

## **ANALYSIS OF TORSIONAL RIGIDITY OF CIRCULAR BEAMS WITH DIFFERENT ENGINEERING MATERIALS SUBJECTED TO ST. VENANT TORSION**

**M. C. AGARANA & O. O. AGBOOLA**

Department of Mathematics, College of Science & Technology, Covenant University, Ota, Nigeria

### **ABSTRACT**

Many engineering structures, such as airplane wings, beams and shafts are subjected to higher torsional forces today due to advancement in Structural Engineering, in terms of size and technology. In this paper, we analyzed the resistance of circular beams, of different engineering materials, to their corresponding twisting moments. We obtained the torsional rigidity for the different beams as the ratio of twisting moment to the angle of twist per unit length. It is observed that torsional rigidity of the beams is a function of their areas and the engineering material they are made up of. Specifically it is observed that the circular beam made up of brass engineering material has the greatest torsional rigidity among the twelve engineering materials considered.

**KEYWORDS:** Beams, Torsional Rigidity, Twisting Moment, St. Venant Torsion, Brass