

The Granite Market in Greece

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The extraction, exploitation and trade of marble are among of the most important comparative advantages of Greek economy. However, despite the presence of many granitic bodies of various sizes in Greece, no granites are extracted systematically. As a result, the domestic demand of granites is almost totally covered by imports of either raw or processed granite. This has a serious impact to the trade gap of granites, which increases over the last fifteen years. Data on the Greek granite market are presented and evaluated, in order to elucidate the current trends. According to these, the demand for granites and the penetration of granites in the marble-granite market appear to increase over the period 1992-2008. The main factors that affect the demand for granites are the number of hotels built and the net per capita disposable income of the consumers and to a less extent the number of new and renovated dwellings.

Natural radioactivity of granites from Aegean islands (Atticocycladic Zone)

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Twenty three granite and granodiorite samples from the Atticocycladic Zone have been measured for their natural radioactivity in order to assess the radiological impact in case they are used as building materials. More specifically, the activities of ⁴⁰K, ²²⁶Ra and ²³²Th in Bq kg⁻¹ were measured. The investigated samples have been taken from Tinos, Mykonos, Paros, Delos, Serifos, Lavrio, Naxos and Ikaria, including any possible rock type found in these regions. The activity concentrations of ⁴⁰K, ²²⁶Ra and ²³²Th of the investigated samples exceeded the average level of these radionuclides in soil and other kinds of building materials. However, this is typical for granitic rocks, because they contain U- and Th-rich minerals in higher amounts than other building materials. In order to assess the health risk of using the above samples as building materials, the following indices proposed by the EC and UNSCEAR were calculated: absorbed gamma dose rate (D_a), annual effective dose (H_E), activity index (AI) and gamma-ray index (I_γ). The calculation of the above indices is based on the standard room model, proposed by UNSCEAR which implies a room with dimensions of 3X3X3m, having infinitely thin walls, without doors or windows and being fully constructed of granite. The absorbed gamma dose rate (D_a) of all the investigated samples lies above the limit proposed by the EC which is 80 nGy h⁻¹. However, two samples from Ikaria and one sample from Naxos exceed the acceptable limit for the absorbed gamma dose rate which is 160 nGy h⁻¹ (199, 172 and 176 nGy h⁻¹, respectively). As far as the annual effective dose (H_E) is concerned, no sample exceeds the limit of 1 mSv y⁻¹. The activity index (AI) of the samples is below or equal to the limit of 1 Bq kg⁻¹, except one sample from Ikaria (1.2 Bq kg⁻¹). Finally, no sample exhibits gamma-ray index (I_γ) higher than 6 which means that the use of all the samples investigated could be recommended. More specifically, all the investigated samples from Tinos, Paros, Serifos, Lavrio and Delos should be exempted from all restrictions concerning their radioactivity, together with one sample from Mykonos, one from Naxos and two from Ikaria. On the other hand, the use of the rest of the samples taken from Mykonos, Naxos and Ikaria is recommended in local level, in exceptional cases. The average values of the above indices of the samples investigated is below the world average as it was taken from the literature, in the case of all indices. Moreover, the indices of the samples of

this study are by far lower than those of the imported granitic rocks in Greece. Therefore, at least from radiological point of view and for the investigated rocks, the granites from the Atticocycladic Zone can be used as building materials rather than the majority of the imported granites.

Tectonostratigraphic models of the Alpine tectonostratigraphic terranes of the Hellenides

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The tectonostratigraphic terrane analysis of the Hellenides has resulted in the distinction of nine terranes, representing five continental crustal blocks with pre-Alpine basement overlain by Alpine carbonate platforms and four Tethyan oceanic terranes with ophiolites and pelagic sediments. The tectonostratigraphy of the above terranes is related to their paleogeodynamic and paleogeographic evolution, which can be distinguished in three major stages: (i) A first stage of continental rifting in the northern margin of Gondwana, which is characterised by volcanosedimentary successions of Late Palaeozoic – Triassic. (ii) A second stage of continental drifting and of oceanic opening of Tethyan basins in between the continental terranes. This stage is characterised by the development of shallow-water carbonate platforms on the continental terranes and by ophiolite suites interlayered with pelagic sediments within the tethyan basins. The duration of this stage is Triassic – Paleogene. (iii) A third stage of docking of the tectonostratigraphic terranes along the active European margin, which is characterised by flysch sedimentation along the trenches developed in front of the evolving arc and trench systems. The duration of this stage is from late Triassic to Neogene. The timing of the transition from one period to the other for each terrane is shown by the different tectonostratigraphic formations observed in each case with distinction of two models: one for the continental terranes and carbonate platforms and another for the oceanic basins. In both cases the duration of each geodynamic stage for each terrane is obtained from the chronology of the tectonostratigraphic facies change. Thus, the rifting stage comprises the ages of the successive volcanosedimentary formations, the drifting and oceanic opening stage comprises the ages of the carbonate platforms and of the ophiolites and associated pelagic sequences respectively and the docking stage comprises the ages of the flysch formations. The general trend is younger ages observed in the southern terranes and older ages towards the northern terranes. The two alternative tectonostratigraphic models are applied in the two groups of terranes with indication of the different timing of each formation, corresponding to the different geodynamic-paleogeographic stages. The period of drifting of each terrane can be used as a dimensional indicator of the Tethyan width that was covered by the terrane motion across the ocean (e.g. 190 Ma for the Tripolis platform but only 110 Ma for the Pelagonian platform).

Tectonostratigraphic observations in the western Thrace Basin in Greece and correlations with the eastern part in Turkey

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New observations on the Tertiary tectonostratigraphy of the western part of the Thrace Basin in Greece enabled the distinction of several tectonostratigraphic formations ranging between Middle Eocene and Late Oligocene. The first major conclusion was that two NE-SW trending dextral strike-slip fault zones – the Soufli FZ in the south and the Ardas FZ in the