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## Studying the Absorption Rate Between Corthocryl & Polyester Resin Used for Prostheses Manufacturing Diesel Environment

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### Abstract

composites have become increasingly popular in orthopedic structures due to their high strength-to-weight ratio and biocompatibility. These materials are commonly used in implants, prosthetics, and other orthopedic devices. However, the long-term performance and durability of carbon composites in biomedical applications are not fully understood, therefore this study discusses the aging of two different types of resins: corthocryl and polyester, against an aggressive diesel environment. In this case, in order to determine weight gain or loss, particularly at the microscopic level, the specimens were exposed to diesel and weighed weekly for one month, resulting in four measurements for each medium. A microscopic study (MEB) was conducted to better understand the weight gain phenomena. The results were compared to assess the aggressiveness of the liquid on both resins. The liquid absorption curves did not follow the Fickian type, instead showing progressive absorptions followed by leaching at the end of the experiments for the polyester resin. On the other hand, a desorption was observed for c-orthocryl resin. Polyester had greater absorption than c-orthocryl, while resin corthocryl exhibited faster physical leaching despite lower absorption. The microscopic study revealed preferential paths for liquid propagation in the material, attributed to the resin properties and the infusion molding process used.

**Keywords:** Absorption, c-orthocryl, polyester, diesel, orthopedics