COVER STORY

DONELLI ALEXO INAUGURATES A NEW PLANT FOR APPLYING FBE POWDER LININGS ON OIL & GAS AND DRINKING WATER VALVES

by **Ilaria Paolomelo**, ipcm®

The Donelli Group, a pioneer in corrosion protection since 1911, has opened an innovative factory in Ferno (Varese, Italy): Donelli Alexo MXP. Equipped with state-of-the-art technology, it will be the company's hub for the application of powders, including FBE powder coatings, on valve, tank, and pipe internal surfaces and of liquid paints on both these components and actuators for the oil & gas and drinking water sectors.

Overview of Donelli Alexo MXP's coating department.

In the petrochemical industry, valves play a key role in the extraction, transport, and refining of fluids because they ensure a safe and efficient flow. However, they are often exposed to harsh environmental conditions and aggressive corrosive agents. Such constant exposure can seriously compromise their structural and operational integrity, putting plant safety at risk and generating malfunctions that can cause costly and potentially dangerous operational interruptions. Corrosion protection is, therefore, a crucial factor that can never be underestimated as it is closely linked to the longevity and reliability of infrastructure.

In this scenario, companies specialising in corrosion protection clearly play a vital role. One of them is Donelli Alexo Srl, a company based in Cuggiono (Milan, Italy), which for decades has been offering anti-corrosion coating, fire protection, and insulation services for plants and structures in the energy, oil & gas, chemical, and offshore sectors. Recently, Donelli Alexo has further expanded its market presence by opening a new site in Ferno, in the province of Varese, just one year after its CX site, a satellite of the main one in Cuggiono. This expansion reflects the company's commitment to meeting the growing needs of the industry through advanced and fully customised corrosion protection solutions. At this new location, Donelli Alexo can apply a wide range of coatings, including FBE linings, powders, and liquid paints, mainly on valves and actuators for the petrochemical and drinking water industries.

The foundation of Donelli Alexo MXP

Established in 1911, the Donelli Group stands out in the field of protective and cosmetic-protective treatments for a wide range of substrates and infrastructures, including industrial, petrochemical, and chemical plants, power plants, and civil, residential, and commercial structures. It stands out especially for its state-of-the-art technology, high quality standards, professionalism, and respect for the environment and operators' safety.

Donelli Alexo, one of the eight companies that make up the Donelli Group, thanks also to the twenty-years experience and technical-commercial collaboration of an external consultant, AMPP Senior Certified Coating Inspector Luca Calore, in recent years has been developing an FBE powder lining service for valves intended for contact with drinking water, in compliance with the main KIWA, AWWA, and WRAS standards, and with hydrocarbons up to 95 °C, in accordance with the most stringent specifications of end users such as SAUDI ARAMCO and SWCC (APCS-102A, APCS-102B, APCS-102C). It also coats the external surfaces of fittings with both single-layer FBE and double-layer FBE (DLFBE) solutions, with the possibility of also applying top coats with high abrasion resistance (Abrasion Resistant Overcoating, or ARO). "Over the years, our company has increasingly consolidated its presence in the market, becoming one of the leading players in the corrosion protection sector," states Donelli Alexo CEO Alessio Trisolino.

"Just one year after the opening of the CX plant[1] in Cuggiono (Milan, Italy), we inaugurated a new site in the province of Varese, near the international airport of Malpensa – hence its name, MXP. We had noticed a growing demand for the application of FBE powder products – this acronym stands for Fusion Bonded Epoxy – for the outer coating and inner lining of valves in a variety of industries, especially from companies operating in the Middle East, which is one of our main markets to date. Indeed, in recent years, our customers have been showing increasing interest in the FBE technology and entrusting us with more and more orders, including large ones. Therefore, to meet these demands and thanks to the experience gained at our primary plant in Cuggiono, where FBE coatings were already applied successfully, we decided to expand our production capacity by opening this new site," says Trisolino.

"The achievement of this important milestone is part of a corporate strategy to position ourselves as the benchmark company in the corrosion protection sector. Especially when dealing with large orders, end customers are often concerned about delivery delays, which leads many of them not to rely exclusively on one coater but rather turn to several suppliers to mitigate potential delays and finishing quality issues." However, Donelli Alexo has taken a different approach, structuring itself so that end customers see it as their one-stop shop. "With three sites devoted to valve coating, we can guarantee greater flexibility and reduce the risk of delivery delays. We optimise work by managing orders through all our plants, distributing them among the three sites or concentrating them in one depending on production requirements, thus ensuring greater adaptability and efficiency. End users also recognise and value process homogeneity among our plants, which translates into high consistency of the end products' quality," notes Trisolino.

The valves' inner lining cycle

Donelli Alexo's core business is the surface treatment of valves intended for the petrochemical industry and for contact with drinking water. Before reaching the coating process, which takes place in a manual plant, each valve undergoes a series of critical steps. These include cleaning, degreasing, and a thorough mechanical surface preparation check, followed by a sandblasting stage, carried out also in one of the tunnel machines supplied by Cogeim (Casorezzo, Milan).

[1] The technical description of the Donelli Alexo CX plant was published in issue no. 43 of ipcm®_ Protective Coatings: https://www.ipcm.it/en/open/protective-coatings/2022/43/24-31.aspx

The lining of a valve's inner surface with FBE powder.

The cluster grit blasting machine supplied by Cogeim.

The inside of the curing oven.

"At the end of the sandblasting process – using abrasives in different types and with different grain sizes depending on the surfaces to be treated and the specifications of the customer's technical data sheets – we proceed with lining the inside of the valves by applying the Scotchkote™ FBE epoxy powder coating," explains Alessio Trisolino.

The FBE powder application system was designed and installed by Eurotherm (Volpiano, Turin, Italy), a plant manufacturer that had already collaborated with Donelli Alexo in the past for the supply of the Cuggiono CX site's coating line. "When we took over the Ferno plant, it was already equipped with a Eurotherm plant, which we decided to keep precisely because we were aware of the high quality of its technology and the skills of this company's technical team. At the same time, we subjected it to a major revamping process, especially in terms of control devices, to ensure compliance with the most stringent specifications, such as those required by ARAMCO, with minimal tolerances for the dew point of the air used for powder application."

Known for its effective corrosion protection properties, the Scotchkote™ FBE coating is mainly used for oil & gas pipelines, including their joints and, of course, valves. Depending on the intended use of such components, FBE coatings may require several processing steps.

"For valves intended for the petrochemical industry, we apply a phenolic primer after cleaning and grit blasting. This is followed by a pre-heating stage in an oven at the temperatures indicated by the product's technical specifications. We then apply the FBE coating and end the process with an oven-curing phase.

Donelli Alexo's valve lining cycle is a rigorous, tailor-made process designed to ensure optimal corrosion protection and long service life, in line with the specific needs of each customer and industry," adds the CEO.

Another significant advantage of the Scotchkote™ XC-6171 product is the possibility of subjecting already coated valves to subsequent machining operations. "This means that we can apply the coating to the entire inner surface of the valves, including the sealing areas in contact with the fluid, and restore the finish with mechanical tooling operations. That distinguishes this product from many competitors as it also guarantees impermeability after machining, which is not always guaranteed by other certified products."

KNOWN FOR ITS EFFECTIVE CORROSION PROTECTION PROPERTIES, THE SCOTCHKOTE™ FBE COATING IS MAINLY USED FOR OIL & GAS PIPELINES, INCLUDING THEIR JOINTS AND, OF COURSE, VALVES. DEPENDING ON THE INTENDED USE OF SUCH COMPONENTS, FBE COATINGS MAY REQUIRE SEVERAL PROCESSING STEPS.

One of the areas devoted to the application of powder coatings.

The advantages of the FBE technology

For Donelli Alexo, Fusion Bonded Epoxy powder coatings are an advantageous solution for protecting both internal and external surfaces. “Although powders are an established technology for the lining of inner surfaces, we anticipate that they may also find fertile ground for the protection of outer surfaces. This fits in with our vision of the ecological transition since we expect powder coatings to completely replace solvent-based liquid products within five to fifteen years. However, we recognise that this change will take time as it is necessary to create an industrial culture that fully embraces this technology and its related processes,” says Marco Malandra, a board member and the coordinator of the technical and regulatory development office (ISO and Qualisteelcoat). “In addition to increased sustainability, powder coatings offer many advantages. Their durability is remarkable, reducing the need for frequent maintenance and its related costs and extending the service life of equipment and infrastructure. In addition, they can be applied electrostatically and in fluidised beds, enabling to coat even the most difficult-to-reach surface areas,” indicates Donelli Alexo’s CEO.

The valves’ outer coating cycle

At its Ferno site, Donelli Alexo performs not only the FBE powder lining of valves’ internal areas but also the coating of their external surfaces with liquid-based paint products. “After inner lining, the valves are shipped to the customer for machining (assembly, coupling, and so on) and then returned to us for outer coating. In the corrosion protection sector, very strict specifications govern 95% of projects. Therefore, customer specifications often determine the coating cycle and the paint products used.” “The plant we have installed at the new Ferno site is designed for manual coating and includes a cluster grit blasting machine supplied by Cogeim, a curing oven supplied by Eurotherm, and 6 manual coating areas, soon to become 9 as 3 more are currently being installed,” indicates Trisolino. The system can handle large-sized valves weighing up to 25 tonnes.

“We recently completed a very sophisticated project engineering-wise, involving the coating of 53 100-inch valves for the transport of drinking water in Mecca (Saudi Arabia).”

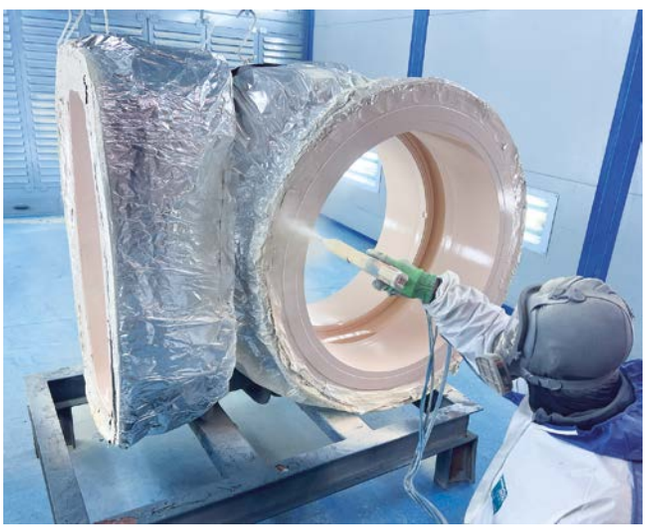
IN ADDITION TO INCREASED SUSTAINABILITY, POWDER COATINGS OFFER MANY ADVANTAGES. THEIR DURABILITY IS REMARKABLE, REDUCING THE NEED FOR FREQUENT MAINTENANCE AND ITS RELATED COSTS AND EXTENDING THE SERVICE LIFE OF EQUIPMENT AND INFRASTRUCTURE. IN ADDITION, THEY CAN BE APPLIED ELECTROSTATICALLY AND IN FLUIDISED BEDS, ENABLING TO COAT EVEN THE MOST DIFFICULT-TO-REACH SURFACE AREAS.

Powder coating products are stored in a dedicated temperature-controlled warehouse.

A partner of excellence in the corrosion protection field

Every Donelli Alexo site has embraced the mission of pursuing continuous growth and researching ever-more advanced anti-corrosion products and processes. “We are committed to providing our customers with the highest coating quality and reliability, and this new plant tangibly embodies that commitment. The Ferno facility is also equipped with a traditional powder coating plant that will enable us to guarantee even higher quality standards,” states Trisolino. “We understand coating as much more than a mere protective solution. We intend to expand our range of services in the powder coating sector by exploring new international markets and applying three-coat systems to achieve aesthetic and protective results of the highest quality,” says the CEO of Donelli Alexo.

“To provide our customers with impeccable service, we are obtaining Qualisteelcoat certification and have already received ISO 9001, 14001, and 45001 quality, safety, and environmental certification for this plant. Our Donelli Alexo CX site in Cuggiono has also obtained ISO 9100 certification for the aerospace and military sectors. In addition, implementing advanced technologies to monitor each stage of the coating process guarantees uncompromising quality. Finally, the installation of state-of-the-art instrumentation such as differential scanning calorimetry (DSC) in our Cuggiono CX plant’s laboratory enables us to perform thermal analysis on coated samples directly in-house, demonstrating our commitment to ensuring the highest quality in every aspect of our work,” emphasises Marco Malandra. “These steps will enable us to provide our customers with an even higher level of quality within a shorter time frame, consolidating our position as their one-stop shop and point of reference for all their corrosion protection needs,” remarks Alessio Trisolino.



FBE for ARAMCO valves.