

---

**Comparative study of different worldwide materials for prosthodontic restoration****A. Rico-Cano<sup>1\*</sup>, N. Florido-Suarez<sup>1</sup>, A. Saceleanu<sup>2</sup>**<sup>1</sup>University of Las Palmas de Gran Canaria, Las Palmas de Gran Canaria, Spain<sup>2</sup>Lucian Blaga University, Sibiu, Romania

**M**any alloys are available for prosthodontic restorations and among them nickel-based alloys are widely used in the porcelain-fused-to-metal and casting crown and bridge. This is due to their simple fabrication process, low cost and, not less important, to their corrosion resistance. Even the nickel-chromium alloys form a thin protective oxide film on the surface, they show unstable galvanic corrosion and also they corrode in physiological solutions such as balanced salt, human saliva, artificial saliva and artificial sweat solutions. Despite all these, the use of Ni-Cr dental alloys is increasing. Many types of Ni-Cr alloys are found in the world markets and contain Fe, Mo, Mn, Cu, Nb, Al and Si in their composition. The present paper made a comparative study of six Ni-Cr dental alloys from USA, Romania and Germany using microstructure analysis, Open Circuit Potential (EOC), Potentiodynamic Polarization and EIS technique. All alloys examined are under the influence of an anodic control, due to the formation of protective layers, most likely of oxide, on the surface of the alloys. The alloys studied can be divided into two categories according to the type of corrosion observed. A uniform general corrosion behavior that was found at the surface of the two Ni-Cr alloys and a localized in points corrosion found in the others Ni-Cr alloys. In terms of susceptibility to corrosion, findings in this study show from the impedance spectra analysis that all alloys investigated have more than adequate corrosion resistance in artificial saliva.

**Keywords:** dental alloys, corrosion, Ni-Cr, EIS**Biography:**

Alberto Daniel Rico Cano is Ph.D student at the Mechanical Engineer Department of Las Palmas de Gran Canaria. Master in renewable energies at the Universidad Europea de Canarias in 2019 and degree in Mechanical Engineering at the ULPGC in 2018. He worked designing the European Comision Sustainable Energy and Climate Action Plan (SECAP) for two councils of Gran Canaria as energy advisor, participated in two research conferences and has published two articles on a new biomaterial.