Listed below are questions that we would like the readers to answer or discuss.

What is the upper limit on installed tension for A325 or A490 bolts?

There is no specified upper limit on the installed tension for a high-strength bolt that needs to be fully tightened. The Research Council on Structural Connections Specification for Structural Joints Using A325 or A490 Bolts gives a minimum tension requirement. One only has to make sure the installation method achieves the minimum tension.

The specification lists the acceptable installation methods to get the appropriate tension. There is no torque installation method for fully-tightened bolts. The differences between two people installing the bolt and starting at the snug tight condition will not have a great effect on the final preload.

The installed tension in a bolt will not effect the applied load on the bolt. Many people will state that since the fully tensioned bolt is installed to 70% of the minimum tensile strength, the applied load on the bolt can only be such that it causes a stress of 30% of the minimum tensile strength, but the installation subjects the bolt to a combined torque and tension. Once installed, the torque is removed and the bolt is subject to only a tensile stress which is always less than the combined stress.

What tension should be used when installing A307 bolts?

A
n A307 bolt is a soft bolt and can not take much tension, therefore there is no specified tension requirement for A307 bolts. These are installed only to the snug tight condition, that is to the point where the plies of the connected elements are brought together. This is defined in the Research Council on Structural Connections Specification for Structural Joints Using A325 or A490 Bolts.

This is also why A307 bolts can only be used in bearing type connections. Most bearing type connections need only be installed to the snug tight condition, slip-critical connections require fully-tightened bolts.

Why are there limitations on reusing high-strength bolts?

A
n A325 bolt that is tightened multiple times exceeds the elastic limit and it can not achieve the same tension after repeated tightening. An A325 bolt will be able to reach the proper tension 3 or four times before the applied tension can not reached the specified minimum. Therefore we allow A325 bolts to be reused at the discretion of the engineer. The figure from the Guide to Design Criteria for Bolted and Riveted Joints shows a graph of an A325 bolt that is tightened, loosened and retightened.

An A490 bolt drops off much quicker so it should not be reused after it has been fully tightened.

What is the minimum stick through needed for a bolt?

The Research Council on Structural Connections Specification for Structural Joints Using A325 or A490 Bolts defines full thread engagement as when the bolt is flush with or outside the face of the nut. A stick-through requirement is not necessary because it will do nothing to
Steel Interchange Editor, Modern Steel Construction, One East Wacker Dr., Suite 3100, Chicago, IL 60601-2001. Questions and responses will be printed in future editions of Steel Interchange. Also, if you have a question or problem that readers might help solve, send these to the Steel Interchange Editor.

One of the primary concerns in flexural design is the use of lateral bracing to control lateral-torsional buckling. What constitutes lateral bracing? Does the bracing member need to be a particular stiffness compared to the member being braced? Does it need to be a particular stiffness compared to the member being braced? Does it need to brace the compression flange, or will it serve its purpose if it braces the web? If the load is applied uniformly by a plate resting across the top flange of the beam, does the plate laterally brace the beam? What if the plate is welded to the beam?

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What are coating requirements for steel that is going to be placed underground or in contact with the soil?

How does one figure out the K-factor for a column that is part of a frame braced with knee braces?

New Questions

Listed below are questions that we would like the readers to answer or discuss.

If you have an answer or suggestion please send it to the