steel quiz

Steel Quiz made its first appearance in the November 1995 issue of *Modern Steel Construction*. This month's Quiz takes a look at some of the best questions from 2001.

1 Paint thickness is commonly measured in which unit?
a. cm **b.** feet **c.** mils **d.** coats

2 Why would a bolt stick through requirement decrease the ductility (ability to stretch) of F3125 Grade A325 and A490 bolts?

3 What is the maximum acceptable wind velocity in the vicinity of the weld when the FCAW-G process is used?

4 What is the minimum thickness of a compact 10 in. wide A572 Gr. 50 flange cover plate welded to the top of a W24×131 beam?

5 **True or False:** Written WPSs are required for all prequalified shop and field welds.

6 **True or False:** The shear and tensile strengths of a bolt are not affected by pretension in the bolt.

7 What is meant by "firm contact" in a bolted connection?

8 What is the generally accepted minimum inside-bending radius for cold bent ½-in. (A36) plate when bending is transverse to the direction of rolling.

9 How is "grip" defined?

10 **True or False:** Spray-applied fire protection material should always be applied over primed steel.

TURN PAGE FOR ANSWERS

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Everyone is welcome to submit questions and answers for Steel Quiz.

If you are interested in submitting one question or an entire quiz, contact AISC's Steel Solutions Center at 866.ASK.AISC or at **solutions@aisc.org**.

steel quiz | ANSWERS

1 **c.** A mil is 1/1000 of an inch.

2 Ductility is related to the number of threads in the grip. Most of the bolt elongation occurs in the threaded portion below the nut. This relationship is described in the 2nd Edition of the *Guide to Design Criteria for Bolted and Riveted Joints* (a free download at **www.boltcouncil.org**) which states: "Since most of the elongation occurs in the threads, the length of thread between the thread run-out and the face of the nut will affect the load versus elongation relationship. The heavy head bolt has a short thread length, whereas the regular head bolt has the normal ASA thread length specified by ANSI standards. As a result, for a given thickness of gripped material, the heavy head bolt shows a decrease in deformation capacity."

3 Maximum acceptable velocity is 5 miles per hour. If expected wind velocity is higher, a temporary shelter can be used for protection. (See AWS D1.1 Clause 5.12.1)

4 3/8-in. See Table B4.1b in the AISC *Specification* for limiting width-thickness ratio for compact flange cover plates.

5 **True.**

6 **True.**

7 The glossary of the RCSC *Specification* (a free download at **www.boltcouncil.org**) defines firm contact as "the condition that exists on a faying surface when the plies are solidly seated against each other, but not necessarily in continuous contact."

8 It would be 1.5×0.5 = 0.75 in. See Table 10-13 in the 14th Edition *Steel Construction Manual*. Note that bent plates exhibit better ductility and require a smaller bending radius when bent perpendicular to their rolling direction.

9 Grip is defined in the glossary of the RCSC *Specification* as "the total thickness of the plies of a joint through which the bolt passes, exclusive of washers or direct-tension indicators."

10 **False.** Many shop-applied coatings (and field-applied coatings, for that matter) are incompatible with common fire-protection materials, causing them to adhere poorly to the steel. In most cases, unprimed steel is the best surface to receive applied fire-protection materials.

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