

# GXS VACUUM PUMPS FOR LITHIUM-ION BATTERY ELECTROLYTE DEGASSING

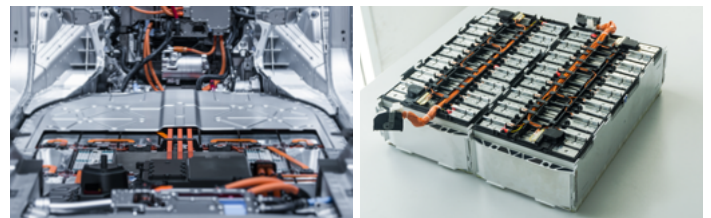
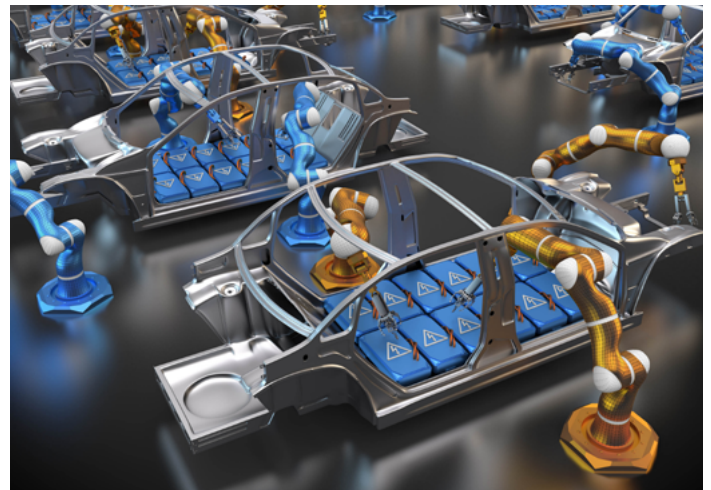
## INTRODUCTION

The GXS dry screw vacuum pump is ideal for major Lithium-ion battery manufacturers owing to its performance, proven reliability and low cost of ownership.

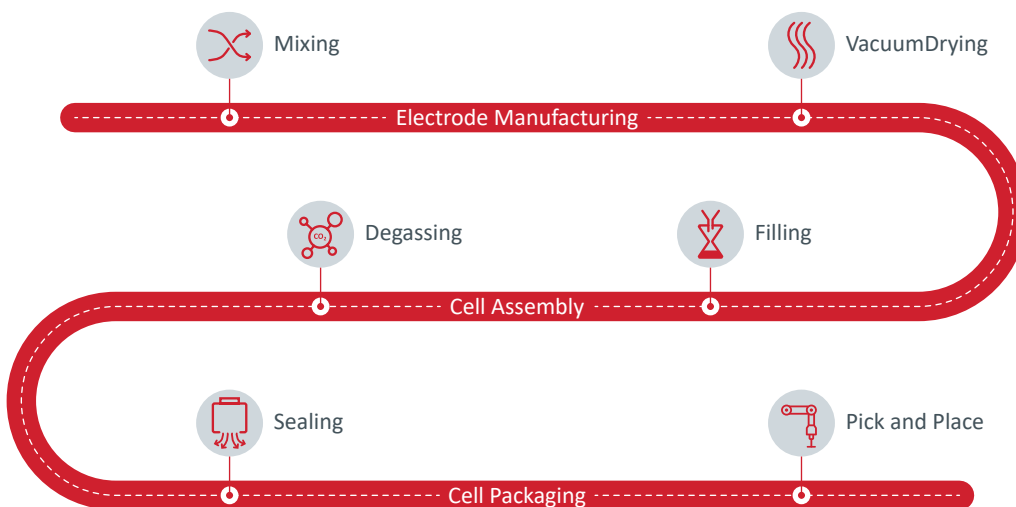
While oil-sealed rotary pumps have been traditionally used in the Lithium-ion battery production process, dry screw vacuum technology is cost-effective and environmentally friendly.

Lithium-ion battery production consists of several steps such as the mixing of chemical slurry, the vacuum drying of electrodes, filling, degassing and sealing, which are all carried out under a vacuum environment to remove solvents as well as moisture and gas traces.

The process of electrolyte degassing is carried out in vacuum after prefilling the battery cells with electrolyte solution. This ensures the Lithium-ions can move freely, enabling efficient charging and discharging. It is essential to remove moisture, gases and contaminants to retain the purity of the electrochemistry for optimum performance and long life of the battery cells. Chemicals such as Dimethoxyethane (DME), Dioxolane, and Lithium Hexafluorophosphate could be present in the solution and the GXS materials of construction have been developed to be compatible with these type of harsh process materials.



LITHIUM-ION BATTERY PRODUCTION FOR CARS



Edwards offers proven solutions and applications expertise in all Lithium-ion Battery manufacturing processes requiring vacuum.

**1. CHALLENGE**

- Electrolyte degassing requires the vacuum pressure to be less than 0.1 mbar.
- As chemicals are present in the solution, vacuum pumps need to be robust and capable of managing the process duty cycles.
- The pumps must provide continuous reliable operation to ensure the uniform removal of gases and deliver low ultimate pressures without downtime losses.

**2. SOLUTION**

- GXS has advanced sealing technology that prevents migration of process materials from entering in to the gearbox, eliminating gear-oil contamination and ensuring long term reliability and uptime.
- The enhanced screw-type rotors, with a variable pitch tapered design, ensure uniform compression for improved thermal control, and delivers optimised pumping performance at all pressures.
- With different options catering to medium and harsh-duty applications, the pump has excellent dust, liquid and vapour-handling capabilities.

**3. BENEFIT**

- Although oil-sealed pumps have a low capital cost compared to that of dry vacuum pumps, the oil can easily get contaminated. This results in frequent oil changes, leading to high maintenance costs and downtime losses.
- GXS dry technology has proven to be reliable and cost-effective with an optimum-yield throughput whilst efficiently managing the harsh process materials of Lithium-ion battery manufacturing.

**GXS DRY SCREW VACUUM PUMPS**

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

- Advanced sealing technology
- Best-in-class thermal control
- High dust and liquid tolerance
- Quiet operation with reliable performance



Edwards, with its global footprint across the world, works together with end users, channel partners, OEMs and vendors across continents offering technical expertise and guidance with proven solutions for Lithium-ion battery production processes.