

A GUIDE TO

MOLDED PULP PACKAGING

Applications and Manufacturing



**LEAD WITH TECHNOLOGY.
SUCCEED WITH SERVICE.**



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INTRODUCTION

If you've purchased a new television, carryout food, or even a carton of eggs in the last few years, chances are it included at least some molded pulp packaging. More manufacturers, retailers, and restaurants are turning to this "green" material for protecting products and serving food. In fact, according to **Global Market Insights** the molded pulp packaging market size was \$3.2 billion in 2020 and is estimated to exhibit a CAGR of over 5.1 percent from 2021 to 2027.

This growth trend is based on consumer demand and environmental regulations. The push toward sustainable and renewable packaging for goods means packaging manufacturers are looking for ways to make earth-friendly, durable molded pulp products efficiently and, above all, affordably.

Companies around the world are shifting toward cost-saving alternatives for packaging. They can reap the benefits of lower costs and a green image by replacing traditional packaging materials with eco-friendly materials such as molded pulp.



APPLICATIONS

Molded pulp, also called molded fiber, is a material created from recycled paper, cardboard, and other organic, fibrous materials. It can be formed into a variety of complex shapes for numerous applications covering many industries.

Most of us are familiar with molded pulp in egg cartons and fast-food drink carrier trays, which have been in widespread use for decades. Over time, molded pulp use has expanded greatly in the packaging industry in terms of sheer volume produced and diversity of applications.

One of the most often considered characteristics is the lower cost compared to EPS foam, complicated die-cut corrugated, PE foam, space-saving in transportation, warehousing, and assembly floor space, stronger than competitor products, recyclability, and price stability.

REGULATIONS

Reducing packaging waste has become a growing concern. According to the **US Environmental Protection Agency (EPA)**, “containers and packaging make up a major portion of municipal solid waste (MSW), amounting to 82.2 million tons of generation in 2018.” This represents 28.1 percent of the total MSW generation.

Several states are restricting or banning plastics and EPS materials. Examples include forthcoming actions in Colorado, Maine, Maryland, New York, Vermont, and Virginia between 2022 and 2025. What is more, a new Maine law charges manufacturers for unsustainable packaging to help offset its recycling costs.

Many more states and municipalities have implemented regulations banning the use of single-use foam food and beverage containers, and even polystyrene loose fill packaging materials.



SUSTAINABILITY

Molded pulp is 100% recyclable. In fact, scraps or defective molded pulp products can be recycled back into the manufacturing process to eliminate waste.

Molded pulp is also biodegradable and compostable because it is made of paper and fibers that are also biodegradable. This means that even if they are not recycled, they will break down over time.



BENEFITS

Molded pulp products offer efficiency and value for businesses that use packaging materials or single-use items. These include:

Lower costs, greater efficiency

- Post-consumer and post-industrial paper/fiber raw materials used in molded pulp manufacturing tend to have low and stable prices over time.
- Raw material prices are not tied to the prices of petroleum or resins.
- Finished items usually nest for storage and transport, which means they take up less space and save on these costs.
- Pieces can be designed and molded to fit products precisely, eliminating die-cutting and assembly.
- Advanced drying technology for molded pulp can further increase manufacturing efficiencies, even among lower-margin products.

Flexible design and manufacturing

- Pieces can be designed to fit items with great precision in complex, 3D shapes.
- Rotary mold equipment is relatively simple and mold tooling can be swapped out easily for quick changeover.

Sustainability and renewability

- Recycled paper/fibers are made into a packaging product that can, in turn, be recycled into new packaging products over and over.

Consumer and retailer approval

- Growing numbers of large retailers are backing sustainable and green packaging. Companies can make their products more attractive to retailers.

DRYING OVENS

Prior to drying molded pulp, pieces have between a 3:1 to a 4:1 water-to-fiber ratio. They must reach a final moisture content of 6 to 8 percent and this is accomplished with a trip through a drying oven.

Drying Ovens typically have a continuous belt that carries pieces through the heating chamber and operate in the 300 to 500°F temperature range. Drying can take anywhere from a few minutes to an hour or more, depending on things like water content, thickness, temperature, and part geometry.



The ability to control timing (i.e., travel speed), temperatures, atmospheric moisture levels, and airflow is critical in oven design. It is also important that these factors can be adjusted easily to accommodate a variety of shapes, sizes, of molded pulp products.

Dryer features that increase throughput and save energy costs

One of the biggest goals for molded pulp manufacturing is to achieve the proper final moisture level in as little time as possible, using as little energy as possible (or even reducing energy requirements). An effective way to do this is by measuring the moisture content of the air in the oven. With this data, it is possible to vary the volume of the exhaust and reduce fresh air intake, which results in a more efficient process.

Data collection capabilities are useful for spotting production trends over time and are an effective way to track costs, throughput, and energy use. You can also use this data to make fine adjustments to your manufacturing process.

Remote connectivity of the system to Wi-Fi or ethernet means real-time alerts notify employees when operating parameters are out of range or change suddenly.

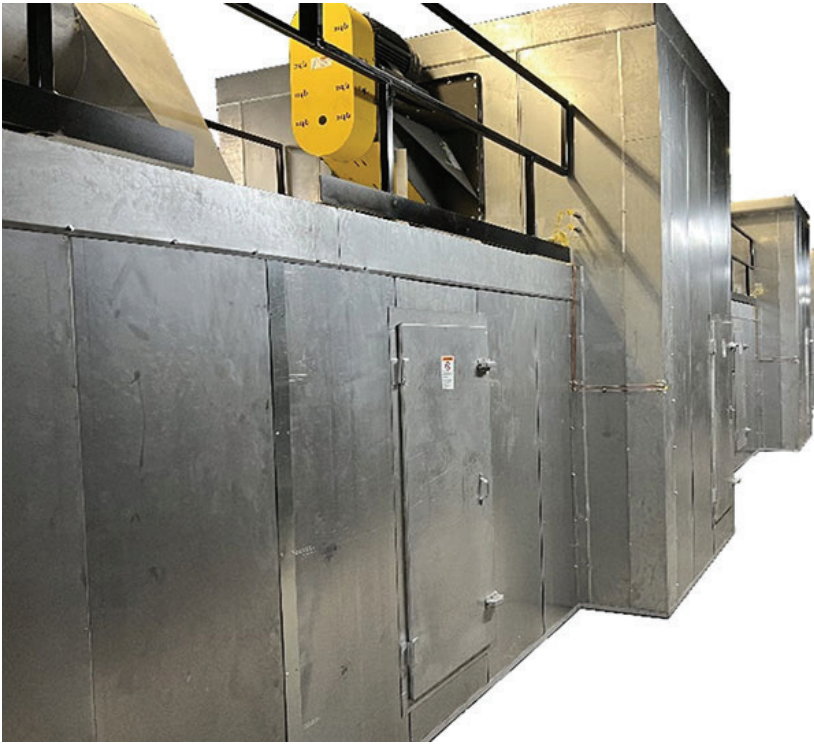
This kind of process monitoring and control increases throughput and reduces the cost of ownership of your oven. That, in turn, lowers energy and production costs and increases ROI.

An experienced oven manufacturer like Abbott Furnace Company can design a pulp drying oven for the exact belt speed, temperature, and airflow that allows for quick and uniform drying. Oven features optimize energy and process efficiencies and include:

- Belt widths of 48 to 72 inches
- Top-down and bottom-up airflow
- Adjustable height top plenum for various part heights
- 6" walls for superior insulation and reduced equipment surface temperatures
- Variable speed exhaust vents
- PLC controls with remote connectivity
- NFPA-86 compliant gas heating system
- Large access doors for ease of maintenance
- Variable speed drives
- Humidity and other process monitoring sensors

Many oven features can be customized to fit your molded pulp parts of different sizes and shapes.

CONTACT THE EXPERTS AT ABBOTT FURNACE COMPANY



Whether you are just starting to explore the advantages of molded pulp packaging, adding capacity or looking for ways to optimize your existing molded pulp manufacturing process, Abbott Furnace can help.

We manufacture customized molded pulp drying ovens that use our proven convective heating technology to evaporate moisture efficiently. Pulp drying ovens are available in multiple heating zones configurations and belt

widths to fit your molded pulp products.

Abbott's team includes experienced and responsive service staff for technical support, troubleshooting, and repair. Please contact us to talk about your molded pulp products and manufacturing process.

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