



The CORTIZO's headquarters in Padrón (Spain).



FOCUS ON TECHNOLOGY

SPECIAL ISSUE ON ALUMINIUM



CORTIZO Enriches its Coating Plant Equipment with a High-Productivity Vertical System Installed in a Fully Interconnected Factory

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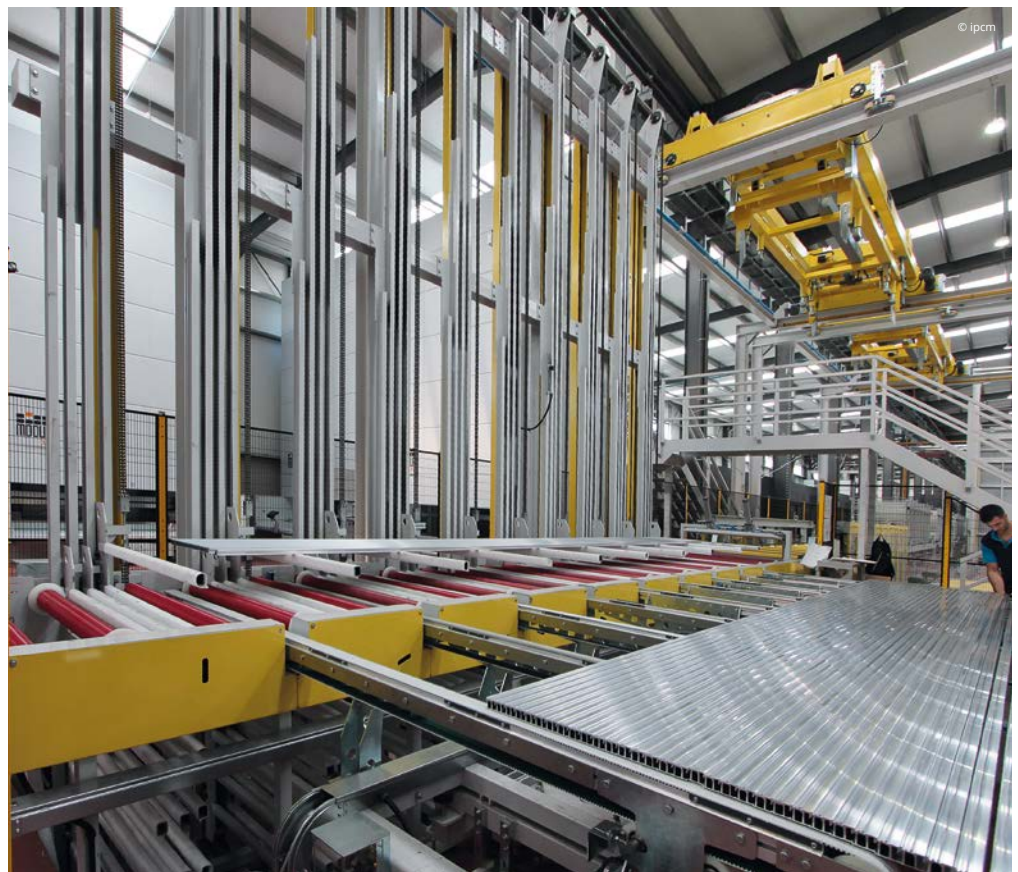
A high productivity and high flexibility vertical line which includes all the latest technologies developed by SAT: brusher, pre-treatment tunnel entirely made of PP for a better resistance to chemicals, VISICOAT - the profile vision system that uses AI, C-Expert powder coating booth, automatic unloading: these are, in summary, the characteristics of the new powder coating line installed by CORTIZO in Padrón, which brings to 7 the vertical lines SAT installed within the Group.

It is pronounced CORTIZO, but it means ALUMINIUM.

CORTIZO is positioned as the first manufacturer and distributor of exclusive aluminium and PVC systems for architecture and the industry in the Iberian Peninsula and as a benchmark at the European level. This Spanish company based in Padrón (Galicia, Spain) is one of the undisputed leaders of the aluminium industry, in which it stands out from competitors thanks to its ability to directly handle its entire production cycle: casting, extrusion, coating, oxidation, polishing, machining, packaging, storage, and distribution. This makes CORTIZO's presence also very strong throughout Europe, where exports are growing steadily, with the American market now also opening up.

CORTIZO's impressive figures

With 9 production centres and 31 delegations all over Europe, a presence in 60 countries, and almost 3900 employees, the Spanish company's production capacity reaches 150,000 T/year, of which 74,000 are produced in its headquarters in Padrón, in the verdant region that is home to the famous city Santiago de Compostela. The headquarters, in particular, is currently equipped with 1 foundry, 9 extrusion presses, 5 vertical and horizontal powder coating lines, 2 anodising plants, 2 chemical polishing plants, countless plants for profile machining, 2 smart automatic warehouses, a technology centre, and a logistics area. In its three-year strategic plan 2017-2020, CORTIZO had earmarked an investment of 87 million Euros to increase its production and logistics capacity. Of these, 17 million Euros were destined for the main factory in Padrón where, over the course of five years, 2 new extrusion presses were put into operation, of which one has a power of 2500 tonnes and is fully automated and capable of producing up to 6000 tonnes/year of profiles and the second is a 4500-tonne system for the production of large profiles, both housed in a newly built plant.



The suspended cages transporting the extruded profiles from the presses to the coating line (above) and the cages unloading the profiles onto the coating plant's roller conveyor.



The plan also included the installation of 1 new vertical coating line and 1 new chemical polishing one. In 2021, the company further expanded the production capacity of the Padrón factory by adding 2 more presses, 1 vertical and 1 horizontal coating line, and packaging, assembly, and plasticisation lines in a newly built plant with a covered area of around 23,000 m². Here, the mentioned production lines are totally connected to each other by a complex automatic logistics system with overhead cranes and storage buffers, which eliminates any unnecessary human handling of profiles.

The vertical coating system installed in this plant, in particular, is a high flexibility vertical line supplied by SAT (Verona, Italy). Developed to meet the need for maximum painting flexibility, SAT's line is a smart system that optimises the aluminium finishing process in order to meet the growing requirements for repeatability and high productivity in the coating industry, thanks to its advanced technological components.

Fully connected and automated process phases

“The plant where we installed our SAT line houses a closed-loop, self-sufficient, and fully interconnected production process, starting with extrusion and ending with plasticisation and assembly of the thermal bridge break,” says Alberto Freire Nande, the communication manager of CORTIZO. “This 20 million Euros investment was started about a year ago, when the previous five-year development plan came to an end.

The fan-shaped loading area. The only manual operation is the insertion of the hanging hooks into the profiles to be painted.

The brushing machine at work.



"The profiles come from the 2 new extrusion presses: the "cages", or trays, containing them automatically reach the heat-treatment ovens for material hardening, and then an intermediate warehouse that takes care of the distribution of the profiles towards the subsequent production lines, that is, coating, assembly, packaging, and plasticisation, via overhead cranes. In addition to the 2 new presses, this investment included the installation of a vertical coating line to which 2 more are going to be added: a horizontal one for non-standard profiles and a new vertical one to be also supplied by SAT. Finally, this part of our factory includes 3 automatic warehouses for powder coatings."

The vertical profile coating line's cycle

"The logistics system connecting one production stage to the other consists of overhead cranes that handle the material arranged on the trays. After extrusion, the profiles are stored in a vertical warehouse. When an order is entered into our management software programme, the system picks up the tray containing the matching profiles and takes it to the paint shop's feed roller conveyor, where the profiles are unloaded by rows and hung onto the line by the operators. Indeed, the only operation in this entire logistical process that requires human intervention is the insertion of hanging hooks," says José Labandeira, the production manager of this new CORTIZO plant. "The line paints profiles up to 7.5 metres and it integrates all of SAT's most important technological innovations. The first one is the automatic brushing machine, which performs a mechanical pre-treatment process prior to the traditional chemical one, in order to remove any extrusion defects from profiles and thus produce higher quality surfaces. We have been the first SAT customer to integrate a brushing machine, first at our Slovakian, French and Manzanares (Ciudad Real) sites, then at our Spanish plants in Canarias, Cervera and in Poland, now here in Padrón."

"The chemical pre-treatment phase includes an acid stage with its rinse, an alkaline stage with its rinse, a pickling stage with its rinse, and a final conversion stage with its rinse using demineralised water," indicates José Labandeira. "This is the first line provided with a pre-treatment tunnel entirely made of polypropylene, a material which guarantees many advantages: resistance to aggressive chemicals, thermal isolation, an improved aspiration system. Each stage is double, in order to achieve better pre-treatment quality. After drying, the profiles proceed to the two C-Expert spray booths, one for dark colours and the other for light colours, which incorporate another SAT's technological innovation: the VISICOAT profile vision system. A picture of the incoming profile appears on the booth's control panel: automatically, the booth and its application equipment set the correct coating parameters, i.e. speed, amount of powder dispensed, distance of the guns from the profiles, tension applied, and so on. Of



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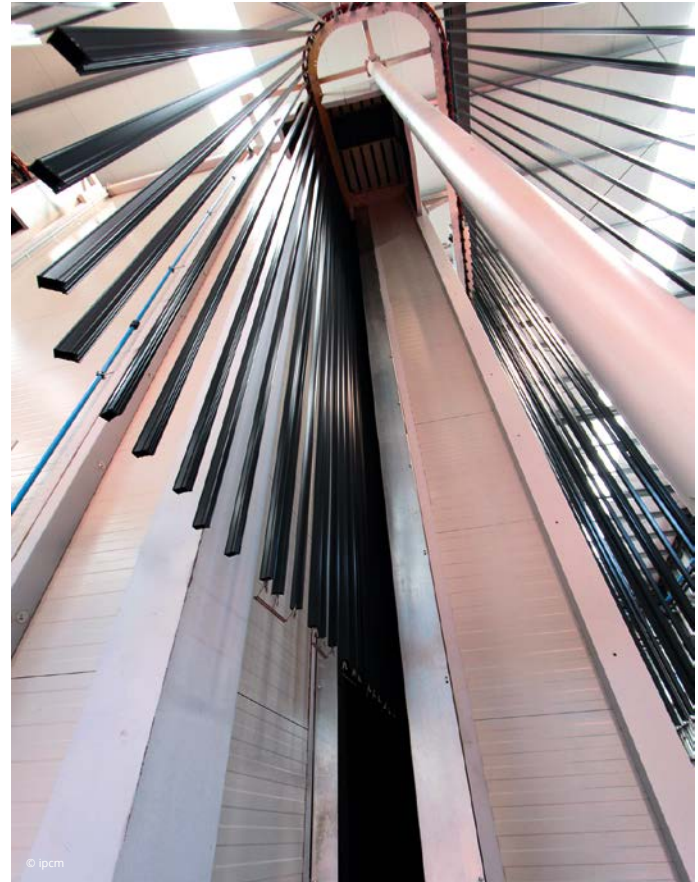


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Profiles exiting the pre-treatment tunnel.



Coated profiles exiting the polymerization oven.

course, we previously entered data for each type of profile we produce, so that the vision system can compare the incoming part to the database information."

"Application is done through OptiSpray 01 pumps with Gema Smart-InLine – Technology. This is the first time CORTIZO uses dense phase feeding equipment," notes José Labandeira. "All the other coating plants we own here in Padrón and in our other eight production centres use Venturi injector technology. Based on our first application experiences, I must say that the result is much better. We still have to check whether maintenance is really so minimal as to justify such a significantly higher investment."

SAT's plant has an impressive capacity at full three-shift operation: 50 tonnes per day. At the moment, 7-8 colour change operations are performed per day, which is a higher number than what will be the average for the plant once full capacity is reached. The plant was designed for very large batches and very high productivity levels.

At the end of the coating cycle and after curing, the profiles reach the unloading platform, featuring SAT's fourth innovation, i.e. the automatic profile offload system. After unloading and placing the profiles on the transport trays, the factory's logistics system separates the coated

material into three different storage buffers that feed the assembly, plasticisation, and packaging lines respectively.

The trays are always called up automatically to proceed to the next processing step. "Storage buffers are crucial because the coating line has a much higher productivity than the three systems that follow it, so they prevent the trays destined for the different lines from mixing up," explains José Labandeira

Analysis of the innovative elements integrated in CORTIZO's plant

VISICOAT

The unique Vision Recognition System developed specifically for vertical coating lines introduces the AI to control the aluminium profile coating process. Thanks to close collaboration between SAT and Gema, VISICOAT is able to recognise the cross section of the profiles, and perform the coating process autonomously through a sophisticated AI solution.

AUTOMATED UNLOADER

It is a cutting-edge technology able to manage profiles of any shape, weight and length in an easier and more efficient way. It uses five

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The VISICOAT system panel.

helical belts or conveyors to transit the aluminium extrusions from the vertical to the horizontal position for the unloading. Once the aluminium profiles reach the horizontal position, they are moved to the motorised unloading table for handling. This five belts unloading system is designed to process extruded aluminium profiles between 2 meters and 8 meters length. The Automated Unloader allows the customer to offload extrusions from their vertical powder coating system without adjusting the position of the unload system. The Automated Unloader is able to eliminate the gaps between the extrusions on the line and to minimise marring and bending of the parts as they move along the vertical curve of the conveyor.

THE BRUSHER

The new Vertical Brushing Machine is placed in-line prior to the entrance of the chemical pre-treatment tunnel. The aim of THE BRUSHER is to operate a mechanical pre-treatment of profiles surface. There are three main advantages guaranteed by a mechanical treatment before the chemical one:

- THE BRUSHER removes a relevant part of the aluminium particles (chips) or dirtiness coming from the extrusion process or from a non-ideal storage, drastically reducing the incidence of surface defects.
- THE BRUSHER permits to scratch the profile surface, increasing the overall surface of the profile and allowing a more thorough chemical attack. This means the possibility of reducing the chemical concentration inside the tank or reducing the time of contact: in any case, it reduces the consumption of chemicals into the pre-treatment tunnel.
- THE BRUSHER increases the grip of powder on the aluminium surface, guaranteeing outstanding adherence performances. Thanks to the 3 pairs of brushes, the mechanical action intensity can be adjusted according to the desired result (varying the Round Per Minute of the brushes and their vertical speed).



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From top left clockwise: Powder application with Gema SIT technology; The powder centres of the two C-Expert booths; The automatic unloading system with five transport belts; Storage buffers housing the coated profiles to be sorted towards the assembly, packaging, and plasticisation lines.

C-EXPERT

It is the new Vertical Powder Booth. Its main characteristics are:

- Complete integration with GEMA CM 4.0
- Enhanced coating penetration in difficult recesses, also at a high conveyor speed
- Developed specifically to work with Visi1 Vision System
- Quick colour change
- Openable cyclone (optional).

Cortizo: historic sales record in 2021

In 2021, the group founded by Manuel Cortizo Soñora reached a 47% higher turnover than before the Covid pandemic. Internationalisation

certainly played a key role in this success, since exports to Europe account for almost 60% of the Group's sales and exports to Americas for a small further percentage.

The mammoth investments made over the past six years have also certainly driven this growth. Currently, the CORTIZO Group owns 17 coating lines, including 2 horizontal systems installed in Padrón, 1 in Romania, 1 in Portugal, 1 in Poland and 1 in Slovakia, and 8 vertical ones. SAT supplied 7 of these, no less.

"SAT is able to provide cutting-edge technology in line with our philosophy: for all our factories, we look for suppliers that share our approach to automation, digitisation, Industry 4.0, and of course sustainability," states Alberto Freire. ○

The new **Vertical Powder Booth**



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