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The Importance of Shot Blasting for Finishing Precision Mechanical Steelwork: The Choice of MTS

Gabriele Lazzari **ipcm**[®]

The key to MTS' success is providing complete mechanical steelwork-related services, from metal sheets to coated products. As it serves numerous markets with specific requirements for corrosion and high temperature resistance, MTS can adapt its production cycles and its offer to different customer needs. In order to optimise processing times and guarantee surfaces with a high roughness degree for optimum paint adhesion, it has chosen OMSG's Dinamo 1216 hook shot blasting machine.

Shot blasted components waiting to be coated.



Frames and other parts intended for cranes, earth-moving machines, cableways, and offshore structures call for customised production cycles, as well as a very high level of corrosion resistance. For many years now, MTS has been supplying finished products for these and other markets and, over time, it has gradually modified its production processes to help its customers always meet the requirements imposed by international standards.

Constantly searching for new solutions and technologies to improve its offer, it has chosen to replace its previous shot blasting machine with a more modern one supplied by OMSG Officine Meccaniche San Giorgio SpA (Villa Cortese, Italy), with the aim of optimising production times and providing surfaces with a high roughness degree, which is crucial for paint adhesion. OMSG analysed the company's

requirements and provided it with its Dinamo 1216 shot blasting machine, a system characterised by two hooks, installed on an overhead Y line, with a maximum load capacity of 500 kg each, which has enabled MST to triple its output and obtain high-quality surfaces for its medium and small-sized products.

A family business with an international market

MST's history began in 1973, when Sergio Tonel and his brother founded Officina Meccanica Tonel - OMT on a 500 m²-wide site devoted to steelwork fabrication for the production of gates, benches, and railings. Subsequently, Tonel decided to enhance the production of high-precision mechanical parts with traditional milling machines and founded MST Meccanica Sergio Tonel in 1985.



MTS headquarters in Bosconero (Torino, Italy).



A coated component waiting to be shipped.

Machining quality and precision and punctual deliveries enabled his company to grow and move from its original small premises to a first factory of about 200 m², with ten employees. MST later diversified its production by opening a new factory manufacturing pedals, spoke levers, gearboxes, and door hinges. The choice to combine steelwork with precision mechanics proved to be successful and the company also started to produce larger components – such as brackets for earth-moving machinery cabins and parts for industrial automation – by purchasing a flame cutting machine and a shot blasting machine provided by Carlo Banfi (now part of the OMSG Group). In 2001, when the new factory building was inaugurated, Tonel was succeeded by his children Daniele (current CEO), Andrea (CTO), and Paola (CFO). They expanded their father's business, which had meanwhile become capable of machining and welding frames up to 8

m in length. In 2017, MTS acquired an additional building for carpentry operations such as flame cutting, laser cutting, bending, and manual and robotised welding. “The market has been rewarding the quality of our work and we have been growing steadily. In fact, we plan to open another production site and expand our foreign market to the US by the end of 2022,” explains Daniele Tonel.

Customised production for each specific requirement

Today, MTS occupies a covered area of 11,000 m²; it boasts 90 employees and numerous high-tech machines. “The reasons for our exponential growth lie in the comprehensiveness of the service we offer. We perform contract machining operations for multiple markets, providing a complete service from metal sheets to coated products,” states Tonel. Although a great part of its production is focused



MSG's Dinamo 1216 shot blasting plant.



The shot blasting machine with its two hooks for load bar handling.

on frames for construction cranes and forklifts and earth-moving machinery, MTS also produces power brakes, ABSs, valves, components for agricultural machinery, construction machinery, cableways, large units for industrial automation, assembly lines, portals, automated warehouses, machine tools, photovoltaic systems, and offshore platforms.

With its native English, German, Spanish, and French-speaking technical staff, the company analyses the specific requirements of each part to be produced together with its customers, in order to develop the most suitable and cost-effective manufacturing cycle. Using advanced CAD/FEM technology and based on customer specifications, MTS then performs every stage of design and subsequent cutting of sheets, bars, tubes, and profiles in-house using flame, laser, and high definition plasma cutting equipment. Subsequently, a press is used

to cold form sheet metal, if required. The workpiece is then subjected to traditional MIG-MAG welding with continuous wire up to 500 °C or to high productivity robotic welding in compliance with standard ISO 1090-1, followed by turning and milling. Finally, the component is shot blasted and coated. The 4x9x9 m blasting cabinet and the Dinamo 1216 basket shot blasting machine provided by OMSG guarantee the accurate surface preparation of small and large workpieces, which are then coated with solvent-based products applied in two spray and drying booths (10x6 and 6x4 m) with dry floor filtration. For customers who request it, MTS also takes care of assembly. "For Brennero Gru, we directly assemble 5-tonne crane frames with stabilisers, skids, cylinders, and wiring and we finally test and calibrate them."

"We work in three shifts and process about 450 tonnes of material per month. At the same time, in order to deliver parts complying with



The hooks movement system with its gears.



One of the shot blasting machine's turbines.



The coating booth.

every customer's specifications, our production is extremely flexible. For example, some sub-assemblies are shot blasted before welding. The undercarriages of Dynapac Italia's road milling machines are cut, welded, shot blasted, and painted before undergoing further machining; they are then cleaned, deburred, and packaged. Berco's components call for a different process, including cutting, welding, shot blasting, machining, cleaning with a phosphodegreasing product to remove machining oils, and coating.

"What all our processes have in common are the shot blasting phase and the application of two coats of paint (primer and top coat) making up anti-corrosion systems (C5, C4, C3, and C2H classes). Coating is indeed a basic requirement of our production: this is why we develop the most suitable solution for each specific requirement together with customers and paint manufacturers, including AkzoNobel, Sherwin-Williams, and Teknos. Some of the frames we produce are intended to be subjected to considerable temperature changes, whereas others to be exposed to marine environments. Therefore, we follow customer specifications in terms of both paint products to be used and salt spray resistance to be guaranteed."

The fundamental contribution of shot blasting and coating

By means of modern testing technologies for the dimensional inspection even of components with very complex shapes, all products manufactured by MTS undergo quality checks to guarantee they

comply with international standards ISO 9001, ISO 14001, ISO 1090 EXC1, EXC2, EXC3, and EXC4, and ISO 3834-2. "As I have said, the success of MTS is linked to the quality and comprehensiveness of the service it offers. This also includes finishing. Customers require finished, ready-to-use parts, and, therefore, shot blasting and coating are two key operations to meet their standards and needs," states Tonel.

MTS' first shot blasting system is a manual cabinet using SA 2.5-grade silica sand-corundum for non-aggressive finishing and smooth surfaces. In March 2022, the company also installed a hanger-type shot blasting system, an OMSG Dinamo 1216 plant featuring three turbines with a power of 7,5 kW each and maximum capacity of Ø 1200 x 1600 mm with two customised hooks that fit the various load bars used by MTS. "It uses S230 spherical grit whose granules can be up to 2 mm in diameter, because certain coating results we are required to achieve call for a high level of surface roughness. It is a very high-performance and compact plant, suitable for treating small and medium-sized mechanical parts. In fact, we use it to mechanically clean all our sub-metre-sized components. In addition, in order to optimise handling speed and cycle times, it was designed to include a hook system that makes the line movement smoother, faster, and more efficient," indicates Tonel.

Having discontinued the previously used machine, MTS looked for a solution that could complement its own production and, after a

market survey, it turned to OMSG. “They proved to be reliable and helpful partners. They listened to our needs – they even matched the colours of their machine to those of our brands, orange and black – and they provided us with a shot blasting plant that allowed us to triple our production. The value for money is exceptional, so much so that we have requested an additional roller machine to blast sheet metal, which will be installed in our new factory building,” says Tonel.

Future evolutions

In fact, MTS plans to expand its production site with a new 3,000 m²-wide covered facility that will include a 36 m-long cutting plant with six motorised trolleys, a 15 m-long milling machine, a roller shot blasting machine, and a 20x10 m coating booth to further differentiate its production, including even crane booms and turrets and workpieces weighing up to 10 tonnes. “We work in three shifts, from Sunday night to Saturday noon. We have a very diverse production in terms of both technical requirements and part shapes and sizes. The components we make can be exposed to extremely corrosive environments, with very high or very low temperatures. Finally, their dimensions range from a few centimetres to plates with a thickness of 0.5 m and a length of 12 m; for instance, during one shift we can cut, machine, shot blast, and coat 180 gearbox plates and then a few 6 m-long crane frames. These are the reasons why we are always looking for new technologies and tools that can help us optimise our processes.” 



Manual spray painting and coated parts awaiting further machining.