

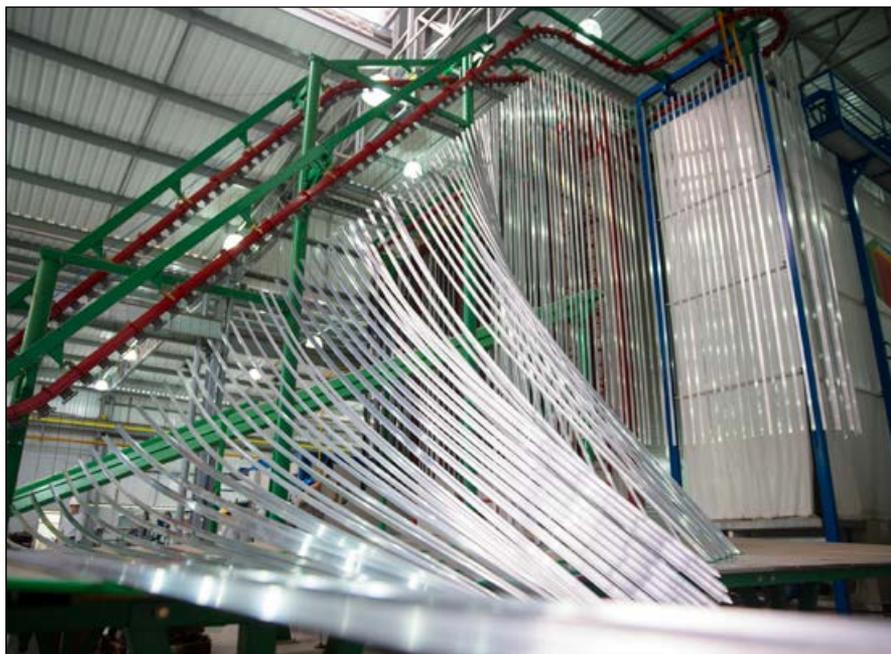
Smart and Compact Vertical Powder Coating Line

As the result of increasing efforts to innovate and find new solutions to improve their surface treatment technologies, Italian engineering company SAT (Surface Aluminium Technology) S.p.A. developed Cube—the first compact vertical powder coating line with smart technology, first made available to the world in 2013. Since then Cube has continued to evolve with updated process control and supervision software to provide advanced automation capabilities. While traditional plants are considered to be mere collections of mechanical components, SAT designed Cube to be an intelligent system with the addition of modern technological components that streamline the aluminum finishing process in order to achieve the increasing repeatability requirements of the coating industry.

SAT is dedicated to the design, production, and installation of surface finishing equipment for the aluminum extrusion industry. Active in the global aluminum market since the early '80s (when the first vertical powder coating lines were introduced in Europe by the Trevisan family), SAT provides Trevisan vertical powder coating lines; the revolutionary Cube compact vertical powder coating line; the Fox system, which allows for automatic, in-line, flash oxidizing pre-treatment, along with vertical powder coating; the Ezy wood effect machine; and Autel anodizing and packing lines. The company has sold more than 350 lines, including both new vertical powder coating plants and revamps of existing lines.

Smart Vertical Powder Coating

Cube is equipped with a new V-shaped powder coating booth with fast color change, one of the most important innovations from SAT. The design locates the powder spray guns on both the right and left of the profiles, enabling the system to spray them from both sides. This results in a cloud of powder that surrounds the aluminum profile, so that the powder is given more time to stick to the profile. Due to its geometry—along with an accurate air extraction system—the V-shape design allows for an improvement



Profiles on track to Cube powder coating booth.

of the powder penetration and deposition efficiency, as well as a reduction of powder consumption by about 20%.

Another advantage is that the Cube compact powder coating line is able to perform quick color changes. The booth's self-cleaning walls are constructed of sliding belts that through rotation make cleaning a continuous process. Due to this design, cleaning is fully automated and operator intervention is not required. With the quick color change system, the booth can be cleaned and ready to coat with a new color in only 5 minutes. This aspect is fundamental in order to provide high efficiency and flexibility in production.

In order to meet increasing repeatability requirements in the finishing industry, SAT developed innovative process control and supervision software. Since repeatability of the coating can only be obtained through higher automation, the dedicated supervision software is able to control all the important variables involved in the process in real-time.

The system, which includes the software and a system of cameras, recognizes the profile sections as they move through the powder coating line. With basic data (painted area, shape complexity, etc.), the software assigns each section a specific recipe that optimizes not only

the coating process (the powder guns in the booth are individually controlled for a better application), but also all ancillary stages (pre-treatment, drying, and curing). Based on this recipe, the setting will change according to the profile. For example, the dosing of chemicals in the pre-treatment tanks can be calculated according to the actual surface load on the line. The result is a highly repeatable process, with every section always coated according to the correct parameters and thus no need to place specifically skilled staff to operate the line.

Conclusion

Cube perfectly represents the idea of innovation at SAT, which derives from the company's constant efforts in research and development. Being a worldwide leader in the surface finishing market for aluminum profiles, SAT has introduced many of the innovations recognized nowadays as worldwide standards, such as cascade pre-treatment and fast color change in a coating booth.

SAT's most recent Cube contract was to Australia for the fifth compact vertical powder coating line sold in that country this year. With more than 40 plants sold since it was introduced in 2013, Cube was and continues to be a resounding success for the company.