

CASE

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Creative solutions from expanded polypropylene (EPP)
in the furniture industry.

An example of the sustainable **Revo** furniture collection by **Profim**.





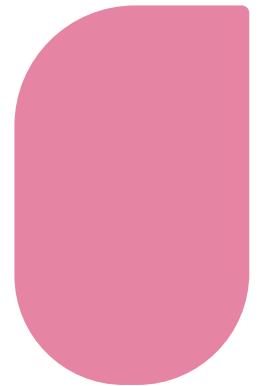
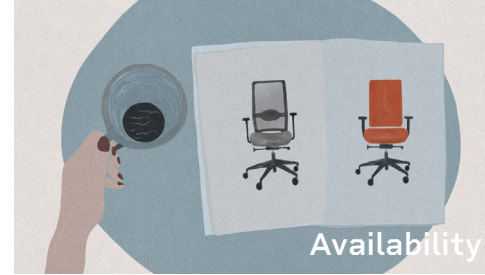
About profim

Belonging to the Flokk Group, the Polish brand 'Profim' has been successfully competing on the global market for more than 30 years.

The high-quality chairs and office furniture in their offer combine timeless design with exceptional durability, functionality and attention to detail. Based in Turek, the furniture manufacturing company relies on local supply chains, but operates on a global scale. It collaborates with well-known designers from around the world and its products are available through an extensive distribution network in Europe and beyond.

The ambition of the young, creative brand is to create thoughtful, affordable products with a unique design that is also versatile enough to appeal to everyone. Profim furniture surprises with its lightness, freshness and comfort of use, as well as being health and environmentally friendly.

In order to limit the use of harmful substances and reduce greenhouse gas emissions while maintaining the high performance qualities of the furniture, the company uses clever material and design solutions, continuing to break new technological barriers.



Design challenge: *Circular Revo collection*

Engineers from Knauf Industries were tasked with producing new non-upholstered office furniture bases from an expanded plastic with recycled content.

These components were intended to replace traditional furniture constructions made of plywood, which is not recyclable and therefore does not correspond to the concept of the new circular Revo collection.



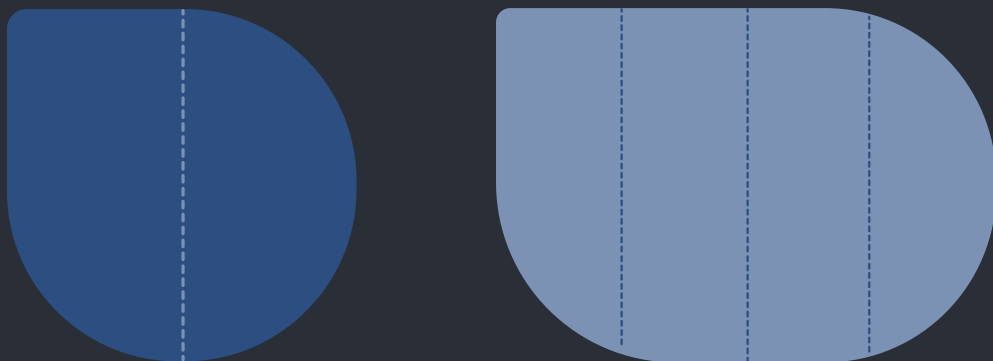
Needs and expectations

Profim operates in a strong, competitive and very dynamic industry. Poland is Europe's first and the world's second largest furniture exporter. As a responsible manufacturer, Profim is aware that mass production for many markets in an industry subject to seasonal trends significantly affects the ecosystems and quality of life of future generations.

The brand has therefore taken on the challenge of designing its furniture collections in such a way that they are environmentally friendly at every stage of their life, from production to disposal. This requires, among other necessities, reducing the number of parts to the functional minimum, which translates into lighter furniture and the saving of raw materials, thereby reducing CO₂ emissions into the atmosphere.

In this context, the right choice of materials is crucial. Recycled raw materials not only reduce landfill, but also require less energy to recycle. Revo's designers assumed that the use of recycled plastic instead of plywood in the new furniture series would make it possible to at least partly collect and manage the plastic that accumulates in the natural environment, while at the same time reducing the use of wood and the exploitation of forests.





Project

Profim's response to the need for sustainability and progressive climate change has been to switch from traditional linear production to closed circulation production. To this end, the company designs innovative circular furniture that can be easily disassembled, separated into individual raw materials, and put back into the production cycle.

The revolutionary Revo seating system is Profim's second and first such complex circular furniture design. The design concept was developed by London-based design studio Pearson Lloyd.

The creative range includes sofas with or without backrests, as well as wall panels and pouffes with softly contoured, organic shapes. Together with a range of seven tables, they allow the freedom to create different assemblies in up to 96 configurations.

Versatility and high functionality are important assets of the collection. As a result, it fits into any interior and allows for easy modification of the arrangement at any time.

Above all, Revo is an example of a revolutionary change in thinking about upholstered furniture in the context of environmental protection, as the designers intend it to return to the material circulation as much as possible at the end of its use.

The concept of replacing furniture plywood with recycled expanded polypropylene (REPP) was a breakthrough. **Not only is it produced using recycled raw material, but it can also be easily reprocessed into new forms many times over using an innovative pneumatic moulding method.**





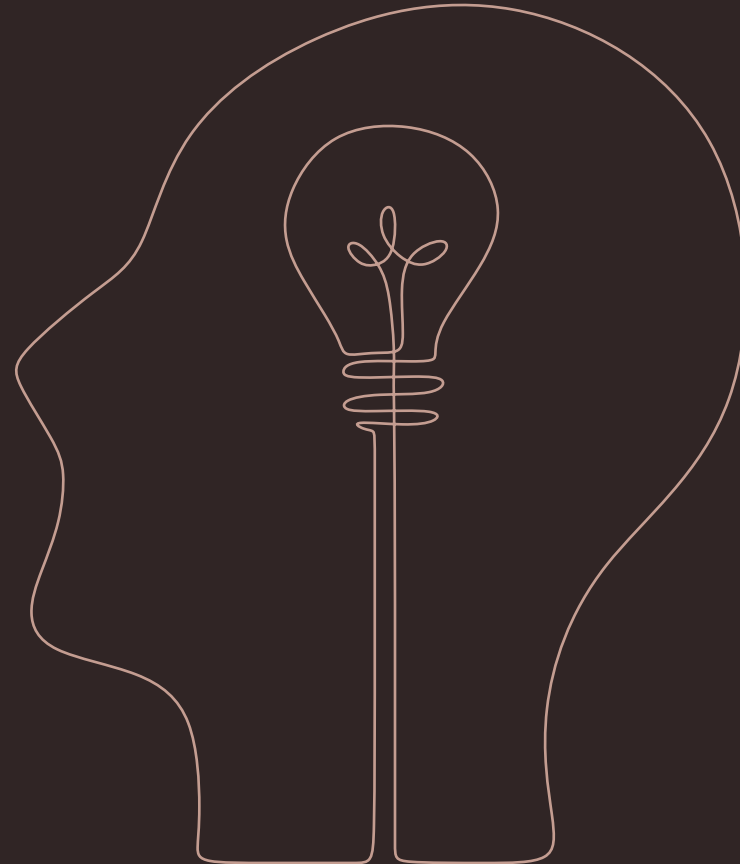
Solution: *renewable bases from REPP*

REPP proved to be the best alternative to furniture plywood construction. However, a completely new material technology required a thorough needs analysis and meticulous selection of production tools.

The specialists from Knauf Industries worked closely with the technologists from Profim to best balance the requirements for mechanical strength and light weight of the components. To do this, the optimum material density had to be selected, taking into account long-term use and all aspects of use.

A particular challenge was the design and creation of the injection moulds needed for the large-scale production of various versions of fittings with quite complex geometries and a large number of details. Success was largely dependent on the precision of the furniture components in every detail, which determined their optimal fit and ultimately the high quality of the products that the Profim brand can boast.

Knauf Industries engineers provided the necessary support to the customer, overseeing every stage of tooling preparation, so that once the samples were approved, serial production could proceed on schedule.



Why did Profim choose *REPP*?

REPP is a variety of expanded polypropylene (EPP) that is partially recycled and retains all the properties of the base material. As it is 100% recyclable, it can be reprocessed into new products without loss of quality.

As a result, it fits perfectly with the Revo's circular design concept, which also incorporates innovations such as recycled fabrics and an innovative upholstery fastening system without the use of glue or staples.

Replacing furniture plywood with REPP material has translated into a reduction in the consumption of natural resources and carbon footprint, but not only that. The material has excellent performance properties that ensure the outstanding quality of furniture manufactured from it.

Thanks to its foam structure, it absorbs impact energy perfectly and is mechanically very strong. It does not fall apart under the force exerted on it and, because it is very resilient, it returns to its previous shape as soon as the pressure stops. It thus provides adequate stabilisation of the body and high sitting comfort.

The example of the use of REPP in the Revo collection is also excellent proof that the use of recycled materials does not have to impose any performance or design constraints on the product, but can even provide completely new possibilities







Result: smaller carbon footprint and infinite recycling

In its new Revo collection, Profim has permanently replaced the non-renewable plywood construction with sustainable REPP plastic with recycled materials. Thanks to innovative bases, recycled fabrics and carefully considered construction, each piece of Revo furniture can be recycled up to 74%. This compares to just 5% for a traditional plywood construction.

By reducing energy consumption at all stages, from production to dispatch, it has been possible to reduce the carbon footprint by up to 40%. The manufacture of Revo furniture emits just 163 kg of CO₂, while the minimum weight of the components of only 9.5 kg translates into lower fuel burn during transport. Overall, this means, respectively, a reduction in the carbon footprint of 13% and 40% - compared to standard furniture made from wood and wood-based raw materials.

Profim's production facility in Turek uses local supply chains, which further reduces its negative impact on the environment. All the materials used to manufacture Revo are made in Poland.

REPP components are manufactured near Warsaw, at the Knauf Industries factory in Adamowice, by means of a pneumatic moulding process, which uses pressurised steam which is harmless to health and the environment. In the whole process, rational use of water is taken into account, as is the prevention of any waste. This guarantees fully sustainable production.

In summary, the versatile and environmentally friendly REPP material helped to fully realise the designers' and manufacturer's intentions, while improving the product in terms of usability.

This is yet another application of foamed polypropylene showing that the material offers almost unlimited possibilities for designing innovative solutions for today's times.

