



2007 United States National Post-Consumer Report on Non-Bottle Rigid Plastics Recycling

Introduction

The 2007 National Post-Consumer Recycling Report on Non-Bottle Rigid Plastics is the first annual report on U.S. pounds of post consumer non-bottle rigid plastics (including packaging and non-packaging) recovered for recycling. Research for this report was conducted by Moore Recycling Associates, Inc. of Sonoma, CA for the Plastics Division of the American Chemistry Council (ACC) of Arlington, VA.

Executive Summary

In order to determine an accurate estimation of pounds of non-bottle rigid plastics recovered in 2007, both the domestic and export post-consumer markets were surveyed. A minimum of 325 million pounds of post-consumer rigid plastic was recovered in 2007. The information obtained is based on recovery data reported by 31 post consumer plastic processors, end-users and exporters. A significant number¹ of MRFs across the country were also surveyed to estimate the amount of non-bottle rigid plastics available in the marketplace.

Use of non-bottle rigid plastic containers and packaging has grown significantly over the past decade. Many rigid containers are made from polyethylene (HDPE) and polypropylene (PP) such as HDPE tubs, PP cups and similar food containers. As more and more markets compete for the collected supply of polyethylene bottles, some markets have begun processing non-bottle HDPE and PP containers to produce post-consumer resin for use in new end-products.

Plastic scrap prices were strong and steady in 2007, including non-bottle rigid plastics. Pricing displayed very little fluctuation throughout 2007; most grades changed less than a couple of cents per pound during the year.

Findings

In 2007, a minimum of 325.44 million pounds of non-bottle rigid plastics was collected for recycling in the United States. Approximately two-thirds of the material was exported, primarily to China, and the remainder was used to manufacture new products such as pallets, crates, composite lumber and gardening products in the U.S. or Canada.

Post Consumer Non-bottle Rigid Plastics

Year	Exported	Purchased for use in US or Canada	TOTAL
2007	204,040,000	121,400,000	325,440,000

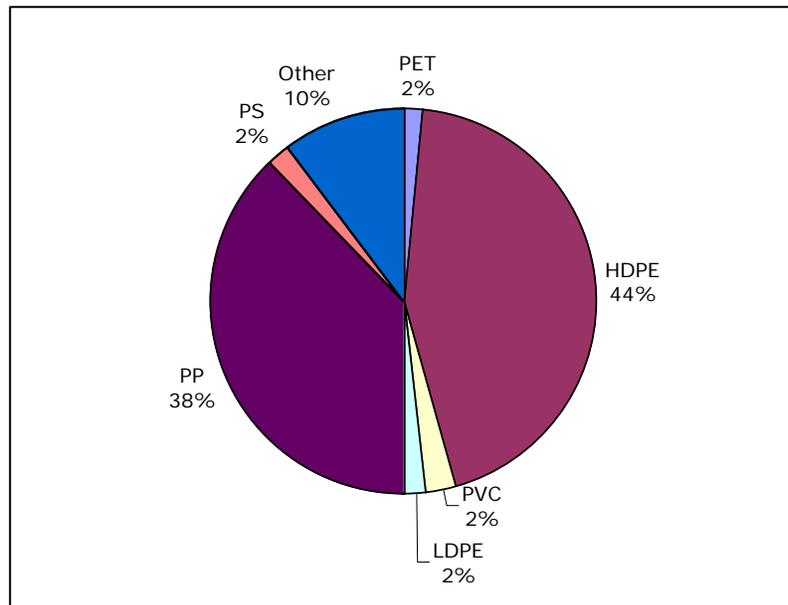
¹ Moore Recycling sent surveys to 81 MRFs



Out of 325.44 million pounds of non-bottle rigid plastics collected for recycling, approximately 55% is classified as durable goods, including items such as pallets, crates, carts, 5-gallon buckets, and electronic housings. A large percentage of non-bottle rigid plastics were polyolefin materials (HDPE, LDPE, PP). Polyolefins generally have the highest value with both domestic and export markets due to the variety of products into which they can be used and their comparative ease of re-use and processing compared to other resins.

The chart below illustrates the percentage breakdown by resin:

Post Consumer Non-bottle Rigid Plastics



Note: "Other" includes 1-6 resins not easily identified during bale characterization studies

Non-bottle rigid plastics are captured in a variety of ways depending on community collection programs, and how MRFs market their materials. The value placed on mixed resin bales is dependent on the likely percentage of polyolefin non-bottle plastics in the bale – higher percentages of polyolefins generally command better pricing.

Non-bottle rigid plastics are sold as single resin and mixed resins. When sold into the marketplace, they can be categorized in many different ways. Approximately one quarter of non-bottle rigid plastics recycled in 2007 were sold as single resin items such as hangers, battery cases, crates, pallets, carts, and bottle caps and floatable items from plastics reclaimers. Some HDPE and PP material was sold as mixed polyolefin containers. More than half of the remainder was sold in mixed resin bales. Listed below are the most commonly requested mixed resin categories, in order of value:

- Injection Plastic (also called Bulky Rigid Plastics) – primarily Polyethylene (PE) and Polypropylene (PP) and includes carts, crates, buckets, baskets, car bumpers

- Electronic Housings – primarily HIPS-ABS-PC
- Commingled Bottles and Containers – generally includes 3-7 bottles and 1-7 containers and/or all bottles and containers in some instances
- Mixed Rigid Plastics (also known as 1-7's, and 3-7's) – includes injection Polyethylene (PE) and Polypropylene (PP) mixed with 3-7 bottles and 1-7 containers
- Other Rigid Plastics – a “catch all” category defined on a case-by-case basis.

One barrier to additional demand for non-bottle rigid plastics is the lack of clear definitions and specifications for different types of baled plastic. This leads to a wide variety of quality and content in bales. Potential buyers of non-bottle rigid plastics need a consistent supply and quality of feedstock. As noted below, the rather random nature of the current collection and processing infrastructure in the U.S. has proven to be obstacle to consistent supply of quality bales.

- All Household Containers 1-7
- All Bottles and Containers 1-7
- All Plastic Containers
- All Rigid Plastic Containers
- Plastic Tubs and Bottles
- Plastic Food and Beverage Containers (bottles and tubs)
- Rigid Plastics with the Recycling Numbers 1-7
- All Bottles and Containers Labeled #2, 4, or 5
- All Clean Plastic
- Plastics Labeled 1-7
- All Plastic Bottles, Tubs and Lids

Examples of Non-bottle Rigid Plastic Containers and Packaging

Below are common examples of non-bottle rigid plastic *containers* and *packaging* that might be accepted in community programs. This does not represent all rigid *packaging* or *plastics*, as other plastics (e.g. blister pack, crates, pallets, carts, 5-gallon buckets, furniture) may be accepted in some community programs.





The number of community programs handling mixed rigid plastics increased significantly over the past few years because of increased demand from domestic and export buyers. Buyers placed an increasingly higher value on this material beginning in mid-2005 when virgin resin prices for polyethylene jumped. High virgin resin prices made mixed rigid plastics an attractive low-cost raw material. As with other commodity materials, quality has not always been a high priority with the export market. This is due to the strong competition, and the lack of direct feedback between converters and suppliers. The processors in China tend to be small family-based businesses that purchase from brokers—they have no connection with suppliers. This is the fundamental reason for the wide variation in quality of bales shipped overseas. Most MRFs (particularly on West Coast), sort out the higher value plastic (PET and HDPE bottles) and then bale the remainder of the rigid plastics together and market these as “mixed rigid” plastic bales. Some MRFs have tailored their sort operations to meet domestic or local market specifications.

In 2008, twenty-eight of the one-hundred largest U.S. cities collected non-bottle rigid plastics through curbside programs. Of the 28 cities collecting non-bottle rigid plastics, 12 collect only all bottles and containers, and 16 cities collect rigid plastics beyond bottles and containers. Most of the 28 cities are located in California or along the West Coast.

Marketplace

Domestic Capacity

The current domestic capacity for mixed rigid plastic and commingled bottles and containers is approximately 70 million pounds per year. Most of the capacity is in mixed resin products such as lumber, railroad ties, garden products and transport packaging. These users prefer the polyolefin fraction but will tolerate and do use the non-olefin bottles and containers (the exception to this is that most pull out all PET and PVC bottles and foamed PS).

There is a strong market for large non-food PE/PP items—well in excess of 240 million pounds per year of domestic capacity. Most of these buyers are seeking clean, bulky rigid materials such as buckets, crates, tubs, toys, storage bins and lawn furniture. These buyers are usually not interested in small HDPE containers such as yogurt cups and butter tubs.

2007 Market

The market price for non-bottle rigid bales was consistent throughout 2007. The domestic market was the price leader for injection grade materials. The export market, primarily China, was the price leader for all other mixed resin bales. As previously identified, approximately two thirds of the non-bottle rigid plastics collected in the United States were exported to China in 2007. The recent October 2008 drop in the demand and price for rigid plastic scrap in China has highlighted the need to expand domestic markets for non-bottle rigid plastics. The potential domestic end market is very large, but as previously noted, there are several barriers to realizing the potential domestic market demand. The primary barrier in 2007 and most of 2008 was the willingness of Chinese buyers to accept low quality, mixed resin bales at relatively strong prices.

End Market Uses

As noted, other than electronic housings, buyers base the value of non-bottle mixed resin bales on the amount of polyolefin plastics in bales. The primary domestic end uses for non-bottle rigid plastics are composite products, such as lumber and railroad ties, and thick-walled injection products such as pots and crates. In addition, a number of companies compound these materials and sell to manufactures that make shapes and forms, such as wheels for roll carts, or roto-molded products such as tanks and carts.

The domestic infrastructure to use much of the non-polyolefin (PET, PVC, PS), non-bottle plastics has not yet developed. In order for this market to develop, domestic users will require a consistent supply of clean, single-resin material typically in excess of 400 million pounds. To generate such a supply will require at a minimum:

- Enforceable reclaimer-generated bale specifications for the various categories of non-bottle rigid scrap plastics.
- Consistent, clear education to consumers about what products to put into the curbside bin.

If these actions occur and collection continues to expand, creating a consistent reliable supply of quality material, then we will likely see an investment in sorting and reclamation capacity for all non-bottle rigid plastics.

Additional Information

The Plastics Division of the American Chemistry Council provides resources to communities, businesses and consumers to increase awareness and education of the recycling of plastic bottles and containers. For information on non-bottle rigid plastics visit www.allplasticbottles.org and www.americanchemistrycouncil.com/plastics and www.plasticmarkets.org for markets and handling guidelines.

The 2007 National Post-Consumer Recycling Report on Non-Bottle Rigid Plastics has been prepared to provide information to parties interested in the recycling of plastics, in particular non-bottle rigid plastic materials. Facilities developing a recycling process and all entities involved in the chain of collection, processing, distribution, and sale of

recycled products have an independent obligation to ascertain that their plans, actions, and practices meet all relevant laws and represent sound business practices for their particular operations. Facilities may vary their approach with respect to particular operations, products, or locations based on specific factual circumstances, the practicality and effectiveness of particular actions and economic and technological feasibilities.

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