EUCLID CHEMICAL

A CONTRACTOR'S GUIDE TO

FIBER REINFORCEMENT PRODUCTS

PSI™ FIBERSTRAND™, TUF-STRAND™ AND PSI™ STEEL

Fiber Reinforced Concrete (FRC) is becoming more common in flatwork construction, pavements, precast concrete and shotcrete applications with new work in elevated deck construction, residential, commercial and industrial projects. The Euclid Chemical Company provides a dedicated staff of sales and engineering professionals to aid contractors in the proper specification, selection and application of fiber reinforced concrete.

Using Fibers = Better Concrete = Less Callbacks

Using fibers will make concrete less prone to plastic and drying shrinkage cracking which leads to more durable and long-lasting projects. Other fiber types can actually speed up construction time and for some applications completely eliminate the need for conventional reinforcement such as rebar and wire mesh.

WHY USE FIBERS?

- Fibers in concrete provided by Ready-Mix and Precast producers help prevent plastic shrinkage cracks, creating more durable concrete.
- Compared to wire mesh, fibers can provide the same level of reinforcement and will be evenly distributed throughout the concrete.
- FRC allows for faster construction times and lower labor costs, saving time and money.
- With no chairs to support wire mesh or conventional steel, FRC will provide a safer and more efficient work environment.
- FRC will finish smoothly with common tools - any fibers present at the surface will quickly wear away under foot and vehicle traffic.
- Fibers are well recognized by major concrete organizations and have been tested to industry leading standards.
- FRC will provide longer lasting and more durable concrete which reduces future maintenance costs and liability.

WHICH FIBERS & FOR WHAT APPLICATIONS?

PSI FIBERSTRAND fibers are used for plastic shrinkage crack control and are ideally suited to secondary reinforcing applications for slabs and precast concrete. They are available in various sizes and lengths of monofilament and fibrillated polypropylene, and nylon.

TUF-STRAND fibers can be used where an equivalent reinforcing option to steel fibers, wire mesh and light gage reinforcing bars are required in precast concrete, slabs on grade, elevated structures and shotcrete applications. Appropriate dosages are calculated by determining the engineering requirements of the existing design and providing an equivalent "strength to strength" option.

PSI Steel Fibers are used for replacement of conventional steel reinforcement and limited structural applications in precast concrete, slabs on grade, elevated structures and shotcrete applications.

PSI FIBERSTRAND and **TUF-STRAND** fibers meet or exceed the requirements of ASTM C1116 and D7508 which define the use of synthetic fiber reinforced concrete or shotcrete. **PSI Steel Fibers** also comply to ASTM C1116 and meet the requirements of ASTM A820, Standard Specification for Steel Fibers for Fiber Reinforced Concrete.

ACI 544 provides additional guidance on the use of fibers for concrete, including design, proportioning, placement and testing. Macro-synthetic fibers are also recognized within ACI 360 for reinforcement in slab on ground design.

TUF-STRAND SF is UL certified for composite metal deck construction to replace WWM at a minimum dosage of 4.0 lbs/yd^3 (2.4 kg/m^3). This minimum dosage is in accordance with the Steel Deck Institute and International Building Code.

CLASSIFIED UL

FIBER PRODUCTS AND RECOMMENDED DOSAGE RATES

PSI FIBERSTRAND
MICRO-SYNTHETIC FIBERS

PSI FIBERSTRAND MULTI-MIX 80, 100 and 150 products
Monofilament Polypropylene Fibers

- typically used at dosages of 0.5 to 1.0 lbs/yd^3
- for all concrete with no steel
- concrete with steel or wire mesh where fiber is in addition to steel

PSI FIBERSTRAND F
Fibrillated Polypropylene

- typically used at 1.5 lbs/yd^3
- replacement of 6x6 10/10 wire
- concrete where unspecified fibers are required for basic temperature and shrinkage crack control

Fibers listed above can be used for plastic shrinkage crack control; Recommended dosages have been tested to provide adequate protection

TUF-STRAND
MACRO-SYNTHETIC FIBERS

TUF-STRAND SF

- engineered fiber replacement with software assistance
- typically used at dosages of 3 to 20 lbs/yd^3
- UL certified for composite steel deck construction
- replacement of steel fibers, heavier gages of wire mesh and light steel rebar in various concrete applications

TUF-STRAND PX54

- typically used at dosages of 3 to 15 lbs/yd^3
- used in precast and shotcrete applications

TUF-STRAND MAXTEN

- typically used at dosages of 3 to 5 lbs/yd^3
- light gage wire mesh replacement
- non-performance specifications

PSI STEEL FIBERS
MACRO-STEEL FIBERS

PSI STEEL FIBERS
PSI C6560 Hooked End Steel Fibers and Other Blends

- typically used at dosages of 20 to 100 lbs/yd^3
- replacement of conventional steel reinforcement
- can be used in limited structural applications

OTHER TIPS AND USEFUL INFORMATION

SLUMP OF FIBER CONCRETE

Do not add water to increase workability as this will decrease compressive strength and potentially add air. Always work with the R/M producer to use a water reducing admixture to improve workability.

FINISHING FIBER CONCRETE

For "broom" finish surfaces, only make passes in one direction and do not overlap brush strokes. Do not start finishing too early as fibers can be pulled from concrete.

PLACING / PUMPING FIBER CONCRETE

Pumping fiber concrete is actually just as easy as plain concrete provided that a "pumpable" mix has been provided. When discharging from a truck to a pumper, raise the chute, if possible, and do not allow concrete to build up.

PROTECTING FIBER CONCRETE

Using fibers does not eliminate the need for proper curing and sealing of concrete. Use normal practices as specified in ACI and other related trade documents.

More fiber tips are available on the placement, finishing and use of Euclid Chemical's fiber products. Ask your Euclid Chemical sales representative for more information.