



# NOAA Marine Debris Program

## Marine Debris Monitoring and Assessment Project

www.MarineDebris.noaa.gov  
Keep the sea free of debris!

### Marine Debris Survey Photo Manual

## Plastic

**Plastic fragments** will have a similar texture to their original condition, but may be more deteriorated due to exposure to the environment. Polystyrene (PS) can be hard or foamed, but may change with exposure to the environment. Pieces of plastic film or sheeting can be found shredded into strips.

Hard Plastic:



Foamed Plastic:



Plastic Film:



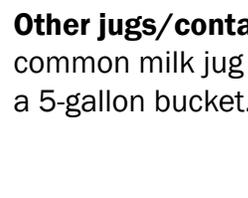
Plastic Film:



**Food wrappers** come in a variety of types and sizes. Food packaging can be made of polypropylene (PP), polystyrene (PS), or polyethylene (PE). Food wrappers are distinguished from plastic films by identifiable labels.



**Beverage bottles** for soft drinks, water, juice, sports drinks, and beer. Made in a variety of sizes (e.g. 6 oz. to 2 L), colors vary (translucent, green, brown, light blue, etc.). Usually made of polyethylene terephthalate (PET or can be made of PETE).



**Other jugs/containers** include a variety of packaging types ranging from the common milk jug to a food container to an oil lube bottle to cleaner bottle to a 5-gallon bucket. Most are made of polyethylene.





**Bottle & container caps** come in various sizes and colors. Caps and closures for beverage bottles are usually made of polypropylene (PP) and high density polyethylene (HDPE) with other container lids being made of low density polyethylene (LDPE) or linear LDPE (LLDPE).



**Cigar tips** are provided on a few brands of cigars and are considered disposable filters.



**Cigarettes/cigarette filters** can be hard or fibrous (both are made of a synthetic polymer – cellulose acetate); some cigarettes may not have filters and are composed of only tobacco and paper.

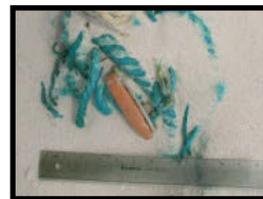
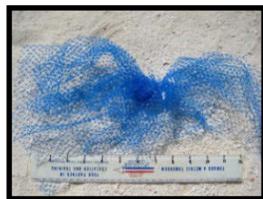
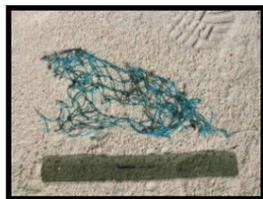
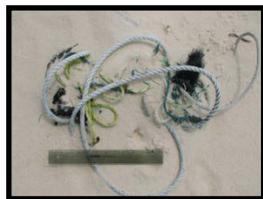


**Disposable cigarette lighters** have a casing made of a rigid plastic (usually with a metal top). May or may not contain fluids.



**Bags (film)** used for dry cleaning, newspapers, bread, frozen foods, bulk ice, fresh produce, household garbage, etc. Bags are usually made of HDPE or LDPE

**Plastic rope & small net pieces** are composed of synthetic material rather than cloth or fabric. Net pieces can be distinguished from rope pieces if knots are present. Plastic rope and net is composed of polypropylene and/or nylon.



**Buoys & floats** are usually associated with fishing and boating activities. A buoy floats at the surface and is moored to the bottom. Floats (some are also called bobbers) can 'float' at various depths or rest at the surface. These come in various sizes, shapes and colors. Most mooring buoys are made from HDPE. Rope floats are made of compression molded polyvinyl chloride (PVC). Some floats can be made of rigid polystyrene (PS-foamed plastic).



**Fishing line & lures** can be found in a variety of forms based on fishing type. Fishing lures come in a variety of shapes, sizes and materials dependent on their function. Modern types are made of plastic with metal hooks and eyes for line. Fishing line types are mostly available in three varieties – monofilament, braided and fluorocarbon. Fishing line is usually made of nylon or PET/PETE, with monofilament being the most popular.



**Cups** (including polystyrene) are usually made of either PP or foamed plastic / PS. However, some cups have been made of HDPE and PET, with most paper cups being coated with a plastic film.



**Straws** come in various sizes ranging from shorter ones (~ 4 inches) used in cocktail drinks to a variety of beverage types (~8-10 inches). Straws that are made of paper will deteriorate faster, even if wax-coated. Straws found on the beach or floating on the water will most likely be made of polypropylene (PP).



**Balloons** (mylar balloons) have a seam and are made of a metal (foil) coated plastic such as polyethylene or nylon.

**Personal care products** is a very broad plastic debris category. This includes various products including health and beauty aids ranging from deodorants (usually with a roller-ball applicator as most aerosol containers are made of metal) to suntan or body lotion bottles to combs/brushes to toothbrushes. This debris can be “left” at the beach or is deposited from storm water drainage or washed in from offshore sources. This debris is usually made of polypropylenes and polyethylenes (including HDPE).



**Pellets** (for use in pelagic and microdebris analysis) Resin pellets are raw plastic material used to produce plastic products. They come in a variety of basic shapes (e.g. round, cylindrical, ovoid), can be translucent or may be in color, but are usually white, black or clear. Once the pellets have been exposed to the environment, their color will change. Most pellets are less than 5 mm in size.



## Metal



**Aluminum/tin cans** are used for beverages (sodas, juice, beer) and food stuffs. Exposure to the environment will cause these containers to deteriorate – aluminum cans become brittle over time and collapse. If dumped at sea, they will most likely sink out before being deposited on the shore. Tin cans can rust when exposed to the environment. These are usually associated with household trash, but larger cans (6 inch diameters or larger) are usually related to ship galley food products.



**Aerosol cans** have an outer shell of metal (aluminum or steel) and compressed contents. The spray valve will be made of plastic and the cap is also usually plastic. The spray valve and cap will most likely not be attached to the canister.



**Metal fragments** can vary in size and may be located with a metal detector. Metal pieces that have been exposed to the environment may rust depending upon their material.

## Glass



**Beverage bottles** are used for sodas, water, liquor, beer, and wine and come in assorted colors (clear, green, brown, blue, and other colors). Most glass beverage bottles have metal caps.



**Jars** for condiments and other foods can be made of glass. This type of debris is usually associated with household waste (land) or galley waste (ocean). The lids are usually metal. If these are dumped at sea without their lid, they most likely will sink.



**Glass fragments** care should be taken in collecting this debris. Use gloves and/or use a slotted scooper to remove pieces of glass.

## Rubber

**Flip-flops/shoes** found as debris may consist of the entire article or part of it, such as the bottom of a flip flop or the sole of a shoe. Shoes may be made of leather, canvas or nylon. Boots used for fishing operations and are usually rubber with heavy soles and steel toes.



**Gloves** are used for numerous water-related activities (both recreationally and commercially). Work gloves used for fishing may be made of natural rubber latex, Nitrile (synthetic rubber compound), neoprene (polychloroprene), polyvinyl alcohol (PVA), polyvinyl chloride (PVC), polyurethane (PUR), or butyl rubber (synthetic). NOTE: In some geographic areas, evidence of sea turtles attempting to feed on discarded gloves can be seen with diamond-shaped bites in the gloves.



**Tires** can come in various sizes (trucks, cars, trailer, bicycle, recreational vehicles, lawn mower, etc.) and may have the wheel rim still attached (metal), hub cap (metal) covering lug nuts (metal). If an inner tube is found, it will be made of rubber but will be from a much dated vehicle as current styles do not use inner tubes.



**Rubber fragments** may not feel like “rubber” due to their degradation when exposed to the environment. Due to oxidation, rubber may even feel brittle.



**Balloons** are traditionally made of a liquid rubber (natural latex). NOTE: Most toy balloons are made of natural latex, but some are made from a synthetic polymer and are therefore considered plastic.

## Processed lumber/paper



**Cardboard cartons** will begin to deteriorate the longer they are exposed to the environment. They absorb moisture and the layers that form the walls will start to fall apart, resulting in the box collapsing. The longer the cardboard carton is exposed, the faster it will deteriorate.



**Paper & cardboard** will consist of newspapers, magazines and books that may have been left on the beach or have been blown onto the beach or into the water. Cardboard might be left behind as packaging for a case of beer cans or allowed to be blown onto a beach from a waste bin. Both materials will most likely be deteriorated due to exposure to the environment.



**Paper bags** may have been left behind by a beach-user or allowed to blow on the beach or into the water. These may be the result of fast food that was consumed near or on the beach. The bags will begin to deteriorate the longer they are exposed to the environment. As bags absorb moisture the paper will fall apart.



**Building material** may include a variety of material types depending upon the use and source. Plywood and lumber pieces can float and will be carried to other areas by the wind and waves. Other potential types of building materials could include PVC piping (polyvinyl chloride), rebar (metal) and polystyrene insulation.

## Cloth/fabric



**Clothing** is usually left behind (lost) by beach goers or fishermen. Shorts, tops and often underwear have been collected.



**Gloves (non-rubber)** made of fabrics are most likely not used on boats or fishing activities.



**Towels/rags** have various sources based on usage. Towels are usually left behind by beach goers and rags might be used on boats for working with equipment and maintenance (cleaning) activities



**Rope/net pieces** that are not made of nylon can be identified by a “softer” feel in most cases. Natural rope material can also be tested using the flame of a lighter where the synthetic rope will melt when exposed to the rope fibers, natural fibers will ignite (provided they are relatively dry). Large (very thick) natural ropes are often used as mooring lines for ships when in port.

**Fabric pieces** are identified when the original object is no longer distinguishable due to deterioration. Fabric pieces usually tear when pulled on.

