In this paper, we present a numerical investigation of the thermal convection for a thermodependent non-Newtonian fluid in an annular space between two coaxial rotating cylinders. The rheological behaviour of the fluid can be expressed through the Ostwald-De-Waele power law: View the MathML source$\tau = K\dot{\gamma}^n$; all fluid properties except consistency index K are constant. K–T relation used is $K = K_0 e^{-bT}$. The problem is studied when the heated inner cylinder is rotating around the common axis with constant angular velocity and the cooled outer cylinder is at the rest. The horizontal endplates are assumed adiabatic. The governing equations are solved using mixed finite elements method. The influence of the temperature on the structure of the dynamic and thermal fields is examined