

# Fibres

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**Material Used Ordinary Portland Cement** The cement used in the specimen acts as a binder. The Portland cement met its general purpose of fixing all variables apart from the amounts of fibre in the experiment. The cement used in the experiment was sourced from the Swan Cement Limited company.

#### Aggregate

The specimens made use of aggregates of varying coarseness. There were fine, 10mm, and 20mm aggregates. The coarse aggregates were sourced from the Holcim Pty Limited (Australia) while the fine ones were supplied by Rocla Pty Ltd. The 10mm and 20mm aggregates were used for the saturated-surface-dry condition (SSD). The preparation of the SSD using the 20 and 10 mm aggregates followed the standards set in Clause 8 of ASTM C127-15. The fine aggregates are also in the SSD in accordance with Clause 8. The water reabsorption rates for the fine aggregates have been calculated with reference to the ASTM C128-15. The water absorption and bulk density of the coarse aggregates were measured and calculated in accordance with the ASTM C29 procedures.

#### Super Plasticiser

The water-cement ratio used in the preparation of all specimens was fixed. Using the same ratio reduces the impact of other variables to the specimens' residual strength. The super plasticiser should be used when fixing the water cement ratio. In this experiment, the super plasticiser was a high range water-reducing retarding admixture. The use of the plasticiser was to improve the workability of concrete when fixing the water-cement ratio for all mixes. The admixture, MasterRheobuild 1000NT, was a product of the BASF Chemical Company. The type A and F MasterRheobuild admixtures <https://assignbuster.com/fibres/>

meet the requirements outlined in the ASTM C494 (BASF 2015).

### Steel Fibre

The RAD6535HW hooked end hard-drawn wire steel used in the experiment is a product of RADMIX. The steel used in the experiment had a hooked end glued with fibre. The steel fibre has a diameter of 0.5mm and a length of 35mm while the tensile strength is more than 1300 MPa. Its aspect ratio is 70. It has a chemical composition C-Max 0.1%, Mn-Max 0.5%, S-Max 0.05%, P-Max 0.04%, and Si-Max 0.1% (RADMIX 2015). The experiment consumed a total of 22.3kg of steel fibre.

### Synthetic

The synthetic fibre used in the experiment is Synmix. It is a fibre for concrete that is used for meeting serviceability requirements such as rotations and deflections. It is also more suitable for creep and crack widths than it would be when used in mines as a temporary ground support.