

# AD CleanFlake™ is recognized by DUYTAN Recycling as a game-changer for PET bottle-to-bottle process

## Case Study



Efficient PET recycling is essential for advancing sustainability, but challenges like adhesive residue and complex label removal often create roadblocks. To address these issues, DUYTAN Recycling, Vietnam's leading bottle-to-bottle recycler, rigorously tested AD CleanFlake™ under their stringent recycling conditions. The results? A proven solution that enhances PET flake quality and operational efficiency. This case study demonstrates how DUYTAN's successful trials of AD CleanFlake™ provide valuable insights for brand owners seeking reliable, sustainable recycling solutions.

## The Challenge

DUYTAN Recycling (DTR), Vietnam's pioneering bottle-to-bottle (B2B) recycler, faced a significant challenge—the recycling of PET bottles with labels applied using permanent glue. These labels did not wash off during the recycling process, requiring time-consuming manual removal and making operations inefficient. Additionally, adhesive residue caused discoloration in recycled PET flakes, reducing both yield and quality of the final recycled products.

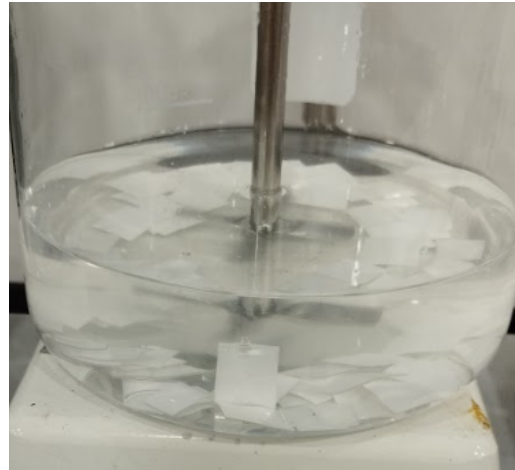
## Exploring Possible Solutions

After learning about DTR's challenges, we introduced them to our AD CleanFlake™ solution. While they had prior experience with wash-off labels and had tested similar products, previous options failed to meet DTR's stringent washing protocols, which require lower temperatures and shorter washing times than the industry standard. Our objective was clear: AD CleanFlake™ had to achieve 100% cleaning efficiency under DTR's specific conditions while delivering high-quality PET flakes.

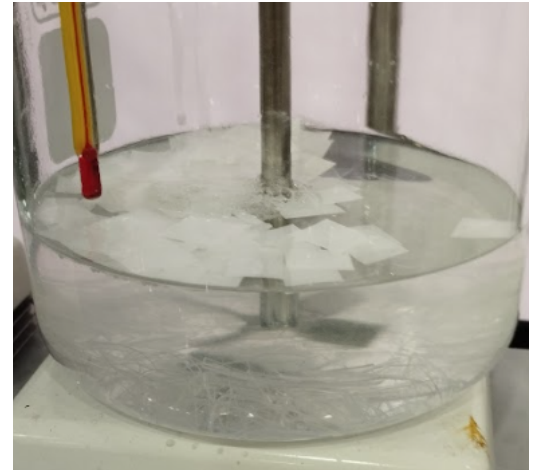
## The Test

Although AD CleanFlake™ meets the Association of Plastic Recyclers (APR) standards for PET recycling, DTR's requirements are far more rigorous than the APR test protocol (85°C, 1% NaOH, 15 minutes). To ensure AD CleanFlake™ could meet their stringent standards, we conducted extensive testing on our labels under DTR's exacting washing parameters.

The results were outstanding—our labels consistently achieved 100% clean flakes across all tests. We shared these positive results with DTR and proceeded to conduct a scaled-up trial at their facility. The AD CleanFlake™ labels passed their demanding washing conditions, leaving no adhesive residue on the PET flakes, an achievement recognized and validated by DTR.



Test begins: The PET flakes, with labels still attached, are immersed in a caustic bath.



Test is completed: The adhesive deactivates, allowing the labels to float while the adhesive-free PET sinks, making it ready for recycling.

(Images provided by DTR)

## The Value of AD CleanFlake™

The AD CleanFlake™ solution provided numerous benefits to DTR's process:

### 1. Improved Efficiency

Labels washed off at lower temperatures and reduced dwell times, without leaving any adhesive residue. This significantly reduced the labor needed for manual label removal and streamlined the recycling process.

### 2. Enhanced Yield and Quality

With no adhesive residue remaining, there was no discoloration of PET flakes, leading to higher recycling yield and improved quality of the recycled PET.

### 3. Energy Savings

Its ability to wash off at lower temperatures aligns with DTR's mission to adopt environmentally friendly practices by reducing energy consumption in their production process.

As quoted by Hao, Lam Hoang, R&D Deputy Manager, "I'm highly impressed by the results of the wash test—100% recovery of PET flakes and complete removal of glue under our stricter washing conditions. Congratulations to Avery Dennison for this outstanding innovation. We look forward to offering this solution to our customers, supporting their commitment to circular design."

Through the recognition of AD CleanFlake™, DTR is leading the charge in creating a more efficient, higher-quality, and sustainable recycling process—a testament to the transformative power of innovative solutions.

## The Importance of Innovation in Recycling

The case of DTR and their endorsement of AD CleanFlake™ highlights the critical role that innovation plays in the recycling industry. Without constant advancements and improvements, recycling processes can become inefficient, resource-intensive, and unsustainable.

As more brands adopt innovative solutions like AD CleanFlake™, recyclers can enhance their operations while driving progress toward a more sustainable future. These innovations not only benefit the environment, but also create economic value by reducing costs and improving the quality of recycled plastics.



### A Zero Waste Factory

DUYTAN Recycling is the first factory in Vietnam to successfully apply the plastic “bottle-to-bottle” recycling technology model. Used plastic bottles will be recycled into plastic pellets, creating a new plastic bottle loop to reduce the use of fossil fuels. In 2024, the factory recycled over 3.8 billion plastic bottles collected domestically. The number of plastic bottles processed for recycling not only provided raw materials for large FMCG partner companies in Vietnam but also enabled the company to export to 12 countries, including the United States and Europe. The factory is operated based on the THREE-NO criteria in the production process: Zero Waste – Zero Emission – Zero Waste Water. Applying these three criteria not only helps the company promote environmentally friendly production but also pays more attention to reusing energy sources in production.

Learn more: [www.duytanrecycling.com](http://www.duytanrecycling.com)

[info@duytanrecycling.com](mailto:info@duytanrecycling.com)

+84 272 3779 920

Zone D2 - Duc Hoa Ha Plastics Industrial Complex,  
Duc Hoa District, Long An Province, Vietnam

Find more sustainable label solutions at [label.averydennison.com](http://label.averydennison.com)



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