

Study of Siltstone Powder

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A study to investigate the feasibility to use siltstone powder provided by Eidsvold Siltstone Pty Ltd as a pozzolanic material.

A total of 10% siltstone powder was used in replacement of cement for making mortar samples. Two other mortar mixes were also prepared as benchmark.

1. One mix contains of 100% Portland cement as the binder.
2. In another mortar mix, 10% silica fume was used in replacement of cement.

The addition of silica fume can increase the strength of concrete. Thus, the silica fume is commonly used for making high performance concrete. The wholesale price for silica fume is 387 \$/t based on a recent quote.

For all mortar mixes, the water to binder ratio was kept as 0.45 and the sand to binder ratio was 1.5. To obtain a workable mix, the same dosage of water reducer was added to all mixes during mixing.

The compressive strength tests were performed on 50 x 100 mm cylinders. Specimens were tested at ages of 3 and 7 days.

For each mix, 3 specimens were tested and results are presented in Fig. 1 and Table 1. It can be seen that mortars containing siltstone powder and silica fume developed higher strength as compared to the pure cement mortar. This indicates that siltstone powder has a potential for being used as a pozzolanic material.

At 7 days, the strength of siltstone mortar is 12% lower than that of silica fume mortar, but 14% higher than that of the cement mortar.

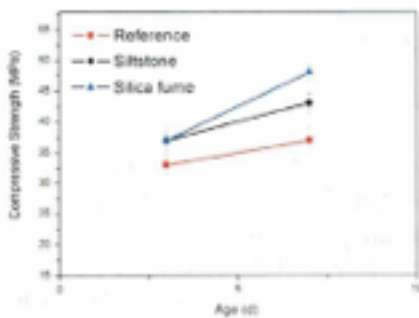


Fig. 1 Compressive strength results



Fig. 2 Furnace for heating sample

Table 1 Compressive strength results

	3 day strength (MPa)	7 day strength (MPa)
Reference	33	37
Siltstone	37	43
Silica fume	37	48