

COMPANY PROFILE



**FULLY AUTOMATED AND
DIGITALIZED SPINNING MILLS**



Marzoli

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



MARZOLI, 160 YEARS OF INCESSANT INNOVATION

The story of Marzoli is the story of the Italian textile machinery sector itself. Being established and growing within one of the most important textile districts in Europe, during its 160 years in business, Marzoli has accrued numerous partnerships with the most important fabric creators, which have allowed the company to develop unique skills for the fine-tuning of innovative solutions exported all over the world as a model of production efficiency, flexibility and quality. This has allowed Marzoli to become one of the leading manufacturers in Europe of complete lines for opening, preparing and spinning natural, synthetic and technical fibers.

The mission of Marzoli derives from this consolidated expertise: being a Solution Provider by leveraging technical and technological know-how that is unique in the world.

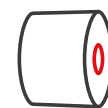
OVER
160 ■ YEARS
OF SUCCESSES

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
-

A PERFECT PARTNER FOR THE DEVELOPMENT OF DIGITAL SKILLS

The synergies with the Camozzi group, which merged with the company at the end of the 1990s, allowed Marzoli to exploit all the wealth of technical, methodological and R&D skills coming from its various integrated manufacturing entities.

The recent addition of a Digital division within the Group has also made access to digital skills and to the potential offered by Industry 4.0 possible.

For Marzoli, this has translated into full process digitization, accompanied by the development of a new concept of Textile Engineering.

Through the implementation of Textile Engineering, Marzoli is the first company in the industry to provide its customers with a new spinning model, called *Smart Spinning*.



HEADQUARTERS



30 SUBSIDIARIES AND SERVICE CENTRES



50 EXCLUSIVE DISTRIBUTORS



GROUP



CAMOZZI GROUP

DIVISIONS:


CAMOZZI AUTOMATION
division


CAMOZZI MACHINE TOOLS
division


CAMOZZI TEXTILE MACHINERY
division


CAMOZZI MANUFACTURING
division


CAMOZZI DIGITAL
division

PROCESS

Technology at the service of spinning: Textile Engineering



01

Study of the spinning plan



02

Testing center to test the production process



03

Plant design, logistics support & complementary services

To be a reliable partner for our customers. Follow them step by step with our expertise and ability. Offer them our know-how and targeted solutions based on specific needs. Propose the most suitable technology tools to manage their plants at maximum productivity, reaching a full process digitization.

These are the goals that Marzoli continually pursues by developing a careful Textile Engineering activity. The term Textile Engineering is understood by Marzoli as the set of software and hardware that, together with its technological know-how and skills, which

have always set the company apart, allow it to provide not only simple machines, but especially customized solutions based on the customer's specific need.

The peculiarity of Marzoli lies precisely in understanding such needs and translating them into a project accompanying the customer from the design of the spinning plan to the start-up of the machines, regardless of the type and brand of machinery used in the process.

This is the added value that Marzoli wants to convey to its customers through the implementation of Textile



04

Machines production



05

Installation, Start-up & Fine tuning



06

Consultancy on yarn sales

07

Worldwide after-sales service

Engineering: to be a competent partner responsible for the quality and productivity of the entire spinning process, providing the most appropriate technological solutions.

Studying an ad hoc solution means being aware of the process in all its facets, not only from a technological but also from a functional standpoint. In the project management cycle, this means knowing how to offer the necessary engineering support for the project. To this end, Marzoli provides support in the organization of logistics, in the choice of accessories, air conditioning

and everything that contributes to maximizing plant performance.

Furthermore, Marzoli can perform accurate tests in its testing center, in which to replicate the plant's characteristics to validate the process.

Last but not least, the company also provides an after-sales assistance service, thanks to a widespread servicing network throughout the world and remote assistance systems.

MARZOLI TEXTILE ENGINEERING

Technology for a smart spinning mill



The company's well-established know-how and membership in a business group with cutting-edge digital skills, have allowed Marzoli to be the first company in the world to develop and launch the only cloud-based platform for predictive maintenance in the spinning industry. This has allowed Marzoli to implement the concept of Smart Spinning, i.e. expert spinning that provides customers with solutions based on the potential of Industry 4.0 technology, thereby enabling the optimization of the entire spinning process.

Regardless of the type and brand of machinery, through the installation of its own software, *YarNet* and *MRM*, Marzoli allows the customer to make informed decisions based on the available data.

Decisions are in fact made on the basis of intelligible information coming from the data of the various devices and software installed inside the spinning machine. This information may, for example, concern the percentage of waste and its composition, productivity ratios, figures on the quality of raw material or finished product. All of this makes it possible to meet the customers' needs thoroughly and in a targeted manner, giving them the best tools to be more efficient, productive and flexible. In this way, Marzoli generates a true and concrete value for the customer, making available the latest-generation plants, control platforms and management systems with which spinning operations, which may include either Marzoli or third-party machinery, can be managed at maximum yield.

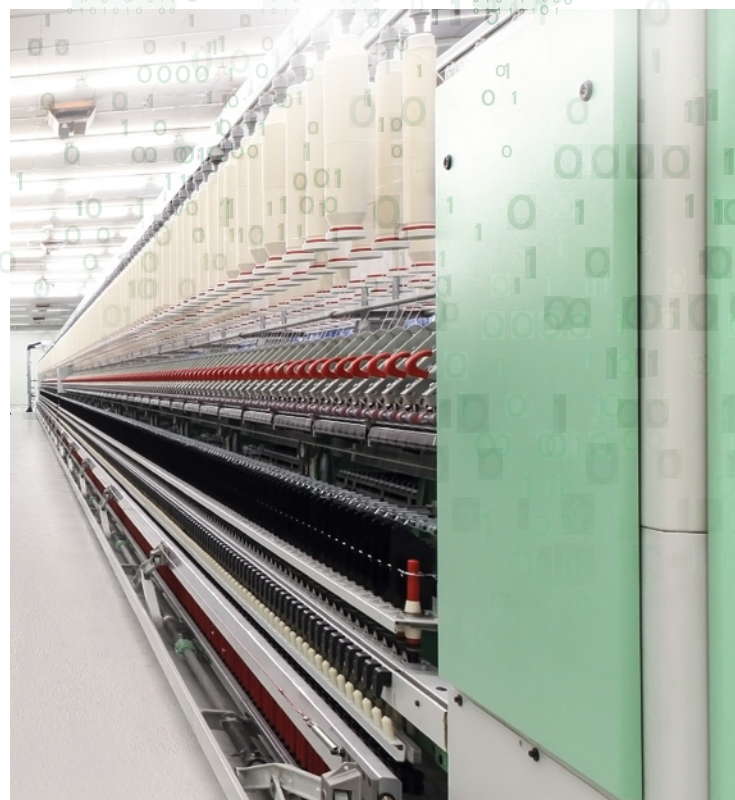
ARTIFICIAL INTELLIGENCE: BIG DATA TO SUPPORT BUSINESS DECISIONS

The advent of artificial intelligence, also in the target sector of Marzoli, has made it possible to add important new features to the management of spinning operations, pushing the envelope with *Smart Spinning* but at the same time concretely implementing its applications.

The artificial intelligence process, which enables the implementation of models capable of supporting customers in all their decision-making phases, is divided into 3 phases:

1. **IIoT** (Industrial Internet of Things): this first phase consists in the possibility of acquiring and accessing a huge amount of data. IIoT in fact allows the connection between a multitude of devices capable of communicating with each other thereby collecting and analyzing the data contained in them.
2. **Data processing**: in this phase, the data and information collected are processed to be given an intelligible form, being transformed into elements such as KPIs, tables and graphs, which are useful during the decision-making phases.
3. **Data modeling**: this last phase is an extremely important step for Marzoli. In fact, while most software manufacturers stop at the previous stage, Marzoli, as a full line manufacturer, has the know-how necessary to access this last step; more precisely it is able to create software to define the benchmarking models for the machine's performance. These performance models, are continuously populated by the data coming from the devices and provide value in the form of information.

IIoT Data processing Data modeling



The great advantage of artificial intelligence consists precisely in this: to generate added value through big data. This added value, within Marzoli, takes the form of the ability to constantly monitor machine performance through the models defined in the third phase to ensure the optimization of critical parameters. The full digitization provided by artificial intelligence allows customers to make intelligent and informed business decisions based on constantly updated data and information.

OPTIMIZED SECTION

Three sections capable of improving and optimizing production processes

■ HIGH-PRECISION OPENING AND CARDING SYSTEM

Opening, cleaning, blending and carding: Marzoli provides cutting-edge technical solutions for the processing of any types of fiber - natural, synthetic and artificial, technical or blended - and for every type of woven or non-woven application. The Marzoli opening and carding section is characterized by innovative mechanical solutions that reduce stress on fibers, thanks to a progressive opening action, and provide a better blending, cleaning and carding.



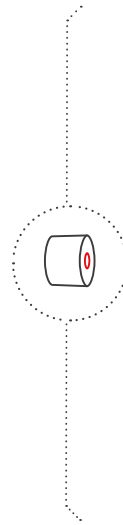
Opening



Card

■ AUTOMATED COMBING

The quality and productivity of the combing section are ensured by the fully automated lap transport and lap piecing systems. The control electronics assembled on the machine and the related production management software enable a constant production flow throughout the section and, at the same time, maximum flexibility and availability of production as operating conditions change. All of this is in addition to the incredible quality performance of the Marzoli combing unit: excellent fiber selection, reduction in the number of neps and short fibers, extreme evenness of the sliver, minimum percentage of waste.



Draw frame



Lap winder



Comber

■ INTEGRATED SPINNING TECHNOLOGY

The spinning section is configured as a full line of machines: roving frame, bobbin transport system and spinning frame. Like the other two production sections - carding and combing - the Marzoli spinning unit uses the same integrated electronic control technology, thanks to which the three plant machines can be managed in a synchronized and flexible way. This allows to maximize the unit's performance thanks to the optimization of the machine speed, minimization of energy consumption, reduction of roving and yarn breakages and an effective predictive maintenance activity.



Roving frame



Spinning frame

APPLICATIONS FOR SMART SPINNING

To complement the three sections illustrated above, Industry 4.0 today can offer a range of utilities capable of improving spinning performance and results.

YARNET

Expert, smart production management is guaranteed by the software platform *YarNet*, developed by Marzoli, which can provide the operator with all the tools necessary to control each machine individually and the entire plant. *YarNet* also makes it possible to easily find the most efficient production solutions based on the trade-off analysis between production and energy consumption, setting optimized production

In particular, the two main software platforms developed by Marzoli, *YarNet* and *MRM*, have made the development of Textile Engineering possible.

recipes for each individual machine, as well as collecting and analyzing all the information arising from the various devices, to carry out fine-tuning and/or diagnostic operations.



MRM

Greater productivity and efficiency, as well as an extension of the machine's and its components' useful life are possible thanks to the predictive maintenance and remote assistance provided by Marzoli. For the customer, this translates into a reduction in machine downtime, prevention of operating anomalies and performance maintained at an optimal level. By using specific hardware, sensors installed in critical parts of the machines, predictive algorithms developed during the research phase

and the most recent paradigms and technologies (IoT, data warehouse, big data, cloud computing, machine learning, M2M, M2H), based on an important partnership with Microsoft, one can analyze the operating conditions of the machines and monitor critical parameters.



In addition to *YarNet* and *MRM*, there are also specially designed applications that allow optimization at the individual machine level and which, being integrated with the two main software programs, contribute to the entire system's greater efficiency.

An example of this is Trash Analyzer, a tool introduced recently that analyzes the waste from blowroom machines and from carding, and gives a performance index of the overall efficiency in removing the waste of the machine to which it is applied.

For a Smart Spinning, all systems capable of providing fully automated actions that previously could only be carried out manually, play a key role thereby ensuring greater efficiency and quality. The lap transport system, from the lap winder to the comber, is a tool that perfectly summarizes this concept. In fact, in addition to allowing savings in terms of costs, the main advantage offered by it is precisely the guarantee of a higher quality of finished products by eliminating any type of damage resulting from the operator's product manipulation.

PRODUCTS

Advantages of a full line

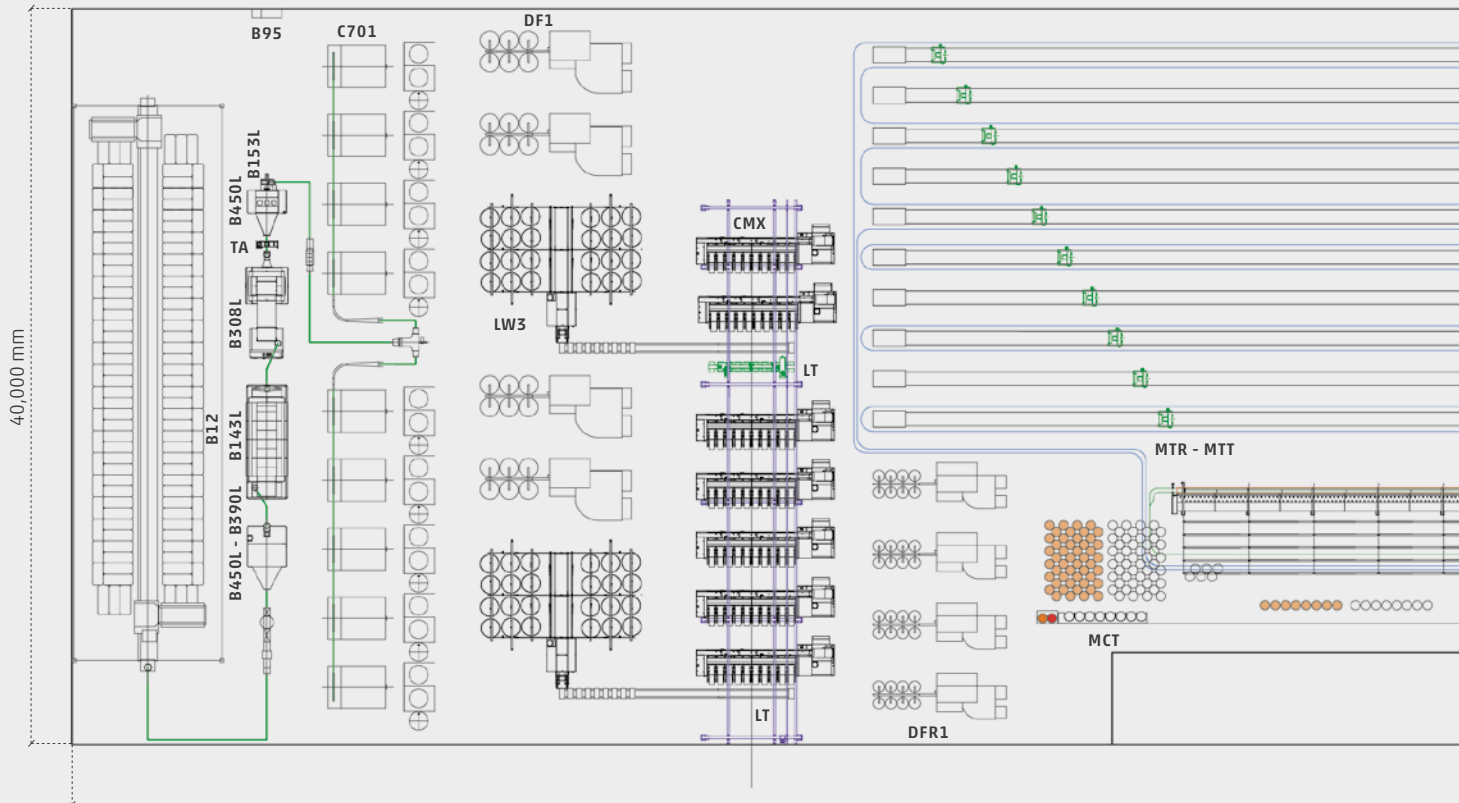
Relying on Marzoli for the construction of a full system means taking advantage of several benefits, starting from the possibility of only having one point of contact for project design and outline of the spinning plan and, consequently, for the choice of machines to have a perfectly balanced production plant in every section.

This, in addition to translating into greater ease in the management of machines, thanks to electronics and data setting methods, guarantees the customer

only one partner responsible for the plant's quality and productivity.

Thanks to YarNet, the software platform created by Marzoli, it is also possible to have only one data collection system on all plant machines for the immediate control of productivity and easy identification of critical machines or machines with below-average efficiency.

Layout of the new 24,000 spindles module made by Marzoli

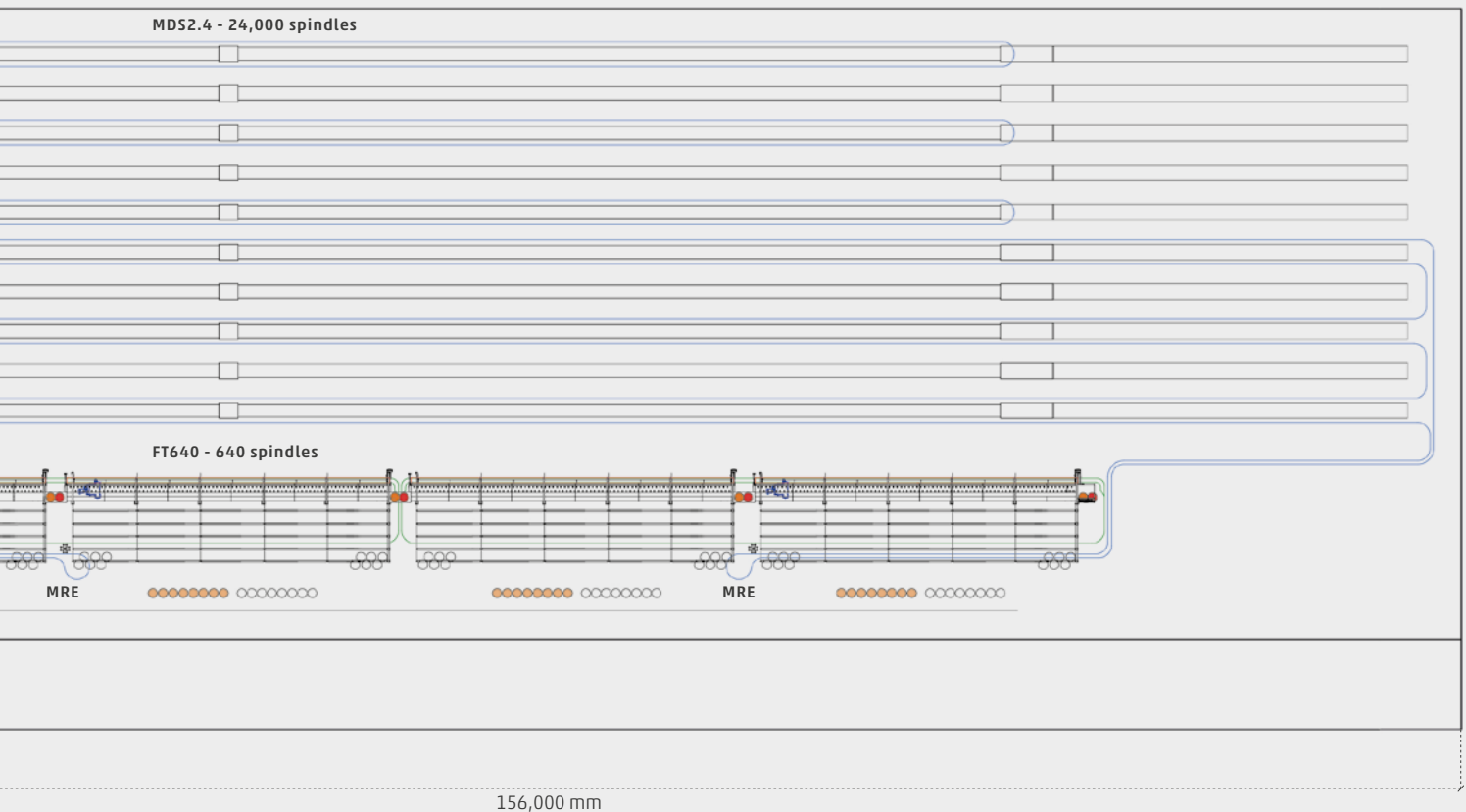


Moreover, from a business standpoint, making use of a single partner allows one to reduce the volumes of minimum stock of spare parts and offers opportunities for greater discounts on purchases. Last but not least, this allows Marzoli to provide its customers with a more efficient and accurate assistance service.

NEW MARZOLI MODULE

Benefits of the new Marzoli module with 24,000 spindles compared to a standard layout with long machines, spinning frames with 1,824 spindles and roving frames with 224 spindles, are:

- Investment cost: saving on land, building and lighting
- Operating cost: 4% saving on conditioning; up to 9% cost saving on internal logistic and reduced unskilled labor



PRODUCTION AND PROCESSES

The drivers of Marzoli



TQM

Constant quality control from the design phase to the start-up phase, to better meet customer expectations.

LEAN PRODUCTION

Organization and management of processes and activities to ensure maximum efficiency and waste reduction

DEDICATION & COMMITMENT

Perfect fusion between competence and technology, know-how and experimenting, for a continuous results-oriented approach and attention to detail

LONG-STANDING COMPETENCE

Broad, long-standing experience and know-how for the design of customized solutions



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USA

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TEXTILE SRL
Italy

MARZOLI INDIA
MTMM PVT. LTD.
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