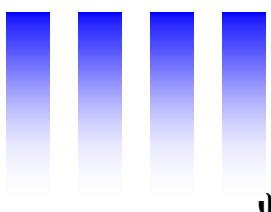


Re-Certification Exam

Version 1.1 2011





Re-Certification Exam

This open book test consisting of forty questions is based on the articles in the re-certification workbook. Please read each article carefully and answer the questions for each section. Each correct answer is scored 2 points. As an open book test, a grade of 85% is required to pass the exam.

Step 1 – Review the re-certification workbook

Step 2 – Complete the re-certification application

Step 3 – Complete the test sections and place **all** answers on the *Answer sheet*

Step 4 – Send **ONLY** the completed *Application sheet*, *answer sheet* and renew fee to ACMA (Please note: Your credentials cannot be processed without the renewal fee)

Step 5 – Upon successful completion of the test (scoring an 85% or higher) your credentials will be revalidated.

If the exam score does not qualify for revalidation, the exam workbook will be returned to the applicant for remedial review. The applicant can then correct and resubmit the test. If an applicant fails the re-certification test on the second attempt, his/her CCT credentials will not be revalidated. The candidate will be required to requalify by taking the original CCT exam.

Return Completed Exam and Re-Certification Fee to:

American Composites Manufacturers Association
CCT Re-Certification Program
1010 N. Glebe Rd., Suite 450
Arlington, VA 22201

CCT-CP Re-Certification Application
(Print Clearly)

Applicant Information

First Name: _____ MI: _____ Last Name: _____

Primary Email: _____

Home Address: _____

City: _____ State: _____ ZIP: _____

Home Phone: _____

Company Information

Company: _____

Address: _____

City: _____ State: _____ ZIP: _____

Phone: _____ Fax: _____

Payment Information

Renewal Fees: \$50 members, \$100 nonmembers

Check: _____ Visa: _____ MasterCard: _____ Amex: _____

Amount: \$ _____

Please fill out the full credit card information on the following page to pay with your credit card.

VISA MASTERCARD AMEX

Full Credit Card Account Number:	
Expiration Date	
Security Code 3 Digit Code (Visa, MC) 4 Digit Code (AMEX)	
Billing Address	
Date	
Phone Number	

Federal Tax ID (52-1144059) ACMA Fax: 703-525-0743

I hereby authorize ACMA to charge my credit card for the payment of items below. I agree to pay for all requested registrations, enrollments and other items/services from ACMA, and agree that ACMA can charge my card for an amount different than what is below if the amount below is not correct.

Card Holder Name: _____

Signature: _____

Last Four Numbers of Authorized Card: _____

Amount to be charged: \$ _____

Description of Charge/ Names of CCT Candidates Paid For: _____

Name of Company Payment should be applied: _____

Internal Use Only:

Date Processed: _____ Initials: _____

Notes: _____

CCT-CP
Answer Sheet

For office use only
SCORE

2.5 points each
Certification Date _____
Expiration Date _____

Instructions: Place correct answer(s) next to the corresponding number.

Mailing Information –Your test results will be sent to the address you provide below.

Today's Date: ____/____/____

First Name: _____ MI: _____ Last Name: _____

Company/Institution: _____

Address (can not be a PO BOX): _____

City: _____ State: _____ ZIP: _____ Country: _____

- | | | |
|-----------|-----------|-----------|
| 1. _____ | 16. _____ | 31. _____ |
| 2. _____ | 17. _____ | 32. _____ |
| 3. _____ | 18. _____ | 33. _____ |
| 4. _____ | 19. _____ | 34. _____ |
| 5. _____ | 20. _____ | 35. _____ |
| 6. _____ | 21. _____ | 36. _____ |
| 7. _____ | 22. _____ | 37. _____ |
| 8. _____ | 23. _____ | 38. _____ |
| 9. _____ | 24. _____ | 39. _____ |
| 10. _____ | 25. _____ | 40. _____ |
| 11. _____ | 26. _____ | |
| 12. _____ | 27. _____ | |
| 13. _____ | 28. _____ | |
| 14. _____ | 29. _____ | |
| 15. _____ | 30. _____ | |

CCT-CP Re-Certification Exam

Section 1 – Defining Composites

1. The term composite is derived from the Latin root word *componere*, which means:
 - A. To compare
 - B. Many elements
 - C. To bring together

2. Indicate the material combinations that qualify as composites under the broad definition:
 - A. Wood
 - B. Adobe brick
 - C. Steel belted tires
 - D. All of the above

3. What is 'aspect ratio'?
 - A. The fiber diameter
 - B. A comparison of length to width
 - C. The Amount of material in a mixture

4. Fillers in a resin matrix do not effectively transfer loads because they have:
 - A. Lower density
 - B. Uniform shape
 - C. Low aspect geometry

5. The precise definition of composites is:
 - A. A reinforcement fiber in a thermoset polymer resin matrix
 - B. Dissimilar materials combined together
 - C. Two or more photographs joined to form a single image

6. The function of a reinforcement in a composite is:
 - A. To take up the load strain transferred through the matrix
 - B. To increase the viscosity of the matrix
 - C. To increase the material's flexibility

Section 2- Understanding Polyester Resin Curing

7. The fundamental chemical reaction that takes place when curing polyester resin is:
 - A. Cross-linking
 - B. Hardening
 - C. Drying

8. The cross-linking reaction is at maximum activity from the time initiator is added to the resin to the time of:
 - A. Maximum Barcol hardness development
 - B. Peak exotherm
 - C. Endotherm termination

9. Indicate three items that can cause poor initial cross-linking reaction:
 - A. Low initiator level
 - B. Low shop temperature
 - C. Improper level of promoter or inhibitor
 - D. Improper resin viscosity

10. If a laminate is not properly cured in the initial stages, it will eventually fully cure given enough time.
 - A. True
 - B. False

11. The minimum acceptable shop temperature for properly curing polyester resin is:
 - A. 50°F
 - B. 60°F
 - C. 70°F

12. In warm weather, it is acceptable to drop initiator levels below the specified percentage to control resin gel time.
 - A. True
 - B. False

Section 3 – Composites Manufacturing Processes

13. Cast products, including cultured stone and solid surface, are considered:
- A. Reinforced composites
 - B. Polymer concrete
 - C. Unreinforced composites
14. The following are considered hard tooling used to produce cast polymer products:
(Indicate all that apply)
- A. RTV silicone
 - B. FRP composite polyester
 - C. Electroformed nickel shell
 - D. Glass
15. In gel-coated cultured marble the matrix is blended from the following materials:
(Indicate all that apply)
- A. Calcium Carbonate
 - B. ATH filler
 - C. Pigment
 - D. Polyester resin
16. In cultured onyx, what filler creates the translucent appearance?
- A. Calcium Carbonate
 - B. Alumina trihydrate (ATH)
 - C. Vinyl ester resin
 - D. Polyester resin
17. Solid surface parts are homogeneous throughout.
- A. False
 - B. True
18. Solid surface products are made void-free because:
- A. Solid surface parts are homogeneous throughout
 - B. Vacuum-mixing techniques are used
 - C. They are gel-coated prior to casting

Section 4 – Cast Polymer Materials

19. Polyester resins are the most commonly used in cast polymers because:

(Indicate all that apply)

- A. They are low cost
 - B. They meet many of the physical properties needed
 - C. They are stronger than real stone
20. What type of resin is general purpose or GP resin?
- A. Isophthalic
 - B. Orthophthalic
 - C. Dicyclopentadiene
21. Gel coat is a specialized polyester resin that:
- A. Is a paint
 - B. Provides a cosmetic outer surface on a composite part
 - C. Can be thinned with acetone
22. The higher the surface area, the more resin it will take to coat the surface of the filler particles. This means that particles with high surface area will:
- A. Increase the viscosity of a resin mix
 - B. Decrease the viscosity of a resin mix
 - C. Have no effect on the viscosity of a resin mix
23. The most common filler used in cultured marble manufacturing is:
- A. ATH
 - B. Dolomite
 - C. Calcium Carbonate
24. What is particle packing?
- A. Cross-linking
 - B. Resin shrinking
 - C. How individual particles fit together

25. Organic peroxide initiators, such as MEKP, should never be allowed to come into direct contact with dry fillers.
- A. True
 - B. False

Section 5 – Limiting Emissions

26. What best describes emissions generation during the transfer stage?
- A. High concentrations over an extended period
 - B. Low concentrations because of the short duration
 - C. High concentrations over a short time
27. How many phases of emissions are there for resin?
- A. One
 - B. Three
 - C. Ten
28. How much pressure is ideal for spray gun settings?
- A. The more pressure, the better
 - B. The minimum pressure necessary for proper fan pattern
 - C. The original factory settings
29. Transfer losses are distributed as evaporative loss and _____.
- A. Overspray loss
 - B. Pressure loss
 - C. Atomization loss
30. What is the major factor influencing emissions during the open mold gel coating and laminating processes:
- A. Laminate or gel coat film thickness
 - B. Laminate or gel coat film surface area on the mold during the curing stage
 - C. Laminate or gel coat film surface area on the mold during the curing stage PLUS overspray surface area

31. During spraying operations, fan pattern particle size has an effect on surface area compared to the volume of material dispensed. One droplet 100 microns in diameter has the same volume as 100 droplets of 10 microns in diameter. The surface area of the 100 individual droplets is _____ larger than the single large droplet.
- A. 1000 times
 - B. 50 times
 - C. 10 times

Section 6 – MACT Misconceptions

32. There are no control requirements for cast polymer manufacturers. However, polymer casting operations must still fully comply by:
- A. Closing all vents on bulk HAP-containing storage tanks
 - B. Following the administrative provisions of the rule
 - C. Not using styrene as a cleaner in closed systems
33. A Title V permit is:
- A. A federally enforceable operating permit
 - B. Not needed in any state
 - C. Not needed if all employees are CCTs
34. What is a major source?
- A. A facility producing \$5 million or more in sales each year
 - B. A facility with the potential to emit 10 tons per year of any single HAP, or 25 tons per year of any combination of HAP
 - C. A resin supplier
35. Most composites manufacturers will have to adopt closed molding to comply with the MACT standard.
- A. True
 - B. False

Section 7 – Electrostatic Discharge in Composites Operations

36. The primary safety hazard of ESD is the potential for:
- A. Electric shock
 - B. Mold cracking
 - C. Fire
37. The ability of a material to shed or attract electrons is known as:
- A. Charge potential
 - B. Conductivity
 - C. R-factor
38. Spray guns develop _____ because of the friction of fluid moving through the lines.
- A. An electrostatic charge
 - B. Pressure
 - C. Polarization
39. Because typical FRP molds are poor conductors, they can build a high charge on their surfaces.
- A. True
 - B. False
40. What environmental conditions create the highest potential for ESD?
- A. High humidity
 - B. Low humidity
 - C. High air flow