

The Commercial Characterisation of Dimension Stones Through the Use of Multivariate Statistics: the Case Study of the Bitti Granites (North-Central Sardinia, Italy)

CAPPELLI A., VIOLO M., University of Rome "La Sapienza", I.C.M.M.P.M. Dept., Via Eudossiana, 18, 00184 Rome, ITALY

This paper deals with the commercial characterisation of granites from the Bitti zone (Sardinia) and its scope is to find some correlation between the different varieties exploited in the abovementioned mining basin and the physical, chemical and petrographical characteristics of the stone. The aim is to identify a general methodology for the technical-scientific characterisation of the commercial quality of the rock under study.

Chemical, physical and petrographical analyses were effected on each variety of granite, while the slabs were investigated also from the aesthetic point of view with the help of image analysis. Colour indices were thus defined, together with the dimensional homogeneity of the crystals and the presence and frequency of eventual macroscopic defects

All the measured variables were analysed with the help of multivariate statistical techniques in order to identify which of these were the most important in defining the aesthetic quality of the stone. By projecting the variables on factorial levels the factors of the Multiple Correspondence Analysis show a clear correlation with a number of characteristics of the stone: factor F1 seems correlated to the mineralogical composition of the granites, in particular to the percentages of Qz, K/Na-feldspars and femic minerals, while F2 shows a strict correlation with both the petrographical and commercial classes of the slabs. The factorial variable F3 appears tied above all to the characteristics of colour and to the dimensional homogeneity of the crystals. An evident correlation between the presence of macroscopic defects in the slabs and the F2 factor is also made clear.