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# Resin identification code

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## Namespaces

The **ASTM International Resin Identification Coding System**, often abbreviated **RIC**, is a set of symbols appearing on plastic products that identify the plastic resin out of which the product is made.<sup>[1]</sup> It was developed in 1988 by the [Society of the Plastics Industry](#) (now the [Plastics Industry Association](#)) in the United States, but since 2008 it has been administered by [ASTM International](#), an international [standards organization](#).<sup>[1]</sup>

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## History

The US Society of the Plastics Industry introduced the Resin Identification Code (RIC) system in 1988, when the organization was called Society of the Plastics Industry, Inc. (SPI). The SPI stated that one purpose of the original SPI code was to "Provide a consistent national system to facilitate recycling of post-consumer plastics."<sup>[2]</sup> The system has been adopted by a growing number of communities implementing recycling programs, as a tool to assist in sorting plastics. In order to deal with the concerns of recyclers across the U.S., the RIC system was designed to make it easier for workers in materials recovery and recycling facilities to sort and separate items according to their resin type.<sup>[*citation needed*]</sup> Plastics must be recycled separately, with other like materials, in order to preserve the value of the recycled material, and enable its reuse in other products after being recycled.

In its original form, the symbols used as part of the RIC consisted of arrows that cycle clockwise to form a triangle that encloses a number. The number broadly refers to the type of plastic used in the product, by chronological order<sup>[*citation needed*]</sup> of when that plastic became recyclable:

- "1" signifies that the product is made out of [polyethylene terephthalate](#) (PET) (beverage bottles, cups, other packaging, etc.)
- "2" signifies [high-density polyethylene](#) (HDPE) (bottles, cups, milk jugs, etc.)
- "3" signifies [polyvinyl chloride](#) (PVC) (pipes, siding, flooring, etc.)
- "4" signifies [low-density polyethylene](#) (LDPE) ([plastic bags](#), six-pack rings, tubing, etc.)
- "5" signifies [polypropylene](#) (PP) (auto parts, industrial fibres, food containers, etc.)
- "6" signifies [polystyrene](#) (PS) (plastic utensils, Styrofoam, cafeteria trays, etc.)
- "7" signifies other plastics, such as acrylic, [nylon](#), [polycarbonate](#) and [polylactic acid](#) (PLA).

When a number is omitted, the arrows arranged in a triangle form the universal [recycling symbol](#), a generic indicator of recyclability. Subsequent revisions to the RIC have replaced the arrows with a solid triangle, in order to address consumer confusion about the meaning of the RIC, and the fact that the presence of a RIC symbol on an item does not necessarily indicate that it is recyclable.

In 2008, [ASTM International](#) took over the administration of the RIC system and eventually issued ASTM D7611—Standard Practice for Coding Plastic Manufactured Articles for Resin Identification.<sup>[3]</sup> In 2013 this standard was revised to change the graphic marking symbol of the RIC from the "chasing arrows" of the Recycling Symbol to a solid triangle instead.

## Views



Resin code for [polyethylene terephthalate](#)



[Polypropylene](#) lid of a [Tic Tac](#) box, with a [living hinge](#) and the resin identification code, 5, under its flap

Since its introduction, the RIC has often been used as a signifier of recyclability, but the presence of a code on a plastic product does not necessarily indicate that it is recyclable any more than its absence means the plastic object is [necessarily] *unrecyclable*.

## Table of resin codes [\[edit\]](#)

Sources: [\[4\]](#)[\[5\]](#)

Recycling number ↕	Image ↕	Alternate image #1 ↕	Alternate image #2 ↕	Abbreviation ↕	Polymer name ↕	Uses ↕	Recycling ↕
1				PETE or PET	<a href="#">Polyethylene terephthalate</a>	Polyester fibres (Polar Fleece), thermoformed sheet, strapping, soft drink bottles, tote bags, furniture, carpet, paneling and (occasionally) new containers. (See also: <a href="#">Recycling of PET bottles.</a> )	Picked up through most curbside recycling programs.
2				HDPE or PE-HD	<a href="#">High-density polyethylene</a>	Bottles, grocery bags, milk jugs, recycling bins, agricultural pipe, base cups, car stops, playground equipment, and <a href="#">plastic lumber</a>	Picked up through most curbside recycling programs, although some allow only those containers with necks.
3				PVC or V	<a href="#">Polyvinyl chloride</a>	Pipe, window profile, siding, fencing, flooring, shower curtains, lawn chairs, non-food bottles, and children's toys.	Extensively recycled in Europe; <sup><span>[</span><i><span>citation needed</span></i><span>]</span></sup> 481,000 tonnes in 2014 through Vinyl 2010 and VinylPlus initiatives.
4				LDPE or PE-LD	<a href="#">Low-density polyethylene</a> , <a href="#">Linear low-density polyethylene</a>	Plastic bags, <a href="#">six pack rings</a> , various containers, dispensing bottles, <a href="#">wash bottles</a> , tubing, and various molded laboratory equipment	LDPE is not often recycled through curbside programs, but some communities will accept it. Plastic shopping bags can be returned to many stores for recycling.
5				PP	<a href="#">Polypropylene</a>	Auto parts, industrial fibres, food containers, and dishware	Number 5 plastics can be recycled through some curbside programs.

6				PS	<a href="#">Polystyrene</a>	Desk accessories, cafeteria trays, plastic utensils, coffee cup lids, toys, video cassettes and cases, clamshell containers, packaging peanuts, and insulation board and other <a href="#">expanded polystyrene</a> products (e.g., <a href="#">Styrofoam</a> )	Number 6 plastics can be recycled through some curbside programs.
7				OTHER or O	Other plastics, such as <a href="#">acrylic</a> , <a href="#">nylon</a> , <a href="#">polycarbonate</a> , and <a href="#">polylactic acid</a> (a <a href="#">bioplastic</a> also known as PLA), and multilayer combinations of different plastics	Bottles, <a href="#">plastic lumber</a> applications, <a href="#">headlight lenses</a> , and <a href="#">safety shields/glasses</a> .	Number 7 plastics have traditionally not been recycled, though some curbside programs now take them.

Below are the RIC symbols after ASTM's 2013 revision [\[6\]](#)[\[7\]](#)

Resin Identification Number	Resin	Resin Identification Code –Option A	Resin Identification Code –Option B
1	Poly(ethylene terephthalate)	 PETE	 PET
2	High density polyethylene	 HDPE	 PE-HD
3	Poly(vinyl chloride)	 V	 PVC
4	Low density polyethylene	 LDPE	 PE-LD
5	Polypropylene	 PP	 PP
6	Polystyrene	 PS	 PS
7	Other resins	 OTHER	 O

## Consumer confusion [\[edit\]](#)

In the United States, use of the RIC in the coding of plastics has led to ongoing consumer confusion about which plastic products are recyclable. When many plastics recycling programs were first being implemented in communities across the United States, only plastics with RICs "1" and "2" (polyethylene terephthalate and high-density polyethylene, respectively) were accepted to be recycled. The list of acceptable plastic items has grown since then,<sup>[11]</sup> and in some areas municipal recycling programs can collect and successfully recycle most plastic products regardless of their RIC. This has led some communities to instruct residents to refer to the form of packaging (i.e. "bottles", "tubs", "lids", etc.) when determining what to include in a curbside recycling bin, rather than instructing them to rely on the RIC.<sup>[8]</sup> To further alleviate consumer confusion, the [American Chemistry Council](#) launched the "Recycling Terms & Tools" program to promote standardized language that can be used to educate consumers about how to recycle plastic products.<sup>[9]</sup>

## Possible new codes [\[edit\]](#)

Modifications to the RIC are currently being discussed and developed by ASTM's D20.95 subcommittee on recycled plastics.<sup>[10]</sup>

In the U.S. the [Sustainable Packaging Coalition](#) has also created a "[How2Recycle](#)" label<sup>[11]</sup> in an effort to replace the RIC with that aligns more closely with how the public currently uses the RIC. Rather than indicating what type of plastic resin a product is made out of, the four "How2Recycle" labels indicate whether a plastic product is

- Widely Recycled (meaning greater than 60 percent of the U.S. can recycle the item through a curbside recycling program or municipal drop-off location).
- Limited (meaning only 20–60 percent of the U.S. can recycle the item through a curbside recycling program or municipal drop-off location).
- Not Yet Recycled (meaning less than 20 percent of the U.S. can recycle the item through a curbside recycling program or municipal drop-off location).
- Store Drop-Off (meaning the item can be recycled if brought to participating store drop-off locations, typically at grocery stores).

