

steel quiz

LOOKING FOR A CHALLENGE? *Modern Steel Construction's* monthly Steel Quiz tests your knowledge of steel design and construction. The answers to this month's questions can be found in the AISC 14th Edition *Steel Construction Manual*, which includes the AISC 2010 *Specification* and is now available for purchase at www.aisc.org/manual; AISC *Steel Design Guide No. 24*, available as a free download for AISC members at www.aisc.org/dg; and ASTM A500, which is available for purchase at www.astm.org or as part of the AISC publication *Selected ASTM Standards for Structural Steel Fabrication*, available for purchase at www.aisc.org/astm.

- 1 For what does the acronym HSS stand?
a) Hollow Structural Section b) Hollow Structural Steel
c) Hollow Structural Shape d) None of the above
- 2 For what does the acronym ERW stand?
- 3 Which ASTM A500 shapes are available as indicated in Table 2-3 of the AISC 14th Edition *Manual*?
a) Round b) Rectangular
c) Elliptical d) A and B
- 4 True/False: For hot-dip galvanizing of unsealed HSS, holes to allow for filling, venting and drainage are necessary.
- 5 True/False: Part 7 of the AISC 14th Edition *Manual* describes several types of mechanical fasteners that can be used to directly connect to an HSS wall.
- 6 True/False: The restriction on the minimum gap ratio in AISC *Specification* Table K2.2A for gapped K-connections in HSS trusses generally represents the parameter range over which the equations have been verified in experiments.
- 7 What AISC resources provide information on design of HSS members and connections?
a) AISC *Steel Design Guide No. 24*
b) AISC 360-10, *Specification for Structural Steel Buildings*
c) 14th Edition *Manual*
d) All of the above
- 8 The scope of the AISC *Specification* and *Design Guide 24* is limited to which of the following for HSS connections?
a) Static loading b) No offset elements
c) Single planar design d) All of the above
- 9 What is the maximum periphery dimension of HSS as defined in the new ASTM A500-10a?
a) 64 in. b) 88 in. c) 120 in. d) 44 in.
- 10 What is the maximum nominal wall thickness for HSS as defined in the new ASTM A500-10a?
a) $\frac{5}{8}$ in. b) $\frac{1}{2}$ in. c) $\frac{7}{8}$ in. d) 1 in.

TURN TO PAGE 14 FOR ANSWERS

steel quiz ANSWERS

- 1 (a) HSS refers to a hollow structural section, typically square, rectangular or round, that is produced in accordance with a pipe or tubing product specification.
- 2 (a) ERW stands for Electric Resistance Weld. This is a weld through the full thickness of the tube wall formed by passing a current across the surface between the two sides while they are in compression. There is no arc, nor is there filler metal.
- 3 (d) Round and rectangular (including square) HSS are manufactured according to the ASTM A500 standard. The dimensions and geometric properties of HSS are included in Part 1 of the *AISC Manual*.
- 4 True. Also, adequate hole sizing minimizes differential thermal stresses experienced by the piece upon galvanizing. For additional information on this topic, refer to the American Galvanizers Association website (www.galvanizeit.org).
- 5 True. These methods of mechanical fastening include through-bolts, blind bolts, threaded studs, flow-drilling, nails and screws.
- 6 True. The gap ratio (g/B) limit serves to ensure that sufficient load from a branch is transferred to the chord member sidewalls, and to ensure that the demand for load transfer through the gap region is not excessive. The limit on g being at least the sum of the branch thicknesses is specified so that adequate space is available to enable welding at the toes of the branches to be satisfactorily performed.
- 7 (d) All three of these AISC resources provide guidelines for design of HSS members and connections. In addition, the AISC Design Examples illustrate the use of design and detailing requirements found in *AISC Specification Chapter K* (www.aisc.org/designexamples). This resource is currently still based upon the 13th Edition *AISC Manual*, but an update is planned for later this year that will correlate the examples with the new 14th Edition *Manual*.
- 8 (d) Guidelines for conditions outside the scope of the *AISC Specification* appear in other codes and design guides. See *AISC Design Guide 24* for a list of what is not covered and where to find additional resources for other cases.
- 9 (b) With recent changes to ASTM A500, the periphery has been increased from the longstanding limit of 64 in. to a new value of 88 in.
- 10 (c) Another recent change to ASTM A500 involves the maximum wall thickness. It has been increased from the previous limit of 0.688 in. to a new maximum of 0.875 in., or $\frac{7}{8}$ in.



Steel
SolutionsCenter

Anyone 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.