PURESTEAM Sales Mastery Program

The Paradigm Shift in High-Value Plastic Deodorization

Internal Training Material | Based on FYCH Patented Technology (EP4013300A1)

The Achilles Heel of Mechanical Recycling

The Current State: Downcycling

Limited by Odor & VOCs.
Low Market Value.

The Barrier: Odor

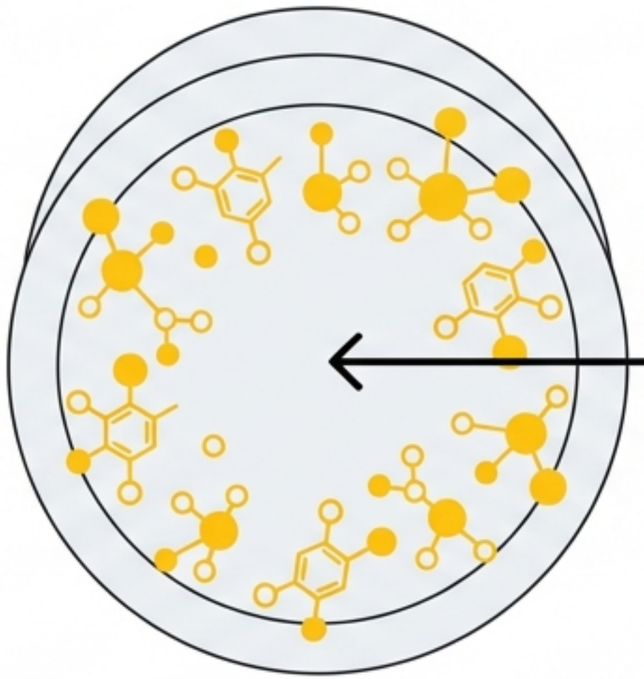
The Opportunity: Upcycling

Odorless & Pure.
High Market Value.

Source Data: Post-consumer waste contains NIAs (Non-Intentionally Added Substances) and degradation products that limit application scope.

Know the Enemy: VOCs and NIAS

- **VOCs (Volatile Organic Compounds):** Primary odor cause, absorbed during first life (e.g., Limonene).
- **NIAS (Non-Intentionally Added Substances):** Chemical residues from waste stream contamination.
- **Degradation Products:** Compounds formed during thermal stress of previous extrusion.



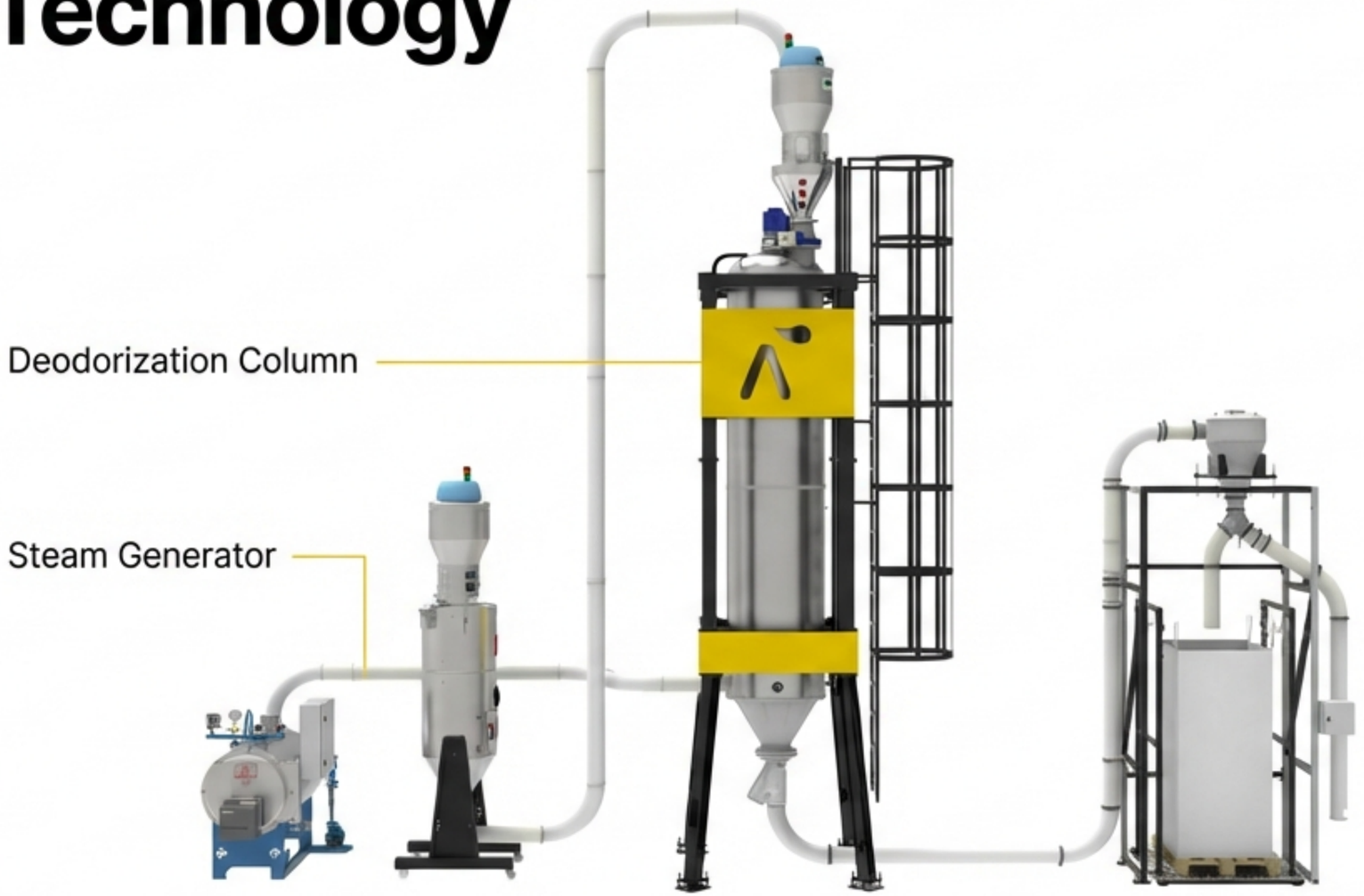
Why Washing Isn't Enough: Traditional washing only cleans the surface. VOCs migrate inside the polymer matrix. You need extraction from the core.

The Solution: Steam Stripping Technology

Fych Technologies

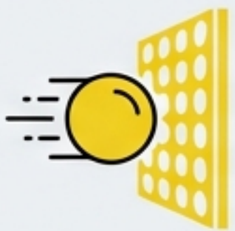
PureSteam

"Unlike hot air systems that just bake the plastic, PureSteam uses water vapor to carry contaminants away without oxidizing the polymer."



Patented Technology (FYCH EP4013300A1) combining Steam + Vacuum.

The Physics of Steam Stripping

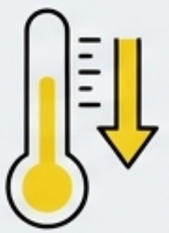


Molecular Transport:

Steam molecules penetrate the pellet surface faster than dry air, grabbing VOCs and pulling them out.

Protection:

Steam displaces oxygen, creating an inert environment. Prevents oxidation and yellowing.

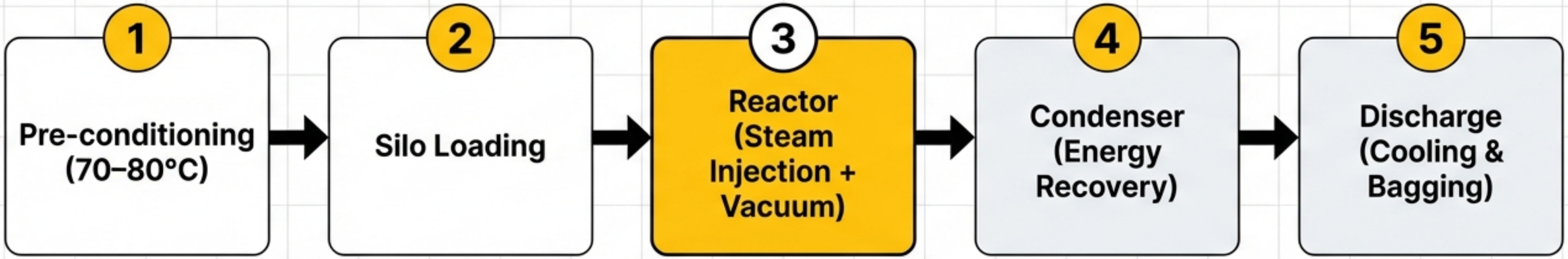


The Vacuum Effect:

Lower boiling point of volatiles allows extraction at lower temperatures, saving energy.

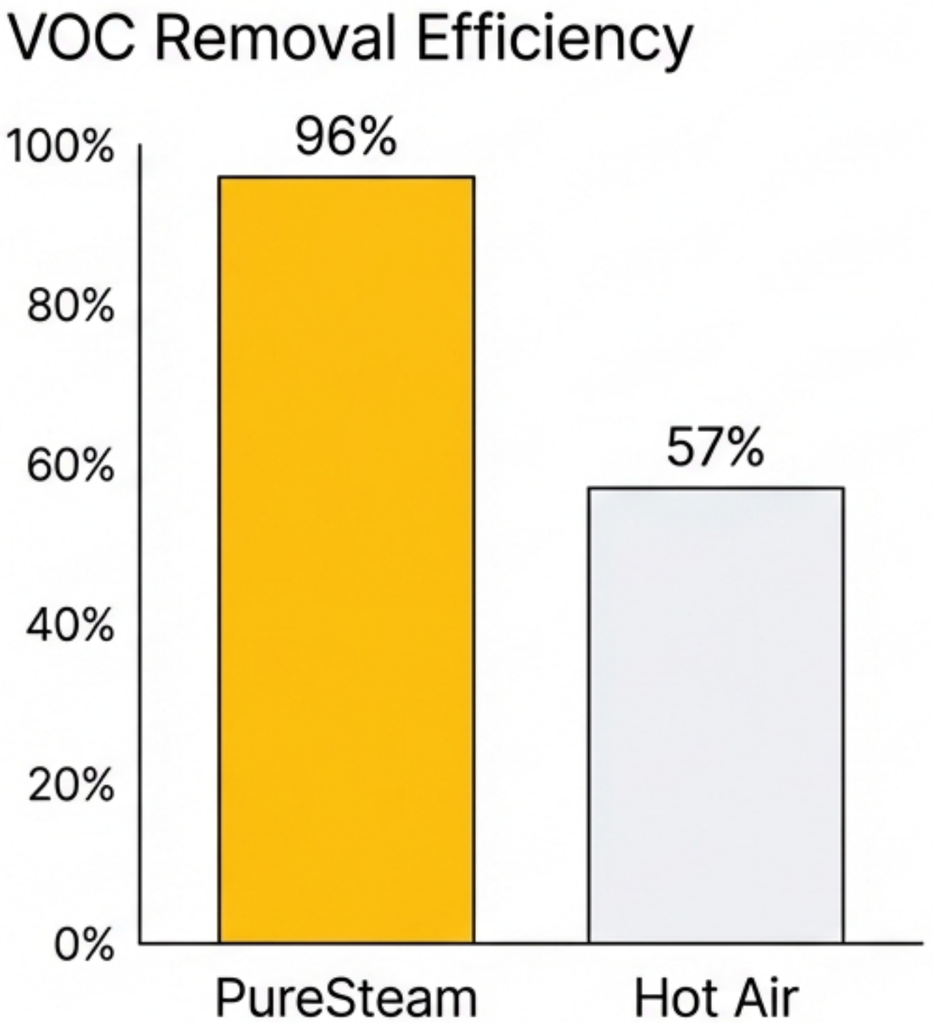
Agent Tip: Emphasize that we protect the material's physical properties (IV/MFI) while cleaning it.

The Process Flow: From Contaminated to Pure



Flexible Configuration: Offline (Standalone) or Inline integration.

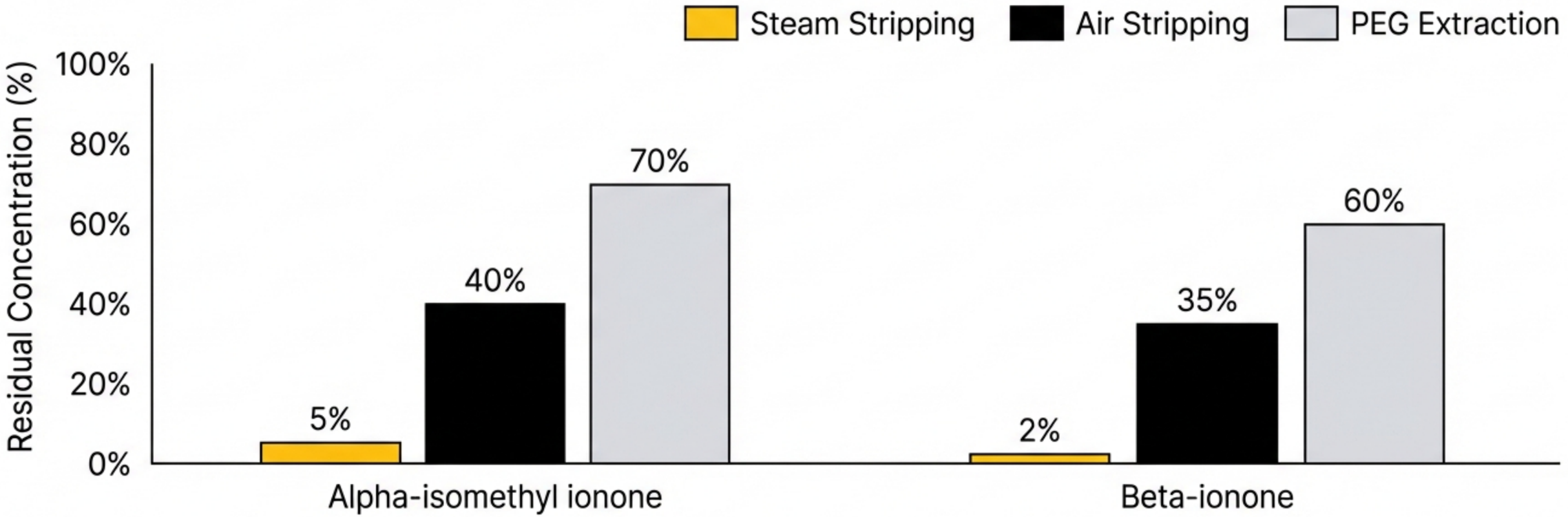
PURESTEAM vs. The Status Quo (Hot Air)



	PureSteam	Hot Air
Processing Time	**3–10 hours**	8–12+ hours
Oxidation Risk	**None (Inert)**	High
Emissions	**Zero (Condensed)**	Atmospheric

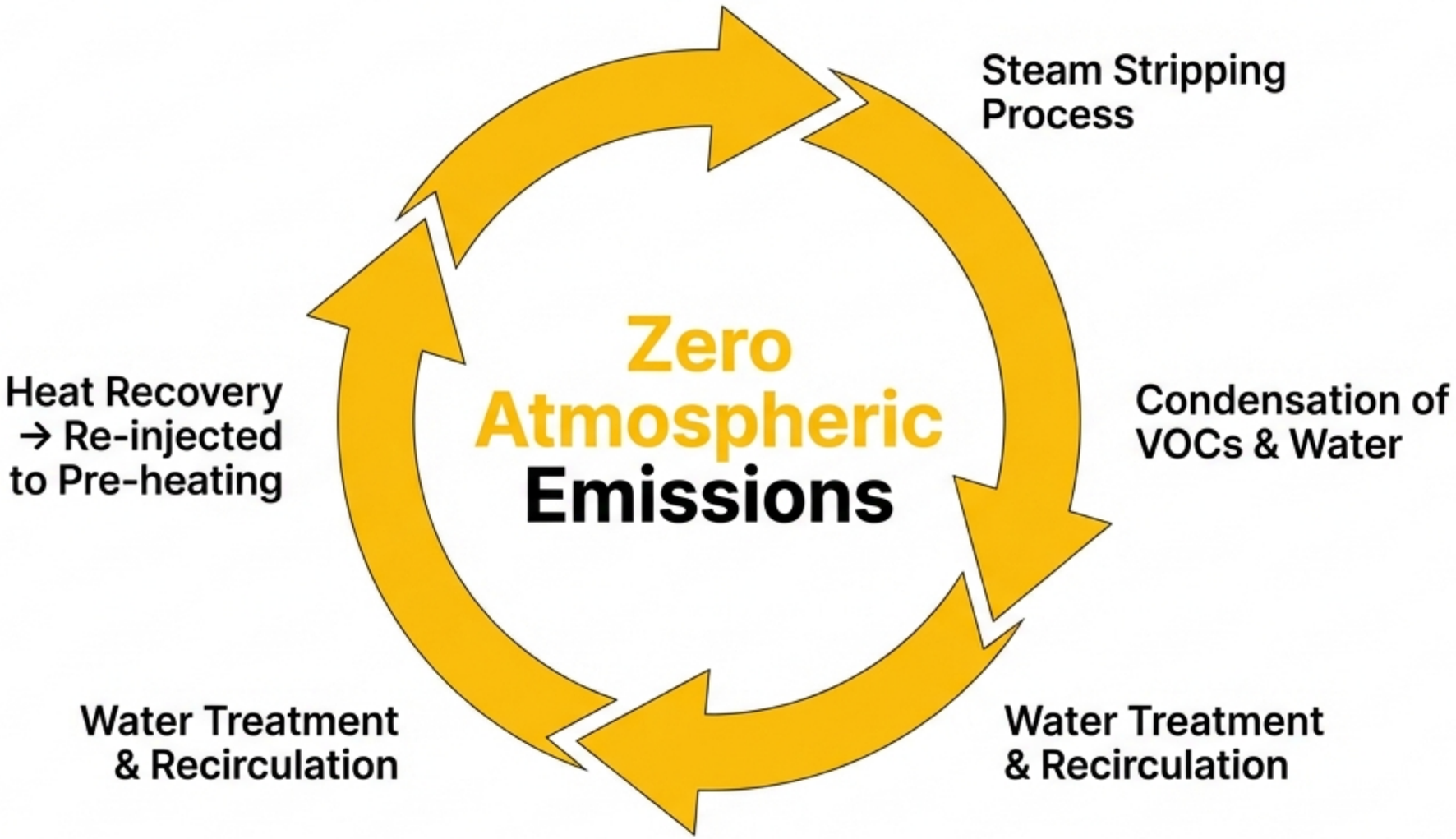
Scientifically Validated Performance

Data Source: Thesis by Andrea Cabanes Gil & University of Alicante



"Steam stripping improved efficiency in reducing **overall VOCs** compared to hot air stripping." — Thesis Conclusion

Sustainability & Energy Efficiency

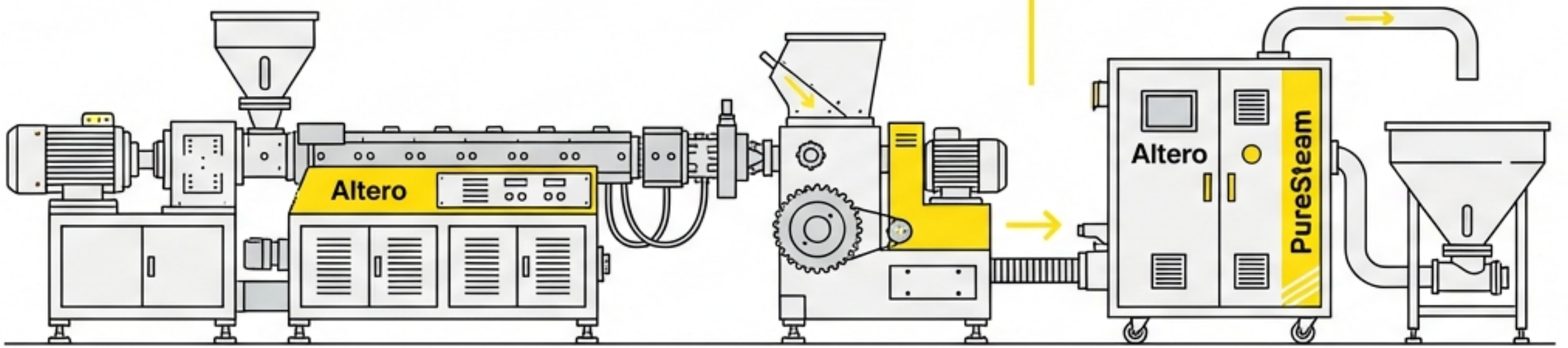


Agent Script: “We don’t just clean the plastic; we keep the factory air clean too.”

Integration & Flexibility

Inline: Direct connection to Pelletizing Line

Offline: Standalone treatment for stored batches



Key Features:

Micro-Batch Mode capable.

Handles HDPE, LDPE, PP.

Inline: Direct connection to Pelletizing Line

Offline: Standalone treatment for stored batches

Unlocking High-Value Markets

Cosmetics Packaging
(High odor sensitivity)

Detergents & Household
(Consistent quality)

Food Contact
(Approaching compliance)

Shift from **Downcycling** (Construction)
to **Upcycling** (Consumer Goods).

Machine Anatomy

1. **Steam Generator**
   High-efficiency boiler
2. **Upper Silo**
   Thermal insulation (70-80°C)
3. **Deodorization Column**
   Stainless steel with internal stirrer
4. **Vacuum Pump**
   Extraction engine
5. **Condensate Tank**
   Capture of contaminants

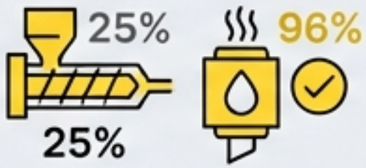
Objection Handling Playbook

Is steam expensive?

No. We recover latent heat. Vacuum lowers boiling point, reducing energy demand.

Will moisture get trapped?

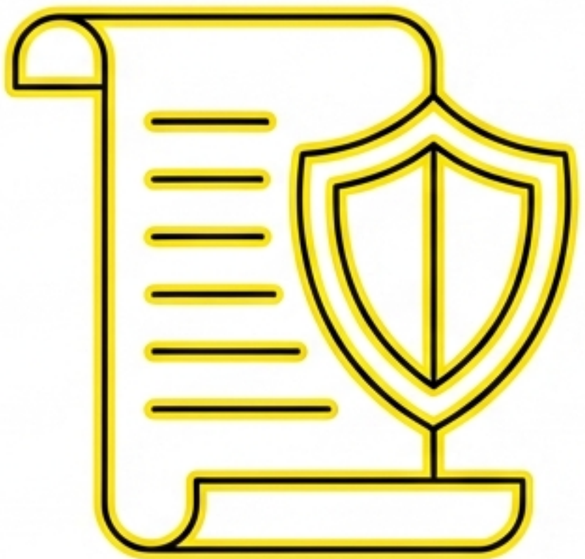
No. Material exits dry; residual heat evaporates surface moisture immediately.



I have a degassing extruder.

Extrusion is ~25% effective. PureSteam is 96% effective because it treats the pellet *after* formation.

Future-Proofing with REACH Compliance



- **Context:** EU regulations (REACH) are tightening on recycled polymers.
- **The Benefit:** PureSteam removes "Substances of Very High Concern" (SVHC) and degradation products.
- **Strategic Value:** Selling PureSteam is selling regulatory safety.

Source: REACH and Polymers: The Challenging Reality (Locatelli)

The 5 Pillars of PURESTEAM

1. Efficiency

Inter **96%** **VOC removal**
(vs 57% for air)

2. Speed

Inter **3–10 hour** **cycle**
(vs 8–12+ hours)

3. Quality

No **polymer oxidation**
(Inert atmosphere)

5. Patented

Exclusive **FYCH** **cycle**
(vs 57% for hourt)

4. Sustainability

Zero **atmospheric emissions**
+ Energy recovery

5. Patented

Exclusive **FYCH** **technology**
(EP4013300A1)

Stop selling a machine. Start selling the ability to supply the high-end packaging market.