EPS Recycling Advancements
& Technology Innovations

**TECHNICAL BULLETIN**

EPS Industry Alliance

# Recycled Content in EPS Foam Protective Packaging

Using recycled content in plastic production is one of the most effective ways to reduce environmental impacts and achieve circularity goals. It also increases demand for recycling and expands end-use markets, ultimately helping to reduce costs in the process. Recycled content resin further reduces EPS' environmental impacts with lower energy use and a smaller carbon footprint.

Recycled content is the percentage of a product made from materials that have been recovered from waste. This includes material recovered from the manufacturing process that would have otherwise been disposed of as waste, as well as material diverted from landfills after consumer and commercial use, known as post-consumer recycled content, or PCR[1].

## Recycled Content in EPS Applications

The expanded polystyrene (EPS) industry has used recycled content for decades. Material collected from various sources of post-consumer EPS are ground to a compatible size with EPS from virgin resin and is reincorporated into the final molding stage of EPS manufacturing. This regrind material typically replaces 5-15% of virgin feedstock.

Incorporating recycled content is not only an effective way to keep waste out of landfills, but also plays an important role in reducing $CO_2$ emissions. Recycled content EPS requires less energy and generates lower emissions than virgin feedstock. It also requires less water and other resources to process than raw materials. Recycled content EPS can help reduce environmental impacts from this segment of the material life cycle[2].

*From cold chain shipping containers to protective foam packaging components & bracing inserts, EPS applications can use 30 to 50% recycled content.*

TWO METHODS TO ACHIEVE
**EXPANDED POLYSTYRENE RECYCLED CONTENT**

**ONE**
RECOVERED MATERIAL REGRIND PROCESS

**TWO**
RECYCLED CONTENT RESIN FORMULATIONS

## Recycled Content Levels & Performance Parameters

To appreciate recycled content capabilities in expanded bead foam materials, it is important to understand industry supply chains and product manufacturing methods. EPS manufacturers use an expandable EPS resin that contains a blowing agent, which is then expanded using steam and molded into a foam block or shape. The steam softens the plastic and activates the blowing agent that expands the material into a block or custom molded shape used in a wide range of product applications including building insulation, packaging, manufacturing components, and personal safety gear.

When using regrind material incorporated as recycled content, the waste material no longer contains a blowing agent which can influence mechanical properties. Through careful material flow management and mixing techniques 5-15% recycled content levels can be achieved without losing performance. This plays an important role in diverting EPS waste that would otherwise be landfilled, supports manufacturing efficiency, and contributes to the EPS industry's circularity goals.

New EPS resin formulations increase the percentage of recycled content that can be achieved. Recycled content EPS resins are now available with 30% or 50% PCR. By using proprietary molecular weight engineering and innovations in nucleation and pelletizing these new resins exemplify circularity and perform as well as virgin EPS resin. Applications that are especially well suited to EPS recycled content resin include protective packaging, safety equipment (such as bike helmets), and temperature-controlled shipping containers.

## Recycled Content Certification

Environmental claims demand rigorous transparency. The process to verify recycled content materials requires standardized certification schemes and stringent testing procedures via independent, third-party audits. The audit verifies manufacturing data, processes, chain of custody procedures, material quantification and mass-balance calculations. Recycled content certification demonstrates a commitment to provide environmentally conscientious products and conserve natural resources. North American producers of recycled content expandable polystyrene (EPS) resins have achieved certification for a variety of these new formulations.

The expanded polystyrene (EPS) foam industry has been circular since day one - and continues to establish innovative ways to boost recyclability and increase levels of recycled content to meet sustainable packaging requirements, support consumer demands, and anticipate and adapt to environmental regulatory measures.

*[1]Environmental labels and declarations — Self-declared environmental claims (Type II environmental labelling), International Standard 14021-16, International Organization for Standardization (ISO), 2016*
*[2]Resource & Environmental Profile of EPS Packaging Products, Franklin Associates, 1997*

## NUMBERS AT-A-GLANCE

- *EPS Converters Replace Virgin Resin With 5-15% Regrind Using Post-Consumer Material Collected Directly from Commercial and Industrial Waste Sources.*
- *With 79 Million Pounds of Online Capacity In North America, Many New EPS Recycled Content Resins Are Third-Party Certified.*

# FOUR REASONS

TO CHOOSE RECYCLED CONTENT EPS

**REDUCE** THE USE OF RAW MATERIALS

**REDUCE** ENERGY CONSUMPTION & LOWER EMISSIONS

**REDUCE** WASTE & AVOID LANDFILLING

**MEET** ENVIRONMENTAL REGULATORY REQUIREMENTS



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