

The world of Styrenics

A versatile family of synthetic polymers bringing value to our societies and economies*.

WHAT ARE STYRENICS?

Styrenics constitute a versatile family of synthetic polymers, including polystyrene (PS), expanded polystyrene (EPS), extruded polystyrene (XPS), acrylonitrile butadiene styrene (ABS) and styrene acrylonitrile resin (SAN).

They offer a wide range of sustainability and societal benefits, such as:

- 1** **Recyclability** and excellent circularity capacity
- 2** Low weight and associated **fuel and GHG emission savings** during transport and production
- 3** **Insulation** and associated reduction of food waste, energy and GHG emission savings
- 4** **Affordability** and **durability**



The styrenics sector employs about:

5,000 people directly in production

60,000 employees in polymer converters

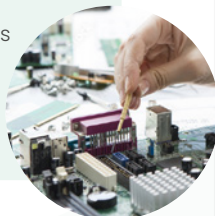


RECYCLABILITY

Styrenics possess a unique circularity potential which the industry is advancing.

- 1** Styrenics are one of the world's most **easily sortable** and **recyclable** materials
- 2** Styrenics excel in closed-loop recycling, maintaining **high quality** and **safety standards**
- 3** Efforts are progressing towards full circularity of styrenics:
 - PSLoop project in the Netherlands is recycling EPS insulation removing additives
 - In France, PS value chain co-signed the **ChartePS**, committing to achieve full circularity of PS packaging
- 4** A recent Life Cycle Assessment Study found that **recycling PS food packaging** delivered up to:

80% savings of CO₂ emissions



APPLICATIONS

Styrenics are used across a wide range of applications, but the following represent the **largest and most impactful uses**:

Construction

Due to their **durability** and excellent **insulative** properties, styrenics make **buildings more energy efficient**. PS, EPS and XPS are also cheaper and more durable than other alternatives, offering solutions to challenges of affordability of sustainable housing (UN SDG 11).

95% reduced heat demand

27 tons of CO₂ emissions are saved per year

€7,000 of heating costs per year

Packaging

Styrenics offer unmatched characteristics in food packaging, providing a safe and affordable solution to keep food fresh and hygienic, **ensuring consumer safety while contributing to food waste reduction**. Very lightweight, they also contribute to save **transport-related emissions**.

Using EPS boxes to transport **20%** of all fishery products consumed in the EU per year

fuel savings of **~1.2 million** litres, CO₂ emission savings



PS dairy applications

PS is particularly suited for so-called **form, fill, seal (FFS)**, where dairy producers make their own packaging from PS sheets, **rather than being supplied with pre-formed, empty plastic pots**. FFS with PS **saves** about:

30% plastic material, as pre-formed pots need to be thicker to not be deformed when supplied empty

50% of the production process energy

75% of the truck loads to supply empty, pre-formed pots.

Furthermore, PS yoghurt pots are about **10-15x lighter** than glass jars.

Healthcare

Styrenics are an effective enabler of healthcare access across the world. They offer reliable **safe, hygienic and consistent medical product packaging**.



~80% of petri dishes

50% of medical inhalers & drug delivery devices are made using styrenics

Electrical equipment

Styrenics provide thermal, electrical and stress resistance combined with light weight, representing a key component for **safe, long-lasting and energy efficient devices**.



Automotive applications

Styrenics are widely used in vehicle components like panels, trims and linings. Due to their lightweight properties, they offer considerable **weight, fuel and emissions savings**, while ensuring a **high level of passenger safety and comfort** – due to **impact resistance and absorption** and excellent insulation qualities. The use of PS enables the final components to be very durable, hence increasing the lifetime of a vehicle, while water and chemical resistance of EPS prevents degradation of components.

300,000 tonnes of styrenic polymers



€500 million were sold for use in the automotive sector in Europe in 2019

*Wood Group UK Limited, Socio-economic analysis of styrene-based food contact materials, commissioned by Plastics Europe, December 2021. Report available upon request

Closing the loop to achieve full circularity

Across Europe, efforts have been made by governments and the industry to realize the potential of using high-quality recycling.

BELGIUM



Indaver is building a Plastics2Chemicals facility, which will recycle approximately **650,000 tons of end-of-life polystyrene** yoghurt pots ending up with reduced or depolymerized plastics, practically identical to equal to the materials extracted from fossil streams. The quality requirements satisfy food industry standards – a textbook example of the circular economy.*

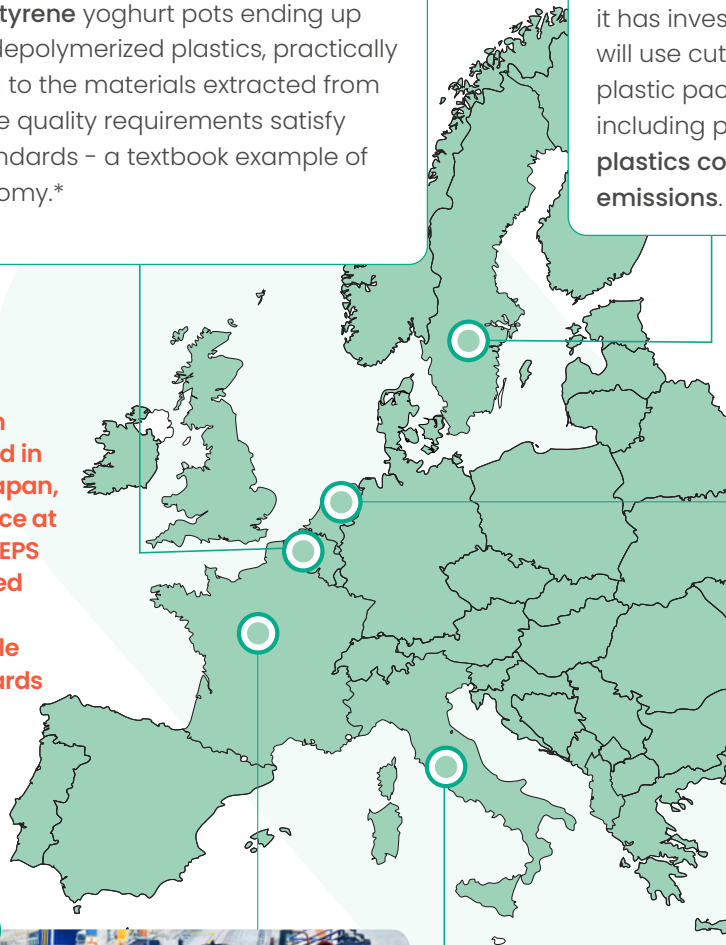
SWEDEN



It is one of the world leaders in plastic recycling – it has invested heavily in **Site Zero**, a facility which will use cutting-edge technology to recycle all plastic packaging from Swedish households, including polystyrene and EPS, and **make plastics completely circular – without any CO₂ emissions.**



EPS post-consumer packaging has been recycled at scale and in practice in the EU, Japan, and South Korea since at least 2018. In the EU, EPS packaging is recycled in accordance with reliable and verifiable international standards like ISO 14021-16.



NETHERLANDS



PSLoop is a pioneering project in the country, recycling EPS insulation by safely removing a legacy additive so the polystyrene can be reused. By recycling, rather than incinerating the EPS, **CO₂ emissions are reduced by 50%.**

FRANCE



In France, the polystyrene value chain has jointly signed the **Charte PS** – a clear and stepwise commitment to achieving the full circularity of polystyrene packaging, including a target of collecting and sorting **100% of polystyrene** packaging **by 2025.**

For more information on styrenics see here



ITALY



In Italy, "Porto a Porto" is a project to recycle thousands of EPS fish boxes in ports and transformed into new raw materials for use in new applications.