



your needs **our innovations**

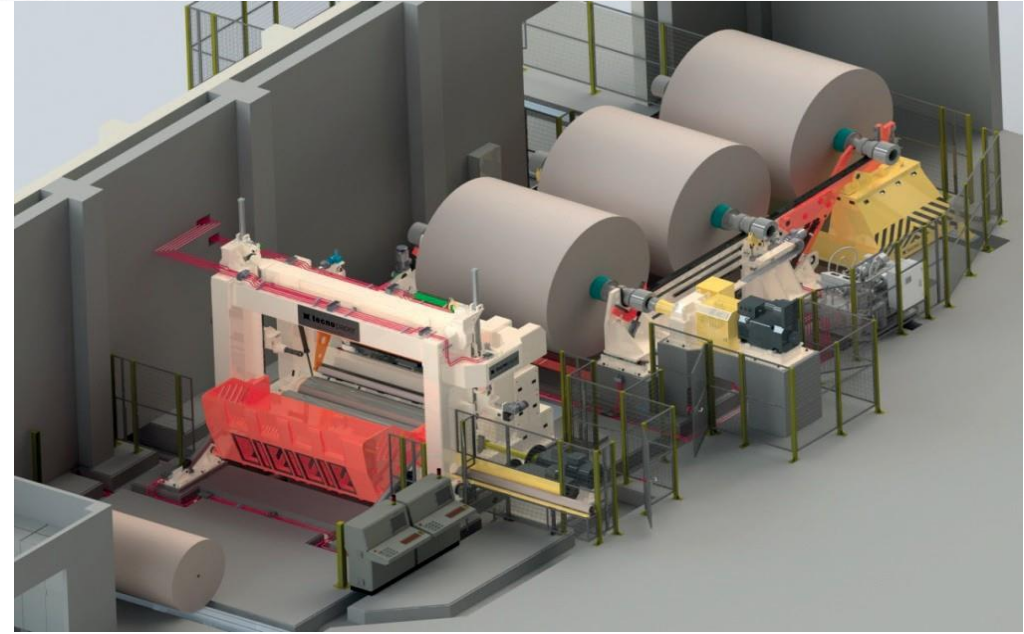
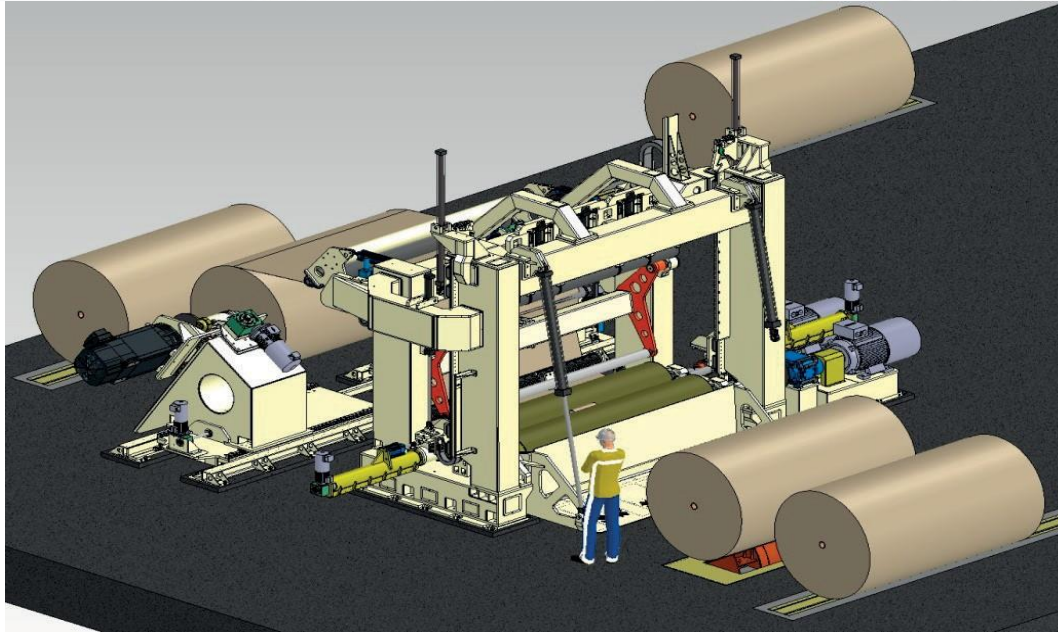


tissue winding technology



Tecno Paper, based in Lucca - Italy, it was founded in 2005 by a team of technicians and engineers with many years of experience in the paper industry

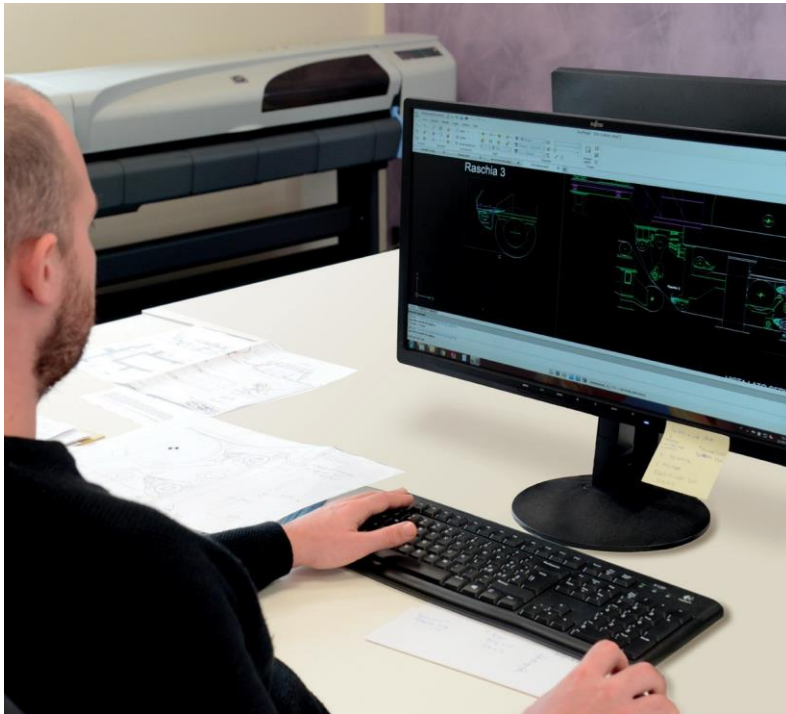
Tecno Paper supplies to important paper producers in Europe, Asia, Africa, USA and Latin America, offering accurate engineering projects, reliable, high technology machinery and efficient after sales service.



Tecno Paper Srl is mainly focused on winding systems technology. The core business of the company is the production of brand new and the rebuilding of winders for Tissue, Kraft, Coreboard and special applications, as well as pope reels, calanders and paper machine parts.

Tecno Paper has a customer oriented philosophy, the attitude of approaching the customer in a way to understand his product particularity and real needs, that combined with an ongoing R&D activity allow to offer to the market:

- CUSTOMIZED SOLUTIONS
- INNOVATIVE SYSTEMS
- TURN-KEY PROJECTS
- AFTER SALE SERVICE



Company Profile

- **Founded in 2005**
- **Focused on winding systems technology**
- **Specialized in supplying brand new winders for Tissue and Paper, and revamping of existing ones**
- **3.000 sq. mt. for Workshop, Ware-house, Offices**
- **50 skillled workers (mechanicians, installation supervisors)**
- **10 engineers (technical office, project management)**
- **5 start-up and process engineers**
- **More than 60 Major Projects worldwide for winding equipment**



your needs **our innovations**

	TP - BWIND	TP - SWIND	TP - HWIND	TP - HWIND ^E ST-CL	TP - PWIND ST-CL	TP - PWIND ^E ST-CL
Basis weight	12:40 gsm	12:40 gsm	12:40 gsm	12:40 gsm	12:40 gsm	12:40 gsm
Speed up to	800 m/min	1.000 m/min	1.500 m/min	1.500 m/min	2.000 m/min	2.000 m/min
Finished reel diam. up to	1.300 mm	1.500 mm	1.800 mm	2.200 mm	2500 mm	2.500 mm
Trim width up to	2.800 mm	2.800 mm	3.800 mm	3.800 mm	5.600 mm	5.600 mm
Carrying drum	400 mm	500 mm	605 mm	700 mm	850 mm	850 mm
Relieving system	Pneumatic	Pneumatic	Hydraulic	Electro-Hydraulic	Hydraulic	Electro-Hydraulic
NIP control system	Curves set in control system, changeable by the operator	Curves set in control system, changeable by the operator	Curves set in control system, changeable by the operator	Both Automatic and by curves set in control system, changeable by the operator	Both Automatic and by curves set in control system, changeable by the operator	Both Automatic and by curves set in control system, changeable by the operator
Spool handling	Manual, with special trolley	Manual, with special trolley	Manual, with special trolley or Automatic	Automatic or Manual, with special trolley	Automatic	Automatic
Special version ST ⁽¹⁾	N	N	N	Y	Y	Y
Shaftless version S-L ⁽²⁾	N	N	Y	N	Y	N

⁽¹⁾ **ST** version is “**S**oft **T**ouch” for very **S**oft **T**issue - ⁽²⁾ Max. working speed for “**S-L**” version is 1000 m/min - **CL**: Closed Loop type, ElectroHydraulic

standard equipment

- Modular unwind stands, peripheral belt type, with reel centering
- Automatic empty spool removal
- Winding on cores with expanding shafts
- Automatic winding shafts loading system
- Set web length or reel diameter control
- Automatic finished reel changes
- Unloading table for finished reels
- Shaft puller and winding shaft handling system
- Hydraulic and pneumatic on board plants
- Tangential slitting system (wrap on grooved roll on basic models)
- Manual slitters positioning
- Translating walkway in front of slitting group
- Safety protections
- Wound reel density control
- Accurate relieving system for chucks and rider roll.
- Trim removal system
- Operator friendly control system
- Easy access for maintenance

options

- Automatic slitter positioning
- Visualization of slitter position (when manual positioning)
- Dust removal system
- Calender
- Finished reel wrapping and handling

Model TP – BWIND
Rewinder



Model TP – **S**WIND
Rewinder



Model TP – **H**WIND
Rewinder



Model TP – PWIND
Rewinder

Relieving of chucks
and rider roll is
«Electro-Hydraulic
CLOSED LOOP»
type.



Model TP - BWIND
Unwind Stands



Model TP - **SWIND**
Unwind Stands



Model TP - **HWIND**
Unwind Stands



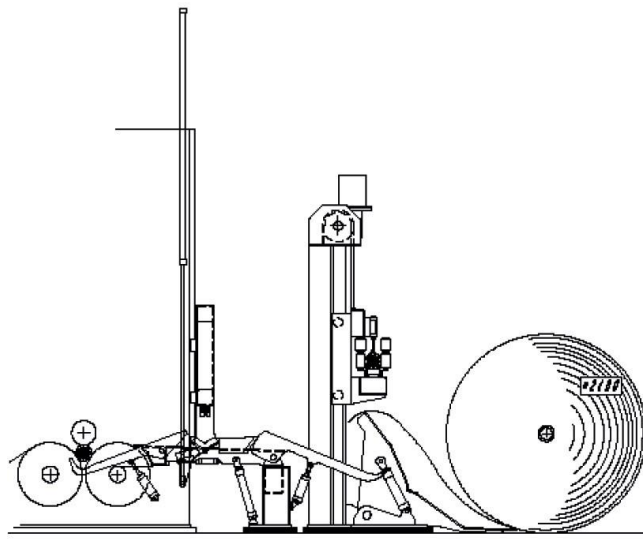
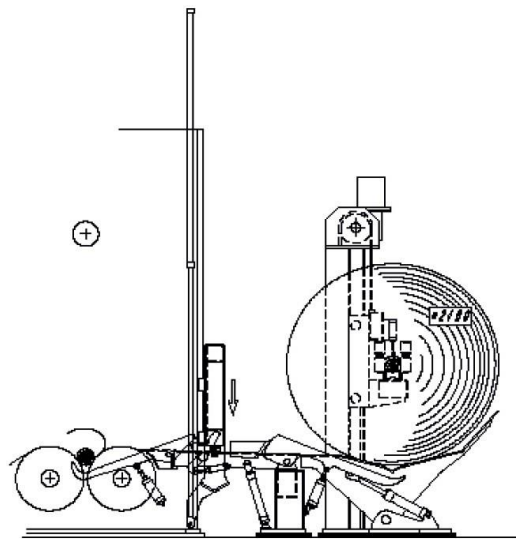
Model TP - PWIND
Unwind Stands



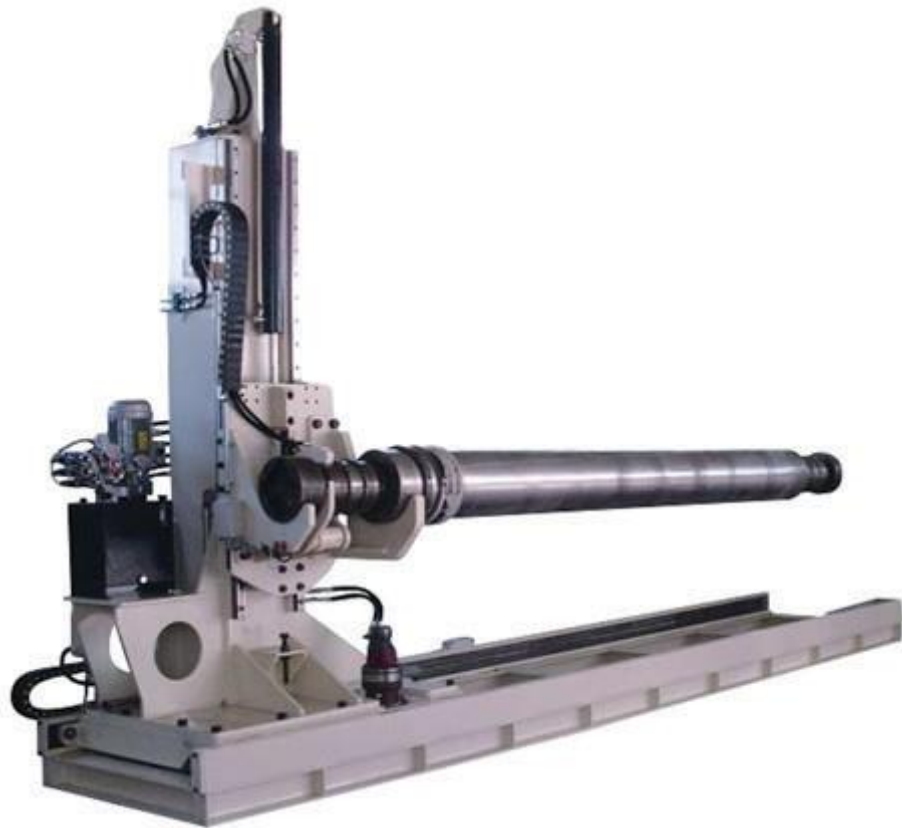
Model MULTIFUNCTION
Unwind Stand



AUTOMATIC WINDING SHAFT HANDLING SYSTEM WITH WEB CROSS CUT



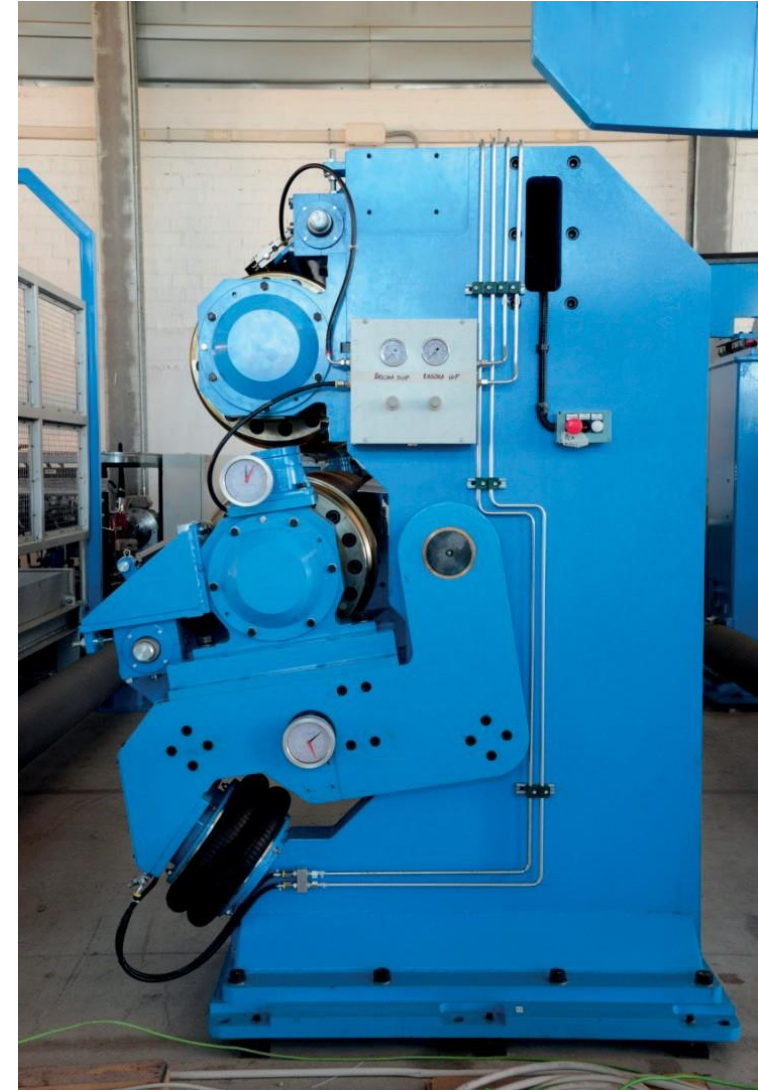
SHAFT EXTRACTOR



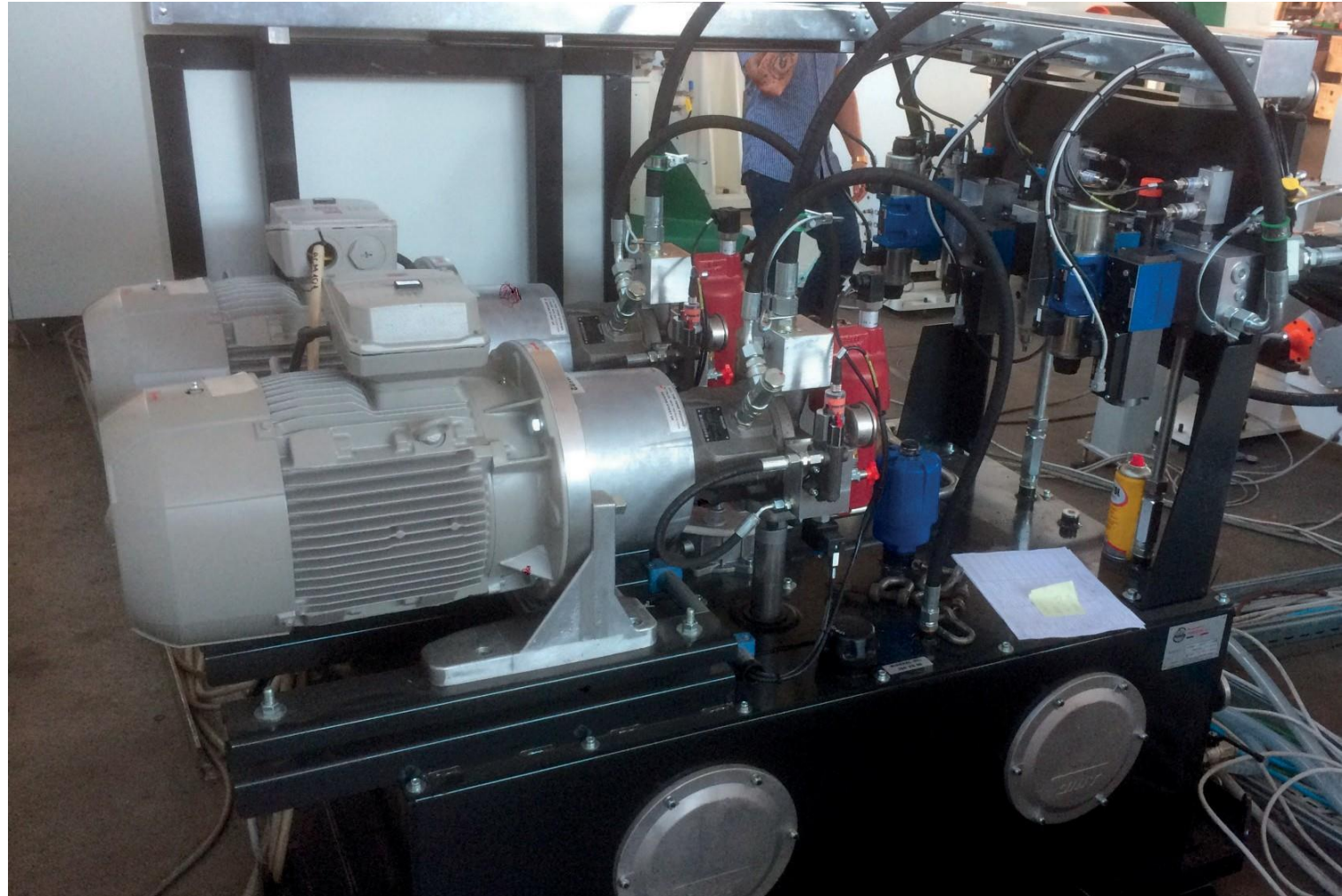
REEL TILTER



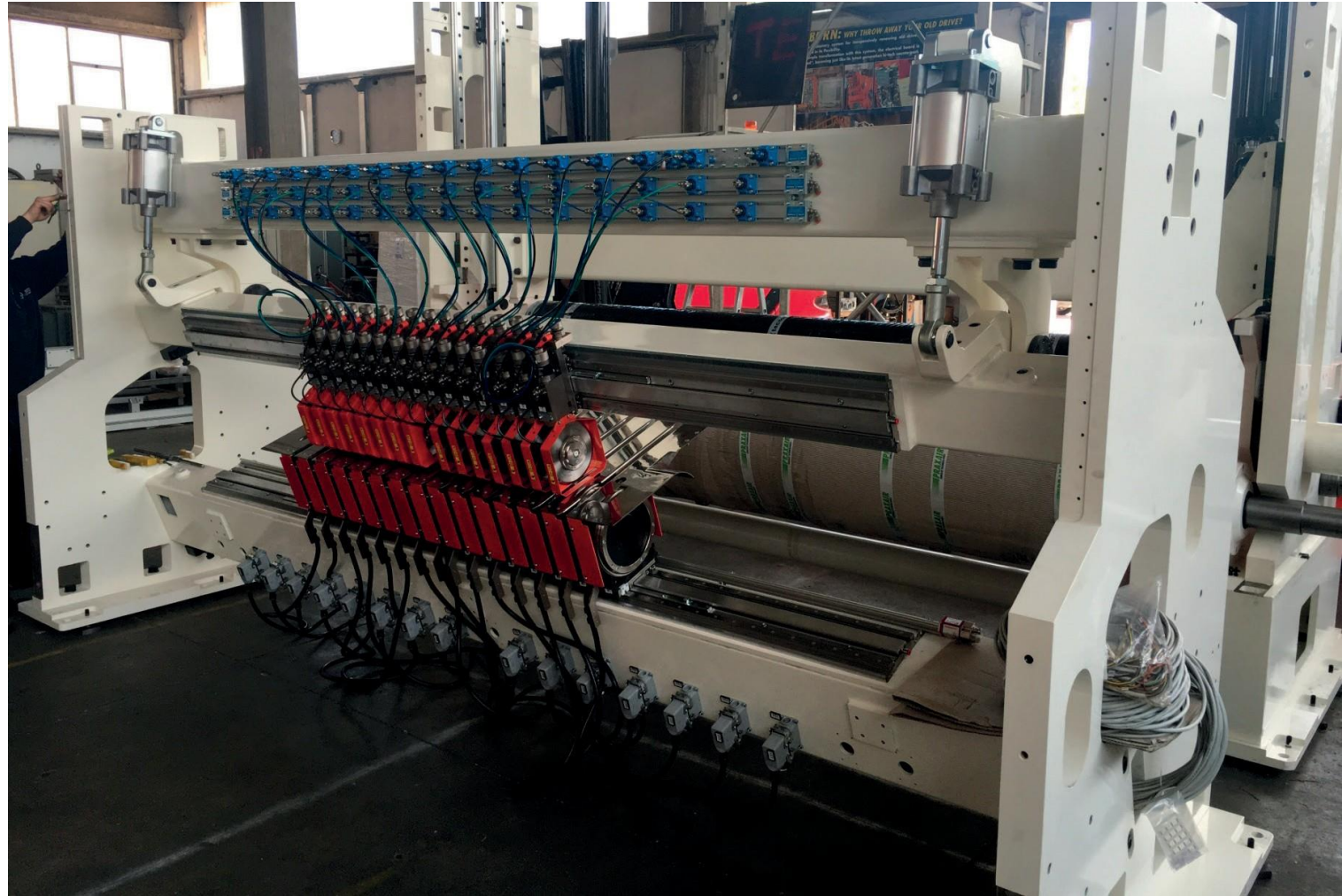
CALENDER - Skew and Crown Control types



HYDRAULIC UNIT



SLITTING UNIT
Single motor Counterknives



SLITTING UNIT
Grooved Counterknives roll

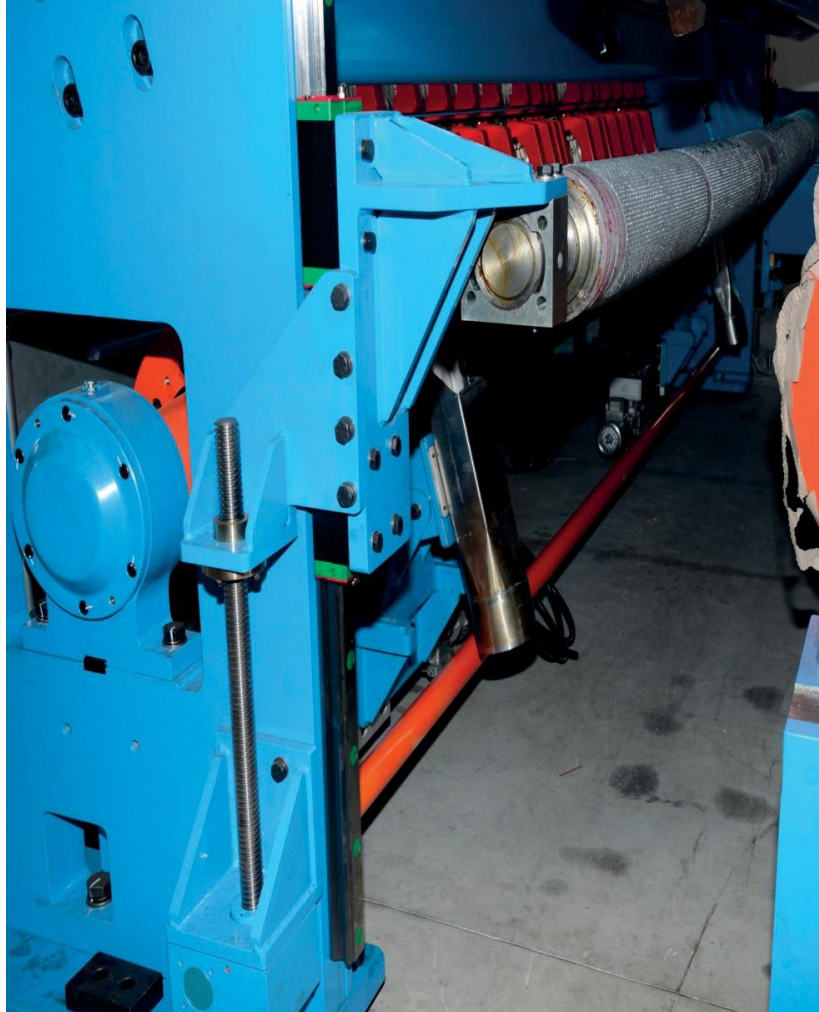
*Type mostly used
on rewinders
mod. «B» and «S»*



1

1) Adjustable position
of spreader roll and
trim chutes

2) Tilting crosswalk
at slitter unit



2



The tissue market in general, but particularly in some areas, is experiencing a rapid evolution and there are more and more products with many different characteristics from the so-called "conventional" tissue.

The OEMs of tissue machines have developed new solutions in the several zones on the machines themselves in order to give to final products the different characteristics.

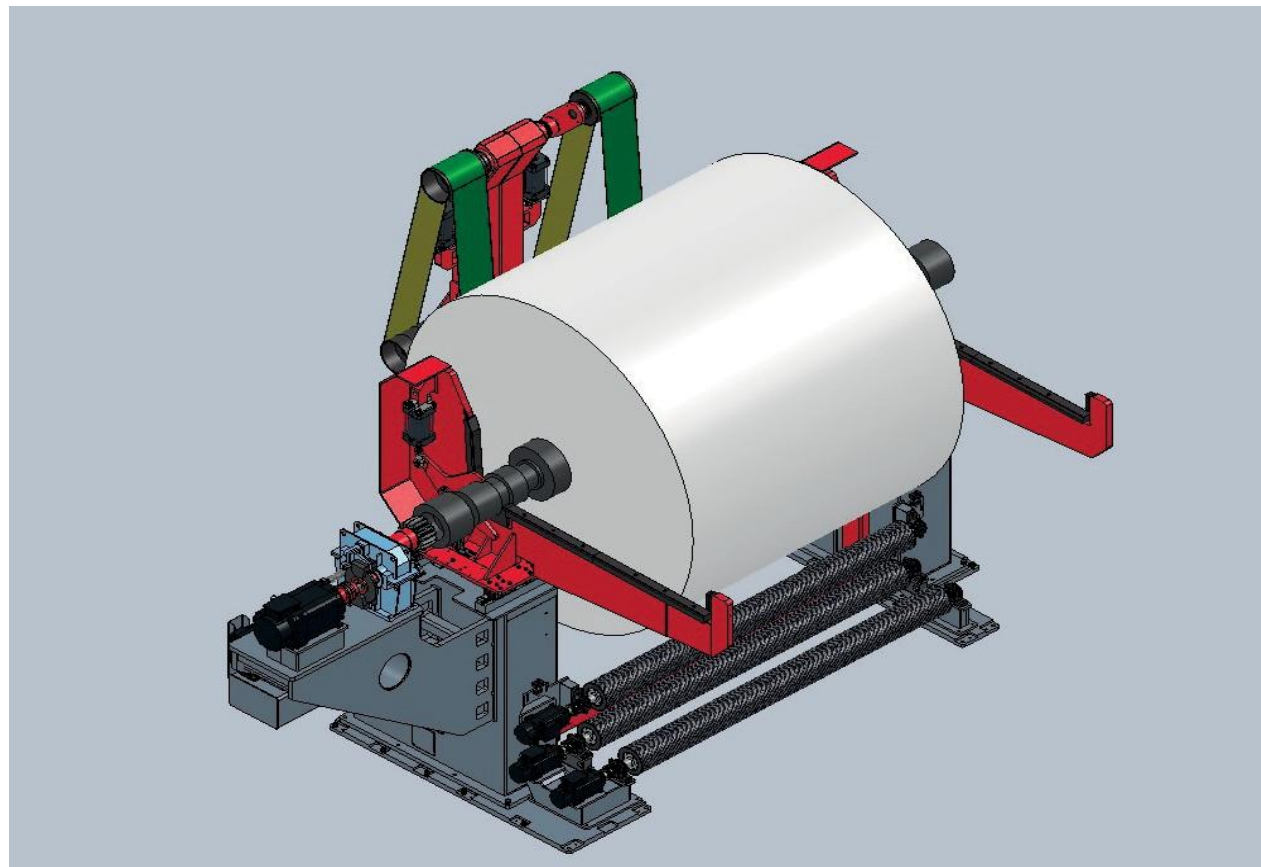
Tecno Paper has always been attentive to product changes, and to the consequently changing needs of tissue manufacturers, in developing appropriate and dedicated solutions to be applied to their rewinding lines, so as not to make it vain or reduce what has been done on the tissue machines.

Approximately eight years ago, Tecno Paper developed a type of unwinder, named ***MultiFunction***, with double unwind system: peripheral with belts and centre drive with direct connection of the reel spool to the driving motor. This type of unwinder has been installed on several tissue rewinding lines and has significantly helped to solve many problems, and to increase performances as well, thanks to the possibility to use both systems together or separately and to a perfect web tension control with load cells.

The **MultiFunction** unwind stand has had several modifications and implementations.

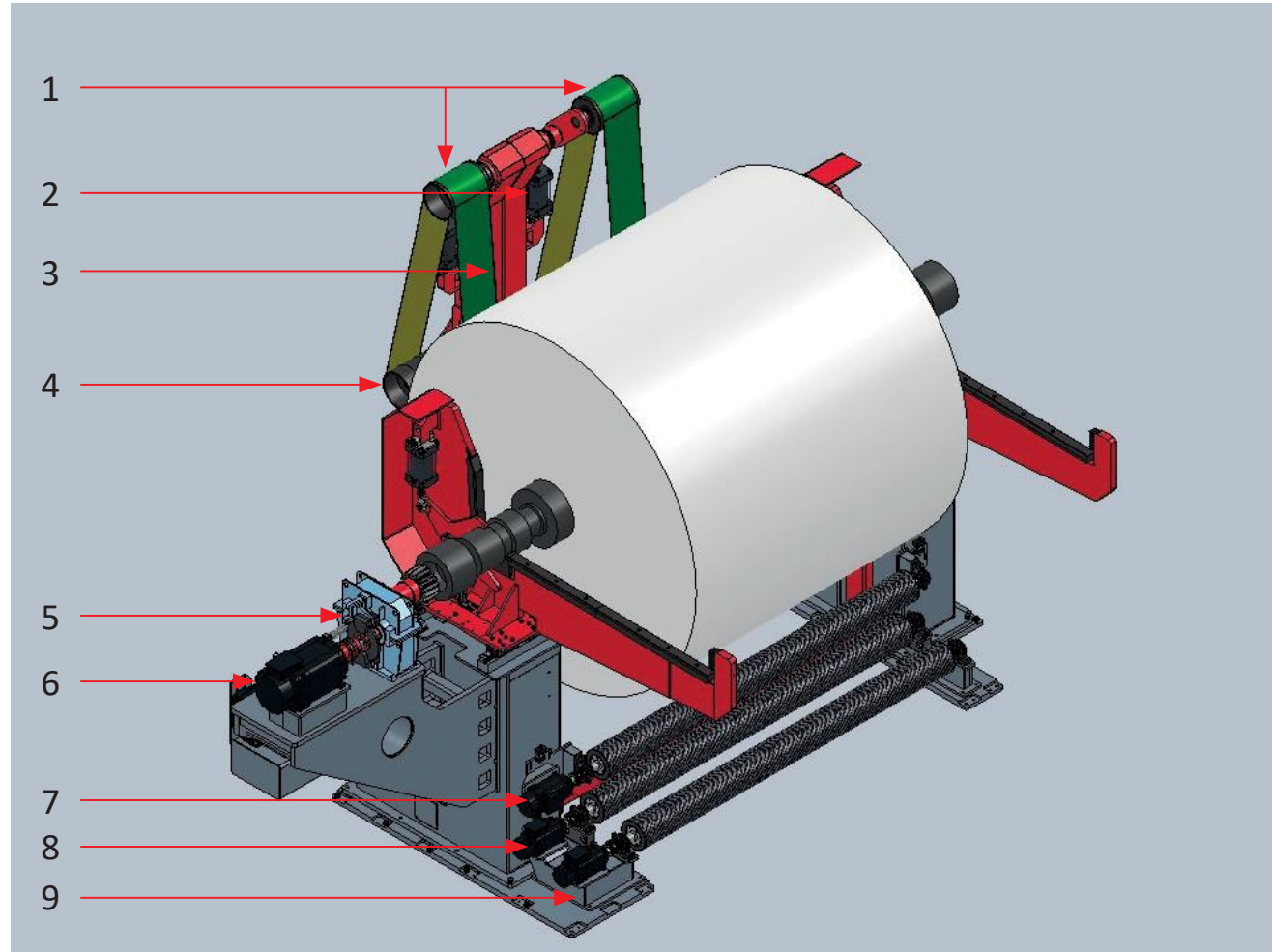
The latest version has the configuration shown in this picture.

It is mainly composed by the parts indicated on the next slide.



MultiFunction

- 1 Unwinding belts, large size, driven by AC motor
- 2 Pneumatic compensation system for each belt to absorb reel off roundness
- 3 Arm holding the belt; hydraulically operated
- 4 Pulley mounted on Load Cells
- 5 Gearbox for Centre Drive
- 6 AC Motor for Centre Drive
- 7 Lead-out roll
- 8 Lead-out roll mounted on load cells for web tension control
- 9 Lead-out roll for plies combining



for super **soft tissue**

The features of the ***MultiFunction Unwinder*** allows to reach the following performances:

- Less specific pressure of the belts when centre drive is used in combination. This allows to minimize loss of properties of the tissue;
- High precision and constant control of the belt pressure on the reel thanks load cells measurement and regulation by the control system;
- No «torsion» effect in the structure of the reel, even in presence of cross profile unevenness, thanks to independent pneumatic compensation system on each belt;
- Possibility to use Center Drive only with certain products, thus avoiding deformation to the reel and loss of properties of the tissue due to the pressure of the belts;
- High precision control of the web tension, thanks to lead out roll mounted on load cells whose signal is the feedback for the regulation by the control system;

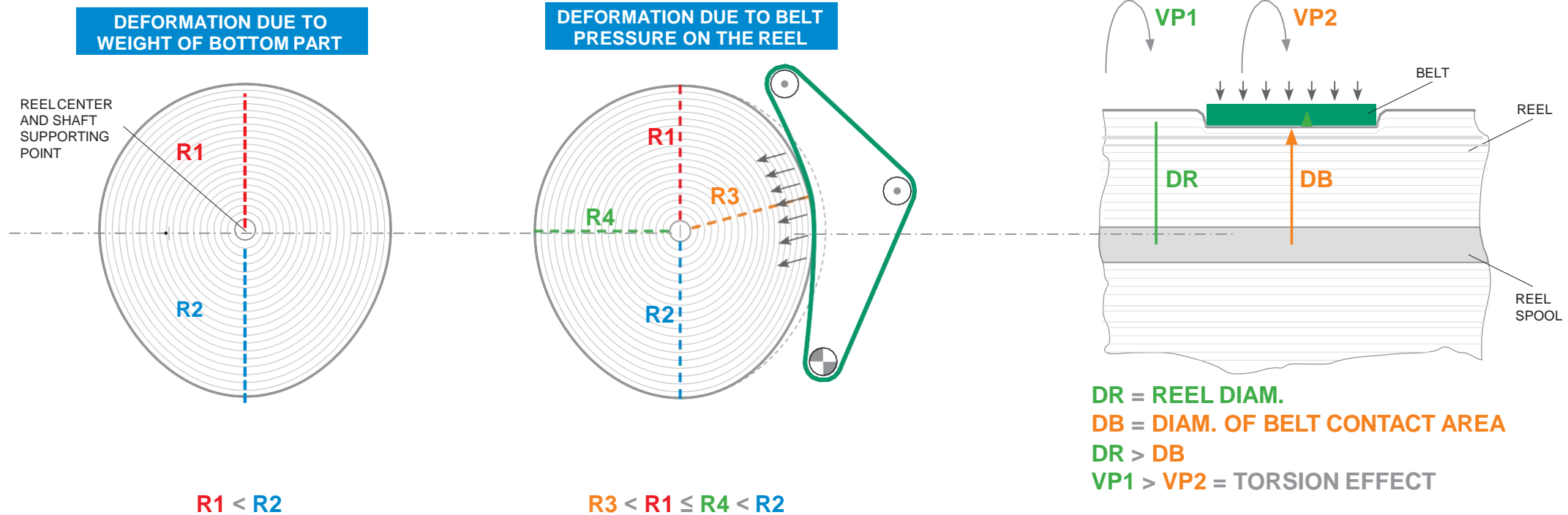
BUT, nowadays on the Tissue market are present products whose reels coming from the Tissue Machines have a very low density, thus making them difficult to handle in rewinding lines, and also the performances offered by the ***MultiFunction Unwinder*** are not enough.

Most of the problems, and of the limits in speed and productivity, in rewinding Super Soft high volume tissue grades, are due to the high deformability of both mother and finished reels.

The study of the technical team in Tecno Paper has been therefore mainly directed to find process solutions avoiding deformation of the reels, but at the same time allowing an operator friendly use of the rewinding line and an increase of productivity.

The study started by considering why and how the **deformation** of reels arises in the rewinding lines currently used, and mostly at the traditional “belt” unwinding section, **that are:**

REEL DEFORMATION ON BELT UNWINDER



*This effect happens also with
Drum type Unwinders (reverse Pope Reel)*

In order to overcome such problems, and to offer the tissue producers winding systems assuring high standards of quality and productivity, Tecno Paper has developed, and patented, solutions purposely dedicated to such “difficult to wind” products.

They avoid the Super Soft reels are permanently deformed and the loss of bulk is huge.

The last product which comes in to join the family of the **TP-Soft Touch** equipment is the new ***Unwinder***.

It is fitted with innovative and dedicated drive and control systems for low density tissue reels, thus allowing to reach, and ensuring, high precision, accuracy and productivity for the unwind process on rewinding lines.

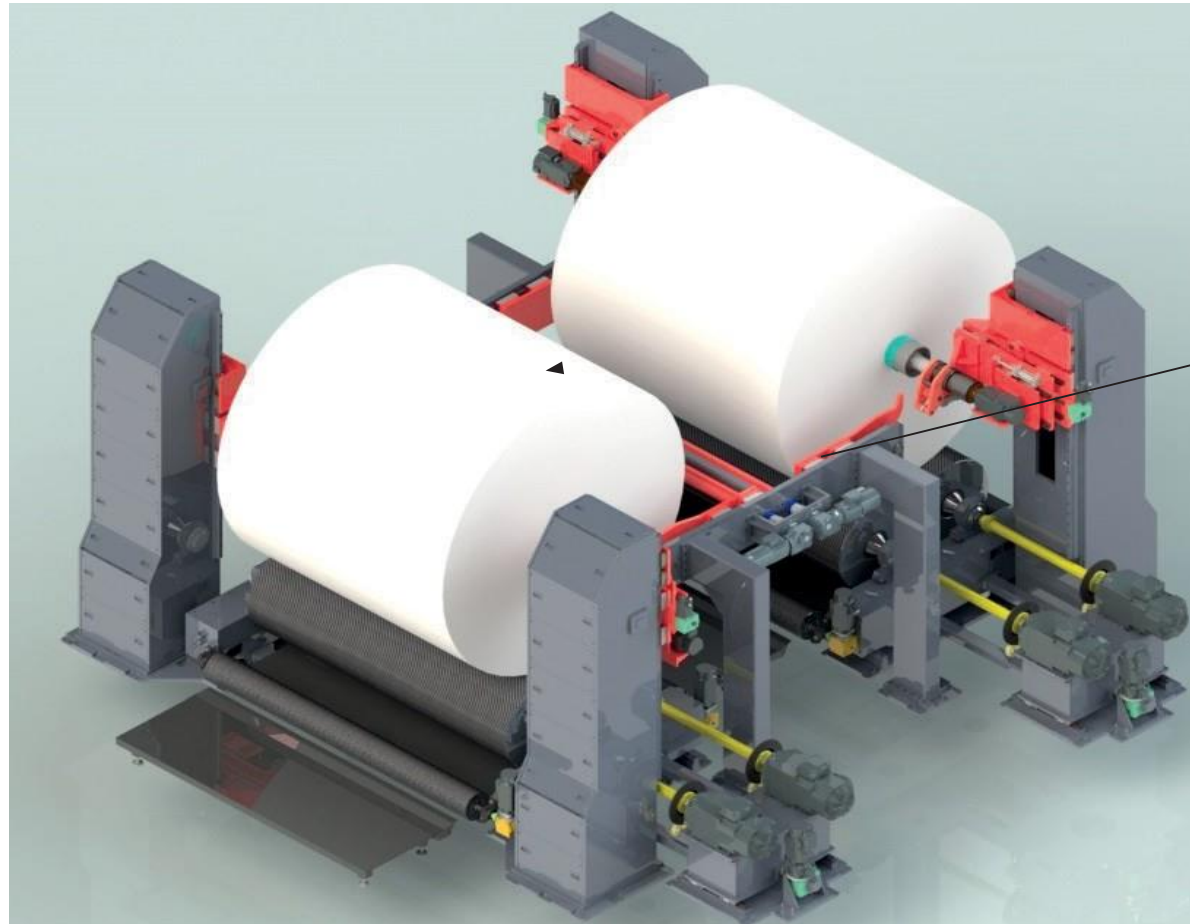
TP-Soft Touch, the innovative winding concept of Tecnopaper for Super Soft Tissue

The main features of the **TP-Soft Touch Unwinder** are two large diameter carbon fiber rolls (driving rolls) - independently driven by variable speed motors, sustaining the reel and giving it the rotation movement - and a centre drive assist, still with variable speed motors, that nullifies the rotation inertia, thus avoiding any torsion effect in the structure of the reel. This unwinder offers also a high production efficiency thanks to its automatic functions of reel change and return of the empty spool to a parking station. Its control system with double load cells allows to obtain constant and extremely precise measurement and control of the NIP of the reel on the driving rolls during the entire unwinding phase; the accurate relieving movement is obtained by an electromechanical system.

The TP-Soft Touch Unwinder DOESN'T GIVE any deformation to the tissue reel and it can be installed in Converting Lines as well.

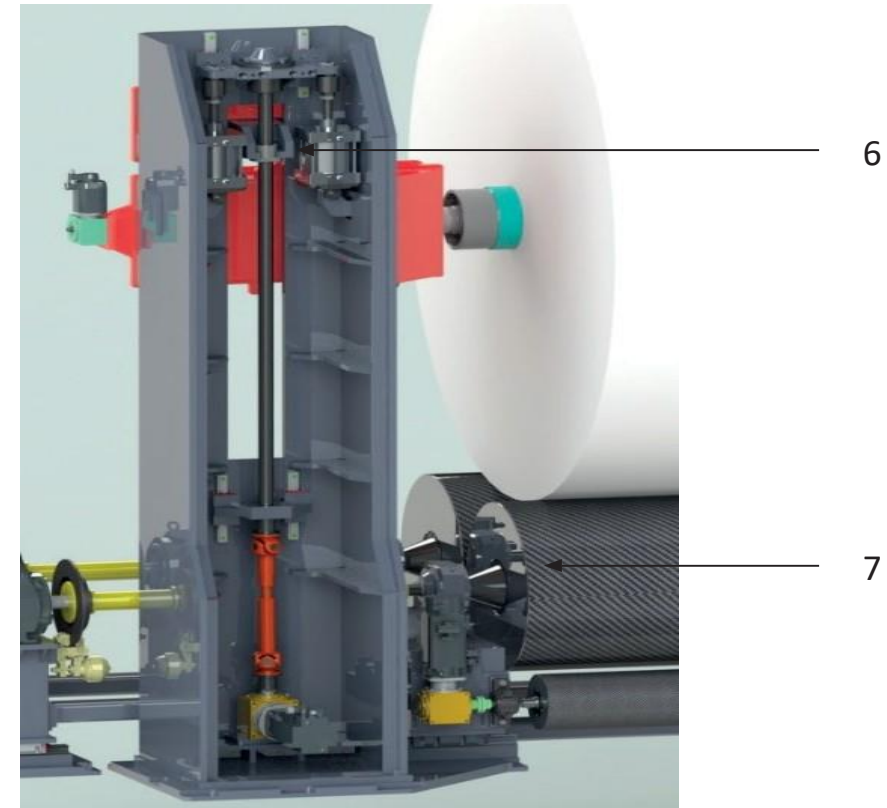
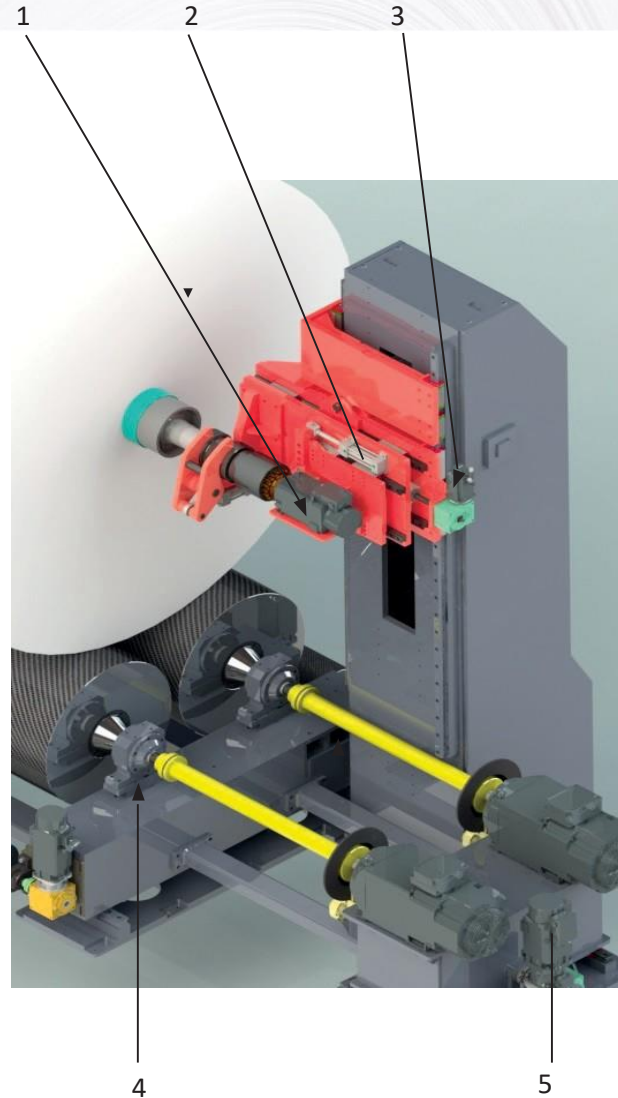
*General view of
«Double Reel»
arrangement.*

*The Unwinder can be
supplied also in «Single
Reel» version and as a
stand alone unit.*



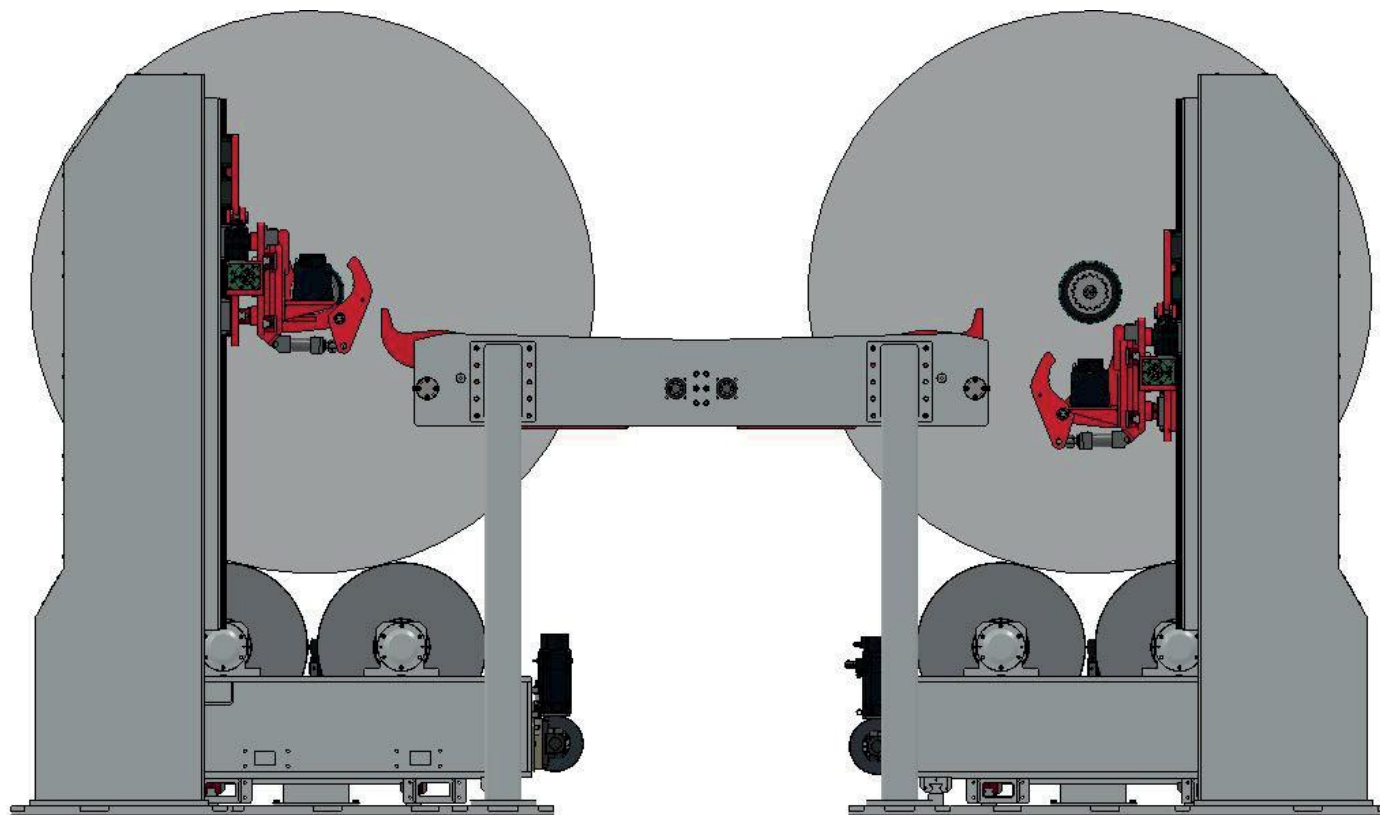
Empty Spool
Removal System

- 1 Centre Drive
- 2 Pneumatic System to open/close centre drive
- 3 Reel Centring motor
- 4 Load Cells
- 5 Carrying Drums centring motor
- 6 Pneumatic Device to absorb off-roundness of mother reel and load cells reading reel weight
- 7 Carrying drums made of carbon fibers with tungsten carbide coating



The Unwind Stand has been designed taking care that its overall length doesn't exceed the max. diameter of the parent reels to be processed.

In this way the unit can replace existing unwind stands of different type without modifying the layouts of the rewinding or converting lines.

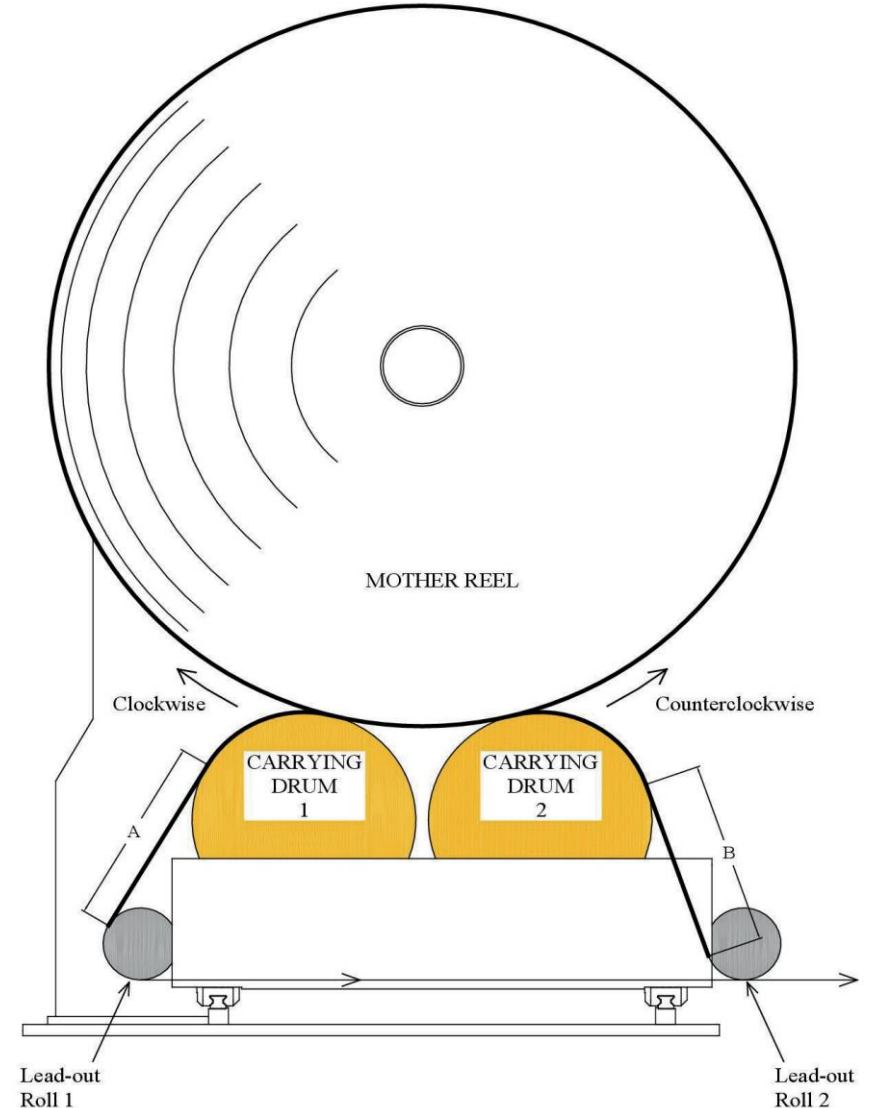


TP-Soft Touch Unwinder

Another **important advantage** offered by this type of unwinder is that the free paths “A” and “B” (no matter which is the reel rotation direction) are very short and remain the same during all reel unwinding phase.

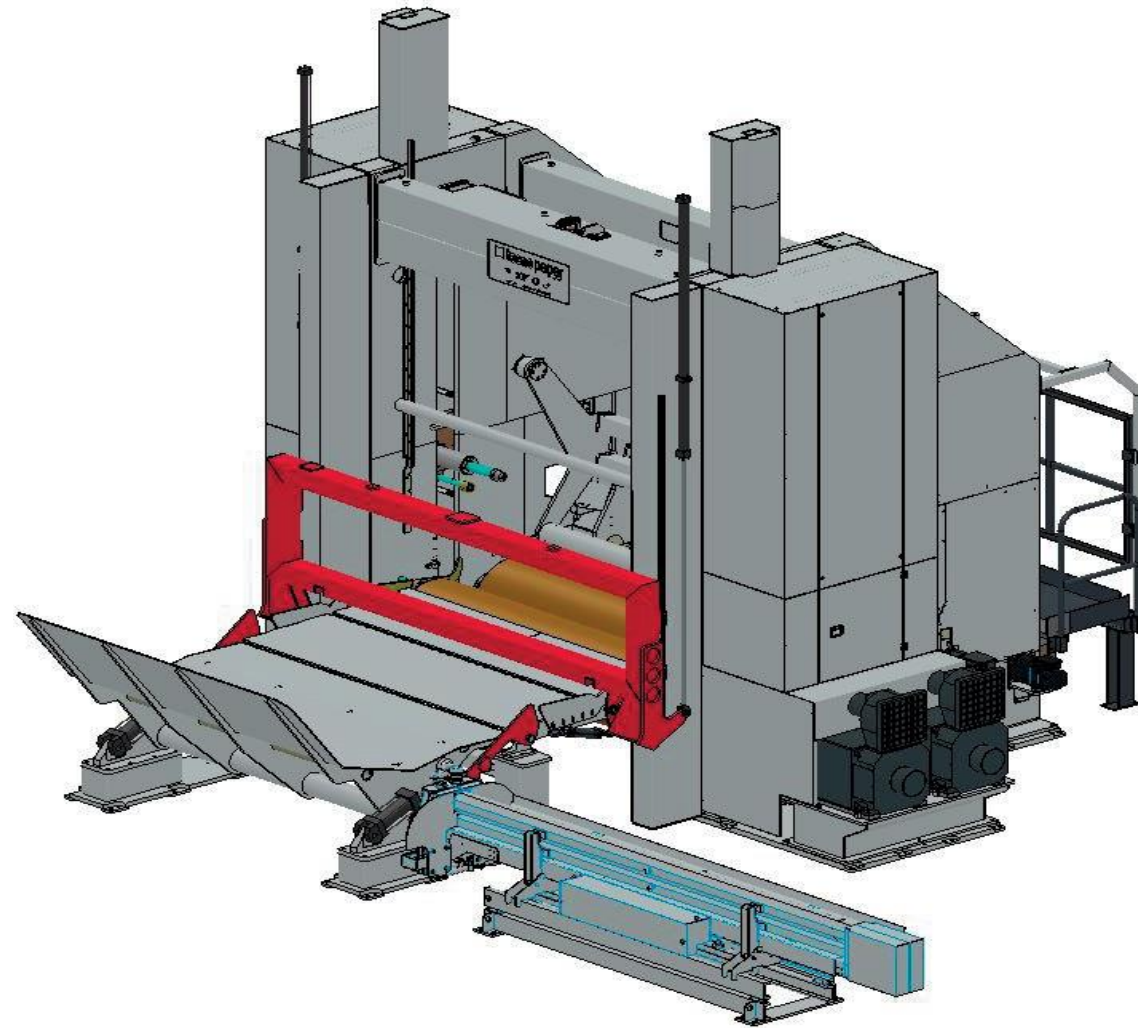
So they do not represent a factor limiting the working speed of the line.

On traditional “Belt” type unwinders, where the rotation centre is fixed, these two paths increase while the reel diameter decrease, thus reducing the web stability and obliging in many cases to reduce speed or to increase web tension.



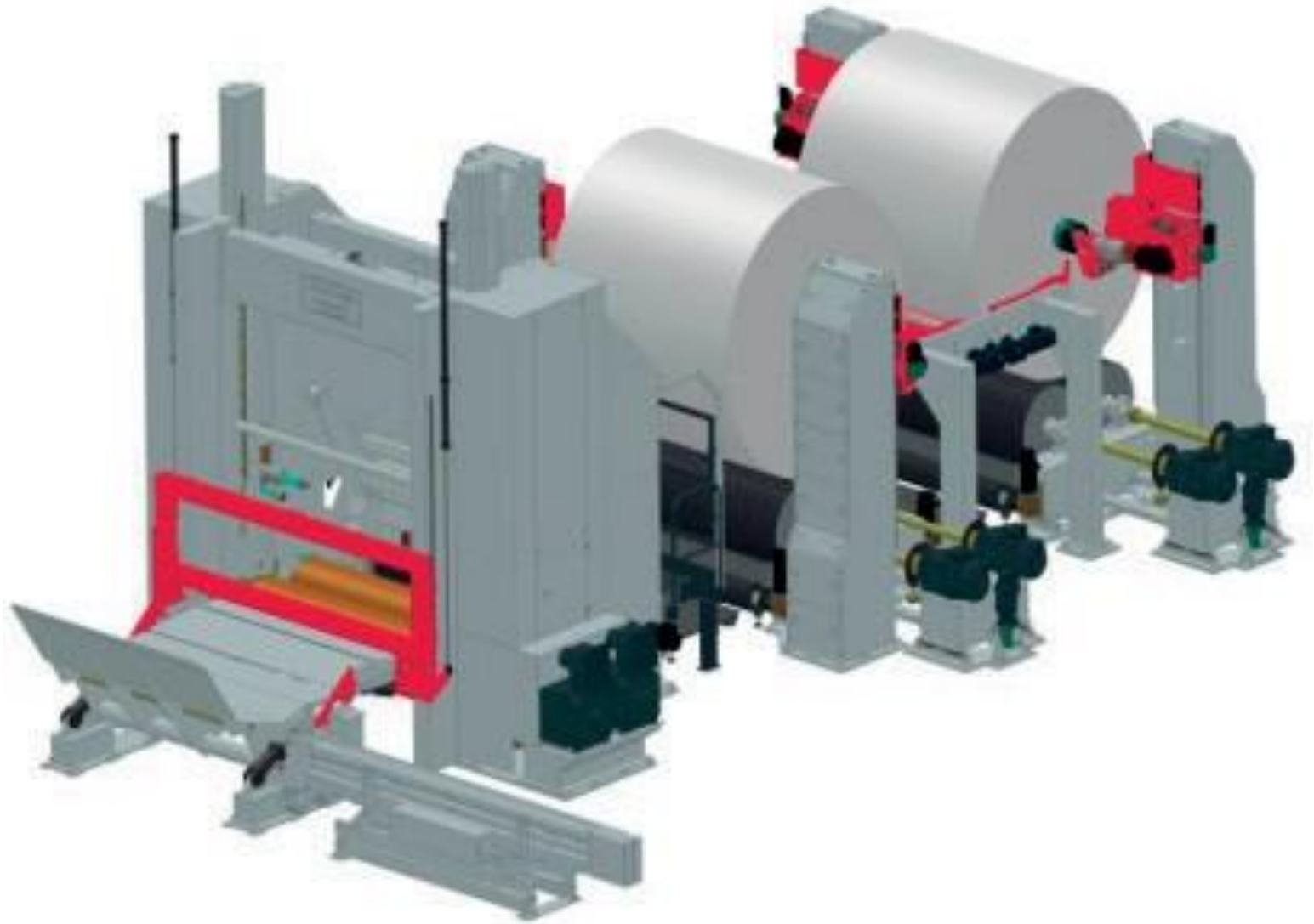
TP-Soft Touch Rewinder

*Hydraulic type, Closed
Loop bulk control by
means of signals from
load cells on chucks
carriages and rider roll*



TP-Soft Touch

INNOVATIVE WINDING CONCEPT
FOR SUPER SOFT TISSUE



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TP-Soft Touch - Benefits offered by the innovative winding concept TP-Soft Touch

- Reels (mother and finished) fully supported during all the process by full width driving rolls;
- Nullification of all the inertia forces thanks to addition of center drive at unwinder;
- High precision NIP control thanks to special electro-hydraulic relieving systems, both working in “Closed Loop” mode with constant feedback from the on board sensors;
- High operation efficiency thanks to spools and shaft automatic removal and handling;
- Minimized bulk loss;
- Integration with **TP-Win 4.0 e TP-Service**.
- Operator friendly control system and HMI;
- Easy to switch from “Closed Loop” automatic NIP control to “Open Loop” control by curves set in the control system and adjustable by the operator

TP-StopLess

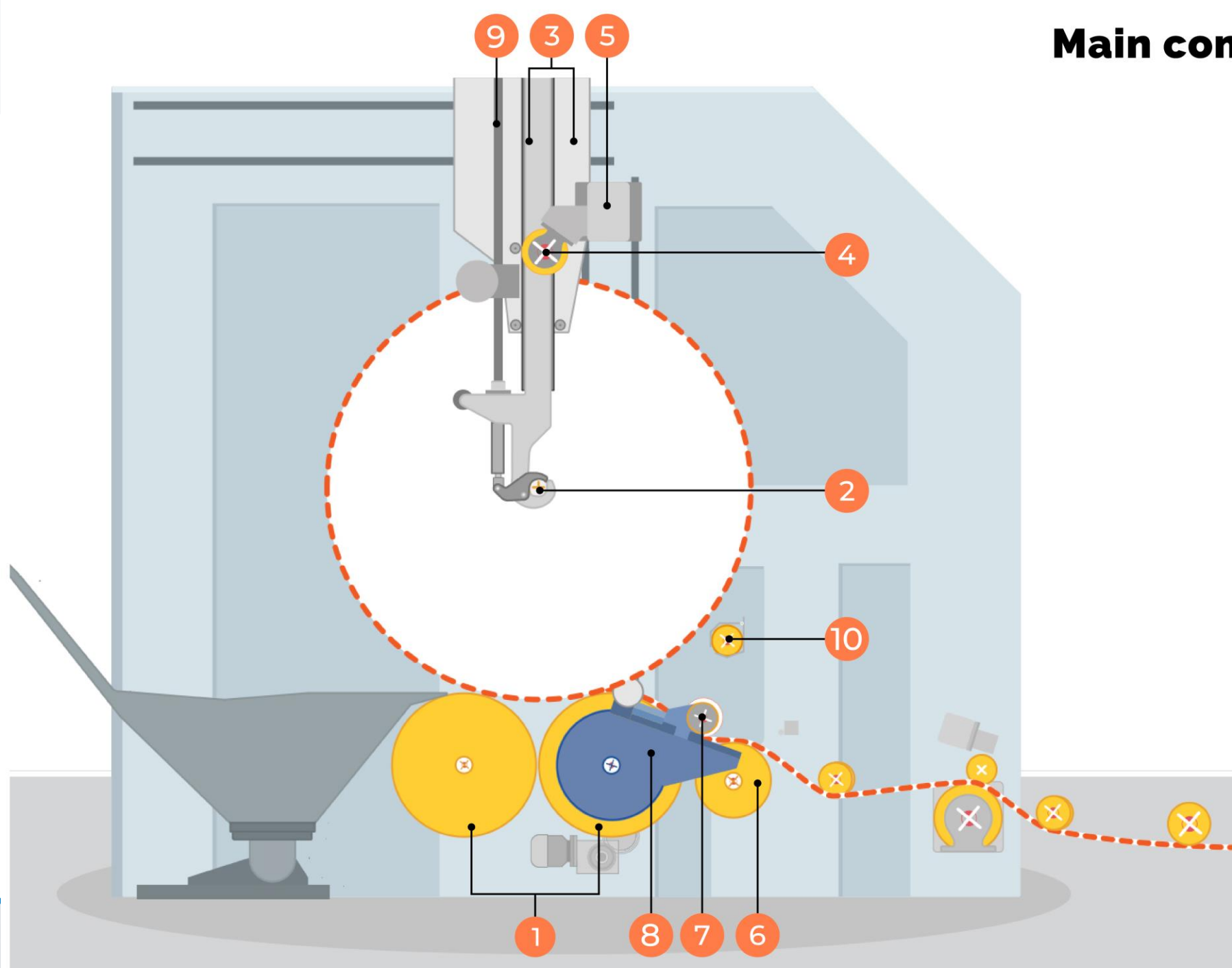
NON STOP Reel Change method in Tissue Winders

When winding Tissue there are many factors that limit the winders operating speed. On “**conventional**” tissue products the main limiting factors are: paper width, number of plies, diameter of cores at wind-up, number of slitters into operation.

When talking about “**Super Soft**” tissue, whose reels (mother and finished ones) have a low density and the structure of the web is more sensitive to permanent deformation, to the factors mentioned above we have to add the high relieving actions on chucks and rider rolls, which is necessary to keep tissue properties, that reduce the reels stability on the carrying drums thus limiting the operating speed. In order to keep high the productivity of Tissue winders, enabling them to match the output of tissue machines, also in those cases where speed cannot be raised, TecnoPaper has developed, and patented, rewinding methods able to increase the operation efficiency significantly.

We mean that for the productivity “speed is not all”, but **EFFICIENCY** has a great impact.

Main components of the system



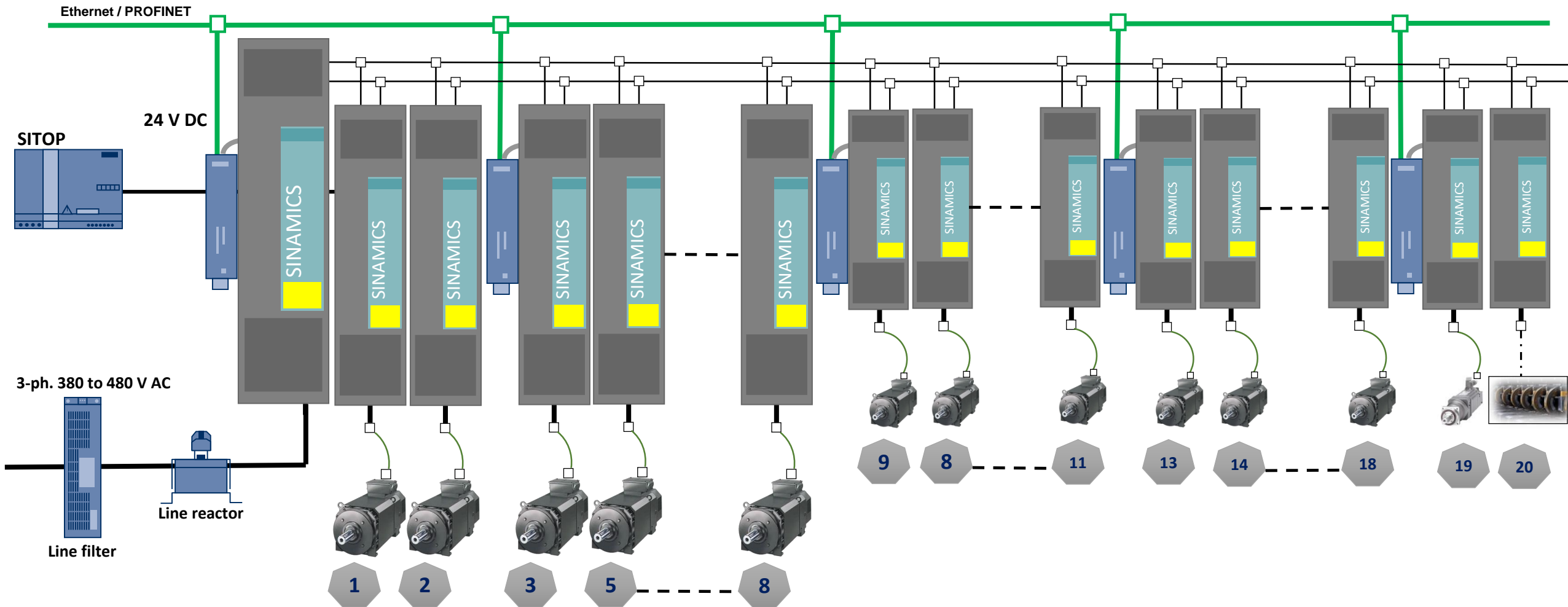
- 1 Carrying drums
- 2 Primary chucks
- 3 Primary chucks relieving system
- 4 Rider roll
- 5 Rider roll relieving system
- 6 Change roll
- 7 Secondary chucks positioner
- 8 Helper (pivoting system of change roll)
- 9 Finished reel removal system (positioner)
- 10 Core shaft

Main Features and Benefits offered by TP-StopLess system

- **Efficiency increase of the winder by 15% to 22%**, depending on several factor like:
 - Number of unwind stands in operation
 - Diameter of parent reels
 - Diameter of finished reels
- **Very smooth finished reel removal** obtained by a dedicated device which gently pulls the reel off the carrying drums and positions it onto the lowering cradle, thus avoiding any deformation to the reel structure. This device has replaced the traditional hydraulic pusher.
- **High precision "Closed Loop" NIP** control of reels against all rolls during the entire winding operation (reel growth and finished reel change)
- **No free movement of reels** at any phase of winding operation.
- **Bulk and crepe loss reduced** at the minimum extent.
- **Control system and HMI** are very operator friendly.
- **Integration** with TP-Win 4.0 e TP-Service.

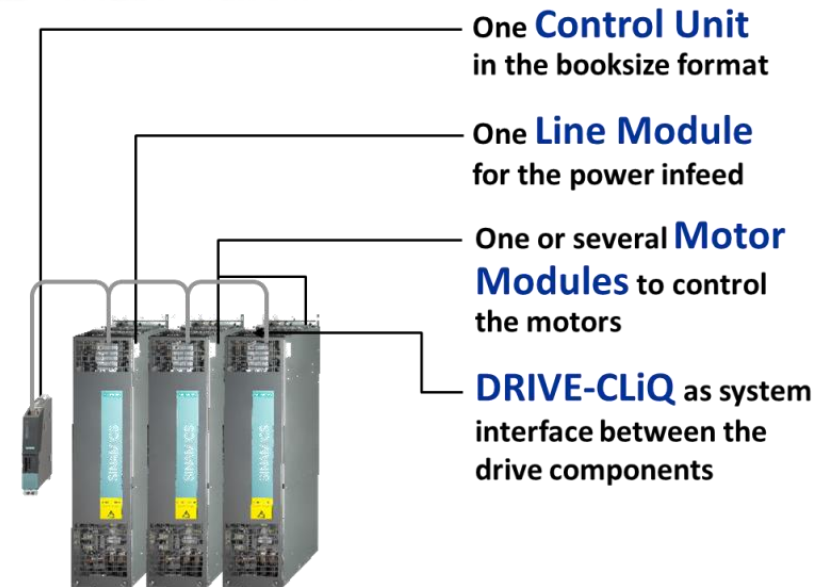
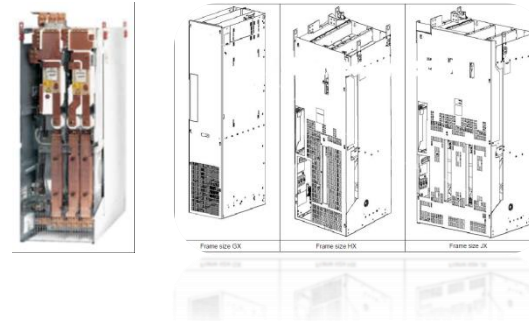
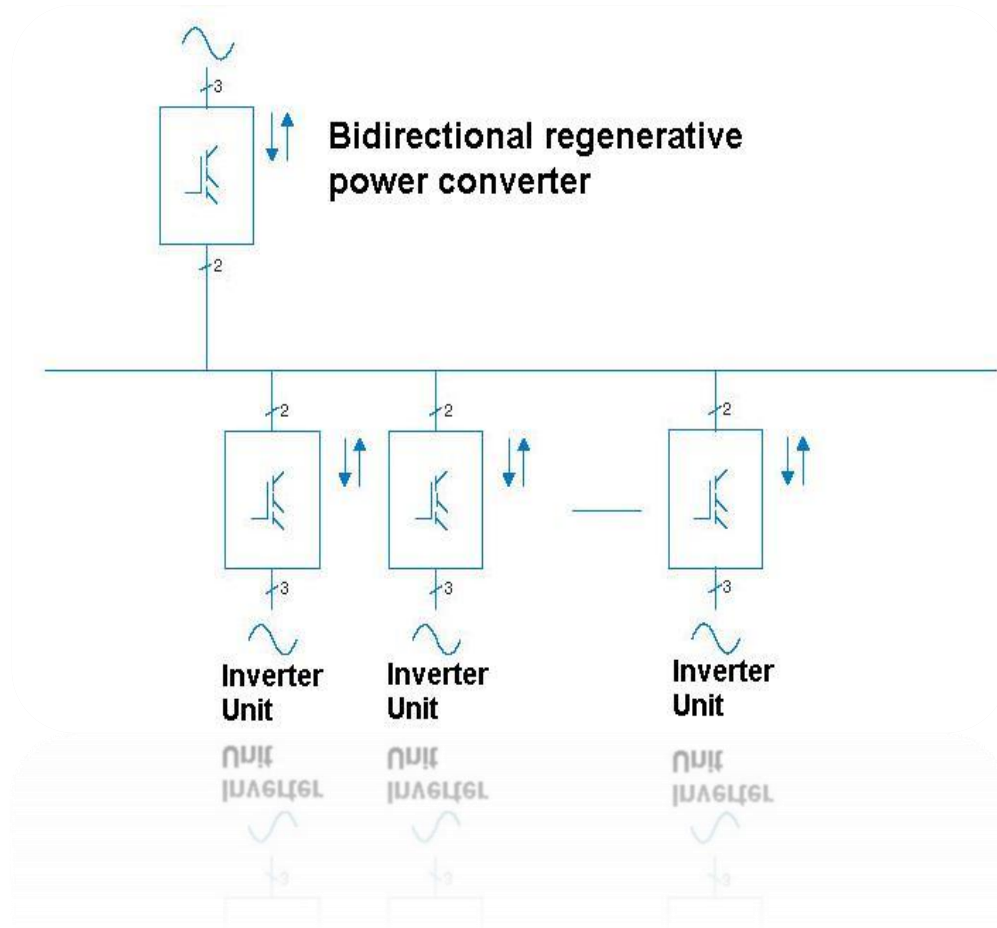
AUTOMATION AND DRIVES

- Distributed I/O concept
- User Interface HMI
- AC Motors
- Drive



Rectifier Regenerative Unit & Drive

SINAMICS s120

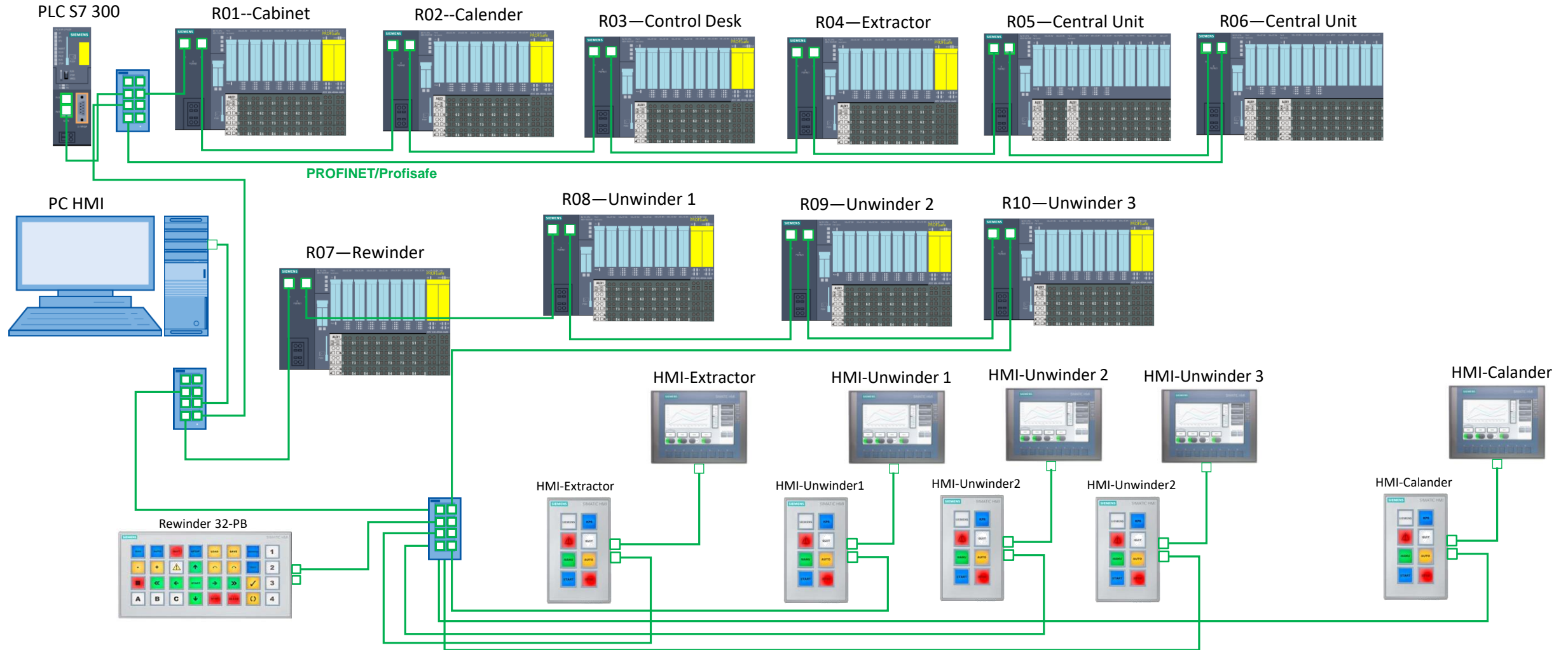


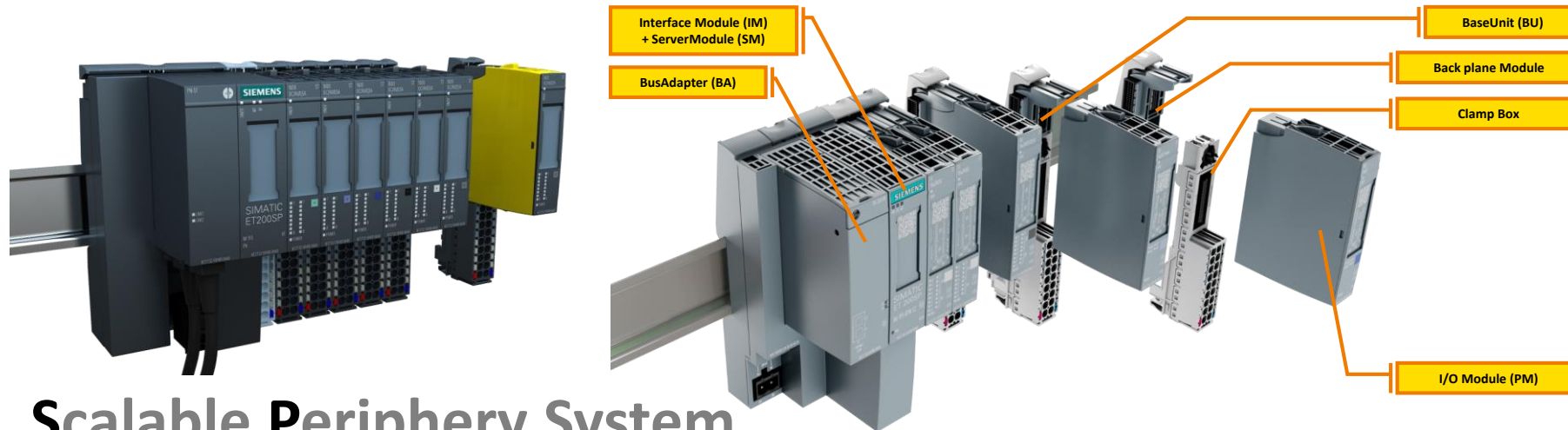
One **Control Unit**
in the booksize format

One **Line Module**
for the power infeed

One or several **Motor Modules** to control
the motors

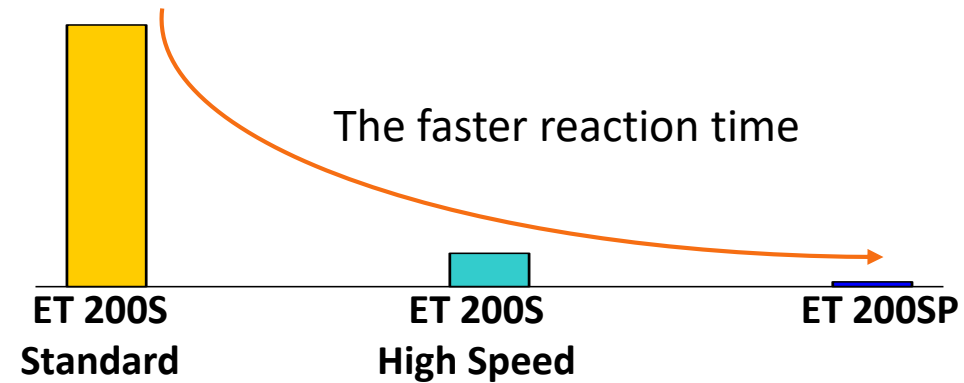
DRIVE-CLiQ as system
interface between the
drive components

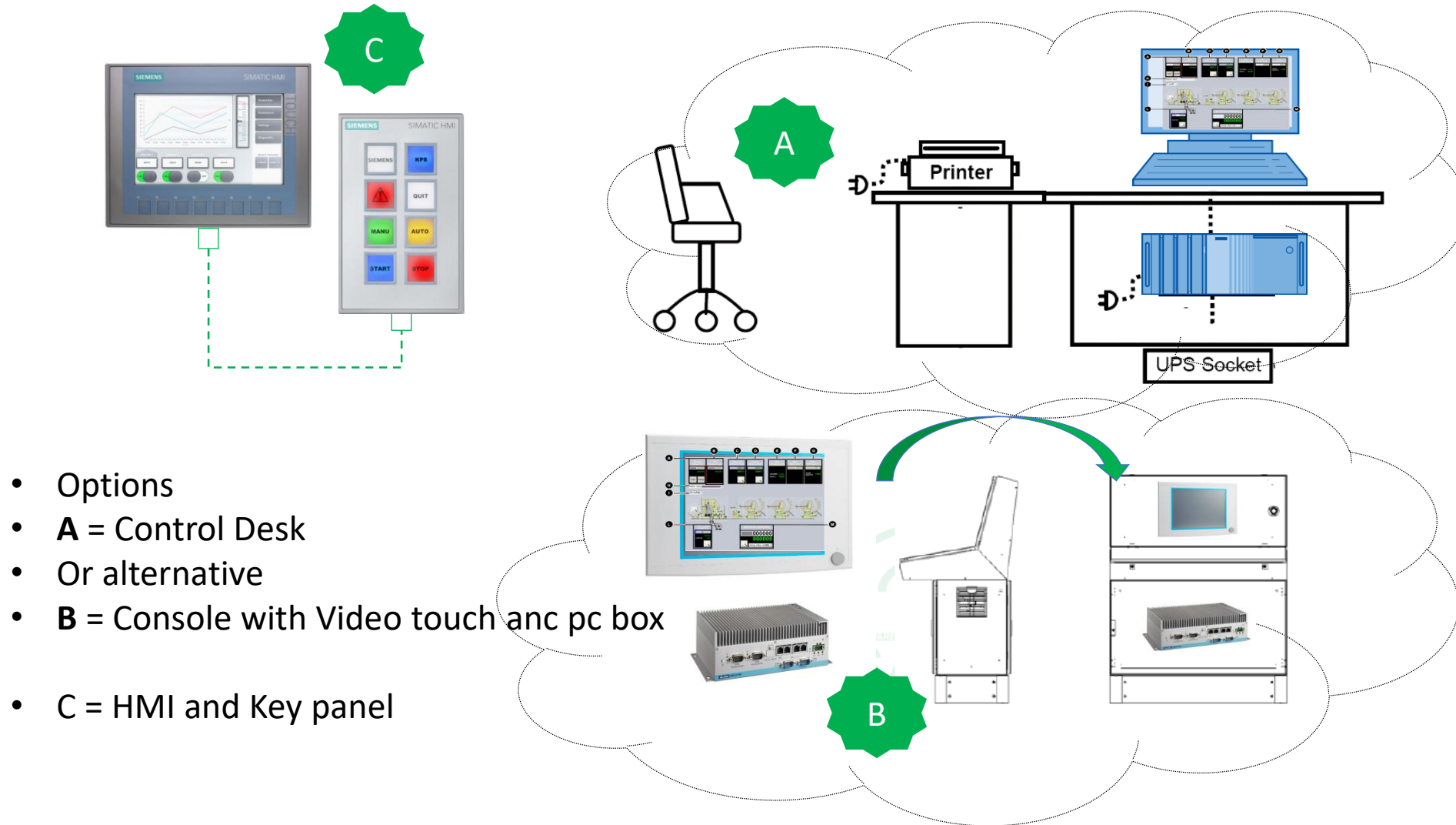




ET200SP

	ET200 SP	ET200 s
Count 24V	200KHz	100KHz
Count 5V	1MHz	500KHz
DO Delay output (0→1)/(1→0) ohmic load	50us/100us	100us/600us





- Options
- **A** = Control Desk
- Or alternative
- **B** = Console with Video touch and pc box
- **C** = HMI and Key panel

Thanks to:

- Directional servo-valves Q&P, with position feedback & Hydraulic Cylinder
- Accurate load cells feedback and control.
- Thickness calculation.
- Closed loop with continuous feedback from on board sensors

The TECNOPAPER “*Hydraulic with closed loop*” Rewinder offers:

- ❖ ***NIP controlled during the whole winding phase from start to stop.***
- ❖ ***Even reel density***
- ❖ ***Accurate reel roundness***

THANK YOU VERY MUCH FOR YOUR ATTENTION

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the art of **ideas**