

# Structural Fasteners & Anchors Roundup

compiled by the Editors at *Fastener Technology International*

**Suppliers have responded to our call for the state-of-the-art in structural fasteners and anchors technology.**

## The Fundamental Flaw of the Structural Fastener (and how to solve it)

Dr. Douglas E. Hersh, Founder, **Sentient Design, Inc.**, and Inventor of the Goldilocks Ratchet Fastener, says, "One of the essential qualities of structural fasteners is permanence. Once fastened, it is mission critical that these fasteners hold together. Yet despite this, many structural fasteners vibrate loose, leading to catastrophic accidents and costly liability. Investigations by the **National Transportation Safety Board (NTSB)** evidence this. Analyses of disastrous failures of bridges, tunnels, automobiles, trucks, buses, railroads, commercial aircraft and other structures often point to fastener failure as a key contributing factor.

**THE FASTENER REINVENTED**



"Why do structural fasteners fail? Often the reason is vibration-induced frictional slippage. Little by little this slippage causes nuts to unwind, loosen and even fall off their bolts entirely. Think of how many times you have seen this happen. A bolt here, a nut there, loose parts everywhere. From kids' toys to passenger airlines, things fall apart and this is never a happy accident.

"While entire industries have arisen around the reality that helical fasteners screw loose, the underlying issue has remained unchanged: nuts that are torqued onto bolts are prone to coming undone. For many applications in which structural fasteners are used, this is simply unacceptable.

"So what is the essential flaw engineered into helically threaded fasteners? Simply put, it's the helical thread. No thread locking adhesives or tapes, lock washers, nylon inserts, clips or retainers, cotter pins, tension or jam nuts are going to change this. In the presence of gravity, what goes up must come down. And when kinetic friction overcomes static friction, nuts that are screwed onto helically



threaded bolts will almost certainly loosen. It's a basic fact of physics.

"The only way to overcome this flaw is to redesign the nut and bolt fastener so that they no longer rely on helical threads. But wouldn't this represent a radically new system? The answer is yes, and the name is Goldilocks™. A product of iterative design and testing, the patented Goldilocks fastener replaces the traditional helical thread with a series of seemingly microscopic ratchets. Yet these are no ordinary ratchets.

"Ratchets generally work through the friction generated by the asymmetrical geometry of a toothed rack (or wheel) and a pawl. A pawl is a lever or spring-loaded catch that engages the teeth of the rack or wheel and prevents reverse motion. The angled teeth allow the pawl to slide over them, enabling forward motion. But when force is applied in the reverse direction, the pawl locks against the vertical side of the teeth, preventing slippage. You are probably aware of ratchets in hand tools, winches, jacks, clocks, watches, bicycles and even zip ties. But in nut and bolt fasteners?

"The patented Goldilocks fastener works in a unique way. The design has managed to eliminate the pawl – a source of complexity and failure – and made it possible for teeth in the nut and bolt to slide past each other in one direction only. This means that the nut can be pushed onto the bolt but will not slip back off it. It is an innovative solution that can be used in building and construction, automotive, aerospace, heavy machinery and equipment, energy, robotics, electronics and more. The Goldilocks™ fastener is easy to assemble, cost effective, tamper-proof and secure. It is removable, but only when you want it to be. See it at [www.goldilocksfastener.com](http://www.goldilocksfastener.com) or contact [info@goldilocksfastener.com](mailto:info@goldilocksfastener.com) for a demo today."

[www.goldilocksfastener.com](http://www.goldilocksfastener.com)

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