

The Zinc Challenge Questionnaire

1. List **five** advantages of the die casting process versus plastic injection molding.
2. List **three** advantages of zinc die casting versus aluminum or magnesium die-casting:
3. What is the preferred zinc die casting alloy for most applications in North America?
4. What is pressure die casting?
5. Why use alloys instead of pure zinc in pressure die-casting?
6. What is the major difference in composition between SAE 903 and SAE 925?
7. What is the major difference between the hot chamber die casting process and the cold chamber process?
8. What is the major alloying element in all zinc die casting alloys? Why?

9. Which three alloys demonstrates excellent bearing and wear resistance?

10. What determines the anti-sparking characteristics of some zinc alloys?

11. Does recycled zinc lose its properties?

12. What temperature limits is recommended for stressed and unstressed applications for zinc alloys?

Stressed:

Unstressed:

13. Parking meters take advantage of the high impact strength of zinc alloys. What is the impact strength of Zamak 3 versus 380 Aluminum?

14. What mechanical property is generally accepted as an indication of a materials overall strength?

15. *For comparable strength*, what is the ratio of the wall thickness of a zinc die casting versus a plastic injection molding?

16. Which zinc alloy has the best fatigue strength?

17. Young's modulus is a measure of a material's:

Put in order by modulus: Magnesium, Plastic, Aluminum and Zinc

18. Zinc has high damping capabilities. Give an example where this property is important.

19. What is the parting line in a die cast part?

20. What is the first consideration in determining the parting line?

21. The fine grain structure of the surface layer "skin" of a zinc die-casting is approximately _____ inches.

22. Why are ribs and corrugations used in casting design?

23. Why crown flat surfaces when casting decorative castings?

24. Bending forming or spinning take advantage of what mechanical property?

25. Which is preferred: Raised or recessed lettering in the casting? Why?

26. What alloy is best used for a prototype?

27. Which is easier to cast? An external or an internal thread? Why?

28. What property is important in applications that require prevention of electrostatic discharge?

29. The typical range of fill times for most die-castings is?

30. Name at least three websites and/or organizations that are available to the designer with information on zinc alloys:

31. Which zinc die casting alloy would you choose for the following application and why?
A tubular component that has to be bent and spin riveted to hold onto a circuit board.

32. Which zinc die casting alloy would you choose for the following application and why?
A gear for a washing machine that has to be very strong and has good bearing properties.

33. Which zinc die casting alloy would you choose for the following application and why?
A low cost craft knife that has to withstand mechanical abuse.

34. In the Cu/Ni/Cr electroplating system, which layer provides the corrosion resistance?
35. What are the two common chemical coatings?
36. Which chemical coating is primarily used under a decorative paint top coat?
37. What inexpensive coating is used on zinc die cast parts for identification and corrosion resistance?
38. What is the most popular plating system?
39. If you wanted the least expensive metallic coating to coat a zinc die cast trophy, what process would you use?
40. Organic finishes can be applied by the following five methods:
41. What problems during electroplating and painting are created by blind holes?
42. Fill in the blanks. For corrosion to proceed there must be an _____, a _____, and an _____ joined by an external current.

43. What can be done to prevent galvanic corrosion of a zinc die-casting (example: a car door handle) and sheet steel?
44. Zinc alloys have low melting points _____ $\pm 10^{\circ}\text{F}$, what is the main disadvantage and three advantages?
45. What is the white material formed on the surface of zinc?
46. What is zinc coated steel commonly called?
47. What is the approximate composition of brass?
48. What is the composition of the current US penny?
49. What coating is described as a mossy green surface made up of phosphates and chromates and is used in zinc die cast pump housings in washing machines?

List Additional Student Names Here (if applicable):