

# VACUUM SOLUTIONS FOR THE PLASTICS INDUSTRY



# EDWARDS THE PARTNER OF CHOICE

Edwards, a world leader in vacuum solutions and innovators in vacuum pump design and manufacturing have for 100 years been delivering solutions that bring value to manufacturing industries.

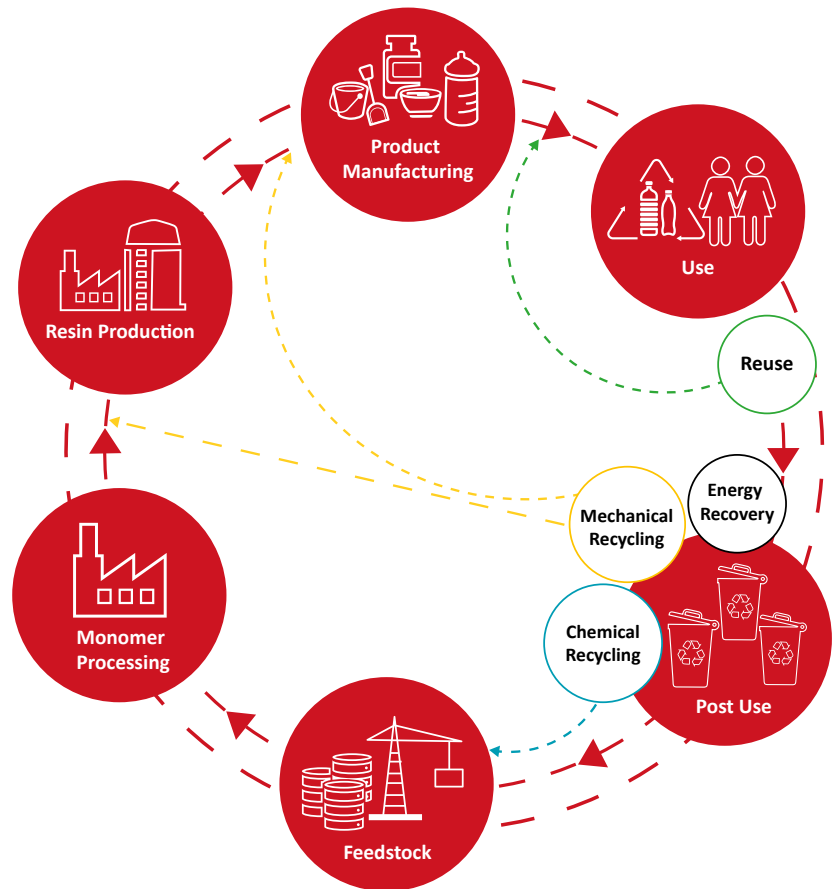
# DEGASSING PLASTICS WITH EDWARDS VACUUM SOLUTIONS

Vacuum pumps are widely applied in processing plastics, mainly to extract gases and vapour and to operate at lower processing temperatures to manufacture high quality products. Our expertise in vacuum applications allow us to design robust and reliable vacuum systems to meet your vacuum needs.

Vacuum pumps play an important role in degassing plastics as water vapour, toxic and corrosive gases and other impurities affect the quality of the product. Polymer melts are degassed to remove these impurities at low pressures using vacuum pumps on extruders when being compounded into different grades with additives and colourants and while being formed.

Various plastics manufacturing methods like vacuum forming, injection moulding, EPS foaming, etc. employ vacuum pumps on the mould to avoid significant defects such as burn marks, incomplete filling of the mould cavity, moisture removal to eliminate internal defects and to create that all important smooth surface finish.

Our experts will help you make the right selection from the wide range of Edwards vacuum pumps, for your plastics degassing, processing and recycling application.



## RELIABILITY IS OUR CORE COMPETENCE

Edwards vacuum solutions give you a clear advantage by being:



**Environmental** – Proven dry technology  
Kinder on the environment: dry pumps do not generate contaminated oil or water



**Economical** – Affordable systems with low cost of ownership  
Low installation, running, service and maintenance costs



**Simple** – Automatic and manual control options  
Easy integration with your system



**Global Applications and Service support**  
Experienced dry pump applications and service experts



**Reliable & Flexible** – Rough to high vacuum pumping technologies for corrosion-free operation with robust liquid and solids handling  
Increased productivity between service intervals

# VACUUM SOLUTIONS FOR EVERY APPLICATION

Vacuum pumping systems used for processing plastics need to handle solids and liquids in a reliable and efficient way, providing vacuum on demand while ensuring control and reducing the environmental impact giving you the advantage of low cost of ownership.

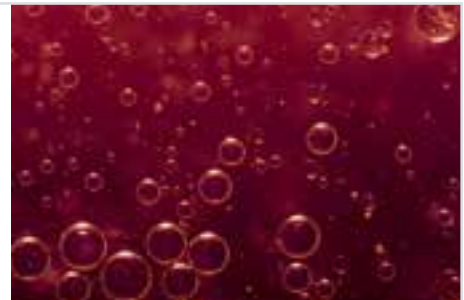


## Polymer & Bio-based Plastics

- Initiate and aid the reaction
- Efficient monomer recovery
- Steady and reliable pumping speeds for batch and continuous processes

## Extruder Degassing

- Extract entrained gasses, vapour and contaminating gases
- Efficient monomer recovery
- Flexible vacuum for multiple degassing zones



## Compounding & Masterbatch

- Maintain thermal stability of heat sensitive additives, pigments and resins
- Repeatable vacuum performance for multiple degassing stages
- Rough to high vacuum

## Recycling Plastics

- Aid the reaction
- Eliminates entrained gasses
- Efficient handling of contaminating and waste gases and materials



Our expertise in chemical processes and applications has allowed us to design rugged, non-contacting dry mechanisms capable of handling a range of contaminating materials, with excellent liquid and solids handling capabilities, ensuring high reliability in every condition.



### Film and Sheet

- Stable vacuum for single layer sheets and multilayer (or laminated) film structures
- Flexible vacuum for multiple degassing zones
- Expert waste gases handling for PP, PA and EVOH

### Vacuum forming

- Stable vacuum on the mould
- Quality throughput
- Rough to high vacuum



### Moulding Plastics

- Enhanced feature replication
- Avoid burn marks and diesel effect
- Avoid short shots

### EPS Foaming

- Moisture recovery
- Increased accuracy of shape
- Faster curing



# APPLICATION MATRIX

| Plastic Applications                    | Vacuum Pump Systems    |                           |                                |                               |
|---|------------------------|---------------------------|--------------------------------|-------------------------------|
|   | Claw<br>(50-1000 mbar) | Screw<br>(0.01-1000 mbar) | Rotary Vane<br>(0.5-1000 mbar) | Liquid Ring<br>(33-1000 mbar) |
| Plastics Recycling                      | ✓ ✓                    | ✓ ✓                       | ✓                              | ✓                             |
| Polymer & Bio-based Plastics Processing | ✓                      | ✓ ✓                       |                                |                               |
| Extruder Degassing                      | ✓ ✓                    | ✓                         |                                | ✓ ✓                           |
| Compounding and Masterbatch             | ✓ ✓                    | ✓ ✓                       | ✓                              | ✓ ✓                           |
| Film and Sheet Processing               | ✓ ✓                    | ✓                         |                                |                               |
| Vacuum Calibration                      |                        |                           |                                | ✓ ✓                           |
| Vacuum Forming                          | ✓                      |                           | ✓                              |                               |
| Mould Evacuation                        | ✓ ✓                    |                           | ✓ ✓                            | ✓ ✓                           |
| Pneumatic Conveying                     | ✓ ✓                    |                           | ✓ ✓                            | ✓                             |
| Vacuum Drying                           | ✓ ✓                    | ✓ ✓                       | ✓                              | ✓                             |

- ✓ ✓ Preferred technology
 ✓ Some applications
- ✓ Recommended
 ✓ Less recommended, Economically and/or Environmentally
✓ Not Recommended (Economically and/or Environmentally)

Our application expertise and in-depth knowledge of your industry makes it possible for us to offer a comprehensive range of vacuum pump and system solutions customised for your application:

- Process design
- Equipment specification and selection
- Safety and operating procedures
- Vacuum systems and control integration
- Commissioning and installation
- Installation and operational qualification for FDA compliance

Our global network of application specialists and highly focused central applications team are on hand to offer expert support throughout your selection and installation process.

# EDWARDS EXDM SYSTEM FOR PLASTICS PROCESSING AND RECYCLING

Not just pumps but complete vacuum solutions



**EXDM 1 Filter System**



**EXDM 2 Filter System**

## Edwards systemisation for plastics processing and recycling

Edwards' new EXDM system is ideal for degassing, processing and more importantly recycling plastics. The EXDM system is a modular package for your new or existing installation which comes with an easy logic manual control philosophy or automatic control options.

The trusted performance of our dry claw pumps equipped with stainless steel claws and a coated inner chamber housing allows for corrosion free operation. The new range of our EDC dry claw pumps features an innovative design which are designed to tolerate a number of starts and stops without affecting the pump performance or your process creating a new benchmark in the claw pump market.

For processes that need higher capacities or further systemization, we will design the system as your individual package from modules and accessories built as per your specifications. This will typically include multiple pump systems, customised filtration systems and integrated control mechanism. Edwards gives you full flexibility without compromising quality and lead time.

Depending on your process, our application experts will help you select the right Edwards system for your process.

- Modular Dry System for new and existing installations
- Easy logic Manual control philosophy
- Intelligent Automatic control option
- Environmental friendly
- Low cost of ownership

# VACUUM PUMPS FOR PLASTICS APPLICATIONS

## EDC Dry Claw Pumps

Edwards EDC range is a new generation of robust single stage dry claw vacuum pumps. The simplicity, robustness, efficiency and contaminant handling capability of these pumps make them the smart choice for your application.



### **Built to last**

Innovative construction material and coatings

### **Easy Maintenance**

Simple design with quick access for quick cleaning

### **Improved Productivity**

Best in class ultimate vacuum level, market leading pumping speed and lower continuous vacuum level

### **Low Cost of Ownership**

Best in class power consumption

## GXS Dry Screw Pumps

Our GXS dry pumps take vacuum performance to the next level. With unique screw technology and world leading high efficiency drives, enabling advanced temperature control and long service intervals, you are guaranteed best-in-class pumping speeds and low running costs for many years to come.



### **Increased Productivity**

Faster process and longer intervals between service

### **Improved Product Quality**

Better ultimate vacuum

### **Highly Reliable**

Ability to handle harsh processes

### **Small Carbon Footprint**

Low power and utilities usage

### **Complete control**

GXS features fully enabled intelligent on-board control



## EDS Dry Screw Pumps

Edwards' new range of EDS dry screw pumps features an innovative design which creates a new benchmark in the screw pump market. An intricate piece of engineering, available in air-cooled or water-cooled options providing you with a trouble-free and cost-effective solution to meet your needs.



### **Faster**

Faster process and longer intervals between service

### **Flexible**

Better ultimate vacuum

### **Process Capable**

Ability to handle harsh processes

### **Robust**

Highly tolerant water-cooled and air blast-cooled standard products

Edwards has a range of conventional pumping technologies consisting of oil sealed rotary vane pumps and liquid ring pumps especially for customers with excellent waste stream disposal facilities providing consistent performance.

## nES Single Stage Rotary Vane Pumps

Edwards nES single stage series represents the next advancement in oil sealed rotary vane vacuum pumps for use in a wide of range industries and applications offering high reliability, low life cycle cost and proven performance.



### **Efficient Cooling**

Low operating temperatures and increased oil life improving the reliability

### **Compact and Clean**

Robust and compact in design

### **Oil Return System**

Optimised oil return system supports stable pumping performance and minimises oil loss

### **Proven Performance**

Consistent pumping performance, excellent vacuum stability and good condensable vapour handling

## HR series Liquid Ring Pump

The Edwards two stage liquid ring vacuum pumps provide the optimum solution for many rough vacuum applications in the process industries. Two stage liquid ring pumps are an efficient solution for continuous operation on low pressures, to handle wet corrosive process streams and are tolerant of particulates while offering minimal maintenance requirements, vibration and noise.



### Process Capable

Solids and liquid handling capability

### Material of Construction

Various material of construction options

### Standard Packages

Once-through, partial re-circulation and total re-circulation operation mode options

## ACCESSORIES

Edwards standard systems typically include a dry pump system with a series of accessory modules such as:

- Mechanical boosters – for increased pumping speed and improved ultimate vacuum
- Gas purges to dilute flammables and extend seal life
- Safety devices - Flame arrestors, solvent flush, inlet isolation valves
- Recovery vessels for solvents or other fluids - Knock-out pot, condenser, receiver
- Acoustic devices to reduce pulsation in the exhaust and hence noise – Silencers (drainable), full system enclosures
- Monitors and controls from gauges and 4-20 mA transmitters to fully enclosed bespoke control units - temperature and pressure transmitters, pressure gauges, rotation sensors, inverter drives, control box



**EH Boosters**



**Stokes 6" Mechanical Booster Pump**



**HV Booster**

# EDWARDS GLOBAL SERVICE

Your business success depends on maximum equipment uptime and minimum total cost of ownership. As a global leader in vacuum technology and processes, we understand how vacuum pumps and systems perform in real life. Our wide portfolio of services is designed with you in mind: to help keep your processes and equipment running in the most economical and environmentally efficient manner.

## Services include:

- Onsite preventative maintenance and health checks
- Overhaul and repairs using genuine Edwards OEM parts performed onsite or at Edwards repair centre
- For maximum convenience a prepared exchange pump (or pump module) is supplied – The pump that requires service is return to us.
- OEM spares and kits available for immediate dispatch
- Global network of expert field service engineers available to respond quickly to unexpected equipment failures
- Extended warranty, to help manage the cost of the unexpected
- Our Expert Advantage Service Plans provide you with the ongoing support necessary to continuously improve your operational efficiency and meet your business objectives. As service offerings may vary slightly from product to product, please contact your Edwards representative to discuss your specific requirements.





## GLOBAL CONTACTS

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