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SIMPLY

BETTER

NEW SMART 400 E

FOR THE

SINGLE FACER

UPDATED AUG 2010

Fosber America, Inc.

1333 Parkview Road
Green Bay, WI 54304

Phone: (920) 339-6100
Fax: (920) 339-6110

www.fosber.com

Cover | Introduction

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evolution in corrugated

SMART 400 E Single Facer – Key Features evolution in corrugated



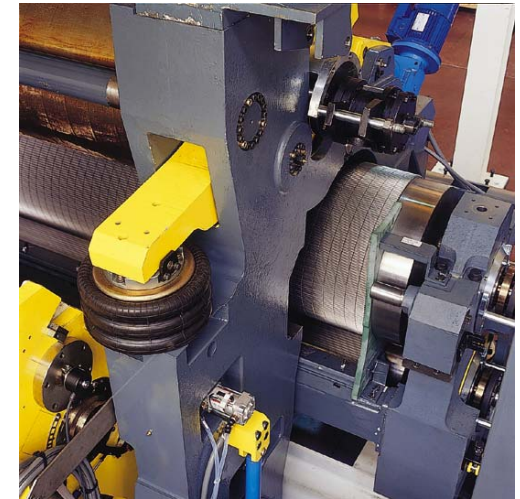
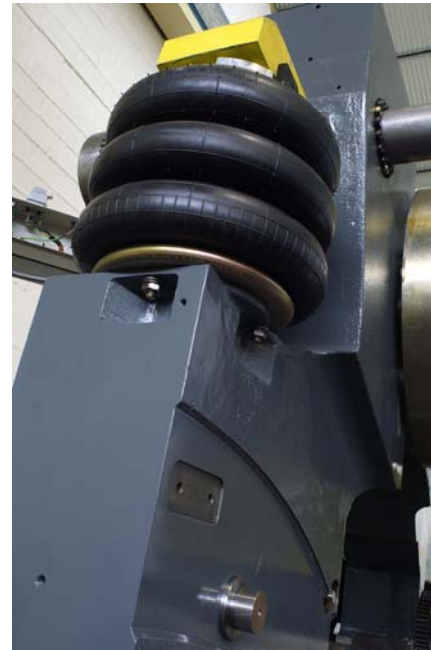
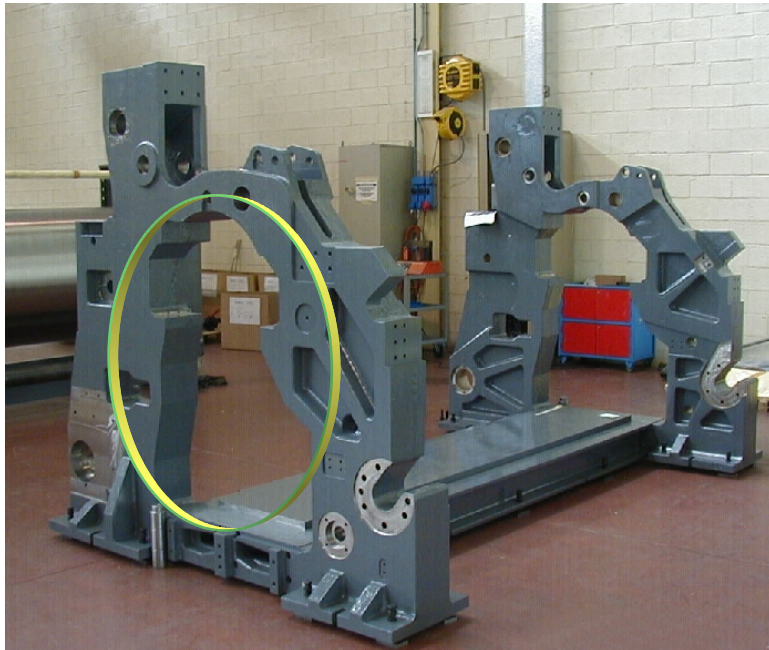
- Heavy **Robust** design----- **58000** LBS!
- **Simple & Compact** permits easy installation
- **Total Flute flexibility** – **cassette** machine
- **Positive Pressure** – no vacuum
- **Reduced** labyrinth at flute formation
- **Beltless** design = **lower cost of ownership**
- **Extended Nip System** – less pressure required from pressure (KISS) roll. Extended dwell time provides bond!
- **“Set & Forget”** Pressure Roll Control
- On board **touch screen** control
- On board steam system **included** in supply



SMART EVO – Heavy Duty

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- **Heavy Duty** Construction with **low center** of gravity
- 14.5" thick cast iron frames with **"egg shell"** structure formed from a single fusion

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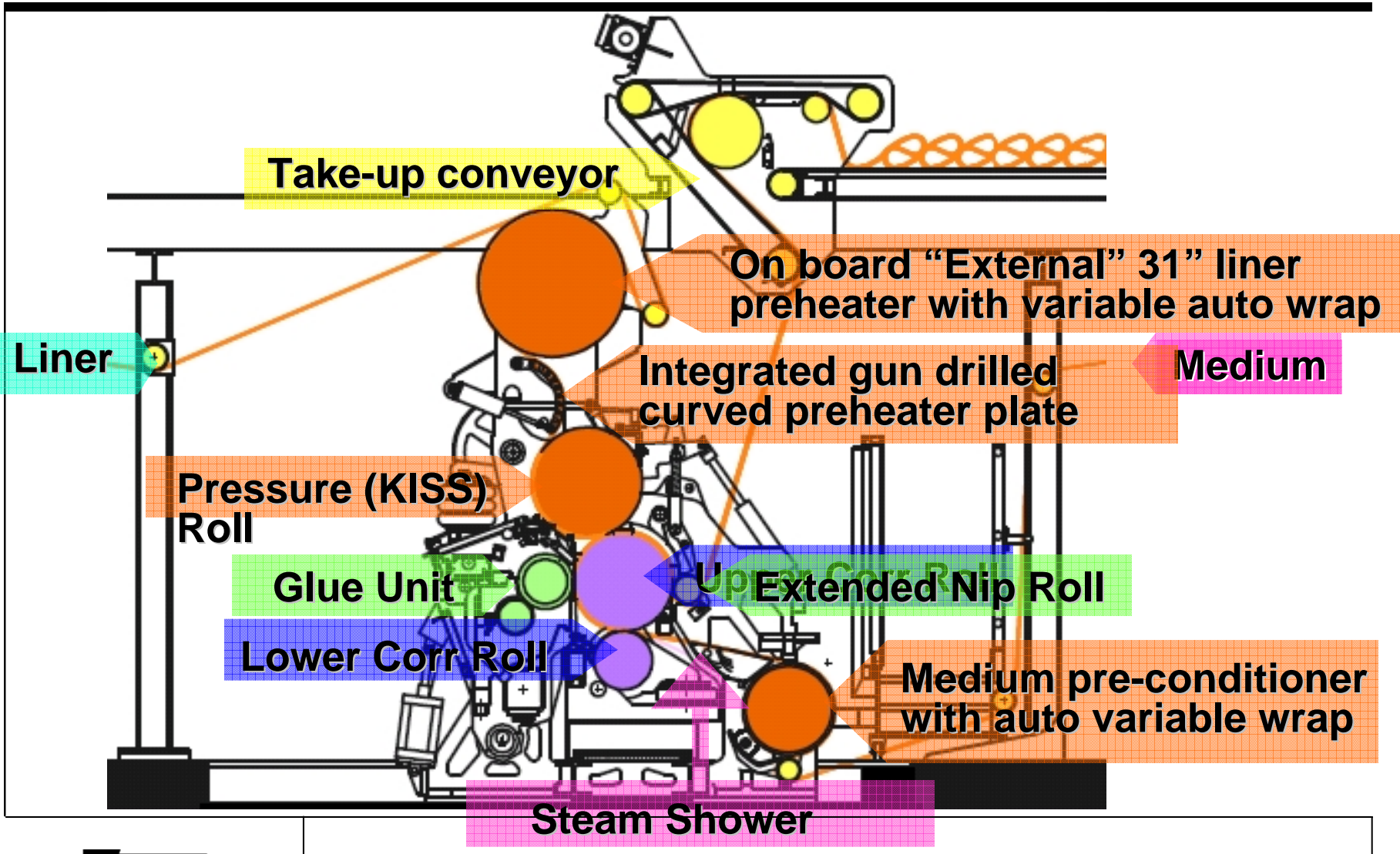
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SMART 400 E – General Concept



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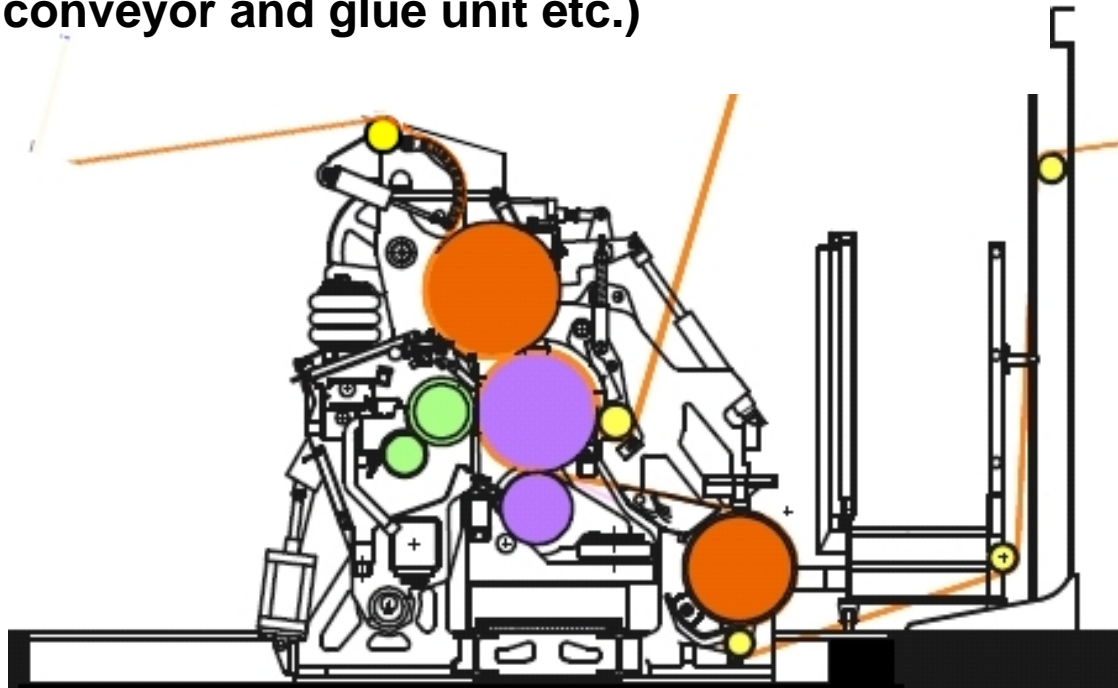


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Demonstrates SMART in "Full Wrap"

SMART 400E – Concept & Principal Features

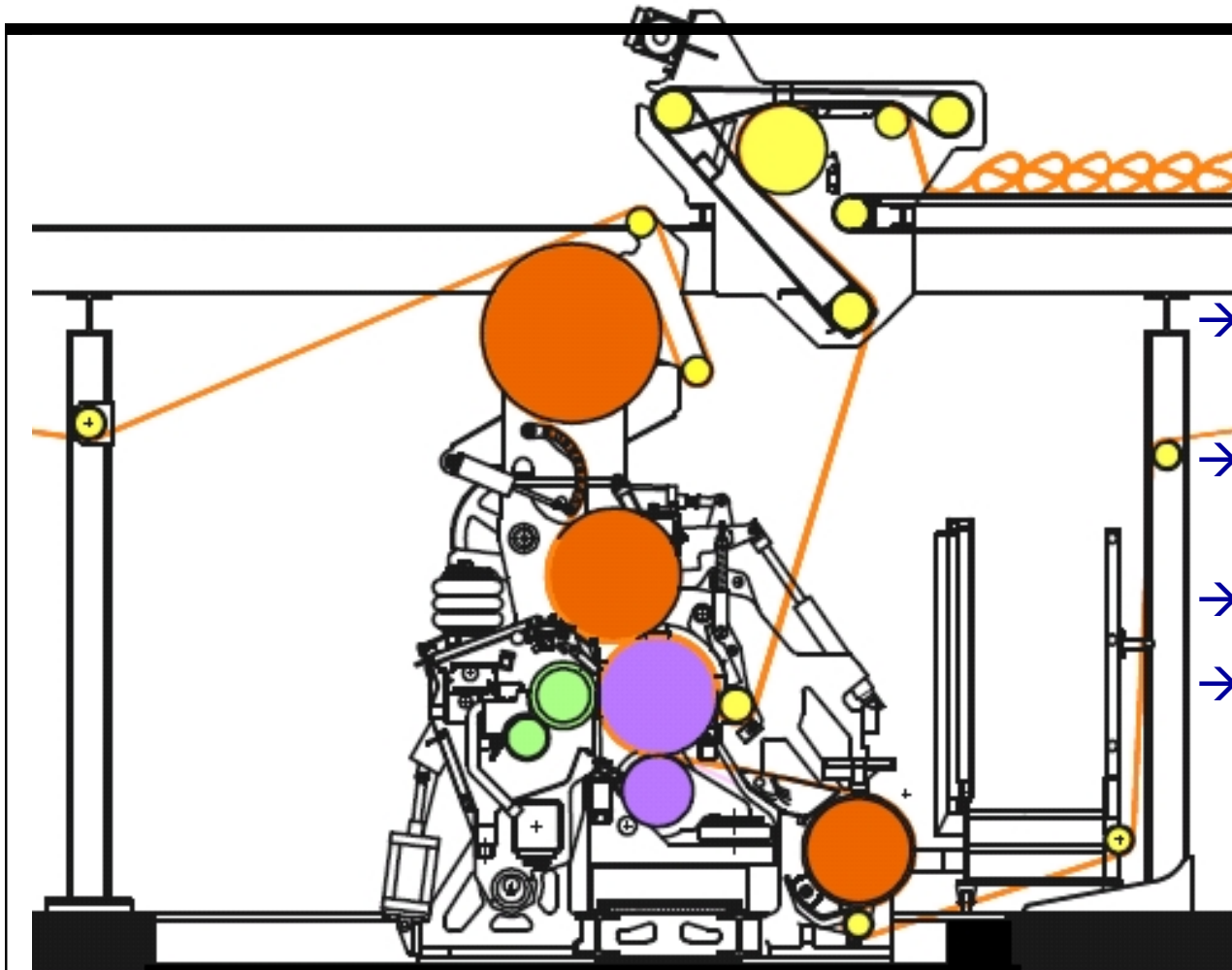
- **Base machine** can be supplied without the “external” preheater utilizing existing preheater’s
- Can also be supplied using **existing** take-up conveyor
- **Utilizes Allen Bradley for all PLC and Drives (for main machine, take up conveyor and glue unit etc.)**



SMART 400E – Concept & Principal Features “BASE PLUS”

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→ Added 31” Preheater and Bridge belt

→ Bridge Belt “pulls” from liner side of singleface !

→ Safe, easy thread-up

→ “LINER” preheater mounted on machine preventing heat loss and minimizing space requirements.

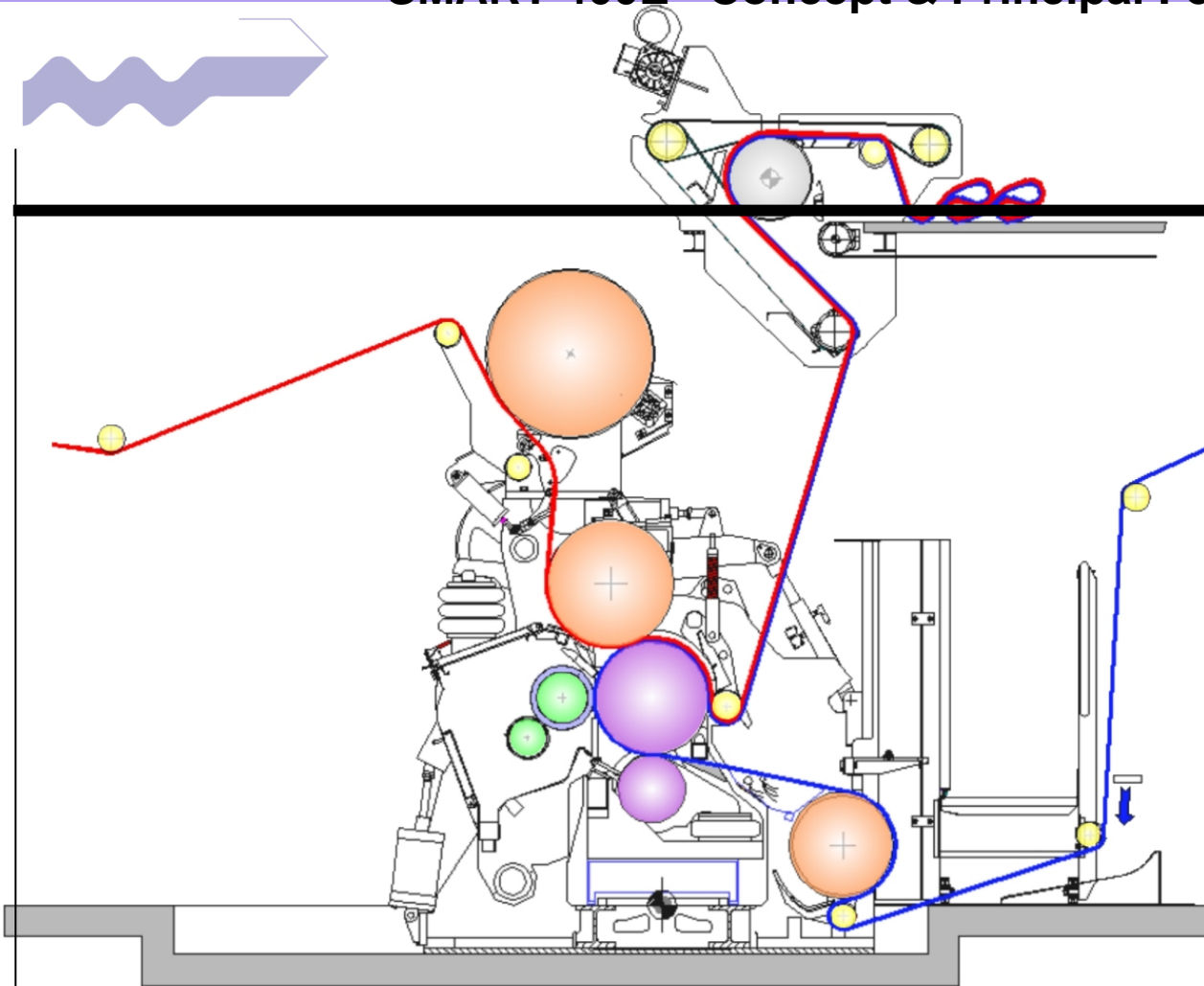
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SMART 400E– Concept & Principal Features

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- **Up to 1200 FPM (400 MPM) running speed**
- **Widths 98-110" (2.5 to 2.8M)**
- **Quick change cassette accessible from either side of machine**
- **No liner re-threading at cassette change**
- **Compact dimension (fits in all existing SF positions)**

SMART 400E with Min. Wrap

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SMART 400E– New Electrical Package

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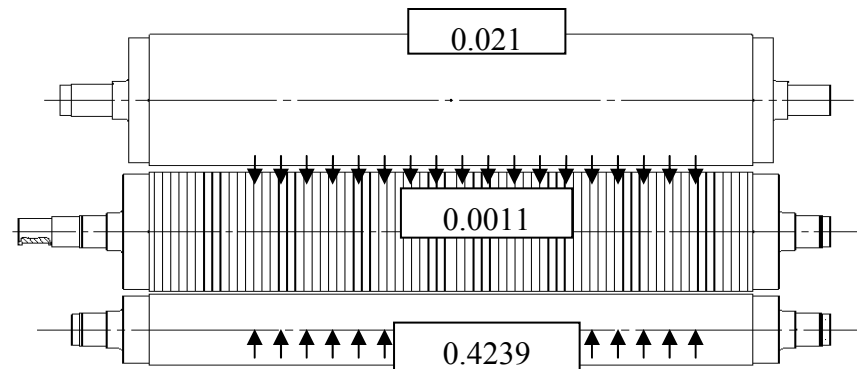
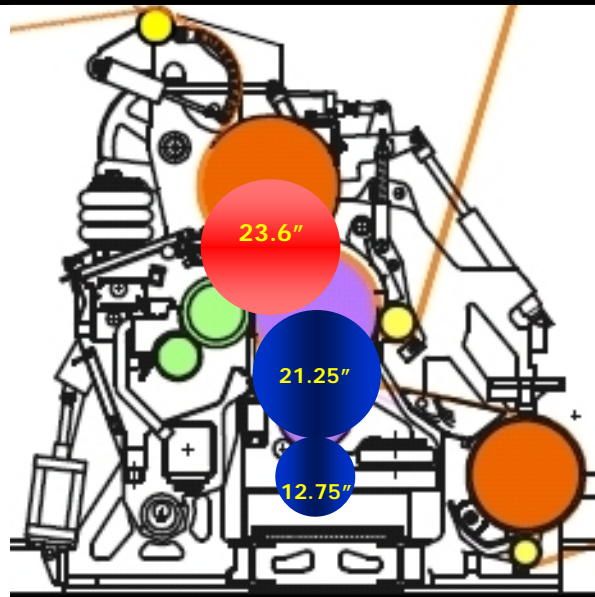


- On board touchscreen control with **user-friendly** graphical interface
- On “**BASE**” version operator inputs paper width data on the **touchscreen** to set both:
 - corrugating roll pressure
 - motorized glue dam position

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SMART 400E– Roll Sizes



- Roll sizes & crowns – unlike any other cassette machines on the market!
- Close to 3:5 ratio lower to upper corrugator roll for the ideal flute forming labyrinth: **less tension**, no loss of **paper strength**, **stronger ECT** values
- Customer choice of profile in **Tungsten** or **NuChrome**



SMART 400E– Ease of Operation

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- On board “external” 31.5” liner preheater & pre-conditioner both with automatic **motorized** wrap arms
- The main corrugator rolls are driven by **timing belts** (no gear box) so very simple cassette removal and re-engagement thanks to **quick release system**
- Pressure roll – “**set & forget**” control system with independent adjustment on drive and operator side.

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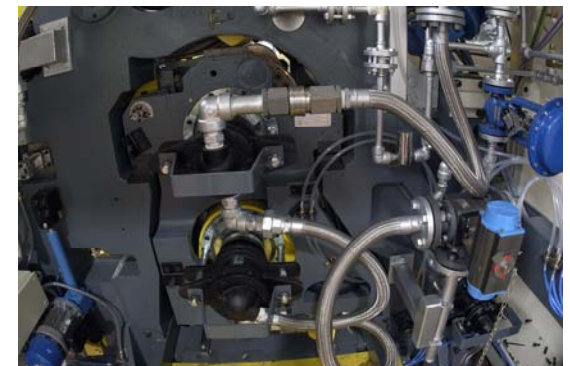
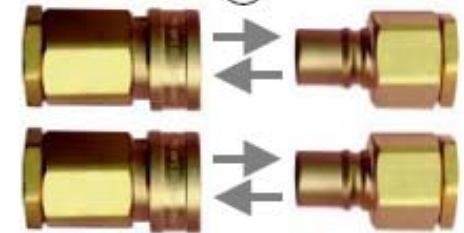
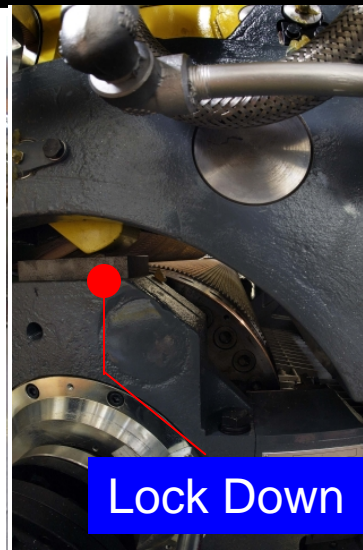
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SMART 400E Single Facer – Cassette

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- The **weight** of the cassette **18,000 LBS** (9 Tons) assists in securing cassette to frame.
- “CAM-LOCK” mechanism positively **locks down** cassette.
- QTY. 2 “**quick disconnect**” couplers used for cassette removal and insertion
- The cassette is fully **interchangeable** with all models of Fosber **SMART** single facer’s

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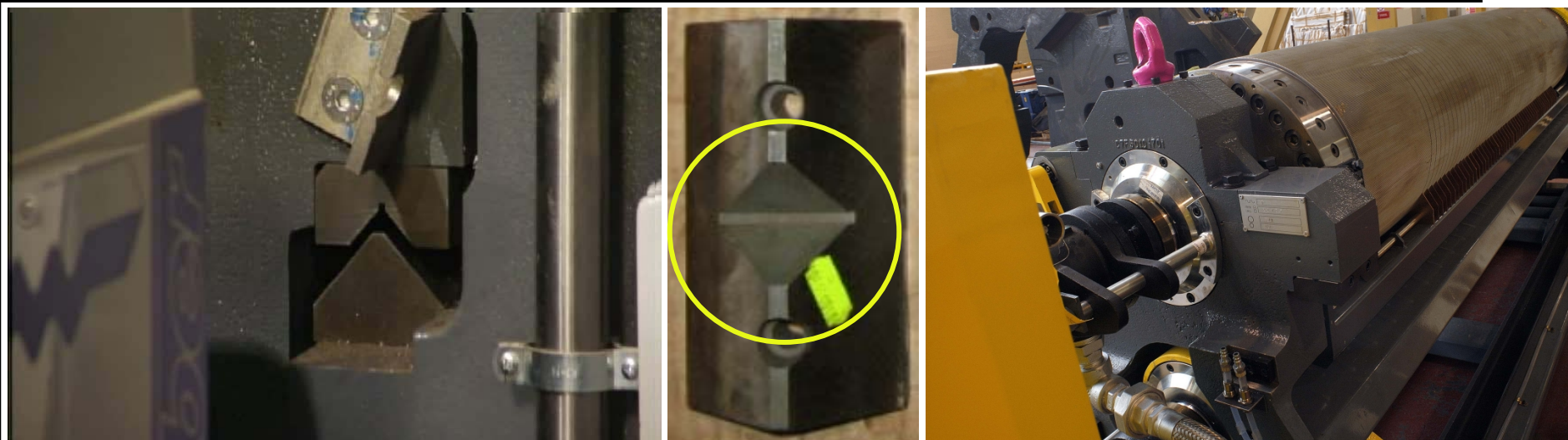
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SMART E400E Single Facer – Cassette

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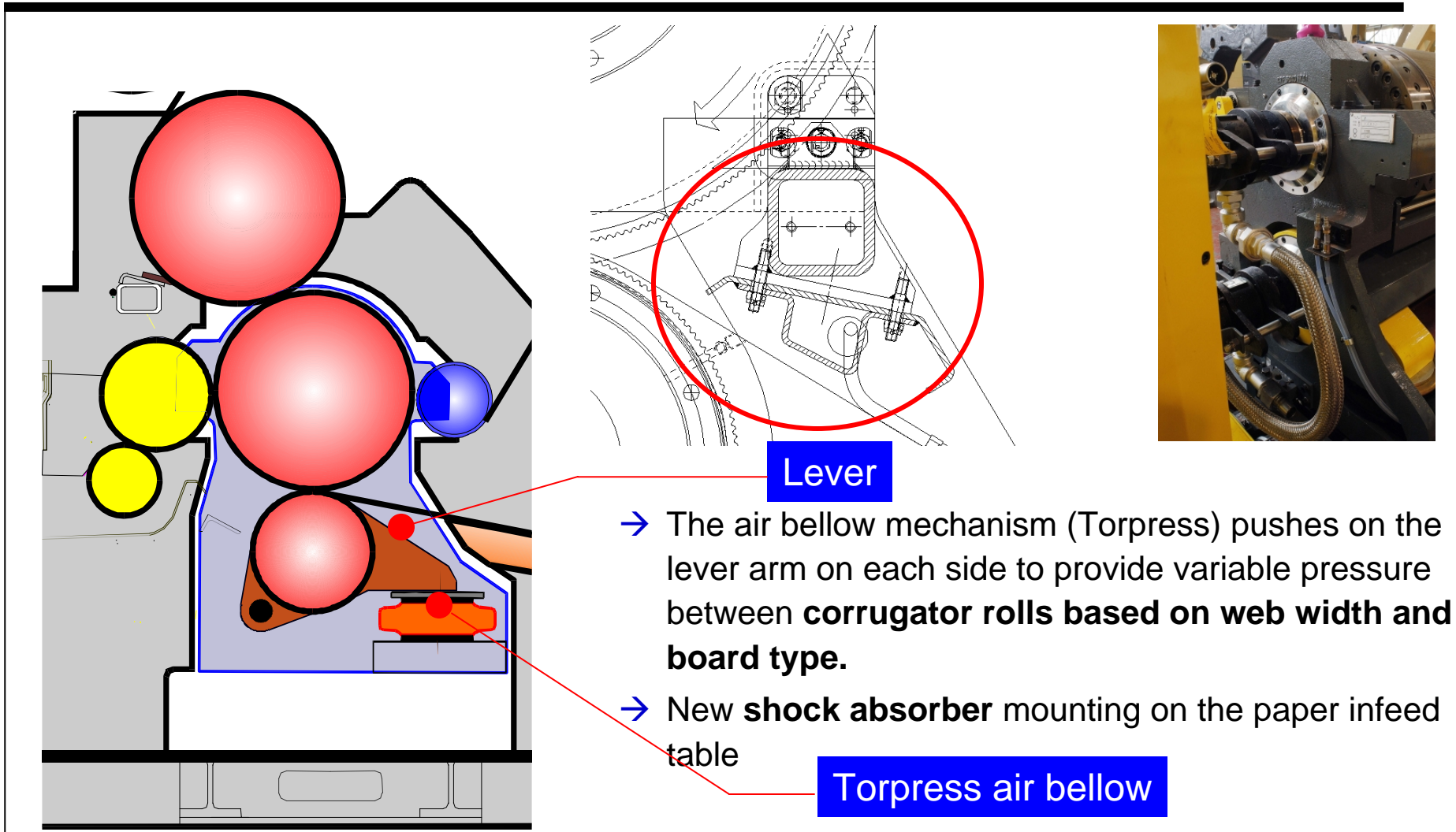
- Channelling guide rails & **auto-aligning** entrance plate ensures the cassette is perfectly aligned while manoeuvring into machine
- The cassette is lowered into position by the “MULE” on to specially positioned **locating X-blocks** to ensure it is always loaded into the correct **position**
- Large dimensional cross beams support the new cassette design
- **Ethyl Glycol** incorporated into the cassette’s cross beam, located on the glue side provides greater stability and balance.

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SMART 400E Single Facer – Cassette



Lever

→ The air bellow mechanism (Torpress) pushes on the lever arm on each side to provide variable pressure between **corrugator rolls based on web width and board type.**

→ New **shock absorber** mounting on the paper infeed table

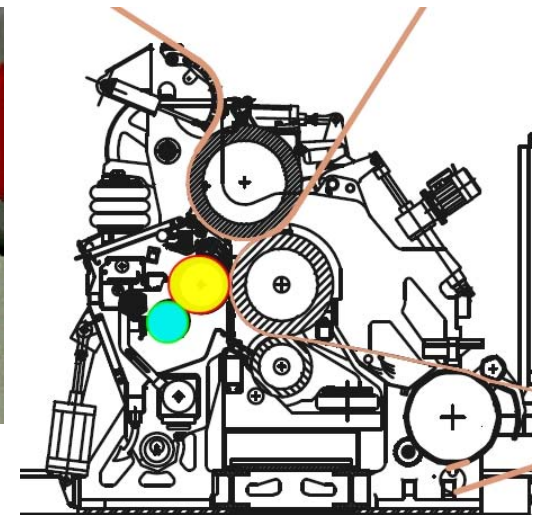
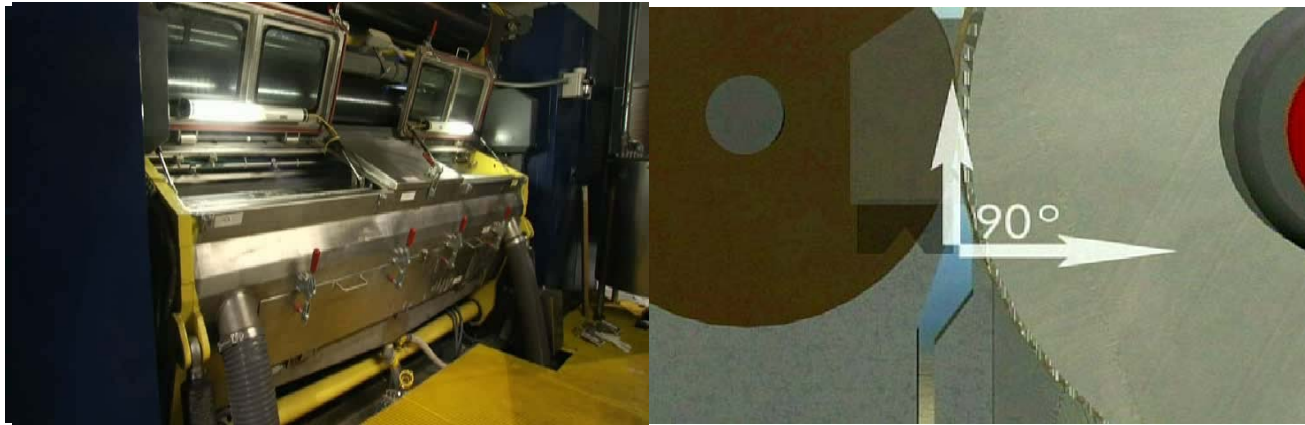
Torpress air bellow

SMART 400E Single Facer – Motorized Trolley



- **Motorized “MULE”** to move cassette around based on **pallet jack technology**
- Steering wheel **spring loaded** for **smaller turning radius and storage**
- Extremely fast & easy **cassette change** thanks to: **quick release** timing belts, **no re-threading** of liner, “Quick Disconnect” steam fittings, **self aligning** cassette entry plate & guide rails **independent** cassette legs,
- Potentially faster with the use of a **second motorized cart!**

SMART 400E– Glue Unit Features



- The **glue applicator roll** is positioned at 90° to corr roll
- Mechanically adjusted to within **.003”(0.1mm)**
- **.003” to .023”** or (0.1mm to 0.6mm) **glue gap setting**
- Auto **self-calibrating gap control** between glue roll & corr roll
- Auto **gap control** between the doctor roll and applicator roll
- On board **wash-up** system via multi-nozzles - motorized **glue dams** fabricated with nozzles that spray while moving

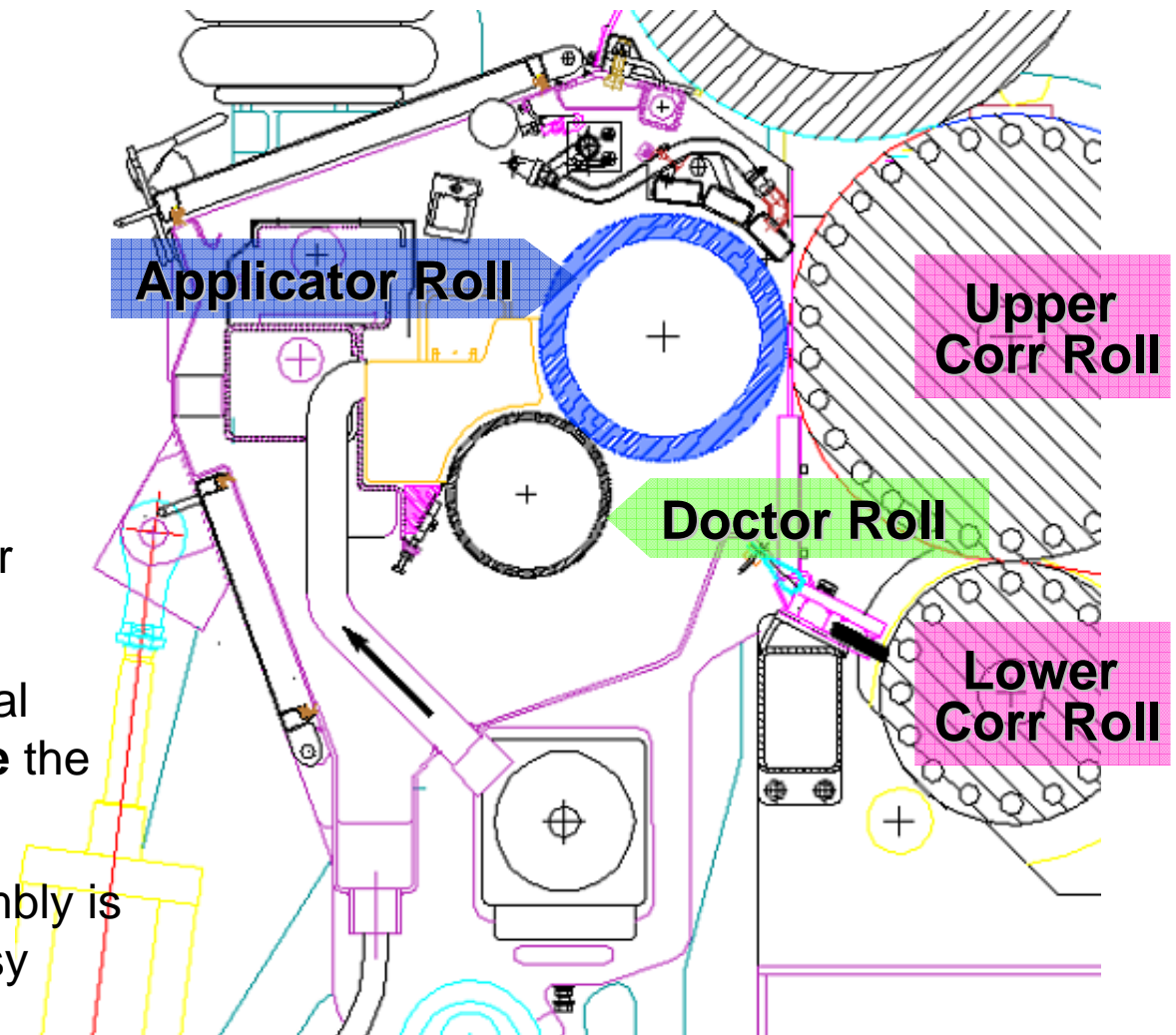


SMART 400E– Glue Unit Features

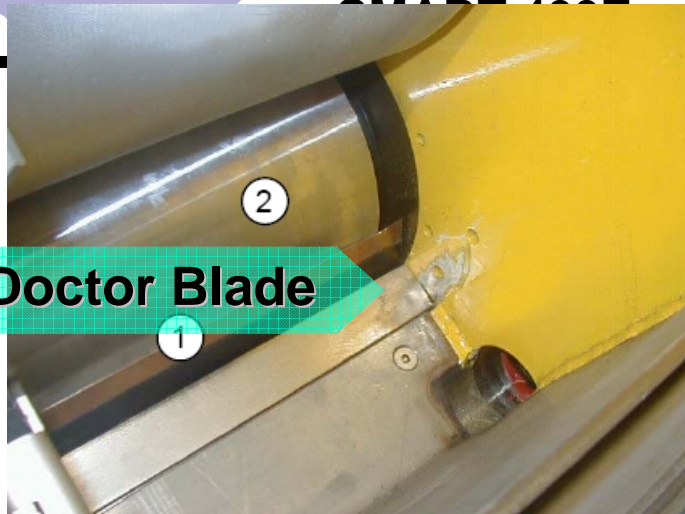
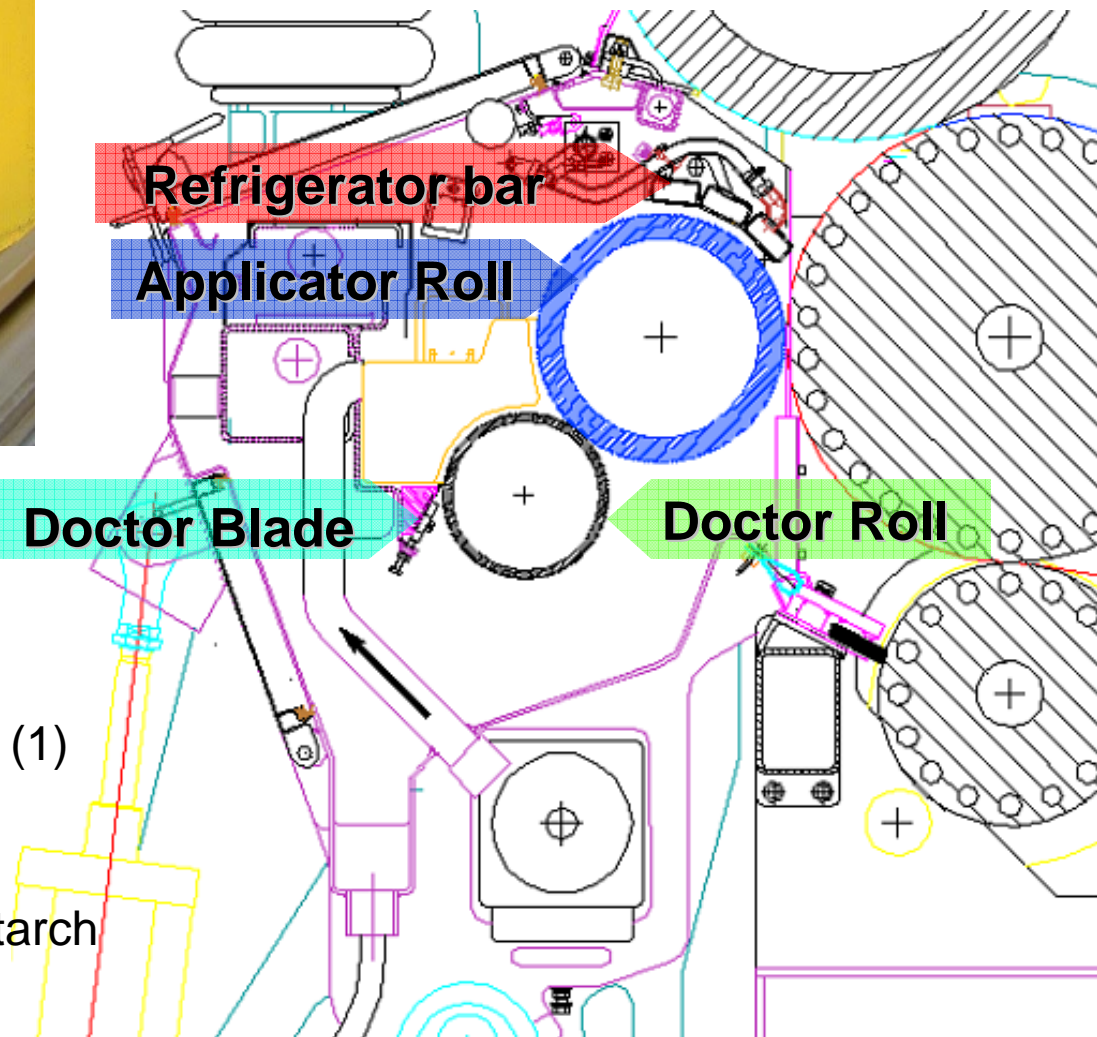


(1) Applicator Roll

- **Engraved** chromed diameter 11.81" (300mm)
- Filled with high inertia thermal liquid to **stabilize & equalize** the temperature at all speeds
- Applicator roll bearing assembly is mounted on a flange for easy replacement if required



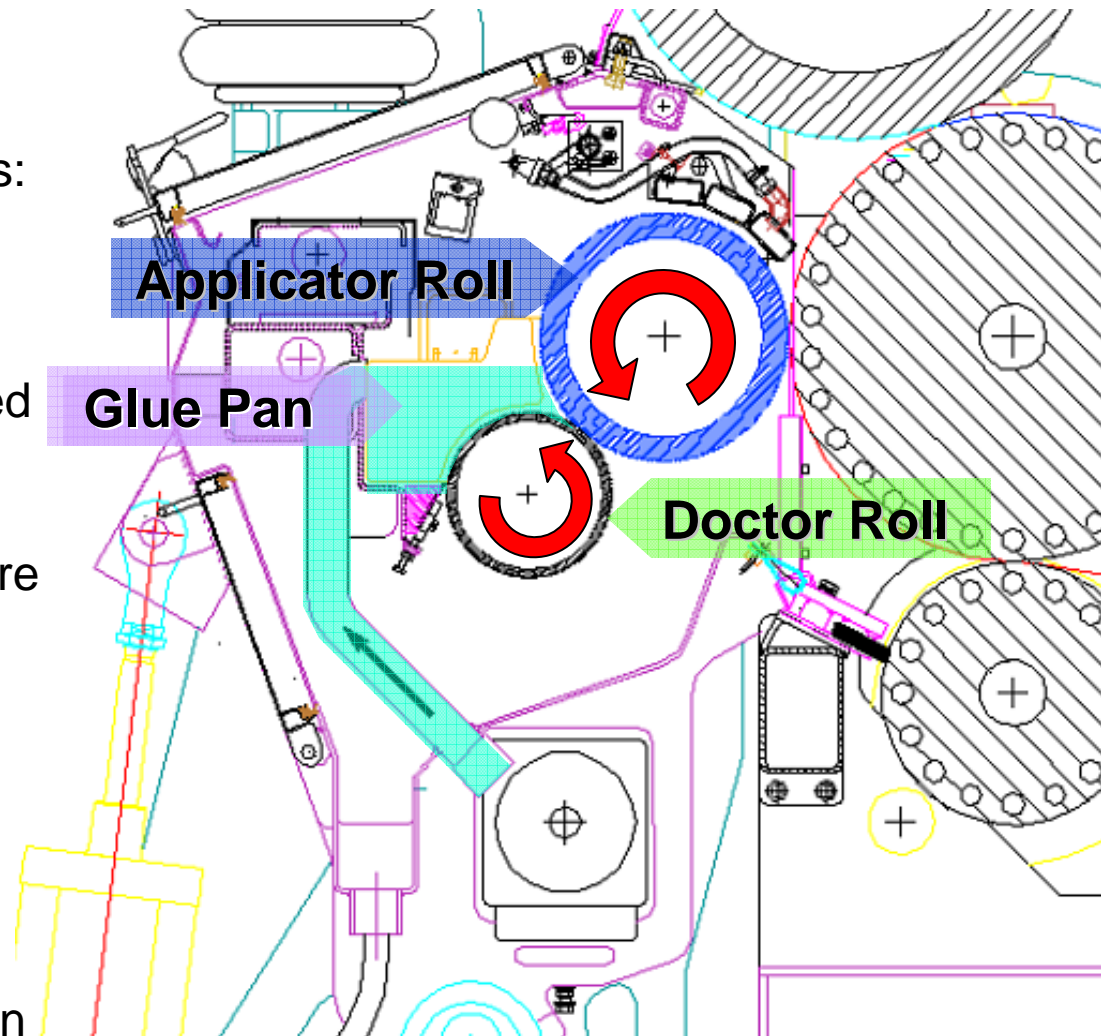
Glue Unit Features

**Doctor Blade**

- Doctor Roll (2) is **chromed**, diameter 7.87" (200mm)
- Machine tooled doctor blade (1) with new **adjustable** seating **seals** the starch tank
- **Refrigerator bar** prevents starch gelling

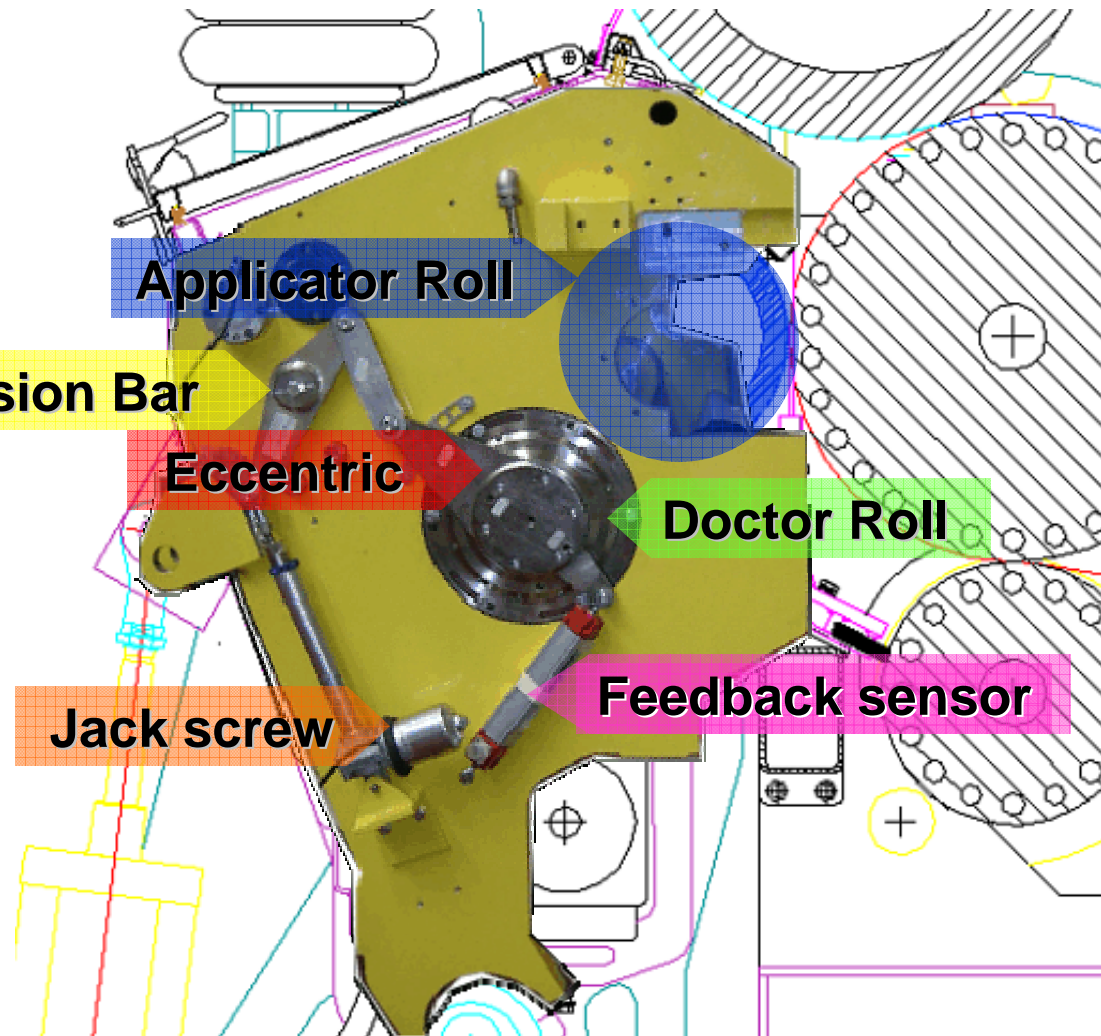
SMART 400E – Glue Gap Setting

- **Simple to precisely** set the gap (**glue film**) between applicator roll & doctor roll as:
- **Neither** are effected by temperature.
- Glue film is **always** generated **below** glue level so it is always generated under **constant** hydrostatic pressure
- Allows **extremely accurate** glue film application at any speed from .003 to .023” (0.1mm to 0.6mm) film thickness
- **Reduced** starch consumption

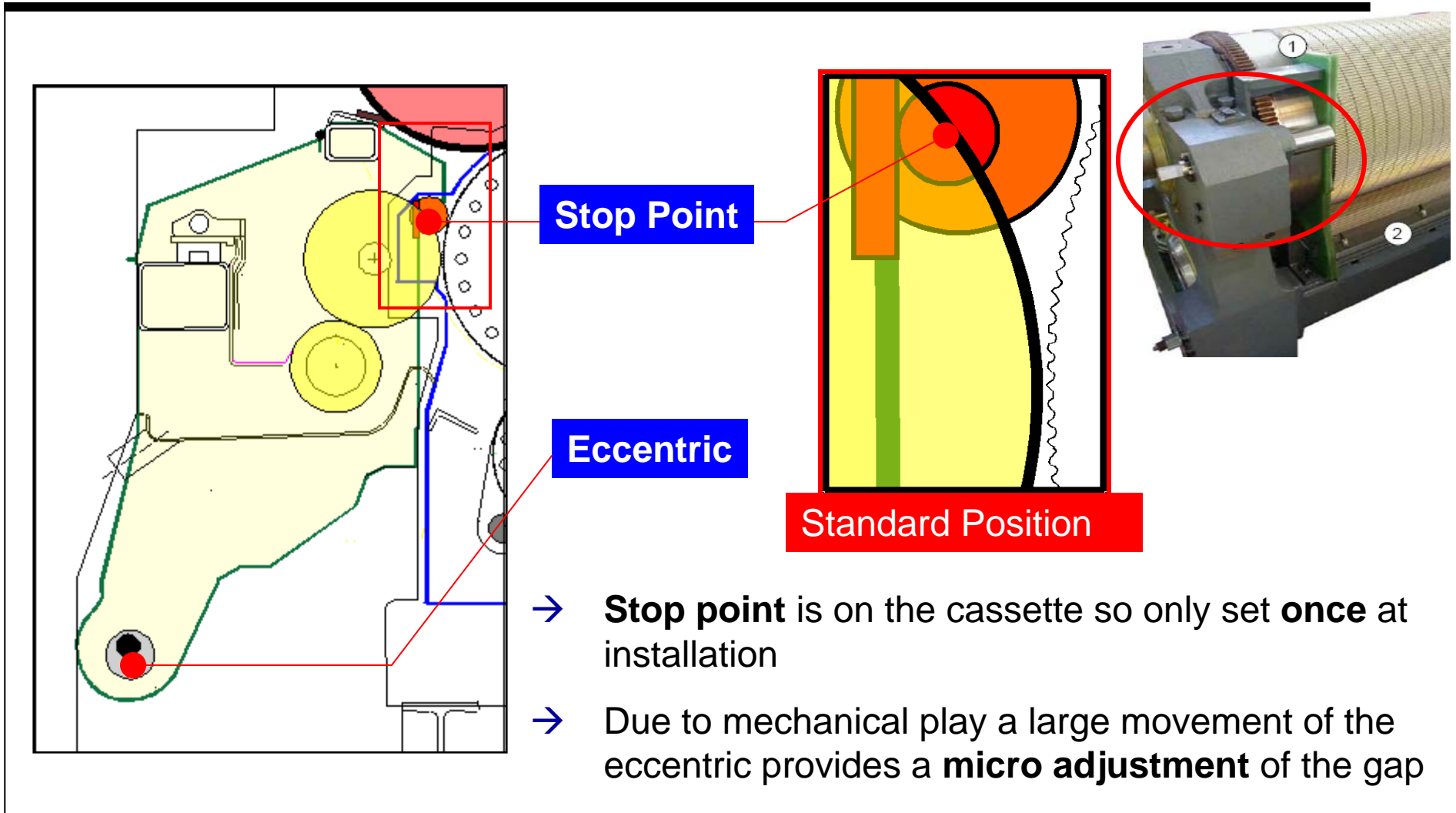


SMART 400E – Glue Gap Setting

- **Automatic gap control** between the doctor roll and applicator roll
- The gap (distance) is varied by the **eccentric** that is rotated by the **jack screw** arrangement.
- Feed back sensor & torsion bar ensure **precise** gap control



SMART 400E – Gap positioning

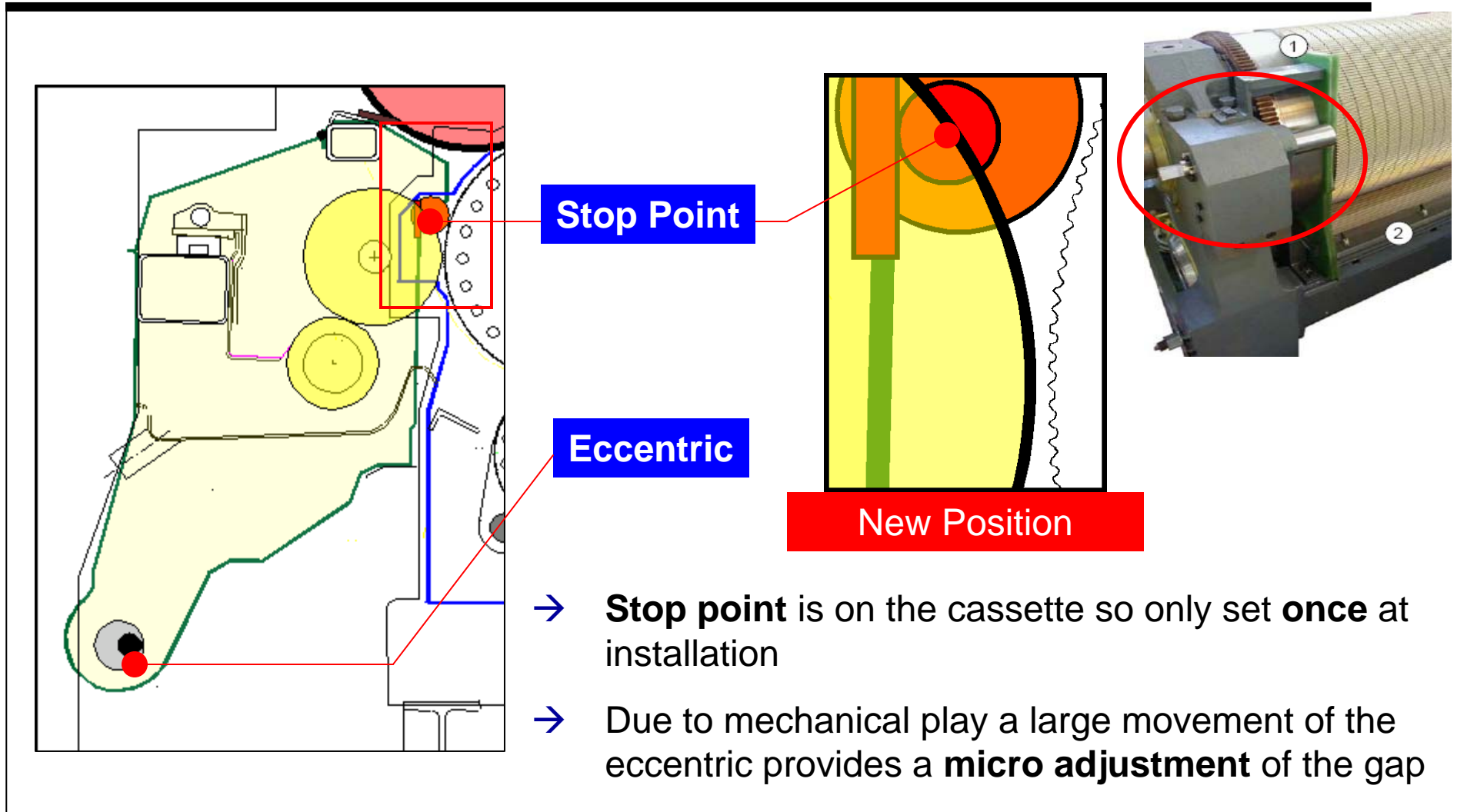




SMART 400E – Gap positioning

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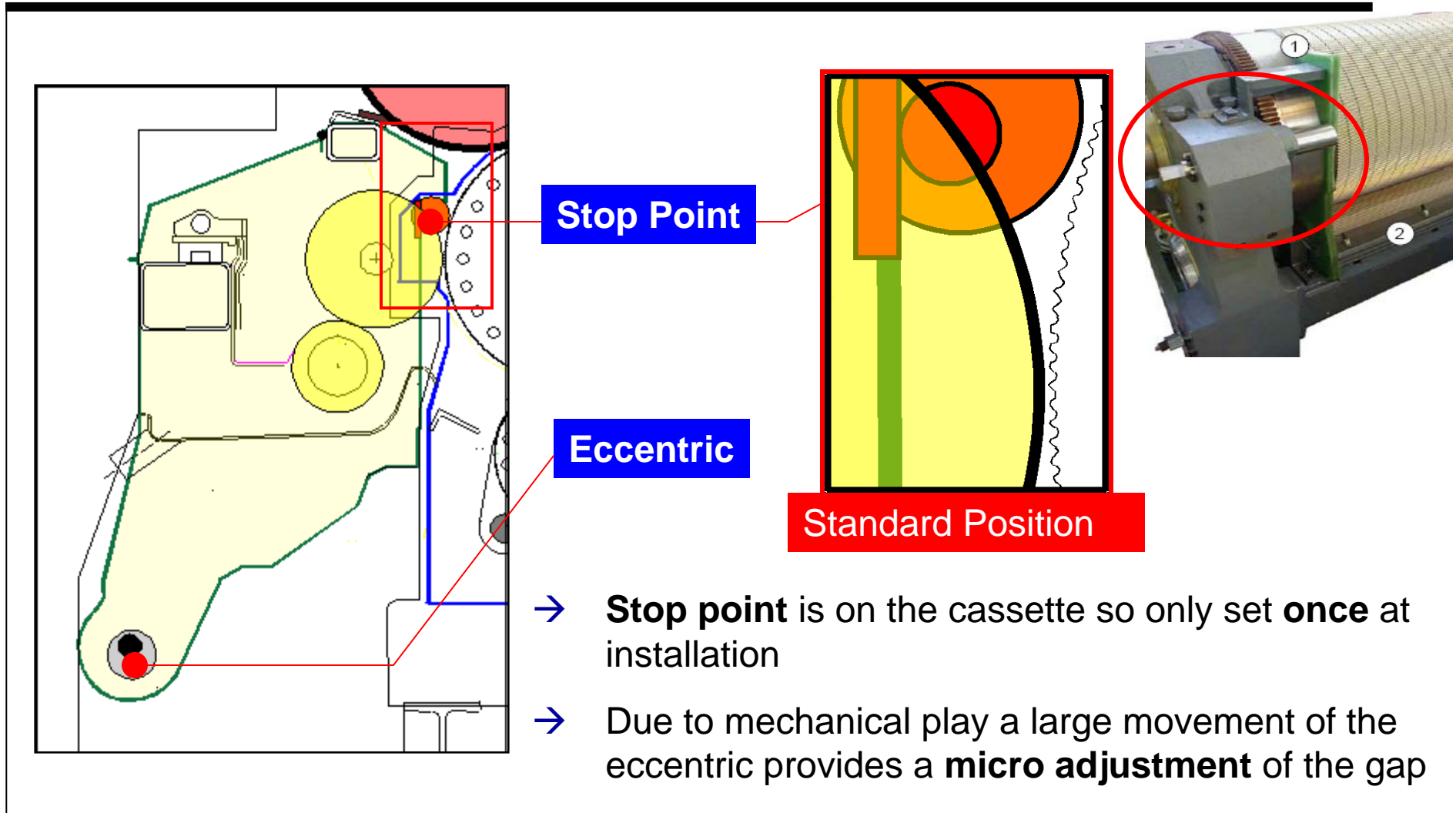
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SMART 400E – Gap positioning

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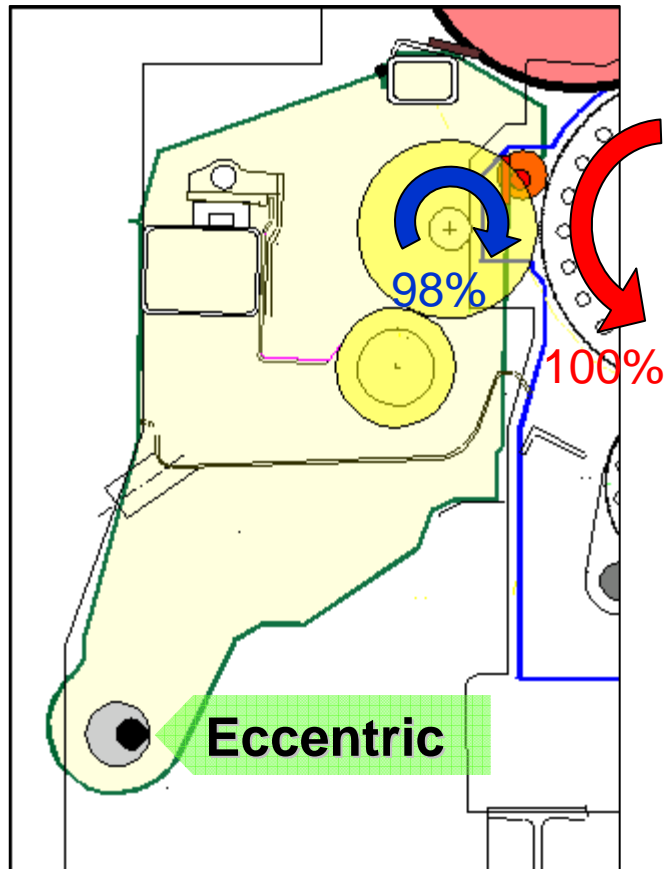


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SMART 400E – Gap positioning



- The **gap** is set via the rotation of the eccentric.
- Applicator roll speed is set at **98%** of corrugator roll
- To **self-calibrate** the applicator roll is moved towards the corrugator roll
- **On contact** with the paper the applicator roll is now driven at **100% speed** by the corrugator roll
- The sensor **instantly** recognizes this change: drive recalibrates **zero position**
- The eccentric opens the gap to the **desired** set gap
- **Self-calibration** is carried out at every **paper change, any speed change, or every 5 minutes**
- Hardened integral backstop rings on the applicator roll **prevent** accidental contact/damage from corr roll



SMART 400E – Fine Adjustment

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- **Fine adjustment** of the parallelism between applicator roll and corrugator roll via operator fly wheel
- This adjustment can be carried out **on the run** if required (e.g. to compensate for a wet streak)

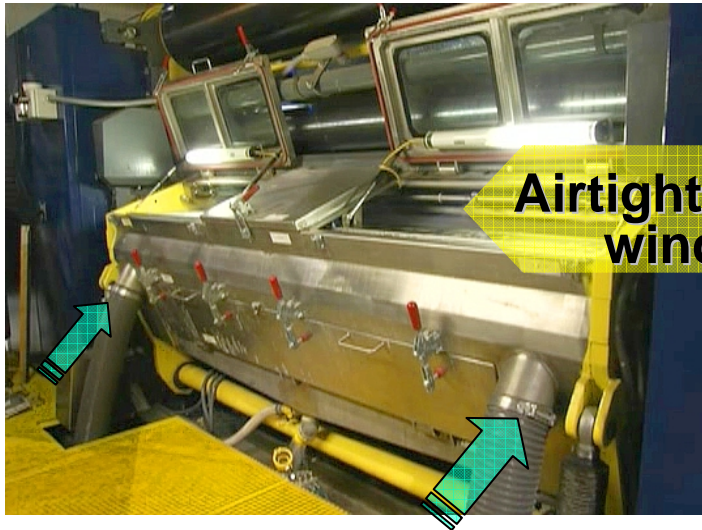


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SMART 400E – Positive Pressure Chamber evolution in corrugated

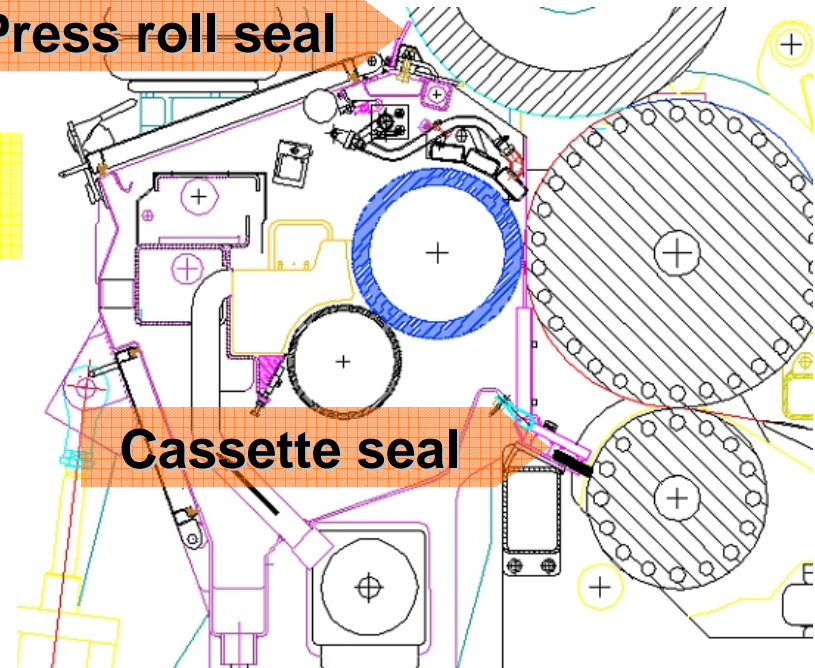


Airtight doors & windows



Side Seal cassette

Press roll seal



Cassette seal

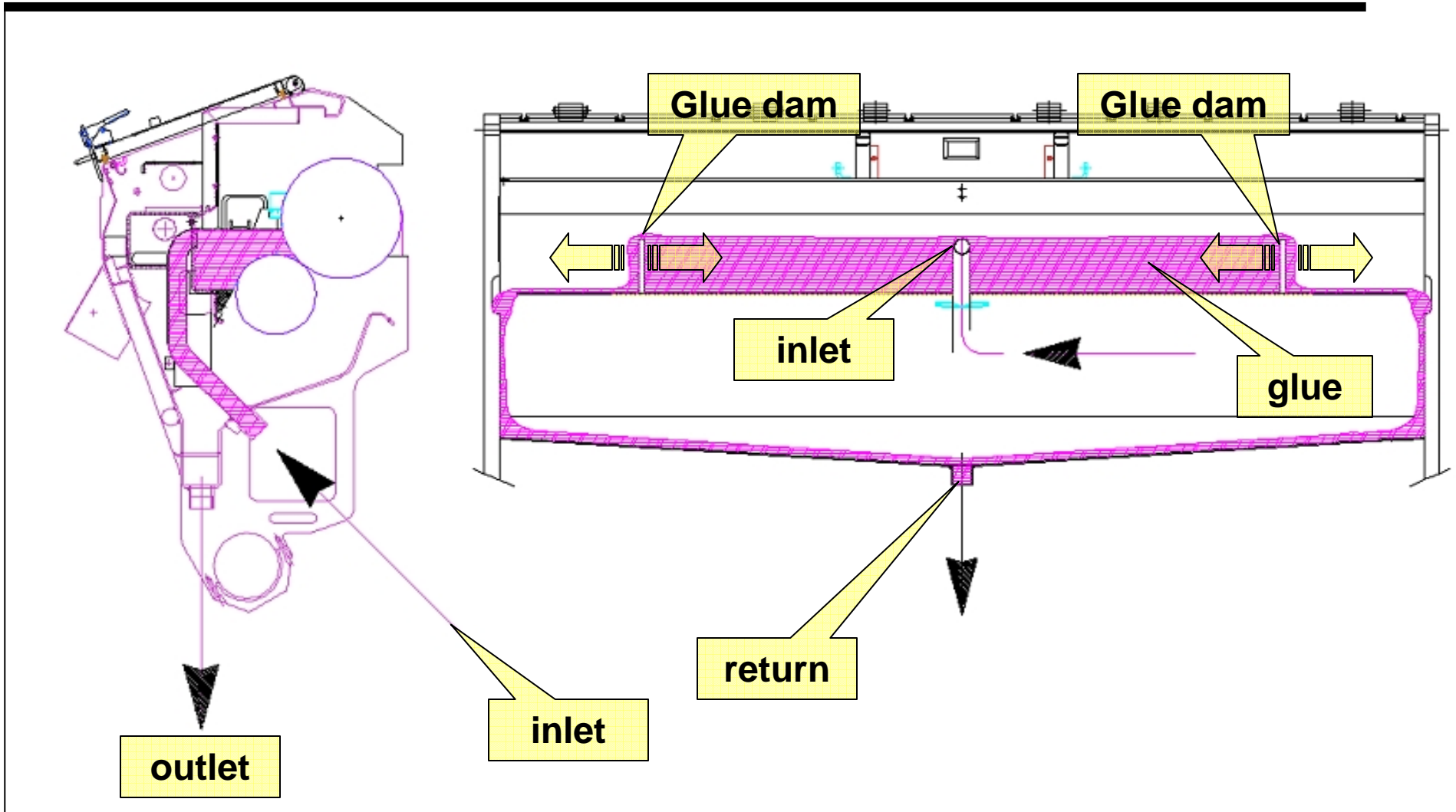
- Air inlet chutes on **each side**
- Airtight doors & **inspection** windows
- **Side seals** on cassette
- Press roll and cassette **main seals**



SMART 400E – Glue Flow



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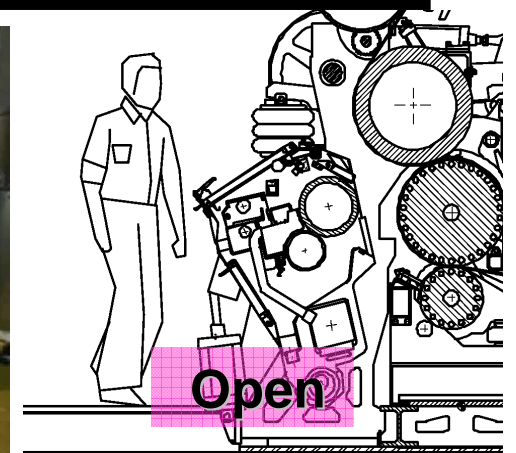
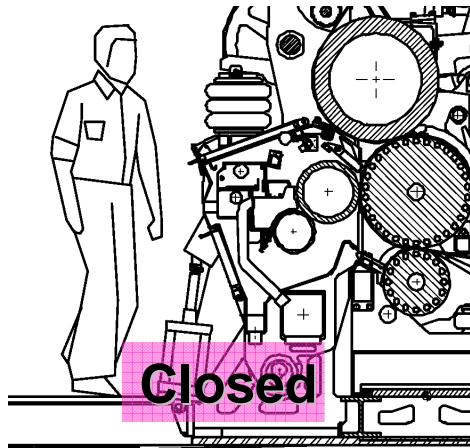


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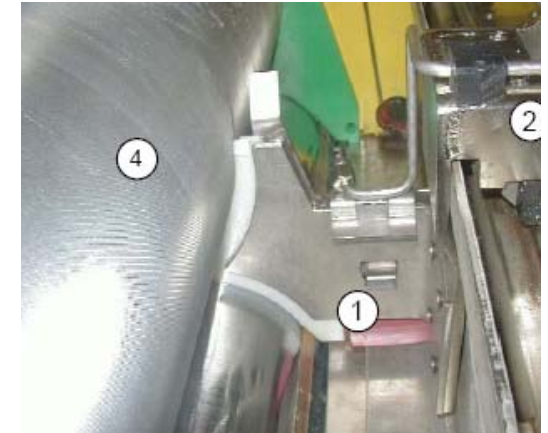


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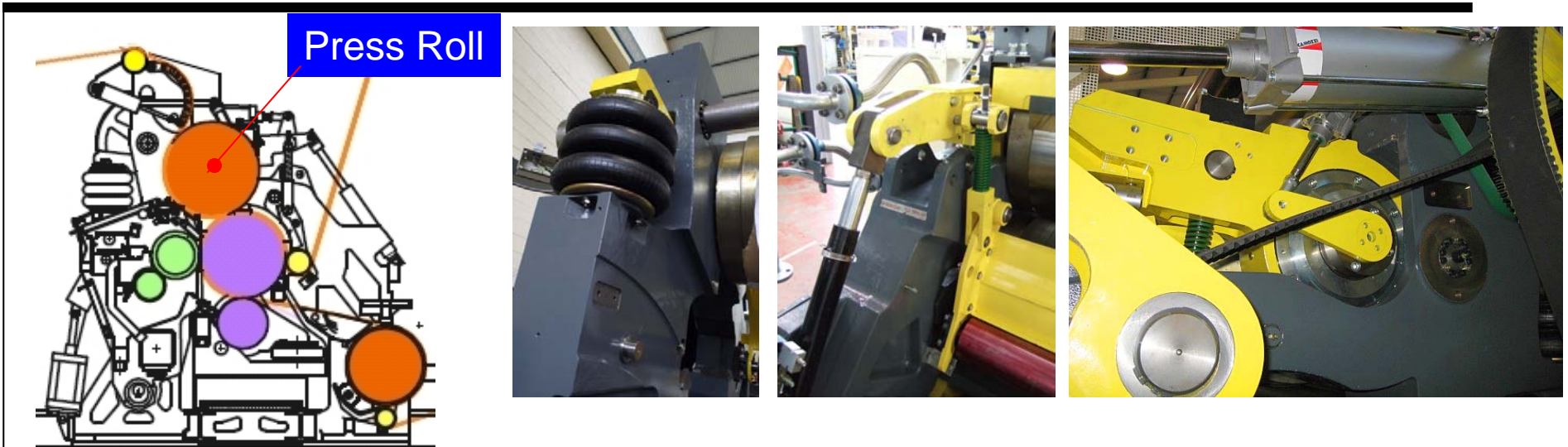
SMART 400E – Glue Unit Maintenance



- The glue unit can be opened up at the **push of a button**.
- **Motorized** glue dams independently driven on each side down to minimum of 38.5” (980mm) paper width!
- **Easy, safe** glue dam removal

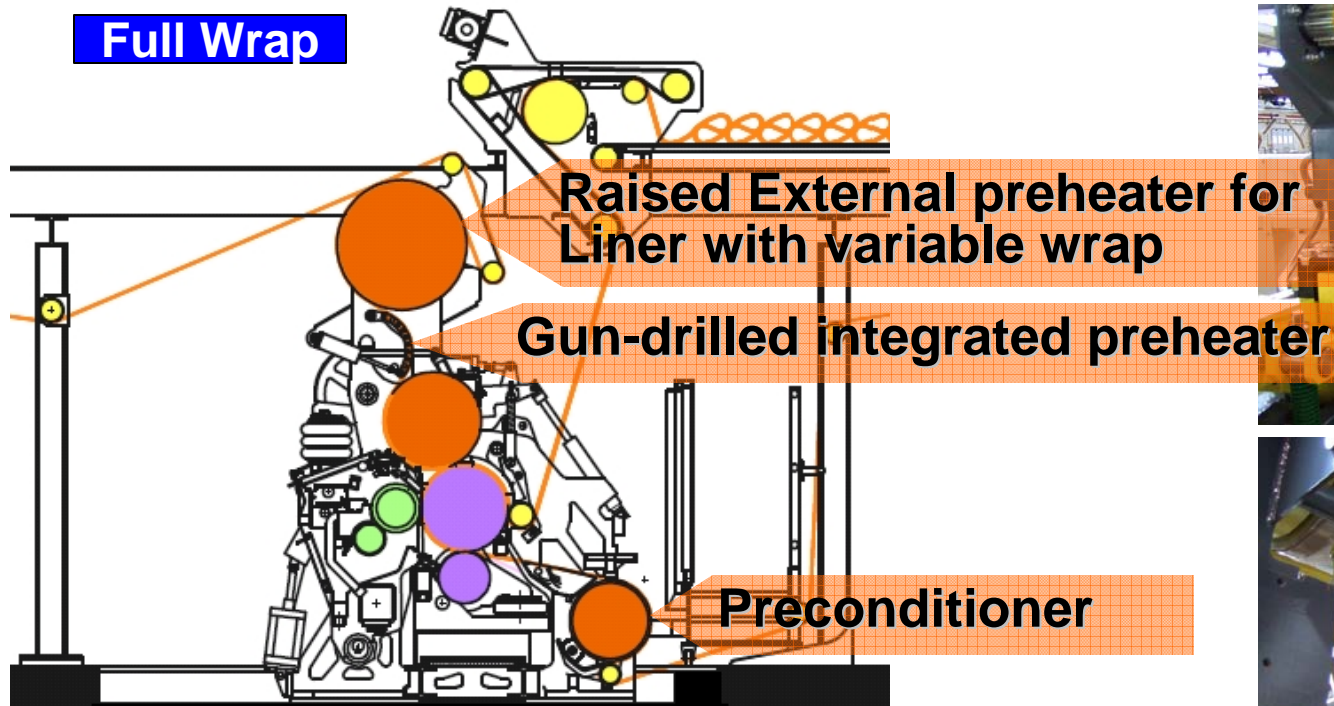


SMART 400E – Pressure Roll



- On “**BASE**” version operator inputs required pressure. “**Set & Forget**” system keeps the set pressure **constant** at all times via closed loop hydraulic control
- Independent setting on each side of machine (drive side and operator side)
- Pressure roll is continuously **rotated** when line is stopped via a small pneumatic motor
- Pressure roll is fabricated out of specialized **induction hardened steel** with low carbon content to prevent starch build up and minimize heat deformation.
- Supplied with thermally insulated bearings & siphon pipe

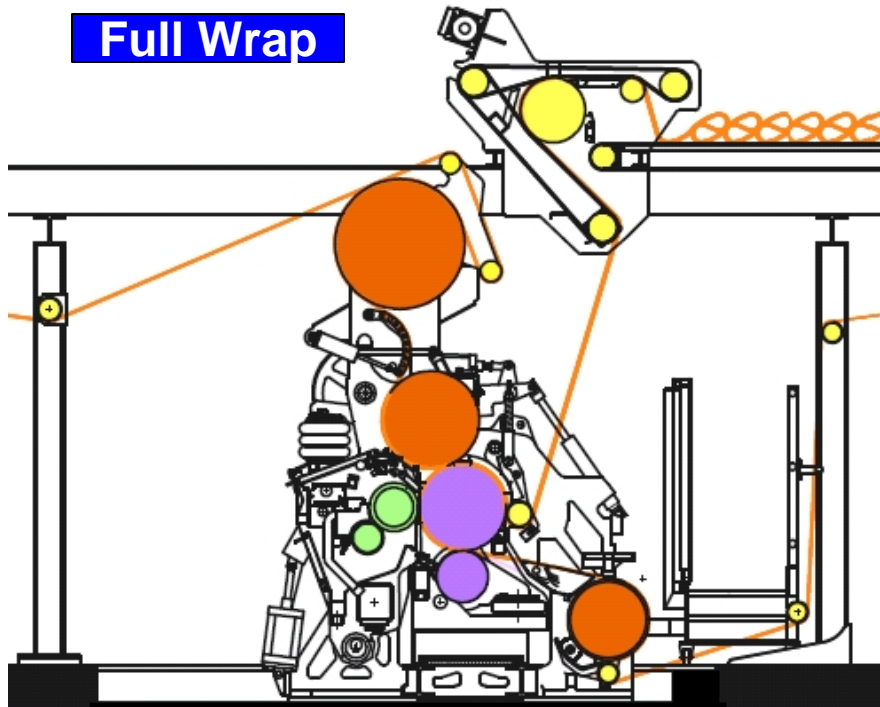
SMART 400E – Preheaters

Full Wrap

- **Gun-drilled** curved steam chest integrated liner preheater with adjustable positioning to vary wrap
- Medium preconditioner 19.68" (500mm) with **automatic** motorized **variable** wrap arms
- 19.68" (800mm) "on-board" driven external liner preheater with **automatic wrap arms**, **located at the machine**, safe position, heating both sides of the liner.

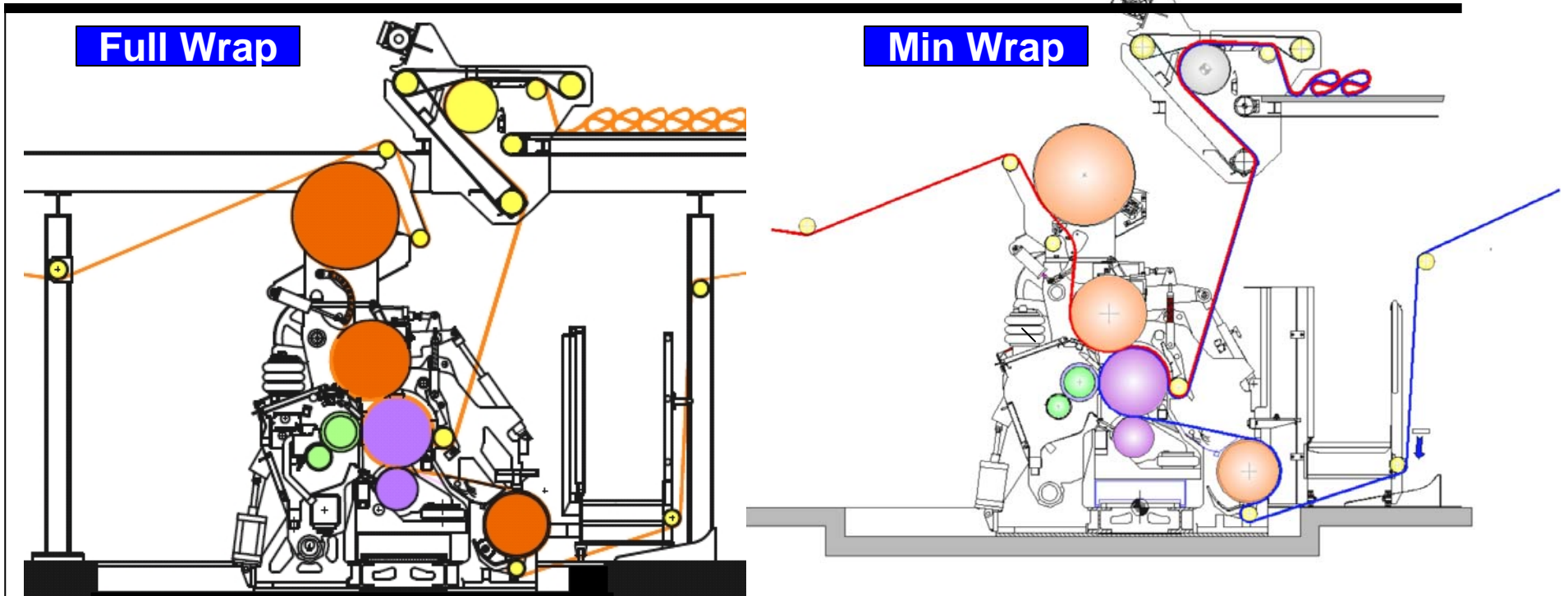
SMART 400E – Preheaters

Full Wrap



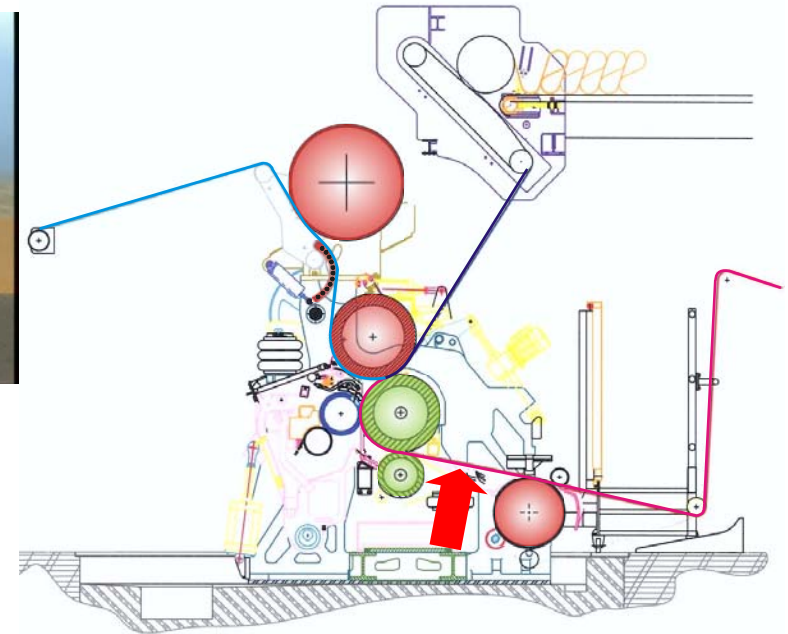
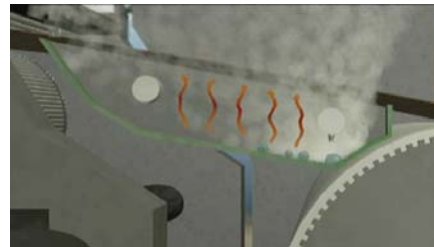
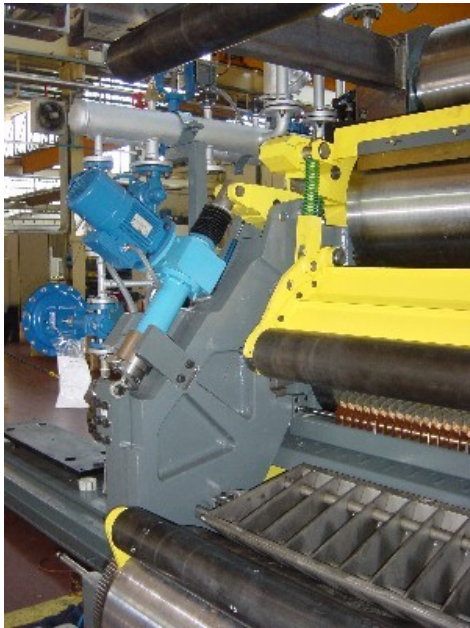
- Proximity of all pre-heaters, steam shower, plus presence of heated pressure roll eliminates need for **external preheaters or preconditioners**.
- **Gear & sprocket system** to drive all the wrap arm preheaters (no chains which can stretch over time affecting **parallelism** & giving **uneven tension**)

SMART 400E – Preheat Flexibility



- From maximum to minimum wrap for **complete range of production**
- Machine can run with variable steam pressure set externally from **55 to 235 PSI** or **(16 bar to 4 bar)**
- Maximum **machine flexibility** from the heaviest to lightest papers

SMART 400E - Steam Shower



- **Steam shower** located immediately **after** the pre-conditioner just **prior** to corrugating roll “nip”
- **Variable Pressure** – PLC Controlled – to adapt to different papers run
- Steam is **injected DOWN** into the steam chamber to ensure the **steam** (not water) conditions the medium!

SMART 400E – steam system

- **Full on-board steam system** included
- **Pre-erected** on perpendicular panel
- **Fully tested** for potential leaks with **high pressure steam** before installation
- **Operator interface** outside of the guarding. Practical, safe, neat and tidy.

SMART 400E – steam system option

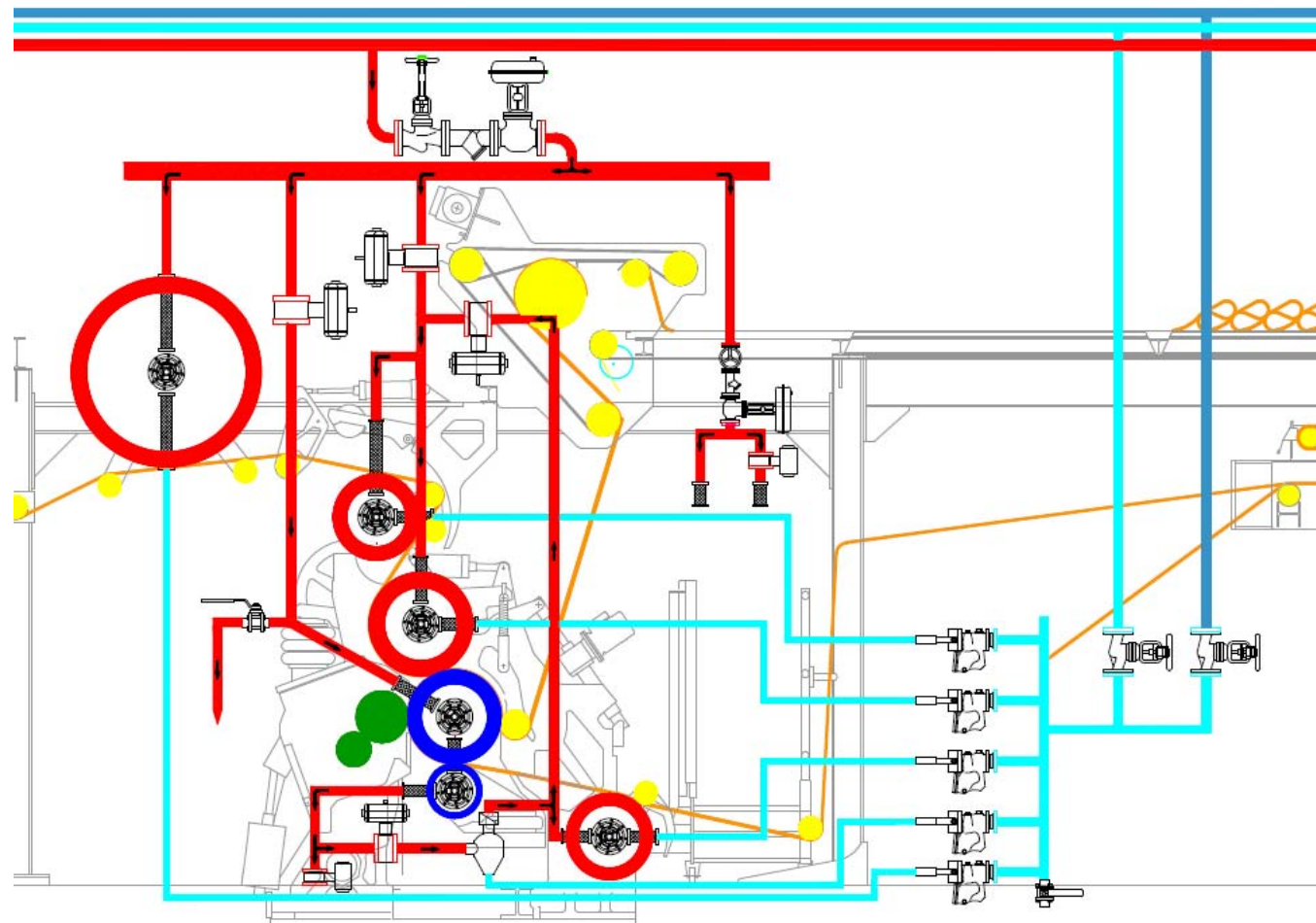
PERIPHERALLY HEATED ROLLS OPTION



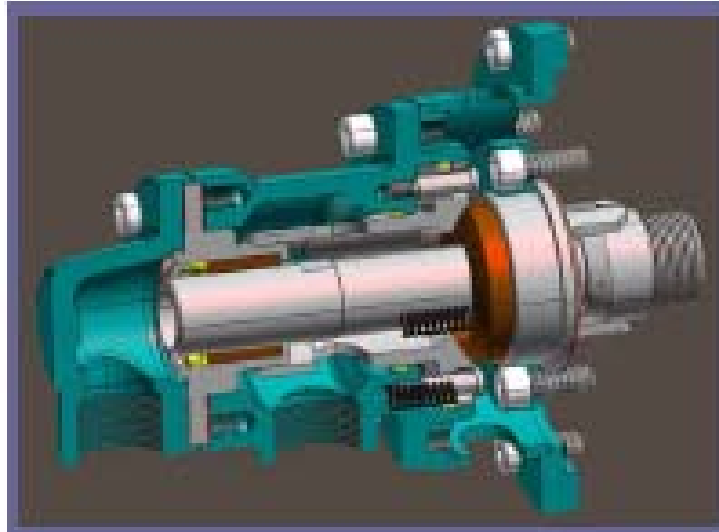
- **Peripherally** heated corrugating roll option
- **Eliminates** need for siphon pipes and “banana” effect from remaining condensate
- **Fast** heating of corrugator rolls in the machine permits quicker production

SMART 400E – peripheral heating system

- Ability to run with steam pressure from **55 to 235 PSI (16 down to 4 bar)**
- According to product being run steam exiting corr rolls can be **routed**:
 - (a) into the **medium preconditioner only** or
 - (b) into the **medium preconditioner & pressure roll** simultaneously
- **Live steam** in all preheaters/preconditioners



SMART 400E – Steam Joints



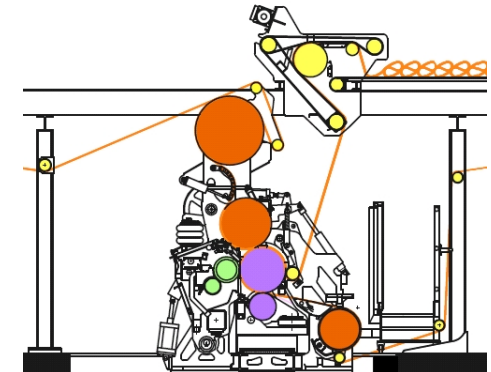
- Compact design: full stainless steel steam joints with robust rigid mountings
- Same diameters for steam inlet and steam outlet
- Spherical seating for graphite seals positioned to compensate for any roll flex
- “Knee-bend” fixed siphon with external adjustment to eliminate any risk of sticking
- Same steam joint bodies and graphite seals whether for primary or secondary applications



SMART 400E – take-up conveyor

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- Take-up conveyor at reverse angle. No nip point for easy & **safe** thread up
- **Positive** paper traction on **the liner side** full 98” or 110” paper width
- No vacuum required, **easy-fit** clipped belts
- First **bridge belt section** with **walkway** & simplified **bridge control system** can be supplied with **SMART**

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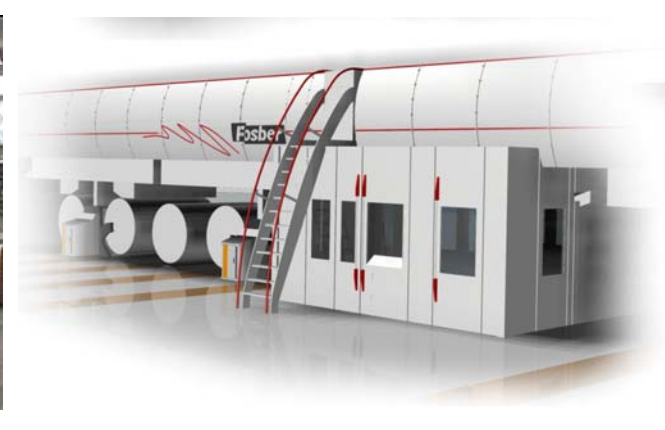
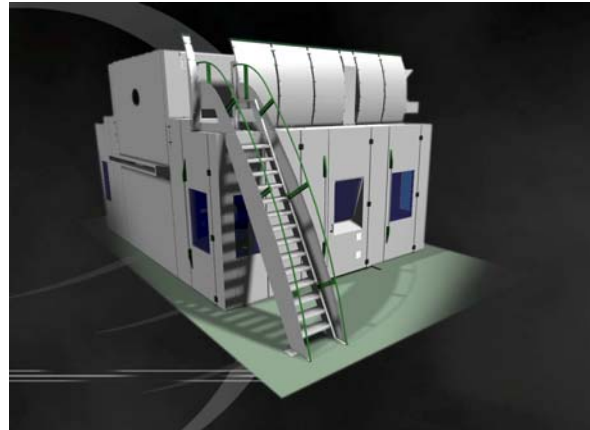
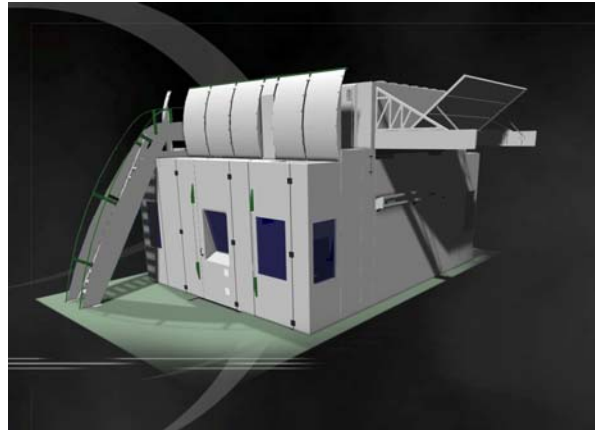
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SMART 400E – Sound Booth

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- **Compact modern design**
- **An integral part of a new overall corrugator noise reduction design**

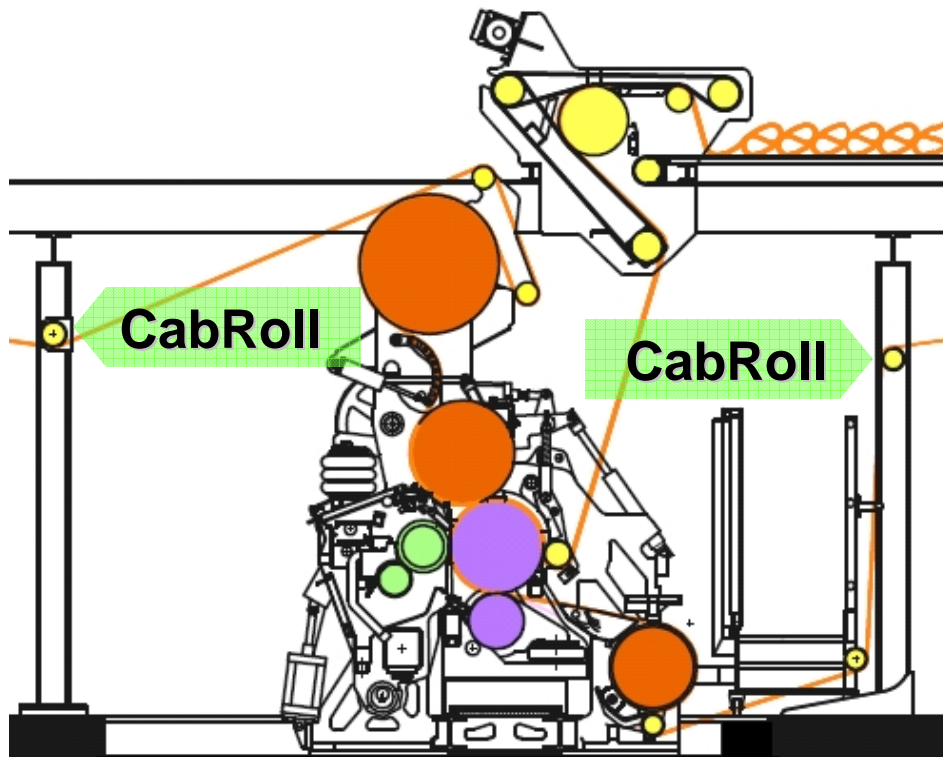
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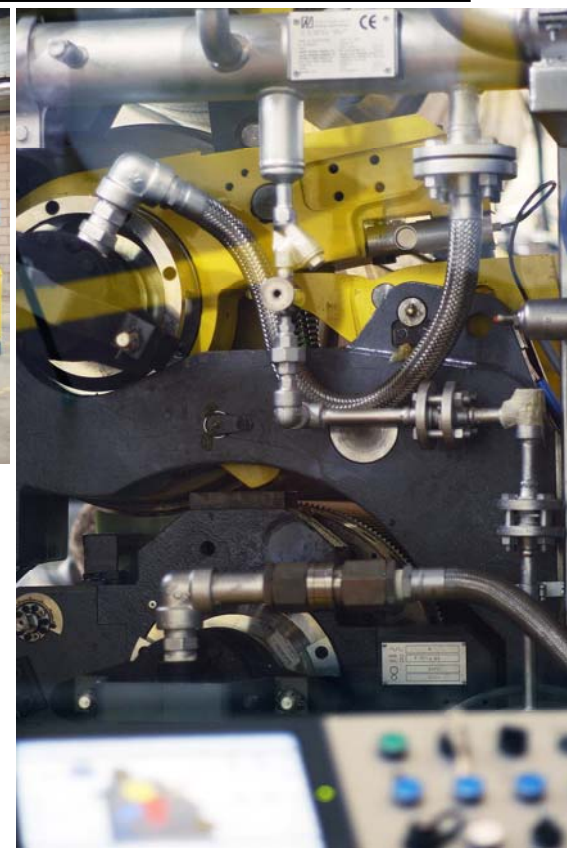
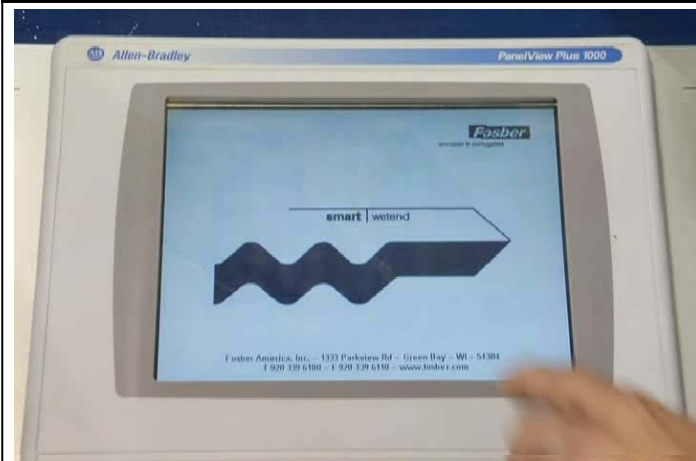


SMART 400E – “CabRoll” Option



- Fosber “Cabroll” - **self compensating and self-aligning** roller
- Removes unequal **paper tension** across the web (providing even heating)
- **Stand-alone** roller (no electricity nor compressed air required)

SMART 400E – “Automation” Upgrade Package

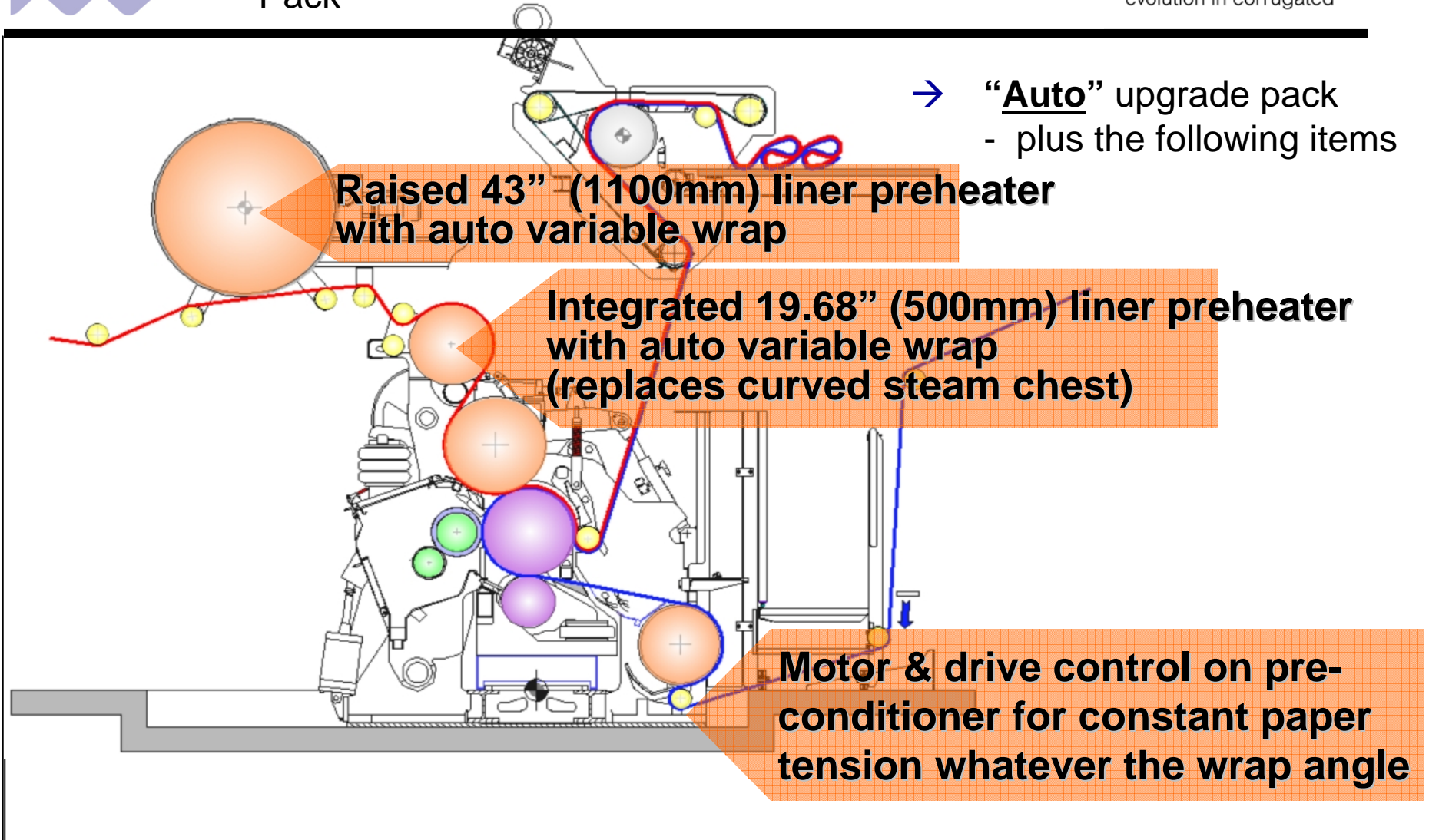


- **Auto Glue Dam** positioning system complete with edge detection system
- **Fully auto pressure (KISS) roll control** according to paper types being run, speed and flute type
- **Auto pressure control** between **corrugator rolls**
- **Fully auto steam valve control** both for cassette change and for main steam to machine

SMART 400 E – “FULL” Upgrade Pack

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→ **“Auto”** upgrade pack
- plus the following items

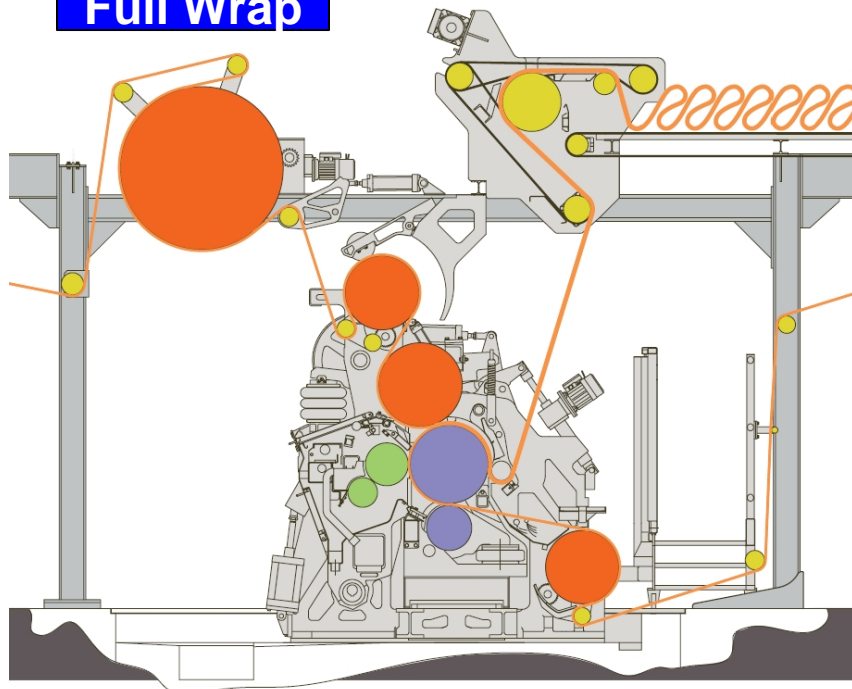
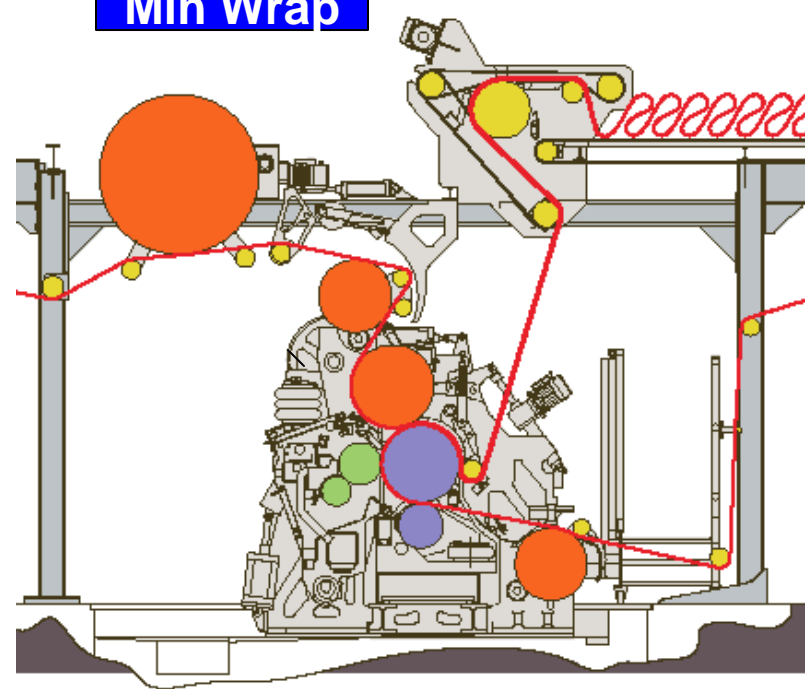
Raised 43” (1100mm) liner preheater with auto variable wrap

Integrated 19.68” (500mm) liner preheater with auto variable wrap (replaces curved steam chest)

Motor & drive control on preconditioner for constant paper tension whatever the wrap angle

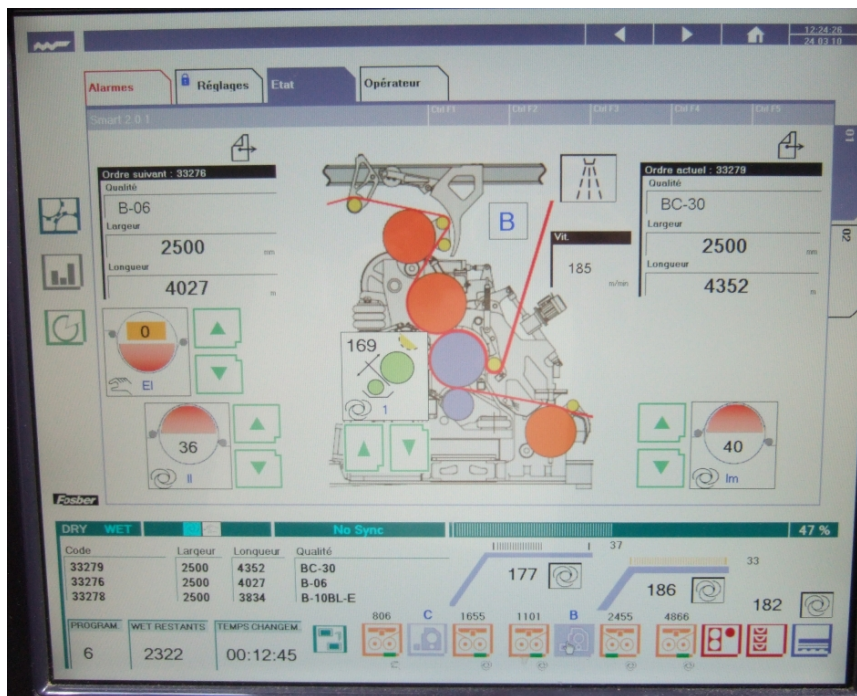
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evolution in corrugated

SMART 400E – “FULL” version**Full Wrap****Min Wrap**

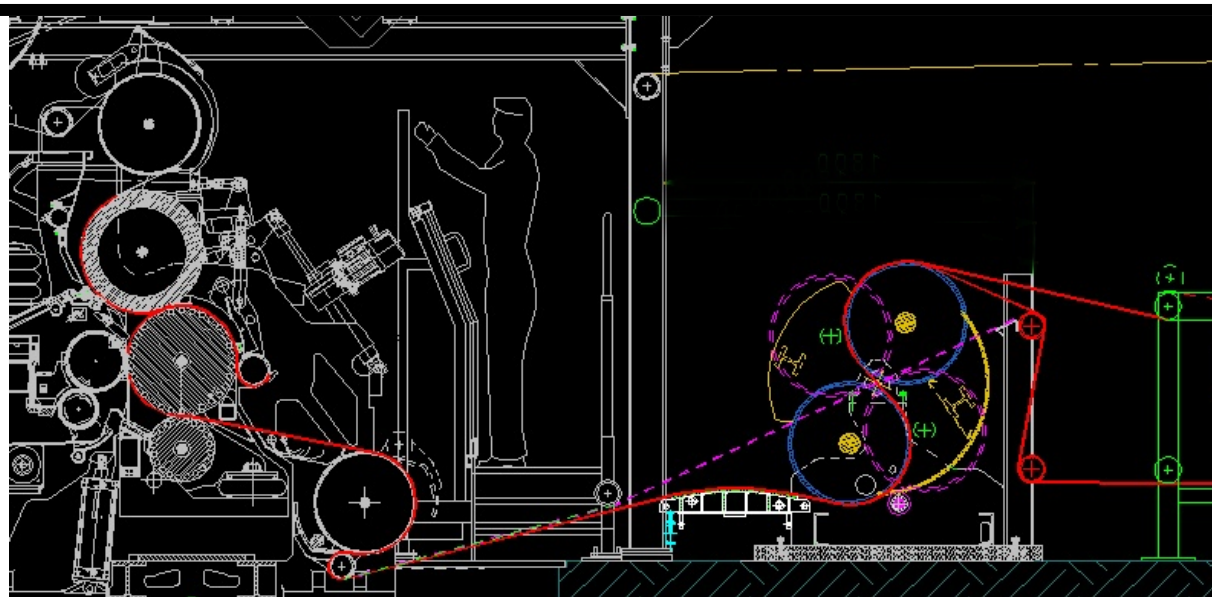
- From maximum to practically zero wrap – **automatic** control of ALL wrap arms
- Ability to run with steam pressure from **55 to 235 PSI (16 bar down to 4 bar)**
- Maximum **machine flexibility** from the heaviest to lightest papers (min-max wraps, steam pressure flexibility, extended nip ↔ press roll **combination**)

SMART 400E – Additional Upgrade Options



- **Fully automatic wrap arm control based on actual measured temperatures** as opposed to running speed
- Automatic detection and **control of the glue level** in the machine via 2 x pneumatic pumps

SMART Single Facer – “Dual Arch” Option



- Double driven preheater drum 19.68” (diameter 500mm) on rotating carousel for **S-wrap heating** (to bond two mediums prior to single facer)
- **Elimination of wrap arms** (which distort the bonding) and allows for zero wrap when running conventionally
- **Pantograph** system to ensure siphon pipes are always pointing vertically down. **Curved “Booster” steam chest as an option!**