



# Seppi: a Pioneer in Mechanised Agricultural Mulching, a Pioneer in Environmentally Friendly Coating

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Efficiency and streamlining of production facilities and their energy consumption have been among the hottest topics in the last few years. SEPPI M. (Mezzolombardo, Trento, Italy), a leading company in the production of agricultural mulchers, has recently collaborated with Savim Europe (Arbizzano, Verona, Italy) and a group of industrial partners including CMA Automation, Wagner, and Sherwin-Williams to build a coating plant that would be the heart of the company itself, fuelled with biomass to increase efficiency and reduce environmental impact.

SEPPI M. is among the leaders in the production of agricultural mulchers.



he 2020 pandemic and the geopolitical events that followed it led to a shortage of gas throughout Europe and an excessive rise in the cost of this raw material. These factors have been weighing on the budgets of many companies, especially those with high energy

consumption rates, for example in the coating sector, notoriously one of the most energy-intensive processes in the industry.

This increase in energy costs went hand in hand with a spike in demand, which exploded in markets around the world after the pandemic. Companies therefore found themselves facing excellent market and growth prospects with the handicap of energy costs.

That is why SEPPI M., a leader in the mulching sector, worked with Savim Europe, a company specialising in the design and construction of liquid and powder coating plants and booths, to turn its newly installed coating line's power supply system into a hybrid one, using both methane gas and hot water produced by a biomass boiler to heat the plant. This modification project was ambitious and unexpected. After a design process that had lasted several years, Savim had actually just completed the installation at SEPPI of an automatic coating system with a two-rail conveyor designed and supplied by CM Automazione as well as three static oven-booths for treating large parts, on the occasion of SEPPI's relocation to a new plant in Mezzolombardo (Trento, Italy) specially built around the new coating plant itself as the heart of the production activities.

Savim's design and technical capabilities, however, made it possible to carry out the necessary modifications to the line and booths in just a few months, so that they could also be powered with hot water: SEPPI's coating line has thus been running on energy produced from wood chips since April.

# SEPPI M.: from the post-war period to the present day through three generations

Founded in 1939 by Max Seppi, the company is among the leaders in its field worldwide.

A pioneer in mulching technology, SEPPI M. has been specialising in the production of mulchers for professional agriculture, public green maintenance, and forestry for forty-five years now. Flail mulchers, rotary mowers, solutions for orchards and vineyards, mulchers with large working widths for use in open fields and large areas such as airports and parks, forestry mulchers for tractors, excavators, or forestry equipment carriers, stone crushers, and soil tillers are just some of the 70 products included in SEPPI's range.

"My grandfather Max set up his own business on the eve of World War II, after the company he worked for closed due to the conflict," recounts Lorenz Seppi, the current president of SEPPI M. "His company was immediately successful because it produced everything the country needed in the post-war period: items for agriculture and waterworks, bandsaws, and other tools. SEPPI's portfolio as we know it today was introduced in the early 1970s: we were among the first companies in the world to specialise in mulchers and today we are one of the leaders in our field."

#### A vertically integrated production process

"The Mezzolombardo factory is brand new: we entered it at the end of 2021. Previously, we were headquartered in Caldaro, in the province of Bolzano (Italy), but that space had become too tight, especially for our coating operations, which are the true heart of our production process," explains Lorenz Seppi. "We invested around 20 million Euros to better



The brand-new headquarters of SEPPI M. in Mezzolombardo, Trento, Italy.



A mulcher by SEPPI M. mounted on a tractor.



Overview of the plant installed by Savim Europe.

organise our production flow, which is fully integrated: we start by subjecting sheet metal to laser cutting, bending, turning, welding, and partial assembly before coating. This is one of the reasons why we have never considered powder coating: we paint pre-assembled machines with bearings, seals, and heat-sensitive components that would not withstand the curing temperature of powders. After coating, the systems are fully assembled, tested, and shipped. All our products are developed and industrialised in-house, with such a vertically integrated production process."

#### Coating at the core of SEPPI M.'s activity

"Coating had been a headache," notes Lorenz Seppi, "since I started working at the company in 2006, as the province of Bolzano had already banned the use of solvent-based paints. This is why we were among the first to switch to water-soluble paints. However, initially, quality was poor and we received numerous complaints from customers as the colour faded or flaked off. Although some might think otherwise because agricultural machinery operates in the fields and thus gets ruined very quickly, finishes are actually a very important part of these products' quality, since they are the first thing that customers see when buying them. Every machine must be aesthetically pleasing and the quality of its colour must be preserved.

"That is the reason why coating is one of the production steps that has been the subject of constant development at SEPPI more than any other. First, we defined the layout of the new coating plant with Savim, and then we built the factory around it: the paint shop is the only department that, once located, can no longer be moved, so we adapted the entire company to it," says Lorenz Seppi. "The plant's development process lasted three years, during which Savim fully supported us with design studies, estimates, and modifications. In fact, our first contact with Savim goes back more than ten years: we can say they have earned it! The process we have developed together guarantees a very high coating quality in terms of both adhesion and colour. In addition to Savim, we also relied on the expertise of Sherwin-Williams for the supply of water-based paints, Wagner for the application system with electrostatic technology, and the supplier of pre-treatment products. We witnessed great team effort among the various suppliers, which our engineering department synchronised to have a plant, process, and application system fully tailored to our products."

#### **Main features of the line**

SEPPI's paint shop consists of two operating units, both featuring equipment from Savim, which acted as the general contractor: an automatic line with a two-rail conveyor from CM Automazione with a capacity of up to 2000 kg, which can coat parts with a maximum cross-sectional dimension of 1.5x1.5 m and a maximum length of 3.2 m; 2 static oven-booths for finishing oversized parts, each of which can coat parts up to 6 metres long, served by a cleaning booth with a manual nozzle and using a pickling product.

The pre-treatment phase performed by the automatic line includes 3

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stages, i.e. pickling and 2 rinses with mains water. After drying, the parts enter the booth for manual application of the epoxy primer, followed by a 40-minute flash-off in the oven. The workpieces then enter the water-based top coat application booth and finish the cycle in the drying oven at 70 °C. When designing the conveyor, CM Automazione was faced with a plant engineering challenge due to the limited space available and the characteristics (size and weight) of the products to be processed. The choice fell on the robust, flexible, and reliable XD45/59 PF Power&Free. The line develops for approximately 120 metres and the chain moves with a continuous motion at 7 m/1'.

The loading/unloading area is served by a counterweighted elevator/ lowerator for safe part handling. Stop stations located along the line allow for the stationing of the load bars during the coating cycle. The pickling and double rinsing stations are served by tilting systems to ensure optimal pre-treatment. In order to guarantee the correct stationary times, the flash-off and final cooling areas have 2 storage buffers with a sideshift system, again highly compact to optimise the available space.

SEPPI applies Sherwin-Williams two-component water-based paints, namely epoxy primers and polyurethane top coats, fed from a paint



The entrance to the pretreatment tunnel.

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management unit set up by Wagner Spa, which is equipped to feed all 4 booths, i.e. the 2 automatic and the 2 static ones, through a high-pressure circulation system for the following products:

- 1 two-component water-soluble epoxy primer- 1 hardener for the water-soluble epoxy primer
- 2 standard two-component water-soluble polyurethane top coats
- 2 wild-card two-component water-soluble polyurethane top coats
- 2 hardeners for the two-component water-soluble polyurethane top coats
- 2 cleaning mixes for the paint and the hardener.
- Each feeding unit is composed as follows:
- 3 Wagner Leopard 35-70 pumps for the primer and the standard top coats, with a by-pass system between 2 PGR 200 elevators for 200-litre drums equipped with an electric agitator (while one PGR 200 is feeding paint, the other is in preparation)
- 2 Wagner Leopard 35-70 pumps for the wild-card top coats
- 2 Wagner Leopard 35-70 pumps for the hardener featuring an airtight tank and a by-pass system between 2 PGR 200 elevators for 200-litre drums- 1 Wagner Leopard 35-70 pump for the hardener cleaning mix
- 1 Wagner Leopard 35-150 pump for the paint cleaning mix. All these pumps feed 4 Wagner Intellimix Touch 2k devices positioned in the respective booths of the automatic and manual systems. Each Intellimix Touch device, in turn, feeds an AirCoat GM 4700 manual gun for medium-pressure coating. The Intellimix Touch devices also control 4 Gun Flash Boxes to manage the cleaning and colour change operations on the individual guns.

This whole line was built according to the interconnection parameters of Industry 4.0. It is also prearranged for the future use of articulated robots in the automated system.

#### From top:

# The interior of one of the two manual liquid paint application booths supplied by Savim.

The loading area of the automatic painting line designed by Savim with a power&free conveyor supplied by CM Automazione, it is equipped with a counterweighted elevator/lowerator for safe part handling.

A buffer on the power&free conveyor.

"With the two main colours we apply, i.e. black and red, we can quickly switch from one tint to the other using the same pumps," comments Lorenz Seppi. "With Savim, we chose a Power&Free conveyor to make the individual workstations more independent, although we do not take full advantage of its full potential since we have little storage buffer spaces among the working areas, due to the compactness of the line. Savim did an excellent job on design, construction, and installation and I am also very pleased with the choice of CM Automazione as the conveyor supplier. Savim fully grasped the characteristics of our ideal plant in terms of both size and process, it ensured continuous technical support and advice, and above all it showed that it cared a lot about the project, also considering that our decision-making phase lasted almost ten years! Finally, even



The primer application booth with one of the four Wagner Intellimix Touch 2k devices.

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The topcoat application booth; The paint kitchen equipped by Wagner Spa; Lorenz Seppi.

when we asked for a modification to the plant's power supply system only a few months after start-up, Savim accepted the challenge."

#### From methane gas to biomass

As mentioned at the beginning of this article, SEPPI installed this new coating line in one of the blackest periods for energy supply and its related costs. The plant, which started up in April 2022, has an installed capacity of 2 MW of methane gas: SEPPI's immediate concern was its ability to sustain such rising costs for a long time. Last summer, therefore, SEPPI's owners requested a major plant modification from Savim to power the plant with hot water produced by a biomass boiler (wood chips) instead of methane gas. As a result, the company reduced energy costs and the environmental impact of its coating process in general. "Savim did a very good job in a very short time," states Lorenz Seppi. "We now have a hybrid power supply system: if one day the biomass boiler were to go out of use for maintenance or for any other reason,

we could switch to natural gas without having to stop the coating plant. It was another big investment, but its ROI is quick because the cost of biomass is about 35% of that of gas for the same heat output (based on an annual average). The thermal-hydraulic project was done by Savim in autumn 2022 and its implementation started in December 2022. By the end of last cold season, the system was up and running: this year, we will be able to quantify the savings achieved."

#### A high degree of satisfaction

"I am very satisfied with our investment," concludes Lorenz Seppi. "The system is working well and we have achieved a very good colour and finishing quality degree, as also confirmed by our customers. Productivity has not reached the optimum level we had set, yet, but this is due to many different factors including the organisation of work and people and the procurement of materials. I am sure that for any further plant engineering project, Savim will be at our side."



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2023 14<sup>th</sup> Year - Bimonthly N° 84 - **NOVEMBER/DECEMBER** 

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