



FASTENER FORUM

In the fastener industry, we hear and repeat this phrase often, “The most important person in fastener assembly is the person with the wrench.” This is true with one condition ... that person must know the proper tightening strategy for the specific joint being assembled. Without knowledge of how that joint will behave during tightening, the “person with the wrench” could soon be faced with a whole host of issues: bolt fracture, thread stripping, torque tool “faults” and any number of field concerns. Predictive joint analysis tools can help get us closer to a proper tightening strategy, but nothing replaces assembly testing.



Engineering & Testing Center

We offer a wide range of assembly tests. In this issue, we focus on Coefficient of Friction testing and Production-Intent Torque/Angle testing.

Coefficient of Friction (CoF) Testing

Often specified for critical clamp applications, CoF testing is typically used to evaluate the frictional behavior of the threaded fastener, and is useful for comparing different design, manufacturing, or finish application conditions of bolts, nuts, and washers. For example, this test can be critical when a change to plating is being proposed to increase corrosion resistance or to avoid prohibited chemicals (RoHS compliancy). CoF testing is problematic for ongoing manufacturing process control due to the need to use surrogate bolts. There are simply too many fastener size combinations to make lot testing of unique part numbers practical. Nevertheless, part specific CoF tests can be very useful in diagnosing sources of variation in fastener assembly.

The GFC Engineering Center has the capability to measure CoF per ISO 16047 for a wide variety of fasteners.

- We routinely test sizes from M4 – M20
- The test will generate comparative data on head, thread, and total friction

Sample Results Table

| Legend | Sub-series 2 No. | $\mu_b(30000 \text{ lbf})$ | $\mu_b(35000 \text{ lbf})$ | $\mu_{th}(30000 \text{ lbf})$ | $\mu_{th}(35000 \text{ lbf})$ | $\mu_{tot}(30000 \text{ lbf})$ |
|--------|------------------|----------------------------|----------------------------|-------------------------------|-------------------------------|--------------------------------|
| Green | 2.1 | 0.09 | 0.08 | 0.08 | 0.08 | 0.08 |
| Blue | 2.2 | 0.09 | 0.08 | 0.07 | 0.06 | 0.08 |
| Purple | 2.3 | 0.09 | 0.08 | 0.08 | 0.07 | 0.08 |
| Orange | 2.4 | 0.09 | 0.09 | 0.09 | 0.08 | 0.09 |

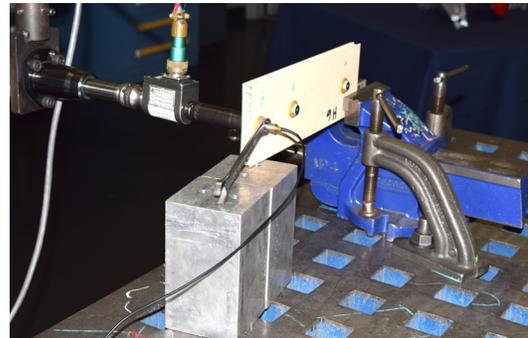




Production-Intent Torque/Angle Testing

For most fastened joints, simply ensuring the fastener will be adequately tightened into the upper half of its elastic strength without damaging the assembly is a sufficient tightening strategy. Accurate torque/angle testing utilizing the production intent assembly components is a quick and inexpensive means of accomplishing this. This simple test can identify potential unforeseen assembly concerns before parts hit the production floor. The GFC Engineering Center has the capability to measure Torque/Angle per a number of industry and OEM standards.

- Torque capability up through 3000 Nm (over 2000 ft lbs)
- Quickly establish torque specifications at desired percent of statistical yield
- DC electric torque guns allow for programmed installation strategies



In Memorium – Joe Greenslade

In October, we suddenly lost a good friend and longtime fastener industry contributor, Joe Greenslade. Joe was the founder of Greenslade and Company and also the Technical Director of the Industrial Fasteners Institute (IFI). He was a mentor to everyone, and many of us were eased into this industry with the kind advice of this thoughtful leader. Joe will certainly be missed!

The IFI released this statement:

“Joe was passionate, silly, loving, kind and strove every day to do something to make the world just a little better than it was the day before. He was a husband, a father, a grandfather, a friend, and a mentor. He was loved by many. *In lieu of flowers, the family is asking that donations be made to Joe’s project at Paschal High School, www.paschalpantherhero.org*”

Product Development Support from Concept through Production

Find out why our experienced staff of Application Engineers are relied on for their cost-effective design support and data analysis. They are ready to assist you!

- | | | |
|---|---|-------------------------------------|
| • Benchtop Torque/Tension Systems | and tightly controlled fastener installation | Assembly Verification |
| • Dynamically Monitor Torque, Angle, Time, Speed, Load, and Friction Coefficients | • Portable Equipment for In-Plant Product Trials, Tightening Strategy Development and | • Ultrasonic Clamp Load Measurement |
| • DC Electric Tools for accurate | | • Predictive Joint Design Analysis |
| | | • Fatigue Testing |

Contact our Engineering & Testing Center

CLICK ON EMAIL: gfengineer@genfast.com or CALL: 248-307-0572