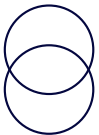


# Sustainable



## EPS - A sustainable solution for packaging and construction

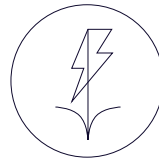
EPS is a versatile, reliable, sustainable, and (cost)-efficient material used as insulation, packaging and in life-saving applications.

It is vital to improving living conditions of Europeans and an important part of Europe's transition towards a climate neutral circular economy.



## We have a great product...

For more than 70 years, Expanded Polystyrene (EPS) has been facilitating peoples' lives and contributing to a more sustainable future. We call EPS **'engineered air'**, as it consists of 98% air and just 2% polystyrene [1]. Hence, our product exhibits **unique characteristics**. They make it the **most sustainable, efficient, and affordable solution for multiple specific insulation and packaging** applications. Other materials cannot provide the same mix of functional performance and sustainable qualities. In fact, the Danish government has concluded that for a large number of EPS applications there are **no environmentally better alternatives** [2]. Thanks to its unique characteristics, which the industry has constantly further improved, EPS can play a key role in **preserving our climate and nature**:



### 1. Energy efficiency

EPS helps **saving millions of tonnes of CO2 emissions** per year. Approximately 75% of the EPS produced in Europe is used in the **construction** sector. Houses around the world are renovated using EPS as insulation to improve their **energy efficiency**. Studies have shown that the **insulation capacity** of EPS exceeds that of competing products [3].

Also when used as **packaging** e.g. in food logistics and catering, the **light weight** and superior thermal insulation properties of EPS reduce the need for heating and cooling, e.g. with heavy ice, **saving energy during transport** and storage.



### 2. Resource efficiency and waste prevention

The production process of EPS ensures it is highly **resource efficient**. Since its structure contains 98% air, EPS consumes little raw material.

Moreover, the high percentage of air in an EPS bead makes it a very **lightweight material**, which is **easy to handle**. It helps **reducing CO2 emissions during transport of heavy goods and insulation material**. EPS keeps its outstanding material performance (robustness and weather resistance) over several decades, reducing the need for replacement with new products.

The use of EPS **packaging** also preserves the environment by protecting the packaged product. EPS significantly **reduces waste and resource loss caused by damage along the supply chain**. EPS **packaging** has excellent cushioning properties that provide shock resistance [4]. Therefore, EPS is literally the perfect fit for the transport of fragile, precious goods, such as large and heavy electric appliances like dish washers, washing machines or ovens. EPS' **unique insulating and protective properties that preserve the cold chain** make it the material of choice for **transport of fresh seafood** over long distances. When it comes to fish boxes, there are no alternatives to EPS offering the same combination of essential functionality, resource efficiency and circularity [5]. Together with partners, the EPS industry has published a fact sheet on EPS fish boxes as the versatile, reliable & sustainable solution for the fish supply chain [6], which provides further details.

[1] <https://smartpackagingeurope.eu/eps-at-a-glance/>

[2] <https://fvm.dk/nyheder/nyhed/nyhed/undersoegelse-af-epsxps-plast-i-oestersoen> retrieved on 29.10.2021.

[3] EPS boxes Archives - Matis ([matis.is](https://matis.is)) and Multi-criteria comparison of insulation materials ([eumeeps.construction](https://eumeeps.construction)), both retrieved 30.05.2022

[4] <https://smartpackagingeurope.eu/why-eps/>

[5] A peer-reviewed comparative life cycle analysis (LCA), PwC concluded that for two scenarios in Spain and France, EPS fish boxes performed similar or better than Polypropylene (PP) and cardboard alternatives on all environmental indicators except one (the formation of photochemical oxidants) <https://fishboxes.info/lateststudies.html>, retrieved on 26.01.2022.

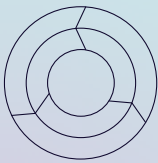
[6] <https://smartpackagingeurope.eu/wp-content/uploads/2021/04/20210413-EPS-industry-fact-sheet-Fish-boxes-WEB- FINAL.pdf>, retrieved on 02.06.2022.





### 3. Cost efficiency

The **(cost-) efficient** production of EPS enables its supply at **affordable prices**. Therefore, EPS insulation is the perfect solution to face the “twin challenge of energy efficiency and affordability” – as set out by the European Commission in the Green Deal [7] and the Renovation Wave [8].

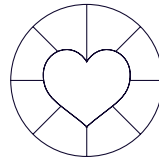


### 4. Reusability and recyclability

Whilst EPS **insulation** needs no replacement during life spans of multiple decades (please see above), EPS **packaging** is re-used where possible, e.g. in food catering [9]. However, in many EPS applications, re-use is not feasible due to hygiene, food safety, or functional reasons, or not reasonable due to life-cycle considerations. For example, protective EPS packaging is so efficient because it fits exactly the packaged good it protects; however, it is not reasonable to return it to the manufacturer of that specific product for re-use. Here, recycling delivers “the best overall environmental outcome”, justified by life-cycle thinking on the overall impacts and taking into account technical feasibility, economic viability, protection of resources as well as the overall environmental, human health, economic, and social impacts, in line with the waste hierarchy.

At the end of EPS’ often extensive use, during which it contributes to climate change mitigation and the circular economy, it (unlike many other plastics) is easily recognisable, mostly used as **mono-material** (i.e. not combined with other materials in the same product) and is often relatively clean. These advantages make EPS **100% recyclable**. **Multiple** (mechanical, physical, and chemical) **recycling technologies** have been successfully applied to EPS. It is mechanically recycled directly into EPS foam granulate as well as into rigid, non-foamed PS, from which recycled EPS can be produced. Therefore, recycled EPS has **multiple opportunities for a second life** [10].

The most recent figures underpin this statement. In 2019, the **overall recycling rate** for EPS waste in Europe **amounted to 30%**, with an average **annual rate of increase of 4%**. These figures translate into a recycling rate of 37% for EPS packaging applications and 10% for EPS construction applications [11]. In various European countries and for specific applications, such as **fish boxes** in Norway, the **recycling rate of EPS already exceeds 70%** [12], [13].



### 5. Unique, life-saving functionality

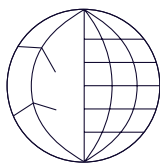
Vaccines, pharmaceuticals, and donated human organs often need to be kept and transported under special conditions, for instance, in (very) low temperatures. Many other materials get brittle under such conditions, but EPS packaging retains its cushioning and insulating performance. This is why EPS boxes have been playing a crucial role in the safe distribution of vaccines against COVID-19 [14].

EPS is **further protecting people in their daily lives** by preventing severe injuries as it is used to produce **bike helmets, car seats and life jackets**.

**Fire safety** is of utmost importance in the construction sector and our industry is committed to the highest standards. EPS passes multiple fire safety tests on the applications where it is used and is thus fully **compatible with fire safe constructions**.



[7] Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions, The European Green Deal COM(2019)640 final, [https://eur-lex.europa.eu/resource.html?uri=cellar:b828d165-1c22-11ea-8c1f-01aa75ed71af.0002.02/DOC\\_1&format=PDF](https://eur-lex.europa.eu/resource.html?uri=cellar:b828d165-1c22-11ea-8c1f-01aa75ed71af.0002.02/DOC_1&format=PDF), retrieved 29.10.2021.  
[8] Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions, A Renovation Wave for Europe - greening our buildings, creating jobs, improving lives COM(2020) 662 final, [https://ec.europa.eu/energy/sites/ener/files/eu\\_renovation\\_wave\\_strategy.pdf](https://ec.europa.eu/energy/sites/ener/files/eu_renovation_wave_strategy.pdf), retrieved 29.10.2021.  
[9] <https://smartpackagingeurope.eu/case-study/reusing-recycling-eps-denmark/>, retrieved on 02.06.2022.  
[10] See for instance <https://eps-airpop.dk/2019/11/eps-er-100-genanvendeligt-og-indgaar-i-den-cirkuellaere-oekonomi-paa-mange-maader/>  
[11] The EPS Industry’s Journey Towards Circularity, Progress Report, <https://eumeps-powerparts.eu/content/11-extranet/reports/the-eps-industry-s-journey-towards-circularity.pdf>, retrieved 29.10.2021.  
[12] <https://www.grontpunkt.no/om-oss/fakta-og-tall>, retrieved 29.10.2021.  
[13] In the rare case where the EPS cannot be recycled, at least its very high heating value can be recovered in waste to energy plants, whose use EU policy recognises as a transition technology. It is then used e.g. in district heating.  
[14] <https://newsroom.kunststoffverpackungen.de/en/2021/02/03/coronavirus-vaccines-optimally-packaged>



## 6. Sustainability

All in all, the **EPS industry contributes to a more sustainable and resource efficient world.**

EPS packaging supports hygiene and **helps prevent food-waste** because it resists humidity and, unlike alternative packaging materials, EPS does not support the spread of bacteria, mould and fungi, thus **keeping the food safe**. It maintains its shape, size and structure when other materials lose their functionality. Due to its **cushioning abilities**, the **loss of resources decreases tremendously** because **goods packaged in EPS do not break** (no loss by damage).

EPS insulation **significantly lowers the energy consumption of houses** for a long time as it lasts up to 100 years. Due to its excellent insulating properties and the associated savings in heating energy, EPS generally offsets its total energy consumption after only about 2.5 years [15]. On average, EPS facade insulation recoups the pure consumption of its raw material input within just one winter [16]. Due to its efficient production and effective functionality, insulating 1m<sup>2</sup> of wall with EPS produces considerably less CO<sub>2</sub> emissions than insulating it equally well with other materials [17].

Thus, the **EPS industry** is a key player in creating a more sustainable future. We are a **solution provider** and very committed to further improving our already sound ecological performance. In particular, the EPS industry is heavily engaged in increasing EPS recycling across Europe, which can reduce the climate footprint of EPS even further, by up to 70% [18].

## About EUMEPS and the EPS industry

The association for European Manufacturers of Expanded Polystyrene (EUMEPS) is the voice of the Expanded Polystyrene (EPS) industry in Europe. Its members cover the entire EPS value chain from raw material suppliers to EPS converters and recyclers as well as supporting industries including machinery and additive suppliers. Members include individual companies as well as 23 European national EPS associations. This unique representation of the entire value chain ensures that EUMEPS represents both large companies and small- and medium-sized converters and recyclers. Altogether EUMEPS' membership represents more than 1,000 companies, most of them small- and medium-sized enterprises (SMEs), and employs more than 80,000 people.



### How to contact us

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[15] The so called "grey energy" is the hidden energy associated with a product, meaning the total energy consumed throughout the product's life cycle from its production to its disposal.

[16] Fact Sheet: EPS saves fossil fuels <https://www.eumepps.construction/downloads/> retrieved on 22.05.2022

[17] Multi-criteria comparison of insulation materials retrieved on 22.05.2022

[18] The CO<sub>2</sub> benefits of EPS recycling varies with the recycling method, and the best recycling method depends on the EPS application as well as the collecting and sorting of the EPS waste.