



## SUBJECT DATASHEET

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| <b>Semester:</b>                    | 2010/11/2   |
| <b>Subject:</b>                     | Material engineering examinations laboratory practice |
| <b>Code:</b>                        | VEMKSIB238A   |
| <b>Responsible department:</b>      | Institute of Materials Engineering                    |
| <b>Responsible department code:</b> | MKSI  |
| <b>Responsible lecturer:</b>        | dr. Tamás Korim                                       |

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### Educational objectives:

Demonstrate quality assurance methodologies and measurement technique of the silicate industries.

### Detailed content of the subject:

Investigation of the compaction methods of powders (axial pressing, isostatic pressing, dye-casting); comparison of the physical properties of green and fired samples (strength, density, porosity); Rheological investigation of suspensions; Investigation of the surface area of powders by Blaine's method; The effect of comminution (crushing, grinding) on particle size distribution; determination of particle size distribution by different methods; Investigation of plastic ceramic raw materials: plasticity (by Pfefferkorn's method or by using a plastometer) shaping characteristics (potter's wheel, pressing, casting ? electrolyte sensitivity; Effect of heat treatment on the physical properties of clay-based products Drying: shrinkage, sensitivity, kinetics of drying Firing: shrinkage, water uptake, bulk weight, porosity; Investigation of the chemical resistance of surface coatings and of structural materials by X-ray diffraction and electron microscopy; Measurement of thermal dilatation (dilatometry): body/glaze match; Strength determination Destructive (compressive strength, flexural strength) Non-destructive (microhardness, ultrasonics investigation); Investigation of microstructure by scanning electron microscopy; Investigation of the frost resistance of samples by Powers' method; Qualitative and quantitative investigation of raw materials by thermal methods; Measurement of thermal conductivity of various products (Bock's apparatus); Setting, hardening, soundness of cementitious materials; Investigation of plaster materials; Determination of zeta potential; Colour of silicate products: colouring agents, colour measurement systems, Characteristic points of viscosity vs. temperature plots in glasses (Littleton's point, dilatation T<sub>g</sub>).

### Requirements:

### Required and suggested references:

Tamás F.: Szilikátipari laboratóriumi vizsgálatok, Műszaki Könyvkiadó, Budapest, 1970 Tamás F.: Szilikátipari kézikönyv, Műszaki Könyvkiadó, Budapest, 1982 Riesz L.: Cement- és mészgártási kézikönyv,



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Építésügyi Továbbképző Központ, Budapest, 1989 Knapp O. - Korányi Gy.: Üvegipari kézikönyv, Műszaki Könyvkiadó, Budapest, 1964 Kakassy Gy. et al.: Durvakerámiáipari technológia, Műszaki Könyvkiadó, Budapest, 1979 Somodi Zs. et al.: Finomkerámiai technológia, Műszaki Könyvkiadó, Budapest, 1984 Klingsberg: Physics and Chemistry of Ceramics Uhlmann: Glass. Science and Technology a tanszéki munkaközösség által összeállított laboratóriumi jegyzetek, aktuális szabványok