



*a clear edge*

*Vacuum solutions for  
chemical process industries*

 **EDWARDS**

Vacuum science... product solution.

*a clear edge*

*more than pumps,  
complete vacuum solutions*



# *Vacuum expertise and application solutions*

**Edwards is a world leader in the design, technology and manufacture of dry vacuum products for process applications in the chemical, speciality chemicals and pharmaceutical industries.**

Our application expertise allows us to provide you with reliable vacuum solutions and to support you all the way, from the choice of your standard or customised system to long-term service agreements to give you complete peace-of-mind.



CXS dry screw pump



CDX dry pump



EDP dry pump

# Applications

Edwards has a unique combination of applications expertise, product portfolio, engineering strength and global presence.

We pride ourselves on the experience and flexibility of our applications specialists, who will work with you to design the correct solution for your process. Our application specialists have unrivalled knowledge and can advise on pump selection, configuration and operation to suit your requirements.

Our proven and rugged non-contacting dry pump designs, both screw and reverse claw mechanisms, include the ability to control pump body and internal gas temperatures allowing a comprehensive range of solvents, flammables and corrosives to be pumped. The mechanisms can tolerate both liquids and particles in the gas stream and are suitable for many applications.

	Chemical Dry Pump	Mechanical Booster	Rotary Piston Pump	Rotary Vane Pump	Liquid Ring Pump	Steam Ejector
Distillation, normal	✓✓	✓✓	✓	✓	✓✓	✓✓
Short path distillation	✓✓	✓✓	✓	✓		✓✓
Molecular distillation	✓✓	✓✓	✓	✓	✓	✓✓
Reactor service	✓✓	✓✓	✓		✓✓	✓
Central vacuum (flammables & corrosives)	✓✓	✓✓			✓✓	
Fatty acid deodorisation, Biofuels	✓✓	✓✓			✓✓	✓✓
Drying, evaporation, crystallisation, concentration	✓✓	✓✓	✓	✓	✓	✓
Gas recovery/recirculation	✓✓	✓✓				
Degassing	✓	✓	✓	✓✓	✓	✓
Absorption, Adsorption, Desorption	✓✓	✓✓			✓✓	
Pervaporation	✓✓	✓✓			✓✓	
Solvent recovery	✓✓	✓✓			✓	
Isocyanates production	✓✓	✓✓		✓	✓✓	✓✓
Impregnation	✓✓	✓✓	✓✓	✓✓	✓✓	
Polymers and plastics production	✓✓	✓✓	✓	✓	✓✓	✓✓
Paints, pigments, coatings and ink production	✓✓	✓✓	✓	✓✓	✓	✓
Soaps/detergents production	✓✓	✓✓	✓			✓✓
Ethylene Oxide sterilisation	✓✓	✓✓		✓✓		
Oil treatment plants	✓✓	✓✓	✓✓	✓	✓	✓
Dewatering and filtration	✓				✓✓	
Flammable and corrosive gases	✓✓	✓✓		✓	✓✓	✓✓
✓✓ - Preferred technology or widespread use ✓ - Some applications						
	Lowest cost of ownership, typically		High cost of ownership, typically			Highest cost of ownership, typically

Edwards are world leaders in designing pumps and pumping systems for safe pumping of hazardous inflammable material. We comply with all global legislation, including ATEX, please contact your Edwards representative for more information.



## Our technology and expertise

We are a market leader in dry pump technology and the pioneer of dry vacuum for the pharmaceutical, speciality and base chemical industries. We offer a range of innovative and reputable technologies, including our EDP pumps with reverse claw mechanism, proven for over 20 years and our benchmark CDX double ended screw pump. Now with the recent introduction of our intelligent CXS dry pump with tapered screw design and high reliability, we are setting new standards for reliability, performance, control and cost of ownership.

### Why dry?

With no oil, steam or water in the process volume, dry running pumps eliminate at source the pollution traditionally associated with 'wet' sealed vacuum systems, this provides cost and material handling benefits as the sealing medium does not need to be replenished.

- No contamination of the process stream
- No polluted effluent
- Improved processing with reduced down time
- Lower utility and consumables cost

Our proven and rugged non contacting product designs include the ability to control pump body and internal gas temperatures allowing a comprehensive range of solvents, flammables and corrosives to be pumped.

### New technology

Our long experience in dry pumping in all industries and in particular in chemical process market is allowing us to constantly improve and to develop the best in class technologies. The new CXS range features an innovative tapered screw rotor delivering smooth, gradual compression for improved thermal control and optimised pumping at all inlet pressures and intelligent control features.

- Reliable and repeatable vacuum
- Excellent liquid and solids handling
- No end compression plate to trap solids or cause hydraulic locks
- Special start up and shut down modes to free the rotors or avoid cold seizures

### Safety

Edwards has always lead the field in safety and pioneered the design of safe dry pump packages. Our global engineering standards ensure that safety is guaranteed while maintaining performance.

Edwards dry pumps, with their unique design that creates turbulence, ensure that no gas or solvent is in contact with the internal surfaces long enough to cause a hazard.

Certified for operation in Class 1, Group C&D, Division 1 Hazardous Locations.

The European ATEX (Atmospheres Explosive) legislation is the most stringent in the field, requiring pump manufactures to consider "malfunctions" and "rare malfunctions" and products to be tested by external test houses for Category 1 (Zone 0) T4 operation. Edwards offers a range of ATEX certified pumps.



# Application engineering, design and systemisation

Our application expertise and in-depth knowledge of your industry will ensure we can offer a comprehensive package of design and systemisation solutions.

- 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 highly focused applications team; central applications group and regional networks of applications specialists, are on hand to offer expert support throughout your selection and installation process.

## Configured packages

Where possible, we will design your individual system from standard modules and accessories, this will typically include a dry pump system with a series of accessory modules including:

- Mechanical boosters – for increased pumping speed and improved ultimate vacuum
- Gas purges to dilute flammables and extend seal life. Options include: Inlet purge, shaft seal purge, gas ballast
- 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 (reduce system noise by >5 dBA)
- 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

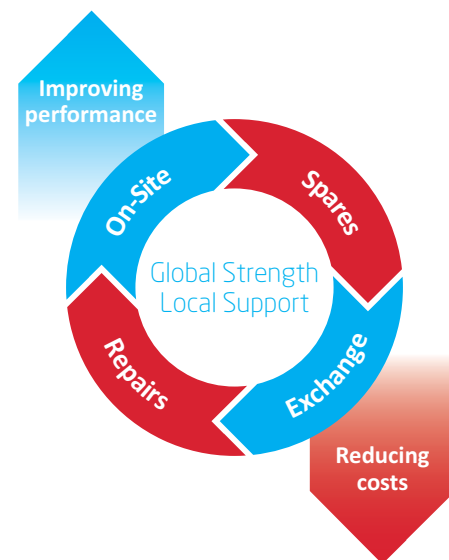


## Service and support

Our expertise, your advantage.

Our expertise is in vacuum technology, we have been in the business since 1919 and our knowledge runs deep. We design, develop and manufacture vacuum equipment to the very highest standards. But it's not just the technology. With a global installed base of 750,000 pumps, we understand how vacuum pumps and systems perform in real life. We know how to get the best from our products, whatever the application. We know how to look after them. That's why a large section of our expert workforce is dedicated to service and support.

Our service solutions come under three main headlines; on-site service, repairs and exchange, and quality spares. All built on our world-class technical know-how and backed by our sophisticated logistics and supply chain infrastructure.



# Our vacuum products

## CXS chemical dry vacuum pump

CXS is Edwards most advanced chemical dry pump featuring new tapered-screw technology for exceptional energy efficiency and performance. It offers high reliability and effluent-free pumping even in the most difficult of harsh chemical and pharmaceutical processing applications.

The CXS pumps up to one litre of liquid per minute continuously or up to 25 litre-slugs without stopping, and provides an ultimate vacuum down to  $10^{-2}$  mbar. CXS is available in two sizes, with capacities of  $160 \text{ m}^3\text{h}^{-1}$  and  $250 \text{ m}^3\text{h}^{-1}$ .



## CDX dry vacuum pump

Edwards CDX 1000 use a double-ended screw mechanism dry pump to provide peak speed up to  $900 \text{ m}^3\text{h}^{-1}$ . This pump gives the ability to handle large volumes of dust and water vapour without any loss of performance while minimising maintenance requirements and running costs. The CDX dry pump are capable of continually operating from atmosphere to ultimate and offer excellent temperature control with indirect cooling fitted as standard.



## EDP chemical dry vacuum pump

Edwards EDP series incorporates our long proven, patented non contacting reverse claw mechanism to create an oil-free vacuum, preventing contamination of the process stream. These pumps are highly tolerant to liquids and particles in the gas stream and are capable of operating from atmosphere to ultimate pressure. In addition, an indirect cooling system prevents chemical reactions within the pump. EDP is available in four sizes with capacities of  $80 \text{ m}^3\text{h}^{-1}$ ,  $160 \text{ m}^3\text{h}^{-1}$ ,  $250 \text{ m}^3\text{h}^{-1}$  and  $400 \text{ m}^3\text{h}^{-1}$ .



## HV mechanical booster pump

When high pumping speed is required our chemical dry pumping systems can be complemented with the HV range of mechanical booster pumps designed for large scale harsh industrial and chemical applications such as polymerisation or fatty acid deodorisation.

The HV8000 and HV30000,  $7,200 \text{ m}^3\text{h}^{-1}$  and  $30,000 \text{ m}^3\text{h}^{-1}$  nominal displacement at 50 Hz ( $8640 \text{ m}^3\text{h}^{-1}$  and  $36,000 \text{ m}^3\text{h}^{-1}$  at 60 Hz) are controlled with variable frequency drives to allow start up from atmospheric pressure and great versatility.

## EH mechanical booster pump

The EH mechanical booster pump, based on the simple Roots principle, remains the favorite pump for applications where high pumping speeds are required for pressures in the region of 0.01 to 10 mbar. This pump must always be backed by another pump, which can deliver against a high-pressure differential to atmospheric pressure.

Operating at relatively low pressures, the mechanical booster pump is not exposed to the same concentrations of corrosive process media as is the backing pump, which makes it highly reliable. EH booster pumps have a unique and patented hydrokinetic fluid drive, which couples the motor to the pumping mechanism. The hydrokinetic drive offers the following advantages:

Pump down times cut by up to 50% when compared with direct drive pumps.



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