Oral Presentation
Block C1

Scientific-technical-topic:	***Knowledge of products and their applications***
Title:	**The use of surface topography measurements for ceramic tile surfaces**

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Abstract:

For metal substrates surface topography characterisation for quality control and product development is a well established method. To use the full potential of this method for ceramic applications, the measurement set up and the settings have to be adapted to the specific nature of the ceramic surface. The development of these setting in the light of new measurement technology, the interpretation and validity of the acquired results and the use of these measurements to analyse surface quality, surface defects as well as to asses functional aspects, like wear and slip resistance characteristics will be highlighted.
Standardized 2D tactile methods have proven to have only limited use to capture the heterogenic nature of the ceramic surface. Elaborate measurements have to be performed to statistically capture all surface elements, defining the surface design. The height of the structures and profiles may cause a problem to use the tactile method. New optical 3D measurement technology allows a more efficient capture of the ceramic surface, given the right settings, most important of which the filtering of the acquired primary data.
Filtering of measured profiles, using different wavelengths, provides the possibility to capture different degrees of surface texture, from micro roughness to macro scale waviness. The requirements for these settings, based upon the existing 2D standards, and their influence on the measured surface parameters, like average roughness, profile peak values and material portion curves, will be discussed. The 2D and 3D measurements of ceramic surfaces will be compared.
The interpretation of these parameters will be discussed using practical examples. The reproducibility of different parameters to describe the tile surface quality for ceramic production control is evaluated by comparing measurements within production lots. The impact of surface defects on the measurement and the consequent possibilities for defect characterisation are shown.
Changes in topography due to wear can be measured for quantitative laboratory as well as large scale assessment. The use of a special adapted duplication technology for the measurement of local surface effects and defects, without destructive preparation of samples from existing floorings, is presented.
A first assessment of quantitative changes in surface parameters correlating to changes in the slip resistance of tiles is displayed. These preliminary results have been integrated in the SlipSTD European collective research project to design slip resistant standard surfaces with defined surface characteristics. The project will be briefly introduced.
The perspectives of the described developments will be presented, as well as the future standardisation for 3D topography measurements, affecting the use for tiles as well as the use of the measurement for other ceramic applications.

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