BEKAERT

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Creep Test

Status June '08

Polypropylene fibres tend to creep 10-30 times more than steel fibres

Set-up creep test
Specimen with steel fibre concrete after 1600 days.

The beams have been pre-cracked and then loaded in a displacement controlled manner as prescribed by most international standards relating to steel fibre concrete. At a deflection of 5mm the load has been removed The residual load at that moment is shown by the load deflection curve.

Beams have been produced with following mix design:

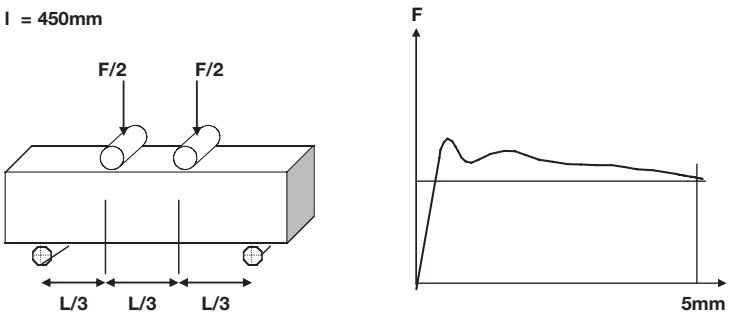
427 kg/m³ Cement CEM I 42.5R
854 kg/m³ Sand 0/5
854 kg/m³ Broken limestone 4/7 w/c = 0.50

Macro synthetic fibres type1 and type 2 are added at a dosage of 4,55 kg/m³ (7.67 lb/yd³).

Type 1 is a 48 mm long macro synthetic fibre with L/d of 48, embossed over the length, and tensile strength of 520 MPa.
Type 2 is a 50 mm long macro synthetic fibre with L/d of 83, and tensile strength of 640 MPa.

Dramix® RC-65/35-BN steel fibres are dosed at 20 kg/m³ (33 lb/yd³).

b = 150mm
h = 50mm
l = 450mm



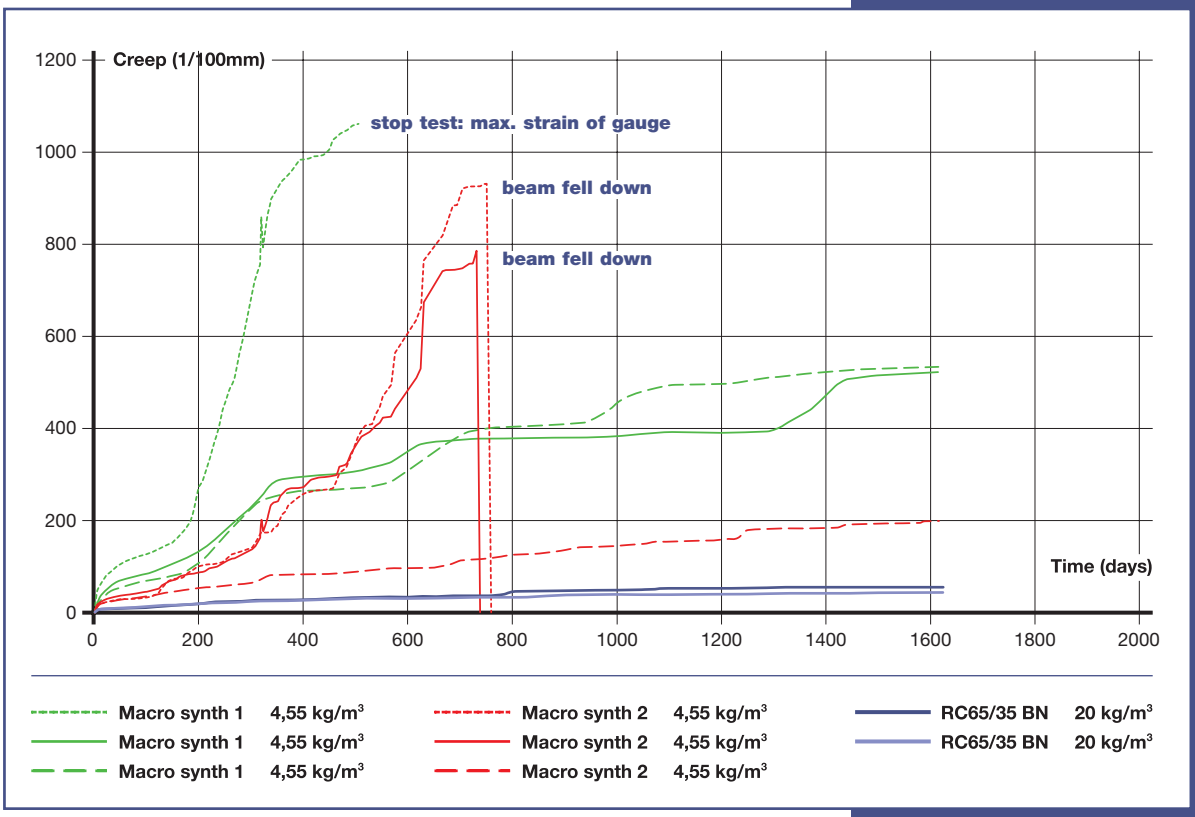
Apply load = 50% residual load at 5mm

The beams are now ready to be subjected to the creep test. For this test 50% of the residual load is applied on the pre-cracked specimens. The load is applied in a 4 point bending configuration. The deflection is measured and shown on the Y-axis in 1/100mm as on the graph.

Dramix®

Creep Test

As can be noticed from the creep curve, the polypropylene fibres tend to creep 10 to 30 times more than the steel fibres after 2 years. Even a couple of beams with macro synthetic fibres couldn't carry the load anymore, and broke down in two pieces after 700 days.



Moreover the creep of the macro synthetic fibre is not finished yet: the creep curve for the macro synthetic fibre is not yet stabilised. Therefore at present, the creep tests are still going on, as considerable higher creep can still be expected for the macro synthetic fibres

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