Federal Communications Commission.

Magalie Roman Salas,

Secretary.

[FR Doc. 98–18036 Filed 7–13–98; 8:45 am]

BILLING CODE 6712–01–P

DEPARTMENT OF TRANSPORTATION

National Highway Traffic Safety Administration

49 CFR Part 571

[Docket No. NHTSA–98–4028: Notice 4]

RIN 2127–AC85

Federal Motor Vehicle Safety Standards; Glazing Materials

AGENCY: National Highway Traffic Safety Administration (NHTSA), Department of Transportation (DOT).

ACTION: Withdrawal of notice of proposed rulemaking.

SUMMARY: This notice withdraws a proposal in which the agency considered amending Federal Motor Vehicle Safety Standard No. 205, *Glazing materials*, to revise its light transmittance requirements. The amendments would have specified a new procedure for testing the light transmittance of glazing samples. Instead of specifying that they be tested at the currently specified 90 degree angle, the standard would have specified that they be tested at the acute angle at which the glazing would be installed in the vehicle (the rake angle). The amendments also would have added light transmittance requirements for light trucks, vans, sport utility vehicles, and buses of less than 10,000 pounds gross vehicle weight rating (GVWR), and specified different transmissibility requirements for the various windows.

After reviewing the available information, NHTSA has decided to withdraw this proposal. The reasons for taking this action include the following: the cost impacts of testing at the installed angle pursuant to the proposed new procedure would not be adequately offset by the potential safety benefits of increased visibility if glazing continues to be installed at current rake angles; the practical limits imposed by concerns about visual distortion will prevent rake angles from increasing; the agency does not want to prohibit the use of the best present solar windshield glazing in order to achieve slight differences in effective light transmittance at current rake angles; the agency wishes to better define the relationship between light transmittance and highway safety before it establishes transmittance levels for various vehicle windows; and without controlling for the installed angle of the glazing, setting specific transmittance levels would not consistently and predictably result in improved light transmittance. Another reason for withdrawing this proposal to establish light transmittance levels for additional classes of motor vehicles concerned the fact that the proposed transmittance levels were premised upon adopting the proposed new test method. Since the agency is not adopting the new method, it can not adopt transmittance levels selected on the basis of that method.

FOR FURTHER INFORMATION CONTACT: *For technical issues:* Richard Van Iderstine, Office of Crash Avoidance Standards, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C., 20590. Telephone: (202) 366–5280.

For legal issues: Paul Atelsek, NCC–20, Rulemaking Division, Office of Chief Counsel, National Highway Traffic Safety Administration, 400 Seventh Street, SW., Washington, D.C. 20590 (202) 366–2992.

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I. Background

A. The Current Standard

Federal Motor Vehicle Safety Standard No. 205, *Glazing Materials* (49 CFR 571.205), specifies performance requirements and permissible locations for the types of glazing that may be installed in motor vehicles. The standard incorporates by reference American National Standards Institute (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 Z26 are specified in terms of performance tests that the various types, or ''items,'' of glazing must pass.

One of the tests is for luminous, or light, transmittance. This test measures the regular (parallel) transmittance of a sample of the glazing, in terms of the percentage of incident light that passes through the glazing. During the test, light strikes the glazing at a 90 degree angle. To pass the test, the glazing must allow 70 percent of the incident light to pass through.

The amount of light transmitted through vehicle glazing affects the ability of the driver to see objects on the road. Low light transmittance can make it difficult to detect low contrast objects, such as pedestrians, whose luminance and coloring causes them to blend with the background of the roadside environment. The effect of low light transmittance levels on the driver's vision is most pronounced at dusk and night when the ambient light level is low. This is because the ''contrast sensitivity'' of the eye diminishes as the overall brightness of the scene decreases. This lower contrast sensitivity makes it especially difficult to discern low contrast objects. This problem is most acute for older drivers who have poorer contrast sensitivity. Contrast sensitivity declines by a factor of two about every 20 years after age 30. Thus, older drivers have poorer dusk and night vision.

The light transmittance requirements must be met by all glazing installed in windows that are ''requisite for driving visibility'' (see Z26, table 1). In a longstanding interpretation of this term, NHTSA has determined that all windows in a passenger car, with limited exceptions not relevant here, are considered requisite for driving visibility.

For buses, trucks, and multipurpose passenger vehicles (MPV's), glazing that meets the 70 percent light transmittance requirements is required in the windshield, the windows to the immediate left and right of the driver, and any rear or rear side windows that are requisite for driving visibility. The agency has not issued an interpretation specifying which rear or rear side windows are requisite for driving visibility. In rear windows in buses, trucks, and MPV's that are not requisite for driving visibility, items of glazing that are not subject to the 70 percent

light transmittance requirements may be installed.

As mentioned above, light transmittance of glazing is measured in a laboratory test with the glazing perpendicular to the measuring device, instead of at the angle at which it is mounted in the vehicle (called the ''rake'' angle). Glazing transmits the maximum amount of light when it is mounted perpendicular to the line of sight (i.e., at an angle of 90 degrees), as in the current Standard No. 205 test. As the mounting angle decreases, the amount of light transmitted by the windshield also decreases. For example, windshield glazing with a light transmittance of 73 percent when tested perpendicular to the measured light beam, would have a light transmittance of about 65 percent when tested at a typical windshield rake angle of 60 degrees. (A rake angle of 60 degrees from the vertical axis places the sample at a 30 degree angle with respect to the horizontal light beam representing the line of sight.)

B. Previous Events Related to This Rulemaking

1. Request for Comments

NHTSA received four petitions for rulemaking to amend Standard No. 205 ''to permit 35 percent minimum luminous transmittance plastic film on glazing in the side and rear locations of passenger cars.'' If that film were placed on glazing with 70 percent light transmittance, the combined effect would be to allow an overall transmittance of 24.5 percent.

NHTSA granted the petitions and issued a Request for Comments on July 20, 1989 (54 FR 30427). NHTSA received over 100 comments from a variety of groups in response to the Request for Comments. The comments are available for public review in Docket 89–15, Notice 1.

NHTSA received many comments from police departments and other safety groups opposing darker tinting. These commenters were concerned about the ability of the police to see occupants and objects in vehicles with darker tinting and about traffic safety risks. Some commenters opposed any reduction in the required level of window light transmittance under Standard No. 205 because they believed the current level of light transmittance was necessary, particularly for older drivers and for night driving. Domestic automobile manufacturers advocated more research to define driving visibility needs and opposed allowing additional tinting unless research shows that driver and police safety would be maintained. They further indicated that they were pursuing technological advances to reduce solar loads without reducing safety.

Some commenters were supportive of the petitions. Three German automobile manufacturers and a European research institute working on visibility issues supported allowing darker tinting for rear and rear side windows, but opposed it for front side windows. The petitioners and other commenters stated that darker tinting reduces solar heat transmittance and would increase the comfort of vehicle occupants and reduce chlorofluorocarbon (CFC) emissions, thus providing an environmental benefit.

2. Report to Congress

The House Appropriations Committee requested NHTSA to report to the House and Senate Committees on Appropriations on the adequacy of current regulations governing window tinting. In March of 1991, NHTSA issued a Report to Congress which concluded:

- The light transmittance of windows on new passenger cars complying with Standard No. 205 does not present an unreasonable risk of crash occurrence. While it is not possible to quantify the safety effects of lowering the light transmittance through window tinting, data indicate that extensive tinting can reduce the ability of drivers to detect objects, which could lead to an increase in crashes.
- A change in the way light transmittance is measured in Standard No. 205 may be appropriate. Performing the test at the angle the glass is installed on the vehicle, along the driver's line of sight, is more representative of the real world. Light transmittance requirements could be based on the light transmitting performance of production cars since, as noted above, windows in these vehicles provide light transmittance which does not present an unreasonable risk of crash occurrence.
- Because light trucks, including pick-ups, vans and sport utility vehicles, and buses with a GVWR of less than 10,000 pounds (collectively referred to in this document as light trucks) are now used more as personal transportation vehicles, it may be appropriate to harmonize light transmittance of these vehicles with the requirements of passenger cars.
- The benefits of tinting do not appear great enough to justify any loss in safety that may be associated with allowing excessive tinting of windows. Further, technology already being applied in production car windows can reduce the heat build up in the occupant compartment while preserving the driver's visibility. A greater reduction in the ability of drivers to see through the windshield, rear window or front side windows would be expected to decrease highway safety.

3. Court Case Against Tint Film Installers

NHTSA initiated an enforcement case against aftermarket tint film installers who were installing tint film which results in less than 70 percent light transmittance, thereby making safety features installed pursuant to the requirements of Standard No. 205 inoperative. The U.S. District Court of the Middle District of Florida ruled against the agency, holding that Standard No. 205 was not enforceable against window tinting businesses because the agency did not issue a ''new and revised'' Federal Motor Vehicle Safety Standard pursuant to the second sentence of Section 103(h) of the National Traffic and Motor Vehicle Safety Act (Safety Act, since codified at 49 USC Chapter 301). *United States* v. *Blue Skies Projects, Inc.*, 785 F.Supp 957, (M.D. Fla., 1991).

II. Notice of Proposed Rulemaking (NPRM)

NHTSA published an NPRM on January 22, 1992 (57 FR 2496). In the NPRM, the agency first analyzed the issues presented by the petition, the Report to Congress, and public comments submitted in response to the Request for Comments. Then the agency proposed a number of substantive changes in the light transmittance requirements.

A. Summary of Issues Analyzed

The agency examined the suggested benefits of tinting. These included reduction in heat and energy transmittance, reduction in excessive amounts of visible light, reduction in glare, reduction in lacerations and ejections, and increased privacy and aesthetic concerns. NHTSA tentatively concluded that all of these benefits were minimal, could be better achieved through other means such as sunglasses, or could be achieved equally well using untinted film.

NHTSA also examined the potential effect on highway safety of various levels of light transmission. NHTSA generally concluded in its report to Congress that excessive window tinting reduced the ability of drivers to perceive the driving environment, particularly for older drivers and drivers with spectacles. The reduction was most pronounced when viewing low contrast objects, especially at dusk or at night.

NHTSA also examined the necessity for good visibility through particular windows. Front side windows are necessary for viewing intersections, making lane changes with peripheral vision, viewing the side mirrors, and for making eye contact with other drivers and pedestrians who wish to cross the driver's path. Rear side windows are necessary for viewing intersections with acute angles, and for merging onto limited access highways. Rear windows are necessary for merging, backing, and allowing other drivers to see the center high mounted stop lamps.

In addition, the agency examined research studies on the issue of tinting safety. Based on three research studies on the relationship between tinting and object detection, NHTSA concluded that the ability to detect objects decreases as the tint level increases. Although NHTSA concluded that low levels of light transmittance are a safety problem, it was unable to define the magnitude of that problem in terms of a numerical relationship between vehicle collisions and tinting levels. The agency also noted studies showing that 35 percent light transmittance tinting would make it difficult for police officers to detect objects, including a drawn weapon, inside a vehicle during traffic stops.

B. The Proposed Rule

After considering these issues, the agency proposed to amend Standard No. 205 in two major ways. First, to account for the effect of rake angle on light transmittance, NHTSA proposed to change the test procedure so that the glazing sample's luminous transmittance would be viewed and measured at the maximum installation angle (i.e., the maximum nominal rake angle at which glazing could be installed in a motor vehicle). Second, the agency proposed to specify different light transmittance levels for the various windows in vehicles.

1. Test Procedure

The proposed test procedure was based on the Society of Automotive Engineer's (SAE) Recommended Practice J1203, Light Transmittance of Automotive Windshield Safety Glazing Materials and the current Test No. 2 in ANSI Z26. However, the agency simplified the test by eliminating the need to consider the seating reference point when determining the maximum rake angle.

2. Light Transmittance Levels

Since the proposed new test procedure had the effect of making the existing transmittance requirements more stringent, NHTSA proposed to reduce the required light transmittance levels of the windshield to 60 percent. This level is close to the current level of line-of-sight transmittance for most vehicle windshields as measured by the proposed procedure (i.e., on average, the transmittance levels would not have changed from the status quo). Therefore, the proposed reduction in light transmittance presented no additional safety concern. All but two currently produced vehicles would have passed the proposed test. NHTSA requested comment on whether it should specify a line-of-sight transmittance level higher than 60 percent because a research study indicated that permitting transmittance as low as 60 percent might present difficulties for spectacle-wearing drivers and because the European Economic Community was considering proposing a 65 percent level.

NHTSA proposed to require front side windows to have a line-of-sight light transmittance of not less than 60 percent. All current vehicle models would have complied with the proposed requirement. NHTSA chose this level because the agency believes that the light transmittance level for side vision should be the same as for front vision. Because front side windows are not raked as much as windshields, front side windows could have become slightly darker under the proposed amendment.

NHTSA proposed to require 50 percent minimum line-of-sight light transmittance for rear windows. NHTSA did not propose the 60 percent line-of-sight transmittance because (1) the 50 percent level is adequate for high contrast objects, and low contrast objects are less important in rear vision than in frontal vision, (2) 50 percent transmittance would be adequate to preserve the benefits of center high mounted stop lamps, and (3) 60 percent transmittance would disallow a number of current vehicle designs, for which no safety problem has been identified. However, the ''privacy windows'' offered as optional equipment on some MPV's would not be permitted under the proposed amendment since they have a line-of-sight light transmittance of 20 percent or less.

NHTSA proposed to require 30 percent minimum line-of-sight light transmittance for the rear side windows. It chose this level because (1) all new passenger cars and MVS (except MPVs with optional 'privacy windows') currently meet these requirements, and (2) rear side windows are less important for driving visibility than other vehicle windows, so darker tinting on them might not result in measurable adverse safety consequences.

NHTSA noted that requiring improved reflectance of interior and side rear view mirrors in Standard No 111, *Rearview mirrors*, could compensate for any potential darkening of the side and rear windows. The agency requested comment on whether those requirements would be desirable.

3. Vehicles Covered

NHTSA proposed to apply the requirements consistently to all passenger cars, light trucks, MPVs, and buses with a GVWR 10,000 pounds or less. This would have represented an extension of light transmittance requirements to certain unspecified rear and rear side windows in light trucks that NHTSA has said in interpretations are not requisite for driving visibility. NHTSA observed that some of these passenger vehicles were being sold with glass having very low light transmittance.

4. Compliance by Multi-stage Manufacturers

Some light trucks are manufactured in more than one stage or altered after they have been completed and certified by the original manufacturer. Under 49 CFR Part 567, a final-stage manufacturer must certify that the completed vehicle complies with all applicable safety standards and an alterer must certify that the altered vehicle continues to comply with all applicable safety standards. (Throughout the rest of this document, the term ''final-stage manufacturer'' is used to refer to both final-stage manufacturers and alterers.) A practical impact of extending light transmittance requirements to certain rear and rear side windows in light trucks would have been to require final-stage manufacturers to certify compliance with light transmittance requirements for rear and rear side windows, if such windows are present in a vehicle, as they now do for front windshields and front side windows.

NHTSA believed that final-stage manufacturers would generally be able to certify compliance with the expanded light truck requirements in Standard No. 205 without conducting compliance testing, because they could continue to rely on the certification of the prime glazing manufacturer. The prime glazing manufacturer would certify that its glazing material would comply with the light transmittance requirements of the standard if installed in a vehicle at up to a certain rake angle. A final-stage manufacturer would be able to rely on the certification so long as it installed

the glazing at an angle not less than the specified angle.

5. Amendments to the language of FMVSS No. 205

To effectuate these changes, NHTSA proposed adding sections to the standard describing the test procedure and the transmittance requirements for the various windows. The NPRM also proposed numerous changes to the sections specifying where the various items of glazing described in Z26 can be installed in vehicles. Basically, the changes would have taken those items of glazing that could be installed in areas requisite for driving visibility and tested under the current test procedure of Z26, and restricted them to use in trucks, buses, and MPVs with greater than 10,000 pounds GVWR. At the same time, the NPRM proposed to create corresponding new items of glazing (item 2A instead of item 2, for example) that would have been tested according to the proposed test procedure and permitted to be installed in passenger cars and light trucks. NHTSA also proposed to designate a new kind of bullet-resisting glazing that would have 85 percent of the transmittance of the permanent vehicle glazing.

III. Comments on the NPRM

The nearly 1,000 comments on the NPRM were predominantly negative. Over 90 percent of the comments came from automobile window tint film installers, distributors, and manufacturers, and from consumers, although most of these were form letters. There were also comments from law enforcement personnel and organizations, legislators, physicians, highway safety groups, automobile manufacturers, and members of the glazing industry. The comments are summarized below, grouped according to the constituency that they represent.

A. Tint Film Industry

The tint film industry (tinters) of 5,000 businesses employing 20,000 people and represented by the International Window Film Association (IWFA), opposed the proposal and urged NHTSA to amend the standard along the lines of their original petition. IWFA's extensive comment was consistent with, and included nearly every argument made by, the other members of the industry. It stated that there was no justification for NHTSA to propose higher levels of light transmittance than the levels for which they had petitioned. It insisted that the total transmittance be lowered to 24.5 percent. It also disputed NHTSA's jurisdiction over their industry, citing the *Blue Skies* case.

IWFA commented that there was no safety problem with tint film. It stated that one eighth of all cars have tint film, and many MPV's have privacy glass, yet these vehicles have demonstrated no safety problem. It further stated that no data had been submitted to the docket proving a safety problem, that no tinter was aware of any lawsuits or customer complaints alleging that tint film was a safety problem, and that virtually all consumers commented that there was a safety benefit to the film. In addition, it asserted that most police commenters support the state tint laws, most of which allow more tinting (usually 35 percent total) than Standard No. 205.

In support of its position, IWFA submitted research studies that it had commissioned. Its studies concluded that 35 percent tint film does not affect: (1) The ability of police to see into vehicles at night or at dusk; (2) driver detection of low contrast targets at night or at dusk; or (3) older driver performance.

IWFA also criticized the conclusions that the agency drew from the research cited in the NPRM. It stated that two of the studies were unrealistic, poor quality, or carelessly designed and conducted. In IWFA's view, the third study actually supported the use of dark tint films behind the driver.

IWFA asserted that the regulatory flexibility analysis in the NPRM grossly undervalues the benefits of tinting because it did not consider the aggregate benefits of tinting. It especially noted the medical benefits of protection against harmful radiation, and the reduction of solar load with consequent reduction in fuel consumption and CFC emissions.

IWFA also stated that NHTSA underestimates the economic impact of the rule on the tinting industry. According to an IWFA survey, 77 percent of all tinters, which are predominantly small businesses, stated that they would be put out of business by NHTSA's proposed rule.

IWFA stated that NHTSA, in performing its cost-benefit analysis, should consider that different areas of the country (e.g., the Sunbelt versus the Northeast) derive different levels of benefit from tinting. It stated that, for this reason, a uniform national standard for window tint is inappropriate and that regulation should be left to vary among the States.

B. Medical Commenters

The medical commenters were divided on the issue of tinting. Two optometrists wrote in support of the NPRM. One Arizona doctor supported the NPRM and does not believe that ultraviolet (UV) radiation is a significant issue. However, two other doctors commented that they prescribe tint film for protection from UV radiation. A medical researcher offered an extensive comment on the need for tint film, warned of skin conditions and drug sensitivities to even visible light, and concluded that a thriving tint film industry was necessary for patients.

C. Safety Groups

Advocates for Highway and Auto Safety (Advocates) opposed the NPRM because that group believed it would unnecessarily lower windshield and front side window performance. It also stated that it believed that the benefits of international harmonization are diluted by unacceptable light transmittance of the rear and rear side windows. Advocates did not express a strong opinion on the change in the test procedure to measure transmittance at the installed angle.

The Insurance Institute for Highway Safety (IIHS) supported the proposed transmittance requirements for the windshield and front side windows, and generally supported the proposed transmittance measurement procedure. However, it opposed the lower transmittance requirements for the rear and rear side windows. In support of its position, IIHS cited research that it sponsored on the results of reduced transmittance on rearward visibility. The study concluded that older drivers would fail to see low contrast pedestrians up to 83 percent of the time through glazing tinted to 22 percent transmittance. It concluded that transmittance levels below 53 percent (measured perpendicular to the glass) would dangerously reduce nighttime visibility.

D. Law Enforcement Community

The law enforcement community was divided over the issue of tinting, but was generally opposed to the 30 percent transmittance requirements for the rear side windows due to security concerns. Fourteen individual officers wrote to say that they support and use tint film. Another 232 officers opposed the NPRM because of concerns about visibility through the darker rear side windows.

Forty-four police departments and State motor vehicle administrations commented on the proposal. Five supported the NPRM. Thirty-three opposed the NPRM because of the darker rear side windows. Six opposed it because it does not allow tinting as dark as that permitted by the state. Fifteen were opposed because they did

not like the new measurement procedure. Thirteen favored consistent rules for cars and vans. Some of the State agencies believe that the current rule allows States to set transmittance levels, and that the NPRM would preempt State laws for the first time.

Police in some States ran tests of visibility of the interior of the vehicle to a person standing outside the vehicle and looking in through glazing with different levels of transmittance. Virginia and Maine found 28 percent transmittance to provide unsatisfactory visibility. New York found 39.5 percent unsatisfactory. Maine and New York found 40 percent and 58 percent levels of transmittance, respectively, to be satisfactory.

E. Manufacturers of Motor Vehicles

Most of the manufacturer commenters urged that the current standard be maintained until further research indicates a safety need for a change. Ford, GM, Chrysler, Toyota, and the Motor Vehicle Manufacturers Association (now known as the American Automobile Manufacturers Association (AAMA)) all asserted that NHTSA had demonstrated no safety need for the proposal. They cited NHTSA's own conclusion in its Report to Congress that the current light transmittance requirements do not pose an unreasonable risk of crash occurrence. They urged NHTSA to conduct research to quantitatively relate driver visibility needs to crash occurrence before regulating in this area. GM stated that NHTSA should not single out lighting in its analysis from other interdependent factors, such as glare and driver fatigue, relating to crash avoidance.

The foreign vehicle manufacturers generally supported the proposed measurement procedure. Mercedes Benz gave unqualified support to the measurement procedure. Toyota and Suzuki both agreed in principle with the line-of-sight measurement method. However, Suzuki opposed the variability that the new procedure would introduce and instead recommended retaining the existing test and adding a mathematical formula to adjust the results to take the rake angle into account. Volkswagen stated that the procedure was incomplete because the optical systems, procedures, and definitions for certain terms were inadequately specified. Volkswagen and Fiat both recommended the adoption of the European test procedure.

The domestic manufacturers all opposed the new measurement procedure. Chrysler stated that NHTSA's method of defining the installation angle was not objective because sometimes the test installation angle might be higher than the actual angle. Ford and the AAMA asserted that simply changing window trim components on a single vehicle model could alter the test installation angle, and therefore the measured transmittance, even though these changes would not affect the real world installation angle and line-of-sight transmittance. Some of these commenters stated that NHTSA was wrong to base the procedure partly on SAE Recommended Practice J1203, because the development of reflective coated glazing materials had caused the industry to reassess that practice's adequacy and, after the NPRM was published, to take steps to withdraw it.

Ford, GM, and Chrysler also claimed that NHTSA had underestimated the costs of complying with the new test procedure. Ford reported a round-robin test among the manufacturers to support its claim that accurate transmittance measurements could not be made through glazing at windshield rake angles, and concluded that compliance costs would be higher, if indeed the test procedure were repeatable enough to allow certification at all.

Some commenters stated that the procedure was impracticable because the instrumentation necessary to implement it does not exist. Chrysler stated that there are no instruments designed to measure transmittance repeatable with the test specimen at an angle, that it is impractical to try to eliminate all extraneous light, and that existing test equipment would be prone to variability. Hitachi Instruments also commented that there is no commercially available equipment, but said that NHTSA's procedure could be implemented using spectrophotometers, if certain changes were made as Hitachi recommended.

The foreign automobile manufacturers had mixed reactions to the various proposed transmittance levels. Mercedes Benz gave unqualified support to all the proposed transmittance levels. Volkswagen agreed with all the proposed levels except for the 50 percent for the rear window, which it urged be lowered to 40 percent. Toyota opposed all the proposed levels except the 30 percent for the rear side window, stating that NHTSA's report shows that 50 vehicle models, and many of Toyota's current models, would not be in compliance due to their rake angle or the fact that they employ solar energy reflecting glass. Suzuki and Fiat supported the 60 percent level but opposed any higher level.

The domestic vehicle manufacturers all opposed the light transmittance requirements on safety grounds primarily for the reason given above, i.e., that NHTSA had no research proving that there was a safety problem or that it had chosen the correct transmittance levels in the various windows. Ford stated that visibility decreases at a constant rate as light transmittance decreases—therefore, without a break in the curves that could be used as a critical value, the specification of any particular value was arbitrary.

Ford criticized the research studies that the agency relied on to select the proposed transmittance levels. It stated that the NHTSA research was unrealistic because it used passenger cars in a laboratory environment rather than vehicles typically equipped with privacy glass. Ford cited a GM study indicating that drivers of vehicles equipped with privacy glass would likely compensate for decreased visibility, as a result of the higher seating positions and belt lines, by using the vehicle's larger side view mirrors. Ford also submitted an analysis of National Automotive Sampling System (NASS) data that it claimed showed that privacy glass equipped vans have a better safety record than station wagons.

The commenters also cited the loss of benefits of preventing excessive amounts of glare, visible light, and dangerous UV radiation. GM suggested that the loss of daytime safety that would result from disallowing darker tinting might more than offset any increase in nighttime safety.

GM, Ford, and Chrysler all asserted that the proposed transmittance requirements would also increase costs. They all commented that less-tinted glazing would increase the solar load and necessitate a redesign of the air conditioning systems to achieve higher capacity, possibly resulting in a loss of fuel economy. Ford even suggested that body redesign might be necessary to provide for larger grills. GM stated that the additional radiation and heat reaching the inside of the vehicle would cause more rapid degradation of the instrument panel, seats, and other interior materials. GM submitted computer modeling studies of interior vehicle temperatures with different glazing materials. GM concluded that it would have to find or develop new, probably more expensive materials and possibly even redesign instrument panels. Also, it asserted that recently introduced heat absorbing and reflective coated windshields would not be able to be used with installation angles greater than 60 degrees.

Nearly all vehicle manufacturers were opposed to the elimination of privacy glass on the rear and rear side windows of light trucks. They also pointed out that there had been no customer complaints about these products, despite heavy market penetration (50–80 percent) on vehicles where it was offered as an option. GM stated that, given the safety-consciousness of its consumers, the absence of complaints was, in itself, an indication that privacy glass presented no safety problem. Toyota suggested that elimination of privacy glass would result in more vehicle theft, as the cargo became more visible from the outside. In addition, several commenters asserted that there are no available alternative glazing materials that can match current privacy glass in solar rejection and appearance, and that development of these glazing materials would take at least five years.

Some commenters stated that NHTSA should clarify what is meant by the term ''requisite for driving visibility.'' Stating that the proposal would divorce the new transmittance requirements from the portion of Z26 that refers to the term, Mercedes Benz suggested that NHTSA add a definition for ''shade bands'' and declare them not requisite for driving visibility. Suzuki requested that a definition of the phrase be included in the standard.

F. Glazing Manufacturers

PPG Industries (PPG) and Libby Owens Ford (LOF) both emphasized the significant research and investments they had made in developing solar and heat reduction glazing. PPG and LOF believe that the proposed transmittance requirements in the standard would eliminate both the new glazing and the use of standard products by the industry. LOF opposed all aspects of the rulemaking, but recommended various lower transmittance values that would allow the continued use of existing glass products, in the event that NHTSA planned to implement the proposal.

PPG also stated that the lead time required to produce new products that meet the proposed requirements would necessitate the temporary use of less effective materials. LOF estimated that compliant solar control glazing would take five years to develop and test.

PPG stated that heat resistant glazing is more effective than NHTSA assumed in the NPRM, because the heat transfer rate from the glass to the outside air is higher than the heat transfer rate from the glass to the vehicle interior. PPG and LOF also asserted, without providing data, that fuel economy would be reduced by up to 10 percent, or 1.0–1.5 mpg without solar control glass. These and other commenters stated that steeply raked windshields have the greatest need for solar rejection glazing, yet are also the most likely to be restricted in its use by the proposed transmittance requirements.

The glazing manufacturers asserted that NHTSA overestimated the relative impact of light transmission on visual acuity. PPG conducted vision studies at Rensselaer Polytechnic Institute that it said indicate that other factors, such as age, road condition, and glare affect visual acuity more than windshield light transmission reduction (down to 50 percent). At night, with lights shining in the driver's eyes, the reduced windshield transmittance reduced driver visibility by less than one percent. LOF submitted a study conducted in cooperation with GM and Cornell University that suggested that night driving was actually improved when tinted glass was substituted for clear glass. Regarding the safety of police, LOF suggested that NHTSA consider the effect of external reflectivity of the outside surface of the glazing and include in the standard a maximum exterior reflectance of 25 percent.

Glazing manufacturers also commented that the proposed test procedure is impractical and unnecessary, and would increase costs. PPG stated that the test is complex, requires very sophisticated and expensive instrumentation and computer software, including an optical alignment system and a double beam ratio recording spectrophotometer. LOF estimated that this equipment would cost $500,000. In addition, LOF estimated that its certification costs for the 175 types of its glazing would rise from $230,000 to $730,000 annually because it would have to assign different model numbers to the same glass specifying its use in front side windows, rear side windows, and rear windows.

LOF commented that glazing parts that are manufactured close to the lower limit of transmission may fail the standard at the assembly site (presumably because they are installed at a greater rake angle than anticipated), rather than at the glass manufacturing plant where remedial actions are possible. LOF suggested that the standard should permit calculating the angled transmittance values from the normal transmittance values using a series of curves.

Finally, the agency received a September 1995 report from DRI/McGraw-Hill, and a similar docket comment from LOF, indicating that rake angles have reached a practical maximum. The study of glazing design trends was conducted for Monsanto, a supplier of automobile glass, and was based on reviews of the technical literature, secure interviews with industry, OEM, and government sources, and statistics run on market profile data. The report concluded that further increases in rake angles would be limited both by laminate-caused distortion and by viewing glare design considerations to a range of 63 to 66 degrees of rake. NHTSA believes the actual maximum is slightly higher, because it knows of one production vehicle with a 68 degree rake angle. If these conclusions are correct, the recent trend toward increasing rake angles will abate.

IV. Analysis of Issues

The commenters have suggested a variety of arguments for why NHTSA should not go forward with its proposal. NHTSA is relying on some of those arguments in its decision to withdraw the proposal, but not on others. This section identifies some of those arguments that NHTSA finds compelling, and some that it does not find compelling. The following section, Section V, summarizes the main reasons for the agency's decision.

A. Line-of-Sight Measurement of Glazing Transmittance

NHTSA continues to believe that a line-of-sight measurement technique would have many advantages. The technique measures the effective transmittance of the glazing as it is used in the real world. It would also allow the nearly vertical rear windows in trucks and some passenger cars to be more heavily tinted than the more slanted glazing in most car windows without a relative loss of visibility. The current test procedure, although easy to perform, has the disadvantage of allowing vehicles with the same glazing to have radically different effective transmittance values, depending on the rake angle of their windows.

However, the commenters have raised significant questions about the practicability of the proposed procedure. NHTSA agrees that the procedure is more complex. New, expensive equipment would have to be purchased and, perhaps even in some cases, developed in order to test the transmittance of glazing at its installed angle. NHTSA believes that the certification costs would also increase, although probably not so much as LOF suggests. The transmittance for a particular type of glazing that is installed at a variety of angles in different vehicles would, as a practical

matter, only have to be tested at the maximum angle at which it is installed. Only in the unlikely event that a vehicle manufacturer always installed glazing that is tinted to the maximum extent allowed, given its installation angle, would it become necessary to make glazing in a large number of shades to match installation angles.

NHTSA does not agree, however, that it is impossible to measure transmittance at the installation angle. U.S. manufacturers claimed that, for coated glass, accurate measurements and calculations are impossible. Regarding Ford's round-robin tests to demonstrate that measurements could not be made at windshield rake angles, NHTSA disagrees with Ford's conclusion. The problem in Ford's testing was that one company was unable to make accurate measurements, apparently because the required sample size did not fit that company's test apparatus. The measurement scatter for the other companies (about 2 percent) was no greater for the solar reflective glazing than for clear laminated glass. There is some instrumental variation inherent in any measurement.

NHTSA believes that the approach of measuring the transmittance normal to the glazing and then using a formula to calculate the theoretical transmittance at the installed angle would be practical. This is the approach recommended by LOF and the Japanese automobile manufacturers. The Japanese manufacturers suggested a computational method that necessitates only laboratory work to convert normal transmittance measurements at the manufacturing plant to transmittance values at angles. Adoption of this approach would solve any problems associated with measuring coated glass at angles.

There would still be increased costs associated with determining transmittance by calculation. To the extent that manufacturers want to install the darkest possible glass, there would still be a multiplication of the different shades of glazing corresponding to the various installation angles. If this occurred, it would result in increased inventory costs from having to produce and maintain a supply of a greater variety of tinted glazing.

B. Proposed Transmittance Values

NHTSA is also withdrawing the portion of the proposal that specified different light transmittance levels for the various vehicle windows. There are several reasons for taking this action.

First, the agency wants to obtain more data defining the relationship between transmittance and safety before setting different light transmittance levels, especially in light of the absence of support for the proposed values. Ideally, the additional data would include statistics concerning the involvement of vehicles with tinted windows in crashes, but this is problematic, given the existing data collection mechanisms. The presence or absence of tint film is not recorded on State crash report forms. In addition, many crashes that involve backing vehicles go unrecorded because they occur in parking lots and driveways, areas that the agency's databases do not cover. NHTSA will consider how to capture these data in the future.

Second, if the manufacturers are not required to account for the effect of the installed angle of the glass when measuring light transmittance, promulgating a larger set of specific transmittance values for glazing would not necessarily result in the desired levels of line-of-sight transmittance, because of the wide variety of window rake angles. For example, two vehicle models using the same 50 percent transmittance glass (measured perpendicular to the window) in the rear window would have very different actual transmittances if the windows on one model were significantly more raked than on the other. Setting 60, 50, and 30 percent transmittance values for various windows would give a false impression of regulatory precision because the variability in rake angles would generate a much wider range of in-use transmittance values.

Third, given the decision to withdraw the proposal to specify testing glazing at its installed angle, there would have been a scope of notice problem if the agency had adopted the proposed light transmittance levels. The proposal had two interdependent parts: (1) The proposed light transmittance levels; and (2) the proposed new test method. The adoption of the transmittance levels was premised upon changing the test method from the current procedure of testing at a right angle to the glazing to a new procedure of testing the glazing at the same angle at which an occupant would look through the glazing as it is installed in a vehicle. For any given piece of glazing, testing it at a right angle yields higher transmittance values than testing it at an acute angle, i.e., the installed angle. Since the agency is not adopting the new test method, it can not adopt transmittance levels premised on adopting that method. Even if the agency had concluded, based on the comments and other available information, that it were nevertheless desirable to go ahead and adopt new light transmittance levels, the proposed levels would have had to be adjusted upward to offset the effects of retaining the current test method. However, adjusting the levels upward, and then adopting them, would have been beyond scope of notice.

Although the agency is withdrawing this proposal, NHTSA wants to emphasize that it does not accept the proposition advanced by some commenters that the agency cannot regulate in this area without numerically linking crash data to specific light transmittance values. Isolating the contribution of light transmittance from the contributions of the other interrelated driver, vehicle, highway, and environmental factors that cause crashes is extremely difficult. Predicting the effectiveness of countermeasures such as uniform line-of-sight light transmittance at certain values is even more difficult. Although NHTSA attempts, within its capabilities, to quantify the benefits of its actions, it still has a duty to regulate when such regulations would meet the need for motor vehicle safety, even in areas with inherent uncertainty. Therefore, especially for the crash avoidance standards, decisionmaking necessarily rests in part on policy judgment.

The agency is not basing its decision to withdraw the proposal on the research data submitted by IWFA regarding the effect of different levels of light transmittance on object detection. The researchers employed by IWFA used a simulator-type experiment in an attempt to demonstrate that glazing with transmittance as low as 17 percent did not interfere with object detection during left turns, backing, or lane changing. The value of the simulation is questionable, since the actions were sequential, and therefore less challenging than an actual driving experience in which a driver must operate the vehicle controls at the same time he or she is attempting to look through the glazing and detect objects outside the vehicle in the driving environment. Further, the method of characterizing the average contrast of the targets may be misleading because the targets were not homogeneous in color or reflectivity (*e.g.*, it is easier to see someone in a dark suit if he or she is wearing a white hat). NHTSA also does not regard a 22 percent target detection failure rate as good performance.

In fact, most research indicates that light transmittance and safety are related. In 10 of the 15 investigations of target detection with varying light transmittance, there were reductions in the subjects' abilities to identify and detect targets corresponding with

reductions in transmittance. The agency believes that the few investigations in which there was not any significant relationship used inappropriate experimental performance criteria, target contrast, illumination, and task difficulty. Some did not even use glazing with transmittances of less than 70 percent. NHTSA concludes that the most credible studies confirm the common-sense relationship between light transmittance and target identification.

In response to those commenters that believed the NPRM would for the first time preempt States from setting their own transmittance requirements, NHTSA notes this would not be the case. Federal law already preempts States from setting any different level of transmittance for regulated windows on new vehicles at the time of sale. Federal law also preempts States from allowing businesses to make inoperative the transmittance levels on regulated windows of used vehicles. However, States are free to set and enforce lower minimum transmittance levels on regulated windows for vehicles to be licensed in or used in the State.

Similarly, States are free to set and enforce transmittance levels for windows not regulated under the Federal standard (*e.g.*, the rear and rear side windows of light trucks). The States are free to prohibit dark windows in these vehicles if they believe it is necessary for the safety of police officers.

V. Agency Decision

After reviewing the available information, NHTSA has decided to withdraw the proposal regarding the light transmittance requirements of Standard No. 205, for the following reasons:

(1) While the proposal to measure light transmittance at the installed angle has theoretical merit, the proposed requirements would add costs for manufacturers, in the form of increased testing, certification, and inventory costs, which would be passed on to consumers without, as noted below, providing any assurance of commensurate additional benefits.

(2) There is limited prospect of commensurate increases in visibility and safety. The agency believes that, barring unforeseen advances in glass properties, windshield rake angles have now reached a practical limit of about 66 to 68 degrees due to the need to avoid visual distortion. If this is true, the recent trend toward greater rake angles will not continue. Thus, one of the agency's concerns when issuing the NPRM is now moot. At windshield rake angles of 66 to 68 degrees, there would be little practical improvement in windshield visibility between the proposed regulation and the current regulation to offset the increased costs.

(3) The proposed amendment would have had the practical effect of limiting solar reflective windshields to a rake angle of about 63 degrees. The difference in transmittance between the same windshield at rake angles of 63 degrees and 66 degrees is slight and not commensurate to the cost of limiting vehicle design or the changes that might be forced on glass technology.

The agency intends to monitor developments in this area. Should the factors limiting rake angle be overcome in the future and more extreme rake angles become a reality, the agency may revisit the issue.

(4) NHTSA finds persuasive the industry comments that the proposal would make solar control glazing less feasible and more costly for windshields. The windshield is the principal point of entry of solar heat into the interior of most vehicles. Increased rake angles exacerbate solar heating by presenting a more favorable angle for solar radiation and a greater uninsulated surface area. A type of windshield glazing which reflects infrared solar radiation, while retaining the 70 percent perpendicular visible light transmittance required by the present regulation, has been developed for vehicles with high rake angles. Since the proposal would have only affected vehicles with the highest rake angles (over 63 degrees), a possible unintended consequence would have been to bar the use of the most effective solar control windshield glazing on the vehicles with the greatest need of it. Since the agency no longer foresees a continuing trend toward greater windshield rake angles, it is not inclined to prohibit the use of the best currently available solar control windshield glazing for the sake of effective light transmittance differences that are very small at the rake angles that are possible, given the limits on rake angles imposed by visual distortion.

(5) NHTSA wishes to better define the relationship between light transmittance and highway safety before requiring differing transmittance values for different vehicle windows.

(6) Without line-of-sight measurements, setting specific transmittance values would not result in consistent actual light transmittance. The wide range of window rake angles would result in different line-of-sight transmittance values, even when the drivers of vehicles with different rake angles are looking through identical glazing. Therefore, promulgating graduated transmittance values would give a false sense of precision.

(7) The decision to withdraw the proposal to establish light transmittance levels for additional classes of motor vehicles was also based on the fact that the proposed transmittance levels were premised upon adopting the proposed new test method. Since the agency is not adopting the new method, it can not adopt transmittance levels selected on the basis of that method.

VI. "Reissuance" of Standard No. 205

The light transmittance requirements for Standard No. 205 were originally adopted pursuant to the first sentence of former section 103(h) of the National Traffic and Motor Vehicle Safety Act (Safety Act), 15 U.S.C. § 1392(h), as the "initial" standard based on an "existing" standard (*i.e.*, ANSI Z26). The second sentence of that section provided that "new and revised standards" should be issued "on or before January 31, 1968."

Section 103(h) was repealed in conjunction with the 1994 codification of the Safety Act into 49 U.S.C. Chapter 301. The House Judiciary Committee Report accompanying that codification states that the section was repealed because it had already been "executed." This supports the agency's view that section 103(h) did not impose a continuing duty upon the agency to reissue each of the initial standards that had been based on safety standards that existed prior to enactment of the Safety Act. Nevertheless, to the extent that former section 103(h) could have been construed as requiring a reexamination and reissuance of such standards, the present rulemaking proceeding constitutes such a reexamination and reissuance of the current standard.

This reissuance does not affect the requirements of the standard, but simply reaffirms and republishes the requirements as they presently exist in 49 CFR part 571.205. For this reason, no regulatory analyses have been conducted.

Issued: July 8, 1998.

L. Robert Shelton,

Associate Administrator for Safety Performance Standards.

[FR Doc. 98–18704 Filed 7–13–98; 8:45 am]

BILLING CODE 4910–59–P