



Fiber-Reinforced Concrete

Concrete, whether containing natural or waste glass aggregate, is relatively brittle, and its tensile strength is typically only about one tenths of its compressive strength. Regular concrete is therefore normally reinforced with steel reinforcing bars. For many applications, it is becoming increasingly popular to reinforce the concrete with small, randomly distributed fibers. Their main purpose is to increase the energy absorption capacity and toughness of the material. But also the increase in tensile and flexural strength is often the primary objective. While steel fibers are probably the most widely used and effective fibers for many applications, other types of fiber are more appropriate for special applications. For example, architectural and decorative concrete products will call for fibers with a minimum of visual impact, so that nylon or polypropylene fibers may be called for.

A wide variety of different types of fiber have been proposed for use in concrete. For each application it needs to be determined which type of fiber is optimal in satisfying the product specifications. This selection process has to consider whether the fibers are chemically and mechanically compatible with the cement matrix.

Instead of reinforcing the concrete with randomly distributed short fibers, fiber mesh or textile reinforcement is being considered for various applications. We are exploring ways to utilize such mesh reinforcement for thin glass concrete sheets, partition walls, table tops, etc.

Research Sponsors

- New York State Energy Research and Development Authority
- Echo Environmental, Inc., New York