

Bibliographic references /

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- / FYCH Patent EP4013300A1, 'Plastic deodorization by steam and vacuum', University of Alicante, 2022..
- / 'Steam Stripping: The Clear Winner for VOC and Odor Removal in Recycled HDPE'. FYCH internal report, 2024.

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Odor, the Achilles heel of recycled plastic /

Mechanical recycling of post-consumer plastics, especially polyolefins such as PE and PP, faces a major barrier to accessing high-value applications: **odor**.

After being used in packaging for detergents, cosmetics, food, or oils, these plastics absorb **volatile organic compounds (VOCs)** that are difficult to remove even in the traditional washing and extrusion stages. These residual VOCs present in recycled plastic pellets are the cause of bad odors, limiting their reusability in many products.

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 - Recycled plastic cannot be used in certain applications.
 - Recycled products with low quality perception.
 - Lower selling price of recycled pellets.

Altero PureSteam System

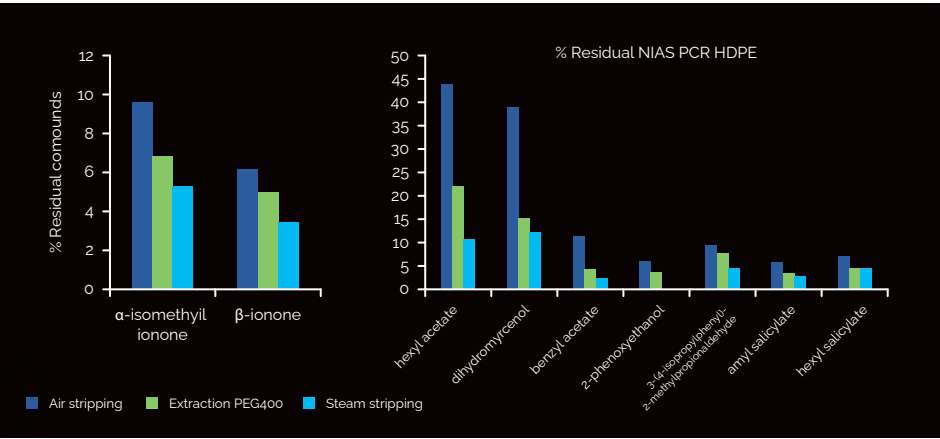
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The **PureSteam Deodorization and Decontamination System** uses patented (FYCH Patent EP4013300A1), scientifically validated technology to remove odors and VOCs in the most effective, fast, and sustainable way.

The key: using steam and vacuum to accelerate the migration of VOCs from inside the plastic, which are then stripped away and eliminated. This allows recycled plastic to be transformed into **high-purity, odourless raw material**, ready for use in demanding applications such as cosmetic and sensitive packaging.

The best technology on the market /

	PureSteam	Other systems (hot air without vacuum)
Total VOC reduction	Up to 84%	Up to 77%
Aromatic compound removal	> 90%	< 57%
Processing time	3 - 10 hours	8 - 12 hours
Polymer oxidation risk	Very low (vacuum environment)	High (hot air environment)
Energy recovery	Possible (Steam condensation)	No
Byproduct recovery	Possible (limonene, oils)	No
Environmental compliance	Zero VOC emissions	Requires post-treatment



System features /

- Optimized geometry to ensure the required steam velocity.
- Automatic start-up system to minimize condensate generation.
- Micro-batch operating mode.
- Available as a standalone unit or integrated with a pelletizer
- Energy savings by utilizing residual heat from the pellets.
- Pressure and temperature monitoring at various points.
- Internal stirrer to facilitate discharge and ensure homogeneous steam distribution.
- Option to recirculate deodorised material.
- Sample extraction without interrupting the process.
- Adjustable working temperature to prevent material clumping.

Advantages /

- The most effective technology on the market to obtain odor-free, high-quality pellets.
- Shorter residence time and higher productivity.
- Processed pellets can be used in the most demanding applications.
- Can be integrated into any existing pelletising process.



Eliminates more than **96%** of unwanted odours in plastics