

Automated blasting technology for optimum fastener preparation

05 January 2021



Netherlands-based Thielco Steel Solutions Group has invested in four new rubber belt tumble blast machines for GEOMET® corrosion protection of small steel parts – having been the sole licence holder for GEOMET chromium-free coating technology in the Netherlands since 2007.

GEOMET® technology is water-based and offers an environmentally friendly alternative to conventional coating or galvanising of smaller metal products. A zinc aluminium laminated coating is applied to the component in a specially designed fully automated production line. This achieves extremely high corrosion resistance and avoids hydrogen embrittlement.

Companies such as Thielco that have acquired the GEOMET licence are subject to the strictest production and quality control inspections by the licensor NOF Metal Coatings Group, thus ensuring the best possible corrosion protection for steel parts from a technical point of view. Thielco also conforms to the international IATF 16949 quality standard for the automotive industry.

Many automotive manufacturers use screws and other small steel parts that are surface treated with GEOMET at Thielco. In addition to automotive applications, GEOMET coated components are also increasingly used in the transport industry and in wind turbines.

Hanger type blast machines for rack goods

"We initially only used the GEOMET process for small parts (bulk material), but the enormous growth in the wind power industry in particular meant the demand for larger components with a GEOMET coating became ever stronger. This led us to invest in a new production line in 2013 for the coating of rack goods with GEOMET," explains Michèl Jacobi, head of production in the GEOMET plant at Thielco. "Rack goods are the name of the game, so-called because the parts to be coated are transported on racks rather than in baskets or similar, as is the case with small parts."

A new production line for the fully automated GEOMET coating of rack goods was designed and implemented together with the plant manufacturer WMV Apparatebau GmbH. One of the key processes involved here is blasting. Only a perfectly prepared surface will result in a perfect coating finish that complies with strict GEOMET requirements. Two AGTOS hanger type blast machines (type HT 11-13) were selected for the blasting process. Each of these is equipped with two high performance turbines, each delivering 11kW of drive power.

The third system (also a type HT 11-13) is used for de-coating and cleaning the racks. "We coat the workpieces together with the racks in these production lines. The racks are de-coated each time following removal of the finished parts, ensuring that fresh racks are always available," points out Michèl.

All three hanger type blast machines can handle a maximum workpiece height of 1.3m and width of 1.1m. The blast machines operate with automatic abrasive volume control (via pre-set value) and have a connection for cartridge filter units.

2015 saw renewed investment in an AGTOS blast machine, but for hot dip galvanising of rack goods in a second Thielco production plant. This system is a linked continuous overhead rail shot blast machine of type DHT 10-08. One special feature of this coating line is the automated loading and unloading of workpieces on the racks using robots, a system developed by the customer.

The largest investment to date was made in 2018 on new blast machines for the GEOMET small parts (bulk material) coating line, which has been in operation since 2007. "More than 10 years of continuous operation of the existing blast machines from another manufacturer had worn them to an extent where they no longer complied with contemporary quality standards. Costs for continuous maintenance and spare parts were high, making any further use of these machines economically impractical. They simply had to be replaced," mentions Michèl. "We sought the advice of WMV Apparatebau, a plant manufacturer with whom we have dealt for many years. Additionally, we also needed to take the specifications of NOF Metal Coatings Group into consideration when selecting new blast machines. Its recommendation and our own extremely positive experience with previous AGTOS blast machines led us to choose four series-connected AGTOS rubber belt tumble blast machines of type MG 0180."

AGTOS blast machines are distinguished by a high degree of robustness, a long service life and maintenance friendliness. The high performance turbines are designed to ensure extremely low wear, even in the severest of operating conditions. Moreover, they are capable of a high abrasive shot flow rate – while requiring the same amount of energy as other turbines. They are extremely efficient as a result. The blasting chamber itself is lined with highly wear resistant, replaceable manganese and tool steel plates.

AGTOS customers always emphasize the high-level of maintenance friendliness of these blast machines. The entire machine is not only designed for long-term operation, but optimised for maintenance and the replacement of spare and wear parts. For example, AGTOS high performance turbines are equipped with easily replaceable turbine blades and the push system means that filter cartridges can be replaced without difficulty in the clean gas area. Other servicing work such as replacement of the rubber belt can also be quickly realised, thanks to a well designed maintenance system.

The tumbling motion of the continuous rubber belt turns the workpieces to be blasted and exposes them to the abrasive stream for the entire blasting duration. The rubber belt also ensures that turning of workpieces is relatively gentle. Maintaining low gap dimensions means that even very small parts can be blasted. Machine loading and unloading is automated at Thielco, involving a feeder and discharge chute.

The turbines used in these rubber belt tumble blast machines each deliver 11kW of drive power and an abrasive shot flow rate of 162kg/min at the currently configured speed.

Within just 10 days, AGTOS and WMV removed the old blast machines with the assistance of Thielco, followed by complete integration, installation and commissioning of the four new rubber belt tumble blast machines in the existing GEOMET coating line. The rack good line continued normal operation during this.

Baskets with bulk material are cleaned and deoiled, blasted, coated several times with a zinc aluminium laminated coating, cooled and dried in continuous four shift operation. Four rubber belt tumble blast machines are positioned parallel to each other in the production line. The baskets with bulk material are moved to the position required in each case by a transfer unit.

"The minimum requirements for GEOMET are two layers of base coat. We can apply up to four base coats, depending on the customer's wishes, but the fourth application would involve a special process. A top coat is then usually applied to obtain particular friction characteristics. The coefficient of friction can be set at values between 0.06 μ and 0.18 μ (ISO 16047)," states Michèl.

The new production machines enable Thielco to provide a complete GEOMET® 321 and GEOMET® 500 package with different top coats for parts in all steel qualities and diameters ranging from M5 to M42, both with and without a thread, and up to a maximum length of 850mm.

www.thielco.net

Save and share

