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Development of nanostructured coatings for anti-reflective properties on polymeric substrates

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Nowadays, a continuous security improvement in automotive industry is desirable for every stakeholder, due to the possibility to create an even more pleasant experience for end-user while driving, being the feeling of safe travel on top of the most important concerns for drivers. Regarding this, the development of new functionalities on car components is a key to answering those issues. Particularly, there has been a growing interest in the development of nanostructured coatings on polymeric or glass substrates that can combine several functionalities such as scratch and abrasion resistance, anti-reflection behaviour, anti-fogging and anti-fingerprint properties, which can be developed by a wide range of technologies.

This work aims to achieve a proper functionalization of different substrates, through Reactive Pulsed DC Magnetron Sputtering Technology. It is intended to develop a thin film, mono or multilayer, with the above-mentioned characteristics, namely improved optical performance and mechanical resistance maintaining the low weight and even a certain degree of flexibility such as standard polymeric substrates. With this work, it is possible to prove the decrease in the number of intermetallic layers to achieve new good optical performance of nanostructured coating onto plastics and glass substrates.

To ensure and validate the obtained results, some characterization tests were performed, like measuring of surface energy and optical measurements (e.g. transmittance) and morphological analysis (SEM, AFM and profilometry).