



Halved Colour Change Times and Tenfold-Reduced Powder Disposal Volumes: Nord Laser's Experience

Alessia Venturi **ipcm**[®]

An excellent partner in managing complexity.

This is how Nord Laser Srl (Reana del Rojale, Udine, Italy), a metalwork company specialising in the processing of pickled and galvanised sheet metal for a variety of industrial sectors, defines itself. After a years-long process of vertical integration of production, it can now offer a complete contracting service for advanced industrial metalwork machining, assembly, and coating. The investment it made in a new-generation Wagner powder centre in 2022 has increased its coating efficiency tenfold, with colour change operations being performed without manual intervention, fast and consistent turnaround times, accelerated production, increased volumes, and maximised finishing quality.

In 2022 Nord Laser invested in a new application system, Wagner's IPS powder centre, conceived with the same perspective as a machine tool to increase productivity, maintain high-quality standards, operate in a simple manner, and constantly reduce colour change times.



“Nord Laser’s key strength is the ability to simplify complexity through its strategic skills, its customer-oriented, problem-solving approach, and its capacity to manage any critical issue developed over forty years,” explains Marco Bovolini, the president of Nord Group Spa, the holding company to which Nord Laser and other companies in the food, fitness, and mining sectors belong. “At Nord Laser, each project is the story of an ethical, technological, and innovation challenge. Over the years, we have structured it to be ready even for the most unexpected requests aiming at always satisfying our customers, also in terms of delivery speed and adherence to the planned processing times. Punctuality is an essential value for Nord Laser,” adds Bovolini. “Our idea of partnership is very concrete. It requires complete operational development plans and involves each customer at every stage, from co-design to objective sharing, including cyclic and tightly integrated monitoring activities. In Nord Laser, customers can find a complete, verticalised service from a single source, thus avoiding all the disadvantages of long and complex supply chains.”

From analysis and production to coating and shipping, every stage is managed to guarantee excellent performance. It was precisely the coating operation that was the subject of a major capital investment in 2022 for switching to a new application system, Wagner’s IPS powder centre, conceived with the same perspective as a machine tool to increase productivity, maintain high-quality standards, operate in a simple manner, and constantly reduce colour change times.

From 1980s craftsmanship to 2000s integrated industrialisation

Nord Group’s history began in 1984, when Alessandro Bovolini founded Bovolini Snc to carry out welding and light metalwork processes for the local market.



The showroom of Canali System. This startup was created by Professor Vincenzo Canali, the inventor of a revolutionary biomechanical approach to training, and Nord Group, which had the idea to translate this sports philosophy into a product of excellence that is revolutionising the fitness world.



General view of the coating line designed by Imel and built by Nord Laser itself.



Over the years, the company has evolved to its current structure, where the holding company Nord Group Spa owns four other firms, i.e. Nord Laser and three startups: Canali System in the fitness sector, North Group Mining in the mining sector, and Gabin in the catering sector. Meanwhile, Nord Laser's evolution has involved moving from purely manual operations to an increasingly technological approach, beginning with its first punching machine and continuing with the installation of laser cutting and many other advanced machines. Over the years, it has made several investments in the vertical integration of its production flow, up to the powder coating stage.

"We are a contracting company, but we have a highly verticalised production cycle: we start with the raw materials, namely pickled or galvanised metal sheets, and we supply machine parts or complete systems, also performing the final plant acceptance phases, including on-board electrical equipment," says Bovolini. "We like to call ourselves "the production department of our customers", which operate in various fields, including the steel, energy, textile, air conditioning, and machine tools industries, as well as the furniture and fitness ones in

the case of Canali System, another of our Group's companies. This means that the technical and quality specifications we have to meet vary greatly depending on the sector for which the parts are intended: they range from purely functional specifications with high corrosion resistance requirements to specifications where aesthetics are of the essence. Our strategy has been to vertically integrate production in order to offer a complete service and a net reduction of all the management costs of a conventional supply chain.

"With time, this approach has rewarded us so much that our customer base is now changing, moving more and more towards industrial companies. These new manufacturing requirements call for extreme production flexibility, definite lead times, and high quality. This, in turn, has led us to sophisticate our management control tools. We have implemented a robust Enterprise Resource Planning (ERP) system for production planning and management, an MES for data collection, and several other tools focusing on digitalisation and Industry 4.0 – like our latest investment, the Wagner IPS coating booth, which we believe is the new benchmark in powder application."



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A three-year investment period with a focus on coating

Over the past three years, Nord Group has invested around 5 million Euros in new technologies, renewing its laser cutting and bending machines, creating a new in-house machining department, installing five robotic welding stations, and upgrading its paint shop with a state-of-the-art Wagner booth.

“Our production cycle includes laser cutting, punching, deburring, bending, machining, welding, coating, and assembly. The vertical integration of all these services is a winning business proposition and coating is a strategic part of it: as it requires skills, expertise, and substantial capital investment, not all manufacturing companies are willing or able to integrate this special process in-house,” notes Marco Bovolini. Nord Laser currently operates in four factories of about 5000 m² each, one of which is

devoted to painting. It is equipped with a coating line designed by Imel in 2000, which can treat parts up to 6 metres in length, 2 metres in height, and 1 metre in width.

From the left:

The Wagner spray booth, with two touch-up stations before and after the automatic coating phase, is part of the advanced IPS system.

General view of the Integrated Powder System (IPS) combining powder preparation, feeding, dosing, and colour change in a fully automatic plant.

Smart Boxer, the smart virgin powder feeding system, during a colour change operation. This is activated at the push of a button.



WHEELS



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This system recently underwent two major updates. The first involved the pre-treatment process, which moved from 5 to 7 stages, including alkaline degreasing, mains water rinsing, phosphating, further mains water rinsing, demineralised water rinsing, atomisation of a nanotechnology passivation product, and final demineralised water rinsing.

“The requirement behind this improvement was to pre-treat both of our raw materials to the same quality: as is well known, alkaline degreasing works best on galvanised sheets whereas phosphating is ideal for pickled sheets,” indicates Marco Bovolini. “In addition, we were facing a few issues in the pre-treatment of galvanised sheets along their laser-cut edges, at the separation between the galvanised surfaces and the cut ones. This is why we also introduced a deburring stage before chemical pre-treatment to radius their edges. Our coating process is Qualisteelcoat certified. We guarantee high corrosion resistance (class 3C) on galvanised sheet metal with pre-treatment + one layer of paint; we can achieve class C4 with the application of two layers of powder, but there is currently no demand within our market.”

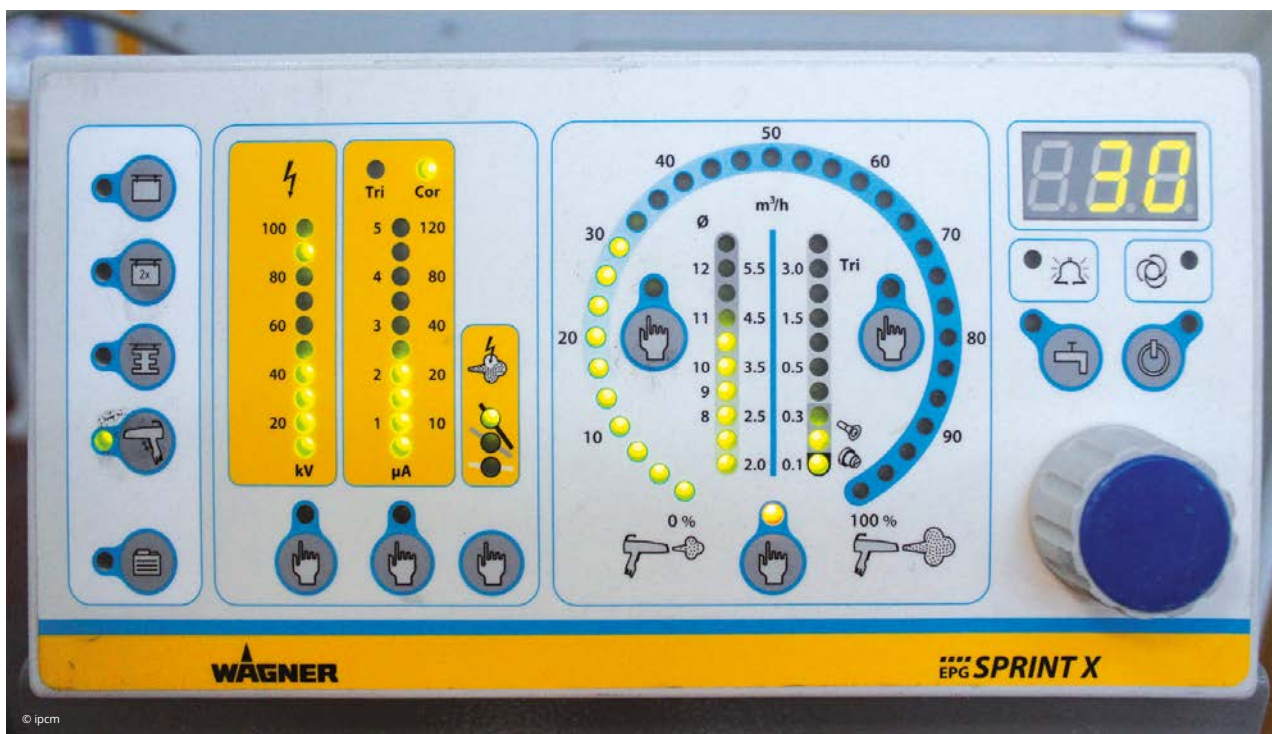
“This update on our pre-treatment process is very recent and validation with Qualisteelcoat is currently in progress,” adds Bovolini. “The second upgrade, the one that has brought us huge benefits in terms of coating efficiency, was the replacement of the old application booth with a latest-generation Wagner IPS system, which has led to a

drastic reduction in the disposal of spent powder, halved downtime required for colour changes, and improved coating film distension and homogeneity. In a nutshell: extreme application efficiency.”

The benefits of IPS

Nord Laser’s coating plant already had an automatic powder application booth, which had undergone a minor upgrade of its electrostatic generators to improve efficiency. However, the company’s spent paint disposal volumes were still very high, about 12 tonnes per year against a total consumption of 80-90 tonnes. In 2021, it began to make contact with some potential suppliers of a new automatic application technology and eventually chose to invest in Wagner’s advanced IPS system, a complete, innovative, and fully automatic solution ensuring consistent finishing results. This entailed a new operator approach to the coating cycle, a system meeting all 4.0 and IoT requirements, and the automation of tasks that used to be manual.

“We were assessing two application benchmark systems at the same level. Wagner’s IPS, however, changed the game,” says Marco Bovolini. “Because of our focus on technological advancement and our desire to stay one step ahead of the competition, we opted for IPS. This solution solved two problems that were very important to us: high powder consumption, as we had reached a peak of 12-13 big bags of fine dust to be disposed of per year, and the long downtimes required for our



One of IPS Master’s gun control modules.

colour changes, about 6 per day. When Wagner presented us with its IPS system, we immediately realised that this new-generation powder centre could allow us to better manage paint consumption as well as our spraying patterns. The advantages in terms of production process management were decisive, rather than those related to aesthetics, which were of less interest to us since industrial products account for 90% of our coating volumes.

“All powder management units on the market have a high level of automation; tasks are sequenced by the system and not managed by the operator. With IPS, the operators only have to clean the booth and the cyclone: for everything else, they only need to press a button. This has enabled us to set a standard process time for colour changes with extreme precision and consistency,” explains Bovolini. “With the old powder centre, we used to leave 12 load bars empty on the one-rail conveyor to guarantee enough chain length for the colour change. Sometimes, this was not even sufficient and the line would stop for up to 30-40 minutes. With IPS, we have reduced the space on the chain for colour changes to 6-7 load bars, i.e. 50% less than before, and we never need to stop the line. While maintaining the same performance degree of the Imel line, the switch to the IPS system has enabled us to cut our

**NORD LASER,
A CONCRETE PARTNER**

50,000 m² surface area of which 18,000 are covered

20 million Euros in turnover (year 2022)

100 customers in 2022

10,000 t of processed material

130 employees

3-shift work

2D/3D Solidworks software

Business Intelligence

Quality Certifications

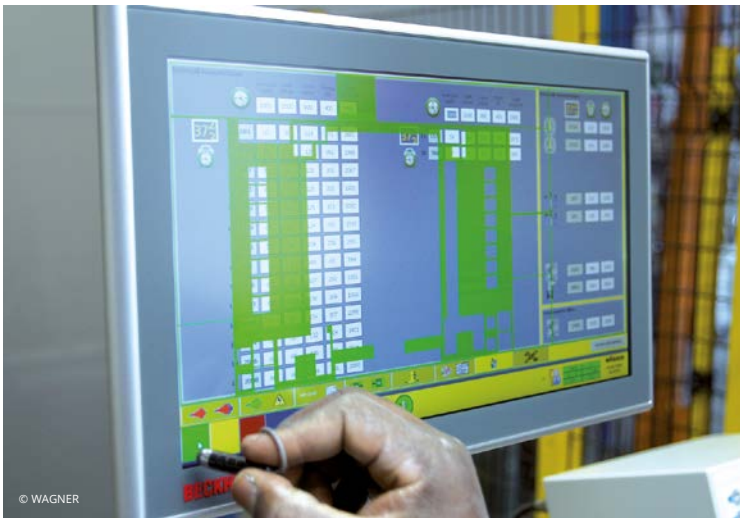
Lean Production



Operator intervention is reduced to cleaning the booth with compressed air.



With the Smart Feeding Technology, the powder is fed through a pressure container and an electronically controlled dosing valve and generates a soft cloud with little overspray.



A touch point controlling all the system.



From left to right, Carlo Salvadori from Imel, Alessia Venturi from ipcm, Nord Group CEO Andrea Montich, Nord Group president Marco Bovolini, Matteo Bovolini, and Venanzio Rosada from Wagner.

powder disposal volumes to 1 bag, i.e. a tenfold reduction compared with the previous requirements."

"It is undeniable that the old system was more wasteful as it was not equipped with a parts detection bar, so that the paint guns, 6 on each reciprocator, were always on, with considerable dispersion of powder," says Venanzio Rosada, Wagner's sales agent for the Friuli Venezia Giulia region. "However, even if we had implemented a parts detection bar, we would not have achieved the same results in terms of consumption reduction, because IPS has a completely different approach in terms of overspray recovery and filtration, with a very soft suction and feeding mode that minimises the generation of fine dust. It is important to note that these data are related to products from the same powder coating suppliers, because particle size consistency also plays a key role in the creation of fine dust. In essence, IPS is a state-of-the-art powder management system that guarantees stable paint feeding conditions

with a 0.5-bar VACUM unit and pressurised ultrasonic sieving," summarises Rosada. "It also offers the highest level of colour change automation requiring no human intervention, centralised control of all process steps, and real-time powder consumption tracking."

A new market benchmark?

"We are still working to fine-tune the management of all the booth's parameters and understand in detail the behaviour of high-density application for optimising paint penetration into 3D parts," states Marco Bovolini. "For Nord Laser, halving our colour change times was crucial because our plant's capacity is always saturated. It is undeniable that the investment required was very high, but I believe that the return on investment is also going to be very high within a very short time. Not to mention that this technology could become a new market benchmark, with a very high future residual value." ○