



## **Granodiorite - one of the most significant Slovenian natural stones**

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The paper provides a description of the petrographic and mechanical characteristics of granodiorite from the Pohorje Mountains (NE Slovenia) and of its use as a natural stone. This stone, which is a calc-alkaline igneous rock of Miocene age (18.7 Ma), is characterised by its grey colour and by its thick white aplite-pegmatite veins. It mainly consists of plagioclase, quartz, and K-feldspar, which are light coloured constituents, with biotite and a small amount of hornblende as dark coloured minerals. Some other minerals are found in traces, among which pyrite is considered to be the most problematic. However, due to the presence of a small amount of arsenic, the pyrite is quite stable and not prone to alteration. In Slovenia currently two quarries are located in granodiorite, both protected as valuable natural geological features; an active quarry at Cezlak which is the largest quarry in magmatic rocks in Slovenia and the abandoned quarry in Josipdol. Granodiorite is considered the highest quality natural stone in Slovenia. It is characterised by high density, low water absorption, and low open porosity, so that it exhibits high frost and salt resistance, as well as a high compressive strength and an extremely high flexural strength, which is due to its pronounced oriented structure. It is widely recognized throughout Slovenia by its durability and its decorative white veins, and is currently the most frequently used natural stone in Slovenia. It is mainly used as paving and cladding material for residential buildings, churches, and other structures, as well as for squares, thus giving a special character to many of Slovenia's largest towns and cities. Several important buildings are decorated by means of this stone, such as the Slovenian Parliament, the Republic Square business complex, the Maximarket department store, and the Faculty of Law of the University of Ljubljana, all of which are located in Ljubljana, some of them having been declared as cultural monuments of national importance. Since 1940 granodiorite has also been widely used by sculptors for various monuments and fountains. An unusual type of degradation of cladding panels, in the form of bowing, was detected on the façades of the above-mentioned Maximarket, which was constructed in 1971. This phenomenon is one among the very few documented cases of the bowing of magmatic rocks.