

# **Mechanical characterisation of Dacron graft : experiments and numerical simulation**

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## **Abstract**

Experimental and numerical analyses focused on the mechanical characterisation of a woven Dacron vascular graft are presented. To that end, uniaxial tensile tests under different orientations have been performed to study the anisotropic behaviour of the material. These tests have been used to adjust the parameters of a hyperelastic anisotropic constitutive model which is applied to predict through numerical simulation the mechanical response of this material in the ring tensile test. The obtained results show that the model used is capable of representing adequately the nonlinear elastic region and, in particular, it captures the progressive increase of the rigidity and the anisotropy due to the stretching of the Dacron. The importance of this research lies in the possibility of predicting the graft's mechanical response under generalized loading such as those that occur under physiological conditions after surgical procedures..

## **Keywords**

Dacron graft, Biomechanical model, Numerical simulation.