

## Study on relationship between water content, NIR absorbance and colour values of various stones and cement mortars

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This study examined the relationships between water content, absorbance, and color values in various building stones and mortar cements. The rocks used are; Shirahama sandstone, Oya tuff, Savonniere limestone, Shirakawa welded tuff, Tago sandstone, while cement mortars used are sulfate resistant Portland cement (SRPC) and normal Portland cement (NPC), NPC mixed with silica fume (SF) and fly ash (FA). Those rocks and mortars are cut into rectangle with the size of 5 cm-5 cm-15 cm. Firstly, the specimens were dried at 110 degrees for 24 hours, and then, they were immersed in distilled water in 24 hours. Then, they were taken from the distilled water and weighed to calculate water content and porosity. By using moisture measurement apparatus (JE-130, JE Engineering Co. Ltd.) with near infrared ray (NIR), absorbance values were measured and weight with elapsed time. In the same way, L\* values were also measured by using colorimeter (CM-700d, Minolta Co. Ltd.) with elapsed time. The relationship among water content, absorbance values, L\* was compared for each specimen. As a result, it is turned out that the values of absorbance increase with increasing water content, whereas the values of L\* increase with decreasing water content.

Keywords: near infrared ray (NIR), water content, colour measurement