able to design and produce any kind of doctors in "paper and board", "tissue" and "non woven" market.

In order to have a best result of the projects, we apply the rule of "the tailor made", so every each installation is well designed and developed according to the real needs and following the Voice of Customer (VOC).

The succeed of this policy is possible only by skilled personnel and through the modern equipment in the technical office and production plant.

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## ACTIVITIES OFFERED

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- Visit to inspection and study the customer request on site
- Measurement of existing application or machine foundation for new projects
- Drawing up the cad file on site for a preliminary discussion with the customer
- Project of the new doctoring system
- Manufacturing of the doctoring system
- Erection with Polimek personnel or supervision at the installation carried out by the customer workers
- Setup and alignment of the supplied system
- Presence during the start-up
- Audit of the existing doctoring systems

This kind of service is an inspection of the existing doctoring systems that will be reported on a related file.



	A	B	C	D	E	F	G	H	
1		PM21	YANKEE CYLINDER CREPING DOCTOR	Position nbr -02-		DOCTORING SYSTEM AUDIT	POLIMEK Srls via G Matteotti, 28 28045 Inverigo (NO) Italy info@polimek.it	 PolimeK	
2									
3	ITEM	TYPE	INSPECTION	YEAR 2016 maintenance stop January 2016		YEAR 2017 maintenance stop January 2017		YEAR 2018	NOTE
4	Yankee condition	metalized	Ø 4572 face 6180 mm						
5	Doctor holder	Flexible	visual check	good condition		cleaned and reinstalled good condition			
6	Pressure plate		visual check	ok		ok			
7	Top Apron		visual check	ok		new			
8	Loadin hose	Ø45		ok		new			
9	Muonting plate	S/steel	visual check	no corrosion ok		no corrosion ok			
10	Blade sensor	IFB 3007- BPG/M/V4A	visual check	ok		ok			
11	Doctor blade	ceramic	85° bevel	120 mm		120 mm			
12	Stick-out			25 mm		25 mm			
13	Blade working angle	COLD WORKING T.	check at 600mm from Front Side 600 mm to Drive Side	F.S. 19.2°	D.S. 19.1°	F.S. 19.2° F.S. 17.5°	D.S. 19.1° D.S. 17.8°		
14	Blade loading		N.1 loading hose	2.5 N/mm		2.5 N/mm			
15	Support bearing	ball bearing SSAR 100/110	visual check	both replaced 2015 ok		both replaced 2015 ok			next changing 2020
16	Side sealing flange		visual check	ok		ok			
17	Hydraulic cilinders		visual check	ok		replaced hyd. hose D.5 L. 630 Ø12 ok			
18	Hyd. Cilinders joints	GE TXG3E	visual check	ok		replaced F.S. + D.S. front and rear joints ok			type of joint not appropriate
19	Oscillating system	elettromec.	SEW Eurodrive R87 DT9054/U	functionality ok		ok			
20	Grear motor		visual check	ok		ok			
21	Drive plate	stainless steel	visual check	ok		ok			
22	Rotating bearing		visual check	ok		greased ok			
23	Oil level			to be replaced on 2017 ok		replaced with type KLÜBEROIL GEM 1-220N			
24	Pneumatic valve	V63D4D7A XA090	visual check	ok		replaced			
25	Brackets		visual check	ok		ok			

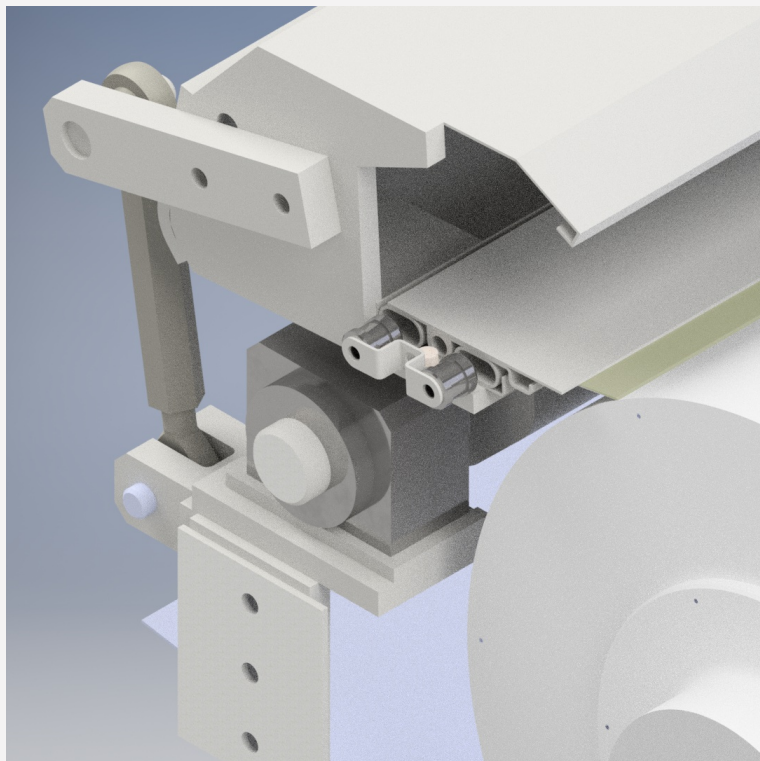
The chart represent an example of a yearly inspection on a flexible creping doctor.

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## EXAMPLE OF DOCTORING SYSTEMS APPLICATIONS

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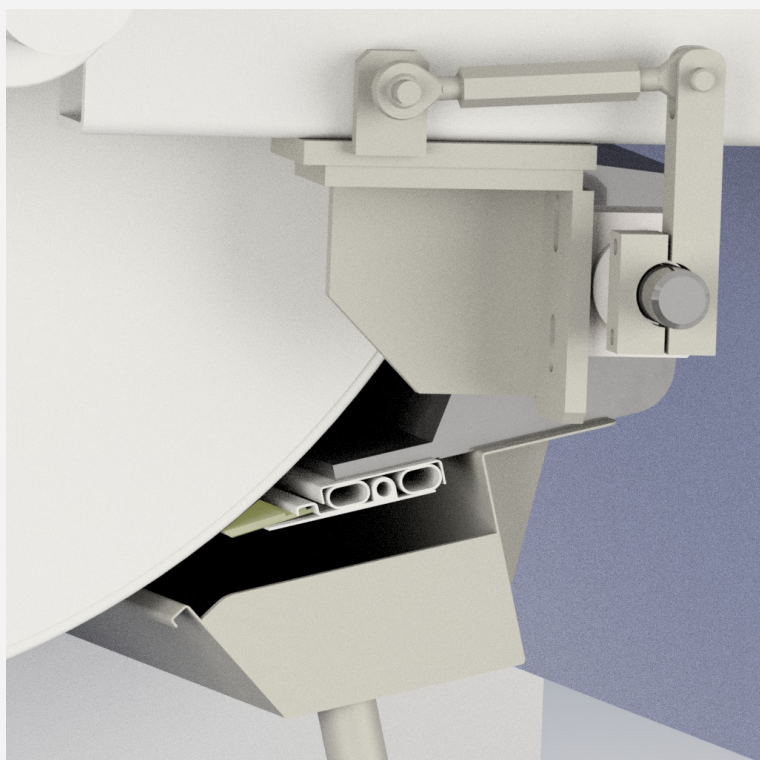
### Wire roll doctor with saveall tray



Flexible cleaning doctor

- Doctor holder type PFlex 200
- Not oscillating
- Saveall tray for water collecting

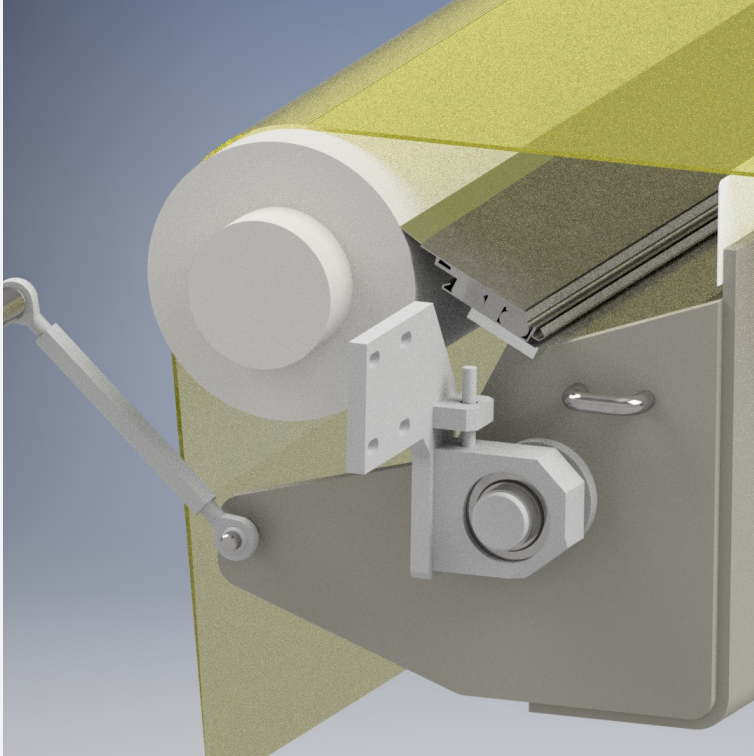
### Forming roll doctor



Flexible cleaning doctor

- Doctor holder type PFlex 200
- Not oscillating
- Saveall tray for water collecting

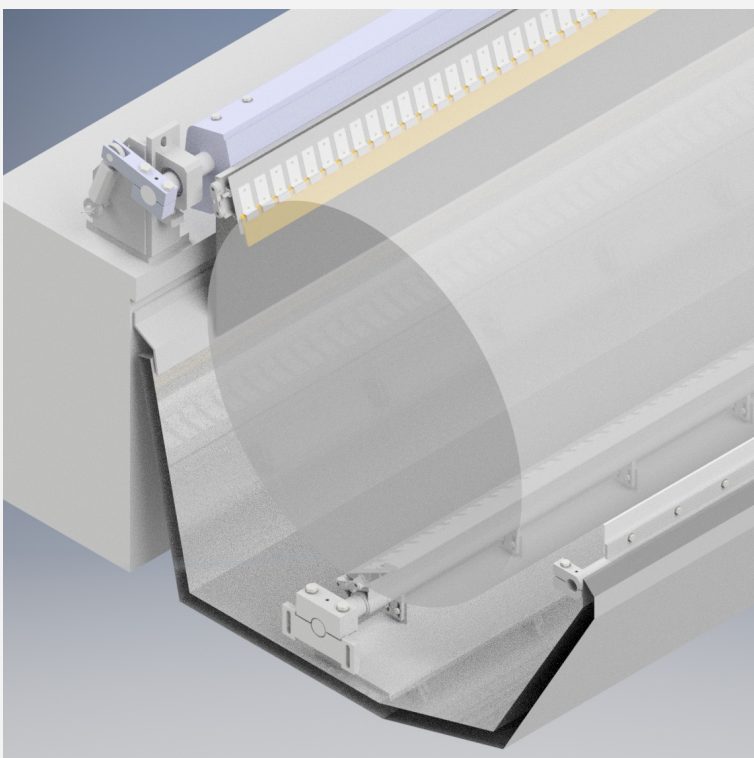
### Inner felt roll doctor



Flexible cleaning doctor

- Doctor holder type PFlex 300
- Not oscillating
- Saveall tray for water collecting with internal heating system

### Couch roll



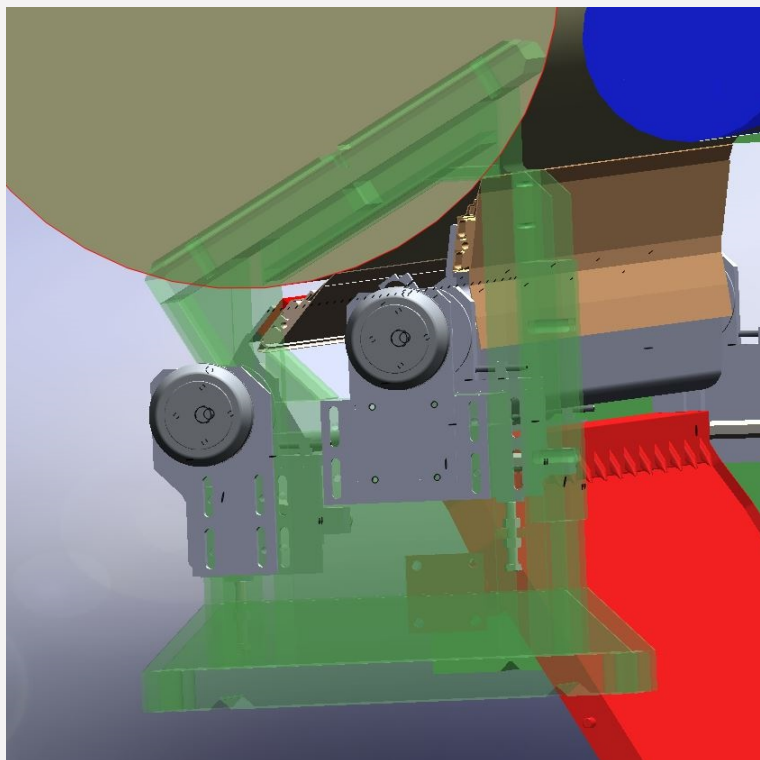
Flexible cleaning doctor

- Doctor holder type PFlex 200
- Not oscillating
- Saveall tray for water collecting

Combination of double point cleaning



### Press section double doctor



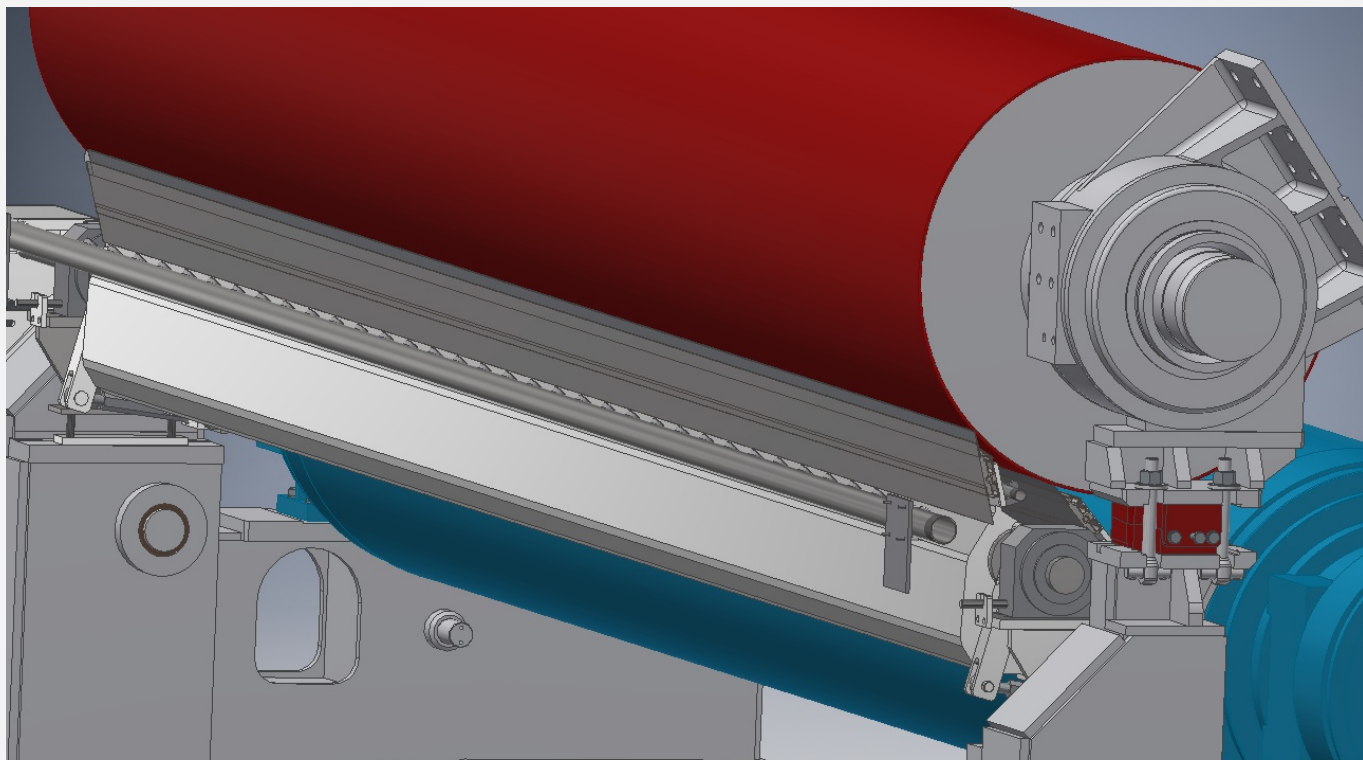
Flexible cleaning doctor

- Doctor holder type PFlex 301
- Pneumatic oscillating unit
- Double doctor with separated beams

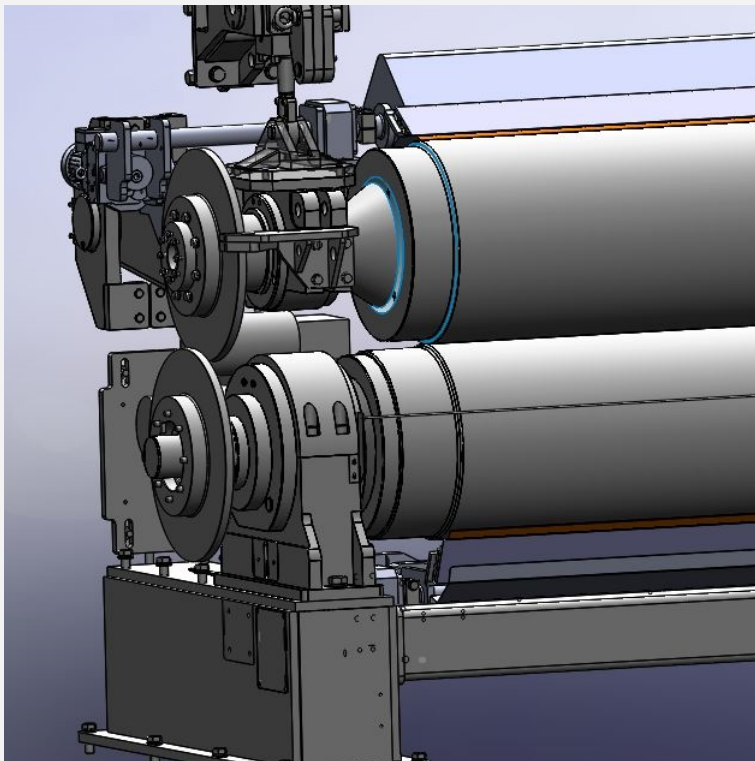
Below

Flexible cleaning doctor

- Doctor holder type PFlex 500
- Electromechanical oscillating unit
- Double doctor with integrated beams



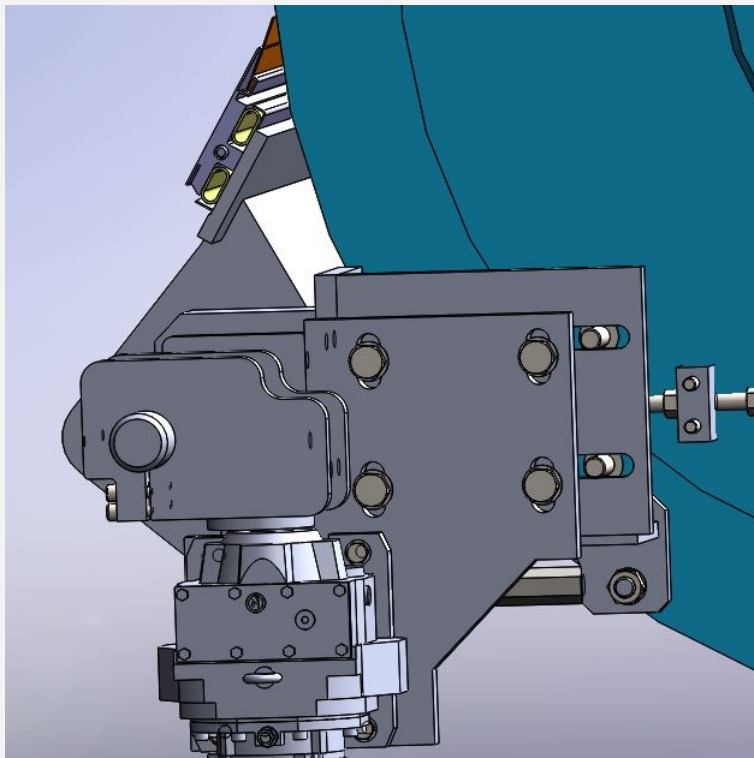
### Calander top and bottom doctors



Flexible cleaning doctor

- Doctor holder type PFlex 300
- Electromechanical oscillating unit
- Top and Bottom calander rolls

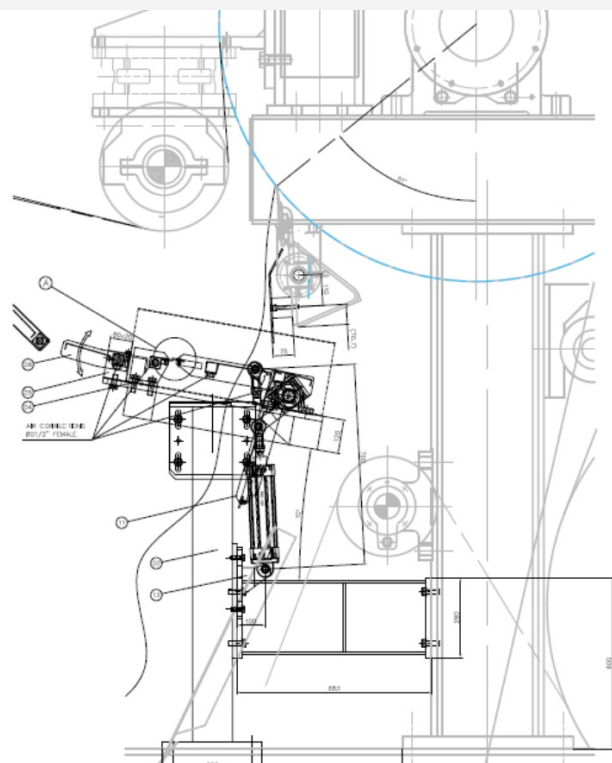
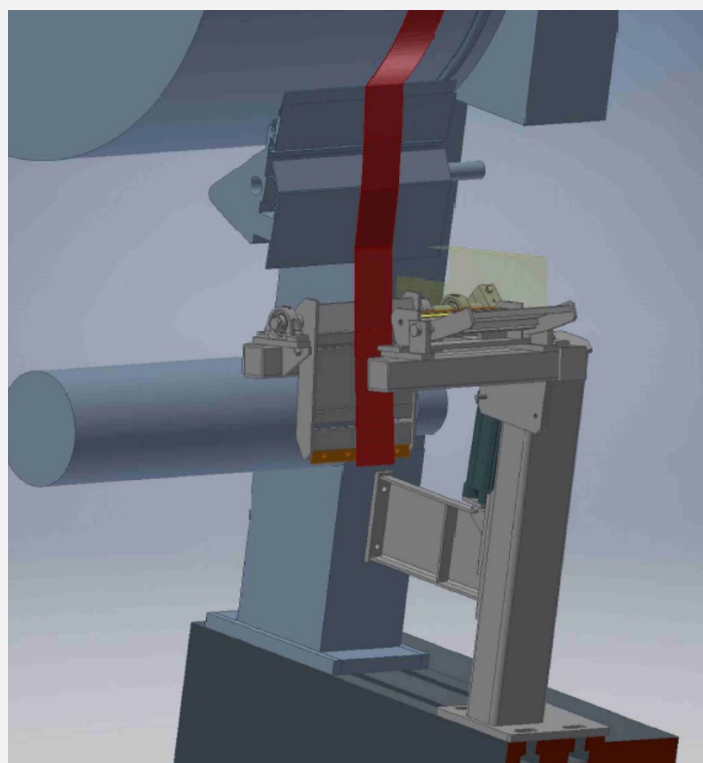
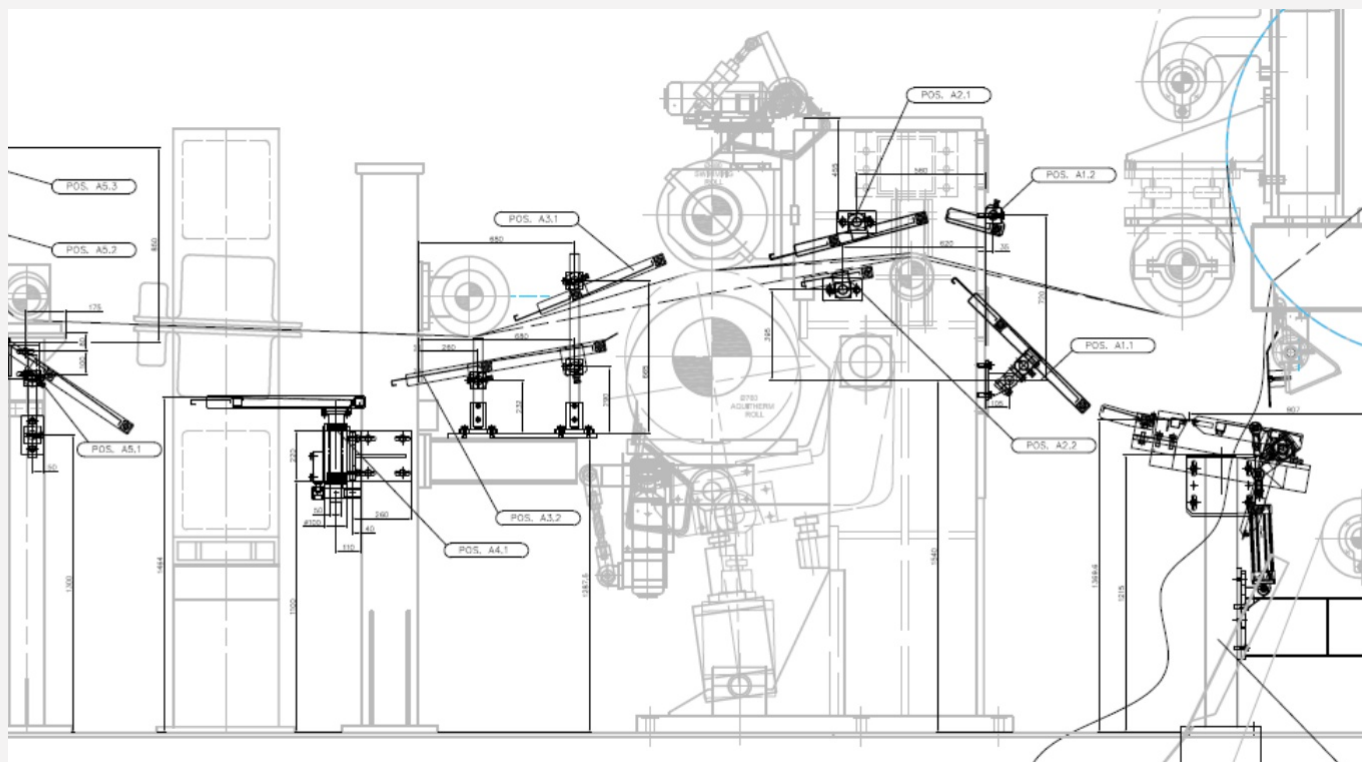
### Top dryer roll

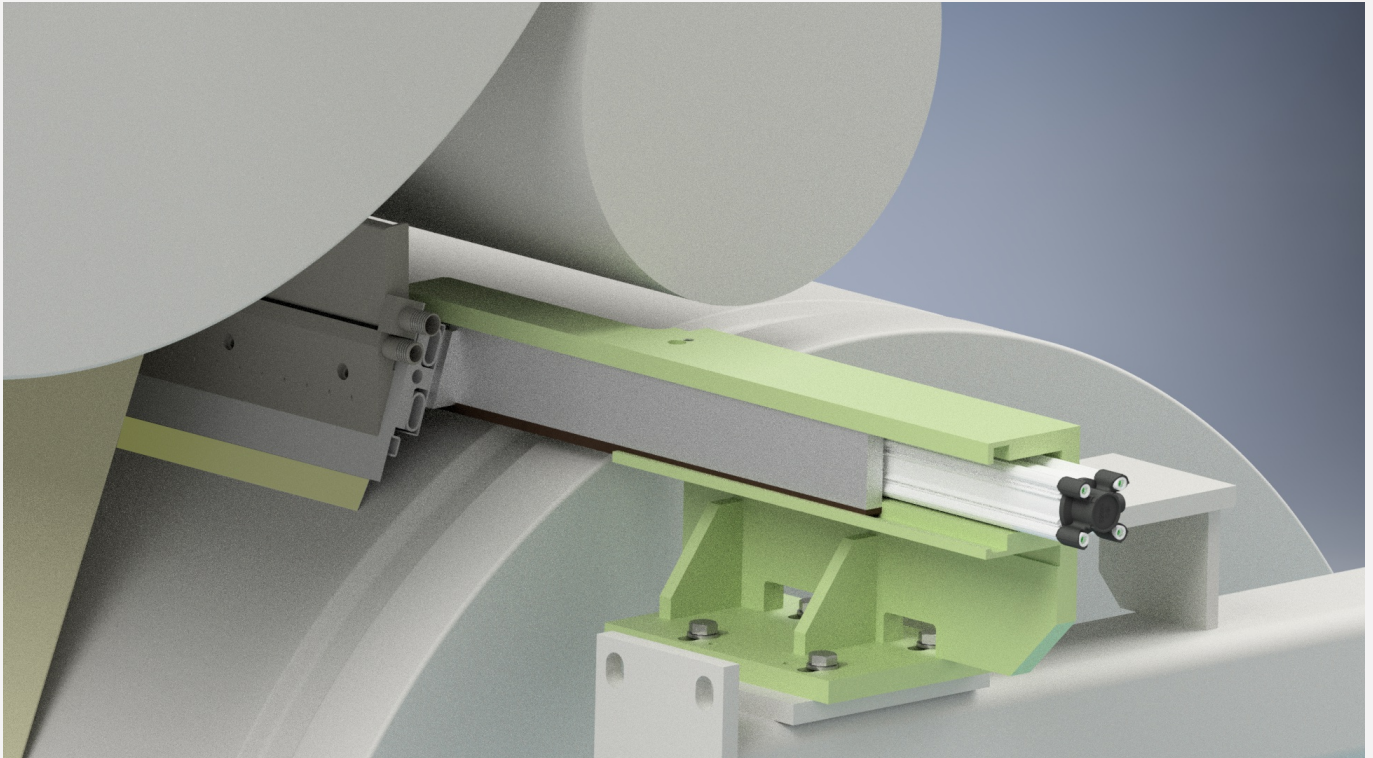


Flexible cleaning doctor

- Doctor holder type PFlex 300
- Electromechanical oscillating unit
- Last dryer application

## Tail threading and tail shooter systems





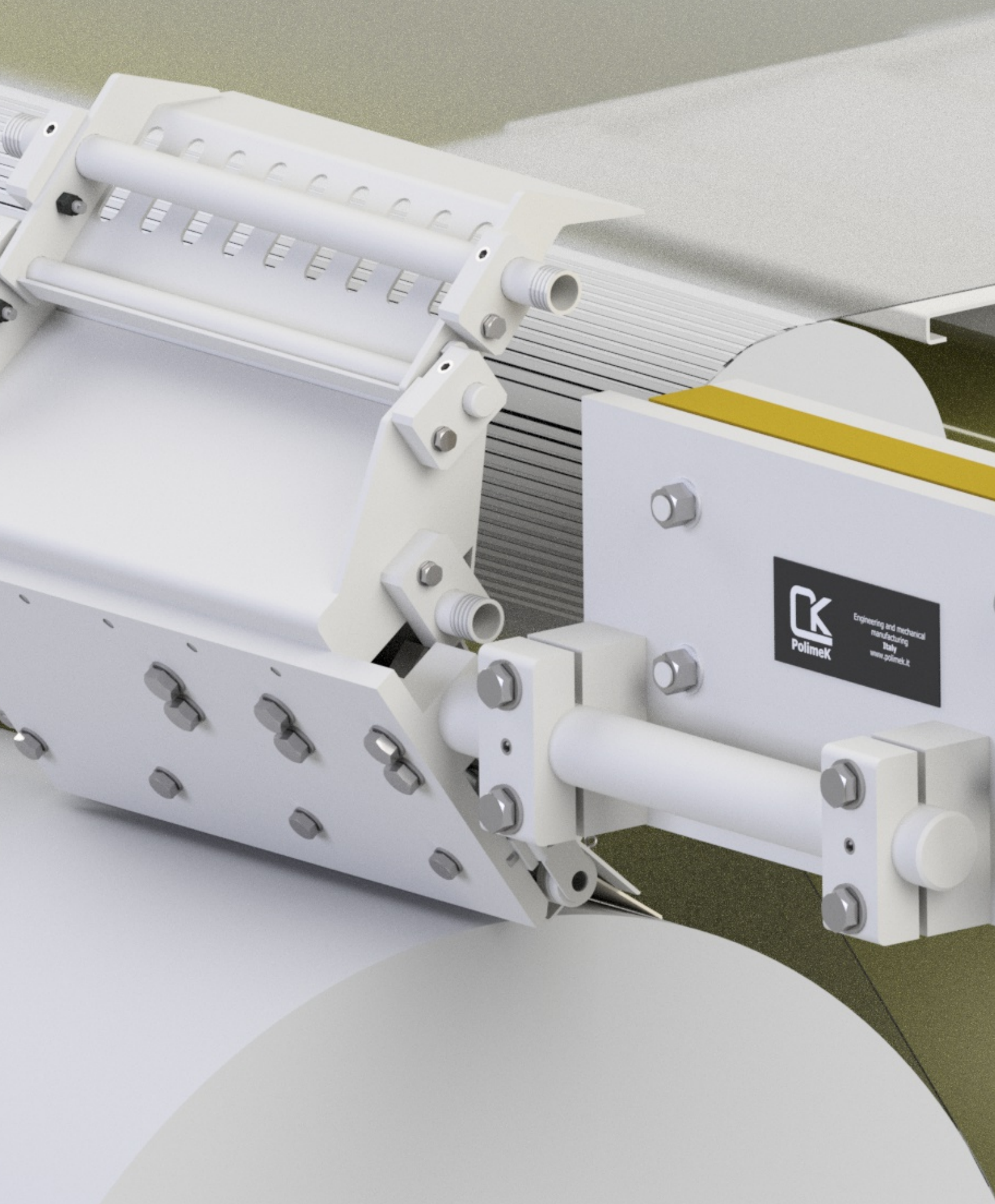
Different applications of tail threading and tail cutting systems on dry section.

Doctor holder type                      PFlex 300

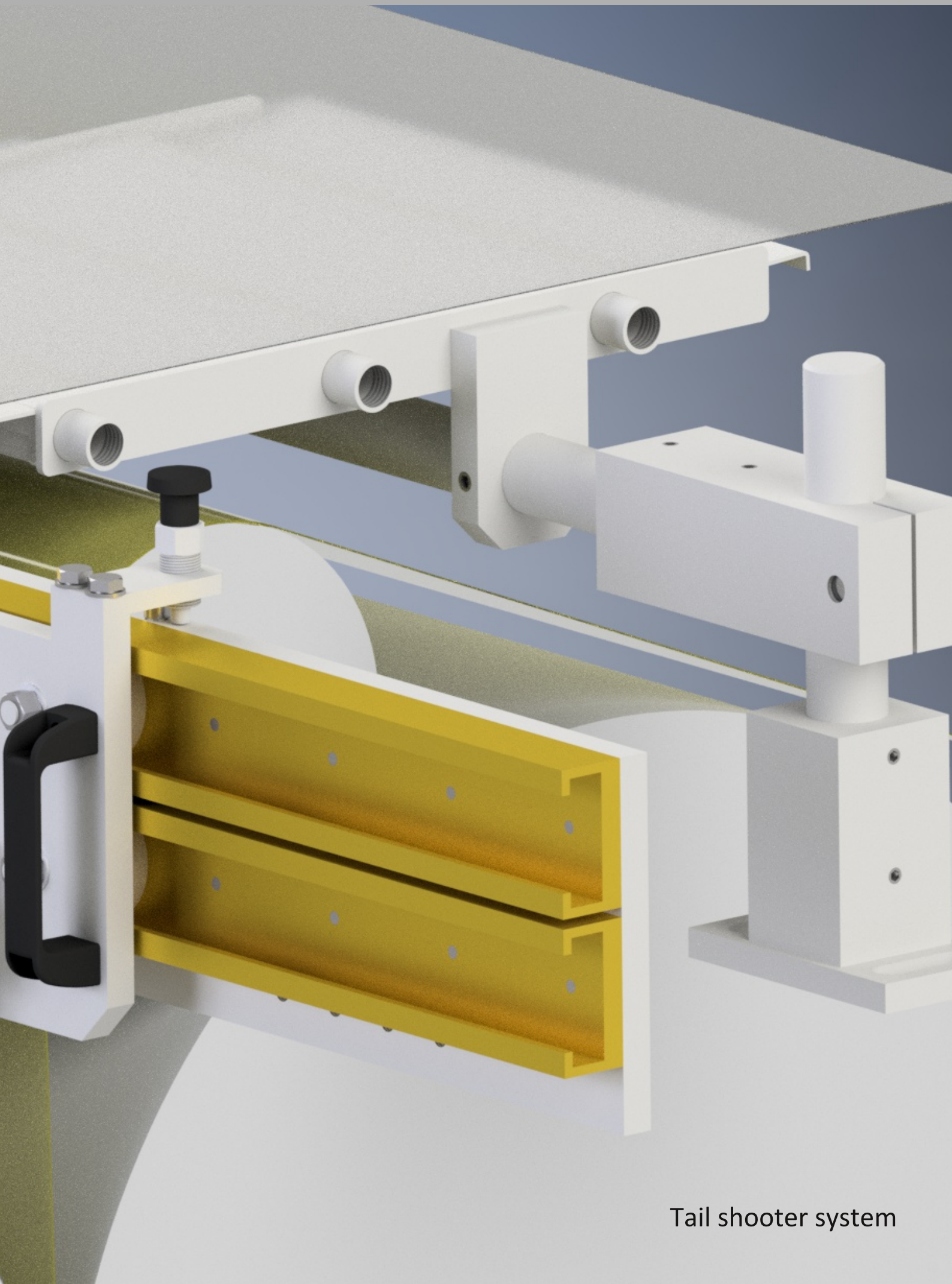
Different version are available

- Stationary
- Manually
- Pneumatic
- Automatic



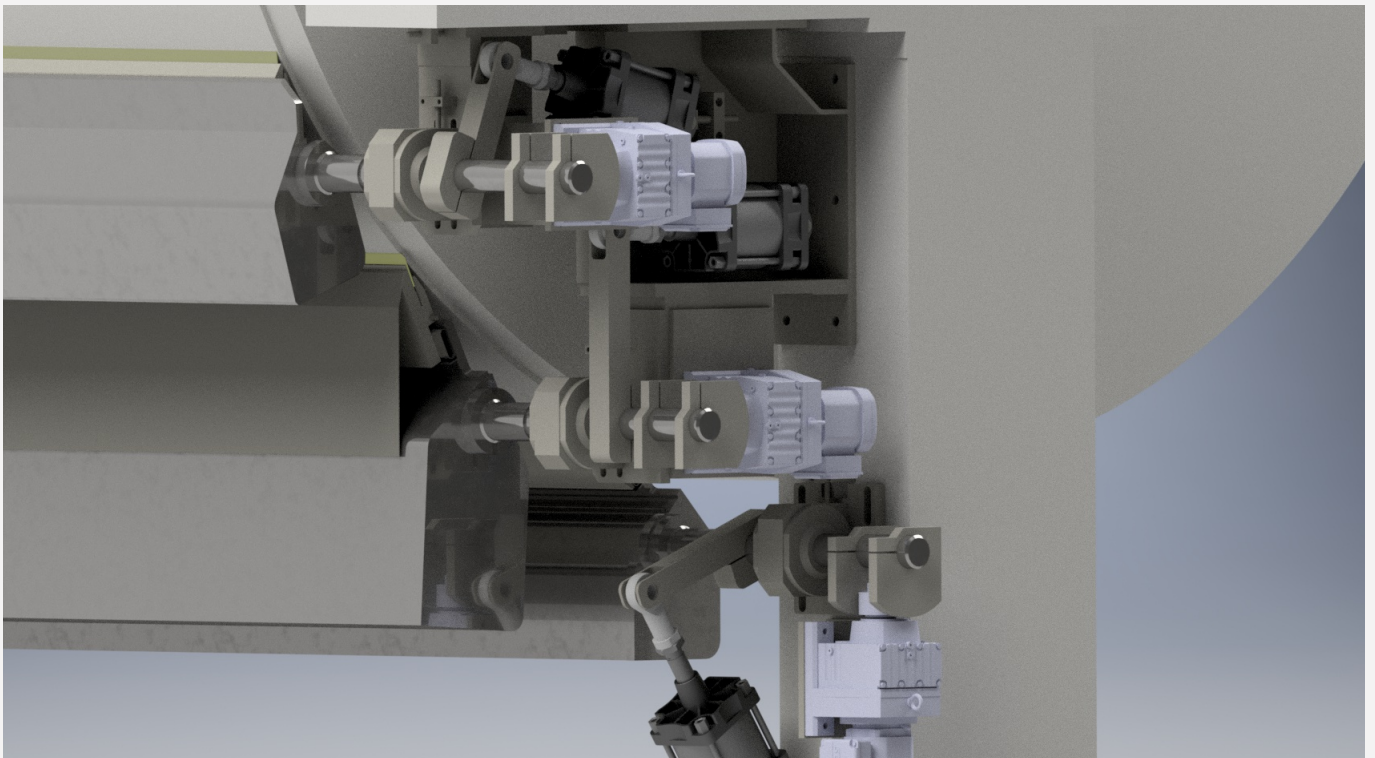
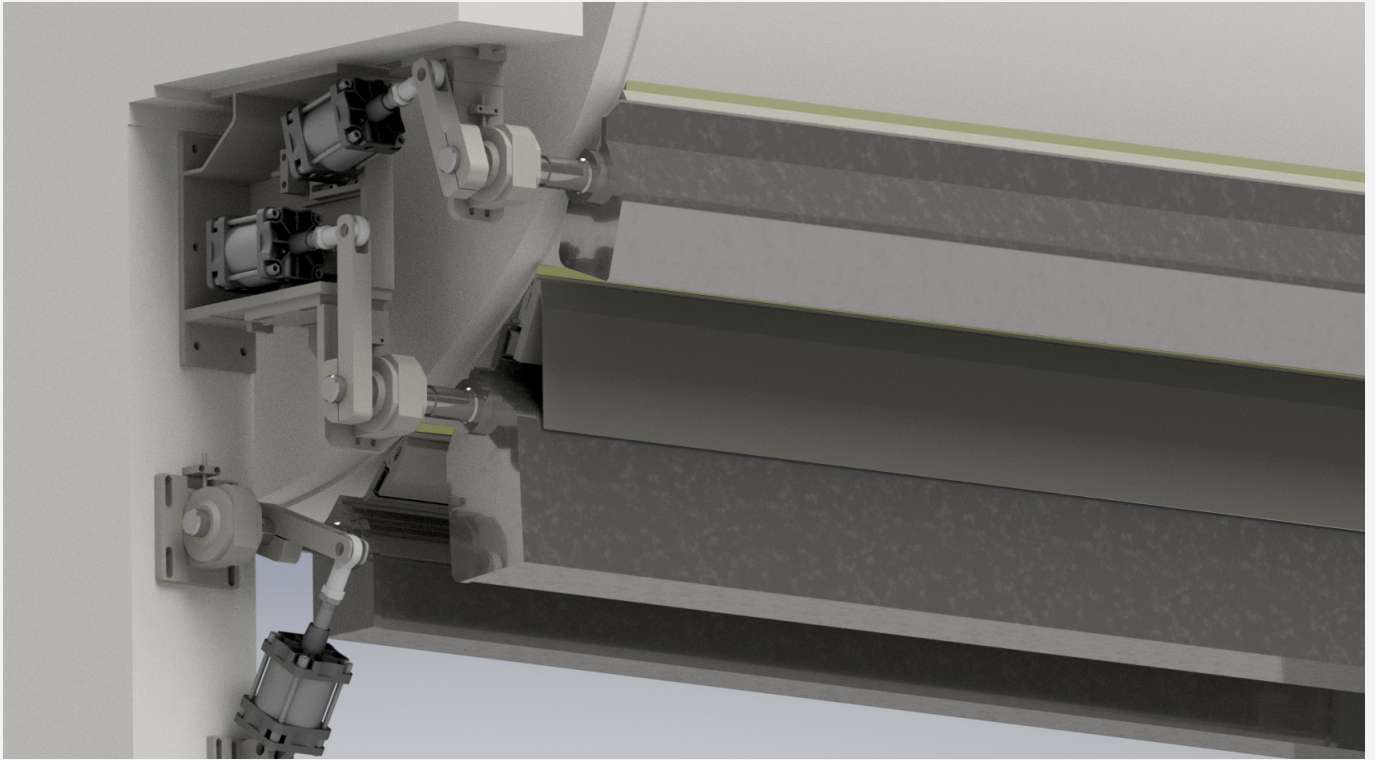




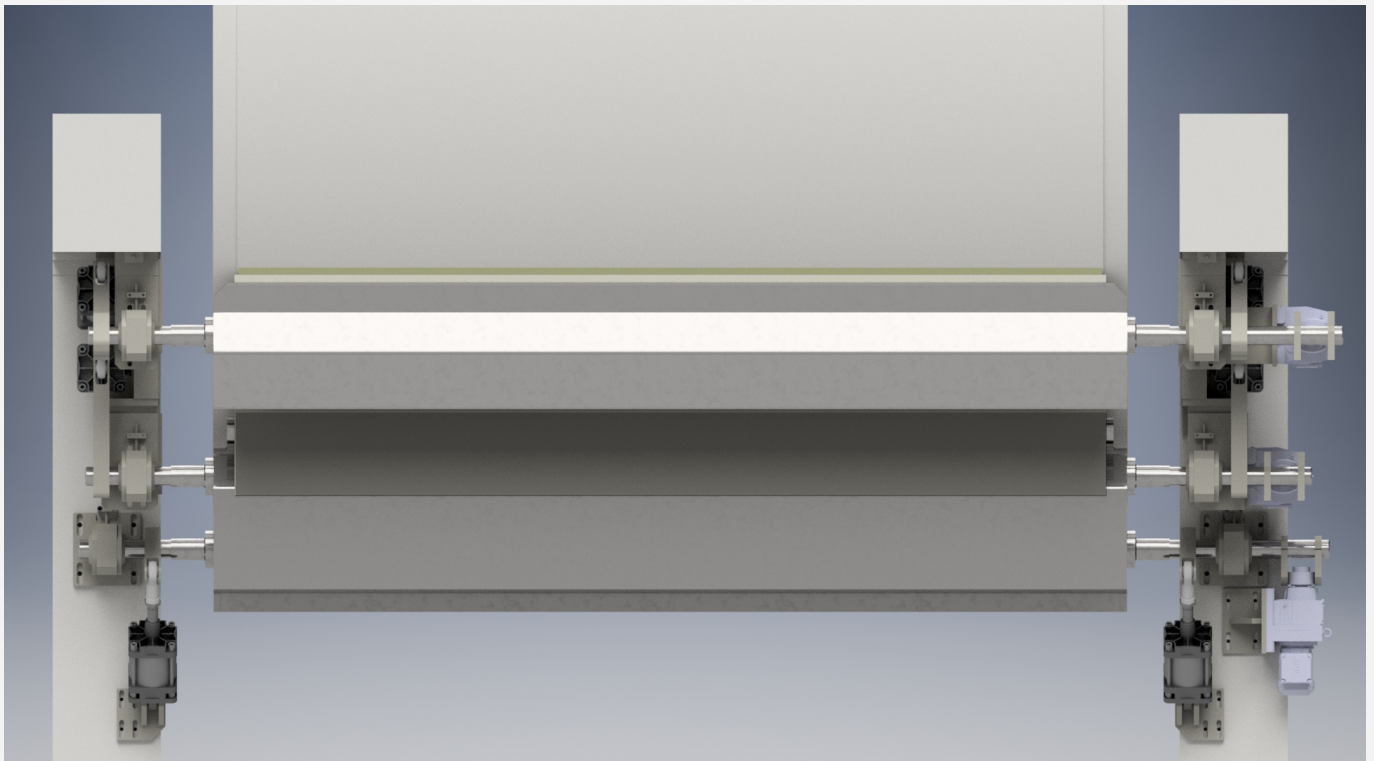


Tail shooter system

## Yankee doctoring systems







Doctoring systems for Yankee Machines can be a combination of rigid and flexible doctor holders.

On the previous pictures it's shown

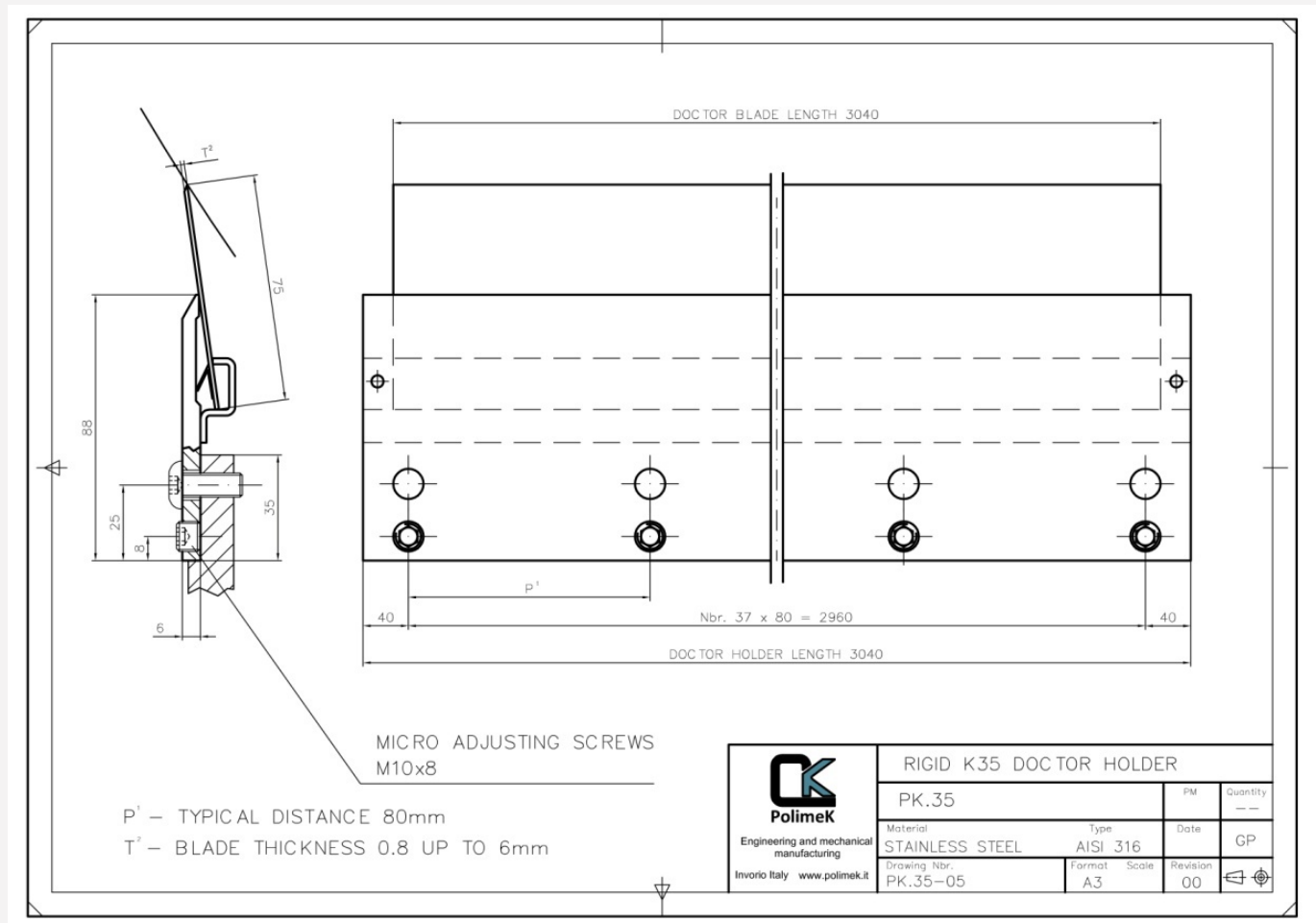
Cut-Off position type  
Creeping doctor type  
Cleaning position type

PCut 500  
PCrep 400  
PClean 300

Rigid doctor holder  
Flexible doctor holder  
Flexible doctor holder

Oscillating system can be electromechanical or pneumatic version

## Example of parametric drawing



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## RANGE OF PRODUCTION

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### DOCTOR HOLDER

- Rigid K35 for simple application wet and dryer section
- Flexible with double air hoses fingerless
- Flexible with double hoses for heavy applications
- Flexible creping doctor with adjustable stick-out
- Flexible cleaning doctor
- Rigid doctor holder for cut-off on yankee position

### DOCTOR BLADE MATERIAL

- Composite of Epoxy resin
- Epoxy resin with glass fiber or carbon fiber
- Stainless steel Aisi 301
- Hardened carbon steel
- Bronze

### DOCTOR LINEAR BEARING

- Support with linear bearing and sides seal for wet and dryer section

Dimensions: Ø55-Ø70-Ø100mm

### OSCILLATORS

- Pneumatic for wet section power 11kN Aisi 316L
- Pneumatic for yankee doctors 22 kN Aisi 316L
- Electromechanical with gear box up to 1kW

## SUGGESTION FOR A CORRECT DOCTOR SELECTION

PAPER AND BOARD MACHINE				
POSITION	DOCTOR TYPE	NAME	VERSION	OSCILLATING
Breast roll	rigid	PK-35	single	yes pneumatic
Wire rolls	rigid	PK-35	single	yes pneumatic
Stretcher rolls	rigid	PK-35	single	no
Guide rolls	rigid	PK-35	single	no
Couch roll	flexible	PFlex-200	double	no
Pick up roll	rigid	PK-35	single	no
Press section	flexible	PFlex-350	double	yes electromec.
First dryer	flexible	PFlex-300	single	yes electromec.
Bottom dryers	rigid	PK-35	single	yes electromec.
Top dryers	rigid	PK-35	single	yes electromec.
Felt rolls	rigid	PK-35	single	no
Coating section	flexible	Pflex-800	single	no
Last dryer	flexible	PFlex-300	single	yes electromec.
Pope reel drum	rigid	PK-35	single	yes electromec.
Calender	flexible	PFlex-300	single	yes electromec.

TISSUE MACHINE				
POSITION	DOCTOR TYPE	NAME	VERSION	OSCILLATING
Forming roll	rigid	PK-35	single	yes pneumatic
Wire rolls	rigid	PK-35	single	yes pneumatic
Stretcher rolls	rigid	PK-35	single	no
Guide rolls	rigid	PK-35	single	no
Press rolls	flexible	PFlex-200	double	no
Cleaning doctor	flexible	PClean-300	single	yes electromec.
Creping doctor	flexible	PCrep-400	single	yes electromec.
Cut-off doctor	rigid	PCut-500	single	yes electromec.
Pope reel drum	rigid	PK-35	single	yes electromec.

NON WOVEN MACHINE				
POSITION	DOCTOR TYPE	NAME	VERSION	OSCILLATING
General rolls	flexible	PFlex-200	single	no
Conveyor rolls	flexible	PFlex-200	single	yes electromec.
Calender	flexible	PFlex-300	single	yes electromec.

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## PRODUCTION FACILITIES

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Thanks to a closed relationship with our sub suppliers we are able to produce any kind of mechanical constructions, pneumatic or hydraulic control systems.

The following pages give an example of the available working machines.

<b>Fabrication dept.</b>	
Flame cutting machine MESSER GRIESHEIM CNC with plasma cutting device	12000x3000x300
Bending machine FARINA	80Tx3000
Bending machine SCHIAVI	400Tx4000
Cutting machine MARIANI	3000x15
Rolling machine	2500x20
Bending machine for steel profile BOLDRINI	
Press	150 T
Submerged arc welding machine - SAW	Lincoln Electric



<b>Machining dept.</b>	
Orizonthal lathe MORANDO	900x6000
Orizonthal lathe	200x2000
Orizonthal lathe	350x3000
Orizonthal lathe	650x3000
Vertical lathe PIETRO CARNAGHI AC42TM (including milling device)	D=4300 H=3000 P= 50 T
Milling machine MECOF CS88	10300x1900x1000
Milling machine MECOF M1000 with rotating table	6300x2000x1250 1800x180
Milling machine MECOF CS103	3300x1200x1000
Milling machine MECOF UNICA 50CS	8000x1700x1000
Milling machine PAMA SR2 with rotating table	15000x4000x900x800 (X,Y,Z,W) 2500x2500 P=30T
Milling machine PAMA SR1000 with rotating table	16000x4000x900x800 2500x2000 P=20T
Milling machine FIL F.A.300	3000x2000x1550
Milling machine ARNO	1200x300x400
N' 2 Boring Machines	1600x80
Bridge crane up to 80 T	
Sandblasting and painting tunnel	

## EXAMPLES OF PRODUCTION



Painting and assembling department



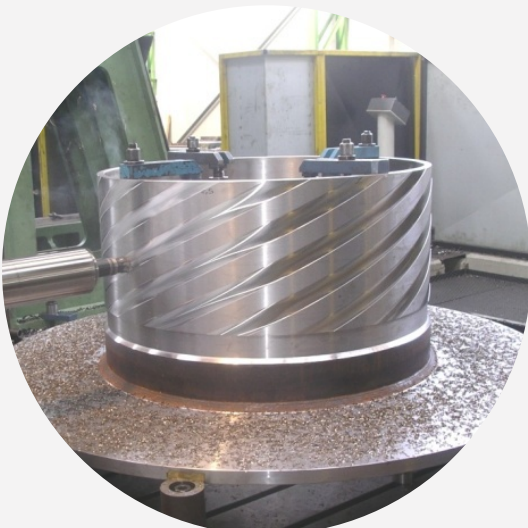
Machining department



Milling machine PAMA SR1000  
with rotating table



Vertical Lathe Pietro Carnaghi AC42TM



Insert oil



Turbine's runner Pelton

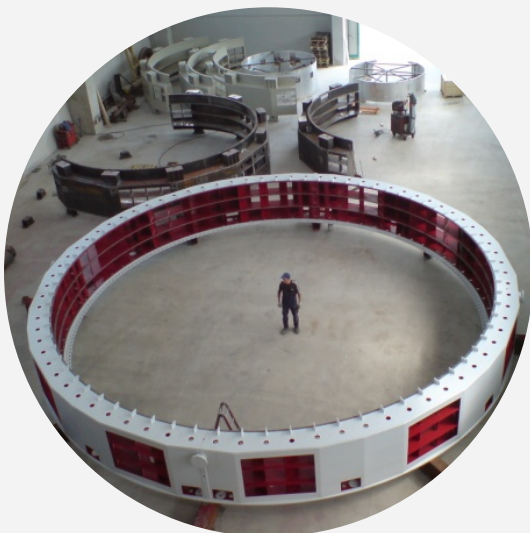




Hydraulic ball valve



Stay ring for Francis turbine



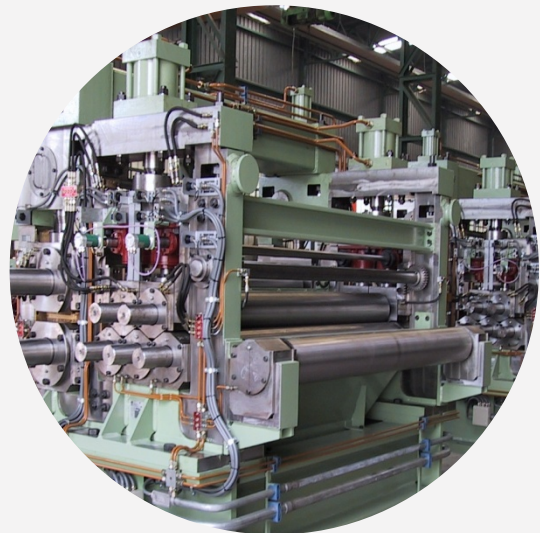
Stator frames for hydraulic turbine



Discharging machine for walking beam furnace



Manipulator for forging



Pinch roll calender



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