Collapse of paperboard packages

Motivation

Paperboard packages are widely used in the storage of many products. Due to their use, packages must be designed to resist time-dependent compressive loads, namely creep. However, under cyclic humidity conditions the creep rate of paperboard increase which can cause packages to collapse at unexpectedly low levels of load.

Problem

What causes the accelerated creep? How to design packages to resist load better?

Task

From the provided experimental data, determine a time- and moisture-dependent material model for paperboard. Implement the material model to finite element software. Use finite element simulations to investigate creep behavior of paperboard packages under cyclic humidity conditions.