

Origami with Abaqus

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Tetra Pak Packaging Solutions

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Exemplar

Abstract: Origami is the art of paper folding. Our entire range of packages is formed from a flat web of packaging material using the origami technique. Virtual and reverse engineering are fundamental for the development of our technology. Complex simulations like extremely nonlinear dynamic events as well as design optimization are part of our daily activity. This paper describes how Simulia's software with the help of automated tools has been successfully used to simulate the fundamental phases of our forming process driving in some cases its design.

Keywords: Packages, Forming, Optimization, Customization

1. Introduction

Tetra Pak packages are formed inside our filling machines starting from a flat web of packaging material. The packaging material is a multilayered composite material that already contains the crease lines which can be considered the folding instructions of our packages. The crease lines are introduced by pushing a male die into a female channel as shown on Figure 1; this creates a delamination inside the board layer fibers.

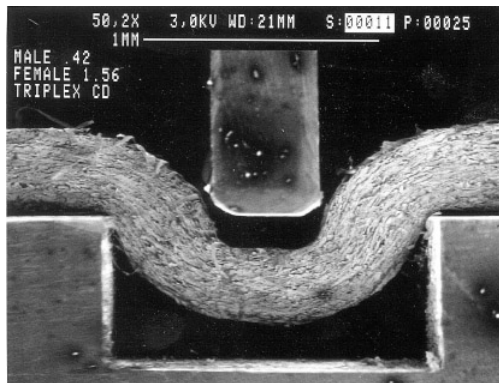


Figure 1. SEM image of the creasing procedure (Dunn, 2000).