Recycling Plastic

Plastic is a useful material found in many day-to-day products, it is non-biodegradable and it takes thousands years to disintegrate and decompose. At the same time, disposing plastic through incineration releases much toxic gases

into the environment.

Types of Plastics and its codes and use

Use of Standard Symbols Facilitates Separation of Distinct Types of Plastics for Recycling

Symbol (letters may be omitted)	Plastic type	Examples
1 PETE	Polyethylene terephthalate	Soda bottles, salad-dressing bottles
2 HDPE	High-density polyethylene	Milk jugs, motor-oil bottles, detergent bottles
3 V	Polyvinyl chloride	Shampoo bottles, wrapping film
4 LDPE	Low-density polyethylene	Grocery and other shopping bags
5 PP	Polypropylene	Cereal-box liners, dairy-product containers prescription bottles
6 PS	Polystyrene	Foam cups, packing materials

Type 1 Plastic – Polyethylene Terephthalate (PET, PETE)

The acronym PETE (polyethylene terephthalate) or PET (poly ethylene terephthalate) are often used interchangeably, to refer to type 1 plastic. PET or PETE plastics are often used in soft drink bottles, as well as food and non-food containers, because of their good gas and moisture barrier properties.

Examples of the recycling codes for PET and PETE plastic are seen below.

PET and PETE plastic can be recycled into carpet yarns, fiberfill, tote bags, food and drink containers, luggage and clothing.

Type 2 Plastic – High Density Polyethylene (HDPE)

The acronym HDPE (high density polyethylene) is often used to refer to type 2 plastic. HDPE plastic is often used to make bottles for beverages with short shelf life, such as milk and juice. Because HDPE has good chemical resistance, it is also often used for containing household and industrial chemicals such as detergents and bleach. HDPE is also used to manufacture grocery and retain bags. Examples of recycling codes for HDPE plastic are seen below

The “PE-HD” symbol is often used by plastic bag industries.

HDPE plastic can be recycled into bottles for holding household chemicals such as detergent, shampoo, conditioner and even motor oil. Recycled HDPE plastic can also be made into pipes, buckets and bins, pens, flower pots, film and sheets, benches, and even dog houses.

Type 3 Plastic -- Vinyl or Polyvinyl Chloride (PVC)

The acronym PVC (Polyvinyl Chloride or Vinyl) is used to refer to type 3 plastic. There are two types of PVC plastic. Rigid PVC are made into bottles and packaging sheet, as well as pipes and fittings, carpet backing and windows in the construction market. Given its stable electrical properties, flexible PVC are used in wire and cable insulation. Given its excellent chemical resistance, flexible PVC are also made into blood bags and medical tubing.

Examples of PVC plastic recycling codes can be seen below.

Recycled PVC can be made into packaging, mud flaps, film and sheet, floor tiles and mats, resilient flooring, trays, electrical boxes, cables, traffic cones, garden hose.

Type 4 Plastic -- Low Density Polyethylene (LDPE)

The acronym LDPE (Low Density Polyethylene) is used to refer to type 4 plastic. Given its toughness, flexibility and relative transparency, LDPE plastic is often used in cable insulation, flexible bottles, as well as film applications. LDPE is also used extensively in manufacturing breadbags, tote bags, dry cleaning bags, furniture, carpets, and squeezable bottles.

Examples of LDPE plastic recycling codes can be seen below. The “PE-LD” recycling codes are often used by plastic bag manufacturers.

Recycled LDPE plastic can be made into garbage can liners, floor tile, film and sheet, bins, landscape timber and lumber.

Type 5 Plastic -- Polypropylene (PP)

The acronym PP (Polypropylene) is used to refer to type 5 plastic. PP plastic is used extensively for packaging purposes. Given its high melting point and good chemical resistance, it is also used to contain hot-fill liquids, and molded in automotive parts. Examples of PP plastic recycling codes can be seen below.

Recycled PP plastic can be made into brooms, rakes, brushes, signal lights, ice scrapers, and trays.

Type 6 Plastic – Polystyrene (PS)

The acronym PS (Polystyrene) is used to refer to type 6 plastic. Given its clear and hard properties, PS plastic is often used in protective packaging, such as CD covers or cases. PS plastic can also be foamed, to be made into Styrofoam which are in turn made into disposable plates and cups and take-away containers, etc.

Examples of PS plastic recycling codes can be seen below.

Recycled PS can be used in manufacturing rulers, license plate frames, foam packaging, foam utensils, plate and cups, vents, switch boards, and thermal insulation items.

Type 7 Plastic – Others

This plastic recycling code indicates that the type of plastic in question is made of a resin other than the six listed above, or is made of more than one resin listed above.

Are all types of plastic recyclable?

The ease of recycling the various types of plastic differs.

Type 1 plastic (PET and PETE) and Type 2 plastic (HDPE) are easy to recycle and poses low risk of leaching breakdown products.

Type 3 plastic (PVC) contains chlorine, and hence, in its manufacture, as well as its disposal (eg. incineration), highly dangerous and toxic gases are released. Hence, type 3 plastic are rarely recycled.

Type 4 plastic (LDPE) are historically not accepted by most American curbside recycling programs. Nevertheless, more and more communities are starting to accept it these days.

Type 5 plastic (PP) are also gradually becoming more accepted by recyclers.

Type 6 plastic (PS), such as Styrofoam, leach toxins and are very difficult to recycle.

Given the high cost of recycling, type 3 to 7 plastics are rarely recycled.

The 6-Step Process for Plastic Recycling

1. Collection – The recycling facilities gather available recyclable plastic material in their area, such as from roadside collections, special recycling bins, or even directly from industries. In this way, both post-consumer and post-industrial plastic items are collected.

2. Manual sorting – All plastic items that are collected are then sorted according to the various plastic types indicated by the plastic recycling symbols and codes on them. Unwanted non-plastic materials found in the piles are promptly taken out.

3. Chipping – After sorting, the sorted plastic products are prepared for melting by being cut into small pieces. The plastic items are fed into a machine which has sets of blades that slice through the material and break the plastic into tiny bits.

4. Washing – At this step in the process of recycling plastic, all residue of products originally contained in the plastic items and various other 'contaminants' (e.g. paper labels, dirt) are removed. A particular wash solution consisting of an alkaline, cationic detergent and water are used to effectively get rid of all the contaminants on the plastic material, making sure that all the plastic bits are clean and ready for the final step.

During washing, the wash tank agitator serves as an abrasive, stripping the adhesive off any labels and shredding any paper mixed in with the plastics. The alkaline, cationic detergent (which is similar to the formulas used in shampoos and fabric softeners) is used because plastic materials have a positive surface charge, and only positively-charged chemical compounds (which in this case are cationic detergents) can properly clean them, and effectively remove dirt and grease from the positively charged plastic surfaces.

5. Melting

The dry flakes are melted down. They can be melted down and molded into a new shape or they are melted down and processed into granules. The melting process is done under regulated temperatures. There is specialized equipment designed to melt down plastic without destroying them.

6. Pelleting – The melted down plastic then put through a machine called an 'extruder' in this stage of the recycling plastic process. The extruder shapes the melted plastic into thin noodle-like tubes. The plastic tubes are then cut into small pellets by a set of rotating knives. The pellets are then ready to be reused and remade into new items.

Advantages of Recycling Plastics

Plastics should be recycled because of a number of reasons as can be seen below:

1. **Provision of a Sustainable Source of Raw Materials**

Recycling plastics provides a sustainable source of raw materials to the manufacturing industry. Once the plastics are recycled, they are sent to manufacturing industries to be redesigned and converted into new shapes and used in different appliances.

2. **Reduces Environmental Problems**

Since plastics are non-biodegradable, they pose a high risk to the people and the environment as a whole. They can block sewer lines, drainages and other waterways leading to blockages and unwanted pileups. When plastics are eliminated through recycling, the environment looks clean and inhabitable.

3. **Reduces Landfill Problems**

Recycling plastics minimizes the amount of plastic being taken to the ever diminishing landfill sites. Most countries have designated areas specifically meant for burying plastics. When they are recycled, these sites will receive little plastic garbage. The remaining areas can be used for other purposes instead of dumping plastics that do not rot. These areas can be used for agriculture or for human settlement. It should be understood that human population is growing each day and land is becoming a problem. Instead of misusing the land for garbage disposal it can be used for settlement and other important economic activities.

4. **Consumes Less Energy**

Recycling of materials including plastics requires less energy as compared to making the plastic from scratch. This saves energy and that energy can be diverted to other important things in the economy. It is therefore important to encourage plastic recycling in the manufacturing industry as it will save the economy billions of money. The process of manufacturing plastic using natural raw materials is expensive and time consuming compared to the recycling process.

5. **Encourages a Sustainable Lifestyle among People**

Individuals who have ventured into plastic collection and recycling business will experience improved lifestyles as they will get their daily income from the business. This will in the long run improve the economy and boost the living standards of the people. So do not just sit there doing nothing, embrace plastic recycling activities and improve your economic standards.

In summary, any sort of effort aimed at saving the environment is very important and matters a lot. Since its inception during the environmental revolution in the late 1960s, plastic recycling is one of the most encouraged solid waste management programs in the world. Prior to the push to use of

plastic containers by manufacturers, products were packaged in glass, metal and paper. Therefore, in order to keep our environment clean, reduce landfills, provide a sustainable supply of plastics to manufacturers, it is important to recycle plastics.