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REQUEST TO LIST IN THE COMPENDIUM OF CANDIDATES
THE UNITED STATES OF AMERICA FEDERAL MOTOR VEHICLE SAFETY
STANDARD FMVSS No. 205 – GLAZING MATERIALS

Transmitted by the representative of the United States of America

Note: The document reproduced below is submitted by the United States of America to the Executive Committee (AC.3) for consideration. It contains a request to include in the Compendium of Candidates FMVSS No. 205 on Glazing materials.

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REQUEST TO LIST IN THE COMPENDIUM OF CANDIDATES
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STANDARD FMVSS No. 205 – GLAZING MATERIALS

The United States of America requests that the Federal Motor Vehicle Safety Standard (FMVSS) No. 205 – Glazing materials.

Background

Federal Motor Vehicle Safety Standard No. 205 Glazing Materials (49 CFR 571.205), was first adopted in the United States of America in 1967 as one of the initial motor vehicle safety standards. The standard incorporated an American National Standards Institute (ANSI) standard which had already been voluntarily adopted by the motor vehicle industry. Therefore, no initial analysis of costs and benefits was done. The standard has been amended at various times to update the incorporation to the current version of the ANSI standard.

In 1967, the standard was amended to specify that exposed edge radii be not less than one half the nominal thickness of the glazing material, rather than not less than 0.187 inch nor greater than 0.250 inch as previously required. No impact analysis as it relieved a restriction. (32 FR 10072; 8 July 1967)

In 1972, the standard was amended to permit the use of certain plastic materials at certain locations, in addition to those already allowed. This amendment also required prime manufacturers to certify glazing material as complying with Standard No. 205 by apply the symbol DOT, a code mark obtain on application to the National Highway Traffic Safety Administration (NHTSA), and the markings required by the ANSI standard. (37 FR 12237; 21 June 1972)

In 1977, the standard was amended to permit the use of rigid plastic glazing in all doors and windows of buses, except windscreens or in windows to the immediate right or left of the driver. (42 FR 61465; 5 December 1977)

In 1981, the standard was amended to delete the abrasion resistance requirements specified for Items 3, 5, 9 and 12 glazing, as these items can be used in vehicles only in window locations that are not necessary for driving visibility. (46 FR 43687; 31 August 1981)

In 1983, the standard was amended to permit the installation of glass-plastic glazing as windscreens, and to establish performance requirements for such glazing. (48 FR 52061; November 16, 1983) While a subsequent evaluation (see below) found such glazing to be less effective in reducing injuries than was thought at the time of the amendment, the standard has not been subsequently amended to prohibit such material as glazing as no manufacturer has used it in a production vehicle for the U.S. market since 1987. (48 FR 52061; 16 November 1983)

In 1984, the standard was amended to incorporate the 1980 version of the ANSI standard. (49 FR 732; February 1984)

In 1991, the standard was amended to permit glass plastic glazing Item 15A, 16A and 16B. (56 R 18526, April 23, 1991)

In 1992, the standard was amended to permit glass plastic glazing Item 15B. (57 FR 30161, 8 July, 1992)

In 1996, the standard was amended to permit the installation of coated rigid plastic glazing in some side windows rearward of the "C" pillar in passenger cars. Prior to this rule, no rigid plastics were permitted to be installed in areas requisite for driver visibility because rigid plastics are more susceptible to abrasion than glass and are susceptible to haze caused by weathering. This limited exception was made to provide manufacturers a way using advanced plastics with the least risk to the public so that the in-service performance of such materials could be evaluated. However, the USA is unaware of any manufacturer who ever used item 4A glazing. All windows in a passenger car are considered requisite for driving visibility. (61 FR 41739; August 12, 1996)

In 2003, the standard was amended to incorporate the 1996 version of the ANSI standard. (68 FR 43964; July 25, 2003) Because of petitions for reconsideration, the effective date of this amendment has been delayed until 1 November 2006. (70 FR 39959; 12 July 2005) Therefore, the standard currently references the 1977 version of the ANSI standard and the 1980 supplement to that standard.

Description of Regulation

Standard No. 205 specifies performance requirements for the types of glazing that may be installed in motor vehicles. It also specifies the vehicle locations in which the various types of glazing may be installed. The standard incorporates, by reference, ANSI Standard Z26.1, "Safety Code for Safety Glazing Materials for Glazing Motor Vehicles Operating on Land Highways," as amended through 1980 (Z26). The requirements in ANS Z26.1 are specified in terms of performance tests that the various types or "items" of glazing must pass. There are 21 "items" of glazing for which requirements are currently specified in Standard No. 205.

To ensure the safety performance of vehicle glazing, Standard No. 205 includes a total of 32 specific tests. Each item of glazing is subjected to an appropriate selection of these tests. It is the particular combination of tests that dictates the requisite properties of a particular item of glazing, and where in a motor vehicle the glazing may be installed.

The purpose of Standard No. 205 is to reduce injuries resulting from impact to glazing surfaces, to ensure a necessary degree of transparency in motor vehicle windows for driver visibility, and to minimize the possibility of occupants being thrown through the vehicle windows in collisions.

Cost Effectiveness

Standard No. 205 was one of the initial motor vehicle safety standards adopted in the late 1960's. The standard incorporated an ANSI standard which had already been voluntarily adopted by the motor vehicle industry. Therefore, no initial analysis of costs and benefits was done. Since then NHTSA has evaluated the effectiveness of two aspects of Standard No. 205.

In 1985, NHTSA examined the effectiveness of High Penetration Resistant (HPR) windscreens. When originally adopted Standard No. 205 included requirements to ensure that all motor

vehicles have windscreens as penetration-resistant as HPR. The study found that HPR glazing is a highly cost-effective safety device. The principal findings and conclusions of the study were:

- When an occupant's head strikes a safety-glass windscreen and tears and penetrates the plastic interlayer, the risk of serious lacerations or fractures to the face, scalp, eyes, nose or mouth is 3 times greater than when the impact merely breaks the glass but leaves the plastic layer intact.
- HPR glazing reduced the likelihood of an occupant penetrating the windscreen in frontal crashes by 78 per cent relative to pre-HPR glazing.
- With pre-HPR glazing, there was a 50 per cent probability that an unbelted occupant would penetrate the windscreen in a frontal crash with a Delta V of 14 miles per hour. With HPR glazing, the likelihood of penetration does not reach 50 per cent until Delta V is 31 miles per hour.
- HPR glazing reduced Average Injury Severity (AIS) 2-4 lacerations by 74 per cent; AIS 2-4 eye, nose or mouth injuries by 72 per cent; AIS 2-4 fractures by 56 per cent; and minor lacerations by 25 per cent.
- HPR glazing had little or no observed effect on injuries characteristic of blunt impact trauma, concussions, contusions and complaints of pain.
- Fatality risk in crashes was not significantly changed by HPR glazing.
- The incremental cost per car (in 1982 dollars) of HPR glazing, relative to pre-HPR, was a savings of US\$5.50. This included an initial purchase price reduction of US\$4.45 and a lifetime fuel savings of US\$1.05 due to weight reduction.

In 1993, NHTSA examined the effectiveness of glass-plastic windscreen glazing in passenger cars. Standard No. 205 was amended in 1983 to allow the use of a new type of glazing known as "glass-plastic" glazing for windscreens, at the option of the vehicle manufacturer. The standard was amended to allow glass-plastic glazing because it was thought to have high potential for reducing windshield-caused lacerations of occupants involved in crashes. Two manufacturers, General Motors and Ford, equipped a number of vehicles in their rental fleets with glass-plastic glazing to field test the windscreens. General Motors also equipped some vehicle lines in model years 1984-1986 with glass-plastic glazing. General Motors discontinued use of glass-plastic glazing with the 1987 model year citing high replacement costs for customers and high warranty costs for the company. Since then no other car company has equipped any production vehicles for the American market with glass-plastic glazing.

The 1993 study found that contrary to predictions, available crash data showed no reduction in bleeding (or lacerative) injuries for vehicles equipped with glass-plastic windscreens as compared to vehicles equipped with conventional windscreens. The study also found that durability issues associated with glass-plastic glazing could be a significant concern, primarily as a result of the susceptibility of the plastic inner layer to damage. The study also found that glass-plastic windscreens would add US\$65 to the cost of the new car, and that replacement of a glass-

plastic windscreen is over US\$1700, or more than US\$1200 above the cost of replacing a conventional windscreen.

Related document:

Regulatory Text FMVSS No. 205 – Glazing Materials
