

# A Preliminary Study for the Correlation Between Physical Properties and Ultrasonic Pulse Velocity of Fired Clay Samples

İlker ÖZKAN<sup>a\*</sup>, Zeliha YAYLA<sup>a</sup>

<sup>a</sup>Dokuz Eylül University, Torbalı Vocational School, Industrial Glass and Ceramics Department, İzmir, Turkey

## Abstract

The aim of this study is to establish a correlation between physical properties and ultrasonic pulse velocity of clay samples fired at elevated temperatures. Brick-making clay and pottery clay were studied for this purpose. The physical properties of clay samples were assessed after firing pressed clay samples separately at temperatures of 850, 900, 950, 1000, 1050 and 1100°C. A commercial ultrasonic testing instrument (Proceq Pundit Lab) was used to evaluate the ultrasonic pulse velocity measurements for each fired clay sample as a function of temperature. It was observed that there became a relationship between physical properties and ultrasonic pulse velocities of the samples. The results showed that in consequence of increasing densification of the samples, the differences between the ultrasonic pulse velocities were higher with increasing temperature. These findings may facilitate the use of ultrasonic pulse velocity for the estimation of physical properties of fired clay samples.

**Keywords:** Brick-making clay, Pottery clay, Physical properties, Ultrasonic pulse velocity, Correlation.

\*Corresponding author. Dokuz Eylül University, Torbalı Vocational School, Industrial Glass and Ceramics Department, 35860 Torbalı-İzmir, Turkey. Tel.: +90 2328531820; Fax: +90 2328531606.

E-mail address: [ilker.ozkan@deu.edu.tr](mailto:ilker.ozkan@deu.edu.tr)

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