

Nonmagnetic UHV Chambers

Atlas Technologies builds aluminum ultrahigh-vacuum chambers and pro-



vides customers with standard aluminum vacuum components, including its patented Atlas Flange. Aluminum is essentially nonmagnetic, with a magnetic relative permeability of 1.00002 compared with 500 for iron. Aluminum also has 9 times the thermal conductivity and 21 times the thermal diffusivity of stainless steel. As a result, an aluminum vacuum chamber heats and cools faster, reducing the bakeout time required to remove gases by an order of magnitude. The Atlas Flange uses a robust, all-metal sealing surface with conventional ConFlat copper gaskets to create UHV seals. High-performance aluminum vacuum chambers have applications in several research and production environments, including semiconductors, thin-film deposition, mass spectroscopy, cryogenics, radioisotope generation, and particle physics.

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Turbomolecular Pump

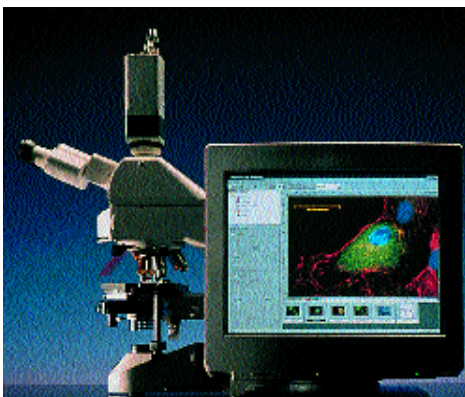
Lesker Co. is the U.S. distributor for Shimadzu's magnetically levitated turbomolecular pumps and twin-screw compressor dry pumps. The pumping speed of Shimadzu's seven turbomolecular models ranges from

190 to 3,200 L/s. The pumps have integral gas purge ports; an internal generator to support the rotor if power fails; high-compression ratios for light gases; and outputs of critical operating parameters, which enable predictive maintenance. Shimadzu's four models of screw pumps have pumping speeds of 30 to 318 cu ft/min. Their screw profile reduces vibration and gives ultimate pressures of 1×10^{-3} to 8×10^{-3} torr. The pumps are useful in both research and production, with applications in such industries as semiconductors, crystal plating, bulb manufacturing, glass coating, and special-metals production. Lesker stocks Shimadzu pumps in the United States to ensure rapid delivery.

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Digital Microscopy

Carl Zeiss announces the release of AxioVision Version 2.0, the latest in its line of modular image-acquisition and archiving systems for digital microscopes. The software can control all Zeiss motorized microscopes, and it offers advanced capabilities for digital-image acquisition and processing, digital-image and text archiving, and the compilation of reports. AxioVision comes in two operating modes. The user mode is intended for routine applications, and the expert



mode provides high flexibility for research applications. The software package permits the convenient interactive measuring of object distances, angles, and areas in the image; the acquisition of optical sections; and the automatic recording of multichannel fluorescence images. AxioVision's automatic focus control enables the recording of a specimen in different focal planes.

Carl Zeiss, Inc.
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Scanning Probes

ThermoMicroscopes has introduced AutoProbe CP Research, the latest in its family of research-grade scanning probe microscopes. The new instrument adds advanced capabilities of scanning capacitance, force modulation, and phase imaging to the line's conventional imaging modes—contact, intermittent-contact, and noncontact atomic force, magnetic force, lateral force, and scanning tunneling microscopy. AutoProbe is intended for research and analytical laboratories that routinely study a wide range of materials. It offers a new ergonomic laser-alignment system, an increased range in photodetector positioning, enhanced electrical and mechanical performance of the cartridge, and a doubling of the signal-processing bandwidth, which yields fast, high-quality images in all modes. ThermoMicroscopes says that AutoProbe "integrates more imaging modes in a single instrument than any other commercially available system."

ThermoMicroscopes
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Gas-Analysis System

Hidden's new HPR-20TP series of gas-analysis systems enable the precise measurement of desorbed and reacted gases and vapors in a variety of processing techniques. These compact, bench-top systems monitor



within a pressure range of 1 atm to 10 mbar. They simultaneously measure on-line intensity, temperature, and time responses of up to 100 individual chemical species. Temperature input is either directly by thermocouple/platinum-resistance-thermometer connection or by analog temperature reference. An optional on-board temperature programming module enables fully integrated process control and data analysis. The multistage mass-spectrometer analyzer, together with the all-metal sealed vacuum construction, ensures long-term performance

and precise, reproducible measurements in parts per billion.

Hidden Analytical Ltd.
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Ultrahigh-Vacuum Valve

The Vacuum Products Group of MKS Instruments has released its new HPS UHV valves, which include a metal bonnet seal and welded bellows. Intended for use in ultraclean thin-film deposition systems, the valves have applications in the semiconductor and thin-film-coating markets. They are available in angle and offset in-line configurations for sizes NW 25 and NW 40, and they can be ordered with manual or pneumatic actuation. Buyers can tailor valves to their needs, with options available in solenoids, limit switches, flanges, and finishes.



The metal bonnet seal limits outgassing and permeation, which allows the valve to maintain a vacuum of 10^{-10} torr. The welded bellows within the valve provide a longer stroke-and-cycle life.

Vacuum Products Group/
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Low-Profile Water Pump

CTI-Cryogenics, a division of Helix Technology Corp., has introduced its On-Board LowProfile Waterpump, a new line designed to add significant water-vapor pumping speed to turbopumped systems.

Increasing water-vapor pumping speed has a direct effect on pump-down times and the ability to achieve ultimate base pressures. CTI-Cryogenics' new pumps increase water vapor pumping by nearly 500% while maintaining pumping speed for nitrogen, oxygen, and hydrogen. The compact pumps use a closed-loop cryogenic system, which relies on helium gas as the refrigerant. CTI-Cryogenics backs its new LowProfile series with a customer support program that provides worldwide immediate technical support 24 hours a day, 365 days a year.

CTI-Cryogenics/Helix Technology Corp.
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Degassing System

MV Products, a division of Mass-Vac, offers its fully integrated portable degassing system, which it builds to customer specifications. It consists of a 15-gal chamber with custom porting; a 1.5-in.-thick Lucite top; vacuum pumps with capacities from 15 to 50 cu ft/min and pressure ranges from 15 to 29.9 in. Hg; inlet and exhaust taps; electrical or rotary motion feed-thrust, gauges, and controls; and plumbing. Typical applications include the degassing of epoxies, adhesives, urethane, and resins; and potting, impregnation, and plastination.

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Multigas Analyzers

On-Line Technologies' new Induct analyzer series provides quantitative, simultaneous, rapid, in-situ determinations of more than 20 gas concentrations within the feed or exhaust line of a processing tool. The devices offer a response time of less than 1 s and lifetime calibration. The instruments can provide data on process behavior, etch end points, plasma behavior, contamination levels, first-wafer effects, and chamber-wall effects. Their stability, wide pressure range, resistance to corrosive gases, and quantitative accuracy make the analyzers ideal for monitoring process chemistries in a production environment. Induct uses On-Line Technologies' Model 2102 Fourier transform infrared spectrometer, which is designed specifically for process and environmental monitoring in hostile environments.

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This section is based on information supplied by the manufacturers and in some cases by independent sources. *The Industrial Physicist* can assume no responsibility for its accuracy. To facilitate inquiries, a Reader Service Card is attached between pages 40 and 41.