



Certified Auto Glass Repair Technician Exam Handbook

NGA

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Preface

An Auto Glass Repair Technician repairs laminated safety glass on automobiles, trucks and other vehicles and equipment. This handbook explains the process necessary to become certified. It also provides the exam specifications and sample exam questions for the auto glass repair technician.

The information contained in this handbook is based on voluntary industry standards for acceptable practice as reflected in the job analysis and exam specifications.

This handbook is merely the starting point for preparing to take the certification exam. You should combine using this handbook with on-the-job training (OJT) and on-the-job experience.

National Glass Association/National Windshield Repair Association Disclaimer for Training and Educational Programs

The National Glass Association (NGA) is a District of Columbia nonprofit corporation, which is tax exempt under Section 501(c) (6) of the Internal Revenue Code. NGA's training and educational programs have been developed in furtherance of its nonprofit tax exempt purposes primarily to benefit the architectural, automotive and specialty glass industries. This program has been developed by NGA in cooperation with the National Windshield Repair Association (NWRA) to provide general education and training in connection with the above industries, but the program cannot however, anticipate all physical and factual situations, and cannot take the place of professional experience and judgment. NGA and the NWRA do not guarantee, warrant, or endorse the methods, procedures, and manner of work or services described or referred to in the educational and training materials, or any work or services performed by any individual person or any firm or shop; all warranties are expressly excluded. Further, neither NGA nor NWRA, nor their officers, directors, members, employees, instructors or agents shall be liable for any loss, damage or claim with respect to any work or services performed, whether or not it is based on the training and education programs. All such liabilities, including special, indirect, or consequential damages, are expressly disclaimed and excluded.

The Certified Auto Glass Repair Technician Program is fully owned by the National Glass Association.

Introduction

Auto glass repair is an exciting business because it is always changing. Every year, and sometimes several times throughout the year, vehicle manufacturers introduce new vehicles and, sometimes, changes to the automotive glass. Auto glass repair is a growing industry and becoming widely known and accepted by consumers. The growth of the auto glass repair industry is challenging for auto glass repair companies and individual technicians.

The purpose of this handbook is to provide information on the Certified Glass Repair Technician Program.

There are eight objectives for NGA's Certified Auto Glass Repair Technician Program:

- Provide a means for practicing auto glass repair technicians to gain recognition and verification of their knowledge in their industry.
- Improve the credibility of practicing auto glass repair technicians by measuring a specific body of basic knowledge.
- Recognize employee efforts to improve individual knowledge and proficiency.
- Promote universal industry safety training to safeguard worker health and welfare, emphasizing the glass industry's commitment to maintaining a safe workplace.
- Provide a forum in which the merits of new procedures and techniques can be analyzed and communicated to industry professionals.
- Ensure the future knowledge of the industry's pool of trained auto glass repair technicians by providing for regularly scheduled renewal.
- Encourage auto glass repair and certification awareness by consumers and licensing/credential boards of government entities.
- Protect the public by ensuring that certified individuals have the knowledge necessary to practice competently as auto glass repair technicians.



This handbook provides information on how to become certified for those auto glass repair technicians who wish to sit for the NGA Certified Auto Glass Repair Technician exam.

How to Use This Handbook

Overview

This *Certified Auto Glass Repair Technician Exam Handbook* is a study resource for experienced Auto Glass Repair Technicians who wish to sit for the NGA Certified Auto Glass Repair Technician Exam. The topics included on the exams reflect the voluntary industry standards for acceptable practice and relate directly to the body of knowledge listed in the job analysis and exam specifications.

The format of this handbook is arranged to describe the certification process and show a list of topics necessary for a candidate to study prior to taking the exam. The certification exam items (questions) are written to test this body of knowledge. The content areas are included as cross-references to the specific knowledge to be tested (pages 13-19).

Handbook Content

This Certified Auto Glass Repair Technician Exam Handbook consists of these content areas:

- NGA's Certified Auto Glass Repair Technician Program
- Certified Auto Glass Repair Technician Exam Specifications

Technician Preparation

Follow these hints for using this reference to help you prepare for your NGA certification exam:

- Reserve a study area and set it up for study in advance.
- Ensure that your study area is comfortable and conducive to learning, with such features as adequate lighting, heat or air conditioning, chair, table (writing surface), and a minimum of outside noise.
- Review the Certified Auto Glass Repair Technician Exam Specifications and sample exam items (questions) listed in this handbook.
- Read the recommended reference material actively and carefully, taking notes or jotting down questions to enhance your understanding of the content.

NGA's CERTIFIED AUTO GLASS REPAIR TECHNICIAN PROGRAM

Providing technical information and education for the glass industry is a high priority for NGA. In fact, NGA's mission statement clearly supports this priority:

To provide information and education, as well as promote quality workmanship, ethics, and safety in the architectural, automotive and window and door glass industries. NGA acts as a clearinghouse for industry information, a catalyst in education and training matters, and a powerful voice on behalf of our members.

To meet this priority, NGA in conjunction with the National Windshield Repair Association (NWRA) has developed the Certified Auto Glass Repair Technician Program. Both NGA and NWRA are committed to providing the glass industry with educational materials and training programs at all levels, from entry level to senior management.



NGA provides these essential certification services:

- Certification program management including registering, collecting and maintaining certification records; issuing certification credentials; enforcing certification policies; and resolving program discrepancies and challenges.
- Liaison between certification candidates and the certification committee.

Note: It should be clearly understood that the certification criteria required by this program have been developed to enhance professional standards within the industry and have no relationship, by design or inference, to local wage schedules, private compensation agreements, or reduction of any management prerogatives regarding promotion or pay.

Auto Glass Repair Certification Committee

This committee serves as the appeals board for the certification program, ruling on such issues as exceptions to established program procedures or challenges that have been unsatisfactorily resolved by the NGA staff. The

committee meets as the appeals board twice a year, typically at NGA's National Auto Glass Conference and at NWRA's National Conference. Since it is composed of a representative group of auto glass repair industry content experts, the committee also is responsible for test development and updates. Guided by NGA's test development professionals, their input assists NGA in assessing and developing certification examination specifications and job analysis. They meet in this capacity only when necessary.

In addition, the NWRA Recommended Practices Committee has established the guidelines to:

- Establish the characteristics of a windshield repair.
- Encourage technicians to strive for the highest quality repair
- Provide the public with an understanding of windshield repair.
- Encourage consistent windshield damage inspection.

Development of the Certified Auto Glass Repair Technician Examination

NGA's Auto Glass Repair Technician Certification examination is developed with the guidance of professional exam developers and administrators. These professionals score the examinations as well. They specialize in developing computer-based examinations for both professional and academic settings.

All NGA certification examinations meet testing-industry standards for fairness, validity and reliability:

- An examination is fair when its contents neither favor nor discriminate against any individual or group due to ethnic background, geographic locale, practice setting, or other demographic criteria.
- An examination is valid when it accurately reflects the knowledge required for competent practice.
- An examination is reliable when it yields consistent results over time.

The validity of NGA's auto glass repair technician certification examination has been documented using two independent methods:

- First, the job analysis used to develop the examination was validated by a random sample of auto glass repair industry practitioners across the United States.

- Second, all examination items were validated by the NGA Auto Glass Repair Certification Committee using well-accepted psychometric rating scales.

Questions and Answers about NGA's Certified Auto Glass Repair Technician Program

How do I register for an examination?

Fill out, sign and return the registration form and pay NGA for the examination fee.

Call NGA at 703/442-4890, extension 134; visit NGA's web site at www.glass.org; or e-mail us at certification@glass.org. The registration form verifies that you have the required amount of experience in the auto glass repair industry. Make sure to give your name, address, telephone number, your five digit certification identification number, or your Social Security Number.

Watch your mail for the NGA letter confirming your registration.

The material will arrive in about two weeks after NGA receives your registration form, and payment.

How do I schedule an examination?

After you receive your registration confirmation letter, contact NGA's examination provider, LaserGrade Computer Testing, using the toll-free exam hotline: **800/211-2754**. You must have ready **all** of the following information:

- Your personal information:
 - Last name, first name, and middle initial
 - 5 Digit Personal Identification Number
 - Home address
 - Home phone number
- Your employment information:
 - Company name
 - Company address
 - Company primary phone number
 - Company fax number

*Note: Once a candidate's record has been pulled from the authorization file, it must be completed. If for any reason the registration was not completed and a call back is necessary to complete registration, inform the Customer Service Representative that you have a current registration record that must be completed. Your record will **NOT** be in the Authorization File.*

NGA's examination provider, LaserGrade, will not schedule an examination for anyone who has not been authorized by the NGA and who does not have an authorization record on file. To be authorized you must have submitted the registration form, checklist and fee to NGA. Once NGA receives these items, a confirmation will be mailed to you informing you that you are authorized to register for the exam. Do not contact the exam scheduling center until you receive this confirmation.

It is a good idea to schedule your examination as early as you can after registering to ensure that the testing center has an appointment available for the date and time you prefer. Once you have scheduled your examination, your examination fee is not refundable.

If for some reason, you cannot keep a scheduled examination appointment; you may reschedule the appointment without penalty, if you notify the testing center 48 hours in advance. If you fail to notify LaserGrade at least 48 hours before the scheduled exam time, the exam fee will not be refunded. *You will be required to re-register and pay the exam fee again to take the certification exam.*

Where do I take the examination?

Examinations are administered at testing centers nationwide and in Canada operated by NGA's examination provider. You can learn the location of the center nearest you by using the toll-free exam hotline: **800/211-2754** or by visiting the test center web site at **www.lasergrade.com**. On this site follow these steps:

- Select "Find a Test Center."
- Enter your zip code.
- Select "National Glass Association" for Sponsor and click "Find a Testing Center."
- The four closest testing locations will be listed along with directions to the testing center. You may change the search for test locations to show more than four testing locations.

Note: You must call LaserGrade at **800/211-2754** to schedule your exam. You will take your NGA examination at the testing center by entering answers to multiple choice items on a computer.

Are special accommodations available?

Special testing arrangements are available for candidates with disabilities. To request a special accommodation, send a registration form and a completed accommodation request form to NGA. An accommodation request form is available from NGA.

Note: All registrations requiring special accommodations must receive specific approval from NGA prior to scheduling the examination.

Once NGA has notified you of the approval of your special accommodations request you may call LaserGrade to schedule your exam. Call 800/211-2754 and ask to speak with the **ADA Coordinator**. You must schedule/reschedule your appointments with the ADA Coordinator.

What are the privileges of NGA certification?

NGA Certified Auto Glass Repair Technicians have the right to use (in accordance with specific licensing regulations) the credentials for the certification program and the right to wear the uniform patch.

How will I know when to renew my certification?

NGA certification requires renewal every three years. NGA will notify you and your employer in writing approximately 60-90 days before the expiration of your certification, so that you may renew your certification.

Who is eligible for NGA's Auto Glass Repair Technician Certification examinations?

Candidates must have six months experience in the auto glass repair industry or have completed an auto glass repair training program. All candidates must have performed 200 or more repairs.

What does it mean to be certified by the National Glass Association's Auto Glass Repair Technician Certification Program?

As a certified NGA Auto Glass Repair Technician, you have passed an NGA examination that shows you have met industry standards for basic

knowledge. You will receive a wallet identification card and 6 uniform patches that attest to your status.

You may purchase optional study materials through NGA by calling toll-free 866/DIAL NGA (342-5642), extension 138; by visiting NGA's web site at www.glass.org or by e-mailing NGA at certification@glass.org. **Do** prepare for the exam. **Do not** assume you can pass without studying for the exam. Before taking the exam, read and study as much information as possible about auto glass repair.

Are study materials available?

You may purchase the optional study materials from NGA by calling toll-free 866/DIAL NGA (342-5642), extension 134, or by visiting our website at www.glass.org. For a list of additional reference materials visit our website.

Are sample examination items available?

The following are sample examination items (questions) for the Certified Auto Glass Repair Technician Examination:

1. Which of the following types of automotive glass is repairable?
 - a. Insulated
 - b. Plate
 - c. Tempered
 - d. Laminated

2. Which of the following characteristics of a break is **LEAST** important when determining repair ability?
 - a. Age
 - b. Size
 - c. Location
 - d. Cause

3. Which of the following is most likely to prevent an effective repair?
 - a. Liquid contamination
 - b. Previous repair
 - c. Combination damage
 - d. Disconnected star leg

4. The purpose of acrylic acid in resin is to
- remove solvent
 - prevent shrinkage
 - increase the adhesion
 - increase the refractive index

Answers: 1. d; 2. b; 3. b; 4. c

What should I expect on the day of the examination?

Be sure to arrive at the testing center at least 15 minutes early. Before being admitted, you will be required to show two forms of identification -- **Primary form of identification** must be a federal or state government issued photo ID. (State-issued driver's license or identification card, passport, active military identification) **Secondary form of identification** must be a valid credit card or a Social Security Card. (In keeping with FTC guidelines to prevent identity theft, it is not recommended carrying your Social Security card. If it is the only secondary form of identification you have, it will be accepted by LaserGrade.)

*Note: If for any reason, you cannot take the exam on the scheduled date and time, call 800/211-2754 and reschedule the exam, at least 48 hours in advance to avoid forfeiting your exam fee. If you fail to notify LaserGrade at least 48 hours before the scheduled time, the exam fee will **not** be refunded. You will be required to re-register and pay the exam fee again to take the certification exam.*

You will be shown to a computer and given operating instructions. A practice program, to familiarize you with taking an examination on the computer, will be run. No prior knowledge of computers or typing is needed to take the examination. Once the examination begins, you will have 90 minutes to complete it.

The computerized examination allows you to skip items temporarily, then return to them after you have seen all of the items. Before allowing you to exit the examination, the computer will notify you about the items that you have marked for review or those that remain unanswered. Upon your completion of the examination, you will receive your examination results. You will learn immediately whether you passed the examination.

What are the testing center regulations?

The testing center regulations are:

- Candidates who arrive after their scheduled time will be required to reschedule the examination. Arrive at least 15 minutes before your scheduled time.
- Candidates must present **two forms of identification**:
Primary form of identification must be a federal or state government issued photo ID. (State-issued driver's license or identification card, passport, active military identification)
Secondary form of identification must be a valid credit card or a Social Security Card. (*In keeping with FTC guidelines to prevent identity theft, it is not recommended carrying your Social Security card. If it is the only secondary form of identification you have, it will be accepted by LaserGrade.*)
- No electronic devices (pagers, palm pilots or cell phones) are allowed in the examination room. Only non-programmable, silent calculators that do not require electrical outlets may be taken into room. No reference materials or notes of any kind will be permitted.
- No exam materials, documents, or memoranda of any sort may be taken from the examination.
- Visitors will not be permitted in the examination room.
- Testing center personnel will be instructed to answer questions about examination procedures only. They cannot respond to inquiries regarding examination content.
- Any candidate giving or receiving assistance of any kind, or found making a disturbance, will be required to turn in examination materials and leave the testing center. Examinations from candidates who violate these security guidelines, or from those who attempt to impersonate another candidate, will not be scored. The candidate's examination fee will not be refunded.
- Once a date and time has been scheduled to take the exam, LaserGrade requires 48 hours notification to reschedule. If the candidate fails to notify the LaserGrade at least 48 hours before the scheduled time, the exam fee will **not** be refunded. The candidate will be required to re-register and pay the exam fee again to take the certification exam.

When will I receive a score report?

You will receive immediate pass/fail results when you complete your certification examination. Permanent certification records maintained by NGA contain only a pass/fail indication, not a numeric or scaled score.

When may I retake the examination if I fail it?

If you fail the examination, you must wait 30 days before taking it again.

The cost of retesting is the same as the cost of the original examination.

If you fail a second time, you must wait an additional 30 days before taking the next examination. If you fail a third time, you must wait 6 months before taking another exam. After waiting 6 months, the examination retest schedule begins all over again (waiting 30 days, 30 days and 6 months).

How is the examination scored?

The score you receive on the exam is a “scaled score.” Since there is more than one form for both, the technician and master exams, NGA’s exam development company has ensured that the exams are equal in difficulty within each certification level. There is a mathematical adjustment across all forms of the exam to ensure that one form is not easier or more difficult than the other forms.

The passing scaled score for the exam is 75. If your reported scaled score is equal to or greater than 75, then “PASS” appears on your score report. If your scaled score is less than 75, “FAIL” appears on your score report. If a failed score appears, your score and the exam topics will be listed with an indication of the acceptable performance or recommended additional study items.

It is important to remember that a 74 on the exam does NOT mean you have missed passing by only one item, because, a scaled score is NOT a percentage score. It is very possible that you have missed passing by more than one item.

A scaled score is a standard method of scoring. It is extremely reliable in ensuring exam fairness.

How do I submit comments about the testing?

Comments or concerns about how the examination was administered, or item challenges must be delivered in writing. Mail your comments to Certified Auto Glass Technician Program, National Glass Association, 8200 Greensboro Drive, Suite 302, McLean, VA 22102-3881. You may also fax your comments to 703/442-0630. Please include:

- Your name, address, 5 Digit Personal Identification Number (or Social Security) and phone number.
- Your test date.
- Your testing center location (found on the results form).

Direct all inquiries and comments about eligibility and procedures for registration to NGA as above.

Are examination results ever released?

To maintain confidentiality, NGA does not share, sell, or circulate certification records.

How can others verify my participation?

To provide information without compromising participant privacy, each participant is identified by a specific identifying code that has five digits which can be found on the participant's confirmation letter or by the last four digits of the participant's Social Security number.

Note: The release of information is restricted to certification program and company participants. Encrypted code is based upon information provided to NGA on the candidate's registration form.

Can my employer verify my certification?

Employers and consumers may contact NGA for a technician's certification status. NGA will release only the following information:

- Certification level.
- Status (active or expired).
- Effective date.
- Expiration date.

Note: Please notify NGA when you change employers.

Certification Checklist

Registration form, checklist and examination fee

- Completed?
- Signed?
- Mailed or faxed to NGA or registered on NGA's web site?

Registration confirmation

- Confirmation letter received?
- Have you called LaserGrade Computer Testing at 800/211-2754 to schedule your exam?

Exam Date _____

Time _____

Location _____

Take to the Exam

- Primary form of identification? (state-issued driver's license or identification card, passport, active military identification)
- Secondary form of identification? (valid credit card or Social Security Card)

Note: *DO NOT bring electronic devices such as cell phones, palm pilots, programmable calculators, or pagers.*

EXAMINATION SPECIFICATIONS

How to use this Table

The table below summarizes the auto glass repair knowledge categories from the job survey conducted industry wide. This information has been divided into content areas, which together add up to 100% of what candidates need to know to become a certified auto glass repair technician. For example, content Area 2: "Preparing to Perform the Repair" is 20% of the exam. Under this major topic are four (4) specific sub-topics. Also listed is the approximate number of items (questions) on the exam from each content area.

Make sure to review each content area to determine the specific topics of study. Make sure to review and understand each content area.

AUTO GLASS REPAIR TECHNICIAN EXAMINATION SPECIFICATIONS

<u>Content Area</u>	<u>% of Exam</u>	<u>Number of Items</u>
1. Diagnosing the Damage		
Inspecting the Vehicle	15%	10-11
A. Assessing glass damage	11%	7-8
1. Knowledge of glass structure, performance, and safety functions		
2. Knowledge of types and components of automotive glass		
a. Laminated glass		
b. Heated windshields and back glass		
c. Shade bands		
d. Solar glass		
e. Windshields with heads-up displays (HUD)		
f. Frit bands or black band around edge of windshield		
3. Knowledge of types of repairable damage		
a. Bull's-eye breaks		
b. Star breaks		
c. Combination breaks		
d. Cracks (edge, non-edge, and stress)		
e. Chips (surface damage; the glass is not broken through to the laminate)		
4. Knowledge of types of un-repairable damage/conditions		
a. Penetration of the laminate		
b. Damage size		
c. Previously repaired damage		
d. Damage in the acute or critical area		
e. Damage age		
f. Damage to the interior lite (layer) of a windshield		
g. Contamination		

<u>Content Area</u>	<u>% of Exam</u>	<u>Number of Items</u>
5. Knowledge of types of contaminants (e.g. solid, liquid)		
B. Assessing vehicle damage	2%	1-2
1. Knowledge of other glass damage (e.g. previously repaired damage, additional breaks and cracks)		
C. Documenting findings	2%	1-2
1. Knowledge of NAGS numbering system for glass repairs		
2. Ability to read and write as necessary to document findings		
2. Preparing to Perform the Repair	20%	14
A. Establishing Customer Expectations	7%	5
1. Knowledge of what a repair is <ul style="list-style-type: none"> a. Process to fix a damaged windshield b. Alternative to replacing a damaged windshield 		
2. Knowledge of what the repair process is <ul style="list-style-type: none"> a. Evacuation of air from the break b. Injection of resin c. Curing 		
3. Knowledge of the benefits of repair <ul style="list-style-type: none"> a. Cost savings b. Restores clarity c. Appearance d. Restores strength and stops the damage from spreading e. Convenience (saves time) f. Saves the windshield g. Reduces waste 		

<u>Content Area</u>	<u>% of Exam</u>	<u>Number of Items</u>
4. Knowledge of the drawbacks of repair <ul style="list-style-type: none"> a. Damage may not disappear b. Damage may spread during the repair process 		
B. Selecting and preparing the resin	4%	2-3
1. Knowledge of resins available <ul style="list-style-type: none"> a. Types b. Viscosities c. Environmental conditions affecting resin selection 		
2. Knowledge of resin packaging, storage, shelf life, and disposal		
3. Knowledge of methods used to warm and cool resin		
C. Planning access to the damage	7%	5
1. Knowledge of access to impact damage <ul style="list-style-type: none"> a. Probing b. Drilling 		
2. Knowledge of access to crack damage <ul style="list-style-type: none"> a. Flexing (and the use of crack opening devices) b. Drilling 		
3. Knowledge of the risks of spreading the damage		
4. Knowledge of cosmetic/appearance considerations		
D. Protecting the vehicle	2%	1-2
1. Knowledge of hazards to the interior and exterior surfaces of a vehicle		

<u>Content Area</u>	<u>% of Exam</u>	<u>Number of Items</u>
2. Knowledge of the effects of resin on non-glass vehicle components		
3. Knowledge of equipment used to protect the interior		
4. Knowledge of equipment used to protect the exterior		
3. Practicing Personal Safety	10%	7
A. Protecting the eyes	3%	2
1. Knowledge of hazards (e.g. glass fragments and dust, resin splatters)		
2. Knowledge of equipment used to protect the eyes (e.g. safety glasses and goggles)		
B. Protecting the skin	3%	2
1. Knowledge of hazards (e.g. chemical burns, development of skin sensitivity to resins)		
2. Knowledge of equipment and materials used to protect the skin (e.g. safety gloves, barrier creams, soap and water)		
C. Protecting the lungs	2%	1-2
1. Knowledge of hazards (e.g. glass dust, resin fumes)		
2. Knowledge of equipment and procedures (e.g. masks, respirators, proper ventilation)		

<u>Content Area</u>	<u>% of Exam</u>	<u>Number of Items</u>
D. Complying with regulations	2%	1-2
1. Knowledge of federal regulations (OSHA [Occupational Safety and Health Administration])		
2. Knowledge of MSDSs (Material Safety Data Sheets)		
3. Knowledge of handling, storage, and disposal of resins		
4. Knowledge of handling, storage, and disposal of solvents		
4. Performing the Repair	55%	38-39
A. Adjusting the temperature of the glass	5%	3-4
1. Knowledge of the appropriate temperature range for glass repair		
2. Knowledge of equipment and methods used to measure the temperature of the glass		
3. Knowledge of equipment and methods used to warm or cool the glass		
B. Decontaminating the damage	5%	3-4
1. Knowledge of equipment and methods used to remove solid contaminants from the damage		
2. Knowledge of equipment and methods used to remove liquid contaminants from the damage		

<u>Content Area</u>	<u>% of Exam</u>	<u>Number of Items</u>
C. Drilling the damage (when appropriate)	7%	5
1. Knowledge of the location to drill		
2. Knowledge of the depth to drill		
3. Knowledge of the angle to drill		
4. Knowledge of the speed to drill		
5. Knowledge of equipment and methods used to remove glass debris		
D. Mounting the repair apparatus	3%	2
1. Knowledge of the operation of the repair apparatus		
2. Knowledge of the positioning of the repair apparatus		
3. Knowledge of methods used to secure the repair apparatus to the glass		
E. Applying or inserting the resin	4%	2-3
1. Knowledge of equipment and methods used to apply or insert the resin		
2. Knowledge of the proper amount of resin to apply or insert		
F. Air extraction process/vacuum cycle	8%	5-6
1. Knowledge of air extraction/vacuum methods		

<u>Content Area</u>	<u>% of Exam</u>	<u>Number of Items</u>
2. Knowledge of when to stop the air extraction process/vacuum cycle		
3. Knowledge of alternative methods to facilitate air extraction from the damage (e.g. probing, flexing, picking, alternating between extraction/vacuum and injection/pressure, heating)		
G. Resin injection process/pressure cycle	8%	5-6
1. Knowledge of injection/pressure methods		
2. Knowledge of when to stop the injection process/pressure cycle (complete fill)		
3. Knowledge of optimum pressure (for conditions)		
4. Knowledge of alternative methods to facilitate resin injection into the damage (e.g. flexing, alternating between injection/pressure and extraction/vacuum, tapping or vibrating, heating)		
H. Curing process/cycle	7%	5
1. Knowledge of equipment and methods for curing (e.g. long wave ultraviolet light curing lamps, chemical catalysts, sunlight)		
2. Knowledge of UV (sun) screens		
3. Knowledge of minimum cure times		
4. Knowledge of factors that affect the cure rate (e.g. UV light wavelength, UV light intensity, environmental conditions)		
5. Knowledge of curing films		

<u>Content Area</u>	<u>% of Exam</u>	<u>Number of Items</u>
I. Finishing the pit/impact point	5%	3-4
1. Knowledge of equipment and methods used for excess resin removal		
2. Knowledge of pit/impact point polishing materials and techniques		
3. Knowledge of incomplete pit/impact point fill and equipment and methods used to correct it		
J. Clean-up/maintenance	3%	2
1. Knowledge of resin spill clean-up		
2. Knowledge of equipment clean-up and maintenance		
3. Knowledge of glass clean-up		

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