

SOLUTIONENGINEERING

NEWSLETTER

Fastening Products, Systems, and Applications from the Industry Pioneer



Advantage...
fastener⁺

Our capabilities today extend far beyond our catalogued standard hardware and equipment.

We are adept at working with our customers to arrive at "custom solutions" for the most demanding design or assembly challenge.

*This *fastener*⁺ approach enables us quickly and practically to focus all of our product, application, and automation experience on a specific requirement, whether the need is for unique fasteners or complete assembly systems.*

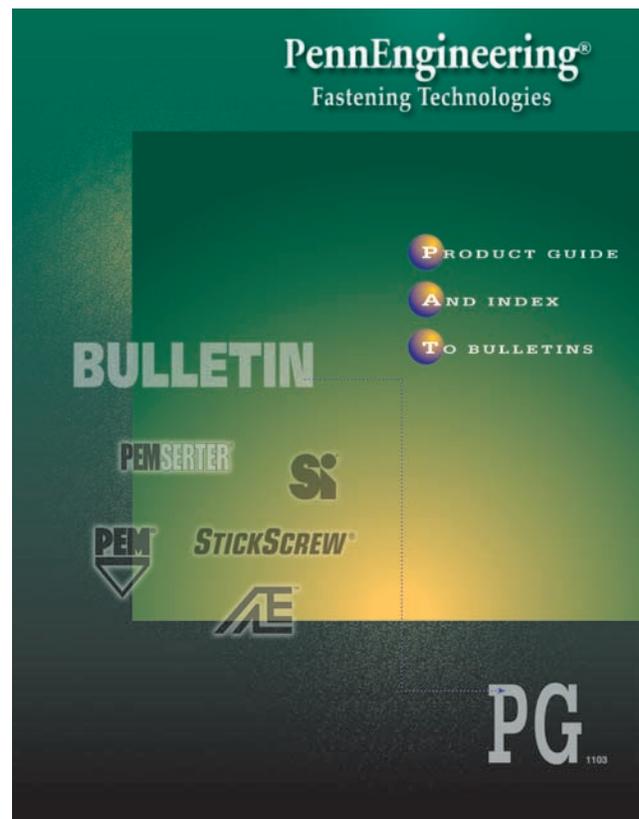
The resulting solutions engineered in concert with particular assembly and production goals can add value to products and to the manufacturing process.

For our customers this approach further provides a competitive advantage as they realize an array of benefits arising from the best possible solution to their challenges.

Kenneth A. Swanstrom,
Chairman and CEO
PennEngineering

www.pennfast.com

LATEST PRODUCT GUIDE



- Handy Reference Source
- Indexes All Bulletins
- Available Free by Downloading from Our Web Site

**'Systems Approach'
to an
Assembly Challenge**
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SPOTLIGHT ON PRODUCTS

Fastener Solutions



Access Hardware

PEM® threaded “access hardware” fasteners are ideal for attaching metal panels or other thin-material components in applications where subsequent access will be necessary.

Our panel fastener selections include:

- Low-profile self-clinching panel fasteners that hug front panels and feature a large knurl for ease of use
- Tool or hand-actuated types in steel or stainless steel to resist corrosion
- Styles that meet UL 1950 “service access area” requirements
- Hardware with a small, compact, and low-profile design for limited-access areas
- Metal/plastic snap-in types that are installed without tools
- Flare-mounted, floating types to compensate for mating hole misalignment
- Types available with anti cross-thread feature to realize benefits from self-aligning threads.



'Blind' Rivet Nuts for Near-Flush Installations

Type AEL™ (low-profile head) and Type AEK™ (minimized-profile head) threaded rivet nuts feature a large diameter and knurled shank, which promote strength. The head profiles provide the capability for near-flush installation.



Both series of **Atlas™ SpinTite® rib-wall threaded rivet nuts** are designed for added strength and allow for near-flush installations in “blind” attachment applications, where only one side of a workpiece is accessible for

fastener installation and final component assembly.

These rib-wall threaded rivet nuts can serve as a practical alternative to tapped holes, weld nuts, rivets, and self-drilling or tapping screws.

They are available in unified threads sizes #6-32 through 3/8-16 and in metric sizes M4 through M10.

Installed from the accessible “front” side of a workpiece, these fasteners can be utilized in panels as thin as .020”/0.51mm. Their use eliminates any need for additional hardware beyond a mating screw to complete final component assembly. They can be installed permanently even after finish, utilizing a hand-held portable tool.



A SYSTEMS APPROACH

Turning an Assembly Challenge 'Inside-Out'

Innovative C3 Technology™ residential gas water heaters have been introduced by A. O. Smith (Ashland City, TN) to meet new ANSI standards and testing protocols.

In the early stages of design, a daunting assembly challenge was how to attach and secure an all-important access door to the water heater's combustion chamber.

The solution came as the result of our "systems approach" to the problem utilizing PEM® self-clinching flush-head studs, PEMSERTER® Series 2000® presses to install the fasteners automatically and safely, and customized press tooling to enable stud installation from the hard-to-reach "inside" of the chamber's 14"-diameter metal ring.



Operator at A. O. Smith installs PEM studs in a combustion-chamber ring by utilizing a PEMSERTER Series 2000 press equipped with 'bottom-feed' stud tooling for the job.



According to Austin Taylor, project engineer at A. O. Smith Water Products, an early plan was to utilize weld nuts on the water heater's round chamber ring. A mating screw then would be inserted through the access door.

But thick insulation on the back of the door made it difficult for installers to locate the nut with the screw to complete the job.

A switch was next made to weld studs. "But we found the studs could not be held consistently perpendicular to the chamber ring," Taylor recalls, "which impeded subsequent mating of stud, door, and nut."

PEM Type HFH self-clinching flush-head studs resolved the problems.

Installed permanently (without welding) into the inside of chamber's metal ring, the high-strength steel fasteners provided the consistent, unwavering, and required perpendicularity. Two PEM studs (thread sizes #10-32) are located in each ring and mated with a nut for secure attachment of the access door.

PEMSERTER®

Their use further keeps the outside surface (and appearance) of the chamber ring undisturbed and with no protrusions.

Should access to the combustion chamber be required for service, Taylor notes that the permanently installed PEM self-clinching studs "preserve the fasteners with the unit."

Expected production rates suggested the need for automatic equipment to install the studs in a "bottom-feed" method. This posed yet another challenge: bottom-feed systems were engineered to install nuts, not studs.

Using a modified version of an injector-tooling package with an anvil for our Series 2000 press instead of a punch and final "tweaking" in the A. O. Smith production environment, our engineers were able to develop safe and effective bottom-feed stud tooling for the job.

The injector holds the stud by the head as the press operator places the combustion chamber in position, compressing the injector and pushing the threaded section and clinch feature of the stud into the

combustion chamber. The operator then activates a footswitch to actuate the press and install the stud.

"The PEMSERTER press with the customized tooling is the only press system we found capable of handling this type of fastener installation – inside-out with a ring," says Taylor, who confirms A. O. Smith conducted an exhaustive competitive bidding and evaluation process before final decision-making.

APPLICATION PROFILE

Reliable Small-Screw Insertion



A fluid-control device for the medical industry serves as a clear example of benefits realized from our StickScrew® System.

In this assembly (shown above), at least three locations are secured with our small screws. Our simple, low-cost system consists of "sticks" of up to 110 serially connected hex-head screws for use with a StickShooter® driver to achieve quick and easy installation.

This particular application drives home how the StickScrew System promotes:

- **Torque engineered reliability**
(seating torque is built into the screw stick)
- **Security and integrity of the fastened assembly**
(screw cannot be removed with standard tools)
- **Ability to access hard-to-reach locations**
(slotless screw installed into recess of boss)
- **Faster and safer screw insertion**
(eliminating manual driving of screws and related repetitive-motion stress injuries)

PennEngineering® Fastening Technologies, a PennEngineering company, develops and manufactures PEM® self-clinching and broaching fasteners, SI® inserts for plastics, and Atlas™ SpinTite®, MaxTite®, and Plus+Tite™ blind threaded inserts.

Fastener installation equipment includes PEMSERTER® automatic and manual precision presses, In-Die and robotics capabilities, and the StickScrew® System for small-screw insertion.

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