# ARCEL® Resins

**a NOVA Chemicals Expandable Styrenics Product**

# Packaging Case Study

**Designed to Meet Performance and Sustainability Goals**

ARCEL® advanced foam resin helps manufacturers produce efficient, sustainable packaging. ARCEL resin is a high-performance foam cushioning material that provides superb product protection and smaller cube sizes.

## Challenge

Tyco Safety Products, a major manufacturer required an enhanced packaging solution for a damage sensitive electronic product. The new packaging for the Simplex® 4100U Fire Detection Panel was required to:

- Decrease overall cost
- Reduce the total packaging footprint
- Offer superior damage protection

## Solution

The ARCEL resin design team worked to optimize the protective packaging for cost and material efficiencies. The engineered solution was designed to meet several goals:

- Withstand multiple drops
- Deliver lower costs per unit
- Be a sustainable solution

The team developed several design options and conducted performance testing to ensure the integrity of the package. With ARCEL resin, Tyco Safety Products was able to reduce its environmental impact throughout the supply chain and help create a positive customer brand experience at a lower total cost.

In this application, ARCEL advanced foam resin:

- Provided protection to help withstand the rigors of shipping
- Delivered significant cube utilization and material source reduction efficiencies
- Met the sustainability goals of the customer

**15%**
Cube Reduction

**16%**
Less Corrugated

**43%**
Lighter Cushion

# ARCEL Resin provides real sustainability benefits

**Environmental Measures and comparisons for 10,000 units**

| Tyco Safety Products 4100U Package Based on WRI Emissions Factors | XPE | ARCEL RESIN | Improvement |
|---|---|---|---|
| **Corrugated** | | | |
| **Corrugate Usage (tons)** Based on box weight | 37 | 31 | 6 |
| **Trees Consumed** At 12 trees/ton of virgin corrugated | 260 | 219 | 41 |
| **$CO_2$ emissions (tons)** At 58% recycling rate | 145 | 122 | 23 |
| **Cushion** | | | |
| **Cushion weight per unit (tons)** | 51.0 | 29.0 | 22.0 |
| **$CO_2$ emissions (tons)** | 15.9 | 9.1 | 6.9 |
| **From cushion manufacturing (tons)** | 56 | 60 | -4 |
| **Land Freight** | | | |
| **Weight of freight/trailer (lbs) 53 ft. standard** | 13,886 | 16,512 | 2,625 |
| **Ton-Miles of Road Freight** | 315,600 | 300,215 | 15,385 |
| **$CO_2$ emissions (tons)** Based on WRI Emissions Factor 0.2639 lb C)2 ton/mile | 42 | 40 | 2 |

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