

2017 Hot-Dip Galvanized Sheet Training Course

Final Test – (with answers in red)

1. Zinc protects steel by acting as both a barrier and by providing galvanic protection.
 - a. True
 - b. False
2. The life of a zinc coating in a given environment is directly proportional to its thickness.
 - a. True
 - b. False
3. Name two unwanted substances that are on the surface of steel sheet prior to galvanizing. **(any two of):**
 - a. Oils/fats
 - b. Emulsion additives
 - c. Bearing/chock grease
 - d. Iron fines
 - e. Iron oxide
 - f. Dirt
4. Non-oxidizing furnaces remove iron fines from the strip surface.
 - a. True
 - b. False
5. What is the approximate air/gas mix ratio for ideal combustion in a continuous galvanizing line furnace?
 - a. 10:1
6. From the following list, choose the two methods by which heat is transferred to and from the strip in galvanizing line furnaces.
 - a. Friction
 - b. Radiation
 - c. Electrical resistance
 - d. Convection
7. The emissivity of the strip surface affects the rate of heating and cooling of the strip by the furnace.
 - a. True
 - b. False

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8. In managing the aluminum level of the zinc bath, what is the most important parameter to control?
- a. **Effective aluminum**
 - b. Total aluminum
9. When producing galvanize (GI), less than 0.14% effective aluminum in the zinc bath is required to produce a stable and adherent interfacial alloy layer.
- a. True
 - b. **False**
10. Name one of the three submerged rolls that are typically used to guide the strip through the zinc bath. **(any one of):**
- a. **Sink roll**
 - b. **Stabilizer roll**
 - c. **Corrector roll**
11. At the same *strip speed* and *pressure*, coating weight is more sensitive to pressure fluctuations (will change more for a given pressure change) when the knives are:
- a. **Closer to the strip**
 - b. Farther from the strip
 - c. There is no single answer
12. At the same *knife pressure* and *knife-to-strip distance*, increasing the strip speed will:
- a. Decrease the coating weight
 - b. **Increase the coating weight**
 - c. There is no single answer
13. If the profile of the coating weight across the strip is a smooth smile shape on the top (back) side (lower weight in the center, increasing toward each edge), and a smooth frown shape on the bottom (front) side (high in the center, decreasing toward each edge), the likely cause is:
- a. Edge baffles poorly adjusted
 - b. Strip crossbow inadequately compensated with the correcting roll

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- c. Strip crossbow overcompensated with the correcting roll
- d. Temperature variation across the strip
14. The profile plots of coating weight for both the top and bottom sides of the strip are sloping up from left to right (lighter weight on the left side, heavier weight on the right side as you face the strip from in front of the pot). Which of the following is NOT likely to be the cause: (either b or c)
- a. The knives are parallel to each other, but the strip is skewed relative to the knives.
- b. The temperature profile of the strip entering the pot is skewed from one side to the other.
- c. The knives are skewed relative to the strip and relative to each other.
15. The coating weights on both sides of the strip are right on target, and both knives are set to the same distance settings, but the top knife pressure is 2 psi greater than the bottom knife pressure. What is the problem?
- a. The strip is skewed relative to the knives.
- b. The strip passline has shifted toward the top knife.
- c. The strip passline has shifted toward the bottom knife.
- d. The correcting roll has been adjusted too far inward.
16. Which galvaneal (GA) coatings are more prone to powdering?
- a. Thin coatings
- b. Thick coatings
17. For galvaneal (GA), higher percent aluminum in the zinc bath tends to:
- a. Increase the alloying temperature
- b. Decrease the alloying temperature
18. Temper mills on galvanizing lines are used to:
- a. Eliminate discontinuous elongation
- b. Improve strip shape/flatness
- c. Condition the strip surface
- d. All of the above

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19. Tension levelers on galvanizing lines use bending over small diameter rolls and tension to elongate the strip, which **both** removes flatness defects and conditions the strip surface.
- a. True
 - b. False**
20. List two causes of zinc splashes that could result in a defect on the surface of the coated sheet. **(any two of):**
- a. Coating knives set too close to strip**
 - b. Knife gas pressure too high**
 - c. Knife set at improper angle**
 - d. Poor strip flatness**
21. Typically, at what “I Unit” value does the flatness of galvanized sheet become commercially unacceptable?
- a. 5 “I Units”
 - b. 20 “I Units”
 - c. 30 “I Units”**
 - d. 50 “I Units”
22. Why is it important that the strip temperature not be above 38°C when leveling or temper rolling?
- a. Causes poor surface quality
 - b. Distorts the strip
 - c. To prevent strain aging of the steel that causes high hardness**
23. The primary reason for chemically treating the strip is to prevent storage stain?
- a. True**
 - b. False