



## **The effect of elevated temperature on the strength parameters of silica acid ester consolidated porous limestones**

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The porous limestone is one of the most widespread construction materials of the monuments in Central Europe, with emblematic buildings in Vienna, Bratislava, Budapest and many other cities of Austria, Slovakia, Czech Republic and Hungary. The restoration of these monuments very often requires the consolidation of the porous limestone material, where various types of consolidants are used to strengthen the highly weathered stone. Our research focused on the understanding of the behaviour of consolidated porous limestone when the material is subjected to higher temperatures. Test procedure included the preparation of cylindrical test specimens from the Miocene porous limestone which was followed by consolidation by four various types of silica acid ester. The samples after consolidation were heated to 300 and 600 °C in electric oven. The material properties such as ultrasonic pulse velocity, density were tested before and after the treatment. Indirect tensile strength (Brazilian test) was used to compare the strength parameters of non treated and consolidated samples. Silica acid ester treated samples after heating were also measured in terms of strength, density and ultrasonic pulse velocity. The results show that there are significant changes in strength of various pre-treated samples after heating indicating the sensitivity of the materials to temperature changes and accidental fire.