

DRAW FRAMES DF1-DFR1

High productivity with low operational costs



Marzoli

Complete spinning line,
components and digitalized
solutions for the best performance
of the spinning process



THE ONE SOURCE FOR A FULLY-AUTOMATED AND DIGITALIZED SPINNING MILL



Marzoli, one of the major brands of the textile sector worldwide, is a unique European manufacturer of the complete line of machines for the opening, preparation and spinning of short-staple fiber. From the bale opener to the ring spinning frame, Marzoli offers the most advanced technology for a completely-automated spinning mill. Through its global sales and service network, its expertise on each type of fiber and application and the competence on the entire process, Marzoli represents a competent and reliable partner. And through its experience, know-how and commitment, it provides its customers with:

- Advanced spinning solutions through a careful activity of textile engineering. Marzoli assists its customers from the study of the spinning plan, throughout sourcing, erection and commissioning, up to maintenance of the resulting turnkey spinning plant, which can comprise Marzoli but also third-party machinery. The customer can rely on the competence and capability of a unique partner, responsible for the quality and productivity of the entire spinning mill.
- The advantages of smart spinning. No matter what the brand(s) of the machinery is, Marzoli can install its software platforms, YarNet and MRM, its hardware applications for gathering data on waste percentages and its composition, quality values, productivity indexes and other kpi data to let the customer build on the potential of Industry 4.0, optimize the entire spinning process through well-informed decisions and reach the highest performance in production operations.

OVER
170 ■ YEARS
OF SUCCESSES

OVER
70 ■ COUNTRIES
WITH ACTIVE CLIENTS



OPENING SECTION

- Openers & Cleaners
 - Mixers & Blenders
 - Card
-



COMBING SECTION

- Draw Frames
 - Lap Winder
 - Comber
 - Lap Transport
-



SPINNING SECTION

- Roving Frame
 - Ring Spinning Frame
 - Bobbin Transport System
-

DRAW FRAMES

DF1-DFR1

KEY POINTS

- HIGH PRODUCTIVITY WITH LOW OPERATIONAL COSTS
- INNOVATIVE PNEUMATIC DRAFTING HEAD
- PRODUCTION SETUP AND CONTROL BY TOUCH SCREEN
- EXCELLENT PERFORMANCE WITH GREAT FLEXIBILITY
- PRODUCTION UP TO 1,000 m/min



The draw frame is one of the most critical machines in a spinning mill. Playing a fundamental role in ensuring yarn quality, it must run at very high production speeds in order to ensure a fast return on investment.

The vast expertise and the continuous improvements on its machine have allowed Marzoli to offer a draw frame that excels on both aspects: the DF1.

This high performance Draw Frame has been designed in order to guarantee production volumes up to 1,000 m/min with lower CV%. Easy to operate, outstanding reliability, high flexibility and low operational costs are Marzoli's draw frames' main features.

DF1 offers a complete range for all market requests: 18", 20", 24" and 40" can size, up to 8 doublings, powered creel with or without autoleveller:

- DF1: single delivery;
- DFR1: single delivery with autoleveller.

Technological parameters are set directly on the touch screen; all the programs are stored and recalled at any time, saving time during lot changes. The draft value on the DFR1 is easily set and is conveyed by servomotors: no need of replacement of pulleys; these drives are coordinated by the central computer.

■ INNOVATIVE GEOMETRY OF THE DRAFTING SYSTEM

Outcomes of the innovative geometry of the drafting system

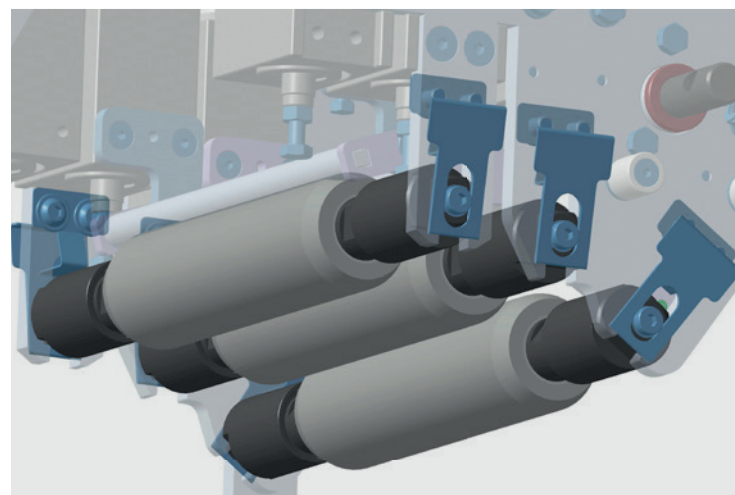
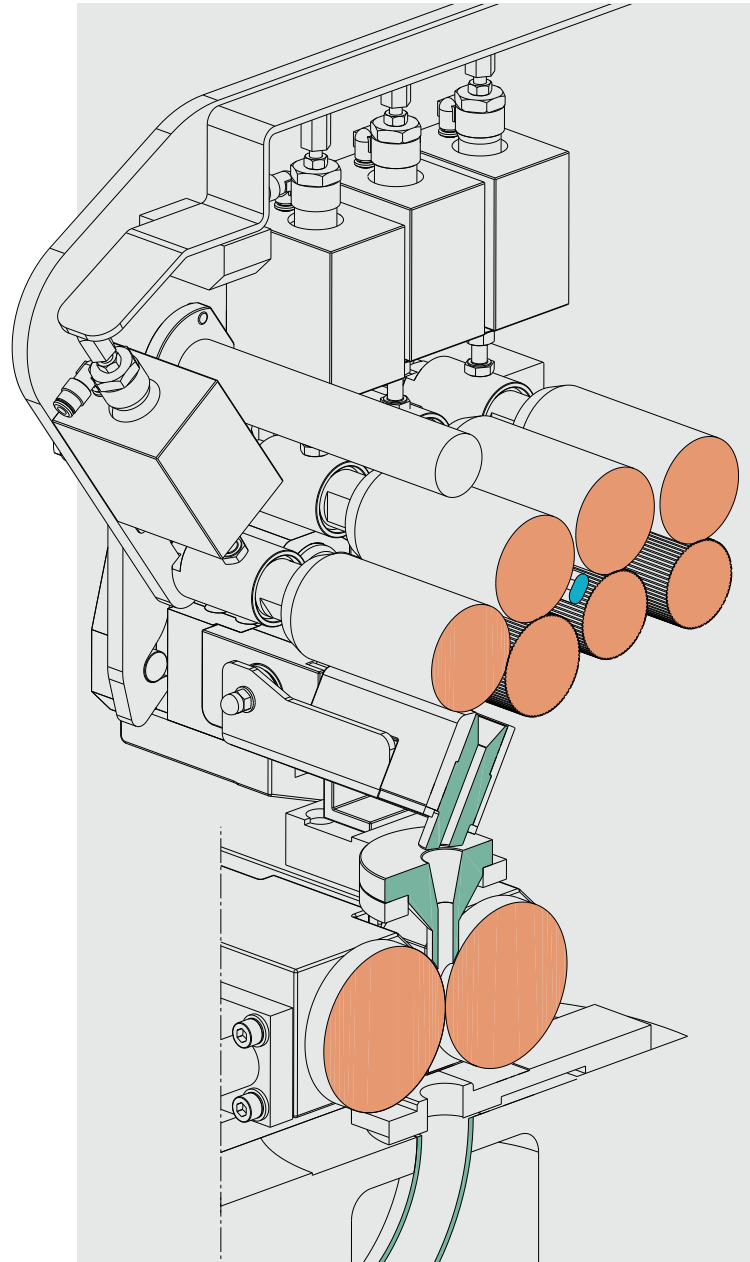
- lower production costs;
- better fibers control in the drafting area;
- high quality of the sliver;
- Great reliability
- High production volumes (up to 1,000 m/min)

Innovative features of the drafting unit

- High productivity and reduced sliver breakages during operation;
- in addition to new 3-over-3 drafting system, there is one guidance roller which minimizes the uncontrolled distance, run by the sliver, from the drafting delivery to the condenser unit before the coiler;
- pneumatic pressure of the top rollers individually adjustable;
- when the machine stops the top rollers are automatically relieved from air pressure to protect the rubber surface;
- scrapers in contact with the top rollers assure high cleaning and avoid roller lapping.
- when the drafting head is open for inspection, the input top roller stays over the bottom steel cylinder, preventing the movement of the slivers out of the drafting head.

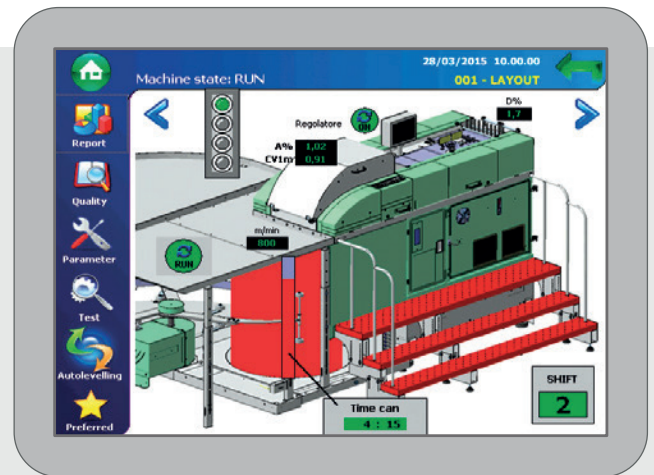
■ NEW DRAFTING SYSTEM

Marzoli has developed a new solution that involves 42 mm diameter unification of all 4 top rollers and the use of lubricated-for-life ball bearings. This makes it possible to achieve high quality standards at low operating temperatures. The top rollers are supported by new clips that are easy for operators to manage.



■ USER-FRIENDLY INTERFACE

The Draw Frames DF1 and DFR1 are managed by a modern PC micro-processor: all the production data and the working parameters are controlled and saved during the production cycle; the multi-language touch screen is user-friendly and permits a simple use with clear diagrams, detailed monitoring pages and step-by-step trouble-shooting procedures.



■ HIGH EFFICIENCY SERVOMOTORS

The latest inverter model guarantees an excellent level of performance; the elaboration of the electronic signals keeps the tension applied to the drafting rollers at a constant level even at the highest speed.

The inverters have a special dissipation unit for internal cooling; all the motors are working at low temperature.

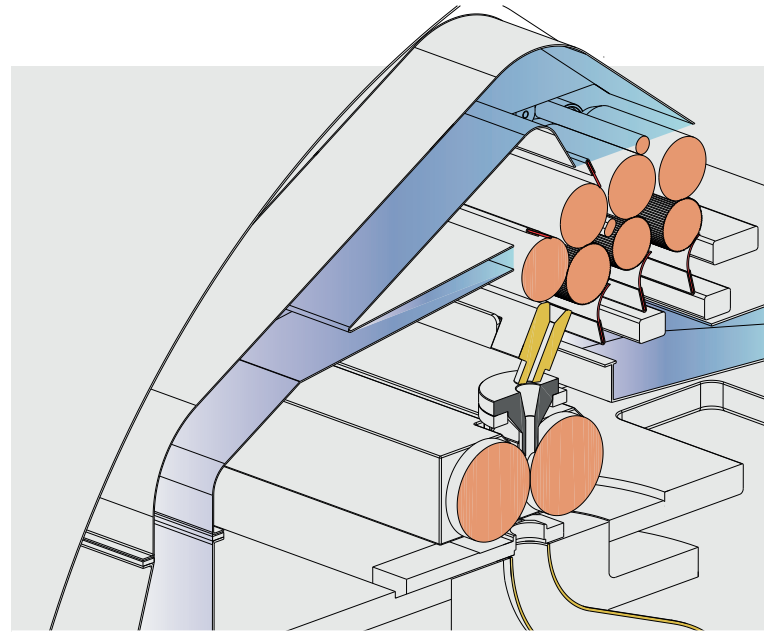
■ ELECTRONIC DRAFTING SYSTEM FOR DFR1

- The draft ratio is set on the touch screen and then electronically controlled through independent motors;
- the toothed belts ensure more efficient power transmission, with reduction of energy consumption, noise and maintenance activity;
- all mechanical parts can be easily accessed during maintenance and cleaning operations thus assuring a high level of performance over a long period of time.



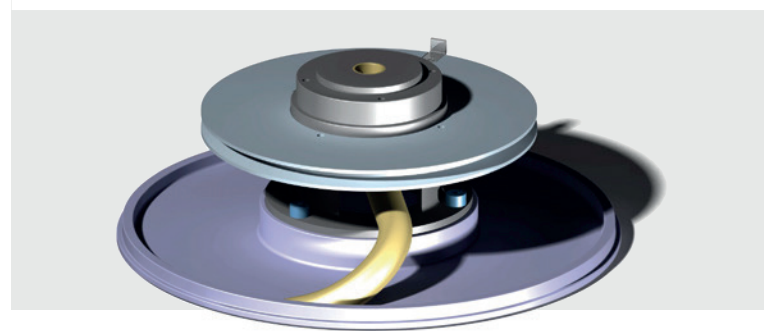
■ SUCTION SYSTEM

The suction system has been designed for high drafting performance: excellent dust removal from the sliver is obtained with a suction unit which is completely adapted to the geometry of the drafting system. Purposely designed suction elements clean the T&G unit (at the feeding side) and the drafting rollers (at the delivery side). There is a connection with the centralized suction station to guarantee a regular and constant cleaning of the machine; as optional it is suggested a self cleaning filter box.

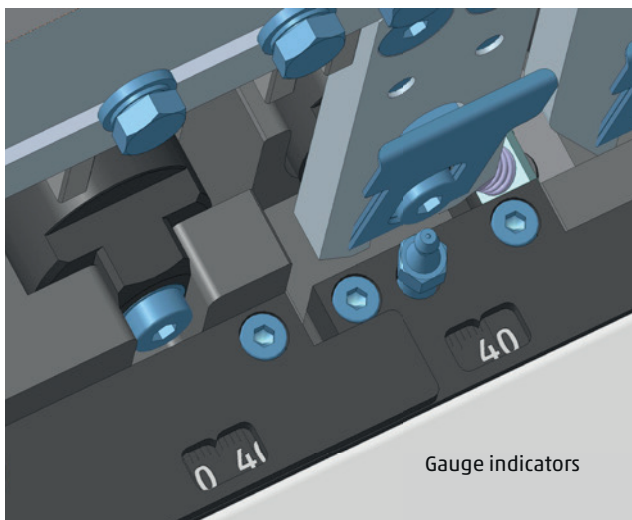


■ COILER

- The rotating plate is given a surface treatment to avoid electrostatic charges and thus allowing high speed;
- special Marzoli design to avoid dust and fibers accumulation inside the tube;
- automatic blow to help the insertion of the sliver into the coiler;
- the rotating can table is driven by an independent motor which can be set from the touch-screen interface in order to modify the number of coils in the can and optimize the number of meters of sliver;



- possibility to apply ceramic treatment for the processing of synthetic materials.
- positioned stop of the coiler controlled by sensor, for a correct cutting of the sliver. Optional a sliver cut system for hard fibers. Pudipsunt aliquas simodit



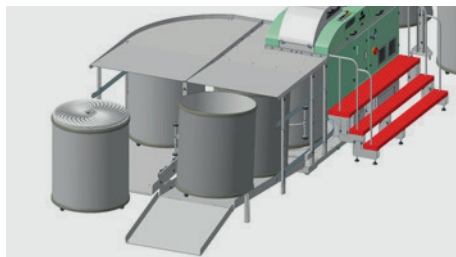
Gauge indicators



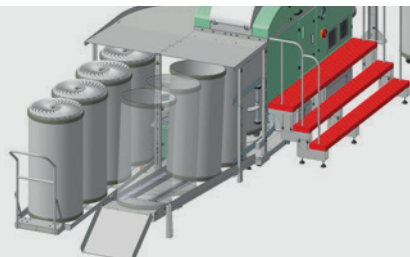
Simple and reliable Toothed Belts Drive System.

AUTOMATIC DOFFING CAN CHANGER

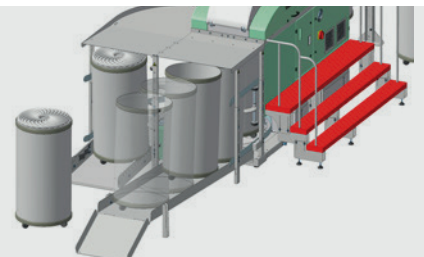
- The Draw Frames DF1 and DFR1 are equipped with a reliable and fast automatic can change system driven by gearmotor;
- the delivery area is pre-arranged for the connection to an automatic transport system of the cans;
- Several options are available for the can changer, for a better management of draw frame machine.



40" slide for cans with wheels



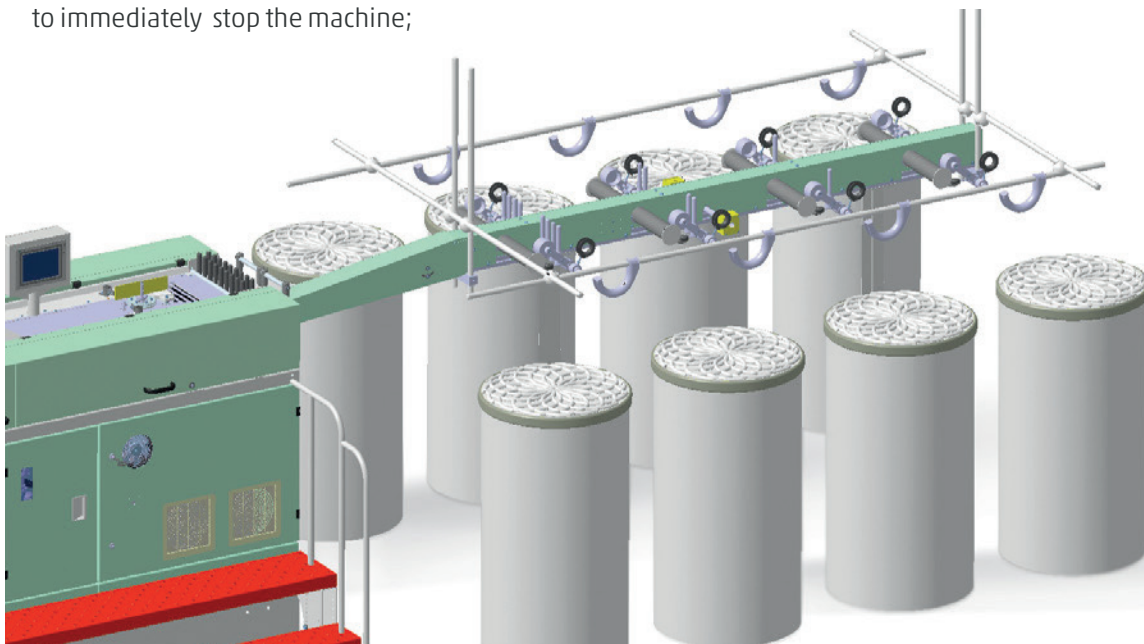
Rollers slides for 18", 20" and 24" cans without wheels



Slide for 18", 20" and 24" cans with wheels

POSITIVE POWERED CREEL

- Sensors to detect sliver breakages;
- the feeding creel has up to 8 cans of 20", 24" or 40". The positively driven creel (driven rollers and calenders), made of resistant stainless steel bars with round shape, prevents false drafts on the sliver;
- a ground contact sensor is able to properly detect breakages of the sliver and, in that case, to immediately stop the machine;
- a sliver control system, Marzoli patented, is positioned before the T&G and assures the stop of the machine in case of a sliver breakage between the creel and the machine. A light ball is put on each sliver before the T&G. When the sliver breaks, the ball falls down and a sensor stops the machine.

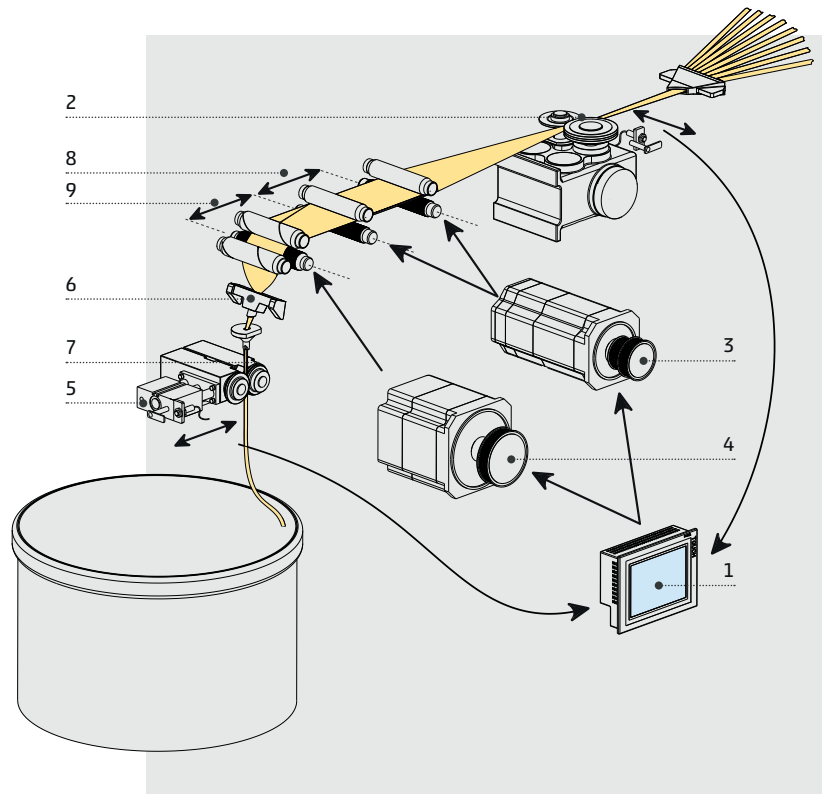


AUTOLEVELLER TECHNOLOGY - R

The sliver autoleveller works as an "open loop" control system (short term); the range of correction is more or less 25% of mass variation. The T&G scanning and the draft adjustment frequency is 3 ms thus ensuring a correction length within few mm at the maximum processing speed; the result is an excellent sliver evenness.

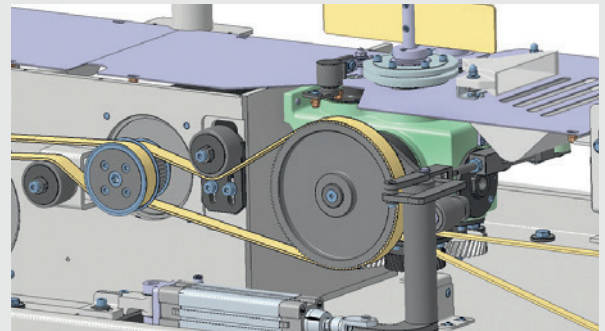
Technical description - Legend

- 1 PLC and Operator panel
- 2 "T&G" measuring unit
- 3 Servomotor
- 4 Main motor
- 5 Quality monitoring sensor
- 6 Web condenser
- 7 Output calender
- 8 Pre-draft (constant)
- 9 Main draft (variable)



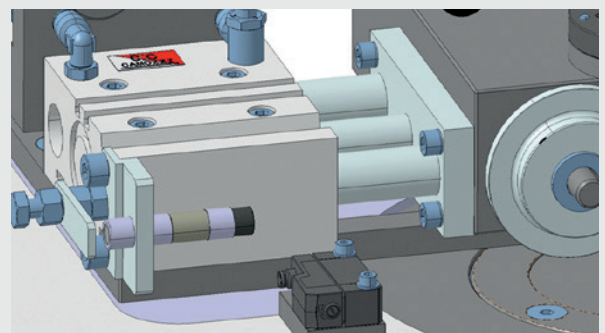
T&G SCANNING ROLLERS WITH LOW FRICTION

The tongue and groove measuring unit (T&G) has a great precision in scanning the mass of the feeding slivers. The on-board digital processor controls the real time difference between the nominal and the actual value, then elaborates a proper correction value to be sent to the dynamic servomotor.

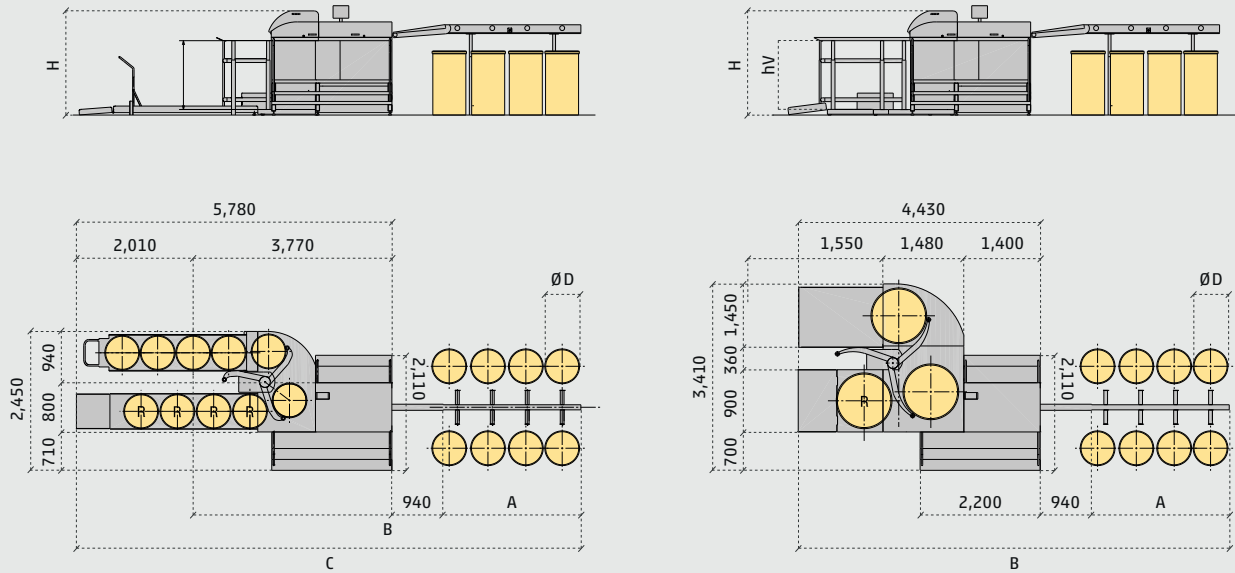


MARZOLI QUALITY MONITORING SYSTEM

The quality monitoring sensor, located at the delivery calender unit, accurately controls the mass of the delivered sliver (A% for sliver count deviation, CV% for mass sliver evenness and Cvt% for count variation coefficient). If real values exceed pre-set tolerance values, the Draw Frame immediately stops.



TECHNICAL DATA



DF1/DFR1	
Design	DF1 - without autoleveller DFR1 - with autoleveller
Delivery heads	One
Material	Cotton, man made fibers and blends with a staple length up to 80 mm
Delivery speed	Up to 1,000 m/min (production speed)
Feeding	Power Creel 6 or 8 fold doublings Double row (VAC)
Sliver count processed	Feed count 20 - 50 ktex (20 - 50 g/m) Delivery count 1.25 - 8.0 ktex (0.47 - 0.07 Ne)
Draft	4 to 10 fold
Drafting system	3 over 3, pneumatic loading + 1 guidance roller
Can sizes	Round cans with diameter 18" to 40" (457 to 1,016 mm)
Installed power	Main motor: 8.14 (DF1) 5.37 (DFR1) Autoleveller: 3.14 kW Driving can: 0.82 kW Can changer: 0.25 kW Suction system: 1.1 kW (Optional)
Compressed air	Minimum 6 bar - Consumption: 200 NL/h
Technological air	1,000 m ³ /h

DF1/DFR1 - Dimensions with delivery cans dia. 18"/20"/24"						DF1/DFR1 - Dimensions with delivery cans dia. 36"/40"				
Machine height		Machine length				Machine height		Machine length		
hV	H	n x D	A	B	C	hV	H	n x D	A	B
40"	1,725	6 x 24"	1,870	6,580	8,590	42"	1,725	6x24"	1,870	7,240
42"	1,725	8 x 24"	2,510	7,220	9,230			8x24"	2,510	7,880
45"	1,825	6 x 40"	2,590	7,300	9,310	45"	1,825	6x40"	2,590	7,960
48"	1,900	8 x 40"	3,590	8,300	10,310	48"	1,900	8x40"	3,590	8,960

B = length of the draw frame with one spare can | C = length of the draw frame with 4 spare cans



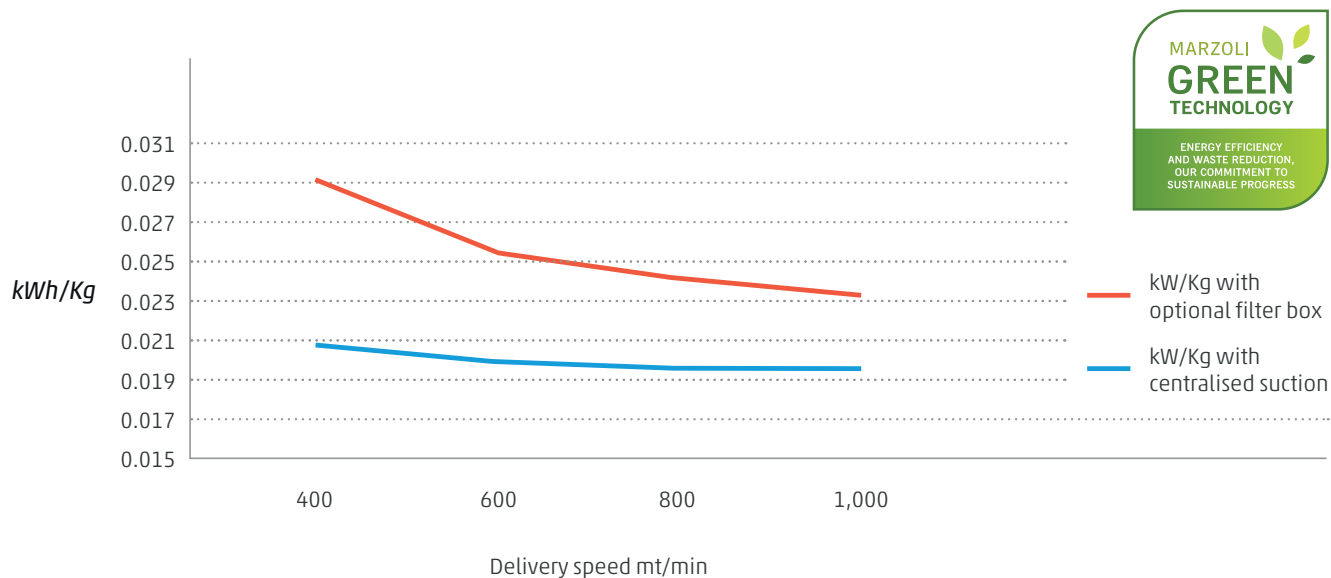
POWER CONSUMPTION: DRAW FRAMES DF1/DFR1

The equipment manufactured by Marzoli is conceived, designed, developed and built with the goal of offering affordable quality and excellent performance within the production process, so that the final product will have a competitive advantage that is created starting

with the earliest stages of production.

Marzoli cares about energy consumption saving and its R&D office aims at reducing the environmental impact of its products and lines.

DFR1 POWER CONSUMPTION



SOFTWARE PLATFORMS

END2END PRODUCTION MANAGEMENT PLATFORM: YARNET

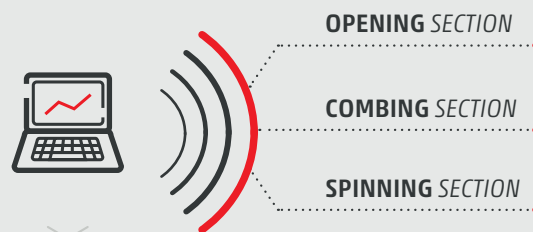
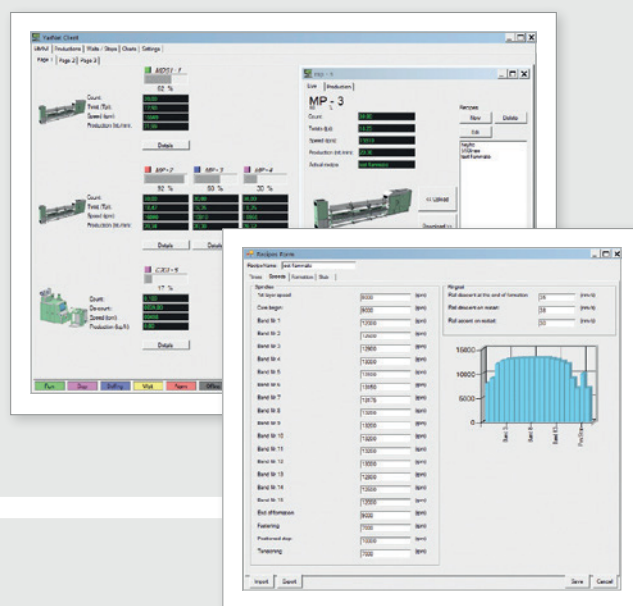
YarNet is Marzoli production management software. It enables the monitoring of production levels, efficiency rates and downtime for both individual machines and the entire spinning mill. Comparisons between machines on selected periods of time are made very simple so that improvement opportunities can be easily identified. YarNet enables the operator to edit production recipes, downloading and uploading them between any machine and their computer. He can also export them in Excel format to share with colleagues as necessary. YarNet gathers and analyses data about production and energy consumption, giving a visual representation of the tradeoffs (kW/kg).

MRM

MRM is Marzoli software to continuously monitor the operating conditions of textile machines. It can identify developing malfunctions before a fault occurs and highlight improvement opportunities on efficiency rates and energy consumption levels. Data about temperature, power consumption, speed and vibration are collected from PLCs (programmable logic controllers) and sensors installed on each machine. The software verifies the monitored parameters are within the nominal operating ranges; it can even adjust for room temperature variations to ensure continuous optimisation. If any parameter is out of tolerance, an automatic email alert is sent to the customer. The customer can also access the dedicated online portal to see information for predictive maintenance and of the overall efficiency of the plant. Through dedicated modules (Optimisation Tools) it is possible to optimise the performance of every machine, in particular on energy consumption and levels of efficiency. If required, Marzoli's customer service team can access the data to diagnose actual and developing problems and recommend appropriate actions.

KEY POINTS

- EASY & FAST CONTROL OF EVERY STAGE OF THE SPINNING PROCESS
- IMPROVED SPEED OF RESPONSE IN PRODUCTION OPERATIONS
- EASY MANAGEMENT OF PRODUCTION RECIPES
- SUPERIOR, EASIER AND FASTER MAINTENANCE



BENEFITS

- Higher productivity
- No machines unplanned downtimes
- Prevention from major machine failures
- Longer plant lifespan
- Higher efficiency
- Complete reliability
- Trouble free spinning experience
- Better maintenance planning



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