

User Guidelines

Finishing

Durus Macro Fibres

Flooring

Finishing Fibre Reinforced concrete

With this document we want to offer the simple guidelines that can lead to a fibre free surface. Exposed fibres are your assurance of a properly distributed three-dimensional reinforcement before the concrete is finished. Any fibres that appear on the surface will quickly wear off under light traffic or degrade due to UV radiation.

Concrete mix

Creating the perfect finish for a fibre reinforced concrete floor starts with optimising the concrete mix design. Concrete mix should be supplied by a certified QSRMC Ready Mix Concrete Supplier, with supporting batch records to demonstrate required compressive strength, minimum cement content, maximum water cement ratio.

By increasing the amount of fine aggregate (0-4mm) in concrete the fibre-concrete matrix will have a better grip on the fibre, more mortar will hold the fibre in place once pushed under the surface. We advise to use a concrete mix design which contains at least 45% of fine aggregate for slump concrete. For concrete which will be power floated we advise a minimum of 47.5% of fine aggregate and a minimum of 350kg of cement. This ensures sufficient fat is available after placement and compaction to ensure fibre suppression below the fresh concrete surface. Typically self-compacting concrete will contain more fines and paste, so the mix design does not need to be changed.

Consistence should be suitable to allow pumping if necessary, generally S3 – S4, confirmed by the concrete supplier. This should be confirmed by appropriate consistence testing by an appointed, qualified Technician, using standard test apparatus, complying to the relevant BS EN Test Standard. If excessive bleed is evident, the mix should be rejected and the concrete supplier notified accordingly. If consistence is not within required tolerance, the mix should also be rejected. Under no circumstances should water be added to the concrete mixer drum under instruction from the Contractor.

Mixing

DURUS Macro Fibres should be added to the concrete during batching in accordance with recommended mixing guidance. Mix trials should be carried out to ensure the procedure followed results in consistent fibre dispersion without balling, at the specified dosage. Preferably this should be determined from a design provided by ADFIL Engineers.

Installation

Upon discharge, the fresh DURUS reinforced concrete, should be placed in situ without segregation. This may be via pumping or direct discharge in to formwork. This may result in the propagation of fibres to the concrete surface by capillary action which will lead to surface fibres interfering with power floating operations.

Preferably a laser screed should be used to complete level and compaction, but a portable mechanical screed (magic screed) is also suitable. Full compaction will allow sufficient paste (Fat) to be brought to the surface of the fresh concrete in order to suppress the fibres below the surface and also align fibres in the top area of the concrete to be aligned horizontally below the surface. This is critical if a high quality powerfloat finish is to be achieved.



Durus Macro fibre concrete mix



Durus Macro fibre concrete mix



Pouring concrete



Laser screed

Timing

Flowing concrete

Flowing concrete should be dapped as soon as it is practically possible. Be careful NOT to use a round skip for this type of concrete as this will push the fibres back up at the end of the skip. Using a flat skip helps to push down the fibres.

Slump concrete

Once the concrete has been poured, the timing of finishing is very important. The concrete needs to have a certain resistance in order to keep a fibre down. The easiest way to check this is to manually push down a fibre and see whether it stays under. If it does, the concrete can be finished.

Ways of finishing

Before finishing, dynamic compaction using appropriate site equipment, like a twin beam compacting screeder or razor back, should be undertaken to ensure full compaction of the slab or topping to full depth, without over compaction which could result in segregation and excessive bleed. Poker vibrators should **not** be used as this has a tendency to pull fibres vertically out of the surface when pulling the vibrator in and out of the concrete. Hand screed bar, magic screeder can be used as if it were a conventional reinforced concrete.

Skip float

A skip float is to be used to close the surface and to correct any small surface irregularities left by the compacting beam. This should occur soon after compaction when some of the surface moisture has evaporated and the concrete has started to stiffen. Each pass should overlap the previous one by about 50mm. The fibres in the surface will be pushed down due to the skip float movement. This will create a nice fibre free surface.

When a rougher surface need to be applied to provide more friction a brushed finish can be applied. Fibres in the surface will be aligned in the brush direction and will be less visible.

Rollerbug

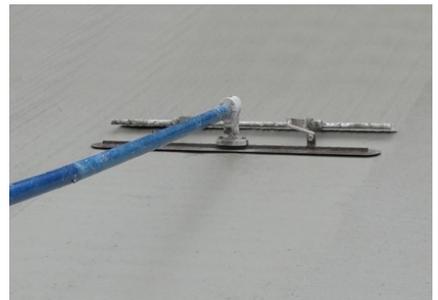
We advise to use a rollerbug as it will provide a more durable concrete finish as it does not open up the protecting upper concrete paste. The rollerbug will also provide the perfect preparation for powerfloating.



Use a flat skip float to finish SCC



Use a flat skip float to finish SCC



Skip Float



Rollerbug

Powerfloating

The fibres in the surface should be pushed down with a skipfloat or a rollerbug prior to powerfloating the surface. This will avoid fibres sticking out of the surface after powerfloating.

Typical site practice is to test the concrete's readiness for power floating by measuring the indentation of the operator's foot: if the indentation is 2mm or less generally the slab is then power floated. It must be noted that the ambient temperature and the concrete mix design may affect power -floating times.

Beware not to set the knives of the powerfloat to deep in the concrete as this might mix the thin upper layer with fibres again.

The Installation Contractor should ensure that powerfloat finishing is not carried out prematurely as this will remove the closed surface fat required to ensure a high quality fibre free finished surface.

Powerfloating operations should only be carried out by competent and experienced operatives as appointed under the responsibility of the Installation Contractor.

The surface should not be over panned as this could lead to delamination and dusting of the concrete surface when trafficked.

Optionally 3-5kg of quartz sand can be added to every square meter of the surface. It is applied to the concrete when it is at the panning stage prior to powerfloating. This will add a layer of 2mm with hard wearing characteristics and increased impact resistance. It will also help to push any remaining fibre down before powerfloating.

Laser guided screed

No actual extra care needs to be taken into account. When the floor is powerfloated after levelling with the laser, please take the above mentioned advise into account.

Curing the concrete

All concrete must be cured.

Curing is the process of ensuring that there is sufficient water present to allow hydration of the cement throughout its life. For all categories of slabs, it is essential that all normal good curing procedures be strictly followed.

We strongly advise to cure the concrete as soon as is practically possible using a proprietary spray applied membrane forming compound. This will avoid water evaporating out of the concrete surface too quickly.

Saw cut joint installation

Saw cut joints should be made within 24hrs of powerfloat finishing, 1/3 of slab / topping depth, or 50mm, whichever is greater. This is critical to ensure uncontrolled cracking does not occur due to shrinkage during final set.



Power floating concrete



Laser guided screed



Always apply a suitable Curing Agent



Applying saw cuts