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Strengthening Lightweight Concrete

Polymer impregnation substantially strengthens lightweight concretes. Vacuum soaking followed by radiation polymerization using a Co^{60} gamma source impregnates perlite concrete, foamed glass concrete, and mearlcrete with polymethyl methacrylate. This process improves the bond between the cement and aggregate and strengthens the cement phase.

With this process the concretes absorb polymer ranging from 31 percent (by volume) for foamed glass concrete to 49 percent for perlite concrete. Compressive strength of unimpregnated samples, generally, is less than 1000 psi. Compressive strength of most impregnated samples varies from 3000 to 6000 psi. Adding 15 percent polymer to concrete having an unimpregnated strength of 5000 psi increases its strength to the 18,000 to 20,000 psi range.

The lightweight concretes strengthened by the polymer impregnation process should be a useful development for the construction industry.

Note:

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Patent status:

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