



The New LEBA Process with Nanoprom Chemicals' Nanocoating Ensures Complete Recyclability of Aluminium

From an interview with

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As a company specialising in finishing treatments for aluminium and light alloys, LEBA 1974 developed its new Nalucoat treatment with the Polysil nanocoating patented by Nanoprom Chemicals, an environmentally friendly alternative to traditional surface treatments.



According to the European Chemicals Agency (ECHA), nanomaterials are “chemicals or materials composed of particles with at least one dimension between 1 and 100 nanometres”. However, not everyone agrees with this definition because, in many cases, their peculiarity lies in the innovative functions that these materials take on thanks to the presence of nanoparticles rather than in their size.

The development of nanotechnology applied to surface coatings has characterised the work and success of Nanoprom Chemicals (Sant'Antonio di Casalgrande, Reggio Emilia, Italy) and recently led it to develop a new application called Nalucoat in partnership with LEBA 1974, a start-up from San Genesio e Uniti (Pavia, Italy) founded to channel over fifty years' experience in the field of aluminium and light alloy surface treatment with a view to sustainability. “In the late 1990s,” explains Nanoprom CEO Gian Luca Falletti, “our company started developing silicon-based nanomaterials applied to all surfaces needing to be protected: polymer-based structures, metals, alloys, and glass. The quality leap came with the industrialisation by a famous multinational packaging company of Polysil, a product that we developed and that it still uses for protecting its steel, aluminium, and glass-made production plants around the world.”

Nanoprom Chemicals has been developing silicon-based nanomaterials to be applied to all surfaces since the late 1990s



Gian Luca Falletti, CEO of Nanoprom Chemicals.



Ivan Bonvini, CEO of LEBA 1974.

From submarines to satellites: nanotechnology appreciated in all fields

"Polysil has the same qualities as glass," says Falletti. "Therefore, all surfaces, be they made of gelcoat, fibreglass, metal, or other substrates, can be recovered or preserved from wear in the same way as the material on which it is deposited, ensuring excellent corrosion resistance and high hardness. In addition, due to reduced surface tension, surfaces become resilient to dirt."

The application potential of this nanotechnology coating is almost endless. "From submarines to satellites, from water to air, this technology can be applied by dipping or spraying, with traditional or latest-generation devices, on any type of product and it can perform different functions depending on customer requirements." Thanks to Polysil's flexibility, throughout its history Nanoprom has been awarded in various sectors, including naval, aeronautics, automotive, food, military, cosmetic packaging, and above all Formula One, to name but a few. "Based on the experience gained from the various applications of Polysil and with the collaboration of LEBA 1974, we have recently patented a nanocoating

application for treating and functionalising aluminium. It is an environmentally sustainable alternative to conventional surface treatments such as electroplating and anodising and it guarantees 100% recyclability of coated parts. It consists of a streamlined, waste-free, 3-stage coating cycle including pre-coating, application, and curing."

Features and benefits of Nalucoat

"As experts in sustainable surface treatments for aluminium and light alloys," says LEBA 1974 CEO Ivan Bonvini, "we were looking for a coating that would maintain the tactile characteristics of this particular metal, but at the same time be environmentally friendly in terms of both energy consumption and waste. We did not find any other process that guaranteed the same component sustainability and recyclability degree as Nanoprom's nanotechnology coating. Therefore, we adopted this aesthetic-functional permanent finishing treatment with very low thicknesses, based on a nanocomposite coating whose main element is silicon dioxide from quartz sand, abundantly present in nature, which allows producing completely recyclable and recoverable



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components.” “One of the advantages of this new process,” explains Falletti, “is that a Nalucoat-coated component can be immediately returned to the melting crucible for recycling and metal recovery, without requiring any further surface treatment.” Indeed, as Falletti adds, “Silicon dioxide (SiO₂), of which our product is composed, does not affect the remelted primary alloy as it only negligibly varies the titration of silicon. It is not overcoatable, but it can be supplied in any colour required. We collaborate with leading pigment manufacturers to meet the most complex requirements and develop new innovative effects. After pre-treatment, our product can be applied in one coat at room temperature by spraying or dipping, just like conventional paints; it is cured with 20% humidity and it is dust-free in 10 minutes, even at 20 °C. The tests we have carried out guarantee a salt spray resistance value of up to 700 hours.”

Innovating behind the scenes

Not only its ability to develop a new technology in the field of nanomaterials, but also its business model have determined Nanoprom’s success. “We have a presence in many sectors,” states Falletti, “but not everyone knows us, because our main objective is to develop technologies to be then promoted and disseminated by our customers. It is only in the military, aerospace, and Formula One fields that we intervene directly and, in general, we do so to solve the innumerable difficulties generated by surface treatments with our nanocoating. We have paved the way for previously unimaginable developments, finding innovative solutions for manufacturers in a wide variety of industries with a constantly updated method that our customers can adapt from time to time. So far, we have accepted and won every challenge presented to us and we are ready to be put to the test every day in future as well.” ○



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LEBA 1974 has created the new Nalucoat treatment for aluminium using the Polysil nanocoating patented by Nanoprom Chemicals.



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