



Making Premium Mattresses Sustainable: Viscoelastic Foams from Renewable Carbon

PROJECT DESCRIPTION

Brand owners can strengthen circularity and carbon reduction claims with new viscoelastic foams made from upcycled CO₂.

Today the chemical industry uses carbon from fossil fuels for most materials, including viscoelastic (VE) polyurethane foams. But consumers, investors, and governments are demanding that industries defossilise. As brand owners seek new materials for increasingly ambitious environmental targets, the challenge for producers and their suppliers is to find sustainable carbon sources that don't negatively impact price and performance.

In this context, Econic has developed a cost-effective process for producing polycarbonate ether (PCE) polyols from CO₂. Polyols made with the Econic process can replace 50% or more of the polyols in VE foams, while imparting performance advantages such as improved rebound and recovery time.

Reduce Carbon Footprint by 20%

Econic's PCE polyols can today yield a 20% reduction in greenhouse gas emissions – and 50+% reduction in the future via molecule design. PCE polyols can be used as the sole polyol for standard foams or used in combination with recycled and bio-based grades.

PROJECT IMPACT

With the Econic process, foam makers can improve performance and achieve cost savings while producing sustainable viscoelastic foams.

Transitioning the market to sustainable viscoelastic requires solutions that are commercially viable and scalable. Mattresses still need to meet consumer expectations in terms of performance and price. PCE polyols allow foam makers to meet the specifications required to make sustainable solutions competitive (see table).

Cost Savings on Isocyanates and Surfactants

When foam makers transition to PCE polyols not only can they offer more sustainable options, they can achieve cost savings on isocyanates and surfactants.

Typically, VE foams are prepared with TDI 65. However, with PCE polyols, foamers can opt for TDI 80/20, which is lower cost and widely available, whilst still achieving high performance. Similarly, specialist silicone surfactants usually required to prepare VE foams can be traded for the more affordable, standard slabstock-grades. Taken together, these substitutions can yield significant cost savings.

Property	Econic Foams
Density (kg/m ³)	56-62
Ball Rebound (%)	<15%
Tensile Strength (kPa)	40-58
Ultimate Elongation (%)	340-400
Hardness (CLD, 40%, kPa)	Approx. 1.2
Recovery time (s)	6-10

“Econic’s technology is exciting because of the flexibility of the polyols it can make. We can keep the flexibility to formulate the polyurethane foams but make it sustainable.”

- Herve Wuilay, PU Flexible Foam Expert

ABOUT ECONIC TECHNOLOGIES

Econic transforms waste CO₂ into high-performance products made from renewable carbon. Manufacturers use our technology to upcycle CO₂ into a key ingredient replacing fossil fuels in polymers. With applications in automotive, furniture, and mattresses, our technology can reduce carbon footprint and cost along the value chain while improving the performance and circularity of products used by billions every day.

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