COMPLETE CORRUGATOR LINE
THE S-Line is Fosber's flagship corrugator range. The S-Line comes in 2.5m and 2.8m working widths and all of its components are 100% exclusively sourced and manufactured in Europe. The S-Line comes in two principal ranges:

**S-LINE 400**
This corrugator line is designed, geared and balanced for 400rpm production speed for mega volume corrugated board manufacturers. Additional and re-engineered drives, motors, belts, and balanced shafts guarantee the 400rpm running speed of the corrugator line. The extra heating capability is provided through a series of supplementary steam infusion and conventional and steam infusion booster heaters in conjunction with enhanced process controls.

**S-LINE 350**
Fosber’s established corrugator line for 350rpm production speed for high volume production capacity. Standard features on this line include automatic splicing at 350rpm and gapless order change at 300rpm on single, double and triple level dry-end configurations. The line is equipped with fully automatic process and machine speed controls to ensure that the corrugator automatically reaches set target speeds to optimise both board quality and production output.
GUARANTEES:

- Syncro intelligence - closed-loop auto process control
- Maximum production flexibility
- Optimum board quality
- Lowest cost of ownership and operation
- The most advanced and efficient corrugator steam system in exclusive partnership with Baviera

Energy efficiency is guaranteed right across the entire production range from the lightest possible micro-flute grades to the heaviest jumbo flute board combinations thanks to design innovation and flexible automated controls.

TECHNICAL FEATURES:

WET END
- Fastest paper roll change cycle in the industry
- Beltless “Extended Nip” technology
- Multiple and fast flute change capability

DRY END
- Oil Free technology across the complete dry-end
- True dry-end gapless order change at line speed
- Short order run capability
IN OUR QUEST FOR THE MOST RELIABLE SOLUTIONS
THE NEEDS OF OUR WORLDWIDE CUSTOMERS
ARE FOREMOST IN OUR MINDS
The **Syncro** corrugator control manages, synchronises and controls the complete corrugator line from a single position. It provides detailed production and process reporting, alarms & displays, intelligent diagnostics and full data links to the host office and scheduling system, materials handling and roll stock management systems. Syncro is totally modular and can be supplied as a “stand alone” Wet-End, Dry-End or Total Corrugator Control complete with automatic closed-loop process control, which monitors and manages all the various process settings according to the individual board quality and paper types being run.

The intelligent **Target Speed** control ensures that the corrugator is automatically pushed to reach set target speeds for each board quality, whereupon it further continues to increase line speed in incremental steps until a new limit is reached and automatically saved as the new target. The result is increased corrugator productivity, reduction of waste and consistent quality of the finished product.

The **Pro-Care** suite of controls provide enhanced features such as on-line predictive diagnostics and preventative maintenance routines based on the actual production run. The interactive software plans and details the required maintenance and trouble-shooting tasks to be carried out. On-line real time monitoring and recording of the consumption of electricity, steam, compressed air, starch and the individual motors along the corrugated line provide unparalleled diagnostics, invaluable historical data and automatically generated preemptive warnings. All this guarantees maximum line efficiency. The **Pro-Quality** corrugated board defect detection system monitors board quality in real time, instantly corrects the relevant process settings and automatically ejects the defective board from the corrugator.

### Technical Features

<table>
<thead>
<tr>
<th>Wet-End Controls</th>
<th>Bridge management &amp; calibration, speed and splice synchronisation, Wet-End quality change, paper reel management, paper break detection.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry-End Controls</td>
<td>Gapless Dry-End order change, production reporting, data management and interfaces, pallet label management.</td>
</tr>
<tr>
<td>Process Controls</td>
<td>Closed-loop control for each individual quality, temperature and moisture controls, laser warp detection, target speed control, total traceability, corrugator consumption monitoring, web access.</td>
</tr>
<tr>
<td>Enhanced Controls</td>
<td>On-line preventative maintenance and diagnostics interactive programs, real time consumption monitoring and recording, total traceability, defect detection and removal.</td>
</tr>
</tbody>
</table>
SYNCRO INTELLIGENCE

PROCESS INTELLIGENCE & CONTROLS

- paper tension
- glue film
- steam pressures
- paper temps
- steam shower
- paper tension
- paper temps
- glue film
- moisture monitoring

Wet-End Controls
Bridge management, splice synchronisation, quality changes, paper reel management, paper break detection

Target Speed
- Self-learning auto speed optimisation
Dry-End Controls
Gapless order change, production data management, plant interfaces, pallet labels

- shoe pressures
- steam pressures
- paper temps
- closed-loop moisture balance control
- closed-loop warp detection control
PRO-CARE

The **Pro-Care** suite is an advanced tool that provides great operational support to the plant's management, improving both line efficiency as well as troubleshooting procedures. The built-in automation assists maintenance personnel with proactive instructions and illustrations on when and how routine maintenance procedures need to be carried out. This on-line preventive maintenance scheduling is based on actual live data collected by the Syncro corrugator control and not by general fixed parameters. The system provides detailed instructions with a wide range of photos, videos and supporting documentation on the procedures to be carried out and also allows the maintenance staff to easily identify and order the required spare parts from Fosber before such components wear out. **Pro-Care** contains two additional modules:

The **CCM** (Corrugator Consumption Monitoring) detects and records various consumption data while the machines are working in production. It acquires in real time the actual consumption data of steam, electrical power, compressed air and starch (via interface to the glue kitchen). Consumptions from the Fosber corrugator are fully monitored, and the data can be specifically analysed for each type of flute produced. All values are recorded and stored in the system and so can be retrospectively accessed, evaluated and evaluated by the plant management at any time.

The **CMD** (Corrugator Motor Diagnostics) analyses and detects anomalies in the Motor-Actuator-Mechanism Kinematic chains across the complete corrugator in real time. A built-in app allows both local and world-wide remote control via smart phone or a tablet. In case of detected anomalies outside expected tolerances, the system automatically notifies and activates Fosber's customer care department so potential problems can be investigated before they result in a possible eventual breakdown.
The Pro-Quality is an advanced intelligent system that monitors the board quality in real time. Detected defects can be instantly corrected by the Syncro process control while the defective is tracked and ejected from the corrugator. The detection hardware is located right at source as board exits the single facer(s). The intelligent software system processes and analyses the acquired data across the full single faced to recognise the type of defect. In this way the process settings can be automatically to remedy the defect as well as tracking and ejecting the bad board from the line at the dry-end.

Pro-Quality optimises the board quality and decreases the waste, and so improves overall corrugator production profitability. The system detects a wide range of defects that includes crush, bubbles, blisters, delamination, folds, rips and tears as well as splice joints.
WE ARE FOCUSED ON QUALITY IN EVERY SINGLE DETAIL.
ROLL STAND AND SPICER/STAND M2 + LINK

With double hydraulic cylinders fitted on each side for jumbo roll capability, the M2 roll stand can be supplied as a manual, semi-auto or fully automatic version.

Multi-disc brakes dramatically reduce wear providing many years of maintenance-free operation as well as allow constant paper tension over time. The Link auto splicer features automatic constant tension control via the servo controlled double dancer roll assembly and a double-sided fixed splice head position for quick, safe & easy splice preparation.

**Technical Features**

<table>
<thead>
<tr>
<th>Feature</th>
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<tbody>
<tr>
<td>Auto Tail Grabber</td>
<td>Core ejectors</td>
</tr>
<tr>
<td>Zero tail splicing</td>
<td>Multi-disc brakes</td>
</tr>
<tr>
<td>Auto tension control</td>
<td>Jumbo reel capability</td>
</tr>
</tbody>
</table>
BELTLESS SOLUTION, ENHANCED BOARD QUALITY; LESS MAINTENANCE COSTS, MORE EFFICIENCY.

SINGLE FACER/SMART

The heavy duty Smart quick-change cassette single facer hosts a series of fully automatic features to control variable wrap arm movements, steam pressures, corrugator roll pressures, proportional steam shower, “kiss” roll pressure applied, all glue gaps and glue dam positioning.

With its Beltless extended nip design and utilisation of two differently sized corrugating rolls the Smart significantly reduces the flute-forming labyrinth to ensure optimum flute formation, resulting in greater board strength. The Smart single facer produces board of a quality that matches or even surpasses that which is produced on traditional belted machines, but at a fraction of the comparative operating cost.

<table>
<thead>
<tr>
<th>Technical Features</th>
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</thead>
<tbody>
<tr>
<td>Quick cassette/flute change</td>
</tr>
<tr>
<td>Positive pressure</td>
</tr>
<tr>
<td>Beltless technology</td>
</tr>
<tr>
<td>Massive low-vibration construction</td>
</tr>
<tr>
<td>Auto glue, steam, &quot;kiss&quot; roll</td>
</tr>
<tr>
<td>Fully auto wrap arm controls with zero wrap capability</td>
</tr>
</tbody>
</table>
INTEGRATED ROLL STAND-SPLICER/ LINK M3

Thanks to its triple-reel positioning system the unique Link M3 integrated roll stand-splicer station sports the shortest continuous automatic roll change cycle time available in the industry and is designed to handle very short Wet-End runs. The automatic reel handling system is located to just one side of the line, the corrugator can be situated next to a wall without effecting the continuous cycle time, saving considerable floor space. After splicing the machine automatically rewinds and discharges the expired roll and automatically loads the next roll in the queue ready for splice preparation. This allows Wet-End operator levels to be reduced, as once the splice is prepared the operator can vacate the area and move on to other tasks.

**Technical Features**

<table>
<thead>
<tr>
<th>Fastest paper roll change cycle</th>
<th>Auto rewinding after splicing</th>
<th>Reduced operator requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auto tension control</td>
<td>Jumbo reel capability</td>
<td>True zero-tail splice</td>
</tr>
</tbody>
</table>
PREHEATER AND GLUE UNIT/THERMOSTACK + CREST

All preheater drums on the Thermostack are driven at line speed with automatic variable wrap arm control each with zero wrap capability. The Crest's automatically adjusting rider roll pressure contact system, micro-precision glue gap controls and the utilisation of servo driven positive cell applicator rolls ensure that only the minimum and exact amount of starch is precisely dosed to the flute tips. This dramatically reduces overall glue consumption and consequentially a reduction in steam consumption as less heat is therefore required.

For highest line speeds especially with coated heavy duty board production, steam infusion booster heaters are added to introduce superheated to the single faced web. The infused steam penetrates the fibre pores so heats and conditions the paper without drying it. The result is faster heat transfer, quicker bond curing and highest possible production speeds.

<table>
<thead>
<tr>
<th>Technical Features</th>
<th>Auto glue dam positioning</th>
<th>Individual servo controls</th>
<th>Less energy consumption</th>
<th>Automatic rider roll control</th>
<th>Minimal starch consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zero wrap capability</td>
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</table>

Technical Features Table

- Zero wrap capability
- Automatic rider roll control
- Individual servo controls
- Minimal starch consumption
- Less energy consumption


The Express double backer comes with three independent controlled heating sections each able to run from 15 Bar down to just 0.5 Bar and fitted with dedicated digital pumps to feed a high pressure condensate recovery system. A fourth “zero section” independent heating section can be added to minimise the thermal impact on entry to the double backer especially when running with minimal starch dosages. A unique pressure shoe system automatically applies variable pressure at any area along the length of the double backer to ensure optimum heat transfer to the board right across the web. In addition the shoe system automatically lifts up and removes pressure exactly at the point of the board edges, whatever the working paper width, eliminating edge crush and prolonging belt life.

**Technical Features**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
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<tbody>
<tr>
<td>3 or 4 independent steam sections</td>
<td>Condensate recovery digital pumps</td>
</tr>
<tr>
<td>Zero edge crush system</td>
<td>Auto shoe pressure control</td>
</tr>
<tr>
<td></td>
<td>Double drive option</td>
</tr>
<tr>
<td></td>
<td>Completely flexible configuration</td>
</tr>
</tbody>
</table>
The Constant System Rotary Shear is utilised to initiate Fosber's patented gapless order change sequence, where change-over speed can be carried out at 300mpm. As the web is not severed and remains continuous there is no switching to a pull roll measuring mode, no web wander and no creation of a lead-edge so order change jam-ups are totally eradicated. The machine also acts as a conventional rotary shear whenever required to completely sever the web when operating in cut-to-waste mode with automatic waste expulsion or to initiate an order change in conventional gap mode.

**Technical Features**

<table>
<thead>
<tr>
<th>Line speed gapless order change</th>
<th>Automatic waste expulsion</th>
<th>Wet-End initiation remote console</th>
</tr>
</thead>
</table>

**ROTARY SHEAR/SHEAR**
OIL FREE SOLUTION, LESS ENVIRONMENTAL IMPACT, MORE PERFORMANCE.

SLITTER SCORER/TWIN

The Twin slitter scorer is a double module unit allowing instantaneous order changeover as well as the back-to-back running of multiple-score profiles. The Oil Free thin tungsten blade slitting system can be configured with tooling situated above or below the board line as customers prefer. Blade lubrication has been totally eliminated with significant benefits for safe hygiene especially for those producers who need to meet strict Food and Hygiene Standards. Furthermore the Oil Free design dramatically reduces maintenance requirements.

The Twin 400 is fitted with a high-speed yet simplistic robotic set up system using a brushless AC motor directly keyed into a precision gearbox, permitting the running of the shortest possible orders so that the whole Fosber Dry-End is able to operate comfortably on a continuous 15 to 20 second order change cycle.

As with all Fosber’s Dry-End range of machines the Twin 400 is equipped with on-board cabinets, IMD (Intelligent Machine Diagnostics) and an independent stand alone machine program.

<table>
<thead>
<tr>
<th>Technical Features</th>
<th>Lubrication-free thin blade slitting</th>
<th>Multiple scoring profiles</th>
<th>Fast robotic tools positioning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slitting from above or below</td>
<td>Reduced maintenance</td>
<td>Instantaneous order change</td>
<td></td>
</tr>
</tbody>
</table>
Fosber’s latest brushless AC cut-off knife provides maximum speed performance especially on short chop lengths. The “OIL FREE” cutting blades have new sharper profiles forged from harder materials and are housed on redesigned knife shafts that sport a patented hydrostatic bearing design that virtually eliminate vibrations. The result is an improved speed curve up to 400mpm, a dramatic increase in blade life and intervals between blade tunes, and the machine no longer needs to be installed on a foundation. The blade design eliminates the need for any lapping procedures saving time and cost.

The cut-off knife is supplied with anti-skew outfeed belts as standard with the option of adding a waste diverter system for single, double or triple level versions, allowing the automatic ejection of sheets, splices and defective board prior to the stacker at line speed. Other options include an automatic self-positioning cut-to-pattern recognition system to detect and synchronise the cut on pre-printed liner papers whether run on the top liner or bottom liner.

**Technical Features**

<table>
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<tr>
<th>Feature</th>
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<tbody>
<tr>
<td>Short Sheets at Optimum Speeds</td>
<td>Long life Oil Free blades</td>
</tr>
<tr>
<td>Auto cut-to-pattern (top &amp; bottom)</td>
<td>Lapping procedure eliminated</td>
</tr>
<tr>
<td>Anti-Skew outfeed with waste diverters</td>
<td>No foundation required</td>
</tr>
</tbody>
</table>
STACKER/Terminal

The Terminal 400 automatic stacker features automatic brush and vacuum shingling for optimum sheet control, precise stack and order separation through a patented mobile clamp system, and electrically controlled “steady-stack” belted platform decks for maximum stack stability. Multiple independently driven anti-skew guided belt sections in combination with the intelligent machine program manage up to five separate orders on the stacker simultaneously, allowing very short order capability. An adjustable angle of entry of the shingled sheets into the stacker bay in conjunction with a counterweight arrangement allow much faster movements of the stacker decks, reducing cycle times and belt speeds, so further improving overall stack quality.

**Technical Features**

<table>
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<tr>
<th>Feature</th>
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<tbody>
<tr>
<td>Very short order capability</td>
<td>Precise sheet count</td>
</tr>
<tr>
<td><em>Tailor made</em> for each customer</td>
<td>Optimised stack presentation</td>
</tr>
<tr>
<td>Steady stack platforms</td>
<td>Intelligent machine program</td>
</tr>
</tbody>
</table>
The Fosber corrugator can be enhanced with a bespoke noise-reduction system integrated directly into the construction of the line. This environmental enclosure not only serves to reduce sound emissions to below 85 dB (meeting all the latest legal directives) but has the dual function of forming an integral part of the machine guarding. Large areas of armoured glass ensure optimum operator visibility to all the various machine operating areas and create a uniquely quiet, user-friendly and stimulating working environment for the operators. Complete with internal lighting and suitable air ventilation systems, another benefit is that a more constant and stable environment is created within the enclosure where the production process is actually taking place. Warm air generated by the corrugating process can now easily be harnessed and recycled to other areas of the factory where it is needed, further improving overall plant energy efficiency.

The sound enclosure is modular and has been specifically designed and “tailor-made” for the Fosber corrugator to ensure easy and unrestricted operator and maintenance access to all areas of the machine whenever required, in total contrast to traditional “second skin” sound-booth solutions.

**Technical Features**

<table>
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<tbody>
<tr>
<td>Sound emissions below 85 dB</td>
<td>Compliant to latest CE rules</td>
</tr>
<tr>
<td>Improved energy efficiency</td>
<td>Better working environment</td>
</tr>
<tr>
<td>Stabilises process environment</td>
<td>No &quot;second skin&quot; design</td>
</tr>
</tbody>
</table>
WE WANT TO BE A TRUE PARTNER TO OUR CUSTOMERS.
Our group of technical experts, fully supported by a team of mechanical, electrical and software design engineers is at complete disposal to provide total solutions for any request or need for technical assistance. A specifically designed IT system has been developed to ensure that customers are constantly updated on the live status of any ongoing active request for technical support.

The remote support control service allows our technical specialists to perform immediate on-line remote diagnostics. By connecting on-line to the local corrugator supervisory control system, we are instantly able to check and monitor all relevant production parameters and to remotely carry out any adjustments accordingly.

TECHNICAL SUPPORT:

Phone: +39 0583 3891
Fax: +39 0583 385 567 | 389 205
E-mail: customercare@fosber.it

24/7 TECHNICAL SUPPORT:

Phone: + 39 335 847 1793
E-mail : h24@fosber.it
Fosber’s Spare Parts Department is made up of a team of experts capable of satisfying any type of request for spare part service, finding the best logistical solution to meet the required delivery timings for the parts needed.

In emergency cases an express delivery service is often fundamental in quickly restoring the production efficiency of the corrugator. In these cases Fosber is able to provide personalised logistical services 24h around the clock thanks to the development of close partnerships with specialist courier companies who provide express delivery services to all quarters of the world.

The permanent stock of all critical replacement and consumable parts in Fosber ensures that we can always react in real time whenever an original part is urgently required.

On customer request Fosber’s Spare Parts Department will propose and provide personalised consumable parts packages that are tailor-made to each individual plant’s particular needs.

### 24/7 SPARE PARTS SUPPORT

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Fosber’s Training Service Department provides customers who wish to train their own personnel with a team of highly qualified and experienced instructors. This team provides on-site training for both machine operators as well as maintenance personnel to optimise machine performance and maximise the corrugator efficiency over time.

Fosber offers two main types of training services:

**Technical Training on the Equipment (operation & maintenance)**
Qualified and experienced instructors provide on the spot training sessions for machine operators and maintenance personnel to optimise the productivity and efficiency of the corrugator line.

**Technical Training on the Production Process**
Specialised Fosber technicians will transfer their know-how on the production process, demonstrating how to maximise the quality of the product while at the same time minimising the input requirements. Fosber’s process expert will work hand-in-hand with the machine operators to carry out a preliminary on site evaluation of how the machine is run. A dedicated program is then implemented to minimise consumptions such as steam, starch and energy while at the same time totally focusing on quality, sustainability and efficiency.
The provision of specialised technical assistance and the utilisation of original Fosber spare parts are fundamental to preserving the long life and production efficiency of your corrugator line.

For these reasons we have focused our attention on our actual customer needs and so we have invested heavily in the development of bespoke service programs and preventative maintenance contracts to guarantee such services using the latest innovative technology and highest quality products.

Highly qualified Fosber technicians carry out a detailed diagnosis and technical analysis of your machines so they can propose personalised maintenance steps to be carried as agreed with the customer. At the end of each maintenance service visit our technicians will issue a detailed maintenance report on all work carried out as well as highlighting an advisory bulletin on what parts should be replaced in the near future to maintain the long-term reliability and operation of the machine.

This extremely expert and experienced team is constantly in contact with our entire customer base to share production experiences to be in a position to suggest relevant and applicable upgrades to existing machines with the aim of continuously improve machine performance whilst reducing operating and maintenance costs.
FMS-FOSBER MAINTENANCE SERVICE

The Preventive Maintenance Programs are dedicated additional services for customers. Fosber places maximum importance on its customers’ needs to ensure we can guarantee the servicing of any necessary maintenance requirement.

Our preventive maintenance contracts are studied and structured on a personalised basis by our technical experts to ensure that the corrugator line efficiency, the quality of the finished product and the duration of all consumable products constantly remain at the highest levels over time.

FSR-FOSBER SYNCRO REPORT

To the customers who have a Fosber Syncro corrugator control, Fosber offers an additional module, the Fosber Syncro Report (FSR), that provides a full analysis and consultancy service on the production process.

Qualified technical experts will analyse in detail the make-up of the production line and the historical data recorded in Syncro as follows:

- Daily production trends
- Individual production shift trends
- Line efficiencies
- Average production speeds
- Eventual downtimes for each individual machine unit and its cause
- Production data according to flute type

Based on the expert evaluation of this data coupled with first-hand checks and controls carried out on the corrugator line itself, Fosber’s expert technicians will identify and propose to the customer the following action plans to improve line productivity:

1. Operator Training
2. Maintenance Personnel Training
3. Preventative Maintenance Programs
4. Equipment Upgrades