



## **Monitoring of the Heat and Moisture Transport through Walls of St. Martin Cathedral Tower in Bratislava**

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Historic monuments are subject to degradation due to exposition to surrounding meteorological conditions and groundwater. Construction of buildings consists of the plaster and material components that have porous structure. Processes like heat transport, moisture diffusion, moisturizing and drying; freezing and thawing can be found in such structures depending on environmental conditions. Monitoring of the temperature – moisture regime gives a picture on the processes running in the structure. Long term monitoring of the tower of St. Martin Cathedral in Bratislava have been performed under window sill of the belfry in exterior in south orientation. Principle of the hot-ball method is used for monitoring of the temperature and thermal conductivity. The thermal conductivity of the porous system depends on the pore content. Moisture sensors are constructed from the parent material in a form of cylinder. Sensors are calibrated for dry and water saturated stage prior installation in the walls. Monitoring has been carried out in plaster and in the masonry in a distance about 10 cm from the wall surface, where sensors are installed. Information on temperature, moisture and thermal conductivity can be gained from measured signal. Use of two sensors allows estimation on heat and moisture transport through the wall. Monitoring has been performed in the period from April 2013 up to July 2013. Monitored data are correlated to the meteorological data. Details of various effects will be discussed.