

FIP 5 – MANAGING SAFETY IN FIBER-REINFORCED CONCRETE APPLICATIONS

The FRCA and its members are committed to being safety conscious with fiber reinforcement for concrete and encourage others to be the same. Fiber reinforcement provides advantages for the durability and performance of concrete. It is important that these advantages not overshadow the construction industry's safety responsibility in the use of fiber reinforcement.

Manufacturers, suppliers and users of fiber reinforcement must understand its potential impact on safety and play their part in ensuring that it is used safely during construction. This bulletin outlines some sensible measures to properly manage safety when using fiber reinforcement in concrete applications.

General Construction Site Management

Before any fiber product is used, the manufacturer's Safety Data Sheet (SDS) should be reviewed. As with any construction site that includes concrete work, management of safety with fiber-reinforced concrete (FRC) should be performed in accordance with applicable local, state or national codes. The following sections provide guidance in specific areas when FRC is used in a construction project.

Proper Storage of Fibers

Fibers are typically supplied in specially designed packaging or water-soluble bags that disintegrate during mixing to facilitate dispersion of the fibers throughout the concrete mixture. Therefore, fibers should be stored in clean, dry and secure areas in accordance with the fiber supplier's recommendations. Packaging that gets wet—in particular, water-soluble bags—can potentially lose integrity, leading to either spillage or waste.

FRC Production Facility

It is important to ensure that all procedures for adding fibers have been reviewed and discussed with all personnel and that fibers are safely and properly staged for addition into the concrete mixer to avoid fiber spillage. Any spillage should be noted, and appropriate action must be taken to clean up the spilled fibers.

Careful consideration of issues—including access to the mixer, height, safety barriers and interlocks—is needed to identify where and how to safely add fibers to the concrete mixer. Personnel should use fall protection devices when climbing ladders on ready-mix trucks to add fibers. Fiber weight and timing of addition also merit consideration due to the repetitive motion associated with fiber addition. Finally, proper personal protective equipment must be used in handling fibers—in particular, steel fibers.

Placement & Cleanup of Fiber-Reinforced Concrete

The placement and finishing of FRC is much the same as conventional concrete. Therefore, construction personnel should wear appropriate personal protective equipment, including safety glasses, gloves and safety shoes in good condition. Because stiff fibers can present a puncture hazard, puncture-resistant gloves and safety boots are also highly recommended.

Waste or leftover concrete in ready-mix trucks, pump hoppers and other equipment should be washed out and discharged into small chunks or sized for the removal equipment that will be used after hardening. Hardened FRC does not easily break apart, and any protruding fibers will remain firmly in place. When handling pieces of hardened FRC, personnel must be aware that stiffer fibers—in particular, steel fibers—can easily cause puncture wounds and, therefore, proper personal protective equipment must be used.