

FIBERMESH®

FINISHING TIPS

FIBERMESH® synthetic fiber, **ENDURO® 600**, **NOVOMESH®** fiber blend and **NOVOCON®** steel fiber reinforced concrete (FRC) slabs can achieve the same high-quality finishes as plain concrete. Whatever the required finish, satisfactory results can be obtained with synthetic and steel fibers if proper placement and finishing techniques are followed. As always, timing and technique are important when finishing fiber reinforced concrete slabs.

PLACING: Synthetic and steel fibers can be placed using conventional methods such as concrete chutes, buckets and pumps. FRC can also be extruded as well as being placed using shotcrete equipment.

WORKABILITY: The addition of fibers into concrete tends to reduce the slump of concrete. This reduction in slump is “apparent,” it appears to suffer from a loss of workability or it appears very stiff. The concrete can actually become very fluid with the use of vibration. The addition of fiber increases the “fine aggregate” surface area in the concrete matrix, also the fibers can hold aggregate in place (reduce segregation) this combination contributes to the apparent slump loss. A rough estimate is that the expected reduction in slump for about 1 inch (25.4 mm) for every 25 pounds per cubic yard (pcy) (15 kg/m³) of steel fibers or 3 pcy (1.8 kg/m³) of macro synthetic fibers. A trial mix is always recommended. Slump should be adjusted with water-reducing admixture. Additional water should not be added to the mix since this can lower the compression strength of the concrete.

STRIKE OFF: Manual, vibratory or laser screeds can be used during the strike off operation. Laser guided screeds and vibratory screeds ensure surface vibration, which brings paste to the surface and limits the possibility of exposed fibers.

BULL FLOATING: Magnesium floats are recommended to establish a smooth, level surface and can close up any tears or open areas that occur during the strike off operation. As with finishing any concrete, be careful not to overwork the surface. This will bring excessive fines to the surface and can cause crazing.

BLEEDWATER: Bleeding is the movement of water within the concrete to the surface due to gravitational displacement of cement and aggregate prior to initial set. Fiber reinforced concrete bleeds more evenly than plain concrete, so you do not experience the same “puddling” effect as with plain concrete. With uniform bleeding, it can seem that initial set has occurred and finishers may get on the concrete too early. The beginning of the finishing operation may need to be delayed to accommodate this uniform bleed characteristic. Wait until the bleedwater has evaporated and a finisher’s footprint leaves only a 1/4” (6mm) deep impression before finishing the concrete further. Otherwise, crazing, dusting or scaling may result. *(continued)*

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MACHINE TROWELING: Premature troweling has been proven to exhibit more fiber at the surface since the cement paste layer can be moved to expose the fibers. If fibers appear on the surface, stop, wait ten to fifteen minutes and start again. Correct timing will produce a smooth, even finish with minimal fiber exposure. The blades should be kept as flat as possible for as long as possible and then slowly increase the angle as the concrete finish is obtained.

FINISHING: Synthetic and steel fibers are compatible with most finishes and surface treatments including pattern stamping, exposed aggregate, brooming and hand or power troweling.

- Burlap Drags: Burlap drags are not recommended for fiber reinforced concrete as they may lift up fibers and tear the surface.
- Rake and Broom Finishing: Brooming and raking is best accomplished by pulling the broom or rake in only one direction. There may be some fibers at the surface, but there is no cause for alarm. Synthetic fibers will wear away in a short time with normal traffic. Or if the slab is outside, ultraviolet light will degrade any exposed fibers. Steel fibers can be removed by clipping the fiber from the surface with offset nippers or wire cutters. These steps are rarely necessary with experience fiber-reinforced concrete finishers.

SAW CUTTING: The final step in finishing fiber reinforced concrete is proper jointing and curing, following ACI recommended guidelines.

- Wet saw cutting, the joints should be cut to a depth of 1/3 the slab thickness or a minimum of 1 inch (25 mm).
- Soff-Cut or early entry saw cut operation should commence with a trial cut, to evaluate for aggregate spalling and fiber raveling before the concrete is cut further. If aggregate spalling and/or fiber raveling does occur, the operator should terminate cutting and return to cut the slab 15-20 minutes later. This trial and evaluation process may be repeated several times depending on the ambient conditions, concrete temperature and curing environment.
- Saw cuts should be positioned following ACI recommended guidelines.

REFERENCES

1. ACI Committee 544, Guide for Specifying, Proportioning, Mixing, Placing and Finishing Steel Fiber Reinforced Concrete, ACI 544.3R93, American Concrete Institute, Farmington Hills, MI., 1993.
2. M. Harding, "Mixing, Placing

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