



IF Series

I-RWM

(Intelligent Rewind Mentholating System)

SPI Developments Ltd



Fluid Control
Experts

 a Tembo company



At SPI Developments, we take pride in being the global leading manufacturer of Glue and Flavour Systems tailored specifically for the Tobacco Industry.

All of our Intelligent Flavour Systems are expertly designed, assembled, and tested at our state-of-the-art manufacturing facility in Rotherham, United Kingdom.

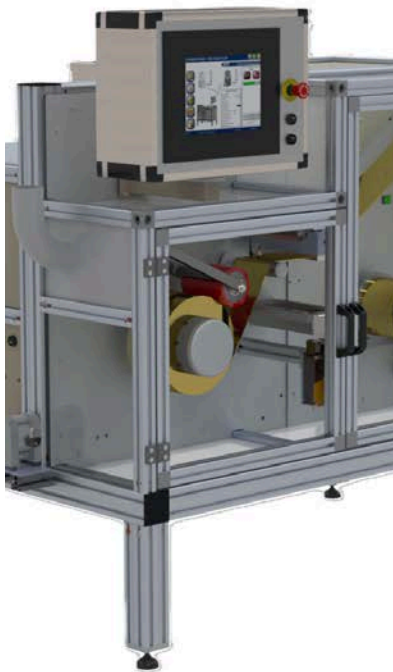
I-RWM System Overview:

The I-RWM Foil Rewind/Mentholator has been designed to unwind reels of aluminium foil and apply controlled dosages of cold flavour solution to the tissue side of the foil, before rewinding the foil into a completed reel, ready for the packaging process.

The machine is a self-contained unit and will operate fully automatically, apart from the manual loading and unloading of the new and completed label bobbins and feeding the initial foil web from the unwind reel and onto the rewind reel.

The machine is fully automatic in operation and has simple user interface controls allowing the operator to change all necessary parameters, including speed, tension, flavour loading per metre of foil etc.

The display screen allows the operator to monitor the product quality and collect data on the operation of the machine and the amount of flavour applied to each bobbin.



Key Features:

- Microprocessor control system, with options for open or closed loop control of fluid delivery
- Micro-precision gear pump, driven by a servo motor via a magnetic coupling ensuring high accuracy of flavour application
- Coriolis flow meter to measure and control liquid flow rate and ensure the system is operating within tolerance
- Siemens PLC, drives and servo motors
- High capacity stainless steel flavour tank with level control for automatic refilling
- High resolution touch screen
- Datalogging functionality for traceability purposes
- Fluid filtration system to protect the system from foreign matter within the flavour solution

I-RWM Advantages:

We believe the I-RWM system will offer the end user the following advantages:

- A speed of up to 600m/min, depending on flavour loading requirements
- Highly consistent and accurate application of flavour per meter of foil, regardless of machine speed
- A simple, easy to use machine, with pneumatically expanding cores to allow for easy loading and unloading of bobbins.
- Produces high quality rewind bobbins, with adjustable rewind tension.
- Minimal waste foil at start and end of bobbins
- Customer specific flavour application line patterns, easily changed to suit different product specifications.
- Includes Coriolis flowmeter to monitor and regulate flavour application rates.
- High resolution HMI screen for controlling the machine, providing clear operator interface and a platform for such features as datalogging, label printing and trouble shooting
- Easily converted to handle bobbins of different core sizes by the use of core size parts
- The machine will be compliant with current CE/UKCA safety regulations and tobacco machinery standards.



System Operation:

The operator loads a new full bobbin onto the unwind hub, locks the hub in position using the pneumatic cores, feeds the foil through the web route and attaches it to the empty core on the rewind hub.

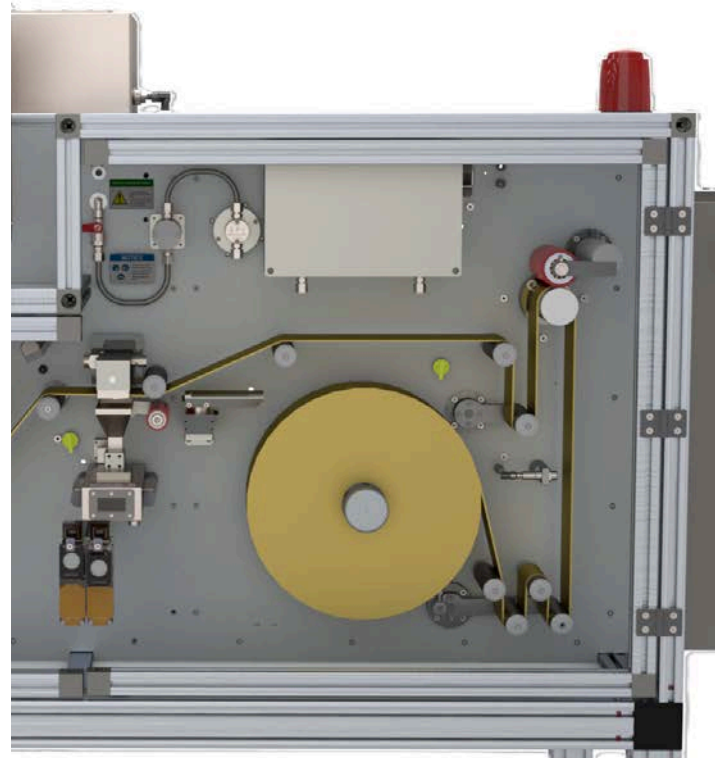
After closing the machine guards, the start button is pushed by the operator and the foil will be automatically fed through the machine, with flavour being applied as soon as the machine starts (even at low speed).

The machine accelerates to the pre-set full operating speed and continues at this speed until the rotation speed of the unwind bobbin increases to a preset value. The speed then reduces to a crawl speed and stops automatically when the end of the foil comes off the unwind bobbin.

The micro-precision pump delivers flavour solution from the reservoir to the applicator head at a rate proportional to the foil web speed, thus ensuring a consistent liquid application rates per metre of foil.

If the sensors in the tank detect that the flavour level is low, the following possibilities may happen:

- If an automatic refill system is connected, the auto refill system will refill the tank
- If no automatic refill system is connected, the machine will issue a warning alarm to the operator. If the operator does not refill the tank, the machine will continue to run until the tank empty sensor is triggered at which time the RWM will be shut down.



Dry rewind

The RWM can also be used in “dry” mode, to rewind foil bobbins without applying any flavour.

This allows the bobbins to be run through the machine to improve the tension or quality of the bobbin winding.



Safety Features:

Interlocks:

The machine doors are interlocked to prevent access to the front of the machine when the machine is running. The doors will not open until a zero-speed encoder confirms that the machine has completely stopped.

The rear machine doors which allow access to the electrical equipment and drive system are locked shut using special engineering fixings which require a specific engineering tool to open them.

Fume Extraction:

The machine is normally fitted with a 3 inch outside diameter (76mm) outlet pipe on the left-hand side panel to allow a fume extraction system to be connected to the machine. If required, this can be changed to a customer specified size.



ATEX (Ex) Compliance:

To cater for alcohol based flavour solutions, key components of the IRWM are intrinsically safe and therefore comply with explosion proof regulations.

In addition to this, ethanol sensors can be installed for monitoring the levels of hazardous vapour within the machine. If these levels exceed a pre-defined level then the system can be automatically powered off to prevent the risk of explosion.

Other safety devices are available such as sealed waste flavour vessels are also available if required.

Flavour Application System:

The flavour delivery system uses standard, well proven, SPI flavour application modules modified to suit the I-RWM machine. Flavour is fed from the pump to the applicator head by a hose assembly.

The applicator assembly contains a pattern bar with several holes which are positioned to allow the correct pattern of lines to be applied the foil. Individual holes can be blocked up with set screws to allow gaps in the application pattern to be achieved.



The machine can be provided with an applicator pattern bar for each width of material, to allow specific patterns to be set up for each product.

The applicator head assembly is supplied with a position adjustment, allowing additional flexibility of application position. The unit is marked with graduations to help the operator align the applicator bar with the centre of the foil.

Key Elements of the I-RWM:

Maximum Reel Diameter:

The maximum reel diameter capacity of the I-RMM is 400mm.

Heated / Cold Flavour Application:

The standard I-RWM is a cold version that will run cold flavours only however, heated versions are available upon request capable of running hot or cold flavours.

Machine Speed:

The machine will run at a maximum operational foil speed of 400m/min, however the final operating speed will depend on the product specification and required flavour loading per metre of foil.

Foil Drive:

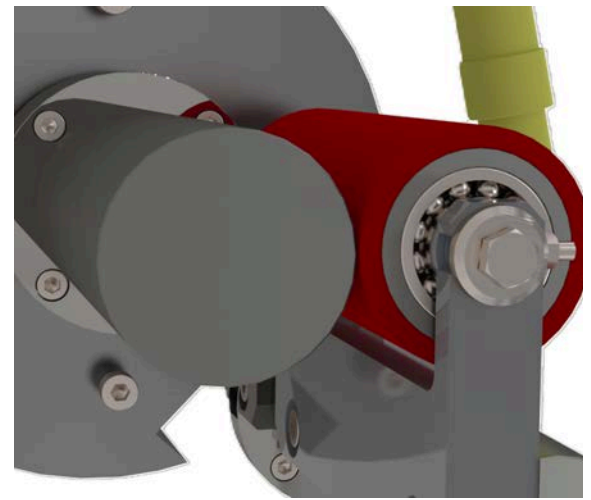
The drive is transmitted to the foil by Nip/capstan drive rollers (one rubber covered and one steel), which pull the foil from the unwind reel at a controlled speed. The operating speed for these rollers is set by the Panel PC/Micro-controller/master Siemens Servo system, which ensures that the foil speed is stable for the application of foil. The rubber roller automatically retracts when the machine stops for easy threading up.

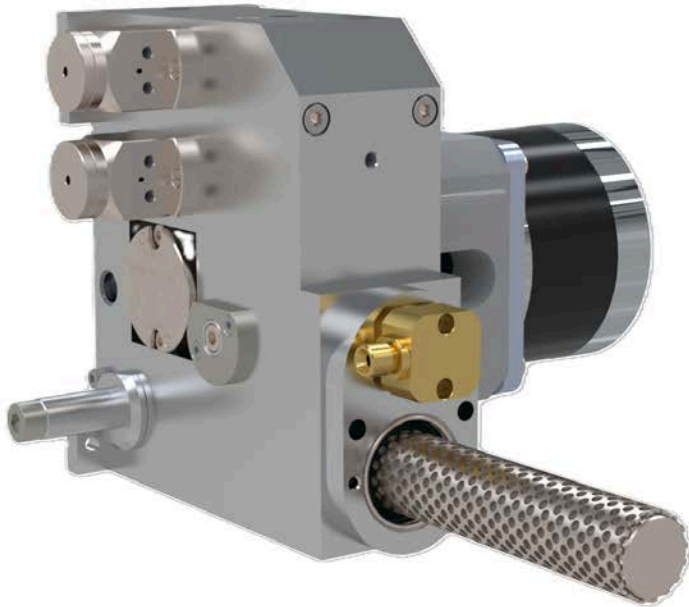
Rewind Reel Drive / Tension Control:

The drive for the rewind reel is controlled by the slave drive unit. The tension load cell measures the foil tension and closed loop control through the system ensures that the slave drive unit is driven at the correct torque to ensure that the foil tension matches the system setting. The tension can be adjusted using the control system, to ensure that a good rewind quality is achieved.

Unwind Reel Braking / Tension Control:

A dancing arm is included in the foil run, which is connected to a brake on the unwind reel. This ensures that the foil from the unwind reel is under constant light tension, and also prevents the reel from running on during stoppages.





Unwind / Rewind Hub Assemblies:

The bobbins are mounted on pneumatically expanding hubs, which lock the bobbins in place. The hubs are specific to each core size to ensure completely true running, but will accept any bobbin width up to the specified maximum.

The hubs are held onto the main drive shafts by locking bolts, which can be easily released to allow them to be changed to suit bobbins with different core sizes.

Machine Datum:

When the bobbins are loaded, the cores are pushed back against the rear face of the hubs, which act as the machine datum line. The foil will run through the machine and will be rewound in alignment with the datum to ensure excellent tracking and rewind quality.

Rewind Pressure Roller:

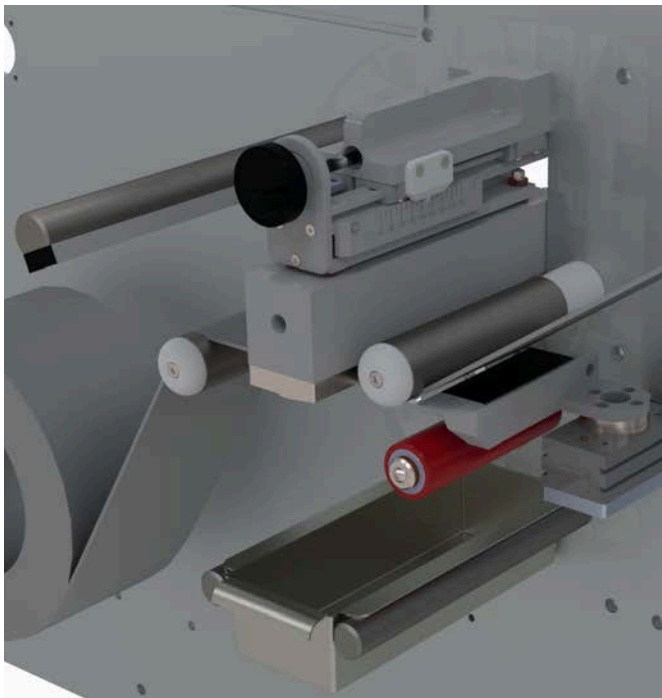
A pneumatically operated pressure roller is fitted to the machine to ensure that the foil is rewound flat on the rewind bobbin.

Web Detection:

A web detection sensor is included on the foil track to check on presence of the foil. If no foil is detected or if the foil were to break, the machine will be automatically stopped.

End of Reel Sensor:

A sensor is mounted on the unwind reel which measures the rotation speed. This signal is used to determine how much foil is left on the bobbin, and when this reaches a minimum level, the machine will slow down to a crawl speed and then stop. This allows the waste at the end of the reel to be minimised.



Control Screen:

The machine is equipped with a 12-inch HMI control screen module, providing an easy to use operator interface. This provides access to all running and setup data, (including calibration routines) and warns the operator that the reel processing is complete when the bobbin is completely rewound.





Typical running data shown include machine speed, flavour application rate, and foil tension. Any alarms will also be shown on the screens, including tank refill alarms.

Besides the standard control elements, the system includes elements to improve operator productivity, including:

- Operator Log-in procedure
- Shift time set up
- Brands database, including detailed setup data for each brand
- Barcode label printer connection
- Production data output for data logging and reel traceability
- Individual reel information



Brand Editor	
Brand ID	6
Brand Number	011L78522/000
Brand Name	01PMH070465
Foil Width	164 mm
Dose Per sq Metre	7.400 g
Process Speed	300 m/min
Calibration Reference Flow	182 g/min
Core Size	115 mm
Tension	30 N
Tracks	2
Heated?	<input checked="" type="checkbox"/>

Data Logging and Production Statistics:

The machine includes standard performance data and analysis software, with data output showing, including measurements of efficiency and other features, together with individual bobbin data analysis.

Note: customer specific software modifications and data network connections can be supplied at extra cost.

Technical Specification:

Unit Size (approx)	2100mm long x 1850mm high x 1000mm deep
Reel Outside Diameter	Maximum 400mm
Rewind Tension	Up to 40N
Rewind Speed	Up to 600m/min. Actual maximum running speed will depend on the flavour solution characteristics and the required flavour loading per metre of foil.
Flavours	Cold Flavours. (Heated flavour application available on request)
Flavour Pump	The machine can be supplied with different pump capacities depending on the total flow rate required. Nominal pump capacity is over 500g/min.
Flavour Application Tolerance	+/- 1% of nominal loading
Flavour Tank Capacity	50 Litres
Electrical Supply	3ph, 50/60Hz supply required. 380/415/480v are acceptable. The customer is responsible for providing this voltage, including neutral and earth wires.
Motors	Siemens Servo Motors
Drive Control System	Siemens Servo Drives and Amplifiers
Pump Control Processor	SPI Microprocessor Control Unit
HMI Display	High resolution 12inch HMI unit
Vacuum Supply	Not required
Air Supply	The machine is designed to connect to a standard factory supply, supplying clean, dry air at a minimum air pressure of 5 bar (70 psi). The airline is connected to an air filter/regulator unit mounted on the machine.
Safety/Guarding	The machine will be fitted with full overall, clear guarding with opening front doors to allow operator access. The front machine doors are interlocked using CAT IV standard interlocks, which prevent the doors being opened until after the machine has stopped rotating.
Noise	Noise levels are minimal and would be expected to be below 80dB(A).
Language	All non-symbolic plates or screens will be in the English Language unless otherwise requested.
CE Compliance	The equipment will be fully compliant with all relevant European Directives and Standards and will be supplied with CE Certificates of Conformity. If local regulations apply different standards, the stricter ones will be applied.
Software Standards	The control system will be built to comply as far as possible with any robustification standards required by the customer.

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