

TOP products of the year

Editors present the 20 highest-rated products as determined by readers of Aerospace Engineering over the past year.

Lightweight material

Moldite Technologies' Moldite is a lightweight, high-strength, thermal-set resin composite sandwich material. It features a high stiffness-to-weight ratio and offers a high-performance alternative to materials such as ultra-high-strength steel and aluminum. Moldite core materials can be engineered to exceed the tensile strength of flanking long-fiber materials including carbon, glass, or aramid fibers.



For more information, circle 12

Rivetless nut plate

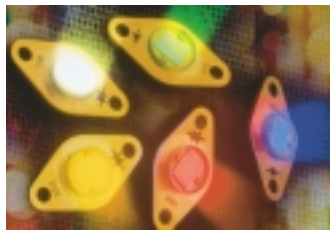
Fatigue Technology Inc. has developed a rivetless nut plate solution that incorporates the beneficial effects of hole cold expansion with the elimination of attaching rivets for nut plates. Hole cold expansion is a mechanical process that introduces residual compressive stress into the material around the hole. The ForceTec nut plate is different from typical designs in that it permanently installs a nut-mounting retainer into the bolt hole. The installation of this part using innovative cold-working technology offers protection from fatigue cracking around the hole and ensures the nut will be allowed to float.



For more information, circle 13

High-intensity lighting

Opto Technology, Inc.'s Shark Series high-flux LED illuminators offer high lumens, high reliability, and a small form factor. The illuminators are targeted for applications requiring a high-intensity light source including aerospace interior/exterior lighting. Standard colors include blue (470 nm), green (530 nm), amber (590 nm), red (630 nm), and white. Typical brightness from the Red Shark is 55 lumens.



For more information, circle 14

Engine component manufacturing

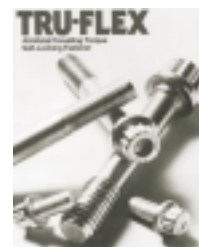
LSP Technologies, Inc. manufactures aircraft gas turbine engine components using a LaserPeen process, which is a surface enhancement treatment for increasing the mechanical and corrosion properties of metal parts through the introduction of deep, compressive, residual stresses. A pulsed laser is used to drive a high-pressure stress wave into the surface of the part, creating deep, residual, compressive stresses that provide substantial property benefits. The compressive stresses are achieved with minimal effect on surface roughness or disturbance to the microstructure. The LaserPeen process increases fatigue, fretting fatigue, and stress and corrosion cracking resistance for many applications.



For more information, circle 15

Self-locking fasteners

SPS Technologies' Tru-Flex all-metal, prevailing-torque, self-locking bolts and screws are described in a brochure. Text and graphics highlight the locking action achieved by the fasteners' unique thread configuration. The fastener can be applied to most headed fasteners where self-locking is required.



For more information, circle 16

Coating for aluminum

General Magnaplate's TUFRAM surface coating enhances the physical properties of aluminum components across manufacturing, processing, and packaging environments. The coatings combine the hardness of aluminum-oxide ceramic with the properties of selected proprietary polymers, providing aluminum parts with new levels of hardness, wear and corrosion resistance, and permanent lubricity.



For more information, circle 17

Self-plugging blind rivet

The Cherry 100° flush head 3/32 in SPR blind rivet from **Textron Aerospace Fasteners** is suitable for securing nut plates located in inaccessible and hard-to-reach areas where bucking or squeezing of solid rivets is not possible. Developed to replace solid and pull-through rivets in nonstructural applications, the unique product design allows a positive lock to be achieved without an additional lock ring component. The shear values for the SPR have been increased to 255 lb, which meets the conventional 3/32 in AD, D, and DD solid-rivet shear values.



For more information, circle 18

Fastener corrosion protection

In cooperation with The **Boeing Co.** and **Hi-Shear Corp.**, **Aerospace Rivet Manufacturers Corp.** has developed corrosion protection for aluminum fasteners. The company applies an organic coating to the aluminum-alloy rivets during the manufacturing process and cures the coating without any detrimental effect to metallurgical properties. This coating eliminates the need for wet-sealant installation by providing equivalent or better corrosion protection along with improved fatigue strength, clean installation, and reduced labor hours and cost. The coating's performance was validated and compared with that of wet-sealant installation through tests, which included salt fog per ASTM B 117 for 2000 h, beach exposure for 2 years and six months, corrosion fatigue, thermal cycle/flexure, and coating adhesion trials. The coated fasteners can be applied anywhere wet or dry aluminum fasteners are installed.

For more information, circle 19

Brushless motors

Size 40 brushless motors from **Transicoil** have integral drive electronics and EMI immunity. The motors provide the advantages of brushless design and high performance for electronics-sensitive locations. Applications include radar, missile control, and aircraft HVAC systems.

For more information, circle 20

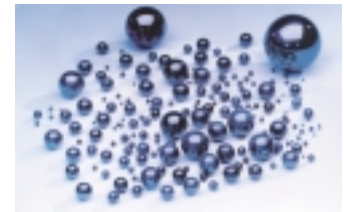


Ceramic balls

Saint-Gobain Advanced Ceramics' CERBEC ceramic balls improve bearing performance in applications including aerospace, machine tool spindles, ballscrews, robotics, instruments, and engine components. The units decrease

wear while enabling bearings to run at high speeds with less maintenance and reduced downtime compared to traditional steel bearings.

For more information, circle 21



Self-lubricated bearing material

Rexnord/PSI Bearings has begun offering the Rexlon 2000 self-lubricated material for high-performance aerospace bearing applications. The material is a polymeric composite offering lower cost and full machinability not available with conventional fabric-backed liners. It can be sprayed or molded to most metallic surfaces to provide a bearing surface with vibration dampening, minimal friction and wear, and an operating temperature range of -65 to +325°F.

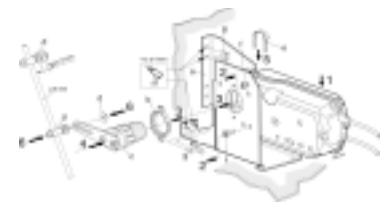
For more information, circle 22



Illustration system

IsoDraw 5 CADprocess from **Itedo Software** can be used to create technical illustrations used in manuals, assembly instructions, and electronic catalogs for the entire manufacturing industry. The software converts 3-D CAD data automatically into illustrations in any desired perspective. Data from all leading CAD systems such as Pro/ENGINEER, CATIA, or Unigraphics can be converted by using standard exchange formats IGES, DWG, or DXF. The Link2Source technology of IsoDraw5 automatically detects and applies changes in the illustration if changes were made to the design data. Prototype design data can be used to create the technical illustration even before the final revision is released.

For more information, circle 23



Automated fastening solution

StressWave has developed an automated fastening technology designed to minimize the cost of improving the fatigue life of holes in metal structures. Fatigue life is improved through "cold working," in which beneficial residual compressive stresses are worked into the material before drilling. A proprietary indentation device, which can be easily integrated into an automated production environment,



is used to create the residual stresses where the holes are desired. StressWave also has a series of end effector designs suitable for integration into most automated fastening and assembly devices. Tests in aluminum and titanium demonstrate a minimum life improvement of three times the life of an untreated hole.

For more information, circle 24

Hydraulic fittings

Shur-Lok Corp. will be showcasing its Sta-Lok line of ring-locked hydraulic fittings, or fluid adapters. Unlike heavier MS fittings that require a lock wire to prevent rotation, Sta-Lok fittings are held in place by a serrated lock ring. The fitting and lock ring are supplied as an assembly to simplify installation. Once the fitting is threaded into the port and torqued to provide proper sealing, the lock ring is driven into the standard pre-broached hole to prevent the fitting from turning. Sta-Lok fittings are designed for applications in fuel or fluid systems of aircraft, helicopters, and engines. The fittings are certified to operate in systems pressurized to 4000, 5000, or 8000 psi and are designed to exceed operating temperatures of -65 to +275°F.

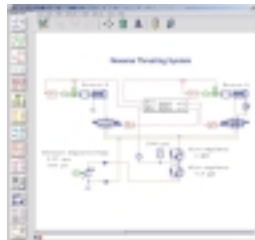
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Fluid systems simulation

AMESim from Imagine Software, Inc. offers a complete 1-D simulation environment that provides adaptive solutions for fluid power, mechanical, thermal, thermo-fluid, and control systems. The solution enables engineers to study the dynamic behavior of any component or circuit with an application-oriented approach. Based on advanced numerical integrators, the AMESim solver automatically selects from 29 algorithms the best calculation method, depending on the dynamics of the system. The software features 14 open libraries that contain state-of-the-art models needed to design and simulate fluid/mechanical systems.

For more information, circle 26



Explosion-suppressant foam

Crest Foam Industries Inc.'s SafeCrest explosion-suppressant foam is highlighted in a new videotape/CD-ROM and technical brochure. A reticulated polyurethane material, SafeCrest is designed to prevent explosion of ignited fuel vapors caused by electrical arcing, overheating of internal components, lightning strikes, static electrical discharge, or arms fire. The product also helps mitigate fuel spray in the event of fuel-tank rupture and baffles fuel to control surging and eliminate sloshing. It is manufactured in block form. The

U.S. Navy has specified a 14-year service life for SafeCrest, with an anticipated service life of 20 years.

For more information, circle 27

Fire-retardant additive

Avtec Industries' TSWB is a highly engineered, non-brominated fire-retardant additive for use in the composite industry. The material's coated composite substrates have passed the ASTM E-162, ASTM E-662, and BSS 7239 protocols. Features include resistance to water, weather, sea spray, and chemical attack. The nonconductive insulating material can extend substrate time to failure by as much as 470% vs. unprotected substrates. It does not chip, flake, peel, or dust and withstands multiple high-intensity impacts.

For more information, circle 28

Miniature pressure transducer

Endevco's Model 8544 is a piezoresistive pressure transducer available in ranges from 15 to 500 psi. The unit features high-temperature performance to 350°F and limited operation to 400°F. This flush-mount sensor is suitable for measuring skin pressure on aircraft, inlet distortion pressures in turbine engines, or transmission pressures in automobiles.



For more information, circle 29

High-temperature lubricants

Krytox XHT from DuPont Performance Lubricants is a blend of low-volatility oils and additives and thickeners that increase adhesion to protect bearing surfaces that are subjected to high heat conditions. The greases are available with useful temperature ranges up to 399°C for continuous use, with temperature spikes at 427°C when used with proper metallurgy and relubrication intervals.

For more information, circle 30

Fiber-optic tool

Based on new fiber-optic technology, ProVision from Chicago Miniature Lamp is helping aviation technicians see into crevices and other spots that the naked eye cannot reach to detect worn parts without major disassembly. Able to fit into holes with diameters as small as 0.5 in, it can spot hydraulic leaks, look into fuel cells, and view long areas of electrical wiring that are generally hard to reach. The inspection tool is made of high-impact ABS and features an 18-in flexible, water-tight sealed shaft. The high-resolution lens provides a clear image of objects as close as 0.75 in from the lens to as far as 1 ft or more. It also provides a wide 40° field of view.

For more information, circle 31

