

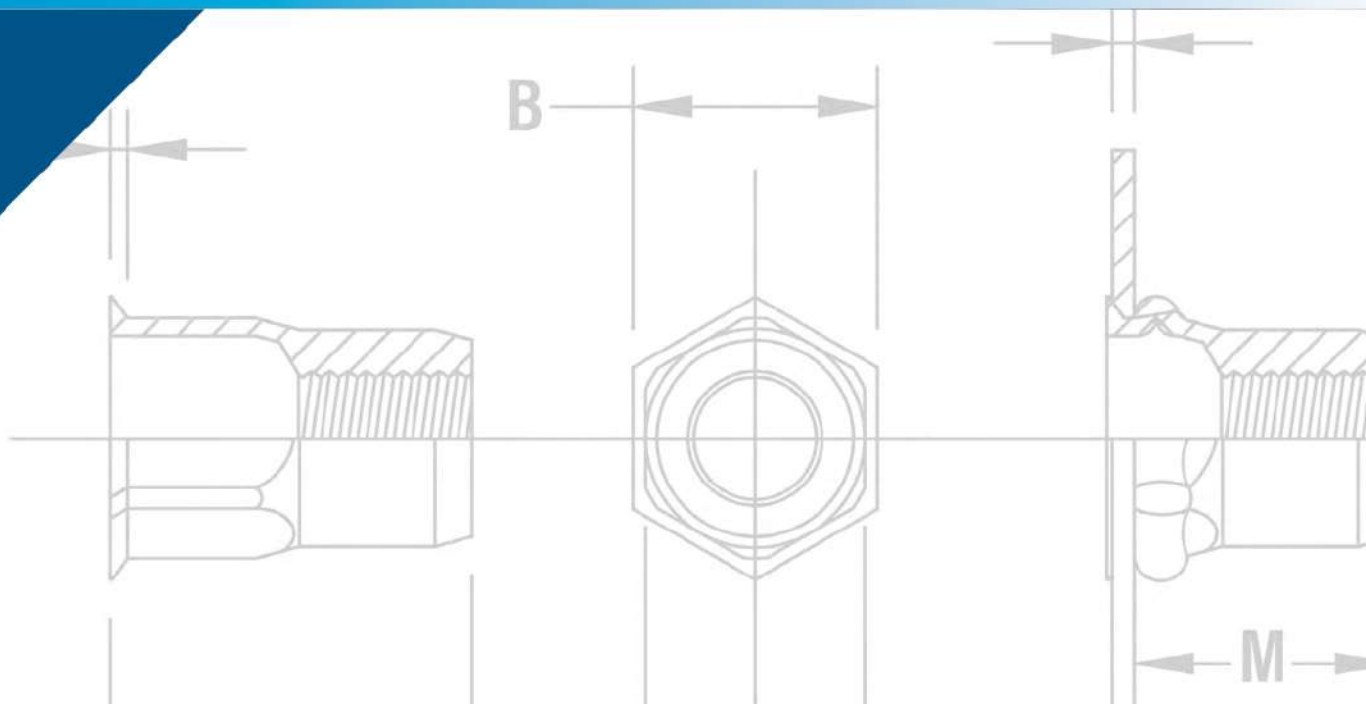


ATLAS® brand blind threaded inserts provide strong and reusable permanent threads in sheet materials where only one side is accessible for hardware installation.



# CATALOG

## ATLAS® BLIND THREADED INSERTS















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








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## SpinTite® Blind Threaded Inserts

		<b>AEL™ LOW-PROFILE HEAD INSERTS</b> <ul style="list-style-type: none"> <li>Feature a large diameter, low-profile head and knurled shank</li> <li>Offers highest all around strength</li> </ul>	<b>10</b>
		<b>AEK™ MINIMIZED-PROFILE HEAD INSERTS</b> <ul style="list-style-type: none"> <li>Same as the AEL but with a minimized-profile head</li> <li>Allows near-flush installations with no need for special hole preparations such as countersinking or dimpling</li> </ul>	<b>11</b>
		<b>AEH™ HALF-HEX SHANK LOW PROFILE HEAD INSERTS</b> <ul style="list-style-type: none"> <li>Features a hex body design</li> <li>Improved torque-out resistance</li> </ul>	<b>12</b>
		<b>AEO™ THIN-WALL LOW PROFILE HEAD INSERTS</b> <ul style="list-style-type: none"> <li>Features a low profile head design</li> <li>Achieves near-flush installations with no need for countersink drilling or dimpling of the parent material</li> </ul>	<b>13</b>
		<b>AET™ AND AEW™ 360° SWAGING LOW-PROFILE HEAD INSERTS</b> <ul style="list-style-type: none"> <li>Works in any thickness over .029" / 0.76 mm including blind hole</li> <li>High resistance to torque out</li> <li>Minimal backside protrusion for restricted space applications</li> </ul>	<b>14-15</b>
		<b>AES™ BLIND THREADED STUDS</b> <ul style="list-style-type: none"> <li>Provide strong external threads in blind applications</li> <li>Easy to install using spin-spin tooling</li> <li>Optional anti cross-threading feature available (see page 25)</li> </ul>	<b>16</b>
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		<b>AETH™ THIN HEAD SEMIHEX BODY HEX COUNTERBORE INSERTS</b> <ul style="list-style-type: none"> <li>Allows near-flush installations with no need for special hole preparations.</li> <li>Semihex body for improved torque-out resistance.</li> </ul>	<b>19</b>
		<b>AEFR™ FLAT HEAD ROUND BODY INSERTS</b> <ul style="list-style-type: none"> <li>Flat head design for high load applications.</li> </ul>	<b>20</b>
		<b>AETR™ THIN HEAD ROUND BODY INSERTS</b> <ul style="list-style-type: none"> <li>Allows near-flush installations with no need for special hole preparations.</li> </ul>	<b>20</b>
		<b>AEFK™ FLAT HEAD KNURLED ROUND BODY INSERTS</b> <ul style="list-style-type: none"> <li>Flat head design for high load applications.</li> <li>Knurled body for high torque applications.</li> </ul>	<b>21</b>
		<b>AETK™ THIN HEAD KNURLED ROUND BODY INSERTS</b> <ul style="list-style-type: none"> <li>Allows near-flush installations with no need for special hole preparations.</li> <li>Knurled body for high torque applications.</li> </ul>	<b>21</b>
		<b>AEFH™ FLAT HEAD SEMIHEX BODY HEX COUNTERBORE INSERTS</b> <ul style="list-style-type: none"> <li>Flat head design for high load applications.</li> <li>Semihex body for improved torque-out resistance.</li> </ul>	<b>22</b>
		<b>AEFH™ FLAT HEAD HEX BODY ROUND COUNTERBORE INSERTS</b> <ul style="list-style-type: none"> <li>Flat head design for high load applications.</li> <li>Full hex feature for high torque applications.</li> </ul>	<b>22</b>

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		<b>AETHH™ THIN HEAD HEX BODY ROUND COUNTERBORE INSERTS</b> <ul style="list-style-type: none"> <li>Allows near-flush installations with no need for special hole preparations.</li> <li>Full hex feature for high torque applications.</li> </ul>	23
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<b>ATLAS® Plus+Tite® Blind Threaded Inserts</b>			
	<b>DESIGNED FOR SUPERIOR PULLOUT RESISTANCE IN PLASTICS AND THIN SHEET METAL</b> <ul style="list-style-type: none"> <li>Internal formed threads are compatible with unified grade 5 or metric class 9.8 screws</li> <li>Shoulder provides self-locating feature</li> <li>All surfaces are plated for superior corrosion resistance</li> </ul>		26-27
<b>ATLAS® MaxTite® Blind Threaded Inserts</b>			
	<b>DESIGNED FOR HIGH LOAD APPLICATIONS</b> <ul style="list-style-type: none"> <li>Thread sizes 632 - 1/2" and M4 - M12</li> <li>Countersunk feature allow fastener to be installed flush with the surface of the sheet</li> <li>Available with rib, key or full hex features for high torque applications</li> </ul>		28-31
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# COMPANY

ATLAS® operations are headquartered within the PennEngineering 225,000 square foot facility located in Danboro, Pennsylvania. PennEngineering companies provide fastener and fastener installation design and product solutions worldwide for diverse industries, including electronics, computer, data/telecom, medical, automotive, marine, aircraft, and general manufacturing.



## CAPABILITIES

### Application Engineering Services

From our factories or in the field we can provide you with application analysis/review, 3D modeling, product samples, on-site training and total engineering support.

### Comprehensive website

Our PEMNET.com fastening resource center provides the tools to help you determine which type of ATLAS® blind threaded insert or installation tool is right for you. It includes a complete CAD library, fastener selector tool, conversion tables, tutorials/animations/videos, literature, tech help, and environmental compliance references.

### Custom Designs

Our engineers can assist you in finding the most efficient solution to your application, and design the right fastener to meet your needs.

### Installation Tools

We can assess your application and recommend equipment that helps you achieve your lowest installed cost. Systems can be developed to address challenging component handling and fastener installation.



### Prototype Development

We're equipped with the latest equipment to provide prototype samples and short run production quantities for your testing and analysis.

### Technical Lab

We have comprehensive testing facilities in each of our manufacturing locations. Our trained technicians worldwide can perform testing and provide complete analysis on pushout, pullout, spinout and assembly torque.





## QUALITY

At PennEngineering, our goal is 100% defect-free product. To this end, we have adopted a manufacturing strategy of defect prevention rather than defect detection. We use statistical tools throughout our manufacturing processes to monitor the performance and assure effective quality control of each process step. If a non-conforming situation arises, it is resolved immediately with the use of appropriate quality assurance tools.

Our fastener quality management system is IATF 16949 registered and Department of Defense QSLM approved, and we can support DFARS clause 252.225 requirements when specified. This further underscores our commitment to excellence as we continue to provide quality products and services that meet or exceed our customers' expectations.

We are members of the Automotive Industry Action Group (AIAG) where we work together with other member companies to resolve issues critical to the automotive supply chain.

PennEngineering is also a registered member of the International Material Data System (IMDS).



## ATLAS® BLIND THREADED INSERTS AND STUDS OVERVIEW

**ATLAS® Blind threaded inserts are designed to provide strong threads in thin panel sections. They are called “blind” because they can be installed from one side of the panel. Access to both sides is not required. This convenient feature makes these fasteners ideally suited for tubing, extrusion, and other similar types of applications.**



There are four types: **SpinTite®**, **ATLAS® FM™**, **MaxTite®**, and **Plus+Tite®** fasteners.

The **SpinTite®** types are used for most applications where strong threads are required for blind applications. They are installed from one side using a spin-spin technique. In addition to high thread strength and torque-out, these fasteners have minimal inventory requirements since each size can accommodate many grip ranges (material thickness).

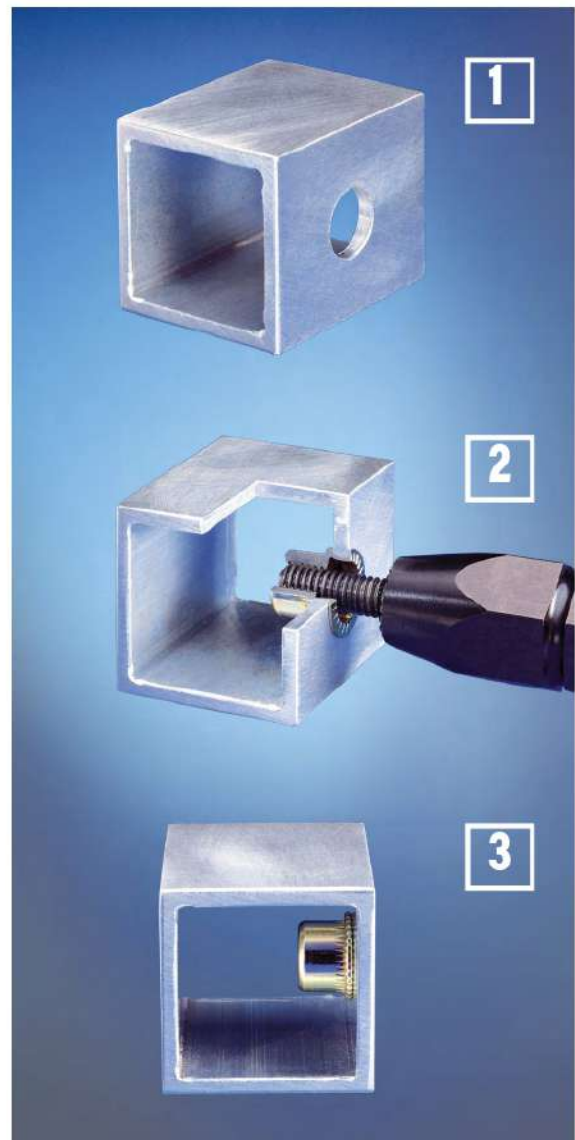
The **ATLAS® FM™** inserts have metric threads and dimensions and install into metric size round or hex holes to meet European design standards. These inserts are installed using “spin-pull” or “pull-to-pressure” installation tools.

The heavy duty **MaxTite®** types are designed for the most demanding applications. They are installed from one side using “spin-pull” or “pull-to-pressure” installation tools.

The blind **Plus+Tite®** inserts feature a slotted body that folds into four petals upon installation, gripping the backside of the parent material. These inserts can be installed into single, variable, or multiple thickness materials.

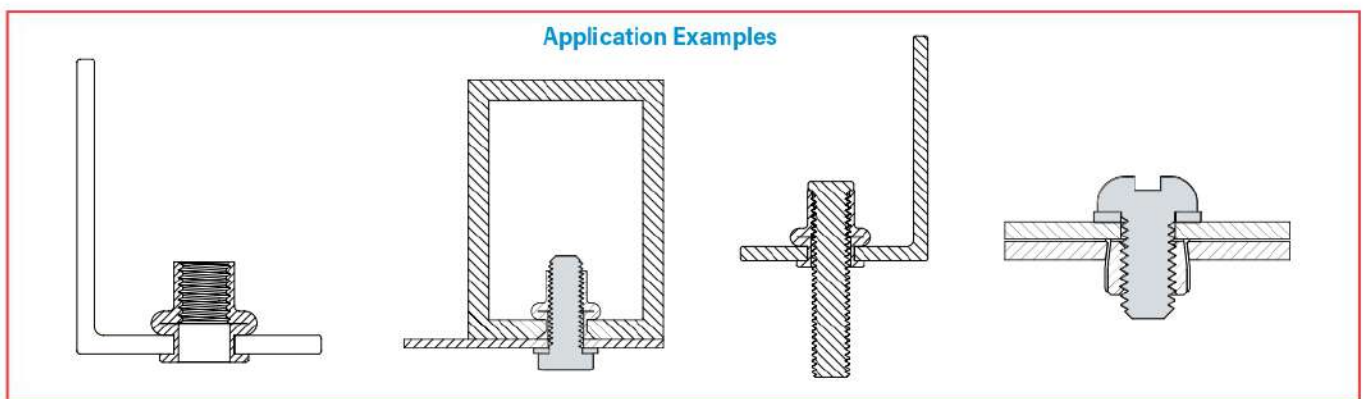
Typical industries that use blind threaded rivet technology:

- Appliances
- Automobiles and accessories
- Aviation and aerospace
- Electronics
- Food service equipment
- Furniture/fixtures/signs
- Industrial equipment
- Lawn and garden equipment
- Lighting
- Marine/boating
- Medical equipment
- Military equipment
- Recreational equipment
- Trucks and trailers



## Advantages of ATLAS® blind threaded inserts:

- ▶ Provide strong permanent threads in thin material.
- ▶ Can be installed quickly and easily in panel sections with limited or no access to the back side.
- ▶ Can be installed in close-to-edge applications.
- ▶ Allow easy attachment to panels of any hardness such as metal, plastics, and fiberglass.
- ▶ Installed with light, compact, cost-effective tooling.
- ▶ Can assemble multiple dissimilar materials during installation.
- ▶ Can replace weld nuts, cage nuts, tapped holes, self-tapping screws, and traditional through-bolted applications with loose hardware.
- ▶ Stocked globally through our worldwide distribution network.



## Application considerations

- ▶ Panel material is not limited by hardness or type, but hole location and thickness must fall within the grip range of the specified fastener.
- ▶ Hole locations are important when it comes to clearance on both the front side and back side of the panel. Allow adequate room for the head of the fastener, the bulbed portion of the fastener, as well as access for your chosen installation tooling. Also allow enough depth behind the panel to accept the fastener prior to the installation process.

## Mounting hole considerations

- ▶ Mounting holes can be prepared in many ways, but must be within the tolerances specified in the catalog or on the drawing.
- ▶ Methods of hole preparation include but are not limited to punching, drilling, milling, laser or water jet cutting, and casting. Also available are the portable RIV990 and RIV991 hex cutter tools, used to transform round holes into hexagonal holes. See page 46 for more information.
- ▶ Mounting holes do not necessarily need to be de-burred, but must allow for the fastener to seat properly and maintain position or perpendicularity when installed.



# ATLAS® INSERT DESIGN GUIDE

## Picking the insert

- ▶ **Round vs. Hex** - For many applications a round insert such as the AEL or AEK series parts will suffice. Properly installed, these inserts will provide all the necessary spin out resistance. In critical applications, a hex hole may be desired as insurance against spin out. The RIV990 or RIV991 hex cutter tool can be used to create a hex hole in tubing. Tooling is only available for creating holes for the ATLAS® FM™ inserts.
- ▶ **Plating** - ATLAS inserts are available in a variety of platings. For normal applications, the standard zinc yellow or zinc clear is adequate. All ATLAS zinc platings are RoHS and REACH compliant. See [www.pemnet.com](http://www.pemnet.com) for compliance certifications. For more extreme environments, the use of zinc nickel or tin zinc coatings may be desired. These coatings are rated for 1,000 hours salt spray protection per ASTM B117.
- ▶ **Watertight** - For applications on the exterior of vehicles or electronic cabinets that will be used outdoors, a PVC or Rimlex® (high temperature) sealant can be added under the head of the fastener. Normally a closed end insert is used for these applications. In most normal conditions this combination will provide a watertight or air tight seal. Sealant under head can reduce the effective grip range of the insert by .020" - .030" (0.5 - 0.76 mm).
- ▶ **Stud** - Inserts that have a male thread are available. These inserts are useful when used to mount a plate or cover that can be hung over the studs for ease of assembly.
- ▶ **Stainless Steel** - For extreme environments, the use of stainless steel may be required. All MaxTite® inserts are available in both 316 Stainless Steel and 430 Stainless Steel. While our SpinTite® parts can be manufactured in Stainless Steel, we recommend that the ATLAS FM™ designs be used for commercial applications since the body sizes are slightly smaller in diameter. This simplifies manufacturing and can dramatically decrease the piece price.
- ▶ **Thread Considerations** - Our catalog shows the most popular thread sizes. Even if not shown, other sizes are available such as 10-24, ¼-28 and 3/8-24. Minimum order quantities may apply.



SpinTite®, Plus+Tite® and ATLAS® FM™ are Unified 2B and Metric 6H thread classes. MaxTite parts are Unified 3B and Metric 6H. Our fastener threads are compliant with these classes before they are installed but dependent upon the condition of the mandrel and the tool pressure and/ or other application considerations could have adverse reactions to the after installed condition and gaugeability of the threads.

AET and AEW Swaging Inserts are tapped oversized to compensate for thread portion shrinkage during the installation process. They are not gaugeable prior to or after installation but will be compatible with Class 2A or 3A or Metric 6g screws after installation.

- ▶ **Insert removal** - Sometimes the insert has to be removed after it is installed for variety of reasons. When removal is required, the best method is to remove the fastener head. This can be accomplished by using an oversized drill bit and gently drilling into the counterbore until the head is removed. Then the body of the insert can be pushed through the mating material. Using a grinding wheel to carefully remove the head is another option.

## Installation Tooling

- ▶ **Spin-spin** - These tools work by running the mandrel into the insert until the air motor stalls. The rpm of the tool needs to be matched to the size of the insert. See the ATLAS tool selector guide for recommended tool models and air pressures. An air pressure regulator is always recommended.
- ▶ **Spin-pull** - These tools use a small air motor to place the insert on the mandrel. Insert the fastener into the mating hole and pull the trigger. The tool will axially pull the mandrel back to a pre-adjusted distance and then the air motor engages in reverse to complete the installation.
- ▶ **Pull-to-pressure** - Similar to spin-pull but with the addition of a pressure transducer that when adjusted properly, will sense the correct fastener installation and then complete the cycle. These tools are state-of-the-art for insert installation tools as they can properly install inserts across the full grip range quickly and consistently.



Rimlex® is a registered trademark of Inlex Locking Ltd.



# ATLAS® INSERT DESIGN GUIDE

As with all air tools, the correct air pressure is critical to proper operation. Air pressure regulators are always recommended. 90-100 psi is the recommended maximum pressure for all tools. Please see the ATLAS catalog for recommended air pressures for our spin-spin tools. The spin-pull and pull-to-pressure tools should always be operated in the range of 85-100 psi.

Air tools in a manufacturing environment will wear and need repair from time to time. Please see the ATLAS website for a list of authorized tool repair locations. ATLAS tools have a one year warranty for manufacturing defects. Parts and labor are covered.

When a very large number of inserts have to be installed repetitively, the use of robotics or automation may be necessary. Please contact us to discuss the application details and possible custom solutions.

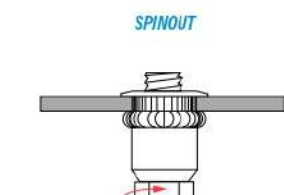


## Mating part/bolts

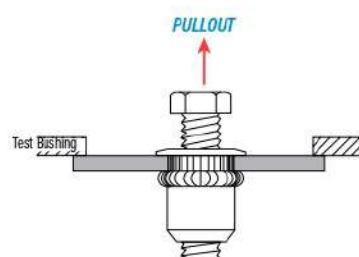
- ▶ Installation holes for ATLAS blind rivet nuts should be aligned to parent material to ensure a uniform backside formation. The hole size should meet the product tolerance and specification. The mating part should contact the head of the blind rivet nut to ensure optimum torque performance of the joint.
- ▶ The mating screw should be Grade 5 or Metric Class 8.8 strength. ATLAS blind rivet nuts are designed to meet the torque, tensile and clamp load of the mating fasteners. Thread fit may be 2A, 3A or Metric 6G design. The mating screw thread length should engage all threads of the blind rivet nut to ensure optimum torque strength.
- ▶ If an application requires a mating screw with a nylon patch, adhesive, or other thread locking mechanism, a hex body blind rivet nut in a hex hole will be needed to resist the prevailing torque created by the locking mechanism.



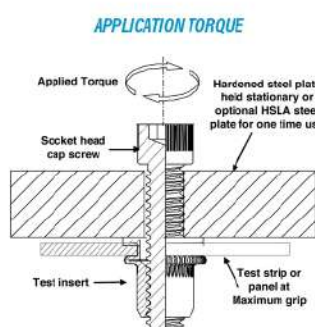
## Test Guidelines



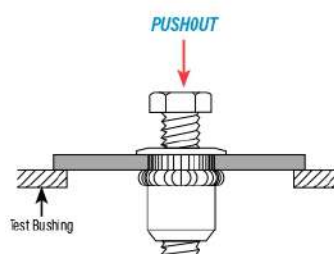
**Spinout** is the measure of the torsional holding power of the fastener in the parent material after installation without inducing clamp load on the fastener.



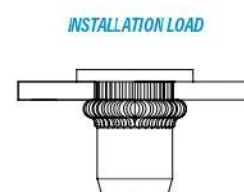
**Pullout** is the force required to pull the insert from the sheet.



**Application Torque** is the torque strength achieved by gradual tightening torque to failure of the insert in application.



**Pushout** is the force required to push the insert through the sheet.



**Installation Load** is the force required to collapse (bulb) the insert in the specified grip range (thickness of application).

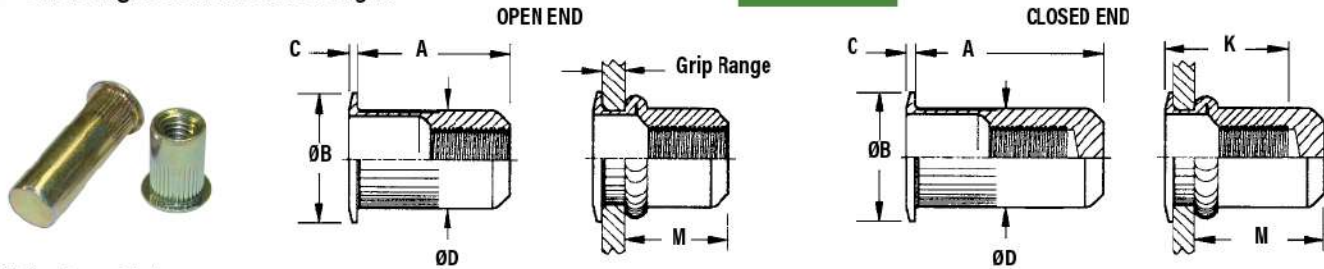
**Because of the variables regarding lubrication, plating, type and class of testing screw or bolt, we recommend that pilot testing should be conducted per the customer specific application requirements to achieve optimum performance values.**

# AEL™ SpinTite® LOW-PROFILE HEAD INSERTS

- Feature a large diameter, low-profile head and knurled shank.
- Offers highest all around strength.

Now available in stainless steel

For recommended installation tool, see tool selector guide on page 50.



All dimensions are in inches.

Thread Size (1)	Part Number (2)	Grip Range (1)	Open							Closed							Hole Size In Sheet +.006 -.000
			A ±.015	ØB ±.015	C Nom.	ØD Max.	M Ref.	Weight lbs./1000		A ±.015	ØB ±.015	C Nom.	ØD Max.	K Min.	M Ref.	Weight lbs./1000	
#6-32	AELS8-632-80	.020 - .080	.420	.390	.030	.265	.305	3.52		.740	.390	.030	.265	.43	.640	6.89	.266
#6-32	AELS8-632-130	.080 - .130	.470	.390	.030	.265	.305	3.77		.740	.390	.030	.265	.43	.580	6.78	.266
#8-32	AELS8-832-80	.020 - .080	.420	.390	.030	.265	.305	3.31		.740	.390	.030	.265	.43	.640	7.20	.266
#8-32	AELS8-832-130	.080 - .130	.470	.390	.030	.265	.305	3.40		.740	.390	.030	.265	.43	.580	7.04	.266
#10-32	AELS8-1032-130	.020 - .130	.475	.415	.030	.296	.315	4.62		.990	.415	.030	.296	.58	.845	11.63	.297
#10-32	AELS8-1032-225	.130 - .225	.585	.415	.030	.296	.315	4.83		.990	.415	.030	.296	.58	.735	10.49	.297
1/4-20	AELS8-420-165	.027 - .165	.580	.500	.030	.390	.380	9.26		1.190	.500	.030	.390	.70	1.005	29.30	.391
1/4-20	AELS8-420-260	.165 - .260	.680	.500	.030	.390	.380	9.39		1.190	.500	.030	.390	.70	.905	21.53	.391
5/16-18	AELS8-518-150	.027 - .150	.690	.685	.035	.530	.470	19.51		1.390	.685	.035	.530	.82	1.175	53.76	.531
5/16-18	AELS8-518-312	.150 - .312	.805	.685	.035	.530	.425	19.80		1.390	.685	.035	.530	.82	1.025	53.25	.531
3/8-16	AELS8-616-150	.027 - .150	.690	.685	.035	.530	.470	16.81		1.390	.685	.035	.530	.83	1.175	45.23	.531
3/8-16	AELS8-616-312	.150 - .312	.805	.685	.035	.530	.425	17.36		1.390	.685	.035	.530	.83	1.025	44.92	.531
1/2-13	AELS8-813-200	.063 - .200	1.150	.865	.047	.685	.850	48.02		1.960	.865	.047	.685	1.10	1.665	50.65	.688
1/2-13	AELS8-813-350	.200 - .350	1.300	.865	.047	.685	.850	51.65		1.960	.865	.047	.685	1.10	1.515	54.40	.688
1/2-13	AELS8-813-500	.350 - .500	1.450	.865	.047	.685	.850	54.60		1.960	.865	.047	.685	1.10	1.315	57.49	.688

All dimensions are in millimeters.

Thread Size x Pitch (1)	Part Number (2)	Grip Range (1)	Open							Closed							Hole Size In Sheet +0.15
			A ±0.38	ØB ±0.38	C Nom.	ØD Max.	M Ref.	Weight kg/1000		A ±0.38	ØB ±0.38	C Nom.	ØD Max.	K Min.	M Ref.	Weight kg/1000	
M4 x 0.7	AELS8-470-2.0	0.5 - 2	10.67	9.91	0.76	6.73	7.75	1.73		18.8	9.91	0.76	6.73	11.6	16.26	3.37	6.75
M4 x 0.7	AELS8-470-3.3	2 - 3.3	11.94	9.91	0.76	6.73	7.75	1.56		18.8	9.91	0.76	6.73	11.6	14.73	3.3	6.75
M5 x 0.8	AELS8-580-3.3	0.5 - 3.3	12.07	10.54	0.76	7.52	8	2.19		25.15	10.54	0.76	7.52	15.6	21.46	5.38	7.6
M5 x 0.8	AELS8-580-5.7	3.3 - 5.7	14.86	10.54	0.76	7.52	8	2.16		25.15	10.54	0.76	7.52	15.6	18.67	4.86	7.6
M6 x 1	AELS8-610-4.2	0.7 - 4.2	14.73	12.7	0.76	9.91	9.65	3.97		30.23	12.7	0.76	9.91	17.5	25.53	11.3	10
M6 x 1	AELS8-610-6.6	4.2 - 6.6	17.27	12.7	0.76	9.91	9.65	4.29		30.23	12.7	0.76	9.91	17.5	22.99	10.24	10
M8 x 1.25	AELS8-8125-3.8	0.7 - 3.8	17.53	17.4	0.89	13.46	11.94	8.5		35.31	17.4	0.89	13.46	20.2	29.85	24.35	13.5
M8 x 1.25	AELS8-8125-7.9	3.8 - 7.9	20.45	17.4	0.89	13.46	10.8	9.13		35.31	17.4	0.89	13.46	20.2	26.04	23.93	13.5
M10 x 1.5	AELS8-1015-3.8	0.7 - 3.8	17.53	17.4	0.89	13.46	11.94	7.13		35.31	17.4	0.89	13.46	20.8	29.85	20.62	13.5
M10 x 1.5	AELS8-1015-7.9	3.8 - 7.9	20.45	17.4	0.89	13.46	10.8	8.11		35.31	17.4	0.89	13.46	20.8	26.04	20.48	13.5
M12 x 1.75	AELS8-12175-5.1	1.6 - 5.1	29.21	21.97	1.19	17.4	21.59	21.78		49.78	21.97	1.19	17.4	17.94	42.29	22.97	17.47
M12 x 1.75	AELS8-12175-8.9	5.1 - 8.9	33.02	21.97	1.19	17.4	21.59	23.43		49.78	21.97	1.19	17.4	27.94	38.48	24.66	17.47

(1) Additional grip ranges and fine thread sizes such as 10-24, 1/4-28 and 3/8-24 are available. Minimum order quantities may apply.

(2) For closed end, add a "B" to the end of the part number.

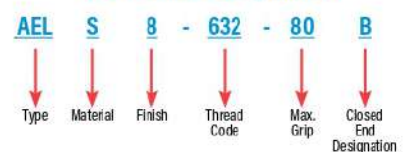
## ALSO AVAILABLE

AEL and AEK inserts are available in MONEL® alloy 400. AEL inserts are also available in wedge head, or sealed head styles (see page 25).

Call for availability.

MONEL® is a registered trademark of Special Metals Corporation.

## Part Number Designation



SEE PAGE 52 FOR MORE DETAIL

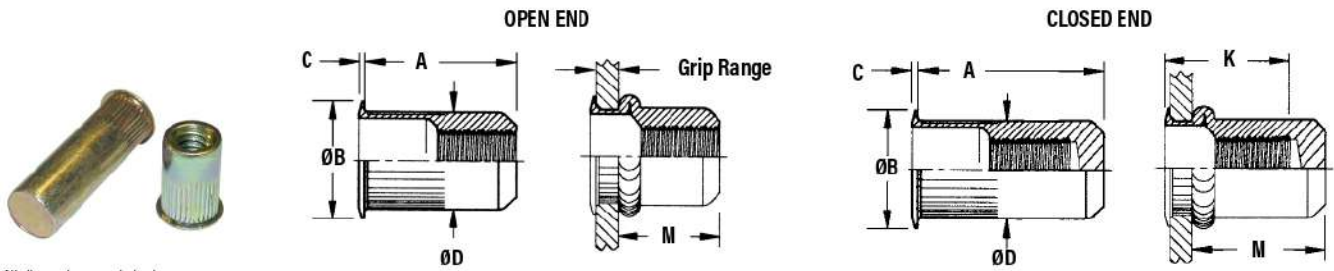


# AEK™ SpinTite® MINIMIZED-PROFILE HEAD INSERTS

- Feature a minimized-profile head and knurled shank.
- Allows near-flush installations with no need for special hole preparations such as countersinking or dimpling.

Now available in stainless steel

For recommended installation tool, see tool selector guide on page 50.



All dimensions are in inches

Thread Size (1)	Part Number (2)	Grip Range (1)	Open						Closed						Hole Size In Sheet +.006 -.000	
			A ±.015	ØB ±.015	C Nom.	ØD Max.	M Ref.	Weight lbs./1000	A ±.015	ØB ±.015	C Nom.	ØD Max.	K Min.	M Ref.		Weight lbs./1000
#6-32	AEKS8-632-80	.020 - .080	.420	.310	.019	.265	.305	3.5	.740	.310	.019	.265	.43	.640	5.24	.266
#6-32	AEKS8-632-130	.080 - .130	.470	.310	.019	.265	.305	3.44	.740	.310	.019	.265	.43	.580	5.06	.266
#8-32	AEKS8-832-80	.020 - .080	.420	.310	.019	.265	.305	3.3	.740	.310	.019	.265	.43	.640	5.75	.266
#8-32	AEKS8-832-130	.080 - .130	.470	.310	.019	.265	.305	3.11	.740	.310	.019	.265	.43	.580	5.57	.266
#10-32	AEKS8-1032-130	.020 - .130	.475	.340	.019	.296	.315	3.99	.990	.340	.019	.296	.58	.845	10.93	.297
#10-32	AEKS8-1032-225	.130 - .225	.585	.340	.019	.296	.315	4.39	.990	.340	.019	.296	.58	.735	10.59	.297
1/4-20	AEKS8-420-165	.027 - .165	.580	.455	.022	.390	.380	8.59	1.190	.455	.022	.390	.70	1.005	23.4	.391
1/4-20	AEKS8-420-260	.165 - .260	.680	.455	.022	.390	.380	8.69	1.190	.455	.022	.390	.70	.905	21.2	.391
5/16-18	AEKS8-518-150	.027 - .150	.690	.595	.022	.530	.470	17.98	1.390	.595	.022	.530	.82	1.175	55.62	.531
5/16-18	AEKS8-518-312	.150 - .312	.805	.595	.022	.530	.425	19.27	1.390	.595	.022	.530	.82	1.025	55.11	.531
3/8-16	AEKS8-616-150	.027 - .150	.690	.595	.022	.530	.470	15.58	1.390	.595	.022	.530	.83	1.175	41.18	.531
3/8-16	AEKS8-616-312	.150 - .312	.805	.595	.022	.530	.425	16.28	1.390	.595	.022	.530	.83	1.025	39.64	.531

All dimensions are in millimeters.

Thread Size x Pitch (1)	Part Number (2)	Grip Range (1)	Open						Closed						Hole Size In Sheet +015	
			A ±0.38	ØB ±0.38	C Nom.	ØD Max.	M Ref.	Weight kg/1000	A ±0.38	ØB ±0.38	C Nom.	ØD Max.	K Min.	M Ref.		Weight kg/1000
M4 x 0.7	AEKS8-470-2.0	0.5 - 2	10.67	787	0.48	6.73	7.75	1.5	18.8	778	0.48	6.73	11.6	16.26	2.61	6.75
M4 x 0.7	AEKS8-470-3.3	2 - 3.3	11.94	787	0.48	6.73	7.75	1.44	18.8	787	0.48	6.73	11.6	14.73	2.53	6.75
M5 x 0.8	AEKS8-580-3.3	0.5 - 3.3	12.07	864	0.48	7.52	8	1.81	2515	864	0.48	7.52	15.6	21.46	4.96	7.6
M5 x 0.8	AEKS8-580-5.7	3.3 - 5.7	14.86	864	0.48	7.52	8	1.99	2515	864	0.48	7.52	15.6	18.67	4.8	7.6
M6 x 1	AEKS8-610-4.2	0.7 - 4.2	14.73	1156	0.55	9.91	9.65	3.9	30.23	11.56	0.55	9.91	17.5	25.53	10.61	10
M6 x 1	AEKS8-610-6.6	4.2 - 6.6	17.27	1156	0.55	9.91	9.65	3.94	30.23	11.56	0.55	9.91	17.5	22.99	9.62	10
M8 x 1.25	AEKS8-8125-3.8	0.7 - 3.8	17.53	1511	0.55	13.46	11.94	8.04	35.31	15.11	0.55	13.46	20.2	29.85	25.23	13.5
M8 x 1.25	AEKS8-8125-7.9	3.8 - 7.9	20.45	1511	0.55	13.46	10.8	8.79	35.31	15.11	0.55	13.46	20.2	26.04	25	13.5
M10 x 1.5	AEKS8-1015-3.8	0.7 - 3.8	17.53	1511	0.55	13.46	11.94	6.66	35.31	15.11	0.55	13.46	20.8	29.85	18.68	13.5
M10 x 1.5	AEKS8-1015-7.9	3.8 - 7.9	20.45	1511	0.55	13.46	10.8	6.93	35.31	15.11	0.55	13.46	20.8	26.04	17.98	13.5

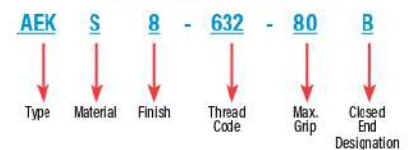
(1) Additional grip ranges and fine thread sizes such as 10-24, 1/4-28 and 3/8-24 are available. Minimum order quantities may apply.

(2) For closed end, add a "B" to the end of the part number.

## MATERIAL & FINISH SPECIFICATIONS

Type	Threads	Standard Material	Standard Finish
AELS / AEKS	Unified, 2B per ASME B1.1 Metric, 6H per ASME B1.13M	Low Carbon Steel	RoHS Compliant Zinc Yellow Plus Lubricant
AELC / AEKC	Unified, 2B per ASME B1.1 Metric, 6H per ASME B1.13M	Stainless Steel	Passivated and/or tested per ASTM A380
AELA / AEKA	Unified, 2B per ASME B1.1 Metric, 6H per ASME B1.13M	Aluminum	No finish
AELB / AEKB	Unified, 2B per ASME B1.1 Metric, 6H per ASME B1.13M	Brass	No finish

### Part Number Designation



SEE PAGE 52 FOR MORE DETAIL

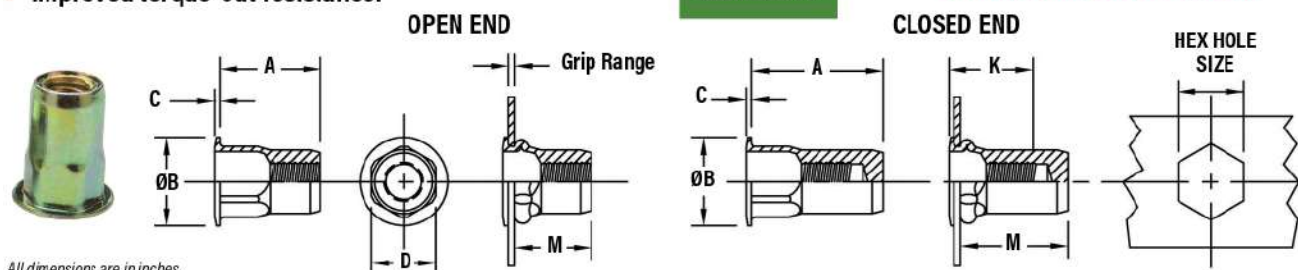


# AEH™ SpinTite® HALF-HEX SHANK LOW-PROFILE HEAD INSERTS

- Feature a hex body design.
- Improved torque-out resistance.

Now available in stainless steel

For recommended installation tool, see tool selector guide on page 50.



All dimensions are in inches.

Thread Size (1)	Part Number (2)	Grip Range (1)	Open							Closed							Hex Hole Size In Sheet +.006 -.000
			A ±.015	ØB ±.015	C Nom.	D Max.	M Ref.	Weight lbs./1000		A ±.015	ØB ±.015	C Nom.	D Max.	K Min.	M Ref.	Weight lbs./1000	
#6-32	AEHS8-632-80	.020 - .080	.385	.375	.027	.249	.295	3.59		.740	.375	.027	.249	.43	.640	6.97	.250
#6-32	AEHS8-632-130	.080 - .130	.435	.375	.027	.249	.295	3.95		.740	.375	.027	.249	.43	.580	7.28	.250
#8-32	AEHS8-832-80	.020 - .080	.385	.375	.027	.249	.295	3.38		.740	.375	.027	.249	.43	.640	7.28	.250
#8-32	AEHS8-832-130	.080 - .130	.435	.375	.027	.249	.295	4.53		.740	.375	.027	.249	.43	.580	8.82	.250
#10-32	AEHS8-1032-130	.020 - .130	.435	.390	.027	.280	.275	4.71	1.030	.390	.027	.280	.58	.845	11.6	.281	.281
#10-32	AEHS8-1032-225	.130 - .225	.535	.390	.027	.280	.275	5.04	1.030	.390	.027	.280	.58	.735	12.51	.281	.281
1/4-20	AEHS8-420-165	.027 - .165	.585	.510	.030	.374	.400	9.45	1.190	.510	.030	.374	.70	1.015	23.07	.375	.375
1/4-20	AEHS8-420-260	.165 - .260	.685	.510	.030	.374	.400	9.72	1.190	.510	.030	.374	.70	.915	23.69	.375	.375
5/16-18	AEHS8-518-150	.027 - .150	.685	.655	.035	.499	.530	18.75	1.445	.655	.035	.499	.82	1.235	53.53	.500	.500
5/16-18	AEHS8-518-312	.150 - .312	.845	.655	.035	.499	.515	21.25	1.445	.655	.035	.499	.82	1.220	54.04	.500	.500
3/8-16	AEHS8-616-150	.027 - .150	.685	.655	.035	.499	.530	17.24	1.445	.655	.035	.499	.83	1.235	45.94	.500	.500
3/8-16	AEHS8-616-312	.150 - .312	.845	.655	.035	.499	.515	19.65	1.445	.655	.035	.499	.83	1.220	46.45	.500	.500
1/2-13	AEHS8-813-200	.063 - .200	1.150	.865	.050	.688	.950	—	—	—	—	—	—	—	—	.689	.689
1/2-13	AEHS8-813-350	.200 - .350	1.300	.865	.050	.688	.950	—	—	—	—	—	—	—	—	.689	.689

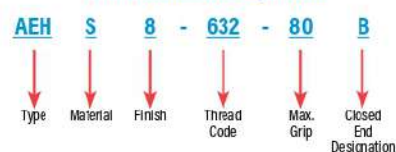
All dimensions are in millimeters.

Thread Size x Pitch (1)	Part Number (2)	Grip Range (1)	Open							Closed							Hex Hole Size In Sheet +.015
			A ±0.38	ØB ±0.38	C Nom.	D Max.	M Ref.	Weight kg/1000		A ±0.38	ØB ±0.38	C Nom.	D Max.	K Min.	M Ref.	Weight kg/1000	
M4 x 0.7	AEHS8-470-2.0	0.5 - 2	9.78	9.53	0.68	6.35	749	1.77	18.8	9.53	0.68	6.35	11.6	16.26	3.3	6.35	6.35
M4 x 0.7	AEHS8-470-3.3	2 - 3.3	11.05	9.53	0.68	6.35	749	1.89	18.8	9.53	0.68	6.35	11.6	14.73	4	6.35	6.35
M5 x 0.8	AEHS8-580-3.3	0.5 - 3.3	11.05	9.91	0.68	7.1	6.99	2.24	26.16	9.91	0.68	7.1	15.6	21.46	5.26	7.14	7.14
M5 x 0.8	AEHS8-580-5.7	3.3 - 5.7	13.59	9.91	0.68	7.1	6.99	2.33	26.16	9.91	0.68	7.1	15.6	18.67	5.67	7.14	7.14
M6 x 1	AEHS8-610-4.2	0.7 - 4.2	14.86	12.96	0.76	9.5	10.16	4.05	30.23	12.96	0.76	9.5	17.5	25.78	10.46	9.53	9.53
M6 x 1	AEHS8-610-6.6	4.2 - 6.6	17.4	12.96	0.76	9.5	10.16	4.45	30.23	12.96	0.76	9.5	17.5	23.24	10.75	9.53	9.53
M8 x 1.25	AEHS8-8125-3.8	0.7 - 3.8	17.4	16.64	0.89	12.7	13.46	8.51	36.7	16.64	0.89	12.7	20.2	31.37	24.28	12.7	12.7
M8 x 1.25	AEHS8-8125-7.9	3.8 - 7.9	21.46	16.64	0.89	12.7	13.08	9.64	36.7	16.64	0.89	12.7	20.2	30.99	24.51	12.7	12.7
M10 x 1.5	AEHS8-1015-3.8	0.7 - 3.8	17.4	16.64	0.89	12.7	13.46	7.82	36.7	16.64	0.89	12.7	20.8	31.37	20.84	12.7	12.7
M10 x 1.5	AEHS8-1015-7.9	3.8 - 7.9	21.46	16.64	0.89	12.7	13.08	8.91	36.7	16.64	0.89	12.7	20.8	30.99	21.07	12.7	12.7
M12 x 1.75	AEHS8-12175-5.1	1.6 - 5.1	29.21	21.97	1.27	17.48	24.13	—	—	—	—	—	—	—	—	17.5	17.5
M12 x 1.75	AEHS8-12175-8.9	5.1 - 8.9	33.02	21.97	1.27	17.48	24.13	—	—	—	—	—	—	—	—	17.5	17.5

## MATERIAL & FINISH SPECIFICATIONS

Type	Threads	Standard Material	Standard Finish
AEHS	Unified, 2B per ASME B1.1 Metric, 6H per ASME B1.13M	Low Carbon Steel	RoHS Compliant Zinc Yellow Plus Lubricant
AEHC	Unified, 2B per ASME B1.1 Metric, 6H per ASME B1.13M	Stainless Steel	Passivated and/or tested per ASTM A380
AEHA	Unified, 2B per ASME B1.1 Metric, 6H per ASME B1.13M	Aluminum	No finish
AEHB	Unified, 2B per ASME B1.1 Metric, 6H per ASME B1.13M	Brass	No finish

### Part Number Designation



SEE PAGE 52 FOR MORE DETAIL

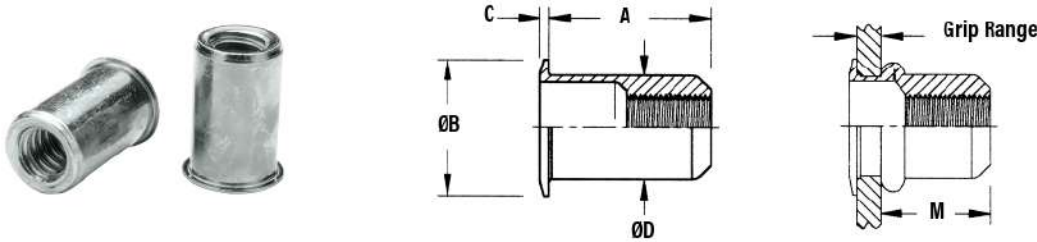
- (1) Additional grip ranges and fine thread sizes such as 10-24, 1/4-28 and 3/8-24 are available. Minimum order quantities may apply.  
 (2) For closed end, add a "B" to the end of the part number.



# AEO™ SpinTite® THIN-WALL LOW-PROFILE HEAD INSERTS

- Features a low-profile head design.
- Allows near-flush installations with no need for special hole preparations such as countersinking or dimpling.

For recommended installation tool, see tool selector guide on page 50.



All dimensions are in inches.

Thread Size <sup>(1)</sup>	Part Number	Grip Range <sup>(1)</sup>	A ±.015	ØB ±.015	C Nom.	ØD Max.	M Ref.	Hole Size In Sheet +.006 -.000	Weight lbs./1000
#6-32	AEOS10-632-80	.020 - .080	.385	.295	.018	.249	.315	.250	2.61
#8-32	AEOS10-832-80	.020 - .080	.385	.295	.018	.249	.315	.250	2.41
#10-24	AEOS10-1024-130	.020 - .130	.440	.320	.020	.280	.330	.281	—
#10-32	AEOS10-1032-130	.020 - .130	.440	.320	.020	.280	.330	.281	3.61
1/4-20	AEOS10-420-165	.030 - .165	.580	.425	.022	.374	.440	.375	8.22
1/4-28	AEOS10-428-165	.030 - .165	.580	.425	.022	.374	.440	.375	—
5/16-18	AEOS10-518-200	.040 - .200	.690	.560	.022	.499	.540	.500	16.64
5/16-24	AEOS10-524-200	.040 - .200	.690	.560	.022	.499	.540	.500	—
3/8-16	AEOS10-616-200	.040 - .200	.690	.560	.022	.499	.540	.500	13.03
3/8-24	AEOS10-624-200	.040 - .200	.690	.560	.022	.499	.540	.500	—

All dimensions are in millimeters.

Thread Size x Pitch <sup>(1)</sup>	Part Number	Grip Range <sup>(1)</sup>	A ±0.38	ØB ±0.25	C Nom.	ØD Max.	M Ref.	Hole Size In Sheet +0.15	Weight kg/1000
M4 x 0.7	AEOS10-470-2.0	0.5 - 2	9.78	7.49	0.46	6.32	8	6.4	1
M5 x 0.8	AEOS10-580-3.3	0.5 - 3.3	11.18	8.13	0.51	7.11	8.38	7.2	1.64
M6 x 1	AEOS10-610-4.2	0.75 - 4.2	14.73	10.8	0.56	9.5	11.18	9.6	3.87
M8 x 1.25	AEOS10-8125-5.1	1.02 - 5.1	17.53	14.22	0.56	12.67	13.72	12.7	7.34
M10 x 1.5	AEOS10-1015-5.1	1.02 - 5.1	17.53	14.22	0.56	12.67	13.72	12.7	5.75

## MATERIAL & FINISH SPECIFICATIONS

Type	Threads	Standard Material <sup>(2)</sup>	Standard Finish
AEO	Unified, 2B per ASME B1.1 Metric, 6H per ASME B1.13M	Low Carbon Steel	RoHS Compliant Zinc Clear Plus Lubricant

### Part Number Designation

AEO	S	10	- 632	- 80
Type	Material	Finish	Thread Code	Max. Grip

SEE PAGE 52 FOR MORE DETAIL

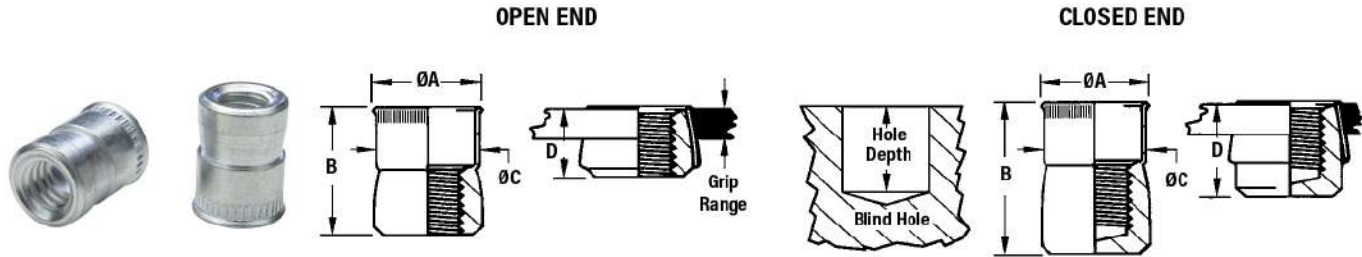
(1) Additional grip ranges and fine thread sizes such as 10-24, 1/4-28 and 3/8-24 are available. Minimum order quantities may apply.

(2) Other materials available. See page 52 for details. Minimum quantities may apply.

# AET™ SpinTite® 360° SWAGING LOW-PROFILE HEAD INSERTS

- Works in any thickness over .029"/0.76 mm including blind applications.
- Minimal backside protrusion for restricted space applications.

For recommended installation tool, see tool selector guide on page 50.



All dimensions are in inches.

Thread Size	Type			Thread Code	Installation Hole Size				Open							Closed				Blind Hole Depth Min.
	Steel	Stain-less	Alum-inum		Grip Range				ØA ±.005	B ±.015	ØC Max.	D Ref.	Weight lbs./1000			ØA ±.005	B ±.015	ØC Max.	D Ref.	
					.030 - .090	.091 - .124	.125 - .186	.187 - OVER					AETS	AETC	AETA					
#4-40	AETS	AETC	AETA	440	.188	.194	.194	.196	.211	.370	.1875	.205	0.99	0.99	0.33	.211	.660	.1875	.495	.400
#6-32	AETS	AETC	AETA	632	.219	.221	.228	.228	.240	.370	.2185	.205	1.48	1.48	0.49	.240	.675	.2185	.505	.400
#8-32	AETS	AETC	AETA	832	.250	.257	.266	.266	.269	.370	.2495	.205	1.98	1.98	0.65	.269	.675	.2495	.505	.400
#10-24	AETS	AETC	AETA	1024	.281	.290	.290	.297	.306	.370	.2805	.205	2.22	2.22	0.74	.306	.685	.2805	.520	.400
#10-32	AETS	AETC	AETA	1032	.281	.290	.290	.297	.306	.370	.2805	.205	2.23	2.23	0.74	.306	.685	.2805	.520	.400
1/4-20	AETS	AETC	AETA	420	.375	.375	.386	.391	.400	.515	.3745	.275	5.94	5.94	1.98	.400	1.005	.3745	.760	.540
5/16-18	AETS	AETC	AETA	518	.500	.500	.516	.516	.528	.615	.4995	.325	12.74	12.74	4.26	.528	1.065	.4995	.770	.640
3/8-16	AETS	AETC	AETA	616	.563	.563	.578	.578	.588	.745	.5615	.390	17.82	17.82	5.94	.588	1.450	.5615	1.095	.770
1/2-13	AETS	AETC	AETA	813	.750	.766	.781	.790	.800	.935	.7485	.485	19.50	19.50	6.27	.800	NA	.7485	NA	.960

All dimensions are in millimeters.

Thread Size x Pitch	Type			Thread Code	Installation Hole Size				Open							Closed				Blind Hole Depth Min.
	Steel	Stain-less	Alum-inum		Grip Range				ØA ±0.13	B ±0.38	ØC Max.	D Ref.	Weight kg/1000			ØA ±0.13	B ±0.38	ØC Max.	D Ref.	
					0.76 - 2.3	2.31 - 3.15	3.16 - 4.75	4.76 - OVER					AETS	AETC	AETA					
M3x0.5	AETS	AETC	AETA	350	4.75	4.9	4.9	4.97	5.36	9.4	4.76	5.21	—	—	—	5.36	16.77	4.76	12.57	10.16
M4x0.7	AETS	AETC	AETA	470	6.35	6.5	6.74	6.74	6.83	9.4	6.34	5.21	0.45	0.45	0.3	6.83	17.15	6.34	12.83	10.16
M5x0.8	AETS	AETC	AETA	580	7.14	7.37	7.4	7.54	7.77	9.4	7.12	5.21	0.9	0.9	0.34	7.77	17.4	7.12	13.21	10.16
M6x1	AETS	AETC	AETA	610	9.52	9.52	9.8	9.92	10.16	13.08	9.51	6.99	1.01	1.01	0.9	10.16	25.53	9.51	19.3	13.72
M8x1.25	AETS	AETC	AETA	8125	12.7	12.7	13.09	13.09	13.41	15.62	12.69	8.26	5.78	5.78	1.93	13.41	27.05	12.69	19.56	16.26
M10x1.5	AETS	AETC	AETA	1015	14.28	14.28	14.68	14.68	14.94	18.92	14.26	9.91	8.35	8.35	2.7	14.94	36.83	14.26	27.81	19.56
M12x1.75	AETS	AETC	AETA	12175	19.05	19.44	19.84	20.05	20.32	23.75	19.01	12.32	8.85	8.85	2.84	20.32	NA	19.01	NA	24.38

Additional grip ranges and fine thread sizes such as 10-24, 1/4-28 and 3/8-24 are available. Minimum order quantities may apply.

**NOTE:** The internal threads are manufactured oversized to compensate for resulting thread portion shrinkage during the installation process. They are not gaugeable prior to or after installation but will be compatible with Class 2A/3A or 6g screws after installation.

Available in RoHS compliant Tin/Zinc plate

## Part Number Designation



SEE PAGE 52 FOR MORE DETAIL

## MATERIAL & FINISH SPECIFICATIONS

Type	Standard Material <sup>(1)</sup>	Standard Finish
AETS	Low Carbon Steel	Cadmium Plate per SAE AMS-QQ-P-416, Class III, Type I
AETC	300 Series Stainless Steel	Cadmium Plate per SAE AMS-QQ-P-416, Class III, Type I
AETA	Aluminum	Cadmium Plate per SAE AMS-QQ-P-416, Class III, Type I

(1) Other materials available. See page 52 for details. Minimum quantities may apply.

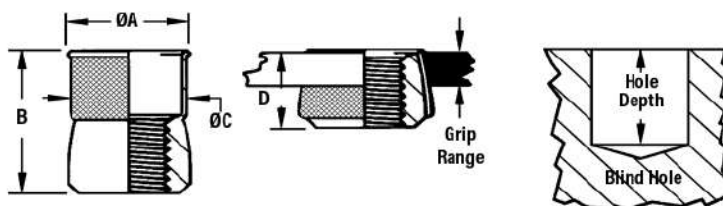




# AEW™ SpinTite® 360° SWAGING LOW-PROFILE HEAD INSERTS

- Knurls under the head of the insert increase spinout resistance.
- Works in any thickness over .062"/1.57 mm including blind applications.
- Minimal backside protrusion for restricted space applications.

For recommended installation tool, see tool selector guide on page 50.



All dimensions are in inches.

Thread Size	Type		Thread Code	Installation Hole Size +.005 -.000	ØA ±.005	B ±.015	ØC Max.	D Ref.	Blind Hole Depth Min.	Weight lbs./1000	
	Steel	Brass								AEWS	AEWB
#6-32	AEWS	AEWB	632	.234	.255	.370	.233	.205	.400	1.62	1.68
#8-32	AEWS	AEWB	832	.266	.285	.370	.264	.205	.400	2.08	2.18
#10-24	AEWS	AEWB	1024	.297	.320	.370	.295	.205	.400	2.47	2.47
#10-32	AEWS	AEWB	1032	.297	.320	.370	.295	.205	.400	2.47	2.47
1/4-20	AEWS	AEWB	420	.391	.415	.515	.389	.275	.540	6.04	6.69
5/16-18	AEWS	AEWB	518	.531	.550	.615	.528	.325	.640	12.67	14.37
3/8-16	AEWS	AEWB	616	.594	.615	.740	.590	.390	.770	17.22	20.09

All dimensions are in millimeters.

Thread Size x Pitch	Type		Thread Code	Installation Hole Size +0.13	ØA ±0.13	B ±0.38	ØC Max.	D Ref.	Blind Hole Depth Min.	Weight kg/1000	
	Steel	Brass								AEWS	AEWB
M4 x 0.7	AEWS	AEWB	470	6.75	7.24	9.4	6.71	5.21	10.16	0.94	0.99
M5 x 0.8	AEWS	AEWB	580	7.54	8.13	9.4	7.5	5.21	10.16	1.12	1.12
M6 x 1	AEWS	AEWB	610	9.92	10.54	13.08	9.88	6.99	13.72	2.74	2.96
M8 x 1.25	AEWS	AEWB	8125	13.49	13.97	15.62	13.41	8.26	16.26	5.75	6.52
M10 x 1.5	AEWS	AEWB	1015	15	15.62	18.8	14.99	9.91	19.56	7.81	9.11

Additional grip ranges and fine thread sizes such as 10-24, 1/4-28 and 3/8-24 are available. Minimum order quantities may apply.

**NOTE:** The internal threads are manufactured oversized to compensate for resulting thread portion shrinkage during the installation process. They are not gaugeable prior to or after installation but will be compatible with Class 2A/3A or 6g screws after installation.



Available in RoHS compliant Tin/Zinc plate

## Part Number Designation



\* None = Cadmium Plate (standard)  
9 = Tin/Zinc Plate (optional)

SEE PAGE 52 FOR MORE DETAIL

## MATERIAL & FINISH SPECIFICATIONS

Type	Standard Material <sup>(1)</sup>	Standard Finish
AEWS	Low Carbon Steel	Cadmium Plate per SAE AMS-QQ-P-416, Class III, Type I
AEWB	Free-machining Leaded brass	Cadmium Plate per SAE AMS-QQ-P-416, Class III, Type I

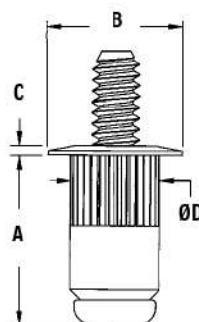
(1) Other materials available. See page 52 for details. Minimum quantities may apply.

# AES™ SpinTite® BLIND THREADED STUDS

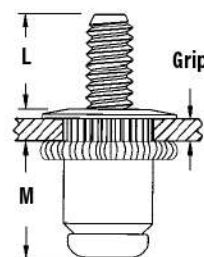
- Provides strong external threads in blind applications.
- Easy to install using spin-spin or pull-to-pressure tooling.
- Available with MATHread® anti cross-threading feature.



**NOTE:** The "L" dimension is the height of the installed stud at max grip. The height of the stud will increase if it is installed into thinner material. To calculate "actual L" use this formula: max grip - actual grip + L = "actual L"



For recommended installation tool, see tool selector guide on page 50.



All dimensions are in inches.

Thread Size	Grip Code	Grip Range	Part Number Description	Stud Length "L" Nom. (at Max. Grip) / ATLAS Stocking Order Number			A ±.020	B ±.015	C Nom.	ØD Max.	M Ref.	Hole Size In Sheet +.006 -.000
#6-32	80	.020 - .080	AESS-632-80-L	.500 / AES9058	.625 / AES9059	.750 / AES9060	.490	.390	.030	.265	.375	.266
#6-32	130	.080 - .130	AESS-632-130-L	.450 / AES9055	.575 / AES9056	.700 / AES9057	.540	.390	.030	.265	.375	.266
#8-32	80	.020 - .080	AESS-832-80-L	.500 / AES9070	.625 / AES9071	.750 / AES9072	.490	.390	.030	.265	.375	.266
#8-32	130	.080 - .130	AESS-832-130-L	.450 / AES9067	.575 / AES9068	.700 / AES9069	.540	.390	.030	.265	.375	.266
#10-24	130	.020 - .130	AESS-1024-130-L	.500 / AES9007	.625 / AES9008	.750 / AES9009	.545	.415	.030	.296	.385	.297
#10-24	225	.130 - .225	AESS-1024-225-L	.405 / AES9010	.530 / AES9011	.655 / AES9012	.655	.415	.030	.296	.385	.297
#10-32	130	.020 - .130	AESS-1032-130-L	.500 / AES9013	.625 / AES9014	.750 / AES9015	.545	.415	.030	.296	.385	.297
#10-32	225	.130 - .225	AESS-1032-225-L	.405 / AES9016	.530 / AES9017	.655 / AES9018	.655	.415	.030	.296	.385	.297
1/4-20	165	.027 - .165	AESS-420-165-L	.625 / AES9020	.8125 / AES9021	1.000 / AES9019	.670	.500	.030	.390	.470	.391
1/4-20	260	.165 - .260	AESS-420-260-L	.530 / AES9022	.7175 / AES9023	.905 / AES9024	.770	.500	.030	.390	.470	.391
5/16-18	150	.027 - .150	AESS-518-150-L	.625 / AES9032	.875 / AES9033	1.125 / AES9031	.805	.685	.035	.530	.585	.531
5/16-18	312	.150 - .312	AESS-518-312-L	.530 / AES9034	.713 / AES9035	.963 / AES9036	.920	.685	.035	.530	.540	.531
3/8-16	150	.027 - .150	AESS-616-150-L	.750 / AES9051	1.000 / AES9049	1.250 / AES9050	.805	.685	.035	.530	.585	.531
3/8-16	312	.150 - .312	AESS-616-312-L	.588 / AES9053	.838 / AES9054	1.088 / AES9052	.920	.685	.035	.530	.540	.531

All dimensions are in millimeters.

Thread Size x Pitch	Grip Code	Grip Range	Part Number Description	Stud Length "L" Nom. (at Max. Grip) / ATLAS Stocking Order Number			A ±0.51	B ±0.38	C Nom.	ØD Max.	M Ref.	Hole Size In Sheet +0.15
M4 x 0.7	2.0	0.5 - 2.0	AESS-470-2.0-L	12 / AES9025	15 / AES9026	20 / AES9027	12.45	9.91	0.76	6.73	9.53	6.75
M4 x 0.7	3.3	2.0 - 3.3	AESS-470-3.3-L	10.7 / AES9028	13.7 / AES9029	18.7 / AES9030	13.72	9.91	0.76	6.73	9.53	6.75
M5 x 0.8	3.3	0.5 - 3.3	AESS-580-3.3-L	12 / AES9037	15 / AES9038	20 / AES9039	13.85	10.54	0.76	7.52	9.78	7.6
M5 x 0.8	5.7	3.3 - 5.7	AESS-580-5.7-L	9.6 / AES9042	12.6 / AES9040	17.6 / AES9041	16.64	10.54	0.76	7.52	9.78	7.6
M6 x 1	4.2	0.7 - 4.2	AESS-610-4.2-L	15 / AES9043	20 / AES9044	25 / AES9045	17.02	12.7	0.76	9.91	11.94	10
M6 x 1	6.6	4.2 - 6.6	AESS-610-6.6-L	12.6 / AES9046	17.6 / AES9047	22.6 / AES9048	19.56	12.7	0.76	9.91	11.94	10
M8 x 1.25	3.8	0.7 - 3.8	AESS-8125-3.8-L	16 / AES9061	22 / AES9062	28 / AES9063	20.45	17.4	0.89	13.46	14.86	13.5
M8 x 1.25	7.9	3.8 - 7.9	AESS-8125-7.9-L	13 / AES9064	17.9 / AES9065	23.9 / AES9066	23.37	17.4	0.89	13.46	13.72	13.5
M10 x 1.5	3.8	0.7 - 3.8	AESS-1015-3.8-L	20 / AES9001	25 / AES9002	30 / AES9003	20.45	17.4	0.89	13.46	14.86	13.5
M10 x 1.5	7.9	3.8 - 7.9	AESS-1015-7.9-L	17 / AES9004	20.9 / AES9005	25.9 / AES9006	23.37	17.4	0.89	13.46	13.72	13.5

**NOTE:** The standard is assembled with an AEL insert but can also be assembled with an AEK or an AEH insert.

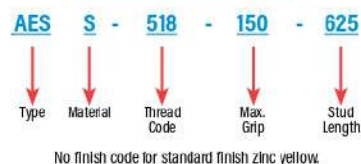
MATHread® is a trademark of MATHread, Inc.

## MATERIAL & FINISH SPECIFICATIONS

Type	Threads	Standard Material <sup>(1)</sup>	Standard Finish
AES	Unified, 2A per ASME B1.1 Metric, 6g per ASME B1.13M	Insert - Low Carbon Steel Stud - Heat-treated carbon steel	RoHS Compliant Zinc Yellow

(1) Other materials available. See page 52 for details. Minimum quantities may apply.

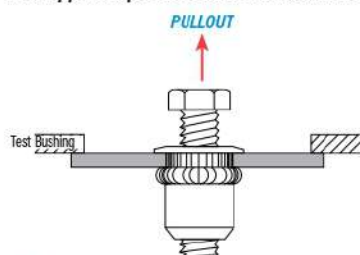
### Part Number Designation



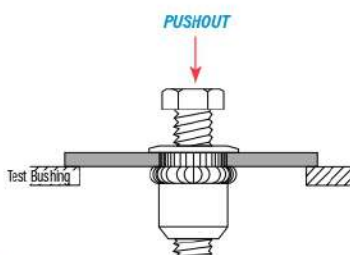


# AEL™ AND AEK™ SpinTite® PERFORMANCE DATA

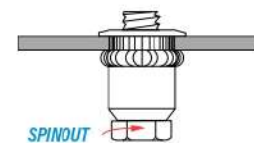
Data applies to parts made from low carbon steel.



**Pullout** is the force required to pull the insert from the sheet. (1)



**Pushout** is the force required to push the insert through the sheet. (2)



Per Application

**Spinout** is the measure of the torsional holding power of the fastener in the parent material after installation without inducing clamp load on the fastener.

Thread Size	Max. Grip	Test Sheet	Near Minimum Grip				Near Maximum Grip				
			Thickness (in.)	Sheet Hardness	Pullout (lbs.)	Spinout (in. lbs.)	Thickness (in.)	Sheet Hardness	Pullout (lbs.)	Pushout (lbs.)	
										AEL	AEK
6-32 & 8-32	.080	Aluminum	.032	HRB 48	339	—	.060	HRB 67	897	—	—
		Cold-rolled Steel	.030	HRB 37	339	13	.071	HRB 43	969	689	390
	.130	Aluminum	.090	HRB 66	1515	—	.123	HRB 63	1684	—	—
		Cold-rolled Steel	.087	HRB 75	1514	17	.115	HRB 52	1869	689	390
10-32 & 10-24	.130	Aluminum	.030	HRB 28	342	—	.125	HRB 57	2284	—	—
		Cold-rolled Steel	.029	HRB 47	469	21	.128	HRB 49	2429	940	408
	.225	Aluminum	.136	HRB 20	2464	—	.185	HRB 57	2220	—	—
		Cold-rolled Steel	.165	HRB 56	2530	21	.187	HRB 77	2442	940	408
1/4-20 & 1/4-28	.165	Aluminum	.032	HRB 48	561	—	.125	HRB 57	2441	—	—
		Cold-rolled Steel	.030	HRB 43	581	39	.165	HRB 56	3448	744	615
	.260	Aluminum	.185	HRB 58	2798	—	.250	HRB 60	3796	—	—
		Cold-rolled Steel	.165	HRB 56	3028	39	.247	HRB 96	3370	744	615
5/16-18, 5/16-24, & 3/8-16	.150	Aluminum	.032	HRB 48	668	—	.125	HRB 57	3602	—	—
		Cold-rolled Steel	.030	HRB 43	687	75	.115	HRB 52	3478	1505	901
	.312	Aluminum	.185	HRB 60	5152	—	.312	HRB 52	6451	—	—
		Cold-rolled Steel	.165	HRB 60	4934	60	.312	HRB 90	5975	1505	901

Thread Size	Max. Grip	Test Sheet	Near Minimum Grip				Near Maximum Grip				
			Thickness (mm)	Sheet Hardness	Pullout (kN)	Spinout (N-m)	Thickness (mm)	Sheet Hardness	Pullout (kN)	Pushout (kN)	
										AEL	AEK
M4	2.0	Aluminum	0.8	HRB 48	1.5	—	1.5	HRB 67	4	—	—
		Cold-rolled Steel	0.8	HRB 37	1.5	2	1.8	HRB 43	4.3	3.1	1.7
	3.3	Aluminum	2.3	HRB 66	6.7	—	3.1	HRB 63	7.5	—	—
		Cold-rolled Steel	2.2	HRB 75	6.7	2	2.9	HRB 52	8.3	3.1	1.7
M5	3.3	Aluminum	0.8	HRB 28	1.5	—	3.1	HRB 57	10.2	—	—
		Cold-rolled Steel	0.7	HRB 47	2.1	2.3	3.3	HRB 49	10.8	4.2	1.8
	5.7	Aluminum	3.5	HRB 20	11	—	4.7	HRB 57	9.9	—	—
		Cold-rolled Steel	4.2	HRB 56	11.3	2.3	4.7	HRB 77	10.9	4.2	1.8
M6	4.2	Aluminum	0.8	HRB 48	2.5	—	3.2	HRB 57	10.9	—	—
		Cold-rolled Steel	0.8	HRB 43	2.6	4.4	4.2	HRB 56	15.3	3.3	2.7
	6.6	Aluminum	4.7	HRB 58	12.4	—	6.4	HRB 60	16.9	—	—
		Cold-rolled Steel	4.2	HRB 56	13.5	4.4	6.3	HRB 96	15	3.3	2.7
M8 & M10	3.8	Aluminum	0.8	HRB 48	3	—	3.2	HRB 57	16	—	—
		Cold-rolled Steel	0.8	HRB 43	3.1	8.5	2.9	HRB 52	15.5	6.7	4
	7.9	Aluminum	4.7	HRB 60	22.9	—	7.9	HRB 52	28.7	—	—
		Cold-rolled Steel	4.2	HRB 60	21.9	6.6	7.9	HRB 90	26.6	6.7	4

**NOTE:** Data given is the average of multiple tests. Values are for reference only and in no way should be used as actual pass/fail criterion.

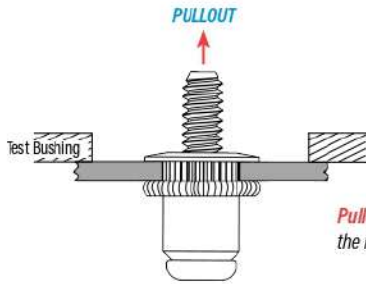
**NOTE:** Most testing performed in material thickness of 20 to 80% of fastener grip.

**NOTE:** All test were conducted using steel inserts and components.

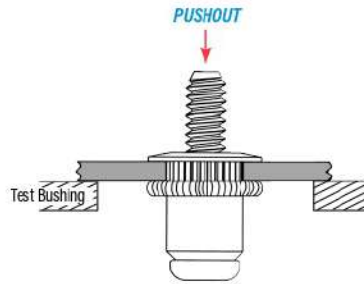
**NOTE:** This data is provided for comparative information only.

# AES™ SpinTite® PERFORMANCE DATA

Data applies to parts made from low carbon steel.



*Pullout is the force required to pull the insert from the sheet.*



*Pushout is the force required to push the insert through the sheet.*

Thread Size	Max. Grip (in.)	Test Sheet	Near Minimum Grip			Near Maximum Grip			
			Thickness (in.)	Sheet Hardness	Pullout (lbs.)	Thickness (in.)	Sheet Hardness	Pullout (lbs.)	Pushout (lbs.) <sup>(1)</sup>
6-32	.080	Aluminum	.032	HRB 48	339	.060	HRB 67	897	—
		Cold-rolled Steel	.030	HRB 37	339	.071	HRB 43	969	689
	.130	Aluminum	.090	HRB 66	1186	.123	HRB 63	1186	—
		Cold-rolled Steel	.087	HRB 75	1186	.115	HRB 52	1186	689
8-32	.080	Aluminum	.032	HRB 48	339	.060	HRB 67	897	—
		Cold-rolled Steel	.030	HRB 37	339	.071	HRB 43	969	689
	.130	Aluminum	.090	HRB 66	1515	.123	HRB 63	1684	—
		Cold-rolled Steel	.087	HRB 75	1514	.115	HRB 52	1828	689
10-24	.130	Aluminum	.030	HRB 28	342	.125	HRB 57	2284	—
		Cold-rolled Steel	.029	HRB 47	469	.128	HRB 49	2429	940
	.225	Aluminum	.136	HRB 20	2288	.185	HRB 57	2220	—
		Cold-rolled Steel	.165	HRB 56	2288	.187	HRB 77	2288	940
10-32	.130	Aluminum	.030	HRB 28	342	.125	HRB 57	2284	—
		Cold-rolled Steel	.029	HRB 47	469	.128	HRB 49	2429	940
	.225	Aluminum	.136	HRB 20	2464	.185	HRB 57	2220	—
		Cold-rolled Steel	.165	HRB 56	2530	.187	HRB 77	2442	940
1/4-20 & 1/4-28	.165	Aluminum	.032	HRB 48	561	.125	HRB 57	2441	—
		Cold-rolled Steel	.030	HRB 43	581	.165	HRB 56	3448	744
	.260	Aluminum	.185	HRB 58	2798	.250	HRB 60	3796	—
		Cold-rolled Steel	.165	HRB 56	3028	.247	HRB 96	3370	744
5/16-18, 5/16-24, & 3/8-16	.150	Aluminum	.032	HRB 48	668	.125	HRB 57	3602	—
		Cold-rolled Steel	.030	HRB 43	687	.115	HRB 52	3478	1505
	.312	Aluminum	.185	HRB 60	5152	.312	HRB 52	6451	—
		Cold-rolled Steel	.165	HRB 60	4934	.312	HRB 90	5975	1505

Thread Size	Max. Grip (mm)	Test Sheet	Near Minimum Grip			Near Maximum Grip			
			Thickness (mm)	Sheet Hardness	Pullout (kN)	Thickness (mm)	Sheet Hardness	Pullout (kN)	Pushout (kN) <sup>(1)</sup>
M4	2.0	Aluminum	0.8	HRB 48	1.5	1.5	HRB 67	4	—
		Cold-rolled Steel	0.8	HRB 37	1.5	1.8	HRB 43	4.3	3.1
	3.3	Aluminum	2.3	HRB 66	6.7	3.1	HRB 63	75	—
		Cold-rolled Steel	2.2	HRB 75	6.7	2.9	HRB 52	79	3.1
M5	3.3	Aluminum	0.8	HRB 28	1.5	3.1	HRB 57	10.2	—
		Cold-rolled Steel	0.7	HRB 47	2.1	3.3	HRB 49	10.8	4.2
	5.7	Aluminum	3.5	HRB 20	11	4.7	HRB 57	9.9	—
		Cold-rolled Steel	4.2	HRB 56	11.3	4.7	HRB 77	10.9	4.2
M6	4.2	Aluminum	0.8	HRB 48	2.5	3.2	HRB 57	10.9	—
		Cold-rolled Steel	0.8	HRB 43	2.6	4.2	HRB 56	15.3	3.3
	6.6	Aluminum	4.7	HRB 58	12.4	6.4	HRB 60	16.9	—
		Cold-rolled Steel	4.2	HRB 56	13.5	6.3	HRB 96	15	3.3
M8 & M10	3.8	Aluminum	0.8	HRB 48	3	3.2	HRB 57	16	—
		Cold-rolled Steel	0.8	HRB 43	3.1	2.9	HRB 52	15.5	6.7
	7.9	Aluminum	4.7	HRB 60	22.9	7.9	HRB 52	28.7	—
		Cold-rolled Steel	4.2	HRB 60	21.9	7.9	HRB 90	26.6	6.7

(1) Values reported are averages when all installation specifications and procedures are followed. Variations in mounting hole size and installation procedure will affect results. Performance testing of this product in your application is recommended. We will be happy to provide samples for this purpose.

For questions, e-mail Technical Support: [techsupport@pemnet.com](mailto:techsupport@pemnet.com)



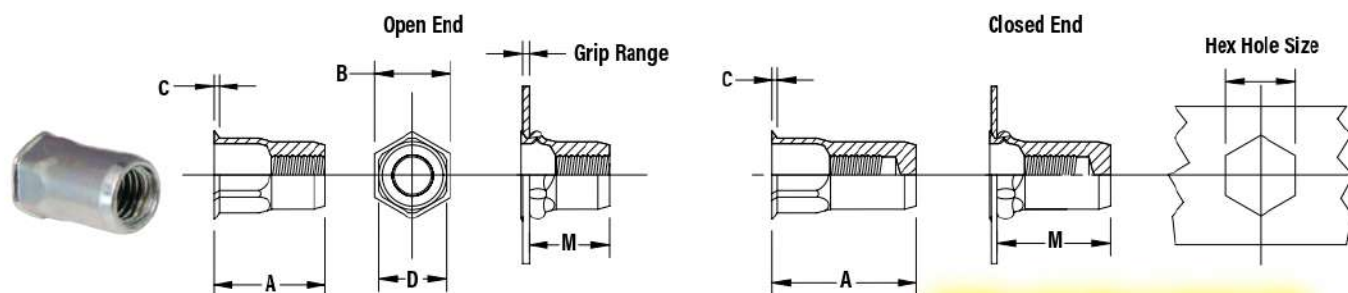
# ATLAS® FM™ FULL METRIC BLIND THREADED INSERTS

The **ATLAS® FM™** inserts meet European design standards. The installation hole sizes are full metric and the standard finish on the inserts is zinc clear. Inserts with head style "T" provides virtually flush installation. These inserts are installed using "spin-pull" or "pull-to-pressure" installation tools. AETH inserts, shown below, are available in unified sizes. Other types are also available in unified thread sizes. Please call for availability.

For recommended installation tool, see tool selector guide on page 50. See page 53 for part number key.

- Install into metric size round or hex holes.
- Available in thread sizes M3 to M10.
- Available in a variety of head styles: Flat, thin, and countersunk.
- Available in a variety of body types: Round (smooth and knurled), half hex, and full hex.
- Available in a variety of materials: Steel, stainless steel, aluminum, and brass.

## AETH™ THIN HEAD SEMIHEX BODY HEX COUNTERBORE INSERTS



All dimensions are in inches.

Thread Size	Type	Grip Range	Open					Closed					Hex Hole Size +.006 -.000
	Steel		A ±.010	B ±.010	C ±.005	D Max.	M Ref.	A ±.010	B ±.010	C ±.005	D Max.	M Ref.	
#8-32	AETHS	.020 - .080	.437	.260	.018	.235	.256	.667	.260	.018	.236	.484	.236
#10-24	AETHS	.020 - .120	.488	.303	.018	.275	.297	.724	.303	.018	.275	.508	.276
#10-24	AETHS	.120 - .220	.587	.303	.018	.275	.297	.823	.303	.018	.275	.508	.276
#10-32	AETHS	.020 - .120	.488	.303	.018	.275	.297	.724	.303	.018	.275	.508	.276
#10-32	AETHS	.120 - .220	.587	.303	.018	.275	.297	.823	.303	.018	.275	.508	.276
1/4-20	AETHS	.020 - .120	.587	.394	.020	.353	.309	.898	.394	.020	.354	.654	.354
		.120 - .220	.685	.394	.020	.353	.344	.996	.394	.020	.354	.654	.354
5/16-18	AETHS	.020 - .120	.650	.472	.025	.432	.419	.996	.472	.025	.433	.724	.433
		.120 - .220	.748	.472	.025	.432	.419	1.094	.472	.025	.433	.724	.433

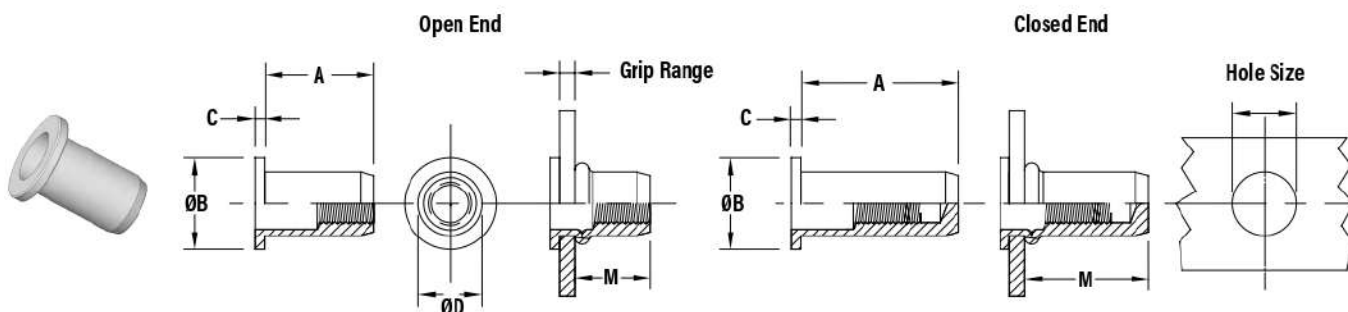
All dimensions are in millimeters.

Thread Size x Pitch	Type	Grip Range	Open					Closed					Hex Hole Size +.01
	Steel		A ±0.25	B ±0.25	C ±0.13	D Max.	M Ref.	A ±0.25	B ±0.25	C ±0.13	D Max.	M Ref.	
M3 X 0.5	AETHS	0.5 - 2.0	10.05	5.5	0.46	5	6.30	14.40	5.5	0.46	5	10.60	5
M4 x 0.7	AETHS	0.5 - 2.5	11.10	6.6	0.46	5.98	6.50	16.95	6.6	0.46	6	12.30	6
M5 x 0.8	AETHS	0.5 - 3.0	12.40	7.7	0.46	6.98	7.55	18.40	7.7	0.46	6.98	12.90	7
		3.0 - 5.5	14.90				6.95	20.90					
M6 x 1	AETHS	0.5 - 3.0	14.90	10	0.50	8.98	7.85	22.80	10	0.50	8.98	16.60	9
		3.0 - 5.5	17.40				8.75	25.30					
M8 x 1.25	AETHS	0.5 - 3.0	16.50	12	0.63	10.98	10.65	25.30	12	0.63	11	18.40	11
		3.0 - 5.5	19.00				9.65	27.80					
M10 x 1.5	AETHS	0.7 - 3.5	20.30	14.2	0.74	13	12.25	31.95	14.2	0.74	13	23.90	13

# ATLAS® FM™ FULL METRIC BLIND THREADED INSERTS

## AEFR™ FLAT HEAD ROUND BODY INSERTS

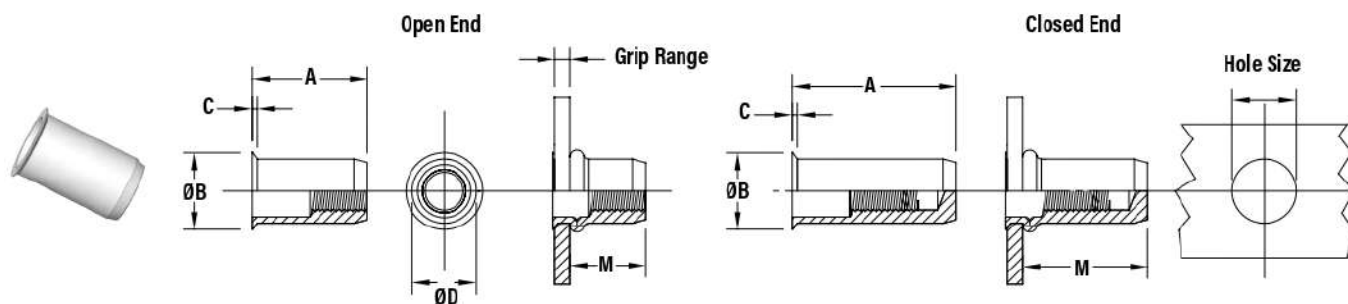
For recommended installation tool, see tool selector guide on page 50. See page 53 for part number key.



All dimensions are in millimeters.

Thread Size x Pitch	Type	Grip Range	Open					Closed					Hole Size In Sheet +0.1
	Steel		A ±0.25	ØB ±0.25	C ±0.13	ØD Max.	M Ref.	A ±0.25	ØB ±0.25	C ±0.13	ØD Max.	M Ref.	
M3 X 0.5	AEFRS	0.5 - 2.0	9.75	8	0.75	5	6.00	14.1	8	0.75	5	10.35	5
M4 x 0.7	AEFRS	0.5 - 2.5	10.75	9	0.75	6	6.15	16.6	9	0.75	6	12.00	6
M5 x 0.8	AEFRS	0.5 - 3.0	12.00	10	1.0	7	6.55	18.0	10	1.0	7	12.55	7
		3.0 - 5.5	14.50					20.5					
M6 x 1	AEFRS	0.5 - 3.0	14.50	13	1.5	9	8.35	22.4	13	1.5	9	16.25	9
		3.0 - 5.5	17.00					24.9					
M8 x 1.25	AEFRS	0.5 - 3.0	16.00	16	1.5	11	9.15	24.8	16	1.5	11	17.95	11
		3.0 - 5.5	18.50					27.3					
M10 x 1.5	AEFRS	0.7 - 3.5	19.75	19	2.25	13	11.70	31.4	19	2.25	13	23.35	13

## AETR™ THIN HEAD ROUND BODY INSERTS



All dimensions are in millimeters.

Thread Size x Pitch	Type	Grip Range	Open					Closed					Hole Size In Sheet +0.1
	Steel		A ±0.25	ØB ±0.25	C ±0.13	ØD Max.	M Ref.	A ±0.25	ØB ±0.25	C ±0.13	ØD Max.	M Ref.	
M3 X 0.5	AETRS	0.5 - 2.0	10.05	5.5	0.46	5	6.30	14.40	5.5	0.46	5	10.65	5
M4 x 0.7	AETRS	0.5 - 2.5	11.10	6.6	0.46	6	6.50	16.95	6.6	0.46	6	12.35	6
M5 x 0.8	AETRS	0.5 - 3.0	12.40	7.7	0.46	7	6.95	18.40	7.7	0.46	7	12.95	7
		3.0 - 5.5	14.90					20.90					
M6 x 1	AETRS	0.5 - 3.0	14.90	10	0.50	9	8.75	22.80	10	0.50	9	16.65	9
		3.0 - 5.5	17.40					25.30					
M8 x 1.25	AETRS	0.5 - 3.0	16.50	12	0.63	11	9.65	25.30	12	0.63	11	18.45	11
		3.0 - 5.5	19.00					27.80					
M10 x 1.5	AETRS	0.7 - 3.5	20.30	14.2	0.74	13	12.25	31.95	14.2	0.74	13	23.90	13