



© Ferrari Costruzioni Meccaniche

**Opening photo:** Ferrari Costruzioni Meccaniche was established by Luigi Ferrari as a repairer of agricultural machinery in Guidizzolo (Mantua, Italy), in 1961. The company is now managed by his sons Francesco and Dario and it has specialised in the production of transplanting machines.



**FOCUS ON TECHNOLOGY**

SPECIAL ON ACE & OFF ROAD VEHICLES



# Ferrari Costruzioni Meccaniche: A New Tunnel Shot Blasting System for Highly Customisable Agricultural Machinery

Barbara Pennati **ipcm**<sup>®</sup>

In our modern globalised world, we are used to having any product at our disposal at any time. This is especially true for food: supermarkets always offer a huge selection of products, vegetables, and fruits from all over the world. Although awareness and interest in this subject are exponentially increasing, we are often too busy to stop and wonder how this is

possible and what process lies behind the salad head that we effortlessly put in our shopping cart. If talking about agriculture, we are more likely to initially recall concepts learned from our history and geography books rather than thinking of it as an integral part of the industrialised societies of the first world. And yet, however far apart from the everyday life of most people,

agriculture has always been the basis of our livelihood and, precisely for this reason, it has evolved hand in hand with man and his habits – not just in terms of crops, which now do not know borders, but also of technology. Ferrari Costruzioni Meccaniche has been one of the players of this evolution since 1961. Established as a repairer

of agricultural machinery in Guidizzolo (Mantua, Italy) by Luigi Ferrari, the company is now managed by his sons Francesco, and Dario and it has specialised in the production of transplanting machines (ref. Opening photo). "Ferrari Costruzioni Meccaniche is located in one of the most important agricultural areas of Italy: 40% of lettuce is produced in Guidizzolo," explains technical director and partner Dario Ferrari (Fig. 1). "The company has followed the metamorphoses of the agricultural sector, adapting its machinery to the needs arising over the years."

With the advent of new agronomic needs and the development of new technologies, the quality level required for agricultural machinery has increased. That is why, in order to offer robust and durable products to its customers, Ferrari Costruzioni Meccaniche has made some changes to its coating plant. One of them involved the mechanical pre-treatment phase, now performed with a tunnel shot blasting machine supplied by OMSG-Officine Meccaniche San Giorgio SpA (Villa Cortese, Milan), a well-established company that has specialised in the design and production of shot blasting, sand blasting, and shot peening systems for over fifty-five years.

**A global presence for every production requirement**

"Over the years, agricultural production has undergone many changes that have made it necessary to adapt the machinery to ever-new needs. For example, for what concerns sowing, the transplantation

technology, which is our core business, makes sure that plants grow before weeds; however, despite the agronomic advantages, there was initially no machine to automate this process, which had to be performed manually," says Dario Ferrari. "The systems developed and produced by Ferrari Costruzioni Meccaniche can handle the semi-automatic and automatic transplantation of plants placed in seed boxes (Fig. 2) or on sods. These two

methods are selected depending on the type of plant: the sod system is more expensive, but it brings significant benefits with short cycle crops, such as salads, whereas seeding boxes are more suitable for longer cycle crops, such as tomatoes, which take three to four months."

With the advent of organic agriculture in 1995-96 and its success on world markets, a new need arose: the reduction of chemical impact. Therefore, Ferrari Costruzioni Meccaniche started offering a transplanting-

mulching machine able to lay a polyethylene or biodegradable film, fix it to the ground, and transplant the plants (Fig. 3). By covering the soil adjacent to the plant, this film prevents the growth of weeds without the use of chemicals. An electronic weeder was also developed: through a viewer, it carries out a mechanical weeding operation at a speed of 4 km/h and without damaging the plant – a job that would require ten people to perform. "In 1985, the agricultural machinery repairing business established by

our father started to convert into a manufacturing company. We have developed different types of machines, but we have specialised in transplanting machines for different crops, especially tomato, brassicaceae, and salads, but also coffee, sugar cane, tobacco, and pineapple," says Dario Ferrari. "By attending various trade fairs, we have managed to open up to the global market and we now have customers in fifty countries around the world, including USA, Latin America, Canada, South Africa, and China."



**Figure 1: Technical director Dario Ferrari manages the company established by his father Luigi together with his brother Francesco.**

**“Ferrari Costruzioni Meccaniche covers three buildings on a 15,000 m<sup>2</sup> area and it has 102 employees, who manage the entire production process in-house. The production flow starts in the technical office, which designs the machines according to customer specifications. Once the work order has been generated, the various production departments are activated: turning (with 6 turning centres and 2 machining centres), laser cutting, welding (with both robotised and manual welding stations), coating, and assembly (where different specialised teams operate depending on the machine type).”**





© Ferrari Costruzioni Meccaniche



**Figure 2:** An automatic transplanting machine developed for vegetable plants placed in seed boxes.



**Figure 3:** With the advent of organic agriculture, Ferrari Costruzioni Meccaniche has added to its range a transplanting machine able to lay a polyethylene or biodegradable film that prevents the growth of weeds without the use of chemicals.

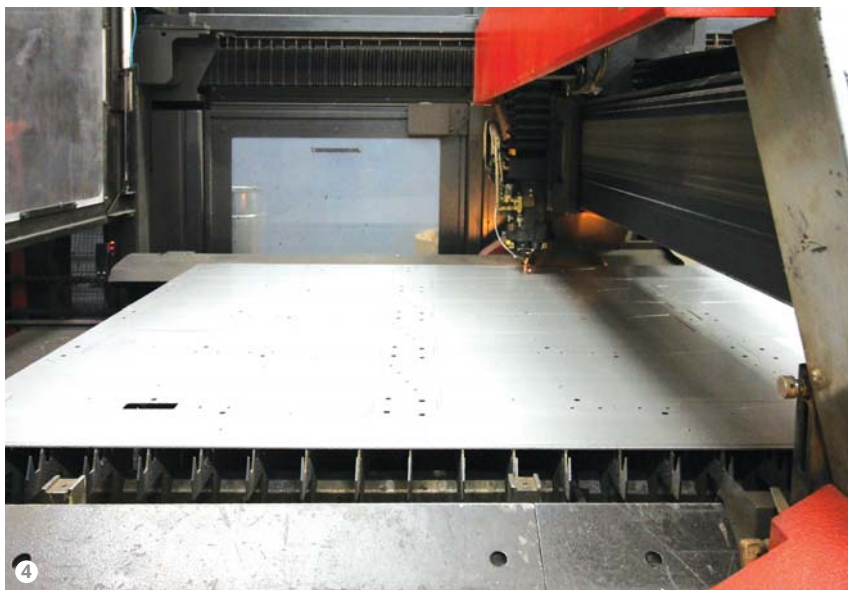
### Productive flexibility in the name of quality

Ferrari Costruzioni Meccaniche covers three buildings on a 15,000 m<sup>2</sup> area and it has 102 employees, who manage the entire production process in-house. "The production flow starts in our technical office, which designs the machines according to customer specifications. Once the work order has been generated, the various production departments are activated (**Figs. 4 and 5**): turning (with 6 turning centres and 2 machining centres), laser cutting, welding (with both robotised and manual welding

stations), coating, and assembly (where different specialised teams operate depending on the machine type)," explains Dario Ferrari. "The process is automated, but not intensively, as our key to success is a high customisation level that requires significant artisanal skills. We produce about 1,000 machines a year, belonging to different price ranges and very different from each other. This is precisely due to the high level of customisation that we make available to our customers, which have the opportunity to build a system that is truly tailored to their needs."

The will to offer tailor-made solutions calls for extreme production flexibility. This has led Ferrari Costruzioni Meccaniche to insource most processes, including coating, to which it has devoted an entire building. "The components we buy are already coated. On the other hand, all products coming out of our turning department can be subjected, depending on the type of workpiece, to a galvanic treatment, carried out by a contractor, or to a liquid or powder coating process, performed with the system we have installed at our premises," says Dario Ferrari.

© ipcm \*



4



5

**Figures 4 and 5:** Ferrari Costruzioni Meccaniche manages its entire production process in-house. Its production departments include turning, laser cutting, welding, coating, and assembly.



“The hydraulic motor cylinders are liquid painted in an offline manual booth, which requires a chemical pre-treatment process; the carpentry parts are powder coated in an inline system, which requires a mechanical pre-treatment operation.”

The in-line coating plant, equipped with a one-rail conveyor, dates back to 1998, the year in which the painting process was insourced. Its booth and polymerisation oven have been revamped over the years. Originally, also this plant performed chemical pre-treatment (phospho-pickling, degreasing, rinsing with mains water, and rinsing with demineralised water). However, this did not guarantee the requested quality, resistance, and consistency performance levels. “Our powder coating line treats different types of parts and materials, including white and black sheet metal and tubes. We constantly had significant yield problems in terms of both quality and corrosion resistance. In short, the previously



Figure 6: The TUNNELBLAST 1525/12 tunnel shot blasting system installed in December 2017 by OMSG (Villa Cortese, Milan).

## The paint performs even under high pressure.

Surface coating expertise on many levels – that’s where Rippert has been making a name for itself for over five decades.

We conceived surface coating plants for PILATUS for the finishing individual components and complete aircraft. We are delighted to accompany a successful company with our ideas and technologies. We make brands shine.

Find out more at [www.rippert.de](http://www.rippert.de)

 RIPPERT







LONDON, UK  
SOUTHBANK  
BELVEDERE

*Well done*



## PERFECT SINERGY

- » ITALIAN FACADE CONSTRUCTION
- » AUSTRIAN SURFACE SOLUTIONS
- » ANODIZED EFFECT POWDER COATINGS



[www.tiger-coatings.com](http://www.tiger-coatings.com)



**Figures 7 and 8:**  
In order to perform a continuous flow process, the tunnel shot blasting system has no closing doors, but it is equipped with vestibules featuring rubber curtains at both the entrance and exit: this reduces the spillage of media and dust from the shot blasting chamber.



used pre-treatment cycle guaranteed neither high salt spray resistance values nor result repeatability, which fluctuated depending on the material treated," says Dario Ferrari. "In order to solve these problems, we would have had to carry out a major tunnel updating and completely reformulate the active baths' chemicals. That is why we decided to look for a different solution: a technology that could be installed inline and that was able to treat both small and large workpieces without affecting logistics and ensuring a high quality level in terms of both aesthetics and corrosion resistance. We thus came into contact with OMSG, which took us to the factory of one of their customers, a manufacturer of corn heads, to enable us to see its technology applied to a machine in our industry, and then developed the best suited plant for our needs." The machine installed in December 2017 at the premises of Ferrari Costruzioni Meccaniche is a TUNNELBLAST 1525/12 tunnel shot blasting system (Fig. 6), able to treat workpieces up to 1500 mm in width and 2500 mm in height and equipped with 12 OMSG-patented single-disc turbines, each with a 7,5 Kw power, to guarantee an SA 2½ finishing degree. "The parts to be treated move continuously at a speed of 0.5 metres per minute. This limited speed allows us to obtain the required



quality level without using larger media, which could damage the workpieces with their intense action,” explains Ferrari.

“One of the requirements of Ferrari Costruzioni Meccaniche was that the shot blasting system could perfectly integrate into the coating plant and work inline and with a continuous flow. We opted for a tunnel shot blasting machine, not hermetic but with vestibules featuring rubber curtains at both the entrance and exit: this reduces the spillage of media and dust from the shot blasting chamber (Figs. 7 and 8),” states Giorgio Pozzi from the technical sales department of OMSG. “The rotation speed of the turbines is adjustable through an inverter. Special valves dose the abrasive, which is then recovered and reconditioned: through a blowing nozzle, the media left on the component are removed by the operator and collected in hoppers placed in the exit area (Fig. 9).”

“As well as consistency and salt spray resistance, another problem that we solved thanks to this machine is related to the coating quality of laser cut workpieces,” says Ferrari. “Indeed, laser cutting creates a sharp edge that often causes a ‘tear’ in the paint. In the past, we rounded these edges with a brushing machine combined with an abrasive; now, thanks to our shot blasting plant, this is not necessary anymore.”

After pre-treatment (chemical in the case of engine cylinders, mechanical for carpentry components), the workpieces reach the coating process. “The carpentry parts are coated in the inline plant, equipped with a booth featuring 4 reciprocators and 2 guns for manual retouching, supplied by Wagner (Fig. 10). A one-layer system is applied



**Figure 9: The abrasive can be recovered and reconditioned: through a blowing nozzle, the media left on the component are removed by the operator and collected in hoppers placed in the exit area.**

that employs Sherwin-Williams polyester powders, which are then recovered during spraying through cartridge filters. The subsequent polymerisation phase takes place at 200 °C for 20 minutes (Fig. 11),” says Dario Ferraro. “On the other hand, for the liquid coating of our engine cylinders, we use an offline manual booth applying water-based two-component paints, also provided by Sherwin-Williams. The colours used are those typical of the Ferrari Costruzioni Meccaniche brand, i.e. RAL 2002 red and blue.”

WHEN IT  
HAS TO BE  
PERFECT



HIGH PERFORMANCE  
POWDER COATINGS







**Figure 10: The powder coating booth is equipped with 4 reciprocators and 2 guns for manual retouching, supplied by Wagner; it applies Sherwin-Williams polyester powders.**

### A historical business keeping up with the times

"Ferrari Costruzioni Agricole has operated in the agricultural sector for over fifty years. With time, we have witnessed and taken part in the succession of different trends and technologies, always trying to establish ourselves on the national and international markets as a solid and reliable company," states Dario Ferrari. "Therefore, it was extremely important to find the right technological partner to obtain increasingly optimal results in line with market needs." "With the adoption of this machine, we have solved the problems related to consistency and salt spray resistance, managing to guarantee much higher quality and corrosion resistance levels (Fig. 12). We are very pleased of this system, of the results achieved, and of OMSG's professionalism and technical efficiency," says Ferrari. "The OMSG Group (OMSG + Carlo Banfi), has always committed to offer constant and efficient after-sales assistance.

**“The OMSG Group (OMSG + Carlo Banfi), has always committed to offer constant and efficient after-sales assistance. Its customers are categorised according to the machines they have installed, and this allows OMSG to intervene promptly and effectively even in the most remote locations. Moreover, the machines are Industry 4.0-oriented and always provided with a package of devices and services for the management of the process (and of any problems), such as a PLC, an integrated touchscreen, remote assistance, and safety devices.”**



**Figure 11: Workpieces entering the polymerisation oven.**

Our customers are categorised according to the machines they have installed, and this allows us to intervene promptly and effectively even in the most remote locations," explains Giorgio Pozzi.

"Moreover, our machines are Industry 4.0-oriented and always provided with a package of devices and services for the management of the process (and of any problems), such as a PLC, an integrated touchscreen, remote assistance, and safety devices."

"The plant has now reached optimal conditions, and we can now focus on future improvements. To obtain an even higher salt spray resistance value, we are considering the implementation of a primer application phase. In this way, we will be able to offer our customers increasingly advanced and competitive services and products, in terms of both technology and quality," says Dario Ferrari. ●



**Figure 12: A finished product of Ferrari Costruzioni Meccaniche.**