



REHAU[®]

Unlimited Polymer Solutions



PROGRESS BEGINS AT THE CORE.

Recycling through co-extrusion.

PLASTICS IN CIRCULATION.

Resource conservation at REHAU.

As a manufacturer, we are conscious of the impact of our actions on people and the environment. We make every effort to use raw materials responsibly and minimise the adverse effects. We consider material usage from the perspective of the entire product life cycle and use fossil fuels such as petroleum to create long-lasting, environmentally sound products and solutions.

The long product life and environmentally efficient properties of our products are confirmed by environmental product declarations (EPDs). This applies in particular to our high-quality window profiles made of PVC (polyvinyl chloride). They are characterised by robustness, safety, durability and excellent thermal insulation properties – it therefore comes as no surprise that window profiles made of PVC are the first choice for new buildings and renovation projects intended to improve energy efficiency.

REHAU is also active in national and international associations dedicated to the improved recycling of removed plastic windows, roller shutters and doors and promoting resource-conserving business practices. For example, REHAU is currently the Vice President of EPPA and is a partner of Rewindo.

The use of recycled materials is one of REHAU's strategic objectives. Our highly developed refurbishment concepts have enabled us to conserve resources and minimise waste disposal and material residues for many years now. We just have to look at the increasingly stringent

legal requirements and growing demand for sustainable construction products to know that we are on the right track. We are aiming to gradually increase the proportion of recycled materials in our products. One example is 5 chamber TOTAL 70 window profile; manufactured using a co-extrusion process.

Co-extrusion is an innovative method of producing top-quality window profiles, enabling different PVC materials to be processed on the core of the profile and the outer skin. The use of recycled material means that valuable secondary raw materials can be re-used, which helps to protect the environment.

This enables us to combine our responsibility to act sustainably with our commitment to offer our customers the best range of products – and thus enable them to act more sustainably themselves. Quality is the key. Using this process, the window profiles retain their outstanding characteristics, creating a unique combination of first-rate quality, innovation and sustainability.



OUTER SKIN MADE OF VIRGIN PVC

CORE MADE OF RECYCLED PVC

Why should I purchase a window profile manufactured via co-extrusion?

Working together towards greater sustainability

Sustainability is an increasingly important economic factor. By purchasing our products, our customers have the opportunity to improve their ecobalance and thus stand out from the competition in terms of sustainability. In doing so, they not only help themselves, but also pass on that added value to their customers. Together, we can achieve greater sustainability. A suitable solution can be offered for seven public tenders in which the use of recycled material is a requirement – without higher prices or any loss in quality.

We are pursuing a proactive strategy: at EU and Local Government level, numerous new provisions call for the use of recycled materials. This is why we are pooling the expertise we need to establish ourselves as a forward-thinking and reliable partner that encourages new standards in the industry.

Top quality

All of our window profiles meet the highest standards. This applies in particular to our co-extrusion products, which also preserve the environment and conserve resources.

We place special emphasis on ensuring that the visible surfaces on the installed windows fulfil the high expectations of the end customer with regard to appearance. All of the materials used not only fulfil the applicable standard (EN12608) but meet the requirements of the various national quality assurance norms (e.g. BSI).

The co-extrusion profiles, as well as the mono-extrusion profiles, are subject to external monitoring and are regularly tested. In addition to the profiles, the window systems are also tested for compliance with requirements, such as those of the RAL system passport.

In short, windows with co-extrusion profiles fully comply with all requirements in terms of colour and function while offering superior sustainability. Co-extrusion profiles can also be processed without requiring modifications to the production equipment and can be used in conjunction with traditional mono-extruded profiles.

Proven return concept

For us, sustainability is the key to a successful future. That is why we are starting with ourselves and our customers. Our return concept is a good example of this. We were the first company in the industry to introduce such a policy in 1988, and we are still profiting from our experience in this field now.

The policy enables us to implement the qualified recycling of used PVC windows and profile

sections to ensure that no resources are wasted. The material is collected, cleaned, shredded, sorted, in some cases re-conditioned, and ultimately used in the production of new window profiles.

As a member of the Rewindo national initiative and the pan-EU initiative VinylPlus, we have been supporting the recycling of used windows both in the UK and internationally for many years.



Why are window profiles made of recycled material not cheaper than those made of conventional PVC?

Higher investment and production costs

Sustainability works with the solutions of tomorrow. Modern technology often means high initial investment costs. For example, in mid-June 2015, we expanded our plant in Srem, Poland, by 1,250 square metres to have more space for our modern recycling technology, with a similar program of investment at our Blaenau plant in 2016. The heart of the facility is a powerful, high-precision sorting system that sorts raw materials by material type and thus ensures top quality during re-processing.

We have also acquired a plant in the UK, PVCR in which we are able to sort, shred, clean and prepare old windows on a material-specific basis. The facility enables us to produce some 5,000 tonnes of recycled material per year which we can then re-integrate into our production processes. Moreover, co-extrusion requires more complex material logistics and the installation of extruder and tool technology in our plants. We do not shy away from this investment, because it's an important contribution to our future success – and that of our customers.



Same performance, same price

Our modern co-extrusion products fulfil all of the demands met by conventional window profiles while providing considerable added value. We thereby enable our customers and their end consumers to play a role in protecting the environment – without paying more.

Why is REHAU so committed to co-extrusion?

Sustainability as a corporate value

As a family-owned enterprise, we think about the long-term. We think in terms of generations. This is why sustainability is one of our core values.

This is also reflected in our focus on co-extrusion; a technology that combines readiness for the future of our business with our desire to establish material use cycles – innovative, resource-saving and of the highest quality.

Customer relationships based on partnership

For us, every customer is a partner. As such, we take the needs of our customers very seriously. Sustainability is becoming increasingly important for our customers, which is why we offer technologies and services such as our return concept for window profiles. We want to support our customers in their efforts to be sustainable and efficient. Co-extrusion technology is setting new standards in this regard.

Dealing with global challenges

The modern world is facing global challenges. As a company we want to turn them into opportunities. One major challenge is the wasteful use of resources and relentless production of waste. These challenges require new thinking on a global scale, and with projects such as our co-extrusion process, we want to take advantage of the opportunity to provide an innovative answer to the key questions of today.



THE SAME ON THE OUTSIDE. INSIDE, THE SAME IN GREEN.

REHAU co-extrusion.

REHAU co-extrusion explained

Previously, window profiles were primarily made via the mono-extrusion method and exclusively used new PVC. Co-extrusion (i.e. multi-layer extrusion) adds a second extruder to the operation that processes a second material and combines the best characteristics of both materials. If recycled material is used in the process, the advantages are clear; the return concept keeps valuable raw materials in the production cycle and thus makes it possible to re-use materials in similar product applications even after their initial product life cycle.

The core materials we primarily use are:

- regrind material generated via our own extrusion and lamination processes (post industrial waste).
- window production regrind material from our processors (post industrial waste).
- materials that we extract from returned windows (post consumer waste).

To maximise the sustainability of the process, both coloured and white core materials are used, and we deliberately dispense with additive-based colour matching. Colour differences between the core and exterior layers are not visible on the finished window elements. We also maximise the potential of the technology by increasing the core element with coloured and white cores. Various technologies are available for this (ie. thick-film and thin-film technology).

We have many years of experience in the use of co-extrusion technology. For example, the GENE0 and NEFERIA profile systems employ it in order to utilise the high-tech fibre composite RAU-FIPRO as a means of enhancing stability. Co-extrusion is also used extensively in TOTAL 70 products.

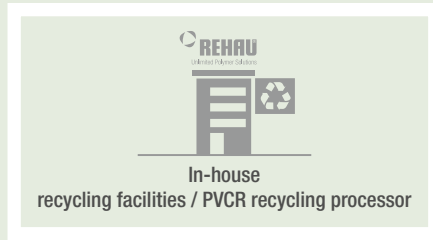
Co-extrusion is being implemented at all company locations and within TOTAL 70 products.

Used windows
(post-consumer)

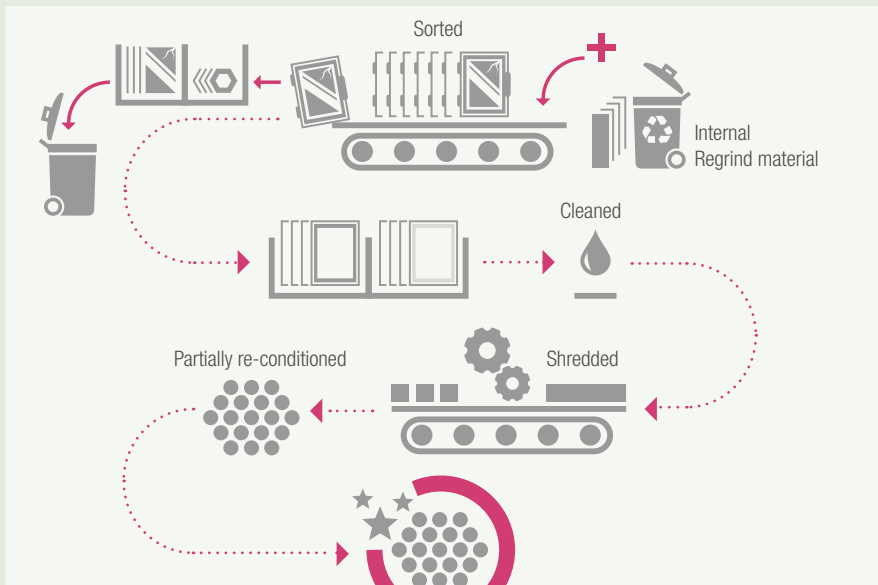


Profile sections from our
processors (post-industrial)

REHAU return concept



Material preparation



Re-use of recycled material in the inner core of new
window profiles through co-extrusion



