Question 41

Q: Can Femtet analyze the material like a sponge?

A: The Ogden foam model of hyperelastic materials can be used for analysis. A foam material is a porous material having pores internally like a sponge, has a large deformation like rubber, and features as follows.
(1) Strain is not proportional to stress for large deformation.
(2) After force is applied, the material can recover its shape upon unloading.
(3) Deformation causes changes in volume.

The features of (1) and (2) are the same as rubber materials. Unlike rubber materials, a foam material changes its volume in response to its deformation. When a rubber material is compressed in one direction, it will expand transversely so as to maintain its volume. In contrast, when a foam material is compressed, it reduces in size and becomes narrower in width.