

Archetype Joint

Joint Design, Testing & Validation

Joint testing and development is all we do, so we can do it better, faster and cheaper.

Let us work on the dull stuff that drives warranty cost, so you can focus on the features that sell your product.

- 1 Fully Independent** – We are not affiliated with the sale of components, equipment or fasteners.
- 2 Broad Experience** – We can develop your joints around the fastening and joining processes most suitable to your product and your production
- 3 Best Technology** – We are expert in the use of the latest micro-sensor ultrasonic measurement of bolt tension. Forget torque – design to tension!
- 4 Balanced Approach** – Our product development experience in both design and manufacturing engineering provides the insight to balance performance, cost and production considerations.



Joint Design

- ▶ Opportunities for joint elimination
- ▶ Selection of fastening and joining process, or optimization of existing joint design
- ▶ Production equipment selection to ensure consistent product conformance.
- ▶ Proposals for cost reduction of labor and materials
- ▶ Problem-solving for existing operations with poor yield or low through-put

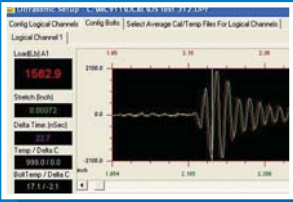
Joint Testing and Validation

- ▶ Independent third-party fastener, joint or equipment testing
- ▶ In-house lab allows immediate testing of proposed designs or changes
- ▶ Testing to optimize process parameters (torque, force, time, etc)
- ▶ Most testing can be performed at the customer's location if desired
- ▶ Testing to validate joints to established specifications

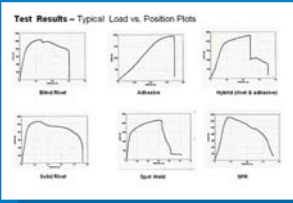
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Partial List of Testing Capabilities



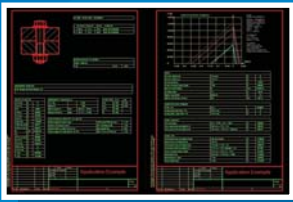
Real-Time Bolt Tension Measurement



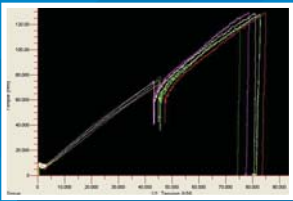
Process Comparison Testing



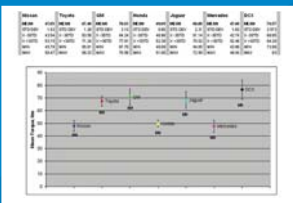
Process Selection Utility



Bolted Joint Analysis



Torque-Tension Torque-Angle Joint Validation



Benchmarking Joint Strategies

- Establish recommended target torque
- Calculate friction coefficient/nut factor (K)
- Torque-Tension testing (with ultrasonics or load cell)
- Torque-Angle testing
- Measure and monitor clamp load real-time with ultrasonics
- Measure residual torque in assembled joints
- Determine joint rates (hard, soft joint)
- Torque-to-failure/strip-out testing
- Joint Validation
- Establish bolt tightening strategies and parameters
- Assess bond strength
- Adhesive substrate surface preparation
- Establish adhesive cure cycles
- Rivet installation parameters
- Crimp installation parameters
- Pull-out/Twist-out testing
- Tensile testing – joints or fastener
- Joint shear, peel and cleave strength
- Hardness testing
- Environmental testing (temperature/humidity)
- Monitor joint relaxation
- Troubleshoot inefficiencies or poor yield of production joints
- Fastener selection – head/drive/thread form
- Installation tool accuracy
- Competitive benchmarking of fastener use and installation strategy

