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سلسلة أساسيات الخرسانة

الإضافات الإسمنتية

السيليكا فيوم (المايكروسيليكا) – الجزء الثاني

Silica Fume – Part II

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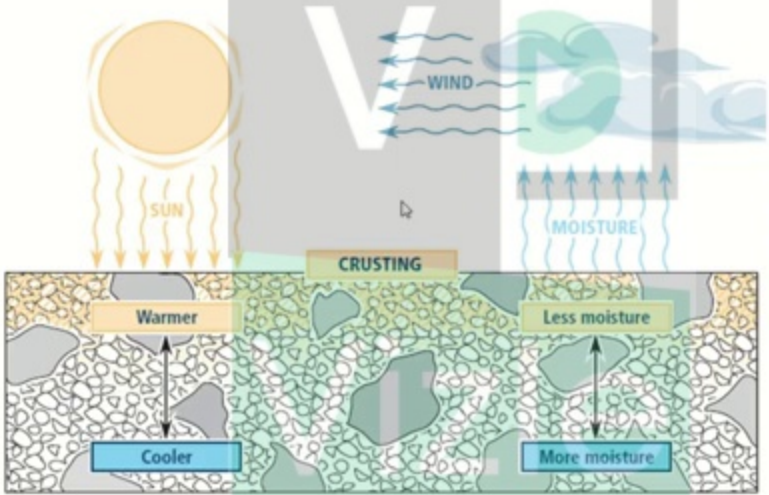
Effects of Silica Fume on Fresh Concrete properties

Properties	Effect of Silica Fume
Water Requirements	Increases
Workability	Decreases
Bleeding and Segregation	Decreases
Air Content	Decreases
Heat of Hydration	Varies
Setting Time	No to little effect
Finishability	Varies
Pumpability	Increases
Plastic Shrinkage Cracking	Increases



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Effects of Silica Fume on Plastic Shrinkage cracking

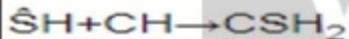


Effects of Silica Fume on Hardened Concrete properties

Properties	Effect of Silica Fume
Strength Gain	
Early Strength	Increases at 1 , 3 and 7 days
Ultimate Strength (at 28 days)	Increases
Late Strength (at 56 days and 91 days)	Little effect
Durability	
Permeability	Decreases
Drying Shrinkage	Little effect
Carbonation	Decreases
Sulphate Attack	Decreases
Steel Corrosion	Decreases

Effects of Silica Fume on Sulphate Attack

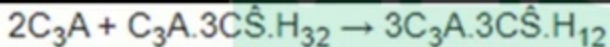
Sulfate ions that penetrate the concrete react with CH to form gypsum



Tricalcium Aluminate + Gypsum \rightarrow ettringite



when concentration of sulfate ions decrease the ettringite breaks down into monosulfates





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