

BENEFIT OF SILICA FUME

1) it forms additional binders = pozzolanic reaction

The hydration (mixing with water) of Portland cement produces many compounds, including calcium silicate hydrates (CSH) and calcium hydroxide (CH).

When silica fume is added to fresh concrete it chemically reacts with the CH to produce additional CSH. The benefit of this reaction is twofold; increased compressive strength and chemical resistance.

2) Ultra fine material (0,15 micron)= fill the gaps and voids increasing impermeabilità

Silica fume is 100 to 150 times smaller than a cement particle it can fill the voids created by free water in the matrix. This function, called particle packing, refines the microstructure of concrete, creating a much denser pore structure. Impermeability is dramatically increased, because silica fume reduces the number and size of capillaries that would normally enable contaminants to infiltrate the concrete.

3) Increase the binding point between cement matrix and fibers

The dissolved calcium hydroxide $Ca(OH)$ reacts with silice fume . So silice fume fills the voids and creates more binders and more binding points on the fibers

