

AUTOMOTIVE PLASTIC RECYCLING

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Enhanced energy savings for automotive ABS, ASR & WEE recycling.

ABS (Acrylonitrile Butadiene Styrene) is a widely used thermoplastic known for its strength, durability, and versatility across industries, from automotive components to consumer electronics. ABS waste can be recovered, reprocessed, and reintegrated into new products, reducing landfill impact and conserving valuable resources.

Edwards' vacuum solutions help companies recycle their post-consumer plastics from landfills. Discarded waste like Automotive Shredder Residue (ASR) and Waste Electrical and Electronic Equipment (WEEE) need to undergo several stages of processing before they are turned into valuable high-quality polymers. These plastic processing and degassing stages are highly dependent on consistent and reliable vacuum power.

Typical automotive component recycling has multiple lines for ABS and other polymers like Polystyrene, Polypropylene, filled Polypropylene operating with liquid ring vacuum pumps. These LRPs generate waste water and pose several challenges and issues. To overcome these shortcomings, our specialised Edwards extruder degassing module system for plastic recycling – the EXDM is the answer.



EXDM: nEDC150 50 400 A CP 2



Edwards nEDC dry claw vacuum pump

KEY FACTS

Application **ABS recycling**

BENEFIT

- **Up to 25% energy savings**
- **Reliable, repeatable vacuum level**
- **Easy onsite maintenance**

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1. CHALLENGE

Mechanical recycling of plastic waste involves a twin-screw extruder that melts waste material chips with vacuum take-off points to remove water vapor and VOCs (volatile organic compounds). The resulting pellets are then moulded into new products such as wheelie bins, automotive parts, toolboxes etc. A typical setup in recycling facilities include twin-screw extruders equipped with LRPs, separator KOPs and cooling water system with water chiller, indirect heat exchanger, LRP waste-water tank and wastewater management. While adequate, LRPs tend to have high maintenance and energy costs.

Traditional systems like these need frequent maintenance including weekly draining and cleaning of water systems. With large carryover spills and complex piping requirements, these LRPS need to be replaced every two years leading to high equipment costs.

2. SOLUTION

For a typical 24-ton batch of ABS and PS/PE/PP/filled PP recycling lines, the vacuum needs are very demanding. Operations can be up to 24 and 36 hours each at 200 mbara and 100 mbara, respectively.

Our EXDM system can meet these needs easily with a smaller footprint. The EXDM system is a fully automated system which typically includes our nEDC dry claw pump with a series of accessories like filters, monitors and safety devices. It can be easily integrated into existing installations.

The dry claw pumps are equipped with stainless steel claws and a coated inner chamber housing which ensures long-lasting, corrosion-free operation. Dry claw pumps are designed to tolerate several starts and stops without affecting the pump performance or the overall recycling process. The two, easy-to-clean filters for continuous operations, and automatic controls can allow a customer to harmonise their vacuum systems across multiple production lines with identical systems and interchangeable components. EXDM eliminates the need for cooling water system and associated costs.

3. OUTCOME

Choosing EXDM system over a traditional liquid ring vacuum pump setup ultimately leads to cleaner and more cost-effective operations.

One of the main benefits is the energy saving up to 25% for the process. For example, energy usage can be reduced from 30kW (excluding external cooling tower) to 22.2kW across multiple production lines.

The removal of the cooling water system dramatically reduces weekly maintenance costs too.

Our dry vacuum technology ensures steady, reliable and repeatable vacuum that is not dependent on cooling water temperature.

Onsite maintenance of EXDM is also easy and hassle-free, owing to the inbuilt solvent flush system that keeps the pump clean. Standard filters allow for interchangeability and ease of maintenance with easy to clean and assemble filter elements.

All in all, the Edwards EXDM can undoubtedly transform your regular plastic recycling operations, giving you full flexibility without compromising quality and lead time.



Two filters



Fully automatic control



Fully automatic EXDM system can deliver upto 25% of energy savings across multiple ABS recycling lines.