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ABSTRACT:

Enhancing Safety and Sustainability in Art Restoration: The GREENART Approach

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The GREENART (GREen ENdeavor in Art ResToration) project, part of the HORIZON Europe Programme, proposes new advanced materials and chemicals to preserve, conserve, and restore Cultural Heritage. The primary goal is to create safe and effective solutions—such as gels, cleaning agents, protective coatings, consolidants, packaging materials, and sensors—for both corrective and preventive conservation of cultural heritage. These solutions utilize low-impact materials derived from renewable natural sources or recycled waste.

In this context, and considering the objectives outlined in the EU Green Deal, it is imperative to adopt a comprehensive approach to identify solutions that promote safer and more sustainable restoration. Building on the sustainability framework of the H2020 NANORESTART project and the new EC framework for Safe and Sustainable by Design (SSbD) chemicals and materials, GREENART proposes a stepwise three-stage approach to assess safety and sustainability performance of its innovative solutions throughout their entire life cycle. The primary goal of this approach is to provide a systematic guidance for the design of safer and more sustainable products.

The initial stage consists of a hazard assessment of GREENART ingredients and formulations. The second stage incorporates a screening sustainability assessment that encompasses relevant indicators for safety, sustainability, and functionality across five lifecycle stages: Raw materials, Production, Application, Post-Application, and End of Life. Finally, in the third stage, Life Cycle Assessment (LCA) and Life Cycle Costing (LCC) are utilized to estimate environmental and economic impacts along the life cycle of the most promising innovative solutions, comparing them to currently existing solutions.

The implementation of a Life Cycle Safety and Sustainability Assessment within the GREENART project is aimed at translating and testing the efficacy of the SSbD framework in the specific professional sector of art restoration and is expected to contribute to the development of criteria for chemicals and advanced materials designed for the conservation of cultural heritage.