

# **Comparison of sustainable cooling systems used in the drilling repair of Mg-Al and Mg-Ti multi-material parts in the aeronautical industry**

D. Blanco Gómez; E. M. Rubio Alvir; M.A. Sáenz Nuño; R.M. Lorente Pedreille

## **Abstract-**

**The article presents as a novelty a comparative study of the efficiency of different sustainable cooling systems in the re-drilling repair process of magnesium-based multi-material components for aeronautical and lubricant with eco-fluid (MQL-Eco), cold compressed air (CCA) and cryogenic machining. Multi-materials used are magnesium-aluminium and magnesium-titanium combinations. The study uses descriptive statistics and ANOVA to conclude the significant factors and interactions. Conclusions highlight differences depending on the type of response variable chosen. The best results for Mg-Al-Mg are obtained using MQL-Eco, and for Mg-Ti-Mg with cryogenic machining.**

**Index Terms-** Multi-material; Machining; Cooling; Sustainable

Due to copyright restriction we cannot distribute this content on the web. However, clicking on the next link, authors will be able to distribute to you the full version of the paper:

[Request full paper to the authors](#)

If your institution has an electronic subscription to Tribology International, you can download the paper from the journal website:

[Access to the Journal website](#)

## **Citation:**

*Blanco Gómez, D.; Rubio, E. M.; Sáenz-Nuño, M.A.; Lorente-Pedreille, R.M. "Comparison of sustainable cooling systems used in the drilling repair of Mg-Al and Mg-Ti multi-material parts in the aeronautical industry", Tribology International, vol.175, pp.107804-1-107804-32, November, 2022.*