



TECHNICAL BULLETIN FC-6

FAQs ON FIBER TYPES AND MIXING PROBLEMS

Q: Are all macro-synthetic fibers the same?

A: No – There are several different types of macro-synthetics on the market all with individual benefits and advantages. Remember the old adage; “you get what you pay for”. The key to the successful use of a macro-synthetic fiber for replacement of WWM, rebar or steel fibers is the dosage rate. Stronger fibers or higher bonding fibers will likely require less material than weaker fibers or fibers with less bonding capacity. The manufacturer must support dosage values with testing information. If questions are still present, a trial should be performed to ensure the desired performance is met.

Q: Can high dosage micro-fibers be used in replacement of low dosage macro-fibers?

A: Possibly – Again, the key will be the dosage rate and the intended function of the fibers. The primary function of a micro-synthetic fiber is the control of plastic shrinkage cracks and research has shown that these fibers do not have a significant ability to carry load across a crack. While the test data may support the use of a micro-fiber, it may not be the best option. Secondly, high dosages of micro-synthetics will be more difficult to mix as the fiber counts and surface area of the fibers will be extremely high causing possible significant loss in slump.

Q: Why do fibers “ball up” in concrete mixes?

A: All fiber types (steel, micro and macro synthetic) have the potential to “ball up” in concrete. This phenomenon is usually caused by addition of fibers into concrete mixes that are too dry (slump decreases to zero) or into mixtures that do not have enough fine particles (cement, sand, supplemental materials, etc.) to coat the fiber particles, which in turn “paste starves” the system and again causes the slump to decrease to zero. Loose fibers in an empty drum may clump together and fiber types that are too long or have varying geometries may also cause problems. As always, a test trial should be performed to ensure that the mixture will support the fiber type and dosage and that the batching sequence will not cause any problems. If necessary, the use of a water reducing admixture may be warranted to maintain the desired slump for placement.

For additional questions, comments or further explanations, please feel free to contact The Euclid Chemical Company at your convenience.