

# Chrome plating without toxic Cr(VI). An eco-friendly electroplating for automotive plastic parts.



The project **freeCr<sup>6</sup>plat** is funded by the SME Instrument of the EU Commission. The project was selected in the call of May 2018, and it has started on 1<sup>st</sup> of September 2018 with the number of grant agreement 829535. The project is being developed by Avanzare Innovacion Tecnologica SL, a Spanish SME, a leader in the field of Nanomaterials.

Plating plastic is a common technology used in order to reduce the weight and cost of a car, and so that plated parts have an appealing appearance together with good corrosion resistance. For many years, the technology was based on the use of a high content of a toxic and cancer-causing compound called *chromium (VI)*, which is a heavy metal and is a probed carcinogenic compound. It is considered toxic for plants, animals and humans. EU has restricted their use under REACH directive, however due to the lack of alternatives, this technology is still in use.



Chrome plating without  
toxic Cr (VI)

Eco-friendly  
electroplating for  
automotive plastic parts

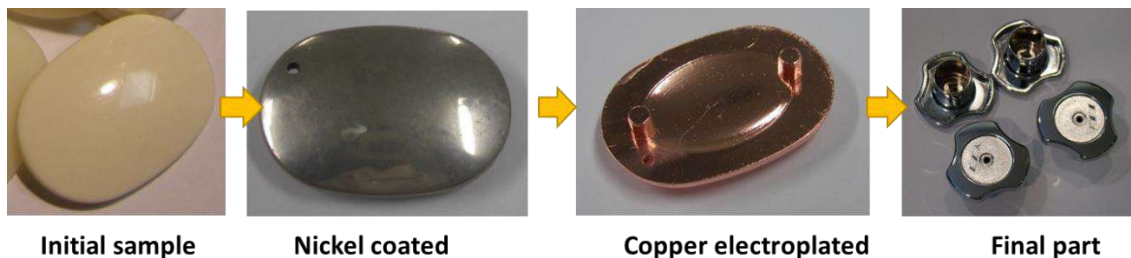
Unique and complete  
solution

**freeCr<sup>6</sup>plat** proposes a revolutionary technology for plating plastics, eliminating the use of *chromium (VI)*, and creating an eco-friendly methodology for electroplating. The project is focused generally on many industries and especially on automotive industry, where *chromium (VI)*, is used usually and which is one of the most profitable markets for electroplated parts. The project offers a unique and complete solution to the removal of this toxic material. Moreover, one of the most important advantages of the project is that the proposed technology does not imply a change in the facilities, only in the chemicals used for obtaining the same results.

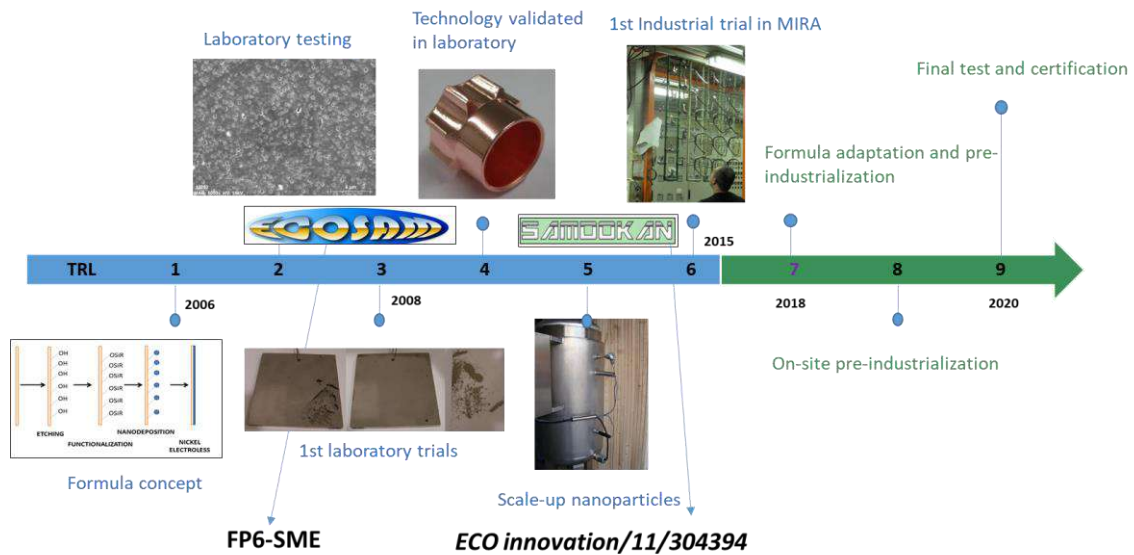


Quality and flexibility	Environment	Cost
<ul style="list-style-type: none"> <li>✓ High adhesion</li> <li>✓ Resistant and appealing finishing</li> <li>✓ Wide range of plastic materials</li> </ul>	<ul style="list-style-type: none"> <li>✓ Cr(VI) free</li> <li>✓ 30% less chemical use</li> <li>✓ 35% less water use</li> <li>✓ 50% less energy consumption</li> </ul>	<ul style="list-style-type: none"> <li>✓ 25% less process timings</li> <li>✓ 20% less water treatment costs</li> </ul>

**freeCr<sup>6</sup>plat** is not only an environmentally friendly technology by eliminating the chromium (VI), but the technology also reduces the use of chemical substances in a 30%, the use of water in 35% and a reduction of energy consumption in 50%. Further, this new treatment has a several properties that makes it superior to the use of Chromium (VI) such as quality and flexibility, high adhesion, and a resistant and appealing finishing. Besides that, the technology can be applied in a wide range of plastic materials. In addition, the solution helps reduce the timing of the process in a 25%, together with a 20% reduction of cost in water treatment.



**freeCr<sup>6</sup>plat** is based on proprietary Molecular Self Assembly (SAM) nanotechnology creating a market innovation for plating many types of polymer and reducing the huge environmental impact of those toxic substances. The process is based on different steps: mild oxidation in order to create roughness in the surface to help in the second step of self-assembly of bifunctional molecules, after that the deposition of the layer of nickel electroless that will help in the following steps of creating the final electroplated sample.



**freeCr<sup>6</sup>plat** started in the year 2006 with the participation of Avanzare Innovacion Tecnologica SL in ECOSAM project funded by EU Commission under the umbrella of FP6 Programme. The technology was validated in the laboratory 2009. Avanzare participated in SAMDOKAN project of the Eco-innovation Programme from 2012 to 2015, where the first attempts to industrialization were developed. Avanzare Innovacion Tecnologica SL will proceed with the **freeCr<sup>6</sup>plat** industrialization of the process, and it will develop the first attempts to place the product in the market after the final testing and the certification of the product.