

Argentium Instructor Certification

Written Examination - Level 2



ARGENTIUM[®]
THE FINEST SILVER

Argentium Instructor Certification Written Examination - Level 2

Important information

- Candidates have **1 hour** to complete all of the following 40 questions.
- Questions 1-20 = ½ point each, questions 21-40 = 1 point each (30 points in total).
- Please tick one box for each question ✓

Multiple choice questions

1. Argentium silver alloys owe their tarnish and firestain resistant properties to the presence of which element?

- A. Silver.
- B. Copper.
- C. Germanium.
- D. Zinc.

2. After torch annealing, Argentium silver alloys should be...

- A. Quenched into acid while still at temperature.
- B. Allowed to cool slightly, then quenched into acid.
- C. Quenched into water while still at temperature.
- D. Allowed to cool slightly, then quenched into water.

3. When torch annealing Argentium silver, it is best to carry this out in a shaded area because...

- A. Argentium silver glows a paler color than traditional sterling silver at the correct annealing temperature. A shaded area makes it easier to see if you are about to overheat the Argentium silver.
- B. Argentium silver has a very bright color at the annealing temperature and bright light hides this bright annealing color.
- C. You cannot see the torch flame in bright light and therefore cannot anneal the Argentium silver evenly.
- D. None of the above.

4. Precipitation hardening is a process that increases the optimal hardness of Argentium Original (by 20-30 HV/DPH). To achieve this, the recommended process is to heat Argentium silver in a furnace or oven, in air at...

- A. 450°C/842°F for three hours, then quench in water to rapidly cool.
- B. 300°C/572°F for two hours, then air-cool to room temperature.
- C. 550°C/1022°F for two hours, then air-cool to room temperature.
- D. 100°C/1292°F for three hours, then quench in water to rapidly cool.

5. What does 'surface passivation' refer to?

- A. Cleaning the surface of the finished piece with polishing cloths.
 - B. Applying a simple heat treatment to finished pieces to promote the formation of a protective, tarnish resistant germanium oxide layer.
 - C. The contamination of other metals on the surface of the finished Argentium silver piece.
 - D. The reaction of the finished Argentium silver surface with harsh chemicals.
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6. Which of the following describes the recommended process for surface passivation of finished Argentium silver pieces?

- A. After the pieces have received their final polishing and degreasing/cleaning operations, heat them in an oven in an air atmosphere at 200°C/392°F for 3 hours.
 - B. After the pieces have received their final polishing and degreasing/cleaning operations, heat them in an oven in an air atmosphere at 300°C/572°F for 3 hours.
 - C. After the pieces have received their final polishing and degreasing/cleaning operations, heat them in an oven in an air atmosphere at 100°C/212°F for 3 hours.
 - D. After the pieces have received their final polishing and degreasing/cleaning operations, heat them in an oven in an air atmosphere at 400°C/752°F for 3 hours.
-

7. Argentium silver will fuse with...

- A. 18 karat gold (or gold finenesses above 18k).
 - B. Pure (fine) silver.
 - C. Platinum.
 - D. All of the above.
-

8. Which of the following fluxes are **NOT** recommended for use with Argentium silver?

- A. 'Handy' or 'Easy Flow' type paste fluxes.
 - B. My-T-Flux (supplied by Rio Grande, USA).
 - C. Battern's Flux.
 - D. Prip's Flux.
-

9. How can sagging be prevented in Argentium Original sheet during high temperature soldering applications?

- A. Heat and quench the sheet immediately.
- B. Hold the sheet in a 'third hand'.
- C. Make sure the sheet is well supported and heat evenly with a large flame to a pale red annealing temperature, then air-cool to room temperature.
- D. None of the above.

Continued on Pg. 4

10. Which answer best describes the appearance of 'under-fused' Argentium silver?

- A. The flux is still slightly brown.
- B. There is a shadow line between the two pieces.
- C. The flux has become glassy and looks like little water droplets.
- D. Both A & B.

11. Which answer best describes 'over-fused' Argentium silver?

- A. The Argentium silver has lost its form or shape because it has entered a semi-liquid state and wires or granules seem to dissolve into the base sheet.
- B. Shrinkage of the metal.
- C. The sheet has crystals growing out of the surface, which gives a gritty texture.
- D. All of the above.

12. When using an ultrasonic cleaner to remove polishing greases from Argentium silver, it is important that the cleaning solution used is...

- A. Strongly acidic (pH of 1-3).
- B. Strongly alkaline (pH of 11-14).
- C. Slightly acidic to neutral (pH 5-7).
- D. Neutral or slightly alkaline (pH 7-9).

13. The protective germanium oxide layer on the surface of a finished Argentium silver piece can be formed by?

- A. Heating the piece to a low temperature and allowing to cool to room temperature.
- B. Heating the piece to a high (annealing) temperature and quenching into water.
- C. Leaving the piece in air, so that it is exposed to oxygen at room temperature.
- D. Both A and C.

True / False questions

14. Argentium silver should be securely supported when heated.

- True
False

15. Argentium silver glows a paler color than traditional sterling silver when at red heat.

- True
False

Continued on Pg. 5

16. Argentium silver cools quicker than traditional sterling silver.

- True
False

17. Quenching too quickly from an annealing temperature can cause Argentium silver to crack.

- True
False

18. You should press hard on Argentium silver to get it to move where you want once it is red hot.

- True
False

19. To minimize distortion of Argentium Original during soldering operations, it is recommended to carry out a pre-annealing step. Simply heat the sheet to a pale-red annealing temperature and allow to air-cool to room temperature.

- True
False

20. Argentium silver can crack when it is moved during soldering.

- True
False

21. Once Argentium silver has been soldered, the piece cannot be repositioned.

- True
False

22. Once a piece has been soldered, it cannot be fused.

- True
False

23. When fusing, the surface should be completely covered in flux and when soldering you only need to flux the seam.

- True
False

24. Argentium silver may be un-fused and moved around or re-positioned after fusing.

- True
False

Continued on Pg. 6

25. You may use the same polishing buffs for copper, gold, traditional sterling silver and Argentium silver with no problems.

- True
False

26. The color of Argentium silver is not as bright as traditional sterling silver.

- True
False

27. Argentium silver is easier to weld than traditional sterling silver.

- True
False

28. Argentium silver's tarnish and firestain resistance relies upon a protective germanium oxide surface layer.

- True
False

29. It is **NOT** recommended to rinse/wash Argentium silver in deionized water.

- True
False

30. Argentium silver has greater ductility and malleability than traditional sterling silver.

- True
False

31. Argentium silver has very good machining and engraving properties.

- True
False

32. Argentium silver will not take a patina.

- True
False

33. To prevent firestain during soldering applications with Argentium silver, you need to apply flux or a firestain preventive coating such as boric acid and alcohol to the whole piece of work.

- True
False

Continued on Pg. 7

34. When investment casting, you should quench your flask immediately after the molten Argentium is cast into the flask.

- True
False

35. You must use Borax when casting Argentium silver.

- True
False

36. When casting Argentium silver, heat to a bright orange color and make sure it is smoking.

- True
False

37. Argentium silver solders do not contain germanium.

- True
False

38. Argentium silver can be welded because the metal has lower thermal and electrical conductivity than pure silver and traditional sterling silver.

- True
False

39. Argentium silver items can be legally hallmarked.

- True
False

40. The Argentium silver identification mark is the shape of a flying unicorn.

- True
False

End of Written Exam - Level 2

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