ECONOMICAL AND TECHNICAL ANALYSIS OF VOLCANO SAND AS ABRASIVE ALTERNATIVE IN SHIPYARD

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ABSTRACT

In the most of construction company which are very concern to HSE (Health, Safety And Environment), the usage of abrasive types which containing dangerous chemical compound has been prohibited. For the example is quartz sand because this abrasive has chemical compiler element of $\text{SiO}_2$ in the form of silica crystal and this element can cause silicosis to blasting operator later. There are so many substitution abrasive alternative has been used by construction company or offshore fabrication. There are garnet, steel grit, or crushed glass. Nevertheless, from those abrasives examples are commonly expensive and used by any shipyard rarely.

The emerge of another alternative, volcano sand as abrasive material, brings new episode of secure, economical, and convenient abrasives. Therefore, in this research some calibration method will be held in order to prove the advisability of volcano sand as material abrasive alternative. There are two main testing, technical and qualitative. The technical test consist of two methods, there are vial test and conductivity test and qualitative test consist of four methods there are cleanliness test, dust level test, anchor profile test and bresle test. Not only check about technical and qualitative capability, but also counting the manufacturing cost of volcano sand until the blasting cost estimation predictively counting by shipyard.

From this research, that volcano sand free from grease or oil and has conductivity level 41 $\mu$S/cm with salt ion level 31.2 mg/m$^2$. Volcano sand also has surface cleanliness level Sa 2.5, anchor profile level 75 µ and dust level class #2 with respirable dust when blasting is level 3.04 mg/m$^3$. This level makes volcano sand reasonable to use as another alternative abrasive with spend Rp. 75.737 per m$^2$ for the blasting expense estimation.

Keywords: Blasting, Volcano sand, Abrasives