



## **Quartzite of historic buildings in Brazil: designations and degradation patterns**

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Quartzite dated with ages between 2.60 and 1.75 Ga were used in historic buildings in Brazil, almost exclusively in Minas Gerais. Dating from the eighteenth and nineteenth centuries, these buildings can be viewed in the cities of Ouro Preto and Tiradentes, as well as part of the architectural complex of the old Colégio Caraça, located in the homonymous ridge. Here, the quartzite used is the oldest (approx. 2.60 Ga). Designated as Cambotas, the material crops out in the vicinity of the complex. On the other hand those quartzite used in the constructions in Ouro Preto are stratigraphically from the Moeda Formation (between 2.6 and 2.56 Ga), or from Itacolomy Group (between 2.12 and 1.75 Ga). The first, designated Lajes, is exposed in the Ouro Preto Ridge, while the second, designated Itacolomy, crops out in the homonymous ridge. In buildings of Tiradentes were employed quartzites with ages also from Lower Proterozoic. They belong to the Tiradentes Formation and are exposed in the São José Ridge, near the city. In these regions, where these monuments were built, the metamorphic rocks of sedimentary origin predominate and it can be affirmed that resulted from a low-grade metamorphism (schists and phyllites from the greenschist facies). The quartzite occur associate and consist essentially of quartz, but may show different contents of accessory minerals such as mica, kyanite and opaque minerals (iron oxides). Depending on the content of mica can show planar structures. Structures of the sediment phase can still be observed, such as banding by compositional variation or other such as cross bedding. The different degradation patterns of these quartzite occur singly or in combinations and were influenced by the textures and structures of these rocks. From all those patterns, the most common has to do with chromatic modifications of the stone materials (patina) occurred due to varying degrees of oxidation and formation of hydroxides. Because of this, the quartzite can show variations of hues ranging from white to yellowish, reddish or orange tones. The observed quartzite, when consisting essentially of quartz grains usually have granoblastic texture and contacts between the grains can be serrated, lobed or straight (polygonal arrangement). Depending on how these grains are juxtaposed, the type of degradation most observed was the disintegration of the granular type (sanding) and whose intensity and extent shown to be quite variable. When show content in micas, forms of detachment can be observed, ranging from delamination to exfoliation or just the separation of submillimetric to centimetric elements, the flakes or scale, parallels to the stone surface and not following any stone structure. Loss of materials with changes of stone surface due to partial or selective weathering, missing parts due to various influences, cracks and fragmentation at the stone surface, blistering, efflorescence, sub-efflorescence and the presence of crusts due to deposits of soot and dust, including those from microbiological origin, are other degradation patterns for the studied rocks.