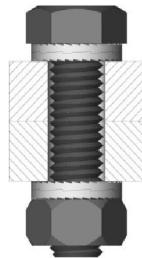


HEICO-LOCK INSTALLATION GUIDELINES

1. **Do not use other washers under Heico-Lock washers.** Other types of washers will disable the function of the Heico-Locks. **Do not use nylon insert nuts or metal lock nuts with Heico-Lock washers.**



2. Ensure that bolt holes, bolt and nut threads and mating surfaces are clean and free of particulate matter, adhesives, lubricants and chemicals.
3. Apply a high quality moly or graphite based lubricant (such as Molykote 1000) to **100% of the surface area of the bolt threads and 100 % of the bearing surface under the bolt head.** It is not necessary to coat the Heico-Lock washers with lubricant. Anti-seize lubricant is recommended for stainless steel applications.
4. Heico-Locks must be used on both the nut and bolt for through-bolt applications. The bolt should be



held stationary while the nut is tightened.

5. 12.9 bolts require the use of carbon steel Heico-Locks.
6. New bolts are recommended with Heico-Locks, especially in critical applications. Visual indications of damage may not be apparent with used bolts.
7. Heico-Locks are glued together as a pair. Do not remove the glue or separate the washers. The glue assists in proper orientation of both washer halves during installation. The glue does not affect the mechanics of the wedge lock system. If the washer halves are separated, ensure the cam surfaces face each other during installation or reinstallation.



8. Flange bolts and flange washers are recommended with large diameter Heico-Locks for bolting soft or thin materials together such as copper bus or aluminum.
9. In order for the washers to function properly, the serrations must imbed in the top and bottom mating surfaces. The serrated surface must be harder than the mating surface. Heico-Lock carbon steel washers are a minimum HRC 46 and suitable for up to grade 12.9 bolts. Contact Heico-Lock for assistance when using hard ceramic coatings and other hard materials.
10. High temperature applications (above 180C) require the use of stainless steel Heico-Locks (i.e. gas turbines, turbochargers, etc). For higher temperatures, consult your Heico-Lock representative. Generally, carbon steel Heico-Lock washers are sufficient for most header applications.
11. Heico-Lock washers are recommended for use with similar bolt and nut alloys (for example, carbon steel bolts should be used with carbon steel Heico-Locks).
12. Apply consistent and accurate torque. When possible, impact wrenches and tightening by hand should be avoided. Torque wrenches should be inspected and properly calibrated on a regular basis.
13. If you have loosening issues, please retain the product, PO and traceability documents for return to our labs so we can conduct an evaluation and assist you in solving your problem.
14. Multi-bolt flanges should be torqued in steps and in the appropriate star pattern to ensure even clamp load on the flange. It is common to tighten only one bolt at a time, however, this can result in point loading and load scatter. To avoid this, torque should be applied in stages following a prescribed pattern.
15. Step 1: Hand tighten to ensure that 2-3 threads extend above the nut on through bolt applications.
 Step 2: Tighten each bolt to one-third of the final required torque following the pattern shown below.
 Step 3: Increase the torque to two-thirds following the pattern shown below.
 Step 4: Increase the torque to full torque following the pattern shown below.
 Step 5: Perform one final pass on each bolt working clockwise from bolt 1, at the full final torque.

