

## Think Sustainable

### **ARCEL Resin Life Cycle Inventory Summary**

By choosing ARCEL resin for package cushioning, manufacturers of valuable, damage-sensitive goods can not only reduce costs but also achieve more sustainable packaging. This Sustainability Topic explores how cube efficiency has the largest influence on the environmental footprint of the packaging systems.

### The sustainability challenge

In today's global economy, businesses are searching for ways to lower their overall environmental impact. In recent years, the United Nations Environment Program (UNEP) and the Society of Environmental Toxicology and Chemistry (SETAC) launched the UNEP/SETAC Life Cycle Initiative to help global businesses quantify their environmental impact and sustainable efforts.

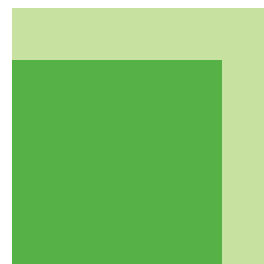
Franklin Associates, Ltd., a leader in Life Cycle Inventory (LCI), recently completed a study for ARCEL advanced foam resin to quantify environmental results for ARCEL resin packaging shapes relative to other protective packaging materials in a defined packaging application.

The study covers the full life cycle of several types of packaging shapes, as well as the production and end-of-life management of the corrugated cardboard box the products were shipped in, and truck transport of product packaged using each type of shape. The study results focused on energy, greenhouse gas emissions (expressed as CO<sub>2</sub> equivalents) and solid waste. The key finding of the Franklin Associates LCI is that cube efficiency had the largest influence on the environmental footprint of the packaging systems analyzed.

The smaller ARCEL resin cushion enabled cube-down by use of a smaller exterior box, which would result in a 13% reduction in the size of the corrugated box used for each packaged product. More units fit on each truckload, requiring fewer truckloads to ship the same number of products and reduces transportation energy and emissions. The reduced box size also means that less corrugated box material is required, reducing energy requirements and global warming potential for the production and end-of-life management of corrugated boxes.

This Sustainability Topic is one in a series demonstrating how ARCEL® advanced foam resin helps manufacturers address concerns for sustainability.

ARCEL resin is a high-performance foam resin for carton cushioning that provides superb protection and reduced cube sizes.



Specifying ARCEL resin reduces package size by up to 40%, resulting in numerous environmental benefits.

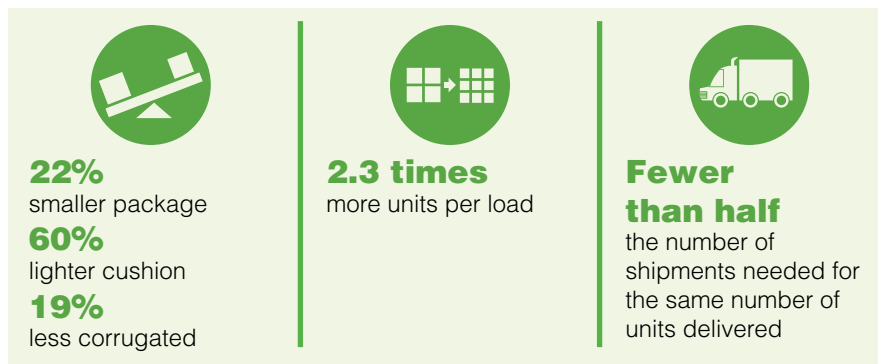
## Additional highlights of the study include:

- There was no significant difference in the total carbon expenditure between shapes made of different cushioning materials. Different types of plastic foam shapes had similar environmental results. Molded pulp shapes generated lower environmental results per pound of material compared to the plastic foam shapes, but the molded pulp packaging shapes were considerably heavier than the plastic foam shapes, so the total shape production results were about the same.
- Because the weight of the corrugated box is much greater than the weight of the shapes used to support the product within the box, the box makes the greatest contribution to the energy and solid waste results for all shape systems.
- The most significant improvements with ARCEL resin packaging are associated with cube reductions. The upside to downsizing with ARCEL resin

## The upside to downsizing with ARCEL resin

Using ARCEL resin for package cushioning delivers three benefits. By increasing the capacity of every container, truckload and pallet, it delivers savings throughout the supply chain. By resisting damage, it reduces customer returns that stem from broken cushioning. And by reducing packaging, it offers a more sustainable alternative that will cut energy used in manufacturing, lower fuel consumption and emissions, and reduce the waste stream for both the foam and the corrugated box.

A recent example of how a cube-down solution provided environmental savings for a major consumer product manufacturer



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