

**Appendix for:**  
**Performance assessment of Alccofine with silica fume, fly ash and**  
**slag for development of high strength mortar**

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**Procedure for Determination of Efficiency Factor ( $k$ )**

Efficiency factor is an attempt to evaluate strength contribution of a given mineral admixture in relation to that of cement. Thus, the obtained number would indicate the parts of cement that can be replaced by the mineral admixture without any change in strength. Following procedure can be adopted for the determination of efficiency factor,  $k$ .

1. The Abram's law stated in Eq. (A1) is first applied to control and blended specimens and the empirical parameters  $A$  and  $B$  are determined.

$$\sigma = \frac{A}{B^{\frac{w}{c}}}, \quad (A1)$$

where  $A$  and  $B$  are empirical constants.

2. The obtained values of  $A$  and  $B$  can be used to plot the variation of strength as function of  $w/c$  ratio. ( $w/b$  ratio in case of blended specimens). The schematic representation for variation in strength of control and blended specimens is shown in Fig. A1:

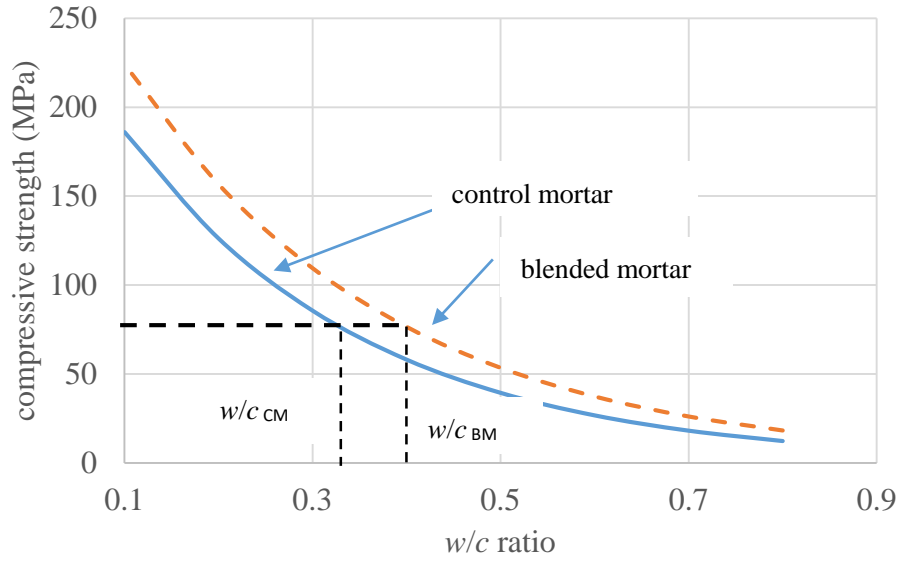


Fig. A1 Schematic representation for variation in strength of control and blended specimens.

3. Corresponding to the strength of control mortar, the difference in  $w/c$  ratio of control and blended mortar specimen can be evaluated.
4. The difference in  $w/c$  ratio ( $w$ ) between control mortar ( $w/c_{CM}$ ) and blended mortar ( $w/c_{BM}$ ) is correlated with the efficiency factor ( $k$ ) as in Eq. (A2):

$$\Delta w = w/c_{CM} - w/c_{BM} = (w/c) \left[ \frac{1}{1+k\frac{f}{c}} - \frac{1}{1+\frac{f}{c}} \right], \quad \dots\dots\dots (A2)$$

where  $c$  and  $f$  represent the quantity of cement and supplementary material used.

The Eq. (A2) is used to evaluate the efficiency factor ( $k$ ). The above procedure will have to be repeated for each curing period and the type of mineral admixture.