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**Opening photo:** Muskita Aluminum Industries, a Cyprus-based company that has recently celebrated 60 years of activity, has been at the forefront of the global aluminium extrusion and finishing market for years, with systems for architecture designed by itself or developed based on customer projects.



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# Muskita Aluminium Industries: Quality from the Starting Point

Alessia Venturi **ipcm**<sup>®</sup>

Muskita, a Cyprus-based manufacturer of aluminium profiles and accessories, has a history of success. The history of a firm that has turned its technology investments into a weapon to conquer the global market starting from a little corner of Europe. The history of an obsession with the quality of raw materials

and processes, which made it one of the few, if not the only company that has never had any complaint about the durability of its finishes or the filiform corrosion of its profiles in the last fifteen years, i.e. since it adopted a chrome-free pre-treatment process. The weather conditions of Cyprus are among the most challenging for aluminium:

high solar radiation, high humidity and salinity, large amounts of dust settling on structures at night, and continuous dilations and contractions of substrates due to temperature changes. This is a lethal mix for the durability, colour retention, and corrosion resistance of finishes. Thanks to its technological and process

choices, Muskita has been at the forefront of the global aluminium market for years, with systems for architecture designed by itself or developed based on customer projects (ref. Opening photo). Its quality-oriented approach did not change even following the serious financial crisis that hit Cyprus in 2013, causing numerous companies to collapse. This firm's entrepreneurial ability, passion for aluminium, and great technical expertise have enabled it to go back to producing, although below its capacity, exporting all over the world, and investing in technology.

In the last two years, Muskita has invested in energy efficiency, installing an economiser that recovers the extrusion

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heat and uses it to warm the diathermic oil that feeds a steam generator, which, in turn, heats the two fixing tanks of the anodic oxidation line. The company has also invested in production and it will soon add a fourth 20,000-ampere oxide tank to the three 16,000-ampere ones already present on the anodic oxidation line, bringing the total capacity of the plant to 68,000 amperes (Fig. 1). Finally, Muskita has invested in an accessory phase of the coating process, greatly affecting productivity, energy efficiency, and operational safety: it has installed a paint stripping system to treat its profile hanging hooks, choosing the technological evolution of the Fastrip ISP machine produced by Alit Technologies



Figure 1: Overview of the anodic oxidation line.





(San Bonifacio, Verona, Italy – **Fig. 2**). The system will help increase the speed of its coating line and it will enable the company to significantly reduce energy consumption and process costs. This is crucial for a company like Muskita, bearing much higher costs for energy supply than in the rest of Europe.



**Figure 2: The paint stripping system to treat its profile hanging hooks, technological evolution of the Fastrip ISP machine produced by Alit Technologies, is Muskita's latest investment.**

## Sixty years of success

### Muskita Aluminium

Industries, which recently celebrated sixty years in the aluminium industry, is currently led by Demos G. Mouskis, one of founder George Mouskis' sons. "At the beginning of the 1960s, Muskita was among the first industrial companies in Europe to introduce aluminium. My late father George saw aluminium for the first time at a fair in Switzerland in 1963 and he had the brilliant idea of bringing back some samples of metal to promote that light but highly ductile and resistant material with architects. It was difficult to move them away from the conventional wood and steel materials, but he succeeded," says Demos Mouskis (**Fig. 3**). George Mouskis threw himself headlong into the design of new systems for architecture, adapting

existing ones to local climate and needs but above all to the new material. Muskita implemented its first anodic oxidation plant in 1965. "In 1985, the company installed its first extrusion plant and, one year later, powder coating with a horizontal plant. In 1990, the firm

– especially island countries, such as Great Britain, Ireland and so on, which have the same logistic and supply difficulties as Cyprus and where we can even out our competitors' advantages on the mainland."

The firm was listed on the stock exchange in the past, but for some years now it has gone

back to being an entirely private capital company. "In 2004, we took a big step: after twenty years of continuous expansion, we needed to rationalise our spaces and production flows. We have reorganised our production, created an automatic profile warehouse (**Fig. 4**), replaced our anodic oxidation line, and installed a vertical powder coating system (**Fig. 5**)," says Demos Mouskis. "Muskita offers products that have never



**Figure 3: Demos G. Mouskis, Executive Chairman, with his daughter Anna, Marketing Manager.**

had any filiform corrosion problem even in the harshest environments. There are two reasons for this success: the exclusive use of primary aluminium for extrusion and the collaboration with highly skilled partners, with which there is a continuous exchange of knowledge and experience."

In 2013, Muskita suffered the Cypriot financial crisis: due to the failure of national banks, the economy was at a standstill and a turnover reduced by 60%. "That period tested all of us and shook Muskita from the ground up. However, today we are back to working well, although far below our potential and with slower exports. On the other hand, these moments of slow production are often the most creative ones: we have diversified our range and we have developed new products and services. And here we are, once again at the forefront of the global aluminium market".

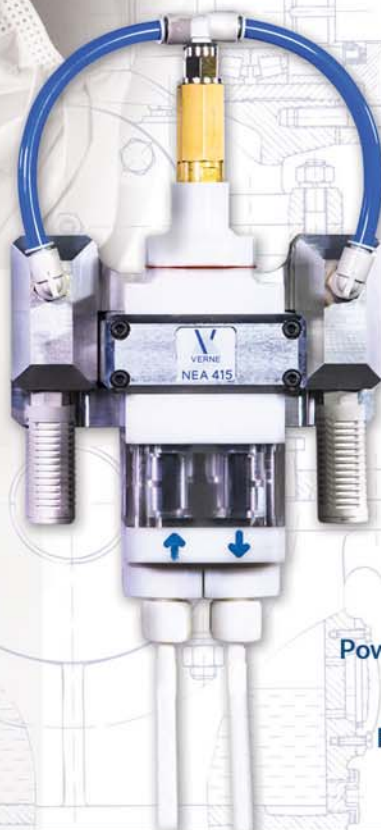
**“Muskita has invested in an accessory phase of the coating process, greatly affecting productivity, energy efficiency, and operational safety: it has installed a paint stripping system to treat its profile hanging hooks, choosing the technological evolution of the Fastrip ISP machine produced by Alit Technologies (San Bonifacio, Verona, Italy). The system will help increase the speed of its coating line and it will enable the company to significantly reduce energy consumption and process costs. This is crucial for a company like Muskita, bearing much higher costs for energy supply than in the rest of Europe.”**

### Quality as a mission

"The choice of primary aluminium for extrusion largely affects our products' performance. However, quality can only be achieved through a production process that is quality-oriented in all its phases," says plant manager Andreas Marcou. "It makes no sense to certify the pre-treatment phase, if the substrate is of poor quality or if non-compliant raw materials are used in other process steps. Quality is a system, and it should be treated as such. We only use primary aluminium for extrusion because we do not want to contaminate our warehouse with extruded parts that are not of high quality, but also because its advantages in terms of higher



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Figure 4:  
The large  
automatic  
profile  
warehouse.

Figure 5:  
Overview of  
the vertical  
powder  
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**Figure 6: Athens Olympic Stadium, one of the prestigious projects in which Muskita was the protagonist.**

extrusion speed, less waste, better oxidation and painting quality, less use of chemicals, and above all lack of complaints from customers compensate for its greater purchase cost,” explains Marcou. “Quality also entails the selection of reliable partners, with technologically advanced

but stable and easy-to-use products. We cannot afford to request daily technical assistance, because we are on an island and the response time of our suppliers is clearly longer. That is why we have decided to rely on one provider of pre-treatment and

anodic oxidation products and we chose Alufinish.”

“Our collaboration with Muskita started about ten years ago, when they decided to implement a chrome-free pre-treatment process,” says Loris Rossi, representing Alufinish. “We currently supply 75% of their anodising products. Over the years, there has been a continuous exchange of experience and technical knowledge between Muskita and us. This has enabled us to develop highly stable anodising products, which allow them to work in complete autonomy. Muskita’s oxidation process is perfectly fine-tuned, so much so that their grey range is one of the most beautiful on the market. For their pre-treatment phase prior to coating, we provide them with our chrome-free conversion product Alficoat 748/3, an easy-to-use product that ensures excellent corrosion resistance and is GSB and Qualicoat approved. We also supply them with all chemicals used upstream of the conversion process: also in this case, Muskita chose a high quality solution by implementing a both acid and alkaline pre-treatment process to obtain maximum resistance performance.”

**“Muskita implemented its first anodic oxidation plant in 1965. In 1985, the company installed its first extrusion plant and, one year later, powder coating with a horizontal plant. In 1990, the firm completed the process with the addition of thermal cutting and assembly machines, long before the issue of European regulations on energy efficiency. The in-house extrusion also started the era of aluminium exports: its production capacity exceeded domestic demand.”**



**Figure 7: The anodic oxidation tanks.**

“**Alufinish collaboration with Muskita started about ten years ago, when they decided to implement a chrome-free pre-treatment process. Alufinish currently supplies 75% of their anodising products. Over the years, there has been a continuous exchange of experience and technical knowledge between Muskita and Alufinish. This has enabled Alufinish to develop highly stable anodising products, which allow them to work in complete autonomy.**”

### The production process: a global quality system

Muskita is a plant engineering company: it designs and produces in-house architectural profiles based on its own systems or tailored to customer needs, offering design support and technical advice. An example of this was the coverage of the Athens Olympic Stadium (**Fig. 6**), designed by Santiago Calatrava, for which Muskita supplied 250 tonnes of powder-coated extrusions.

“We have two extrusion lines, 2,200- and 2,800-ton presses,” says Andreas Marcou. “Since we are located on an island, we must maintain a very large stock in order to always offer a quick and punctual delivery service. Our automatic raw material warehouse has 1,300 slots and it can store up to 2,000 tonnes of profiles. When orders arrive from customers, the planning department determines the profiles to be picked up and sent to the oxidation (**Fig. 7**) or coating station. Once assembled through thermal cutting, the end products are sent to our four warehouses located in the main cities of the Country: Pafos, Larnaca, Limassol, and Nicosia. The standard size of our profiles is 6.5 metres, but we can oxidise or paint parts up to 7.2 metres in length upon request. We can also supply raw profiles up to 9 metres.” Muskita’s coating station is a vertical plant provided by SAT and equipped with a cascade pre-treatment station and two SAT booths featuring 20 GEMA guns each with a traditional Venturi system (**Fig. 8**).

The pre-treatment process includes four active stages: acid attack, alkaline attack, acid neutralisation, and chrome-free conversion. Each stage includes three rinses with mains water, except the last one, which is performed with demineralised water. “Our pre-treatment process is Qualicoat Seaside certified. We preferred a cascade system

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Figure 8: Detail of Gema guns with traditional Venturi system.

“Muskita’s coating station is a vertical plant provided by SAT and equipped with a cascade pre-treatment station and two SAT booths featuring 20 GEMA guns each with a traditional Venturi system. The pre-treatment process includes four active stages: acid attack, alkaline attack, acid neutralisation, and chrome-free conversion. Each stage includes three rinses with mains water, except the last one, which is performed with demineralised water.”



Figure 9: Using hooks that are perfectly suited to each coating process is fundamental in a quality system: it is the only way to ensure perfect electrostatic conductivity. That is why properly paint stripping all hooks between one cycle and another is crucial.



**“The Fastrisp ISP system installed at Muskita’s premises is a 6-metre long chemical stripping tank, with a capacity of 2 tonnes of product and with a hook immersion depth of 30 cm. It is the first tank of this type to have a wall heating system with diathermic oil. The stainless steel tank is jacketed and it contains a circuit fed with electrically heated diathermic oil, which guarantees very low operating costs and optimal temperature maintenance.”**

because, although spraying ensures more uniformity on the outside of the workpieces, the cascade process allows to pre-treat also the inside of profiles,” explains Marcou. “For us, guaranteeing a Seaside quality level means to use first-choice metal, correct pre-treatment processes, and Qualicoat Class 2 coatings. That is the secret for not receiving any complaints for corroded or chalking profiles. Also the choice to use only Class 2 paints stems from our quality policy: we do so also for our wood-effect finishes obtained by sublimation, where we use films of the same quality.”

For Muskita, colour is crucial, too. “Our main supplier, accounting for about 70%, is Sherwin Williams with the brand Syntha Pulvin. We also use colours from Akzo Nobel’s Futura and Structura ranges. Together with Gl Color, finally, we have developed a 12-tint collection called “Colours of Earth” as well as all wood-effect finishes obtained by sublimation. In total, we manage about 100 colours, plus the ones that we have formulated by our partners on request,” says Andreas Marcou.

### **Fastrisp ISP: paint stripping contributes to quality**

Using hooks that are perfectly suited to each coating process is fundamental in a quality system: it is the only way to ensure perfect electrostatic conductivity. That is why properly paint stripping all hooks between one cycle and another is crucial, too (Fig. 9). “Before installing Alit’s machine, we used an induction system that did not guarantee perfect cleaning results and above all modified our hooks’ metal structure, thus

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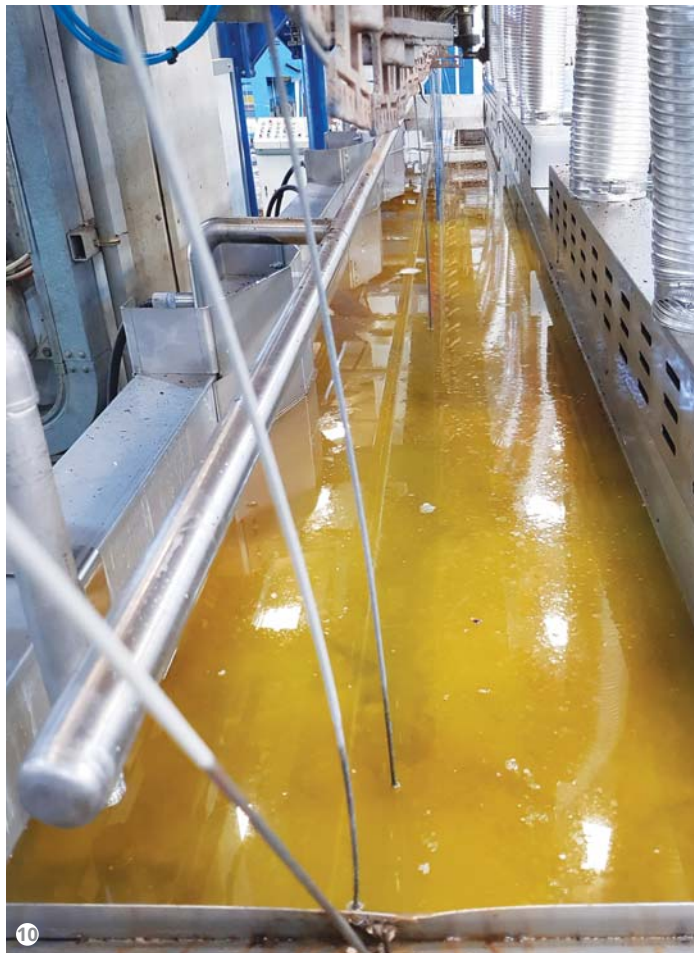




causing their embrittlement and therefore hanging safety issues," states Marcou. "Alit's system was convincing in terms of productivity, but also of efficiency and environmental impact."

The Fastrisp ISP system installed at Muskita's premises is a 6-metre long chemical stripping tank, with a capacity of 2 tonnes of product and with a hook immersion depth of 30 cm. It is the first tank of this type to have a wall heating system with diathermic oil (**Fig. 10**). "The stainless steel tank is jacketed and it contains a circuit fed with electrically heated diathermic oil, which guarantees very low operating costs and optimal temperature maintenance," says Alit Technologies CEO Loris Rossi (**Fig. 11**). "The tank can be completed with a water rinse module to remove the residual paint stripping oil and with an infrared lamp module for drying. The active paint stripping solution should never be changed, because the system is designed to be in balance: two products are used, one for the tank and one for feeding. Management is simple: the sludge is filtered by a filter press that produces a dry residue to be disposed of."

"The length of the machine is determined by the maximum chain speed. A 5-metre tank would have been enough for us, but we chose to install a 6.3-metre tank because it will enable us to increase the speed of the vertical plant with



**Figure 10: The stripping tank is 6 meters long.**



**Figure 11: From the left Andreas Marcou, plant manager of Muskita, Alessia Venturi of ipcm® and Loris Rossi, CEO of Alit Technologies.**

a slightly higher cost," says Andreas Marcou. "This tank can withstand a speed of 2 m/min: we now operate up to 1.75-1.80 m/min, but we are ready for any possible increase in productivity in future. After the first few weeks, we are pleased with both the machines' ease of management and its deep cleaning results. The unloading operators no longer have to tear off the hooks from their housings due to an increase in size caused by badly removed paint."

### **A never-ending success against all odds**

"Muskita never stops investing. Always being a step forward and offering impeccable quality and service are our weapons to convince customers that we can provide high precision engineering products even from the South Eastern frontier of Europe. We are a small company,

but with huge expertise in terms of aluminium and its processing" ends Demos Mouskis. "Despite facing higher energy costs than our competitors, scarcity of water, strict discharge regulations and considerable non-current assets related to raw material, we do not stop, we do not cease to invest, and above all we do not give up offering the superior quality level and competitiveness that distinguishes us." ○