C20 APPLICATION OF LARGE STRAIN THEORY TO RUBBER-LIKE MATERIALS

K.P. Fernando
Polymer Technology Division, University of Moratuwa

Rubber is well known for its ability to undergo large strains without failure. Thus the 'engineering strain' defined in the infinitesimal strain analysis of continuum mechanics has a less practical value for studies of rubber-like elasticity.

In this paper fundamentals of large strain analysis are outlined using the tensor approach. The use of such a developed analysis for crosslinked rubber leads to the most general results which can be used to predict the deformational characteristics under any homogeneous state of strain. Application of such a general expression for the mode of tension is shown to be leading to the same results as those given in the literature.