special focus

Correct usage of SPI's resin identification code

PLASTICS RECYCLING

by The Society of the Plastics Industry, Inc.

The SPI resin identification code was developed to provide a consistent national system to facilitate recycling of post-consumer plastics through the normal channels for collecting recyclable materials from household waste. Improper use of the SPI resin identification code can have serious ramifications for individual manufacturers and could jeopardize the integrity of the coding system. Therefore, all users of the code are encouraged to adhere diligently to SPI's guidelines.

Introduction

Many manufacturers are positioning their products to meet the public's desire for environmentally responsible products. For those manufacturers working with plastics, this may include facilitating the recovery of plastic products and components through the use of a resin identification code.

The early major resin coding systems were all developed as voluntary. As such, they did not include mechanisms to monitor proper usage of codes or take action against misuse. The integrity of coding systems is therefore dependent on the good faith efforts of manufacturers to use the codes in keeping with their intended purposes. Recently, however, alleged abuses of resin identification codes have led consumer and environmental groups to ask the Federal Trade Commission (FTC) and State Attorneys General, among others, to take legal or regulatory action. Manufacturers now considering resin coding should be cognizant of the concerns raised by these organizations. Similarly, manufacturers already using a coding system would be well advised to review their current practices.

To help preserve the right to use the SPI resin identification code, consistent with applicable rules, this article highlights the issues involved and offers guidelines for the proper use.

The value of resin identification codes

Plastic is not any one material. Rather, it is a family of related materials with varying properties that can be engineered to meet the requirements of a broad range of applications. The success of a product often is dependent on matching the right plastic — with the right properties — to the right application.

The same is true when the material in question is a recycled plastic. As a result, there is a premium placed on the purity of post-use plastics. The more uniform the post-use plastics going in, the more predictable the properties of the recycled plastic coming out. Coding enables individuals to perform quality control (i.e., sorting) before recycling, ensuring that the recycled plastic is as homogenous as possible to meet the needs of the end markets.

Another potential benefit of coding is that it may facilitate the recovery of plastics not currently collected for recycling. If there is a readily identifiable supply of a given material in the waste stream, it may drive recycling entrepreneurs to explore means of recovering that material in a cost-effective manner.

spi the plastics industry trade association

These benefits of resin identification have led a number of entities to develop coding systems, including SPI, the Society of Automotive Engineers (SAE), the American Society for Testing and Materials (ASTM) and the International Organization for Standardization (ISO). Except where laws may require the use of a particular code, manufacturers have the option of selecting the coding system most appropriate for their product.

The SPI resin identification code

The SPI introduced its resin coding system in 1988 at the urging of recyclers around the country. A growing number of communities were implementing recycling programs in an effort to decrease the volume of waste subject to rising tipping fees at landfills. In some cases, these programs were driven by state-level recycling mandates.

The SPI resin identification code was developed to meet recyclers' needs while providing manufacturers a consistent, uniform system that could apply nationwide. Because municipal recycling programs traditionally have targeted packaging — primarily containers — the SPI coding system offered a means of identifying the resin content of bottles and containers commonly found in the residential waste stream.

The overwhelming majority of plastic packaging is made with one of six resins: polyethylene terephthalate (PETE); high density polyethylene (HDPE); polyvinyl chloride (PVC or vinyl); low density polyethylene (LDPE); polypropylene (PP) or polystyrene (PS). The SPI resin identification code assigns each of these resins a number from 1 to 6.

The SPI coding system also includes a seventh code, identified as "other." Use of this code indicates that the product in question is made with a resin other than the six listed above, or is made of more than one resin used in combination. The "other" code was developed to address legislative demands in some states that all consumer packages fitting certain size and functional parameters feature a resin identification code.

Proper usage of resin identification codes

From the outset, SPI has offered explicit guidelines as to the proper sizing and positioning of the resin identification code on containers, including the following:

- The code should be molded, formed or imprinted on all containers that are large enough to accept the 1/2" minimum-size symbol and all containers between eight-ounce size and five gallons.
- The code should appear on the bottom of the container, as close to the center as feasible. Placing it in a similar location on all containers allows the code to be quickly located and easily identified.

Observance of these guidelines is essential to the integrity of

the SPI resin identification code's stated mission: to facilitate the recovery of post-use plastics. The code was not intended to be — nor was it ever promoted as — a guarantee to consumers that a given item bearing the code will be accepted for recycling in their community. Much of the past legal and regulatory activity surrounding use of the code has focused on uses that have been construed as making such a guarantee. This scrutiny is part of a larger effort by the FTC and State Attorneys General to crack down on the use of "false and misleading environmental claims" in product marketing.

In light of these concerns, SPI offers the following additional guidelines for use of the resin identification code:

- The code should be applied where it will be inconspicuous to the consumer at the point of purchase so it does not influence the consumer's buying decision.
- Do not make recyclability or other environmental claims in close proximity to the code, even if such claims are properly qualified. Specifically, do not use the term "recyclable" in proximity to the code. ■

Codes	Descriptions	Properties	Packaging Applications	Recycled Products
1 PETE	**Polyethylene Terephthalate (PET), (PETE):** PET is clear, tough, and has good gas and moisture barrier properties. Commonly used in soft drink bottles and many injection molded consumer product containers. Other applications include strapping and both food and non-food containers. Cleaned, recycled PET flakes and pellets are in great demand for spinning fiber for carpet yarns, producing fiberfill and geo-textiles. Nickname: polyester.	Clarity, strength, toughness, barrier to gas and moisture, resistance to heat.	Bottles for soft drinks, water, sports drink, beer, mouthwash, catsup and salad dressing bottles. Peanut butter, pickle, jelly and jam jars. Ovenable film and ovenable prepared food trays.	Fiber, tote bags, clothing, film and sheet, food and beverage containers, carpet, strapping, fleece wear, luggage and bottles.
2 HDPE	**High Density Polyethylene (HDPE):** HDPE is used to make bottles for milk, juice, water and laundry products. Unpigmented bottles are translucent, have good barrier properties and stiffness, and are well suited to packaging products with a short shelf life such as milk. Because HDPE has good chemical resistance, it is used for packaging many household and industrial chemicals such as detergents and bleach. Pigmented HDPE bottles have better stress crack resistance than unpigmented HDPE bottles.	Stiffness, strength, toughness, resistance to chemicals and moisture, permeability to gas, ease of processing, and ease of forming.	Milk, water, juice, cosmetic, shampoo, dish and laundry detergent bottles; yogurt and margarine tubs; cereal box liners; grocery, trash and retail bags.	Liquid laundry detergent, shampoo, conditioner and motor oil bottles; pipe, buckets, crates, flower pots, garden edging, film and sheet, recycling bins, benches, dog houses, plastic lumber, floor tiles, picnic tables, fencing.
3 V	**Vinyl (Polyvinyl Chloride or PVC):** In addition to its stable physical properties, PVC has excellent chemical resistance, good weatherability, flow characteristics and stable electrical properties. The diverse slate of vinyl products can be broadly divided into rigid and flexible materials. Bottles and packaging sheet are major rigid markets, but it is also widely used in the construction market for such applications as pipes and fittings, siding, carpet backing and windows. Flexible vinyl is used in wire and cable insulation, film and sheet, floor coverings synthetic leather products, coatings, blood bags, medical tubing and many other applications.	Versatility, clarity, ease of blending, strength, toughness, resistance to grease, oil and chemicals.	Clear food and non-food packaging, medical tubing, wire and cable insulation, film and sheet, construction products such as pipes, fittings, siding, floor tiles, carpet backing and window frames.	Packaging, loose-leaf binders, decking, paneling, gutters, mud flaps, film and sheet, floor tiles and mats, resilient flooring, cassette trays, electrical boxes, cables, traffic cones, garden hose, mobile home skirting.
4 LDPE	**Low Density Polyethylene (LDPE):** Used predominately in film applications due to its toughness, flexibility and relative transparency, making it popular for use in applications where heat sealing is necessary. LDPE is also used to manufacture some flexible lids and bottles and it is used in wire and cable applications	Ease of processing, strength, toughness, flexibility, ease of sealing, barrier to moisture.	Dry cleaning, bread and frozen food bags, squeezable bottles, e.g. honey, mustard.	Shipping envelopes, garbage can liners, floor tile, furniture, film and sheet, compost bins, paneling, trash cans, landscape timber, lumber.
5 PP	**Polypropylene (PP):** Polypropylene has good chemical resistance, is strong, and has a high melting point making it good for hot-fill liquids. PP is found in flexible and rigid packaging to fibers and large molded parts for automotive and consumer products.	Strength, toughness, resistance to heat, chemicals, grease and oil, versatile, barrier to moisture.	Catsup bottles, yogurt containers and margarine tubs, medicine bottles.	Automobile battery cases, signal lights, battery cables, brooms, brushes, ice scrapers, oil funnels, bicycle racks, rakes, bins, pallets, sheeting, trays.
6 PS	**Polystyrene (PS):** Polystyrene is a versatile plastic that can be rigid or foamed. General purpose polystyrene is clear, hard and brittle. It has a relatively low melting point. Typical applications include protective packaging, containers, lids, cups, bottles and trays.	Versatility, insulation, clarity, easily formed.	CD jackets, food service applications, grocery store meat trays, egg cartons, aspirin bottles, cups, plates, cutlery.	Thermometers, light switch plates, thermal insulation, egg cartons, vents, desk trays, rulers, license plate frames, foam plates, cups, utensils.
7 OTHER	**Other:** Use of this code indicates that the package in question is made with a resin other than the six listed above, or is made of more than one resin listed above, and used in a multi-layer combination.	Dependent on resin or combination of resins.	Three- and five-gallon reusable water bottles, oven-baking bags, some citrus juice bottles and catsup bottles.	Bottles, plastic lumber applications.