



Corrugated Packaging – A Recycling Success Story

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A Corrugated Packaging Alliance (CPA) White Paper



Corrugated Packaging – A Recycling Success Story

Whether you realize it or not, corrugated packaging is a big part of our daily lives. We ship and receive a majority of products in corrugated boxes. Online shopping has dramatically increased the number of boxes entering consumers' homes – and that's in addition to the tremendous volume of products shipped in corrugated containers from manufacturers to stock retailers' shelves.

Corrugated is the most popular shipping container because it's economical, sturdy, and can be customized to fit and protect its contents. It's also the most environmentally-friendly packaging material available in the world today.

In 2015, 93 percent of all corrugated was successfully recovered for recycling in the US, and the average corrugated box was made with 48 percent recycled content. That track record is miles ahead of any other packaging material's recovery and re-use rates, but it didn't happen overnight. It took a prolonged and focused effort that should be viewed as an example to improve recycling rates for other packaging materials.

Do you Recognize this Symbol?

As early as 1970, the corrugated industry was eager to recycle its products. It was then that Wisconsin Senator Gaylord Nelson created Earth Day to build awareness and appreciation for the Earth in a generation of Americans. At the same time, a corrugated company called Container Corporation of America (CCA) sponsored a contest to design a symbol promoting their products made from recycled materials. A student from the University of Southern California, Gary Anderson, submitted the winning entry that CCA modified and introduced to the world. That symbol is the familiar "chasing arrows"

universally recognized as the recycling symbol today.

Chasing Arrows Symbol



The corrugated industry innovated again in the early 1990s, developing the **Corrugated Recycles** symbol to help people identify corrugated for recycling. At the time, curbside recycling was new to most communities. Raising awareness of corrugated's recyclability was an important first step to increasing its recovery rate. The corrugated industry wants its boxes back, because used corrugated containers, also known as "old corrugated containers" or OCC, are needed to make new boxes.

Later adopted internationally, the **Corrugated Recycles** symbol is printed on the bottom of a significant number of today's corrugated boxes as a clear sign that the package can be recycled.

Corrugated Recycles Symbol



It worked. The percentage of corrugated recovered for recycling has been climbing steadily since the symbol's adoption, and grew 3.7 percentage points in 2015 over the year before to a record-high 93 percent. The 2015 increase was driven by a 3.5 percent increase in domestic consumption of recovered fiber and a 10.6 percent jump in OCC exports, as reported in the American Forest & Paper Association (AF&PA) annual report on US paper recovery. More statistics are available at www.paperrecycles.org/statistics.

The corrugated industry's prolonged effort has produced impressive results over time. Even back in 1993, when recycling efforts first began in earnest, 54 percent of corrugated was being recovered – a significant achievement already, considering less than 15 percent of plastic is recovered today, more than two decades later.

Today, when you see any of the following symbols on a corrugated container, you know it can be recycled.

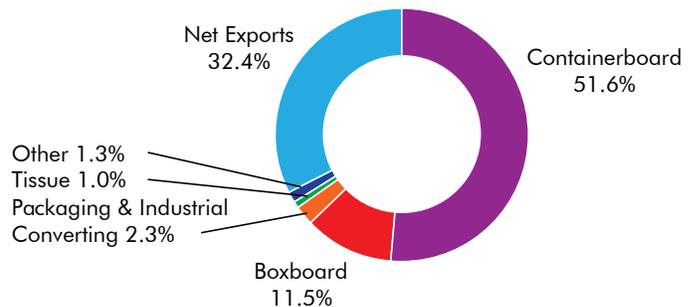


What Happens to the Recovered Boxes?

Corrugated is one of few materials that can be recovered for recycling through an established, healthy market and never needs to go to waste. The fiber in OCC is valuable and is in high demand by both domestic and foreign manufacturers.

Most OCC is used to make new paper products. More than 51 percent of OCC recovered in 2015 was used to make new containerboard for more corrugated boxes. An additional 11.5 percent was used to make boxboard (for primary packaging like cereal boxes), and more than 32 percent was exported. Global demand for OCC generated in the US has grown steadily as well, helping ensure a viable market for US recovered fiber.

Where OCC Goes



How Does Corrugated Recycling Work?

Businesses, retailers and consumers at home collect and return their used corrugated containers to be recycled into new ones. While almost everyone contributes to corrugated packaging's recycling success, fewer people may know where those boxes go from the collection point, or how they are processed to produce new corrugated material. Here's how corrugated is recycled:

1. Corrugated boxes are used for their intended purpose of product protection and transportation.

2. Clean, old corrugated containers (OCC) are collected, in many instances as part of a mixed recyclables stream. To optimize recyclability, containers should be free of contaminants such as food, metal foil, wax, etc.
3. The collected OCC is sorted, compacted and baled for space-efficient storage and handling, either at the point of end-use (store or business) or at the recycling center.
4. Bales are transported to the paper mill.
5. Bales are broken open, and OCC is put into a repulper (a huge tub that looks something like a blender) with water. It is agitated to form a slushy pulp (slurry) of fiber and water.
6. 6a. A big "ragger" chain or rope hangs down into the swirling tub of material. Some contaminants such as long pieces of rope, string or tape, plastic and metal bands will wrap around the ragger and can then be pulled out of the repulper.
6b. The remaining pulp slurry goes through different types of equipment such as towers where the metal falls to the bottom for removal, screens, cyclones, and even big tanks where the

contaminants float to the top and can be scraped off. The cleaned pulp is then sent to the paper machine.

7. The highly diluted fiber solution is poured out onto a moving screen which allows water to drain away, forming a continuous fiber mat, which is pressed between rollers to remove more water.
8. The wet, continuous fiber web is then wound through the dryer section where the top and bottom of the web alternately contact the heated surfaces of the drying cylinders, removing the remaining moisture from the paper.
9. At the end of the paper machine, paper is rolled up on a large reel spool, which can weigh 10-60 tons.
10. The reel is then slit and rewound into individual rolls that weigh approximately 3 tons each. The recycling process is complete; the new paper rolls are shipped to box manufacturers to begin the next stage in life to become new corrugated boxes.

A downloadable graphic of the recycling process is available here: <http://bit.ly/2bbleHR>.



Why Recycle?

Recycling corrugated helps decrease solid waste disposal in landfills. It also provides fiber that is reused to make new corrugated, using less new, raw material in the process. Recycling corrugated even earns revenue for the end-user, because OCC is valuable to paper mills and manufacturers of new corrugated.

Sustainable Packaging

A stellar recovery rate is a fine example of the environmental benefits of corrugated packaging. But that's not all – corrugated packaging is sustainable across the board – renewable, economical, effective – a responsible packaging choice.

According to the US Environmental Protection Agency (EPA), "Sustainability is based on a simple principle. Everything that we need for our survival and well-being depends, either directly or indirectly, on our natural environment. Sustainability creates and maintains the conditions under which humans and nature can exist in productive harmony that permit fulfilling the social, economic and other requirements of present and future generations."

In current business practice, sustainability is understood to encompass responsible

management of environmental, economic and social resources and impacts. Sustainability has become a critical business marketing and survival strategy, driven by public opinion, government regulation, dramatic changes in major retailers' purchasing criteria and increased consumer awareness.

The growing emphasis on sustainability has profound implications in packaging, which is subject to intense scrutiny and innovation. Some of the world's largest retailers now demand measurable improvements in packaging sustainability for the products they buy and sell to consumers.

Renewable from the Start

As if corrugated's recycling story weren't amazing enough, it's important to remember that it is made from a completely renewable resource. Tree farms help clear the air, protecting our environment while helping ensure a sustainable future.

Made from responsibly managed, renewable resources.

- 96 percent of corrugated boxes are made with material supplied by certified fiber sourcing programs such as Sustainable Forestry Initiative® (SFI), Forest Stewardship Council (FSC), and American Tree Farm System (ATFS).



Program participants are committed to sustainable forestry in their own forests, and are required to encourage their suppliers to practice sustainable forestry.

- For the past 100 years, total US forest area has been stable and actually grew by 2 million acres from 2000 to 2005. (AF&PA's 2012 Sustainability Report)
- The forest products industry plants 1.7 million new trees every day, contributing to the long-term viability of North American forests, preserving wildlife habitats, sequestering carbon dioxide and offsetting greenhouse gas emissions. (SFI)
- Today, the United States has 20 percent more trees than it did on the first Earth Day celebration more than 40 years ago.

Life Cycle Assessment (LCA), Recycling and Recycled Content

In addition to supplying vital stock for the manufacture of new paper products, steady increases in corrugated recycling help the industry continue to reduce its environmental footprint. The recycled content of corrugated boxes is tied to total system fiber usage and therefore is linked to many variables in a life cycle assessment (LCA). The amount of new virgin fiber required in the system is offset by the recycled content which affects energy consumption and emissions at the mills. The use of nearly 50 percent recycled fiber in the average corrugated box contributes to a significant reduction in waste to landfills and subsequent methane generation -- which reduces the industry's life-cycle impact on global warming potential (GWP).

The Corrugated Packaging Alliance publishes the corrugated industry's LCAs, including baseline assumptions and documented statistics. The latest studies can be viewed [here](#); check back often for updates. The 2014 LCA revealed a 32 percent reduction in

GWP from the first-ever corrugated industry LCA published in 2009, along with double-digit reductions in eutrophication, respiratory, and fossil fuel depletion indicators.

Get on board.

Supermarkets can do their part by requesting recyclable corrugated packaging from their suppliers – even for products that need moisture protection, using recyclable wax alternatives where special coatings are needed. Grower/shippers and other suppliers can help by packaging and shipping their products in corrugated containers. It's a responsible choice throughout the grocery supply chain.

And remember:

Corrugated Recycles.

CORRUGATED PACKAGING RECYCLING SUCCESS



RECYCLING CORRUGATED
PACKAGING IS
TREMENDOUSLY SUCCESSFUL.

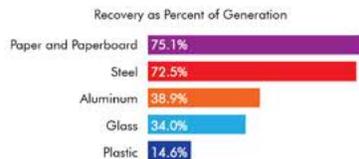
93 PERCENT RECOVERY RATE

In 2015, the recovery rate for old corrugated containers (OCC) was a record-high 93 percent, up from 54 percent in 1993.



MOST RECOVERED MATERIAL

More corrugated packaging is recovered for recycling than any other packaging material.



Source: 2013 EPA "Advancing Sustainable Materials Management: 2013 Fact Sheet"

RECOVERED OCC MAKES MORE BOXES

Nearly all old corrugated containers (OCC) are used to make new paper products. The average corrugated box contains 47 percent recycled content.



RECYCLING PROGRAMS ARE EVERYWHERE

95 percent of Americans have access to community curbside or drop-off corrugated recycling programs.



Source: 2014 AN&PA Community Access Survey, Louis Berger, February 2015

INVESTING IN EDUCATION

The corrugated box industry has made significant investments to educate retailers and consumers on the benefits of recycling corrugated materials.

In 1970, a corrugated company introduced the world to the familiar "chasing arrows" universally recognized as a recycling symbol today.



In 1994, the "Corrugated Recycles" symbol was introduced in the U.S., and today the symbol is present on a majority of corrugated packaging.



For the most up-to-date corrugated industry statistics and information, visit www.corrugated.org.

The new infographic can be [downloaded here](#).

About the Corrugated Packaging Alliance

The Corrugated Packaging Alliance (CPA) is a corrugated industry initiative, jointly sponsored by the American Forest & Paper Association (AF&PA), AICC – the Independent Packaging Association, the Fibre Box Association (FBA) and TAPPI. Its mission is to foster growth and profitability of corrugated in applications where it can be demonstrated, based on credible and persuasive evidence, that corrugated should be the packaging material of choice; and to provide a coordinated industry focus that effectively acts on industry matters that cannot be accomplished by individual members. CPA members include corrugated manufacturers and converters throughout North America.

For more information about corrugated recycling, visit www.corrugated.org, and follow us on Twitter (@corrugatedpkg) at <https://twitter.com/corrugatedpkg>.

