The faculty of Engineering of the Vrije Universiteit Brussel invites you to attend the public defense leading to the degree of

**DOCTOR OF ENGINEERING SCIENCES**

of **Mariana Paz Martinez-Viademonte**

The public defense will take place on **Tuesday, 7th June 2022 at 5:00pm** in room D.2.01 (Building D, Humanities, Sciences & Engineering Campus).

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**THE ROLE OF ANODISING IN THE PERFORMANCE OF CORROSION PROTECTION SYSTEMS FOR AEROSPACE APPLICATIONS**

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Abstract of the PhD research

Chromates have been used for decades in the aerospace industry due to their outstanding corrosion protection performance. Chromates are however known carcinogenic agents and therefore, their use has been restricted and will be completely banned in the near future in the scope of the REACh regulation. In the early 2000s, tartaric sulfuric acid anodising (TSA) was introduced in the frame of the chromic acid anodising (CAA) replacement. Hexavalent chromium however, was not only present in the anodising electrolyte as it can also be found as a corrosion inhibitor in corrosion protection primers and paints.

While a lot of research has been conducted on the primer formulation to replace hexavalent chromium, the focus of this work is on the further development of the current tartaric sulfuric acid anodising process to optimize it for the application of Cr(VI)-free basic primers, thereby generating a comprehensive mechanistic knowledge of the system anodic oxide – basic primer.

To achieve this objective, it is proposed to study the relation between the anodic layer morphology, chemistry, anodising process and pre-treatment with primer adhesion, pH-stability of the oxide and overall long-term corrosion performance.

This PhD thesis has been carried out in collaboration with Airbus.