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## Technology Trends in Vacuum Pumping

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Vacuum pumping remains central to the performance and economy of many manufacturing processes, scientific instruments and scientific research. More vacuum is being used in many of the latest or leading edge manufacturing processes: Current examples include 3D semiconductor devices, EUV lithography, 450 mm silicon wafers, AMOLED displays, LEDs, Lithium-ion batteries and steel degassing. In other applications, vacuum pumping technology developments have led to much lower product costs which for example have enabled mass spectrometers to become a ubiquitous tool in life science research.

Vacuum pumps have continuously evolved during the past 100 years of vacuum-based industrial processing but remain a key component which is often on the critical path of process and product improvements. This is especially so in the growing number of applications where the pumps are highly stressed.

This presentation outlines significant developments in vacuum that have brought about this progress. The likely course of continued improvements is discussed in terms of increased performance and reliability, robust by-product handling, better cost efficiency and reduced environmental impact especially power consumption.

**Keyword:** Vacuum pump