

47,565 Reasons per Minute to Restock Break Rooms with Coffee Cups made with Compostable PHA

“Each year Americans throw away 25,000,000,000 [25 billion or 47,565 per minute] Styrofoam cups. Even 500 years from now, the foam coffee cup you used this morning will be sitting in a landfill.” – U.S. Environmental Protection Agency
(<http://www.epa.gov/reg3wcmd/solidwasterecyclingfacts.htm>)

PHA vs. EPS: The Truth about Expanded Polystyrene Foam Coffee Cups

By Laura Mauney



MHG PHA compostable plastic can be formulated to make a low cost foamed resin, offering a cost-competitive replacement for expanded polystyrene foam.

Businesses stock break rooms with it. Employees on lunch break microwave soups in it. Restaurants and coffee shops deliver takeout meals and beverages in it. Shippers pack fragile products in it. Event venues for concerts, movies, and sporting events offer refreshments in it. Organizers of social gatherings – church potlucks, PTA fundraisers, community fairs – buy it on the cheap to save money.

- Hot drinks won't melt it.
- Eggs don't break inside of it.
- Fully loaded meals don't buckle it.

Though it owns its own recycling number – **Symbol 6**

(<http://www.goodhousekeeping.com/home/green-living/recycling-symbols-plastics-460321#slide-6>) – most landfills don't accept it for recycling.

It leaches chemicals, the fumes of which are detectable in confined spaces.

Flaky bits and pieces of it can attach to food, and float randomly around in the open air (yes, we are ingesting and breathing it).

Top environmental organizations report that its core component (styrene) can severely affect human health when exposure is consistent and long term, impacting the nervous system, hemoglobin, and respiration. (To learn more about the health effects of styrene, visit [NRDC.org](http://www.nrdc.org)

(<http://www.nrdc.org/living/chemicalindex/styrene.asp>)).

Cities throughout California and across the nation have banned it from government purchasing. (To learn more about communities that have banned polystyrene, visit [Surfrider.org](http://www.surfrider.org)



MHG PHA compostable plastic is non-toxic and FDA approved for food substance contact.

(<http://www.surfrider.org/pages/polystyrene-ordinances>)).

Its 500-year full life cycle is 16.66 times longer than the radioactive half-life of cesium, the contaminant leaked into soil and water after the Chernobyl and Fukushima nuclear power plant meltdowns.

EPS Foam is Cheap to Make

Expanded Polystyrene Foam (EPS foam) is often referred to by DOW's branded version of the product: Styrofoam™.

Because it consists mostly of air (90%), which is spun into polystyrene plastic resin using pentane gas, EPS foam one is of the cheapest plastic substances to produce in large quantities.



MHG PHA has a high melting temperature, and is strong enough to contain the weight of a fully loaded takeout dinner.

In the United States alone, the potential market for expanded polystyrene foam is huge, including 1 million restaurants, 300K churches, 40k movie theaters, 98k public schools serving 4.1 million children, and 28 million small businesses plus 16k large businesses employing 120 million adults.

FedEx and UPS combined ship almost 7 billion packages per year. Over 200 million electronics items were sold in the United States per year during each of the past three

years. Many, if not most, of those items were delivered to customers packed up in some version of EPS foam.

An Hour in the Life of a Busy Break Room Supplies Shopper

Considering its light weight and low cost, and the sheer volume of annual sales involved, EPS foam is obviously one of the most difficult plastic materials to justify replacing from a business perspective.

With that in mind, I decided to play devil's advocate with the current state of the compostable plastic marketplace by assuming the character of a shopper of break room supplies for a small business of 50 employees.

I went online and ran searches for products made of EPS foam vs. products made of biodegradable PLA and other vegetable based materials, including paper.

The first chart displays pricing results for break room supplies made of bio-based materials:

Biodegradable Item	Cost Apiece	Cost per 10K/yr
Cardboard Clamshells	\$0.27	\$2,700.00
Cornstarch Cold Beverage Cups	\$0.11	\$1,100.00
PLA Lined Paper Hot Beverage Cups	\$0.10	\$1,000.00
Bagasse Plates	\$0.06	\$600.00
Total	N/A	\$5,400.00

The second chart displays pricing results for break room supplies made of expanded polystyrene foam:

EPS Foam Item	Cost Apiece	Cost per 10K/yr
EPS Foam Clamshells	\$0.13	\$1,300.00
EPS Foam Cold Beverage Cups	\$0.03	\$300.00
EPS Foam Hot Beverage Cups	\$0.02	\$200.00
EPS Foam plates	\$0.04	\$400.00
Total	N/A	\$2,200.00

Depending on a given company's budget and philosophical and environmental priorities, the price differentiation can be seen either as excessive or not so much:

EPS Foam	Cost Savings	Percent Savings
Clamshells	\$1,400.00	
Cold Beverage Cups	\$800.00	51.85%
		72.73%

Hot Beverage Cups	\$800.00	80.00%
Plates	\$200.00	33.33%
Total	\$3,200.00	59.26%

The issue with these comparisons is not the few cents difference between the current crop of biodegradable disposables vs. non-degradable disposables. The issue – just as with the environmental impact of EPS – lies with the bulk usage aspect.

When calculated up to the level of those 25 billion EPS foam cups per year reported by the EPA, for example, the current cost of trading out polystyrene foam cups with cornstarch or PLA lined paper cups adds up to billions of dollars more.

That cruel fact established, is it any wonder the whole wide working world is NOT rushing to the store to buy biodegradable dishware for break rooms?

Clearly, to solve the huge environmental problem caused by cheap, disposable EPS foam dishware, something revolutionary needs to happen in the world of biochemistry, and it is.

MHG is Working the Foamed Plastic Problem with Biodegradable PHA

MHG's compostable PHA bioplastic, which is sourced from Canola, is fully adaptable to a foamed resin strong enough to replace EPS foam. MHG's PHA also has already proven to be cost-competitive with petroleum-based plastics.

According to Chief Science Officer Dr. Isao Noda of MHG, the company is “actively pursuing the direct replacement of Styrofoam with foamed PHA... and customers are waiting in line.”

The airy nature of foamed plastic, combined with the strength and high melting temperature of PHA, casts an even rosier future for the low cost and viability of MHG's PHA bioplastic.

PHA from MHG is already FDA approved for food substance contact, and will biodegrade fully and seamlessly on its own within three months of disposal, or 25% of a single year.

When three months without a trace is compared to the 500 years required for EPS foam to degrade, plus the fumes, litter, and particulate air pollution caused by billions of pieces of unhealthy polystyrene snowing upon us every day in the meantime, the reasons to replace EPS foam with bio-based PHA foam are overwhelming.

Does Your Company Manufacture Plastic Products?

Please visit **MHGBio.com**

(<http://www.mhgbio.com/>), to find out more about how biodegradable plastics from MHG can be adapted to a wide range of product manufacturing and packaging requirements.

Learn more (<http://www.mhgbio.com/mhg-sustainability/mhg-certifications/>) about how MHG's biodegradable PHA plastic is **Certified** (<http://www.mhgbio.com/mhg-sustainability/mhg-certifications/>) for all six levels of biodegradability and compostability.

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MHG PHA composts aerobically and anaerobically, meaning it will disappear into soil or water, leaving no chemical trace, in about 90 days.