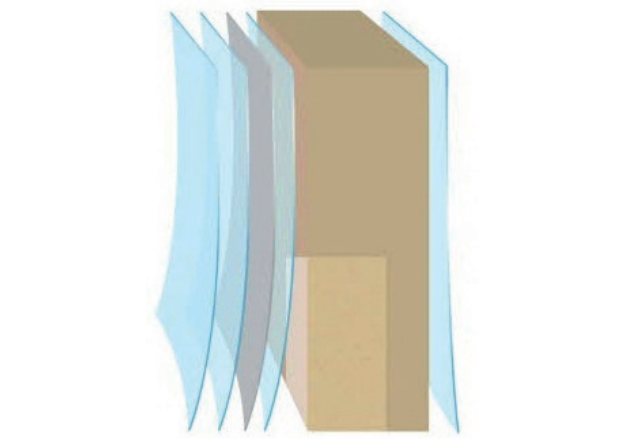
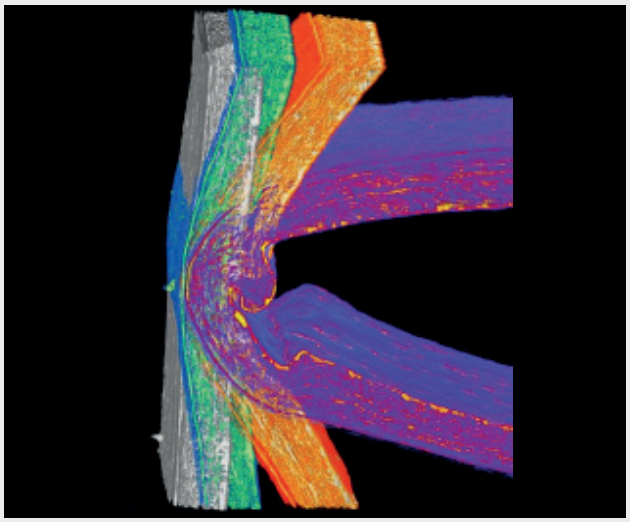
In-Depth Quality Control Strengthens Production

“Faster, higher, stronger” is the Olympic motto. It is also a daily challenge for many companies for whom efficient production equals profit. International packaging solutions company Tetra Pak partnered, via LINX, with a Danish university on a notable project. Their aim was to speed up production, enhance quality and create a more conducive atmosphere for future innovation.

The way companies produce their wares is crucial. Efficiency is key. For example, Tetra Pak uses machines to fold juice cartons, which consist of several layers. The process fuses various combinations of organic and synthetic materials, but predicting how fibers in the organic layer will behave can be extremely hard. Tetra Pak wanted to find the best method for quick and precise folding of the cartons, regardless of the length and direction of the fibers.



Microscopic layers in a Tetra Pak carton



3D replay showing different phases of folded layers

Under the Surface

Tetra Pak wanted a tangible, digital description of its production process as well as insights into precisely where and when each layer was folded – in other words, more detailed, microscopic insight into its packaging. The question was, How could the team examine the packaging from the inside without opening it? The answer came in the form of 3D microscopy X-ray imaging.

LINX put Tetra Pak in touch with the 3D Imaging Center at the Technical University of Denmark (DTU). The center has developed 3D analysis using X-ray microscopy, technique that reveals details on a scale of microns. It can point to how each layer of organic material is folded and can be used for in-depth quality checks.

The collaboration also involved developing a computer model for viewing each layer inside the packaging. The model can digitally validate physical products.

The findings of the project immediately helped Tetra Pak understand how it could optimize the folding of organic layers in the packaging. It was – and is – valuable knowledge regarding production.

Tetra Pak can now apply the newfound data and in-depth understanding to its efforts to quickly and efficiently develop new products. It makes financial sense to ensure that digital simulation achieves maximum detail during the first phases of product development, i.e., before a company starts producing physical prototypes.

By focusing on optimization, we can increase machine production efficiency over time. Imagine, for instance, that we would like the plastic layer on a food container to harden quicker when it is applied to the packaging. Using 3D X-ray images can show us how much the material can withstand before it is damaged. Having access to this knowledge earlier in the design process will help us find the ideal production speed, and the overall result will be optimized production quality.

Tetra Pak®

Innovation Fund Denmark

DTU Technical University of Denmark

More info, contact LINX CEO Jacob-Becker Christensen, jbc@linxproject.dk