



- 1) Vanadium and Niobium combine with \_\_\_\_\_ in order to refine grains.
  - a) Nitrogen
  - b) Silicon
  - c) Oxygen
  - d) Manganese
  
- 2) If proper slag chemistry is not maintained, the slag will react and erode the furnace walls.
  - a) True
  - b) False
  
- 3) For the slide showing “Typical Chemistry Analysis” (Slide 48), what can be said about the heat of steel being processed?
  - a) The heat is Silicon killed.
  - b) Niobium is one of the grain refiners added.
  - c) Copper (0.25%) and Nickel (0.1%) were not added and these concentrations will be on the test report.
  - d) All of the above.
  - e) Only a and c.
  
- 4) During continuous casting, when steel exits the mold, it is NOT completely solidified.
  - a) True
  - b) False
  
- 5) For ASTM Grade A913, the self-tempering temperature range is \_\_\_\_\_.
  - a) 1100°F-1400°F
  - b) 1200°F-1400°F
  - c) 1100°F-1300°F
  - d) None of the above

Steel Construction: From the Mill to Topping Out

Quiz for Session 2: The Manufacturing of Structural Steel Shapes – October 22, 2018

Due: November 12, 8:00 a.m. EST – Submit through the online form

6) A shapes producer produces all of the A992 products below from the same beam blank cross sectional area. Which product will require the strongest chemistry in order to assure the 50KSI minimum yield strength requirement is met?

- a) W36x231 (nominal flange thickness 1.260")
- b) W36x282 (nominal flange thickness 1.570")
- c) W36x330 (nominal flange thickness 1.850")
- d) W36x441 (nominal flange thickness 2.440")

7) A shapes producer wants to improve CVN performance at +40°F for A992, W27x217. The average minus 3 standard deviations is 22 ft-lbs. They would like to increase this to 30 ft-lbs at +40°F. From the choices below, how can this be achieved?

- a) Lower the Sulfur
- b) Increase the rolling temperature
- c) Decrease the rolling temperature
- d) a and c.

8) Based on the shape of a CVN transition curve, a test result at +40°F, can be used for an application requiring a +10°F CVN test temp.

- a) True
- b) False

9) The carbon equivalent (CE) equation for A992 is \_\_\_\_\_.

- a)  $C + Mn/5 + (Cr+Mo+V)/6 + (Ni+Cu)/12$
- b)  $C + Mn/6 + Ni/20 + Cr/10 - Mo/50 - V/10 + Cu/40$
- c)  $C + Mn/6 + (Cr+Mo+V)/5 + (Ni+Cu)/15$
- d) None of the above

10) The amount of Carbon in the steel is kept low because it can adversely affect \_\_\_\_\_ and \_\_\_\_\_?

- a) strength and weldability
- b) toughness and strength
- c) toughness and weldability
- d) ductility and strength