

# THE BENEFITS OF PLASTICS IN CONSTRUCTION

# Sources and justifications

1. Light-weight



"What magic potion does he use?"

Plastic construction products are usually lighter than alternative materials for most applications.

For example, the weight of  $1 \text{ m}^2$  of facade insulation with a thermal resistance of  $5 \text{ m}^2$ K/W will be around (based on typical density and lambda value of commercially available façade insulation products):

- 2,4kg with EPS (for ETICS façades)
- 3.5kg with Phenolic foam (for ventilated façades)
- 3,3 kg with PIR (for ventilated façades)
- 8.25 kg of stone wool (for ETICS)
- 17 kg of stone wool (for ventilated façades)
- 32 kg with wood fibre (for ETICS)

#### Sources

Material	Typical density per m³	Typical Lambda W/mK	References
EPS for ETICS	15kg	0.032	https://neopor.de/portal/load/fid1225157/Neopor_professional%20brochure.pdf
PIR for ventilated façades	32kg	0.022	https://www.bouwkampioen.be/nl/recticel-powerwall-80mm-pak-4-32m-r-waarde-3-60m-k- w.html
Phenolic foam for ventilated façades	35kg	0.018	https://www.kingspan.com/bix/fr-be/produits/isolation/isolation-sous-vide-resol- pir/telechargements/brochures/brochure-kooltherm-k15-panneau-isolant-pour-bardag
Stone wool for ETICS	50kg	0.033	https://cdn01.rockwool.be/siteassets/rw-bnl/downloads-vl/downloads/technische- fiches/gevel/technisch-productblad-rockfit-premium-vl.pdf?f=20200417020819
Stone wool for ventilated façades	100kg	0.034	https://en.rockwool.com.cn/siteassets/rw-cn/document-downloads/datasheets/rockwool- ventrock en ds.pdf?f=20181020030732
Wood fibres for ETICS	160kg	0.040	https://gutex.de/fileadmin/uploads/Downloads/Technische Merkblaetter/GUTEX EN TM Therm owall-NF-gf-L 2018-12.pdf



2. Performance



"Insulation performance is not only about temperature; it is also about space saving."

Plastic construction products offer excellent performance in various ways.

For example, modern plastic insulation materials like EPS, phenolic, PU and XPS offer better insulation performance than traditional materials.

As detailed in the graph below, to achieve a thermal resistance of  $7,5m^2$  K/W, one requires between 13.5 and 30 cm of a plastic insulation material, compared with greater thicknesses of alternative traditional materials, which can lead to space creation and materials savings when using plastics.



\* Note: in this graph, the mention PLASTICS refers to thermoset and thermoplastics.



## Durability



"100 summers and still going strong"

Plastic construction products can have exceptional durability. Several studies and tests have shown that plastic water and gas pipes are expected to perform for over 100 years.

For example, the first large-scale installation of plastic pipes took place in 1936 in Germany, for drinking water distribution and gravity drainage systems in various residential areas. Most of those pipes are still in service use today – representing 84 years of consistent performance.

Reference: <a href="https://www.teppfa.eu/latest-news/tests-confirm-100year-expected-lifetime-for-pvc-and-pe-pipes/">https://www.teppfa.eu/latest-news/tests-confirm-100year-expected-lifetime-for-pvc-and-pe-pipes/</a>



4. Weather Resistant



"After the flood, faster back on track thanks to plastics"

Plastics are generally highly weather resistant.

For example, plastic waterproofing membranes are widely used to seal buildings. Plastics are the best materials to arrest the flow of humidity and moisture.

Plastics, including plastic insulation materials, can also be flood resilient thanks to their low water absorption coefficient.

## 5. Low maintenance



"A (plastic) window of opportunity to do whatever I want."

Plastics construction materials do not usually require specific maintenance except a regular cleaning. For example, plastic window frames do not require repainting.



6. Design Flexible



The diversity and versatility of plastic materials, offer a myriad of architectural combinations for buildings and urban furniture.

7. Cost-effective



For all the reasons mentioned above, plastic construction products contribute to cost effective solutions, are easy to transport & install, long-lasting, high-performant and require a low maintenance.