

The Misconceptions of Polystyrene

Anti-plastic rhetoric has grown increasingly rampant over the past few years. Some argue that the solution to plastic waste is to simply ban all plastic, full stop. However, it is important to step back and ask if that approach truly takes us in the right direction – and if it is realistic. **By Cassie Bradley**

Contrary to popular belief, one of the most versatile, lightweight materials in the market and – perhaps surprisingly – one of the most sustainable, is polystyrene.

Polystyrene is likely the most misunderstood plastic in the market. Held by many to be highly polluting, unrecyclable and even toxic, calls for it to be banned outright are heard on a regular basis.

In fact, polystyrene has many inherently sustainable properties, which enable it to play a substantial role in designing products for recycling or sustainability. Unlike other polymers, polystyrene's material strength and barrier properties mean a single layer often suffices in applications such as food packaging, eliminating the multiple material layer structures that cannot be adequately separated during the recycling process. It also often means less material overall is used to create each package in the first place. Take, for instance, a polystyrene foam coffee cup: the cup is composed of over 98% air. Its outstanding insulation capabilities even eliminate the need for those wasteful cup sleeves. Plus, the material's lightweight properties make it lighter to transport, reducing the level of emissions released.

Another misconception about polystyrene concerns its recyclability – or alleged lack thereof. In fact, polystyrene material can be more precisely sorted and more easily recycled than many other polymers into high-quality, valuable recycled material. Once sorted, there are at least five different ways to recycle polystyrene, including advanced

recycling options such as depolymerisation that enable polystyrene to be fully circular. Many industry leaders, including Ineos Styrolution, are working alongside leading recycling technology providers to create a circular economy for polystyrene.

Polystyrene is a stable polymer that is chemically different from its raw material, styrene monomer. No toxic substances are used in its manufacture. The U.S. Food and Drug Administration (FDA), which regulates the safety of food-contact packaging, has for more than 50 years approved the use of polystyrene for foodservice products. Polystyrene products provide hygienic methods to serve, transport and store fresh foods to help prevent the spread of disease at schools, restaurants, hospitals and in people's homes. A high-quality, FDA-approved packaging material with a low carbon footprint, it requires less energy and water to produce than alternative materials, such as glass, aluminum, paper and compostable plastic alternatives.

Lastly, a common misconception is that there is a simple solution to the plastic waste issue. Some say that eliminating so-called problematic materials like polystyrene would provide a quick and easy win; however,

these knee-jerk and misguided policies generally further complicate the problem by shifting the issue to new materials, which come with their own set of challenges. Compostable materials, for example, require the availability of an industrial composting infrastructure, which, in the U.S. at least, is scarce. Moreover, compostable plastics tend to break down at a slower rate than other composting materials, which causes issues for composters. Also, material choices are made for a reason: certain plastic materials are specified for certain applications because they fulfil the requirements and do the job.

The best solution is to ensure that plastics like polystyrene never become waste: to develop end-of-life, circular solutions and innovate our way to a circular economy instead of restricting access to valuable materials; in other words, to invest in our outdated and insufficient recycling infrastructure and institute policy, which enables resin producers to bring necessary advanced recycling technology to scale. Public and private organisations must collaborate by pooling knowledge and resources in order to implement recycling innovations on a larger, national scale.

After all, a great deal of prog-

ress has been made regarding the design and technology of plastics themselves and their recyclability over the last decade. It's time to change the conversation to catch up with today's technology. Once we overcome the current challenge of getting over the stigma and vilification of plastics, our society will start benefiting from the many innovative recycling solutions – like those for polystyrene.

It may seem like we have a long way to go to completely close the loop, but we have to start taking steps in the right direction to make a real difference. Plastic waste is a valuable raw resource. It is in the interest of all participants in the value chain, from producers, consumers and recyclers, that plastic is recovered, recycled and repurposed, again and again.

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