

# Why Plastic Films Made of MHG PHA Work Better for Families

## Biodegradable PHA Plastics Can Improve Food Quality, Personal Health and the Environment

By Laura Mauney

One of the earliest warnings that young parents receive after the birth of a child is to keep garment bags, trash bags, and carryout bags made of soft plastic films stored out of reach. The reason is to prevent accidental smothering, ingestion or choking on the plastic by curious, playful – and eventually – teething children.



The plastic film safety rule applies whether a product is made of a petrochemical or bio-based plastic.

However, these days, soft plastic films are used for many more household applications than just clothing protection, food shopping, and waste management. Sheltering children from the risks from all the bits of plastic films around the house can often feel like a never-ending game of whack-a-mole.

Manufacturers use soft plastic film for the following (and more):

- Bread bags
- Cereal box liners
- Packaging for dried berries, chips, sugar, rice, candy, frozen foods, and pet food
- Packaging for fresh foods, including cheeses, meats, salad mixes, and bags of fruit
- Packaging for paper goods, including bathroom tissue, paper towels, and coffee filters

- Packaging, wrappers, and linings for disposable diapers and feminine products
- Peel-off lids for yogurt cups
- Safety seals for food containers, medicine bottles, and personal care products
- Shower curtains, backpacks, storage bags and tote bags
- Shrink wrap on cases of foods, beverages, and cleaning products

Soft plastic film is also integrated into products in other, more discreet ways. One example of hidden plastic is the handy-dandy, plastic slot on cardboard tissue boxes, a feature presumably intended to deter tissue over-plucking.

Consumers have also become accustomed to packing and storing home-made food in plastic film products, including:

- Zippered food storage bags
- Rolled food wrap
- Sandwich and snack bags

Many people also repurpose plastic film carryout bags for pet waste pickup, household trash collection, and apparel storage. At my house, I even found an old silver ladle stored in a sticky, plastic bagel bag, presumably to prevent the silver from oxidizing.

## **Love that Clean, New Plastic Smell? You Might Want to Consider Breaking Up!**

Beyond the immediate and obvious dangers to children of plastic films, those made from petrochemicals can create a compendium of other health and safety problems.

The nature of petrochemical plastics means that the films can contain toxic substances that leach into stored materials, including food, directly into bodies via the skin, or into the open air.



Some of the chemicals used to make, strengthen, or soften plastics include BPS, BPA, and phthalate esters. BPS, BPA, and phthalates are known endocrine disrupters, causing hormonal problems that affect reproductive systems, and increased cancer susceptibility.

When warmed, plastics can also off-gas additive chemicals. The effects of off-gassing increase dangerously in homes sealed up for the winter, and in sealed vehicles parked in the sun.

Though most homes never burn, and most people are sensible enough not to incinerate plastic in fireplaces or open-air trash pits, new chemicals are created when plastic burns. Some of those chemicals, including dioxin, are the most toxic substances on earth.

## How Does One Recycle Plastic Glued to Paper?

All the miscellaneous, tiny bits and pieces of plastic film trash we toss away every day can not be recycled. Those scraps of plastic serve no purpose in landfills other than to take up space, for hundreds of years.

Just as in the home, the chemicals used to make the plastics or make them function better, also can leach into soil and water from landfills, risking eventual contamination of the ground water and the atmosphere.

When petrochemical plastic film enters our waterways as litter, it is often swallowed whole by marine life, gets tangled up in fins, snouts, and coral reefs, or simply breaks up into smaller and smaller plastic particles.

These plastic particles sponge up molecules of leaked boat fuels and other toxins while floating around in lakes, rivers and oceans. The tiny plastic fragments are often unwittingly consumed by fish. Reptiles, birds and mammals that eat the fish

subsequently are put at risk.

## **Fish don't know Better, but we, the Humans, Do**

Although less plastic use, in general, may solve many of the waste-stream problems, plastic film remains important to food protection from deadly bacteria and mold, to safer and more efficient goods packaging and distribution, and to trash disposal.

The replacement of petrochemical films with plant-sourced biopolymers for home and medical products is an obvious alternative for personal health and environmental reasons.

As it turns out, some PHA bioplastic films function better for their intended use than petro-plastics.



One of these is MHG Nodax<sup>TM</sup> PHA, which can be used to make a full range of plastic films for common household products.

Because the micro-organisms that thrive in MHG's non-GMO, cold-pressed Canola oil produce the PHA, the polymer does not "require" or "inherit" toxic chemicals during manufacture.

MHG PHA is also certified by organizations such as Vincotte and ASTM as bio-based, biodegradable in soil, freshwater, and marine water, and as aerobically and anaerobically compostable.

Unlike the toxic loop often created by petrochemical plastics that enter the waste stream, MHG PHA, therefore, creates an eco-friendly loop, meaning that it remains part of the biosphere from manufacture to disposal.

Most significantly, MHG PHA offers several mechanical advantages over petrochemical plastics as a feedstock for film resins.

PHA possesses natural UV resistance, meaning that the substance does not crack, melt or break apart when exposed to sunlight.

PHA's molecular structure also works better than petrochemical plastics to preserve food freshness and to protect anything it encases from oxidation and other damage caused by exposure to the elements.

## Dr. Isao Noda, MHG's Chief Science Officer, explains...

"...MHG Nodax™ PHA possesses some very unique and useful properties that even high-grade polyethylene cannot compete against.



MHG Nodax™ PHA preserves freshness and protects food better than petrochemical plastic films.

"...MHG Nodax™ PHA film exhibits unexpectedly high barrier properties against certain important gasses, such as oxygen and CO<sub>2</sub>. Laboratory measurements indicated a stunningly low level of oxygen permeation that was 50 to over 100 times more effective than polyethylene or polypropylene. That means a bag of thin MHG Nodax™ PHA film can contain or exclude oxygen better than a polyethylene container with a wall one hundred times thicker!

"We all know that sliced pieces of apples or potatoes turn color and become brown if left in the air for a long time. This is due to the action of oxygen in the air. Even in a polyethylene bag, apples start changing color overnight. What happens if we keep

a piece of cut potato or apple in a bag made of MHG Nodax™ PHA? ... Even after a full week ... [the potatoes] remained fresh without changing color. The same was true with apples.

"...Another very important topic to think about for barrier property is the containment of various odors. Products sitting side by side in a same warehouse often exchange odors. Breakfast cereal can end up smelling like detergent, or a telephone may have a strong



perfume scent. Neither is a welcome situation, but both of those things can happen in real life because, unfortunately, many plastics films do not have good odor barriers. MHG Nodax™ PHA now comes to the rescue.

“...[a] chopped onion in a MHG Nodax™ PHA bag [would not] smell after five hours, ten hours, and even several days. And, it will remain fresh and crisp since not only odor, but also oxygen is shut off.

“It is very unusual to find high oxygen, CO<sub>2</sub>, and odor barrier properties among soft film-forming polymeric materials. One exception probably is chlorine-containing polymers like Saran™, which is not easily heat-sealable to make commodity bags. Also, environmental concerns are dramatically reducing the use of chlorine-containing polymers nowadays. Thus, material like Nodax™ really stands out as an exceptional and functionally superior alternative.” – Dr. Isao Noda

## Does Your Company Manufacture Plastic Film Products?

Please visit **MHGBio.com** (<http://www.mhgbio.com/>), to find out more about how biodegradable PHA 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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