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# Experimental Strength Behaviour and ANSYS Analysis of Spandex Fibre Reinforced Concrete

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**ABSTRACT:** The analysis and behaviour of spandex fibre reinforced concrete filled beams is discussed in this paper. A nonlinear finite element model was developed for the analysis of the beams. The stainless steel used in the pin ended axially loaded beams test had an external length to plate thickness ( D/T ) ratio of 50 . Spandex fibre a kind of synthetic fibre is used in concrete to improve the ductility of concrete. Made with commercially available steel and synthetic fibre has been investigated flexural stress deflection used to determine flexural strength of concrete was found to increase when synthetic fibre . The Ultimate strength testes were carried M25 grade concrete for compressive strength ,split tensile strength ,and flexural strength and test results were compared with conventional concrete with addition of spandex synthetic fibre concrete. The flexural strength measured deflection of the beam in the concrete and in the flexural reinforcing beams and the cracking pattern used monitored during the test at different stages of the loading until failure. The stress- strain, deflection, deformation pattern will be analysed by ANSYS software.

**KEYWORDS:** Spandex fibre compressive strength ,split tensile ,flexural strength

## I. INTRODUCTION

Fibre reinforced concrete (FRC) containing fibrous material increases its structural integrity. It contains short discrete fibres that are uniformly distributed and randomly oriented. Fibres include synthetic fibres and natural fibres. Within these different fibres that character of fibre reinforced concrete changes with varying concretes, fibre materials, geometries, distribution, orientation and densities. Fibres are usually used in concrete to control plastic shrinkage cracking and drying shrinkage cracking. They also lower the permeability of concrete and thus reduce bleeding of water. Some types of fibres produce greater impact, abrasion and shatter resistance in concrete. Generally fibres do not increase the flexural strength of concrete, so it cannot replace moment resisting or structural steel reinforcement. Some fibres reduce the strength of concrete.

### 1.1 INTRODUCTION TO ANSYS

ANSYS is an engineering simulation software provider founded by software engineer John Swanson. It develops general -purpose finite element analysis and computational fluid dynamics software. While ANSYS has developed a range of computer aided engineering products it is perhaps best known for its ANSYS workbench mechanical and ANSYS multi physics products. ANSYS mechanical and ansys multi physics software are non-exportable analysis tools incorporating pre-processing solver and pre-processing moulds in a graphical user interface. These are general purpose finite element modelling packages for numerically solving mechanical problems including transient dynamic structural analysis, heat transfer and fluid problems as well as acoustic and electromagnetic problems. ANSYS mechanical technology incorporates both structural and material nonlinearities. ANSYS multi physics software includes solvers for thermal, structural, cfd, electromagnetic and acoustics and can sometimes couple these separate physics together in order to address multi-disciplinary applications.