NEW SMART 400 E
FOR THE
SINGLE FACER
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SMART 400 E Single Facer – Key Features

→ 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

➔ Heavy Duty Construction with **low center** of gravity
➔ 14.5” thick cast iron frames with “**egg shell**” structure formed from a single fusion
SMART 400 E – General Concept

Demonstrates SMART in “Full Wrap”

Take-up conveyor

On board “External” 31” liner preheater with variable auto wrap

Integrated gun drilled curved preheater plate

Medium pre-conditioner with auto variable wrap

Liner

Pressure (KISS) Roll

Glue Unit

Lower Corr Roll

Up/Extended Nip Roll

Steam Shower

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”

- 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.
SMART 400E—Concept & Principal Features

- 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– New Electrical Package

→ 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
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

→ 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.
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
→ 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.
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
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
(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
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

→ Stop point is on the cassette so only set once at installation

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- Due to mechanical play, a large movement of the eccentric provides a **micro adjustment** of the gap.
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.
→ **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)
SMART 400E – Positive Pressure Chamber

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

- **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.
→ 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 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
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

- 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
SMART 400E – Sound Booth

- Compact modern design
- An integral part of a new overall corrugator noise reduction design
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 EVO – On Board Control

- On board touchscreen control with full machine diagnostics, control setting features and operator overrides
- Option of duplicate remote control e.g. at dry-end control room for easy change of machine settings
- Unified motor and drive package all from one supplier (Baumuller & Allen Bradley) for main machine, glue unit, take-up conveyor etc.

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

→ "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 pre-conditioner for constant paper tension whatever the wrap angle
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 – “FULL” version
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!**