EVALUATION OF PINNING MATERIALS FOR MARBLE REPAIR

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Abstract

The practice of repairing marble with pins is one that is widely used throughout the fields of both art and architecture conservation. Traditionally, stainless steel has been the most commonly used pinning material, and is widely recommended for such use. However, little to no research has been done to confirm the benefits of this practice, and there is a lack of information regarding the use of alternative materials, which could be better suited for the job. An important variable in the assessment of these materials is Young’s Modulus, also known as the elastic modulus. The modulus is an expression of the relative stiffness of a material and is determined by finding the slope in a specific region of a stress-strain curve. This thesis addresses the gap in knowledge by testing a variety of materials with a wide range of elastic moduli in order to determine which material is best suited for use in marble repair. Marble cores were cut and repaired with pins then subjected to compression/shear tests to evaluate the performance of the pin and its effects on the marble.

This work was completed in conjunction with the Metropolitan Museum of Art’s Sherman Fairchild Center for Objects Conservation and Department of Scientific Research. Additional laboratory testing took place at Princeton University’s Center for Complex Materials.