

TDP Fibres

20mm concrete and screed fibres

The use of TDP Fibres in a concrete or screed mix is a proven method for reducing shrinkage and cracking in flooring and foundation bases.

Being inert and non-chemical, the polypropylene fibres are designed to disperse quickly and evenly strengthening the bonding of the mix during the curing phase (usually 28 days). This is the critical period when shrinkage and cracking is likely to take place.

Surface wear particularly for garage floors, driveways or other heavily trafficked areas can be a problem. In tests, the inclusion of TDP Fibres showed a marked improvement in wear resistance.

TDP Fibres are manufactured to fine tolerances to provide a consistent product for the purpose of minimising shrinkage and cracking in concrete and screed flooring and foundation slabs.

Two bag sizes are available –

100g bags sufficient for 25kg of cement and 900g bags sufficient to make up 1m³ of concrete or screed.

TDP Fibres are suitable for applications such as:

- Industrial and domestic flooring
- Concrete drives and pathways
- Foundation bases
- Conservatory floors
- Garage floors
- Extension floors
- Floor repairs



TDP Fibres

20mm concrete and screed fibres

This test is supplied by independent testing authorities.

Test carried out by CERAM Building Technology

Screed manufacture

Mixed in a 90litre standard cement mixer, the screed material comprised 1:3.5 proportions of cement to sand and the water/cement ratio kept at below 0.4 to replicate commonly used screed. The fibres were introduced into the dry mix (cement and sand) at a dosage level of approximately 900g/ m³ of screed. The dry mix with added fibres was mixed for between 1.5 – 2 minutes and a further 1.5 – 2 minutes after the water was added.

The photographs to the right show the effects of fibre inclusion in the screed mix after a 28 day period.

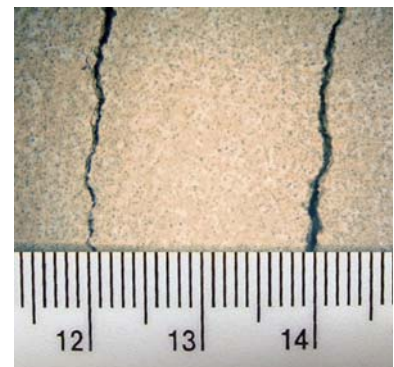
Measurement of shrinkage indicated that after 28 days, the amount of shrinkage experienced by screed containing no fibres is 0.31% compared to 0.09% for a sample containing fibres.

Surface wear resistance was measured by the Böhme method as detailed in BS EN 13892 – 3: 2005.

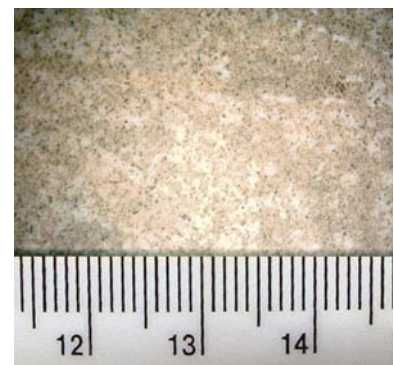
Böhme Value (cm³ per 50cm²)

	Test Value	Average
No Fibre		
Sample 1	18.45	18.3
Sample 2	17.70	
Sample 3	18.75	
With Fibre		
Sample 1	15.85	15.9
Sample 2	16.55	
Sample 3	15.20	

The values reported for the Böhme method refer to the volume of material removed from the test sample per 50cm² of test face; the lower the value the better the wear resistance.



Without fibres



With fibres





Concrete manufacture

A generic concrete mix of 1:1.6:3.1 (cement:sand:aggregate) and a water/cement ratio of 0.45 were used for the test programme. The concrete material was prepared in the same way as for screed using a 90-litre cement mixer with the fibres introduced in the dry mix at a dosage of approximately 900g/m³ of concrete. The mix materials were mixed initially for 1.5 – 2 minutes before adding the water. A further 1.5 – 2 minutes mixing with water ensured an homogenous and workable mix.

Two test samples were produced as shown to the right.

The test results were very similar to those of screed with cracking being self-evident on the test sample shown without fibres.

“The principal benefit identified in the tests, and this is applicable to both the screed and concrete, is that the fibres reduce significantly any shrinkage effects that the material may experience during drying. There are significant cracks observed in screed and concrete samples that contain no fibres (the control mixes) whilst those that do contain fibres display no evidence of cracking (screed) or very minor ‘mini’ cracks (concrete). This property is extremely desirable when placing cement based materials in large areas such as for flooring and foundation bases.”

Any reduction in drying shrinkage cracking achievable is of benefit to the finished product especially when used as a screed or floor slab.”

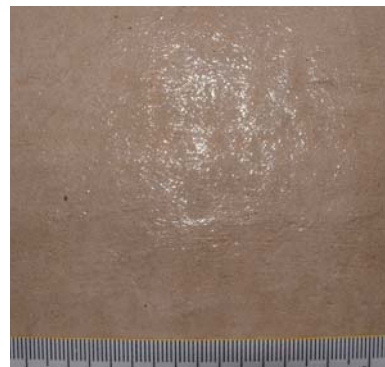
Dr Martin O’Farrell

Materials specialist
CERAM Building Technology

Note: the addition of TDP fibres into concrete or screed mix does not replace steel reinforcement which is used for structural strength.



Without fibres



With fibres



Tried and tested at
CERAM BUILDING TECHNOLOGY

Test reference number: SW 045/06



Properties

Material	
Polypropylene	pure
Density	0.91 g/cm ³
Colour	White/transparent
Dimensions	
Bundle thickness	2mm
Fibrils per bundle	10 to 11
Film thickness	Approx. 38µ
Cut lengths	20mm
Physical properties	
Tensile strength	340 to 400N/mm ²
Elongation at break	10 to 12%
Electrical properties	
Surface resistance	>10 ¹³ ohms
Volume resistivity	>10 ¹³ ohms
Thermal properties	
Melting point	160° C
Ignition temperature	>320° C
Resistance to dry heat	<120° C
Chemical properties	<ul style="list-style-type: none"> Resistant to acids, alkalis and salts Antistatic agent ensures reactive binding to the cement matrix

Independent test results

The following tests were performed by CERAM Building Technology on screed and concrete samples containing fibres.	
Shrinkage (after 28 days)	0.09%
Surface wear resistance Böhme Value BS EN 13892-3:2004	Average 15.9 (cm ³ per 50cm ²)
Compressive strength BS EN 13892-2:2004	Average 15.3 (N/mm ²)
Bending strength BS 4551:2005	Average 3.65 (N/mm ²)

The information is provided in good faith and is deemed, to the best of our knowledge, accurate at time of print. TDP does not, however, accept any liability for any loss or damage, however arising, which results directly or indirectly from the use of such information nor do we offer any warranty or immunity against patent infringement.



TDP Limited
 Derby Road, Wirksworth
 Derbyshire DE4 4BG
 Tel: 01629 820011 Fax: 01629 820022
 Email: info@tdpltd.com
 Website: www.tdpltd.com