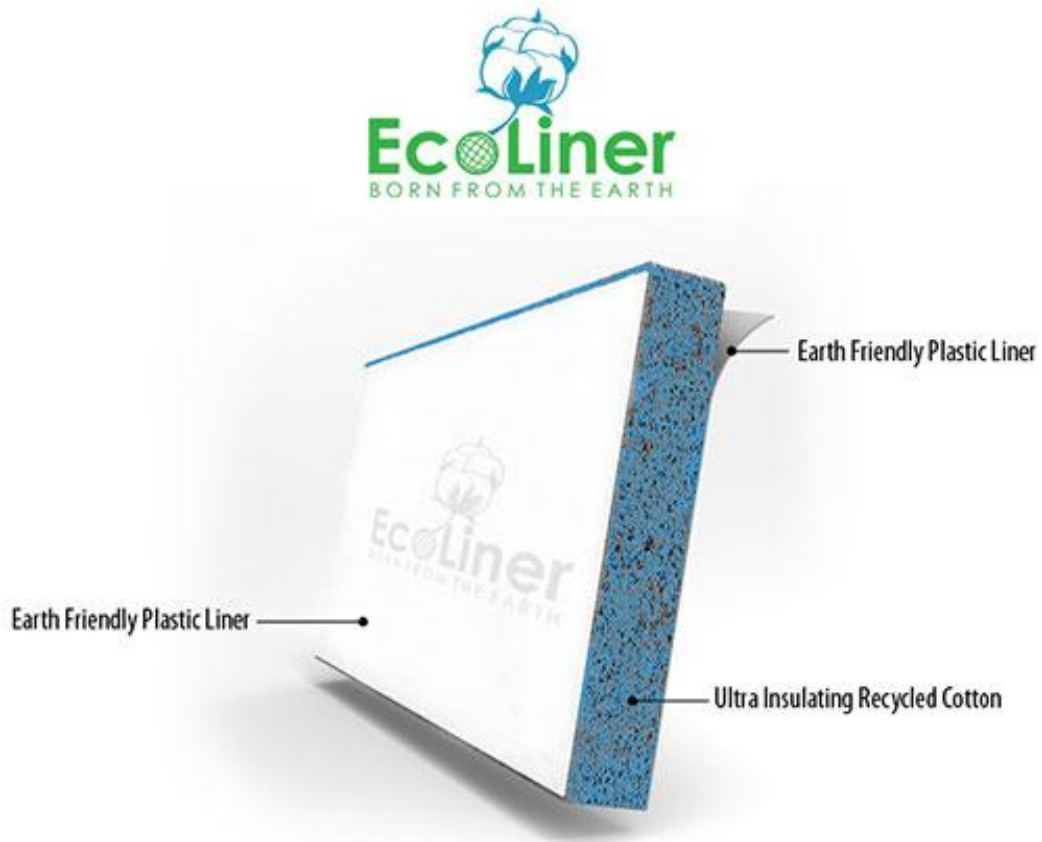




Thermal Performance Comparison: EcoLiner vs Jute



The temperature-controlled shipment of products, such as biopharmaceuticals and perishable foods, requires insulating components to fully or partially shield them from ambient temperature.

Historically, rigid closed-cell foam, such as EPS, has been used extensively in the insulated packaging industry. However, the last couple of decades have seen mounting public and governmental concern about post-consumer packaging waste, which has led to improved waste minimization through recycling.

However, recycling of these materials is not usually practical, and this has created a need for more environmentally friendly insulated packaging materials. Recent trends have seen manufacturers move towards more innovative materials that are curbside recyclable.



These products were developed to provide a superior alternative to unsustainable, non-renewable, heavily polluting insulated products such as EPS (expanded polystyrene). These eco-friendly materials are categorized and tested in accordance with different standardized procedures.

Insulated Products Corporation (IPC) offers an environmentally preferred product, EcoLiner, an insulated box liner that is fully recyclable and made from recycled cotton. In this study, IPC's EcoLiner box liners are introduced and their performance compared to a commonly used hydro-biodegradable product, jute.

IPC's Environmentally Preferred Solution: EcoLiner

IPC's EcoLiner insulated box liners are two-piece insulation liners made to thermally and physically protect the contents of a six-sided container. The EcoLiner's high performance stems from the natural cotton-based panels wrapped in a robust outer film. EcoLiner thermal box liners are encased in a white plastic film and then inserted into corrugated boxes. These insulated containers effectively protect refrigerated, frozen, and room- temperature (RT) products for over 48 hours.

The liners are shipped vacuum-compressed using IPC's patented technology and will inflate upon opening. This space-efficiency feature will save 75% in shipping and storage space as compared to rigid coolers, such as EPS, or products that do not "remember" their original shape after compression, such as jute.

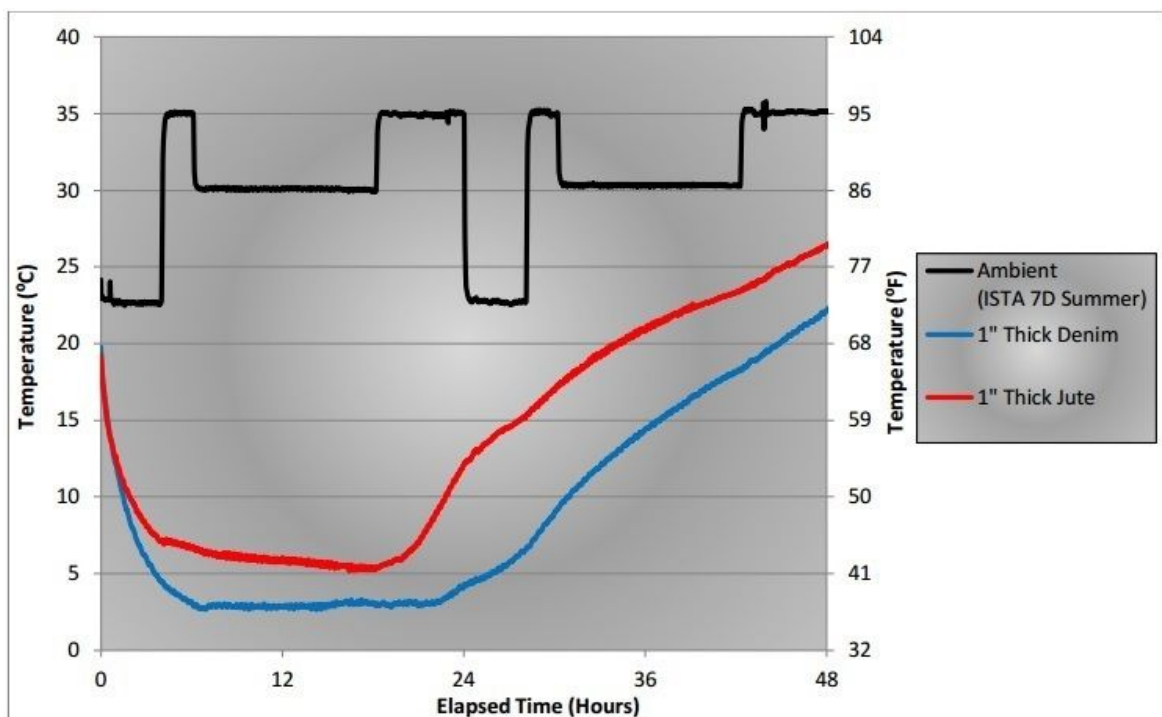


IPC's Eco-Friendly Insulated Box Liner

EcoLiner vs. Jute

A test was designed to compare the performance of jute and recycled cotton in maintaining a consistent temperature inside a corrugated box. During the test, all affecting parameters – such as payload type, payload weight, refrigerant weight, and pre-condition temperature of the payload – were kept identical for jute and recycled cotton insulation.

Recycled cotton (1" thickness) and jute were cut into panels and inserted into corrugated boxes. Then, the payload (9 bottles of vitamin water) and refrigerants (6 x 16 oz gel packs) were put inside the insulated boxes at predetermined positions. Finally, temperature probes were placed inside and the boxes were put into an environmental chamber to be tested under summer conditions (ISTA 7D summer). The temperature profiles of the oven and the payload inside the EcoLiner insulated box liners and jute liners are shown in the figure below.



Temperature profiles of the oven and payload with EcoLiner and jute liner

You will notice that the temperature of the payload drops at an early stage; this is due to the presence of the gel packs. The diagram demonstrates that the EcoLiner insulated shipping container significantly outperformed the jute liner. At the 24-hour mark, the difference in payload temperature was roughly 14.4 oF, confirming that the insulated box liner possesses superior thermal properties.

Summary

Insulated Products Corporation (IPC) aims to manufacture products that remain environmentally compatible and reduce waste, while maintaining their ever-increasing performance. IPC's EcoLiner insulated box liner is no exception, and is developed with minimal environmental impact and post-consumer packaging waste. The EcoLiner insulated box liner is a two-piece thermal liner, made of recycled cotton filler and a robust outer film that thermally and physically protect the contents of a six-sided container.

The study was formulated to compare the thermal insulation performance of EcoLiner and jute, a plant-based solution. The results of the test herein demonstrated that IPC's EcoLiner insulated box liner thermally outperformed the jute liner; the EcoLiner kept the inside of the box at a colder temperature for a longer period of time.

About Insulated Products Corporation (IPC)

Since 1999, IPC has been an innovator of thermal packaging solutions. We have spent over a decade studying, perfecting, consistently producing and delivering effective cold chain thermal packaging to companies shipping medicines, foods, and industrial goods worldwide.

IPC designs and manufactures, in-house, a variety of custom temperature-control products for the cold chain shipping industry. All of IPC's solutions are highly effective, while remaining space-efficient and green. We thrive on special requirements including custom sizes, extended shipping durations, unique temperature requirements, and sustainability. Maintaining strict temperatures, maximizing payload, minimizing weight and preparation time are the cornerstones of IPC cold chain solutions. Contact us today to discuss your unique temperature assurance packaging requirements.

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