ADFIL Construction Fibres

TECH NOTE

Minimum Dosage for Durus fibres

Using the spacing theory of D.C. Mc Kee

In this technical note the minimum dosage of fibres is calculated according to the theory of D.C. Mc Kee

Minimum fibre dosage

The concept of requiring a maximum average 3D spacing between fibres can be explained in two ways:

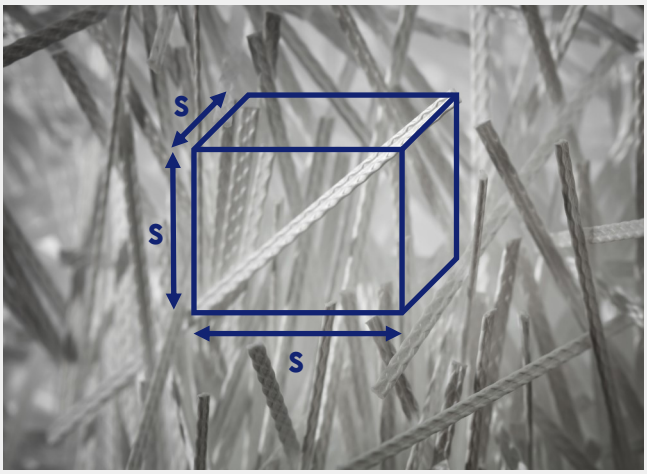
- In order for tensile stress to be transmitted from fibre to fibre and hence through the composite the discreet fibres need to be close enough to permit a compressive strut to form in the concrete matrix between fibres
- Fibres must be close enough together so that they effectively intercept any cracks as they propagate through the composite

The average spacing of fibres in three dimensions can be determined using the spacing theory of McKee using the following formula:

$$s = \sqrt[3]{\frac{\pi \times d_f^2 \times l_f}{4\rho_f}}$$

Where:

s = average 3D fibre spacing
d = equivalent diameter
L_f = fibre length
ρ_f = Fibre volume fraction



This formula can be manipulated to determine a minimum dosage for any macro synthetic fibre. According to the European standard EN 14487-1, the average distance (s) between fibres should be lower than 0,45 * l_f in order to ensure a minimum overlap between fibres.

Product	Aspect ratio	Dosage
Durus EasyFinish	57	2.4 kg/m³
Durus S500 48mm	68	1.7 kg/m³
Durus EasyShot 50mm	62	2.0 kg/m³
Durus S400 55mm	47	3.5 kg/m³