

American National Standard

AUTO GLASS
SAFETY COUNCIL™

*Automotive Glass Replacement
Safety Standard™ (AGRSS)*

AGRSS

Automotive Glass Replacement Safety Standard™



ANSI/AGSC/AGRSS
005-2022
Revision of
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American National Standard
Automotive Glass
Replacement Safety Standard™
(AGRSS)

Secretariat

Auto Glass Safety Council™

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American National Standard

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Foreword (This foreword is not part of American National Standard ANSI/AGSC/AGRSS 005-2022.)

The Automotive Glass Replacement Safety Standard™ (AGRSS) was created and is continuously maintained by the Auto Glass Safety Council working under the auspices of the American National Standards Institute (ANSI). AGSC also serves as secretariat for the standard.

The AGRSS Standard represents the windshield replacement industry's best practices as compiled under ANSI guidelines by a balanced committee of windshield replacement practitioners, suppliers and other interested parties.

This standard contains an industry consensus of recommended terminology, definitions, process and procedures. These recommendations reflect the expertise of the AGSC AGRSS Standards Committee members who hold a combined experience of hundreds of years and many thousands of actual windshield replacements.

This standard contains one annex. Annex A is informative and is not considered part of this standard.

AGSC welcomes proposals for amendments to any portion of this Standard. These proposals should be in writing and sent to the address below and accompanied by a statement of the rationale for the proposal along with the proponent's complete contact information. All proposals will be referred to the AGSC AGRSS Standards Committee for consideration. Submit proposals to: AGSC/AGRSS Standards Committee, PO Box 569, Garrisonville, VA 22463, or by email to info@agsc.org.

This standard was developed, processed and approved for submittal to ANSI by the AGRSS Standards Committee of the Auto Glass Safety Council. Committee approval of the standard does not necessarily imply that all committee members voted for its approval. At the time it approved this standard, the AGRSS Standards Committee had the following members:

Bob Beranek, Chair, AGSC AGRSS Standards Committee
 (Automotive Glass Consultants)

<i>Organization Represented</i>	<i>Name of Representative</i>
AGRR Magazine.....	Debra Levy
Arrow Auto Glass.....	Joshua Levine
Automotive Glass Consultants.....	Bob Beranek, Chair
Binswanger Glass.....	John McGee
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Burco, Inc.....	Bill Castleberry
Carlex Glass, LLC.....	Susan Phillips
Century Glass.....	Randy Wright
City Auto Glass.....	Jon Laski
DINOL U.S. Inc.....	Joe Renzi
Don's Mobile Glass.....	Jacques Navant
DuPont.....	Steve Allison
eDirect Glass.....	Maria Iorio
Equalizer Industries, Inc.	Gilbert Gutierrez
Fremont Auto Glass.....	John Payne
Glass Doctor.....	Thomas Patterson
Henkel Corporation.....	Andrew Scott
Independent Glass Association.....	Gary Hart
JP Consulting.....	Jean Pero
LYNX Services.....	Paul McFarland
Mainstreet Computers, Inc.....	Mark Haeck
Mygrant Glass.....	Mark Cossey
Orion Registrar, Inc.....	Penny Ouellette
Pilkington North America, Inc.	Erica Clouse
Protech Automotive Solutions.....	Mitch Becker
Richardson Glass Services.....	Gene Nichols
Safelite AutoGlass.....	Glen Moses
Serf Midwest, Inc.....	Mark Formentini
SIKA Corporation.....	Mike Rea
SRP/Novus 2, LLC.....	Ted Andersen
Tiny & Sons Glass Co.....	Peter Brown
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Introduction

The Auto Glass Safety Council™ (AGSC) was founded in the late 1990s when professionals from windshield manufacturers, car makers, adhesive companies and auto glass retailers came together with the goal of defining auto glass safety. This group began the process of establishing a safety standard for the auto glass industry.

By 1999, AGSC had developed the Auto Glass Replacement Safety Standard™ (AGRSS) in partnership with the American National Standards Institute. Since that time, many safety conscious auto-glass retailers have voluntarily agreed to follow the AGRSS Standard, giving the consumer an increased level of safety. The AGSC has provided the necessary standard for auto glass retailers to follow to make sure all precautions are taken to ensure driver and passenger safety.

Prior to the formation of the AGSC, the auto glass replacement industry had no standard for windshield installation. There was no consensus in the industry regarding proper installation methods. Unfortunately, this resulted in lives lost and serious injuries that could have been prevented. The lack of responsibility for providing a proper windshield replacement has also exposed many auto glass shops and their insurance providers to legal actions from unsuspecting automobile passengers who thought their glass replacement was performed correctly and safely.

The AGRSS Standard addresses six critical areas relative to the installation process, including:

- Vehicle assessment;
- Selection of glass and retention systems;
- Installation standards for adhesive bonded glass;
- Installation standards for rubber gasket set glass, as well as additional requirements for all other glass in a vehicle; and
- Continuing education for auto glass technicians.

The AGRSS Standard is continuously maintained by AGSC and the industry.

American National Standard

Automotive Glass Replacement Safety Standard™ (AGRSS)

1. Scope and purpose

1.1 Scope

An automotive glass replacement safety standard addressing procedures, education and product performance for motor vehicles falling within the guidelines of applicable Federal Motor Vehicle Safety Standards (FMVSS).

1.2 Purpose

1.2.1 To improve the performance and practices of industry technicians and raise their level of professionalism.

1.2.2 To guide the industry in auto glass replacement procedures that meet the pertinent Federal Motor Vehicle Safety Standard requirements.

1.2.3 To provide guidelines and objectives for groups that supply products, education, and training for the industry.

1.2.4 To promote public awareness of the need for safe installation procedures, which will reduce the risk of personal injury and/or death from traffic accidents.

1.2.5 To provide a comprehensive automotive glass replacement standard.

1.2.6 To achieve a consistency among automotive glass installation practices.

1.2.7 To create an automotive glass installation benchmark for anyone engaged in the replacement of automotive glass.

2. Normative References

The following standards contain provisions which, through reference in this text, constitute provisions of this American National Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to

agreements based on this American National Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below.

ANSI Z26.1 version currently incorporated in FMVSS 205, *Safety Glazing Materials for Glazing Motor Vehicles and Motor Vehicle Equipment Operating on Land Highways – Safety Standard* ¹⁾

Federal Motor Vehicle Safety Standard 111 ²⁾

Federal Motor Vehicle Safety Standard 205 ²⁾

Federal Motor Vehicle Safety Standard 208 ²⁾

Federal Motor Vehicle Safety Standard 212 ²⁾

3. Definitions and Acronyms

3.1 ADAS: Advanced Driver Assistance Systems; automated systems that enhance vehicle safety and assist in reducing driver error.

3.2 adhesive bonding system: an engineered system using chemical products, used together as a technique or process, to bond substrates.

3.3 AGR: automotive glass replacement.

3.4 anti-pinch mechanism: a feature that reverses the window or panel direction of travel when resistance is encountered.

3.5 ARG: automotive replacement glass.

3.6 butyl sealant: a copolymer of isobutylene and isoprene.

3.7 calibration: the process by which a new Advanced Driver Assistance System component is calibrated to the manufacturer's specifications (such as when a new camera is installed).

3.8 dynamic recalibration/calibration: recalibration/calibration that takes place while a vehicle is driven and exposed to roadway conditions specified by the vehicle manufacturer (e.g. speed, lane markings, traffic signs, etc.).

¹⁾ANSI Z26.1 has been withdrawn as an American National Standard. Please use the version of that standard incorporated in FMVSS 205.

²⁾Available from the Superintendent of Documents, US Government Printing Office, P.O. Box 371954, Pittsburgh, PA 15250.

3.9 equivalent retention system: a system that meets or exceeds the vehicle manufacturer's performance strength specifications, or has been certified by the retention system manufacturer or private labeler as appropriate for the specific application.

3.10 final exam: a comprehensive exam that evaluates the individual's knowledge and skills including but not limited to retention system specific replacement procedures, a variety of automotive safety issues, minimum drive-away time, environmental conditions as they affect retention system performance, federal safety requirements, and the basics of safe and effective automotive glass replacement.

3.11 full cut: removing existing bead of urethane to a height of approximately 1 to 2 mm wherever the residual bead is structurally sound and the substrate condition is not defective.

3.12 initialize (also initialization, re-initialization): a procedure that re-establishes proper operation of the intended function.

3.13 minimum drive-away strength: the minimum properties as defined and specified by the retention systems manufacturer or private labeler to meet the requirements of FMVSS 208 and 212 as it pertains to glass retention systems.

3.14 minimum drive-away time: the time necessary for a given adhesive system to attain minimum drive-away strength after an adhesive bonded glass part is set in place.

3.15 OE: original equipment.

3.16 OEM: original equipment manufacturer.

3.17 polysulfide adhesive: an adhesive containing sulfur that cures to a cross-linked rubber compound.

3.18 polyurethane adhesive: a thermoplastic polymer adhesive produced by the condensation reaction of polyisocyanate and a hydroxyl containing material.

3.19 primer: an agent that is designed specifically by the adhesive manufacturer to promote adhesion between the substrate and the adhesive and/or provide shielding from environmental factors.

3.20 private labeler: any individual, corporation or the entity engaged in sale or distribution of a product labeled as its own, but manufactured by any different entity.

3.21 recalibration: the process by which a vehicle's Advanced Driver Assistance System is returned to the vehicle manufacturer's specifications.

3.22 retention system: refers to any original equipment or equivalent method of glazing attachment.

3.23 static recalibration/calibration: recalibration/calibration undertaken on a stationary vehicle in a controlled environment.

3.24 those engaged in automotive glass replacement: refers to any individual, business, or organization that replaces automotive glass.

4. Vehicle Assessment before Replacement

Those engaged in automotive glass replacement shall not undertake or complete any installation unless first a thorough assessment of the vehicle has been made. If, after such assessment, it has been determined that:

4.1 Any discovered condition(s) on the vehicle could compromise the vehicle's retention system, the technician shall not undertake or complete the installation. The owner/operator then shall be so notified verbally and in writing.

4.2 The vehicle has an ADAS which could require recalibration after any automotive glass replacement, and the technician chooses not to follow the guidelines in 8.9, the technician shall not undertake or complete the installation. The owner/operator then shall be so notified verbally and in writing.

4.3 The following are exempt from the requirements of 4.1 and 4.2: egress applications, antique/classic or collector vehicle (as defined by the state in which it is licensed) restorations, or cases in which the requirements of this Standard conflict with current vehicle manufacturer specifications.

Documentation of customer notification shall be kept as record pursuant to 8.7.

5. Selection of Glass, Retention Systems, and ADAS Recalibration/ Calibration Equipment

5.1 Those engaged in automotive glass replacement shall use retention systems that are produced under a current version of the ISO 9001 standard or any standard that contains the entire text of a current version of ISO 9001.

5.2 Those engaged in automotive glass replacement shall use glass products meeting the requirements of ANSI Z26.1 as required by Federal Motor Vehicle Safety Standard 205.

5.3 Those engaged in automotive glass replacement must use either an OEM approved retention system or equivalent retention system as certified in writing by the equivalent retention system manufacturer directly or through a private labeler.

5.4 Those engaged in automotive glass replacement shall obtain and follow written comprehensive and current application instructions from the retention systems manufacturer or private labeler. These instructions shall include at least the proper use of the retention system, storage specifications, minimum drive-away time charts containing temperature and humidity variables if applicable, and any special procedures required for adverse weather conditions.

5.5 Those engaged in automotive glass replacement shall only use retention systems that have lot numbers and expiration dates printed on appropriate products.

5.6 Those engaged in automotive glass replacement shall use glass products compatible with the ADAS which may be affected/impacted by the glass replacement.

5.7 Those engaged in automotive glass replacement shall only use equipment specifically designed and purposed for recalibration/calibration when recalibration/calibration of the ADAS is required by the vehicle manufacturer. Further:

- Recalibration/calibration must be completed using either an OEM-approved recalibration/calibration system/procedure, or equivalent recalibration/calibration procedure as assured in writing by the equivalent recalibration/calibration equipment manufacturer.
- Equivalent recalibration/calibration equipment -- and the procedures used in conjunction with that equipment -- must be represented in writing by the manufacturer as being suitable for and compatible with the accurate recalibration/calibration of ADAS on the vehicle specifically contained within that equipment's database.
- Recalibration/calibration equipment must only be used on vehicles specifically covered within the device's database/software and must never be used to recalibrate/calibrate models beyond the scope of the software.
- Recalibration/calibration equipment must never be altered or modified without the express permission of the manufacturer, and all regular maintenance must be sufficient to comply with the manufacturer's requirements.

6. Installation Standards – Adhesive Bonded

6.1 Those engaged in automotive glass replacement shall follow the adhesive manufacturer's application instructions as provided by the manufacturer directly, or through the private labeler. All in-shop or mobile installations shall be performed under

environmental and other conditions that are compatible with the application instructions required in Section 5.

6.2 Products must be stored and controlled according to manufacturers' requirements as provided directly or through a private labeler.

6.3 No automotive glass replacement shall be undertaken using an adhesive glass retention bonding system that would not achieve minimum drive-away strength by the time the vehicle may be reasonably expected to be operated.

6.4 The vehicle owner/operator shall be notified prior to and after the installation process of the minimum drive-away time under the circumstances of the replacement.

6.5 Adhesive must be applied so that the finished bead cross section profile and dimensions meet or exceed original equipment configuration or recommendation of adhesive system manufacturer.

6.6 If the OEM installation was polyurethane, then the glass must be replaced with polyurethane or an equivalent adhesive bonding system. If the OEM installation was butyl, polysulfide, or other non-polyurethane, and the vehicle is licensed for highway use, adhesive bonded stationary glass installations shall be performed using polyurethane or an equivalent retention system unless in conflict with current OEM specifications.

6.7 All adhesive system component lot numbers must be traceable to each job.

6.8 All glass parts must be traceable to the installation by a DOT number and part number.

6.9 No product that has exceeded the manufacturer or private labeler's stated expiration date, open shelf life, or active shelf life shall be used.

6.10 All supplemental mechanical glass retention devices must be replaced to original equipment specifications.

6.11 When inappropriate replacement materials or methods are detected, those engaged in automotive glass replacement shall report their findings to the vehicle owner/operator.

6.12 When those engaged in automotive glass replacement correct inappropriate glass installations, they shall remove any inappropriate materials that would compromise the retention system. They shall fully correct any adverse glass installation related condition(s) caused by the use of inappropriate materials or methods, and they shall use appropriate methods described elsewhere within Section 5 of this document.

6.13 When sealing air or water leaks within a polyurethane retention system, only compatible polyurethane adhesive shall be used. (No silicone or butyl may be used.)

6.14 Only the full cut method should be used for polyurethane retention systems.

7. Installation Standards – Rubber Gasket

7.1 If the OEM utilizes the combination of a rubber gasket and polyurethane as a retention system, an equivalent adhesive bonding system must be used in the installation. In cases when the OEM did not include polyurethane or an equivalent adhesive system, such systems shall be used if later production models included the addition of adhesive systems without body style modification.

7.2 If the OEM gasket installation did not include adhesive and the vehicle is licensed for highway use and is less than 10,000 lbs Gross Vehicle Weight Rating (GVWR), the installation shall include polyurethane or an equivalent adhesive bonding system. (See 4.3).

7.3 When sealing air or water leaks within a rubber gasket/polyurethane ADHESIVE SYSTEM only compatible polyurethane shall be used. (No silicone or butyl may be used.)

8. Additional Requirements

8.1 All mechanically fastened automotive glass parts shall be replaced according to original equipment specifications.

8.2 Glass parts, including custom cut parts, must be marked in compliance with the certification requirements specified in FMVSS 205 and the marking requirements of ANSI Z26.1 incorporated by reference therein for those vehicles licensed for highway use.

8.3 Those engaged in automotive mirror replacement shall install external and internal replacement mirrors that meet or exceed original equipment specifications and the requirements of Federal Motor Vehicle Safety Standard 111.

8.4 Whenever OEM retention systems are modified on later production models without body style modification, the most current retention system shall be used in the replacement unless otherwise specified by the OEM.

8.5 Notification of defective product:

- A failure or defect in any product used or intended for use in the automotive glass replacement process that could jeopardize customer safety shall be reported promptly to the manufacturer or supplier of the product.
- Any product installed by those engaged in automotive glass replacements that is discovered to be defective or which is determined could jeopardize customer safety must be immediately reported to the customer with an offer to remedy the situation.

8.6 Those engaged in automotive glass replacement shall not introduce any chemical agents, such as cleaners, solvents, lubricants, release agents, or utilize any installation practice, which will adversely affect the glass retention system.

8.7 Those engaged in automotive glass replacement shall create and retain records of each auto glass replacement (and any ADAS recalibration/calibration conducted in conjunction with that glass replacement) for a period of at least three years from the date the work was completed sufficient to demonstrate compliance with this standard. Records, either electronic or hard copy, shall be legible, easily identifiable and readily available. Such three-year period may be temporarily shortened for specific, clear and substantial reasons but must be adhered to when such reasons no longer exist.

8.8 Those engaged in the repair, removal or replacement of motorized windows and/or panels in automobiles that are equipped with anti-pinch mechanisms shall reset, initialize and/or confirm their proper operation before the vehicle is released to its owner/operator. If the reset operation cannot be completed for any reason, the vehicle owner/operator shall be informed verbally and in writing of the failure to reset the system. In addition, the owner/operator shall be instructed to seek out a facility equipped to reset the system. The replacement glass installer is not responsible for the selection of any reset facility. Documentation of customer notification shall be kept as record pursuant to 8.7.

8.9 If the vehicle being serviced has an ADAS, and requires recalibration/calibration, those engaged in automotive glass replacement who elect to provide recalibration/calibration services shall:

- only commence Dynamic recalibrations/calibrations once the minimum drive-away time requirement has been achieved;
- only commence Static recalibrations/calibrations according to the guidelines provided by the manufacturer of the adhesive used for the glass replacement;
- only perform the recalibration/calibration if they obtain and use proper equipment, use trained personnel, and provide the outcome of the recalibration/calibration to the owner/operator.

If these conditions cannot be met, or if the automotive glass company does not provide

recalibration/calibration services, the owner/operator shall be advised prior to and at the completion of the installation, that:

- 1) The vehicle has an ADAS.
- 2) After automotive glass replacement, the vehicle manufacturer requires recalibration/calibration of the ADAS.
- 3) The replacement glass company will not recalibrate/calibrate the ADAS.
- 4) There are locations where recalibration/calibration may be obtained.
- 5) The replacement glass company is not responsible for the selection of any recalibration/calibration location.

Documentation of recalibration/calibration records and customer notifications shall be kept as record pursuant to 8.7.

9. Education

9.1 Technicians installing replacement automotive glass shall be fully qualified for the tasks they are required to perform. Such qualifications shall include, at a minimum, completion of a comprehensive training program with a final exam and an ongoing education component. The program shall include, among other things:

- a) AGR safety issues.
- b) An understanding of OEM installation standards and procedures.
- c) Relevant technical specifications.
- d) Adhesive System Manufacturer specific comprehensive retention system training.
- e) The opportunity to apply and demonstrate the skills technicians learn.

9.2 Technicians performing recalibration/calibration procedures shall be fully qualified for the tasks they are required to perform. Such qualifications shall include, at a minimum, completion of a comprehensive training program with a final exam and ongoing education component.

Curriculum used for ADAS training must be kept on file (in an auditable format) and must contain the following elements:

- a) What ADAS are, what they do, and how they function
- b) Types of ADAS
- c) Purpose of recalibration/calibration and the need for precise execution
- d) Types of recalibration/calibration:
 - Static
 - Dynamic
 - Dual (static and dynamic)

e) Comprehensive and manufacturer specific recalibration/calibration training for the system/equipment used by the automotive glass company:

- Set up and operation of the equipment
- Maintenance of the equipment

Further, successful completion/mastery of the training shall be verified by a final exam which includes:

- Knowledge assessment of ADAS and the recalibration/calibration process
- Skill assessment to verify proper technique and use of equipment

9.3 Training with respect to the content and requirements of the current version of this standard shall be required for all personnel directly involved in the automotive glass replacement process (examples: scheduling, purchasing, installing, customer service, quality control, management). Records of this training detailing content, date, participants and acknowledgement of the participant's successful completion of the training and receipt of a printed copy of the current standard shall be maintained.

Annex A
(informative)

Bibliography

Federal Motor Vehicle Safety Standard 216a
Any other applicable FMVSS standards
AGRSS Training Guide