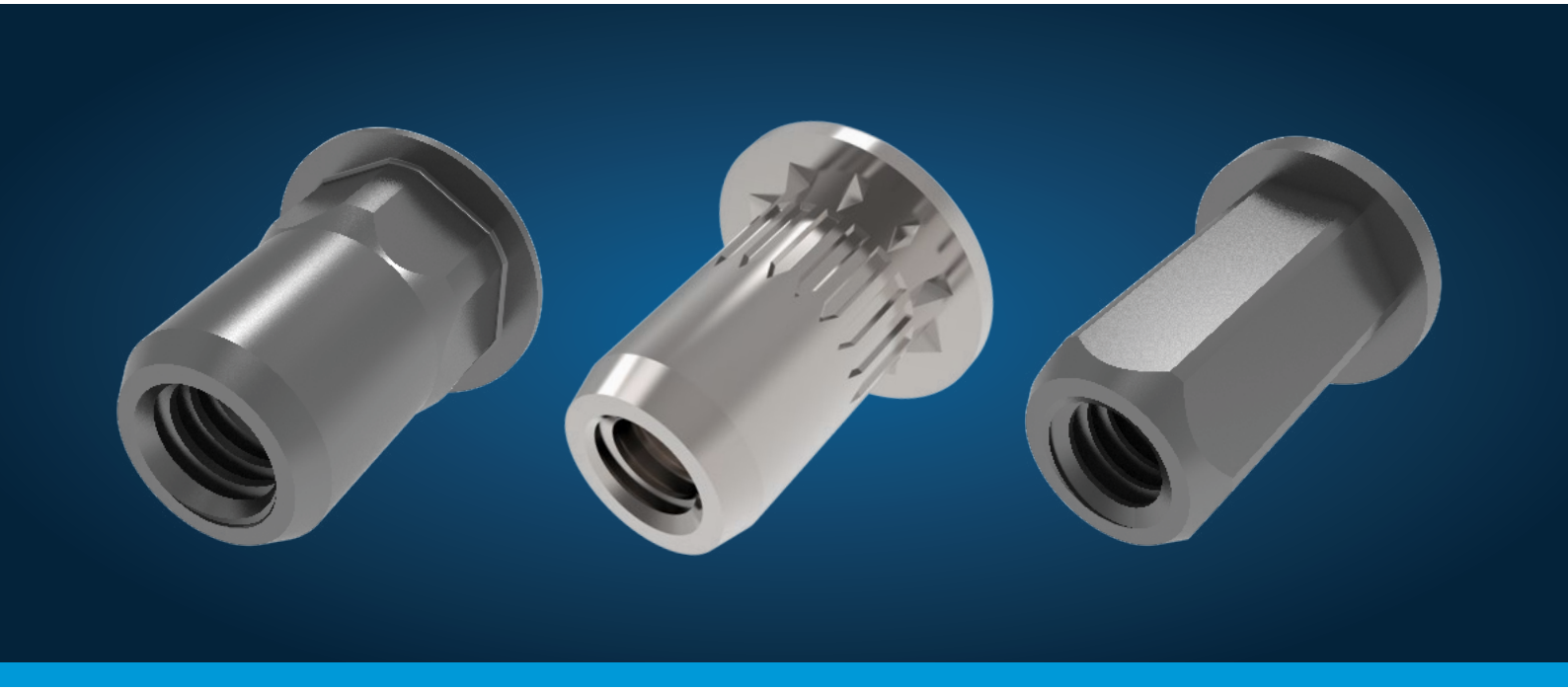
SHEREX® BY PEM®

Rivet Nut Handbook



Fastening Systems Engineered for Performance™

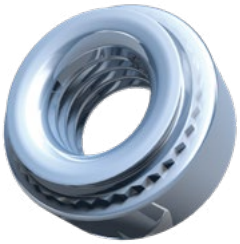






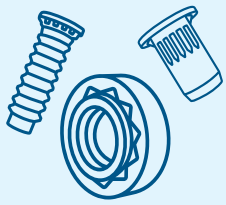
A connected fastening portfolio.

Sherex® by PEM® brings blind rivet nut technology into a broader fastening portfolio, giving access to fastening solutions across multiple applications and materials.



One partner. More possibilities.

PEM® has built its reputation on best-in-class self-clinching technology. Now, with the addition of a blind rivet nut range, the two technologies are designed to work seamlessly together - offering a single, consistent fastening solution from design through to production.



Simplify specification across multiple fastener types

Reduce supplier complexity

Maintain consistency across production. Single source fastener through installation.

Ensure compatibility across components

Blind Rivet Nuts
Sherex Proprietary Rivet Nuts
Standard Rivet Nuts
Rivet Nut Tooling and Automation

MADE IN EUROPE

Contents

A Fastening Solution Born in Aviation

In the 1930s, the rivet nut was developed to solve a specific aerospace challenge – create a strong threaded connection where access to the back side of a panel wasn't possible. That single-sided installation capability proved transformative. In the decades that followed, engineers in the automotive, heavy truck, construction, appliance, and industrial markets adopted blind threaded fastening as a faster and cleaner alternative to welding and traditional hardware. **Today, rivet nuts are specified across almost every manufacturing industry.**

Sherex®: A Global Leader in Rivet Nut Technology

Sherex Fastening Solutions spun off from Sherex Industries in 2004, focusing on rivet nuts and custom fastening solutions. Sherex® by PEM® brings world-class rivet nut technology to European manufacturing, with production rooted in Galway, Ireland. Sherex's commitment to high-quality fastening solutions at the lowest installed cost has driven rapid global growth, supported by manufacturing in the U.S., Taiwan, and Galway, along with sales, engineering, and warehousing facilities in Mexico, the United Kingdom, and Poland.

In 2024, an acquisition by PennEngineering® further expanded Sherex's manufacturing capabilities. Today, Sherex is one of the world's most comprehensive rivet nut manufacturers, with European production based in Galway, Ireland. The Galway facility supports European customers with shorter lead times, local engineering support, and dependable supply chain reliability.

How, Why, and Where to Use Rivet Nuts

A blind rivet nut is a one-piece, internally threaded fastener – called "blind" because it installs entirely from one side of the work piece.

Once installed, the rivet nut creates a strong, permanent, load-bearing thread in materials that are too thin to tap, or where conventional nut-and-bolt hardware isn't practical.

Installation is simple – the rivet nut is threaded onto an installation tool, then placed in a pre-drilled or punched hole where the installation tool draws the body into a bulge or swage against the blind side of the material, attaching it firmly in place. The result is a clean, mechanically-attached thread ready to accept a screw or bolt.

Why Rivet Nuts?

Here's how rivet nuts outperform common alternatives:

Unlike tapped threads, they hold reliably in materials too thin to support them. Unlike loose hardware, they become a permanent part of the assembly – eliminating dropped nuts and simplifying final assembly. And unlike weld nuts, they install without heat, spatter, toxic fumes, or distortion of the base material. They can even be installed after painting or finishing without damaging the surface.

Rivet Nuts vs. Weld Nuts

The efficiency advantage over weld nuts is significant.

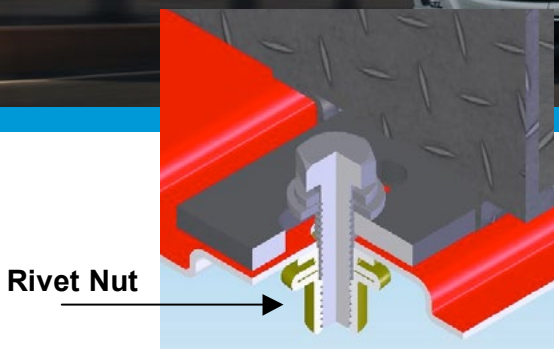
A typical weld nut installation – including positioning, tack-up, welding, and spatter removal – takes approximately 17 seconds per fastener. A rivet nut installs in roughly 4 seconds. Across high-volume production runs, that difference adds up quickly in labor savings and throughput. **Read about Total Installed Cost on p. 15.**

Where They're Used

Rivet nuts are specified across a wide range of industries wherever reliable blind fastening is needed:

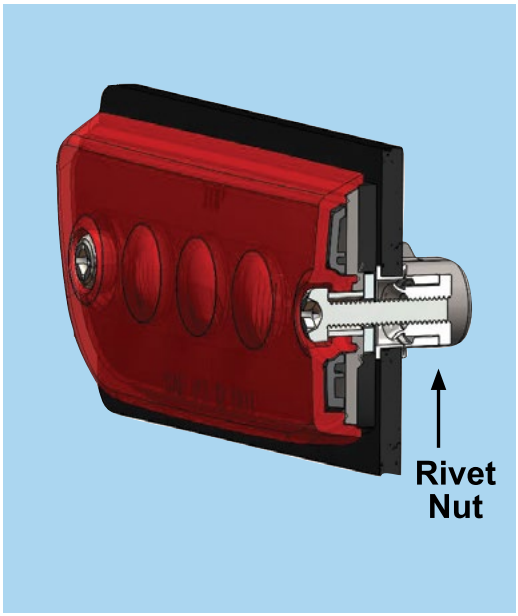
- Automotive
- Agricultural & Construction Equipment
- Railways
- Aerospace & Defense
- Electronics
- Heavy Truck
- General Industrial
- HVAC
- Medical
- Solar, Wind, Energy Storage
- DataCom - TeleCom / Data Centers

Examples of Rivet Nut Applications

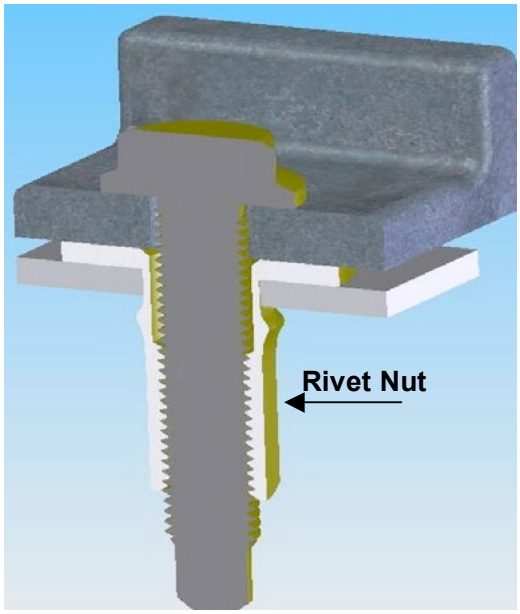


After Market Vehicle
Retrofit – Tool Box

Vehicle Accessory –
Pickup Side Rail



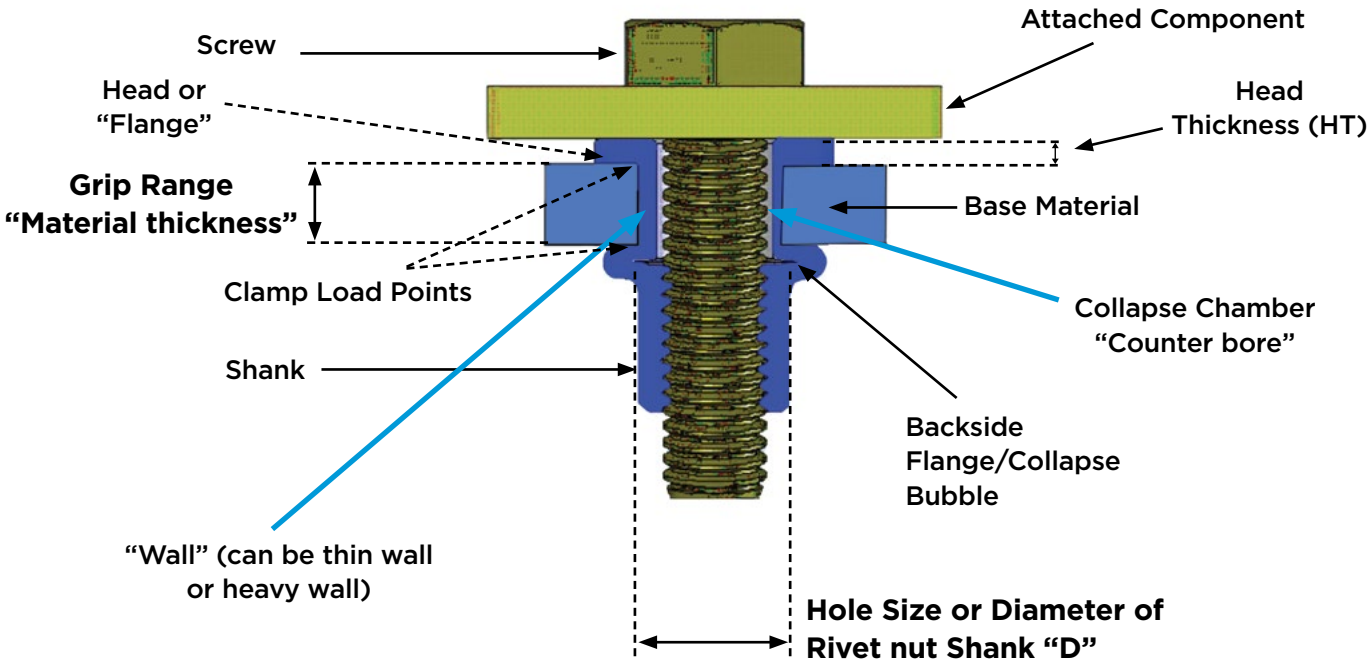
Automotive – Light
Assembly Rivet Nut



Agriculture Equipment –
High Strength Rivet Nut

Anatomy of a Rivet Nut

Cross Section of an installed rivet nut with additional industry terms



Key Advantages

- Fast, easy one-sided installation
- Strong, permanent threads in thin panels
- Ideal when easy disassembly and reassembly of products is required
- Can be installed in different material types – steel, plastic, fiberglass
- Once installed, additional components with threaded fasteners can be attached
- Pre-painted material will not be damaged during rivet nut installation
- Ideal for close-to-edge applications
- Can replace weld nuts, cage nuts, tapped holes, self-tapping screws, and traditional bolted applications

Download 3D models of Sherex® by PEM® rivet nut products at
https://www.pemnet.com/eu/products/rivet-nuts/

Choosing the Right Rivet Nut

Choosing the right rivet nut comes down to body style, performance requirements, application configuration, and industry specifications. Working through each in order will help narrow the field and point you to the best product.

By Body Style: Hex vs. Round

Metric Body:

The Metric Body rivet nut features a metric-dimensioned body geometry that is the predominant specification in European manufacturing. Where European design standards or supply chain requirements apply, Metric Body style ensures compatibility with metric punched or drilled hole specifications.

- Designed for metric hole sizes
- Available in both hex and round body configurations

Specify Hex Body when:

- Maximum spin-out resistance is required
- A hex hole can be punched or laser cut in the base material
- Heavy-duty loads or high assembly torques are anticipated
- Structural or high-vibration applications are involved

Specify Round Body when:

- Round holes when hex holes cannot be produced

Half Hex as a middle-ground option:

- Combines a half-hex, half-round body profile
- Suitable for light duty applications; compatible with all Sherex® installation tools

All Sherex® by PEM® rivet nuts manufactured in Galway are available in metric body configurations as standard.

Choosing the Right Rivet Nut

By Performance Requirements

- **Standard duty**: Smooth or knurled round body; suitable for most light to medium applications in steel, aluminum, and plastic.
- **Heavy duty**: High Strength Rivet Nuts for high clamp load and vibration intensive environments. Compatible with Class 10.9 / Grade 8 hardware.
- **Spin-out resistance progression**: Smooth body → knurled body → half hex body → Optisert® wedgehead and knurled body → full hex body → High Strength rivet nuts.
- **Large thread sizes**: For structural applications requiring greater load-bearing capacity with sizes available up to M16 and 5/8”-11. Sherex’s LRGR and LRGH Series are made for larger thread sizes, with M16 availability particularly relevant for European agricultural and construction OEMs.

By Application Configuration

- **Open end:** Standard configuration; allows bolt to pass fully through the fastener.
- **Closed end:** Seals the blind side against fluid, air, and contaminant ingress; recommended for use with head sealants for optimal leak-proof performance.
- **Small flange:** Near-flush installation profile; preferred where appearance or mating surface clearance is a consideration.
- **Large flange:** Increased bearing surface distributes load over a wider area; provides greater pull-through resistance.
- **Floating nuts:** Self-aligning design compensates for hole misalignment between mating components; reduces assembly time and tolerance stack-up issues.
- **Rivet nut studs:** A two-piece fastener that combines a rivet nut and a bolt; ideal for thin sheet metal applications with blind installation requirements.

Choosing the Right Rivet Nut

By Industry Specifications

- **Electronics & EV Applications:** RoHS, REACH, and ELV compliance requirements for fasteners used in electronic assemblies and electric vehicle platforms
- **Aerospace & Defense:** NAS and MS specification rivet nuts available for applications requiring compliance with military and aerospace fastener standards; available from Sherex® Danboro, Pa. facility.
- **High-strength applications:** Class 10 / Grade 8 thread proof load rivet nuts for heavy-duty environments requiring compatibility with Class 10.9 / Grade 8 bolts
- **Stainless Steel Specifications:** For corrosion-sensitive environments including marine, food processing, medical, and outdoor infrastructure

Quick Selection Guide

REQUIREMENT	RECOMMENDED BODY STYLE	KEY FEATURE
Maximum spin-out resistance	Full hex	Hex hole required
High spin-out resistance, round hole	Round body – Optisert	Underhead wedge design
Light duty, round hole	Round body – smooth or knurled	Standard applications
Middle ground, hex hole	Half hex	Standard applications, all tools compatible
European metric standards	Metric body	Metric hole sizing
Sealed environment	Closed end	Use with head sealant
Hole misalignment	Floating nut	Self-aligning
Aerospace/defense	NAS/MS spec	NAS1329 and NAS1330 style rivet nuts
High clamp load	High strength hex or round	Class 10 / Grade 8 thread proof load

For complete dimensional data, grip range specifications, and material options, reference the Sherex® by PEM® Rivet Nut Catalog at https://www.pemnet.com/eu/products/rivet-nuts/

All standard catalog products manufactured in Galway are available in metric thread sizes and metric body configurations.

Evolving Rivet Nut Technology

The fundamental rivet nut concept has remained the same since its invention but the demands placed on fastened joints have not.

As base materials move toward thinner and lighter substrates, and assembly torque requirements increase, the performance ceiling of standard round body rivet nuts has become a design constraint.

Sherex® Optisert®

The most common limitation of standard round body rivet nuts in softer materials is spin-out – the rivet nut rotating in its hole when assembly torque exceeds the fastener's spin-out resistance. The traditional solution has been to switch to a hex body rivet nut in a punched hex hole, which can add cost and tooling complexity.

Optisert takes a different approach. The proprietary round body rivet nut combines an engineered knurled body with an underhead wedge design that bites aggressively into the base material to deliver superior spin-out resistance without requiring a hex hole.

A patent-pending closed-end option preserves the wedge effect without compromising grip. Available in unified sizes #8-32 to 1/2"-20 and metric M4 to M12, Optisert is proven to meet Class 8 and Grade 5 thread proof load and is seeing rapid adoption in automotive and heavy truck applications.

Case Study: Preventing Costly Design Change

Challenge: A Tier 1 automotive supplier manufacturing aluminum EV truck frames was experiencing spin-out at 8 Nm – well below the required 10–12 Nm assembly torque across 37 installation points. Redesigning rails to accommodate hex holes was estimated at over €150,000.

Solution: Replacing the standard round body rivet nut with Optisert allowed the supplier to retain existing round holes and tooling. Optisert's underhead wedge design achieved more than 20 Nm of spin-out resistance in the application – exceeding assembly torque requirements. A Sherex Hand Tool Calibration Unit was added to verify installation force at regular production intervals.

Savings: After implementation, the tier reported **zero spin-out incidents** – eliminating costly rework and OEM line disruptions. **Total savings across the project reached €230,000**.

High Strength Rivet Nuts: Class 10 / Grade 8 Thread Proof Load

For decades, engineers specifying high-clamp-load applications had limited options: weld nuts, press-in clinch nuts, or standard hex hardware.

Traditional rivet nuts topped out at Class 8 / Grade 5 thread proof load performance – sufficient for light to medium duty applications, but not a match for the Class 10.9 and Grade 8 bolts routinely used in chassis, suspension, cab, and frame designs in heavy-duty industries. **Today, high strength rivet nuts remove that limitation.**

Why High Strength Rivet Nuts?

Modern equipment design is pushing fastening requirements in two directions simultaneously: higher clamp loads and thinner, lighter base materials. High-strength steel, aluminum, and composite substrates are increasingly common, but welding distorts thin sheet metal, creates heat-affected zones, and introduces costly secondary operations like spatter removal, ventilation, and skilled labor.

High strength rivet nuts resolve this conflict directly. They deliver Class 10 / Grade 8 thread proof load performance – the same load values as traditional high-clamp-load fasteners – while installing cleanly from one side in seconds, with no heat, spatter, and welding infrastructure.

Where They're Specified

High strength rivet nuts have gained adoption across industries where structural integrity and installation efficiency both matter: commercial vehicles including HGVs, semi-trailers, and construction equipment, automotive chassis and frame assemblies, construction and agricultural equipment, and renewable energy applications including solar racking and battery storage enclosures.

Sherex® High Strength Rivet Nuts

Sherex® offers Class 10 / Grade 8 thread proof load rivet nuts as standard catalog products in both hex body and round body designs, in open and closed end configurations, across metric sizes M5–M12 and unified thread sizes #10-24 through 1/2"–20.

Hex body designs deliver maximum spin-out and pull-out resistance; round body designs provide flexibility where a hex hole cannot be stamped.

Both designs install with standard rivet nut tooling and no specialized equipment needed. Visit Pemnet.com to view product data and 3D models.

Importance of Quality

After installation, a rivet nut becomes a permanent part of the joint, and the joint's performance under load, vibration, and repeated assembly cycles depends on the quality of that fastener. Dimensional inconsistencies, poor thread tolerances, or inadequate material treatment don't reveal themselves at installation; they reveal themselves in the field.

Critical Quality Areas

Four factors determine if a rivet nut will perform to specification throughout its service life:

- **Dimensional tolerances** govern whether the fastener seats correctly in the hole and sets consistently during installation.
- **Thread fit** determines the quality of engagement with the mating bolt, with poor thread form leading to galling, cross-threading, and premature failure.
- **Heat treatment** affects the hardness and tensile strength of the fastener body, directly influencing how much load the joint can bear.
- **Plating quality** – the uniformity of coating, adhesion, and corrosion resistance determines long-term durability in the operating environment.

Testing Methods

These tests define rivet nut joint performance:

Pull-Out measures the axial force required to draw the rivet nut through the base material. Failures are typically caused by oversized holes or joint loads exceeding design parameters.

Spin-Out measures the torque required to rotate the rivet nut in its hole, caused by cross-threading, excessive corrosion, or mismatched locking features.

Torque-Out measures the force required to strip the internal threads, with assembly torque too high or an incorrect fastener grade being the most common cause.

Suggested Assembly Torque defines the recommended torque value for assembling a rivet nut joint with Class 8.8 / Grade 5 hardware, providing a baseline for proper bolt engagement without risking thread failure. Because torque can be affected by coating friction, prevailing torque features, and washer configuration, values should be validated against the specific application.

Our Galway facility is certified to ISO 9001:2015, ISO 14001:2015, and IATF 16949:2016, meeting the quality system requirements of European automotive and industrial OEMs.

Importance of Quality

PULL OUT

Definition:
- Pull-out occurs when threads are pulled from the rivet nut (ultimate thread strength) or base material is distorted and the entire rivet nut pulls through the base material.

Causes:
- Hole size is too large.
- Forces applied to the joint are higher than anticipated.

SPIN OUT

Definition:
- Spin-out is the amount of torque required to make a rivet nut spin in the hole in which it was installed.

Causes:
- Bolt cross threads into the rivet nut causing it to spin.
- Excessive corrosion causes bolt to bind in the nut.
- Using a screw with mechanical locking feature that has higher prevailing torque than the spin out of the rivet nut.

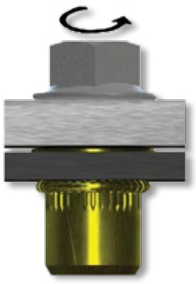
TORQUE OUT

Definition:
- Torque force required to strip threads out of the rivet nut.
- This method of testing sandwiches the head of the rivet nut between the non-rotational mating part and parent or base panel.
- Spin-out is not a factor because tightening the bolt on the non-rotating part holds the rivet nut in place and prevents it from spinning.

Causes:
- Assembly torque is too high causing thread failure.
- Improper grade of fastener used.

*Torque can be affected by various factors such as coefficient of friction of the finish, prevailing torque, washers, etc. Sherex® recommends you test your application.

SUGGESTED ASSEMBLY TORQUE



Definition:
- Recommended torque for assembling a rivet nut joint with Class 8.8/Grade 5 hardware.

Contact Sherex should you require Grade 8, Class 10 or higher joint strength.

THREAD SIZE	SUGGESTED ASSEMBLY TORQUE INCH LBS. -Nm PLATED SCREW GRADE 5 CLASS 8.8
# 6-32 UNC	12
# 8-32 UNC	22
# 10-24 UNC	32
# 10-32 UNF	36
1/4-20 UNC	75
1/4-28 UNF	75
5/16-18 UNC	156
5/16-24 UNC	156
3/8-16 UNC	276
3/8-24 UNF	276
M4x0.7 ISO	2.5
M5x0.8 ISO	5.0
M6x1.0 ISO	8.6
M8x1.25 ISO	21.0
M10x1.5 ISO	42.0
M12x1.75 ISO	72.0

Importance of Quality

Supplier Capabilities & Quality Systems

Two rivet nuts may look identical, but the manufacturing processes behind them determine whether they perform well or fail under load.

Certified facilities will ensure that each fastener was made to a controlled, audited, and repeatable standard. Design engineers will have confidence that published performance values will hold; procurement teams will be protected against incoming quality failures and line stoppages; and quality managers will have the traceability documentation required by OEM and regulatory requirements.

Sherex manufacturing facilities are led by teams and processes that ensure all products are manufactured using reliable, repeatable, and compliant processes.

Sherex® is certified to: ISO 9001:2015, ISO 14001:2015, IATF 16949:2016

Tensile testing, accelerated corrosion, salt spray testing, torque testing, and optical sorting are standard quality assurance processes across all Sherex facilities.
Visit Pemnet.com for certification documentation.

Sherex® by PEM® Galway, Ireland

PennEngineering's Galway facility serves as the centre of excellence for Sherex by PEM rivet nut manufacturing in Europe, producing a comprehensive range of rivet nuts to meet the demands of European OEM and industrial customers. With high-volume production capacity and streamlined logistics direct from Ireland, the Galway facility offers reliable, short lead-time supply into the UK and across mainland Europe. A dedicated local engineering team is on hand to provide application support, and custom design consultation - ensuring customers across the region have direct access to the technical expertise needed to specify, test, and optimise their fastening solutions.

Sherex Danboro, USA

Sherex Taiwan

Sherex Malaysia

The Case for Lowest Total Installed Cost

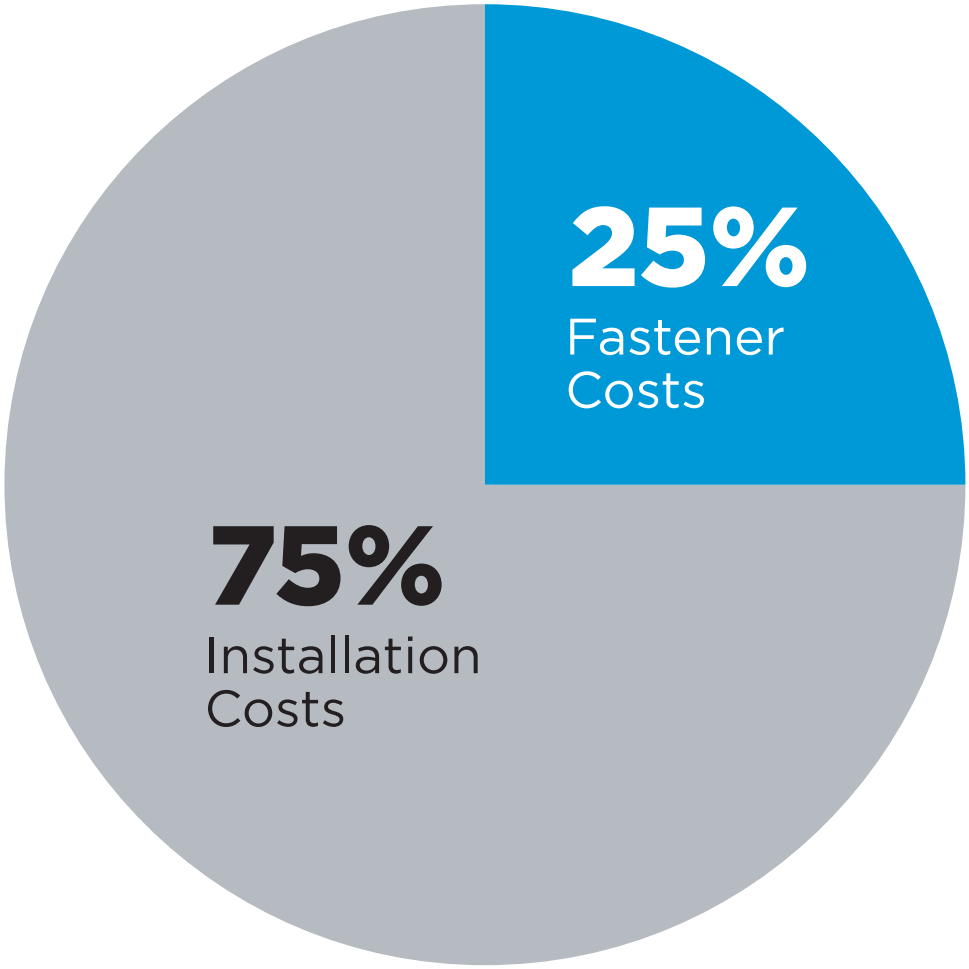
When evaluating fastener options, purchase price alone is a misleading metric.

The true cost of a fastening solution is the sum of part cost plus installation cost. In most manufacturing environments, installation accounts for approximately 75% of that total.

The fastener itself represents just 25% of the installed cost.

This means the greatest opportunity to reduce fastening costs isn't in negotiating a lower piece price. It's in optimizing the installation process.

Total Fastening Cost = Part Cost + Installation Cost



The fastener manufacturing process is very mature, with minimal opportunity to add efficiencies or take cost out of the process. The biggest cost savings opportunity is through optimizing the installation/assembly process of the proper fastener.

The Case for Lowest Total Installed Cost

Numbers in Practice

Two data points illustrate this concept clearly.

First, installation time. A standard weld nut process including positioning, tack-up, welding, and spatter removal takes approximately 17 seconds per fastener. A rivet nut installs in roughly 4 seconds. At scale, the difference in labor time represents significant cost reduction.

FASTENER TYPE	WELD NUT	RIVET NUT
Installation time		
Time for positioning	3 seconds	1 seconds
Time for tack up	2 seconds	0 seconds
Time for welding/installing	7 seconds	3 seconds
Time to remove spatter	5 seconds	0 seconds
TOTAL	17 SECONDS	4 SECONDS

Weld Nut: Process utilized a stick welder for welding a nut to the work piece one fastener at a time. Other dedicated welding equipment could potentially be used for this process and would require a separate cost analysis.

Rivet Nut: Process utilized a Sherex® Flex-5P spin-pull rivet nut installation tool. Process installs one fastener at a time.

The Case for Lowest Total Installed Cost

Second, total installed cost. When part cost, labor, and energy/consumables are factored together, a standard weld nut installation runs approximately €0.270 per fastener. A rivet nut installed with standard tooling comes in at €0.121 (less than half the cost). Automated installation holds that same €0.121 figure while eliminating labor cost entirely.

FASTENER TYPE	WELD NUT		RIVET NUT	
Cost factors				
Installation method	Standard	Automated	Standard	Automated
Piece cost	€ .05	€ .06	€ .10	€ .12
Labor/Time	€ .10	€ .00	€ .02	€ .00
Energy/Consumables	€ .12	€ .12	€ .001	€ .001
TOTAL INSTALLED COST	**€ .270**	**€ .180**	**€ .121**	**€ .121**

*Cost savings are an estimation based on assumed component and processing costs which may vary based on volume, region, and changing market conditions. To review your specific application in more detail please contact your local PennEngineering® representative.

Energy/Consumables

Welding: The cost includes weld gas and/or filler metal as well as electric cost for welding, venting, and temperature control. Electricity consumption generally contributes most of the cost.

Rivet Nuts: The cost includes compressor operation and mandrels.

Figures shown are for illustrative purposes only. European-specific cost analysis is available from local sales engineers.

The Case for Lowest Total Installed Cost

Real-World Results

The cost advantage of Sherex® by PEM® rivet nuts plays out in these two scenarios.

In an agricultural equipment application, switching from welded hex fasteners to full hex rivet nuts increased throughput by 50%, eliminated welding emissions from the assembly environment, **and generated €120,000 in annual savings on a volume of one million fasteners.**

A heavy commercial vehicle manufacturer faced excessive warranty claims for cab roof leaks caused by a competitor's rivet nut failing in composite materials. Sherex's engineering team designed in a custom rivet nut with enhanced spin-out resistance, large flange mating surface, and high-temperature sealing capability for the paint process. The solution has performed flawlessly for over 3 years with zero leaks, **eliminating roughly 140 annual replacements and saving €49,000 yearly.**

(Cost savings figures are illustrative examples based on assumed component and processing costs, which may vary by volume, region, and market conditions.)

Pneumatic Tools (Spin-Spin)

These air-powered tools are best suited for low and medium-volume installations on steel and aluminum thin wall rivet nuts. Available in pistol grip, right angle, and inline configurations, they offer speed and versatility with quick-change nose pieces for easy headset replacement. Installation method applies torque on the threads of the rivet nut.

SSG 800
Pistol Style Series

SSG 900
Inline Style Series

SSG 910
Inline Right Angle
Style Series

SHEREX® PNEUMATIC TOOLING										
	SSG-801	SSG-802	SSG-803	SSG-808	SSG-901	SSG-902	SSG-903	SSG-911	SSG-912	SSG-913
M3x0.5	x				x			x		
M4x0.7	x				x			x		
M5x08		x				x			x	
M6x1.0		x				x			x	
M8x1.25			x				x			x
M10x1.50			x				x			x
M12x1.75				x						
M16x2.0										
04-40	x				x			x		
06-32	x				x			x		
08-32	x				x			x		
10-24		x				x			x	
10-32		x				x			x	
1/4-20		x				x			x	
1/4-28		x				x			x	
5/16-18			x				x			x
5/16-24			x				x			x
3/8-16			x				x			x
3/8-24			x				x			x
1/2-13				x						
1/2-20				x						
5/8-11 UNC										

Hydro-Pneumatic Tools (Spin-Pull)

This is the preferred choice for production environments – combining air pressure and hydraulic force to deliver precise, consistent installation across a range of rivet nut sizes and styles. Installation method applies a tensile force on the threads of the rivet nut.

Sherex's FLEX-5 has an installation force range of 5,000 lbf, RIV943 has a force range of 7,500 lbf, and Sherex's FLEX-18 has a force range of 18,000 lbf.

FLEX-5 Series Rivet Nut Installation Tool 4-40 to 3/8-24 (M3 to M10)

RIV943 Rivet Nut Installation Tool

FLEX-18 Rivet Nut Installation Tool 5/16-18 - 3/4-10 (M8-M20)

SHEREX® HYDRO-PNEUMATIC TOOLING			
	FLEX-5	RIV943	FLEX-18
	22 kN/5,000 lbf	35 kN/7,500 lbf	80 kN/18,000 lbf
M3x0.5	x		
M4x0.7	x		
M5x08	x		
M6x1.0	x	x	
M8x1.25	x	x	
M10x1.50		x	x
M12x1.75		x	x
M16x2.0			x
04-40	x		
06-32	x		
08-32	x		
10-24	x		
10-32	x		
1/4-20	x	x	
1/4-28	x	x	
5/16-18	x	x	
5/16-24	x	x	
3/8-16		x	x
3/8-24		x	x
1/2-13		x	x
1/2-20		x	x
5/8-11 UNC			x

Installation Systems

Checking Installation Quality

Beyond tool selection, verifying that tools are performing correctly is an important and often overlooked part of the installation process. The systems below can help reduce rework, improve consistency, and support quality documentation requirements.

Process Monitoring Systems can be used on the production line to help operators decrease waste and improve assemblies. They can evaluate every installation in real time, confirm each rivet nut has been properly set, and flag any that fall outside specified parameters.

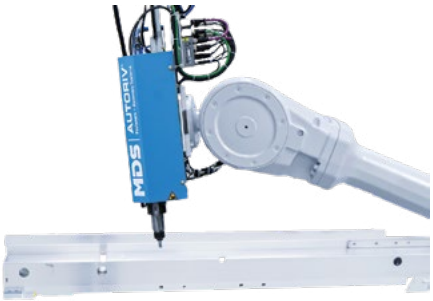
Hand Tool Calibration Units provide a complementary check – allowing operators to verify that pneumatic and hydro-pneumatic tools are operating within the correct force ranges before and during production.




Contact Sherex® to discuss the right installation system for your production environment.

Automated Systems

In large-scale production where a significant number of fasteners are being installed into work pieces, automated installation systems integrate directly into the assembly line – for speed, consistency, and built-in quality control.



Installation Best Practices

Rivet nut installation is a straightforward process, but small errors in preparation or tool setup can compromise joint performance. Following established best practices will ensure reliable results every time.

The Installation Process

STEP 1 The rivet nut is threaded on the tool for installation.

STEP 2 The rivet nut, while on the installation tool, is placed into a properly sized, pre-drilled or punched hole.

STEP 3 The installation tool engages the mandrel and applies pulling force, collapsing the body against the blind side of the material.

STEP 4 The tool releases, leaving a permanently set, load-bearing thread.

Grip Range Selection

Grip range is the range of material thicknesses a rivet nut is designed to accommodate It's one of the most critical selection criteria and a common source of installation error.

Selecting a rivet nut with a grip range that doesn't match the actual material thickness can result in an under-set or over-set fastener, both of which compromise pull-out and torque performance. Always verify material thickness and match it to the correct grip range before specifying.

Installation Systems

Hole Preparation

Mounting holes may be punched, drilled, laser cut, or molded.

Key requirements: holes must be sized to the manufacturer's specified diameter for the fastener being installed after any finishes are applied. Oversized holes will reduce holding power and undersized holes will not allow the part to be placed into the hole.

Holes should not be chamfered or deburred, as removing material reduces the amount available for riveting. Surface finish and coating of the base material are not affected by proper rivet nut installation.

Installation Do's and Don'ts

DO:

- Match grip range to actual material thickness
- Use the manufacturer's specified hole size
- Verify tool calibration before production runs
- Install after painting or powder coating where possible

DON'T:

- Chamfer or deburr mounting holes
- Use a worn or out-of-calibration installation tool
- Install a rivet nut in material outside its specified grip range
- Assume all rivet nut styles install with the same tool settings

Common Installation Errors

Poor performance is the most common symptom of an installation problem, and it typically traces back to one of four causes:

Incorrect grip range selection, an improperly sized hole, insufficient or excessive installation force, a tool that is out of calibration

If a rivet nut spins freely after installation, spins during bolt engagement, or pulls through the material under load, review grip range match and hole size before adjusting your tool settings.

Common Design Challenges

Rivet nuts can underperform if design and installation parameters aren't properly considered. The following guidelines address the most common challenges encountered in real-world applications.

Edge Distance
Insufficient distance between the rivet nut hole and the edge of the base material reduces pull-out and spin-out resistance and risks material deformation during installation. As a general rule, maintain a minimum edge distance of 1.5 times the hole diameter (more for softer or thinner materials).

Fastener Spacing
When multiple rivet nuts are installed in close proximity, the bulge formed on the blind side can interfere with adjacent fasteners. Allow adequate center-to-center spacing to accommodate the installed bulge diameter of each fastener.

Material Thickness
Base material must fall within the specified grip range of the rivet nut. Always verify actual material thickness before specifying.

Base Material Hardness and Compatibility
Softer materials like aluminum, plastic, and composite should consider knurled or wedge-body designs to achieve adequate spin-out resistance. Material compatibility, including any specific platings, should be confirmed during the engineering stage.

Installation Sequence
Rivet nut installation sequence matters in multi-component assemblies. Install rivet nuts before assembly operations that would restrict tool access to the installation point. Plan the sequence to ensure the correct tool can reach each location without interference.

Material and Finish Considerations
Unlike weld nuts, rivet nuts can be installed after painting and powder coating without damaging surface finishes.

Engineering support is available to review your application. Go to Pemnet.com

Fastener Options & Specifications

Choosing the right rivet nut body style and size is the starting point. But coatings, sealants, and thread-locking features allow engineers to further tailor performance to the exact demands of their application. Most standard rivet nut product lines offer these options.

Coatings

Rivet nuts are available with a range of electroplated coatings to increase corrosion resistance. Common options include Zinc Nickel, Zinc with Clear or Yellow Trivalent Chromate, and Tin Zinc. Each offers varying levels of protection measured by salt spray testing per ASTM B117-16.

Zinc Nickel, for example, can provide up to 1,000 hours of protection before red rust. Most standard coatings are RoHS, REACH, and ELV compliant. Custom coatings are available for application-specific requirements.

Head Sealants

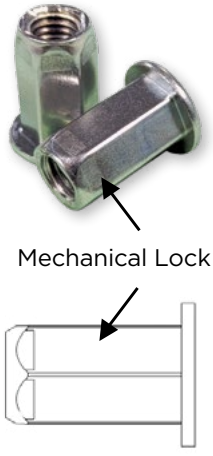
When a leak-proof joint is required, a sealant applied under the rivet nut flange creates an environmental barrier between the fastener and the base material. Options range from general-purpose Plastisol (effective against dirt, dust, and water) to Seal2 for automotive fluid resistance, Silicone for applications requiring paint bake compatibility, and O-Ring seals.

Locsert® is adhesive pre-applied under the head, bonding the rivet nut to the base material during installation. Locsert is best suited for round-hole applications where a hex hole cannot be produced.

Sealants are recommended for use in conjunction with closed-end rivet nuts for optimal performance.

Thread-Locking Options

Thread-locking solutions address applications where vibration or dynamic loading could compromise connection strength. A mechanical lock deforms the final thread of the rivet nut to create a prevailing torque feature that helps resist vibrational loosening. Available on most Sherex® rivet nut series and can be applied to meet IFI, ISO, and NAS torque specifications.

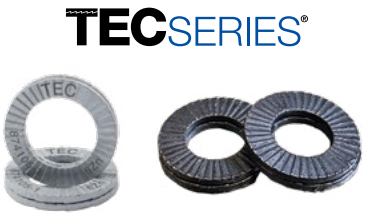


A Broader Fastening Portfolio

No single fastener can solve every assembly challenge. Sherex® offers a complementary range of custom fastening solutions designed to work alongside rivet nuts – or stand on their own – when the application calls for it. Sherex engineering would work with the OEM for the best solution based on performance and cost.

Wedge-Locking Products

When joints are exposed to heavy shock or vibration, conventional friction-based locking can fail over time. Sherex's TEC Series® washers and Disc-Lock® washers and nuts use tension rather than friction to secure the joint. Their cam-and-tooth design creates a mechanical wedge effect that tightens under load – with no thread-locking compounds required. Widely used in automotive, construction, and energy applications where joint performance must be maintained without ongoing maintenance.



Clinch Nuts

When both sides of the base material are accessible, clinch nuts offer a high-strength, flush-mounting alternative to weld nuts. Pressed directly into steel, stainless steel, or aluminum, they deliver superior pull-out and spin-out performance compared to non-Class 10 thread proof load rivet nuts. A direct drop-in replacement for weld nuts and suited for high-volume automated lines.

Compression Limiters

In plastic and composite assemblies, over-tightening can crush or deform the surrounding material and compromise joint integrity. Compression limiters are cylindrical metal inserts that transfer clamp load metal-to-metal and protect the base material to maintain consistent joint performance. Custom engineered to meet specific material, dimensional, and load requirements.

Nut & Stud Plates

For thin sheet and plastic applications where individual fastener installation isn't practical, nut and stud plates are an efficient alternative. Metal plates with pre-installed fasteners – clinch nuts, rivet nuts, or threaded inserts – spread load over a larger surface area for superior pull-out resistance, can be installed post-finish, and allow for part consolidation.

Services & Global Support

From technical resources and value added services to locations around the world, Sherex® is equipped to bring your next project to life.

Use SherexAdvantage® to Test and Confirm Your Design

Application Engineering
- Application Review
- Custom Design
- Customer Drawings
- Catalog Samples
- 3D Models
- Prototype Development Center

Testing Service
- FEA Analysis
- Mechanical Testing
- Tensile and Compression Strength
- Micro Hardness
- Fastener Joint Cross-Sectioning
- Corrosion and Plating Testing

Teardown Service
- Complete Product Disassembly
- Assembly Structure Assessment
- Identify Alternative Fastening Solutions
- Alternative Fastener Replacement/Testing
- Teardown Report

FastenerClass® Master Class
- Complimentary, Customized Fastener and Installation Training from Global Experts (on-site, virtual or on demand.

Index: Sherex® by PEM® Rivet Nut Products

Full Metrix Rivet Line

Full Hex Body - Metric Threads

CFLM
Large flange

CFKM
Small flange

Half Hex Body - Metric Threads

CHLM
Large flange

CHKM
Small flange

Round Body - Metric Threads

CKLM
Large flange, knurled

CKKM
Small flange, knurled

COLM
Large flange, smooth body

CKCM
Countersunk, knurled

COCM
Countersunk, smooth

Metric Thread - Inch Hole Sizes

COKI
Small flange, smooth

CHKI
Half hex, small flange

Sherex Proprietary Rivet Nuts

Inch Body - Inch and Metric Threads

HHS
Full hex body, high strength

RHS
Round body, high strength

FHL
Full hex body, large flange

FHK
Full hex body, small flange

Optisert®
Round body, knurled, wedges

RIV-FLOAT®/RIV-FLOAT®
Short-Floating nut, self-aligning

LRGH
Large size, full hex

LRGR
Large size, round body

Standard Rivet Nut Products

Standard Catalog Products - Inch and Metric Threads

CAL
Knurled, round body, large flange

CAK
Knurled, round body, small flange

CAH
Half hex body, large flange

CPB
Prebullbed, slotted body, large flange

CPN
Straight shank, slotted body, large flange

Index: Specialty Fasteners, Installation Systems and Technical Information

Speciality Fastener Solutions

Fastener Installation Systems

Technical Information

A complete blind rivet nut range.

SHEREX® BY PEM®

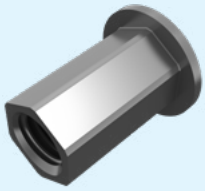
Sherex® by PEM® offers a full portfolio of blind rivet nut solutions, designed to meet different material, strength and installation requirements.

Blind rivet nuts and rivet nut studs

Load-bearing threads in thin sheet material, installed from one side. Available in Full Hex, Half Hex and Round Body designs, with a range of flange styles, materials and plating options.

High strength rivet nuts

Manufactured with Class 10 / Grade 8 thread proof load for applications requiring high strength thread attachment in thin materials. Available in both round body and full hex body configurations.



Large size rivet nuts

Full hex and round body rivet nuts available up to M16 thread size. Designed for applications requiring high tensile performance and critical joint integrity.

Optisert®

Engineered for soft materials. A unique combination of knurling and underhead wedge features improves grip, delivering superior strength and spin-out resistance. Available in steel and stainless steel, with open or closed end options.

RIV-FLOAT®

Features an internally floating thread, allowing for tolerance compensation and misalignment during assembly. Supports easier installation and improved alignment in complex assemblies.

We also offer tailored, engineered solutions backed by in-house expertise to create bespoke fastening systems or address specific application challenges.

SHEREX® BY PEM®

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