



**EUCLID CHEMICAL**

## TECHNICAL BULLETIN FC-5

### FAQ'S ON STEEL FIBERS VS. SYNTHETIC FIBERS

**Q:** Can synthetic fibers actually compete “head to head” with steel fibers?

**A:** Absolutely – but be careful to understand the differences between micro and macro synthetic fibers. In general, macro-synthetic fibers (large, coarse, monofilament fibers) are the only synthetic fiber types that can provide equivalent residual strength capacity to steel fibers. Some steel fiber manufacturers are claiming that steel fibers are far superior to synthetic fibers and that synthetic fibers cannot be used to replace steel fibers. These manufacturers are partially correct in that they are making a comparison to micro-synthetic fibers only (fibers for plastic shrinkage crack control only) and not to macro-synthetics such as TUF-STRAND SF.

**Q:** Steel fibers are stronger than synthetic fibers; How can synthetics be considered equal?

**A:** Macro-synthetic fibers, such as TUF-STRAND SF, have lower tensile strengths and Modulus of Elasticities than steel fibers but will have a much higher fiber count across a potential crack. In effect, the total strength across a crack should be equivalent. This strength is also dependent on the ability of the fiber to bond to the concrete matrix itself. A very high tensile strength fiber that does not bond to concrete will not perform as a good fiber candidate. TUF-STRAND SF, through its unique ability to self-fibrillate, maximizes its tensile capacity through a high surface area, to which it bonds to the concrete, making it one of the premium macro-synthetics on the market.

**Q:** What advantages does TUF-STRAND SF have over steel fiber counterparts?

**A:** Providing that an adequate fiber design has been performed, the use of TUF-STRAND SF will generally require as much as 5-10 times less weight of material making on-site handling and storage much easier. TUF-STRAND SF is non-magnetic and non-corrosive making it a very attractive option for exterior paving projects where aesthetics and safety may be a concern. As TUF-STRAND SF is mixed, it also becomes somewhat pliable and will not be as abrasive or harmful to pumping lines and equipment.

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