

## PRACTICAL APPLICATION OF THE MICROWAVE OVEN IN THE GEOTECHNICAL LABORATORY

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Received: 15.10.2018; Revised: 16.04.2019; Accepted: 23.04.2019

### Abstract

The main purpose of the paper is to present the usefulness of microwave ovens in the everyday work of geotechnical laboratories. Microwave ovens are commonly used to determine soil moisture and to dry soils that are too moist for other laboratory tests. The activities related to the above processes are not standardized in the majority of countries. The only available guidelines are based on the research projects. For the purpose of this particular research 345 tests have been conducted for moisture content determination for 3 soil types: fine sand (FSa; SP – poorly graded sand), sandy gravel (saGr; GW – well graded gravel-sand mixtures) and silty clay (siCl; CH – inorganic clay of high plasticity), using both – standard and microwave methods. The research cycle consisted of 3 different variants which includes soil moisture content, specimen initial mass, number of specimens in microwave oven and their placing. It was established that different factors have impact on the length of the process and it lasted between 2 to 17 minutes. During the heating different undesirable phenomena were observed, e.g., soil explosions or melting and glowing of clay. Based on the above research results this paper introduces guidelines for the soil drying process in the microwave oven (the optimization of the procedure and handling of the dried samples).

**Keywords:** Clay; Conventional oven; Drying time; Gravel; Microwave oven; Moisture content; Sand; Specimen mass; Specimens number.