



POST-CONSUMER RESIN (PCR)

WHAT IS POST-CONSUMER RESIN (PCR)?

Post-Consumer Resin, or PCR, is the technical term for recycled plastic. Plastic waste is collected, sorted, and re-purposed to make various types of new packaging. This includes ocean plastics, which are post-consumer resins made from plastics that are headed to oceans but picked up for recycling before they end up in oceans. PCR is different from Post Industrial Resin (PIR) materials (or pre-consumer materials), which are materials that are recycled or utilized after the manufacturing process, but never make it to consumers.

What are the advantages of using PCR over virgin resin?

- **Reduced carbon footprint:** Plastic packaging, even if made from virgin resin, has a lower overall environmental impact than other packaging (if all US plastic were to be replaced with other materials, the substitute packaging would require 80% more cumulative energy)¹ and plastics can be recycled six or more times before its properties are weakened. While some think that recycling plastic is costly and inefficient when compared to using virgin resin, the reality is the opposite. As an example, the carbon footprint of manufacturing 100% PCR PET plastic is 60% lower than virgin PET, including all the energy to collect, recycle, and re-manufacture the plastic ²
- **Long term resource availability:** Virgin petroleum-based resins are a finite resource that will deplete over time and cannot be renewed. Reusing plastics that already exist in the ecosystem is a way to ensure that supply of raw materials continues in the long term.
- **Customer preferences for sustainable options:** More customers, particularly millennials, are choosing brands and companies based on demonstrated sustainability efforts. There is also an increased push to use PCR by environmentally conscious brands (Seventh Generation, Target, Campbell, P&G, etc.) and entities like The Association of Plastic Recyclers which has been working diligently to increase demand for PCR plastics across North America. All this means that using high percentages of PCR can be a market differentiator for a brand.

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What are some things to watch for when using PCR instead of virgin resin?

- Price Considerations:** PCR pricing is directly related to the feedstock bale pricing. Due to the demand from big consumer brands on using post-consumer recycled content, the price of PCR resin is not necessarily lower than prime resin. The price of PCR resin varies based on the type and grade of PCR resin. For example, HPDE natural PCR, due to its ability to be converted into any color, is more expensive than gray color or mixed color HDPE PCR. PCR resin with an FDA No Objection Letter (NOL) has higher pricing than the same type of resin without an NOL. Finally, odorless PCR commands a higher price as well due to additional processing requirements.
- Functionality Considerations:** If PCR is chosen there are form, fit, and function considerations that need to be understood compared to virgin materials (increase in color variability, hinge performance, drop test performance, etc.). Defining performance criteria is critical when there is a desire to utilize PCR. In some cases, plastics can't be recycled into new bottles without first adding new raw materials because the plastics may not be strong enough to make the new container. The required reheating process can alter the color and clarity of the bottle; as the concentration of PCR is increased, the look becomes gradually darker. This can be counterbalanced with the use of colorants, but these bottles are generally more applicable for products that don't require crystal clear packaging – particularly past the 25-percent ratio. Above you can see the gradual differences in appearance as the percentage of PCR increases. For this reason, the 100% PCR category has been historically dominated by opaque HDPE. But there are newer, more innovative ways to create new, clear-looking plastic bottles without using virgin materials (example: Method bottles, 100% PCR PET)
- Sorting Considerations:** Of the four main types of polymers, polyethylene (PE), polypropylene (PP), polystyrene (PS) and polyethylene terephthalate (PET), PET and high-density PE are the most frequently recycled polymers (PET and HDPE bottles comprise 97.1% of the United States plastic bottle and packaging market, and together, PET and HDPE are 98.6% of the bottles recycled). The infrastructure is built to support the collection of these materials and many CPGs lead initiatives to educate consumers to recycle. However, PET and HDPE reclaimers are facing challenges from lightweighting and shifts to flexible film packaging. PP is readily recyclable but needs more



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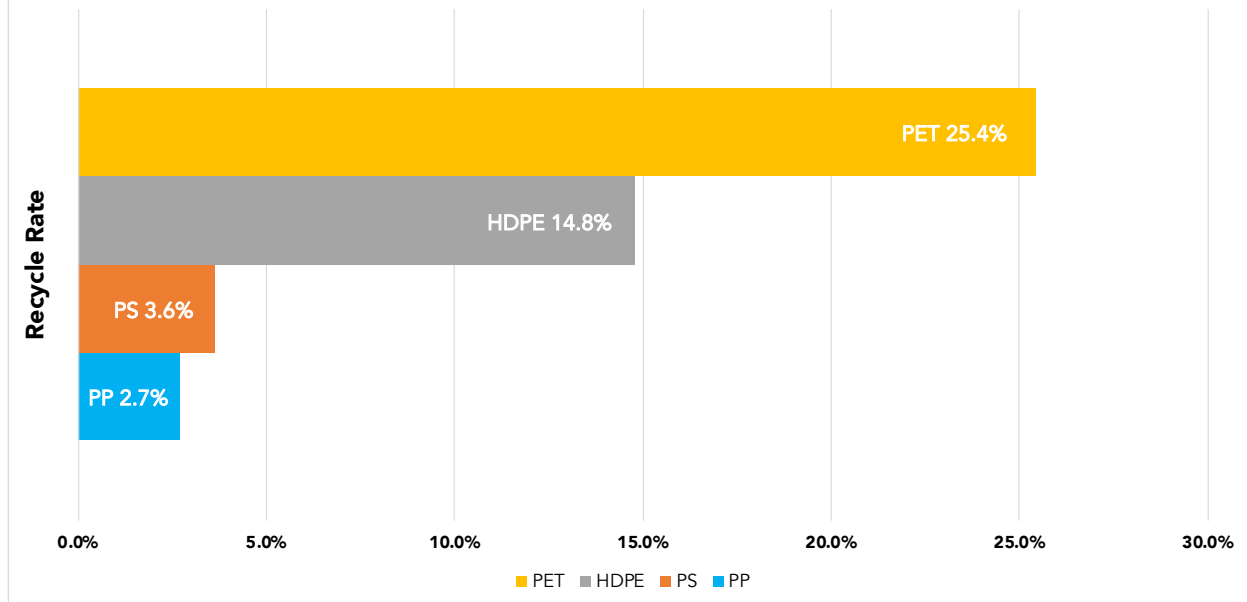
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infrastructure and education around the material. Finally, PS is also recyclable as it is extremely tolerant to “re-melting,” but its collection presents difficulties due to its form factor. We are also seeing some recycling companies are not taking PS foam and plastics, and some state legislation bans the use of expanded PS foam. In addition, certain plastics are like oil and water—they don’t mix well. The contamination caused by their mixing, or worse yet, the addition of other factors (such as food, dirt, or other contaminants) can render the resins very difficult to reuse. The makeup of the resins can be a big obstacle in the industry’s endeavor to achieve a truly circular economy, which is a critical piece for packaging. There is also possible odor from the recycled resin. Testing should be performed to ensure the potential off-odor would not intermix with the products.

US Recycle Rate for Plastics in ⁴ Containers & Packaging (2018)

Source: US EPA “Advanced Sustainable Material Management: 2018 Tables and Figures” Dec. 2020, P. 10



PCR Supply Overview

Due to the outdated recycling infrastructure in most of the United States, the current recycling rates of most plastic types in the US are low, which is limiting the supply of feedstock bales supporting PCR production. In the meantime, big CPG, food, and beverage companies have made a commitment to using more post-consumer recycled content in their packaging. And this is limiting the supply of PCR resin due to their buying power and scale. There are multiple states presenting bills to form extended producer responsibility stewardship organizations, which will have the CPG, food, and beverage companies provide funding to push for recycling infrastructure improvement, expansion, and reform to increase the PCR supply stream. States like California and Washington are leading the demand in PCR content via legislation on the packaging. Currently, PCR legislation impacts rigid plastic containers of various forms and across categories. Multiple US states have implemented PCR content requirements, with more to

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follow in coming years. In addition, virgin resin tax laws in the EU couple with minimum PCR content thresholds have caused continued escalation in demand. More countries around the globe are considering or enacting similar bills and laws, using current policies as a model.

What claims can a brand make regarding environmentally friendly packaging?

Sometimes what companies think their green claims mean and what consumers really understand are two different things. The Federal Trade Commission's [Green Guides](#) are designed to help marketers avoid making environmental claims that mislead consumers. The guidance they provide includes: 1) general principles that apply to all environmental marketing claims; 2) how consumers are likely to interpret particular claims and how marketers can substantiate these claims; and 3) how marketers can qualify their claims to avoid deceiving consumers.³

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¹ SPI - Plastics Industry Trade Association

² [The Huffington Post](#)

³ [FTC website](#)

⁴ [Advancing Sustainable Materials Management \(EPA\)](#)