

Shed simulator

The SHED Simulator from **Analytical Process Systems, Inc.** is a computer-controlled device that uses a mass flow



controller to inject a known quantity of sample gas into a SHED. The timed injections may be performed as a single shot or as multiple shots on an hourly basis for a 24-, 48-, or 72-hour diurnal test. The injections may vary in length from hour to hour and may also vary in rate with each injection. The actual injection will be within 0.5% of the intended injection on a mass flow basis. The system is housed in a suitcase type enclosure for portability. Features include a 6.4-in TFT LCD display, resistive touchscreen, two serial ports, ECA embedded CPU card, DX4-100MHz CPU with 32 MB RAM, Windows 98 operating system, 4-GB hard drive, Ethernet port, and parallel printer port.

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Multi-technology simulation

Ansoft Corp.'s SIMPLORER 6.0 simulation software for the digital prototyping of multi-technology systems is used by engineers at GM to



design power electronics and drive systems for electric and hybrid-electric vehicles. The software is built on a powerful co-simulation technology, which enables engineers to model systems comprised of analog, digital, mixed-signal electronics, mechanics,

hydraulics, controls, and other technologies accurately without having to choose between proprietary modeling languages. The package allows all of these technologies to operate simultaneously, delivering expanded power and flexibility for virtually simulating complex systems. VHDL-AMS is the IEEE standard modeling language for analog mixed-signal design. Other features include a hydraulics library with models for powertrain and other hydraulic applications, and an automotive library with models for extensive electrical system analysis including battery and fuel-cell models.

For more information, circle 43

Exhaust measurement

AVL North America's DVE-150 direct vehicle exhaust measurement device completes an AVL-developed system for the collection and analysis of exhaust



emissions, particularly in ultra-low- and super ultra-low-emitting vehicles. Along with the AVL BMD-150 Bag Mini Diluter and the GEM-150 control software, the unit provides an accurate analysis of the mass flow rate of exhaust emissions. This compact device can be seamlessly integrated into the BMD system, in a footprint 70-80% smaller than a traditional CVS (constant volume sampler) system. The U.S. EPA and the CARB have recommended the use of BMD sampling systems for future low-emissions measurements.

For more information, circle 44

Sound/vibration analyzer

Brüel & Kjær's Pulse Lite is a low-cost, entry-level sound and vibration analyzer that comes in three different models: two-channel basic FFT analysis, four-channel basic FFT analysis, and two-channel CPB analysis. The Basic FFT

Analysis packages can perform FFT analysis (up to 6400 lines), impact testing, correlation analysis, and waterfall capability for transient analysis. The Basic CPB Analysis package measures true, real-time 1/1 or 1/3 octave bands (to all ANSI, IEC, and DIN standards), calculates overall Zwicker Loudness, and also includes a waterfall capability. Both FFT and CPB packages include the Spectra View capability, which allows the user to measure the overall level vs. time and in real-time show the spectrum (either FFT or CPB) at any instance in time. Users can upgrade easily from Pulse Lite to Pulse Pro.

For more information, circle 45

Silicon nitride

According to Ceradyne, silicon nitride has a unique set of tribological and physical properties—low mass combined with high strength and contact



fatigue resistance—that make it a candidate for solving galling and wear problems in the valvetrain and fuel-delivery systems of light- and heavy-duty diesel engines. Ceradyne is in high-volume production of silicon-nitride cam rollers for heavy-duty diesel engines for intake and exhaust valves and unit fuel injectors. Also in high-volume production are rollers or sliding contact parts that are subjected to high stress and low lubrication in common-rail fuel pumps for light- and heavy-duty diesel engines.

For more information, circle 46

Climate chamber

The Micro Climate test chamber from **Cincinnati Sub-Zero** is a stackable 1.2-ft³ (34-L) benchtop chamber used for testing small components and products. Each chamber simulates a range of temperature conditions from -73 to +190°C (-99 to +374°F). Standard features consist of a programmable controller, RS-232 computer interface, and a 2-in (51-mm) access port. Benefits include a small footprint for floor space savings, easy installation with no special electrical connections required, and ability to run on a standard 115-V and 15-A circuit.

For more information, circle 47



Telemetry solutions

Datatel specializes in the application of telemetry to rotating components. Modern electronic methods make it cost effective to use telemetry in locations that previously would have been considered both prohibitively expensive and too restricted for access. These include torque, temperature, and vibration measurement in air-conditioning compressors, torque in cooling fans and clutch flexplates, and tooth stress in gearwheels. The firm adopts a turnkey approach to all



projects, and it has the capability to design and manufacture everything needed, both electronic and mechanical, to provide a complete telemetry solution to meet test requirements.

For more information, circle 48

Analyzer tool

Dearborn Group Inc.'s Hercules is a high-performance analyzer tool that supports CAN and LIN protocols, in addition to supporting single-wire CAN (J2411) and CAN (ISO 11898). The latest version of the software application tool features graphical display of signals, ISO 15765 full support, decoding of CAN ID (user specified), CAN remote frame support, and improved database structure. Using this 32-bit Windows-based application in conjunction with the firm's Gryphon hardware interface, users can monitor, receive, filter, transmit, and edit CAN frames over a variety of communication links.

For more information, circle 49



Analog/digital pressure transducer

GE Druck's PDCR 3500 high-accuracy analog and digital output pressure transducer provides digitally enhanced, high-accuracy output coupled with high analog bandwidth. The transducer is a 1-in (25-mm) diameter fluid-isolated analog output device similar to the PMP 4000 Series. It achieves a total accuracy performance of better than $\pm 0.1\%$ full scale over -65 to +250°F (-54 to +121°C) with the support of internal digital electronics, which correct for the repeatable errors without affecting the analog bandwidth. Due to internal microprocessor electronics, the unit can also give a digital pressure output in engineering units via RS-485. The RS-485 is also used for re-calibration and housekeeping activities such as serial number retrieval and diagnostics.

For more information, circle 50



Weld stud mount

HellermannTyton's weld stud mount is a fastener that enhances productivity by helping to streamline production. The mount, when used with a cable tie, secures wire harnesses and hoses to a frame. Eliminating the need for different sizes of p-clamps, the weld stud mount also eliminates the need for additional nuts, bolts, and washers as well as the process of drilling holes through metal frames. Manufactured from heat-stabilized, impact-modified nylon 6/6, the mount will not rust or abrade hoses and harnesses. It is applied with innovative welding equipment that welds through paint, saving labor time as paint does not have to be removed from the welding spot before installation.

For more information, circle 51




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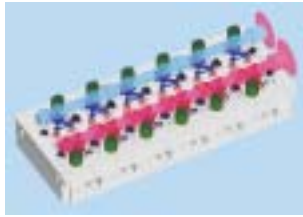
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Circle 329

Variable valve actuation

Version 2.2 variable valve actuation from **Jacobs Vehicle Systems** is an integrated design using parts contained in the cylinder head instead of a separate housing. By electrohydraulically using lost motion to modify valve lift, timing, and rate of opening and/or closing, engines will realize many benefits including increased fuel economy, lower emissions, and higher performance. Just as fuel injection systems have evolved from mechanical to electronic controls, engine valvetrains will follow this trend over the next five to 10 years, and the company is ready to provide innovative solutions.

For more information, circle 52



Refrigerant circuit

The Mobile R744 (CO₂) refrigerant circuit from **Imtech Deutschland's** Environmental Simulation/Test Bed Engineering Division is equipped with safety measures for high-pressure systems. The compact system is built as a mobile, low-noise unit for comfortable operation in laboratory environments. A separate stand-alone brine supply module supplies the gas cooler. The following control loops are integrated: R744 (CO₂) compressor speed control, gas cooler outlet temperature, suction temperature, suction pressure, and expansion valve intake pressure.

For more information, circle 53



Low-temperature cleaning

The low-temperature Recover cleaning process from **Kolene Corp.** operates in the 250 to 300°F (120 to 150°C) temperature range for enhanced cleaning and removal on a broad range of soils and coatings. Processes are formulated to remove cured paints, powders, e-coats, baked-on oils and greases, and coked carbon deposits. Metals that can be safely processed include aluminum, brass, zinc, iron, and steel (galvanized and aluminized). When processed within the operating temperatures, the immersion times range from 30 to 90 min. Highly polished surfaces are virtually unaffected, requiring little or no finessing or repolishing.

For more information, circle 54

Shaker system

The LDS V9-105 shaker system from **Ling Dynamic Systems Ltd.** is designed to test heavy loads at high stress levels over long continuous periods. For maximum reliability, engineers have developed a design that combines proven coil technology with advanced carbon-fiber armature construction and a new concept in shaker structure. The shaker has a maximum sine force rating of 105 kN (23,600 lb). Velocity is 3.2 m/s (10.5 ft/s), and displacement capabilities for shock testing can reach 3 in (75 mm pk-pk). The use of composite materials in the armature and the field coil design means that the shaker can be

more compact for a given force rating. In place of the usual shaker design—one flux gap with two field coils running in opposition—the V9 has two magnetic gaps driven by one field coil. Two additional coils near the air gap concentrate the magnetic field within the shaker, ensuring a low stray field. The two-coil design eliminates rotational force, so the shaker does not try to rotate.

For more information, circle 55



Calibration board

Messring's Type NA33-86-00 calibration board provides static and dynamic calibration of any data-acquisition system. The calibration procedure is freely programmable and fully automatic. It runs with CrashSoft 3 under Windows NT. Eight analog channels as well as 16 digital channels can be calibrated simultaneously. The system generates arbitrary signal waveforms including sine, triangle, and pulse with 0 to 10 kHz and 0 to ±5 V or 0 to ±0.05 V at 16-bit resolution. It is a plug-in board for the NA33 data-acquisition system.

For more information, circle 56



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GEOMET from **Metal Coatings International** is a chromium-free corrosion protective coating that contains no hexavalent



or trivalent chromium, nor any other heavy metals that are considered hazardous to health. The coating is VOC-compliant, which means no harmful solvents are used that could escape into the air. It can be applied by dip spin, spray, or dip drain methods and is used on parts ranging from fasteners to disc brake rotors. It provides good corrosion prevention, consistent lubricity, solvent resistance, and bimetallic compatibility; in addition, the process is hydrogen-embrittlement-free.

For more information, circle 57

Illumination design

LightTools 4.0 3-D illumination design software from **Optical Research Associates** contains a new user interface



designed to make both novices and advanced users more productive and efficient. The Windows-based interface includes functionality such as navigation windows that allow users to locate and edit information quickly, right-click menus that display context-sensitive menu choices, and context-sensitive help for toolbars, dialog boxes, and command buttons. Additionally, all dialog boxes are redesigned to make them easier to read and use. Options are reorganized to help simplify and organize steps for accomplishing complex design tasks. Other improvements to simplify design tasks include direct spreadsheet-style access to analysis results, source apodization, and spline data. Technical improvements include faster converging illumination simulations

using a new ray generation scheme and a new module for CATIA data exchange.

For more information, circle 58

Engine design and optimization

Automated Design with Virtual Engines from **Optimum Power Technology** takes the established engine simulation technology of Virtual Engines and combines it with advanced optimization methods and parallel processing to create an expert system for engine design. The process begins as a base engine model is created. Then, an engineer selects which parts of the engine can be changed in the search for improved performance. Running simulations in parallel, Automated Design creates new engines and compares the solutions. It uses built-in intelligence to assess which direction to move within the design space to create a better engine. Many engines can be evaluated automatically using the system.

For more information, circle 59

Condenser microphones

Series 130 microphones are prepolarized, array, and precision condenser microphones from the Vibration Div. of **PCB Piezotronics**. Prepolarized pressure and free-field units are available in both 0.25 in (6 mm) and 0.5 in (13 mm) sizes. Prepolarized random incidence models



are available in a 0.5 in (13 mm) size. The firm's prepolarized microphones operate from ICP sensor power and are designed for applications including sound power testing, engine noise, outdoor noise monitoring, and acoustic chamber testing. Series 130 array microphones will function with any ICP sensor power supply for large-channel-count sound pressure measurements. A system can be assembled using the 130 Series microphones with a multi-channel, simultaneous sound pressure data-acquisition system consisting of 16 or more channels. The external free-field microphones have low sensitivity to severe humidity and temperature conditions.

For more information, circle 60

Near-net-shape components

Piper Impact's design and marketing capabilities enable it to provide strong, lightweight, near-net-shape critical components. The product offering

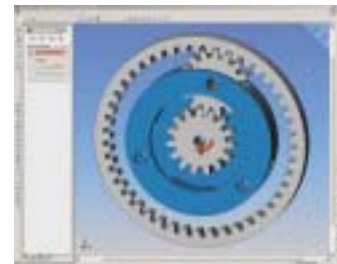


includes airbag canisters, shock housings, driveline yokes, filter housings, steering yokes, A/C canisters and caps, ordnance cartridge cases and flare cases, and high-pressure cylinders for various markets and industries. Custom solutions are available in addition to the standard product offering.

For more information, circle 61

3-D CAD software

SolidWorks 2003 is the latest version of **SolidWorks Corp.'s** 3-D CAD software that streamlines product design. It features hundreds of new enhancements that will help users analyze their design's



structural integrity, easily communicate design information to others, locate downloadable parts via online supplier catalogs, and accelerate the design process with new modeling features. Users have the flexibility to import and work with various file formats including AutoCAD and CADKEY. This capability helps users embrace 3-D and integrate third-party designs into their CAD files, so they can finish designs quickly. The software lets users simulate realistic motion so they can easily check how gears in an assembly, for example, will function in actual operation and address any design flaws prior to manufacturing.

For more information, circle 62

Tactile pressure measurement

The I-Scan system from **Tekscan** uses thin-film array sensors for pressure distribution measurement. The system includes



software, a data-acquisition handle that performs analog to digital conversion, and an interface that brings the data into the computer. The array sensors are available in various sizes and shapes for different applications, and have pressure ranges from 5 psi (34 kPa) to 30,000 psi (207 MPa). Applications include wiper blades, brakes, tire beads, tire footprints, gaskets, fuel cells, seating, crash studies, catalytic converters, and door seals. I-Scan System for Brakes uses sensors that are inserted between the friction pad and brake rotor or clutch plate to indicate the evolution of pressure distribution between these mating surfaces as they come together. I-Scan System for Fuel Cells allows users to ensure good contact between adjacent thin fuel-cell plates.

For more information, circle 63

Shaker vibration control

The 8500 shaker vibration control system from **Vibration Research Corp.** has an Ethernet interface, which eliminates the need for installation of boards on the PC. Another advantage of this feature is that it is not necessary to locate the computer close to



the 8500 signal processing unit. This eliminates many 50/60-Hz noise problems and removes long accelerometer cable runs between the control room and the shaker amplifier. The system has 24-bit A/D and D/A,

which allows separation of input signals 120 dB apart. It also eliminates the need for pre-scale circuits on the inputs and outputs and allows 90+ dB of dynamic range on the China dynamic range random closed-loop test. The device also features the TEDS IEEE standard, and it controls sine and random tests to 20,000 Hz. Random control of 13,000 lines provides fine frequency control.

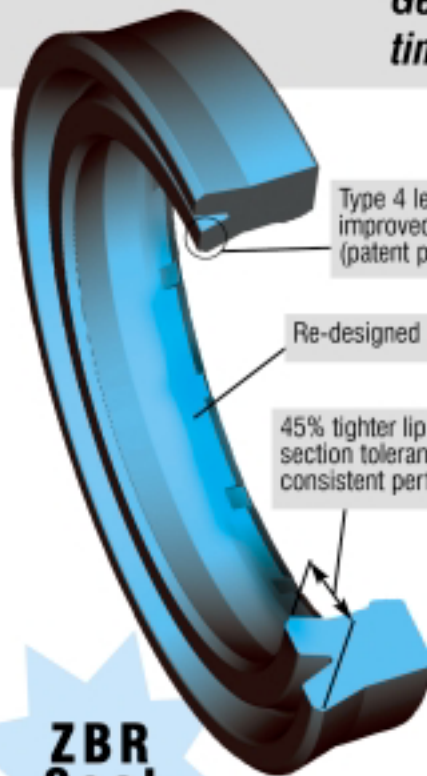
For more information, circle 64

High-speed imaging

The Phantom v7.0 from **Vision Research, Inc.** is built upon the firm's proven SR-CMOS high-speed sensor technology. It offers a full frame resolution of 800 x 600 pixels with image quality that is comparable with pin-registered 16- and 35-mm film cameras. High recording speeds make it the first true digital replacement option for 16-mm rotating prism film

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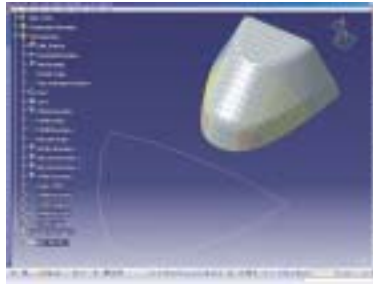


cameras. Recording rate is 4800 pps at full resolution, and over 10,000 pps when windowed to 512 x 384 pixels. The unit is small and rugged; it is equally suited to onboard vehicle crash tests, fixed camera positions, or troubleshooting manufacturing problems on the production floor. A real-time streaming output option enables transfer of image data to an external storage system for extended recording times. Software provides camera control and playback functions, on-site image analysis, and compatibility with previous camera models.

For more information, circle 65

Composite part development

VISTAGY, Inc.'s FiberSIM 4.0 software, which creates a specialized CAD-integrated environment for designing and manufacturing composite parts, is avail-



able for the CATIA V5 platform. FiberSIM tools automate the design process, assess the producibility of a composite part, and generate manufacturing information including documentation, flat patterns, and data to interface with laser projectors, automated cutters, and fiber placement machines. It allows users to drive all aspects of preliminary design, analysis, detailed design, and manufacturing from within a single CAD master model, providing a complete digital product definition of a composite part. The software incorporates XML tools to share composite data with other applications throughout the enterprise, such as software for procurement, quality assurance, and manufacturing. This latest release has a new user interface with the look and

feel of Microsoft Windows on PCs and Motif on UNIX systems.

For more information, circle 66

Conductive grease

Nye Lubricants, Inc.'s Nyogel 758G electrically conductive grease does not rely on problematic, short-lived metal, carbon, or organic additives. Nyogel



758G gets its conductivity from a synergistic relationship among the grease's additives. The result is a lubricious, long-life, channeling bearing grease with 300 Ω -cm volume resistivity. The formula for Nyogel 758G includes a blend of synthetic ester oils, which have a strong affinity to metals, and lithium soap, known for its good channeling abilities. The grease also contains a proprietary combination of standard lubricant additives that not only fortify the oil and protect it from oxidation, but also work to create an electron pathway through the grease.

For more information, circle 67



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