



The Department of Transportation [DOT] Guidebook

Lexan* Sheet Products

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INTRODUCTION

This guide is intended to assist users of Lexan* sheet products in complying with their obligations under US Department of Transportation (DOT) Federal Motor Vehicle Safety Standard (FMVSS) 205 on **vehicle glazing for land highway operated vehicles**.

The Code of Federal Regulations (CFR), Chapter 49 Section 571.205, Standard Number 205, Glazing Materials, requires testing and permanent labeling of all glazing materials used in the following applications:

- | | |
|--|------------------------------------|
| * Passenger cars | * Multi-purpose passenger vehicles |
| * Trucks | * Buses |
| * Pickup covers designed to carry passengers while in motion | * Slide-in Campers |
| | * Motorcycles |

NOTE: Except for motorcycle windshields, SABIC Innovative Plastics materials generally cannot be used for forward facing exterior glazing, but can be applied to side exterior, rear exterior, roof exterior (sunroof, e.g.), and interior partition applications. There may, however, be specialized forward facing exterior glazing not needed for driver visibility. Depending upon analysis and confirmation of suitability, SABIC Innovative Plastic materials might be used in these specialized applications.

NOTE: The ANSI Z26.1 standard and FMVSS 205 regulation do not serve to regulate railroad glazing. The Federal Railroad Administration (FRA) governs the use of glazing on railcars. However, some local authorities may use ANSI Z26.1 to supplement the FRA regulations and require compliance with ANSI Z26.1

With few exceptions, the FMVSS 205 references American National Standards Institute (ANSI) Z26.1 (1996), *American National Standard for Safety Glazing Materials for Glazing Motor Vehicles and Motor Vehicle Equipment Operating on Land Highways-Safety Standard*.

CMVSS 205 (Canadian Motor Vehicle Safety Standard 205) regulates motor vehicle glazing materials used in Canada. This regulation is virtually identical to FMVSS 205 in the United States.

Historically, vehicle-glazing products were required to be tested every five years for re-certification with the American Association of Motor Vehicle Administrators (AAMVA). Please note that AAMVA no longer certifies vehicle glazing. Therefore, SABIC Innovative Plastics no longer has valid AAMVA certificates.

The Federal Government allows manufacturers of vehicle glazing to self-certify their products. To this end, SABIC Innovative Plastics has test reports from independent laboratories to support its products' compliance with FMVSS 205.

Each vehicle-glazing manufacturer (anyone fabricating a window for vehicle use from Lexan sheet), should obtain its own DOT Registration Numbers (See the following section on "Application for DOT Registration Number" for more information).

¹ All references to, and descriptions of, U.S. and Canadian regulations, industry standards and other legal requirements contained in this guide were believed to be accurate at the time of publication. However, SABIC Innovative Plastics undertakes no obligation to correct this guide, or to update it in the event of changes in, or additions to, any laws, standards or regulations. Every vehicle glazing manufacturer or user is responsible for confirming its own compliance with all applicable laws, standards and regulations, and for seeking the assistance of qualified legal counsel when necessary.

APPLICATION FOR DOT REGISTRATION NUMBER

To legally stamp glazing materials as a “qualified manufacturer” (fabricator), it is necessary for that company to register with the National Highway Traffic Safety Administration (NHTSA)

Obtaining a registration number is free.

SABIC Innovative Plastics has arrangements with some authorized manufacturers to use the SABIC Innovative Plastics Specialty Film & Sheet DOT registration number (94).

Any Lexan sheet product customer who wishes to request to use the SABIC Innovative Plastics DOT 94 registration should contact the Industry Manager in charge of transportation.

SABIC Innovative Plastics recommends that fabricators obtain their own DOT registration numbers. The benefit of a fabricator obtaining its own DOT registration is that the registration provides greater flexibility in the fabricator’s operation. Using the SABIC Innovative Plastics registration number, a fabricator is limited to stamping only products authorized by SABIC Innovative Plastics Specialty Film and Sheet. With its own DOT registration, a fabricator can fabricate and stamp a wider variety of products and materials. Products and applications can also be easily added to the registration list as needed.

Help is available from NHTSA –National Highway Traffic Safety Administration- by calling **202 366.5317**.

NHTSA resources:

<http://www.nhtsa.dot.gov/portal/site/nhtsa/menuitem.416f74e8613992381601031046108a0c/>

The next page is a sample “Prime Glazing Manufacturer’s Application” for obtaining a DOT registration number.

PRIME GLAZING MANUFACTURER'S APPLICATION

PLEASE TYPE or PRINT CLEARLY™ AND SUBMIT GLAZING MATERIAL APPLICATION TO: JEANETTE GREENFIELD AT THE FOLLOWING NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION (NHTSA) ADDRESS:

Jeanette Greenfield
Office of Vehicle Safety Compliance
400 Seventh Street, S. W. NSA-32
Washington, DC 20590

DATE: _____

GLAZING MATERIAL PLANT ADDRESS*

MAIN OFFICE ADDRESS

Plant Name _____

Company Name _____

Post Office Box No. _____

Post Office Box No. _____

Street _____

Street _____

City _____

City _____

State (Province) _____

State (Province) _____

Country _____

Country _____

Zip Code _____

Zip Code _____

Plant Contact Person _____

Company Contact Person _____

Phone Number _____

Phone Number _____

Fax Number _____

Fax Number _____

**** (COMPLETE AGENT INFORMATION ONLY IF THIS IS A FOREIGN MANUFACTURER)**

GLAZING MATERIAL PLANT US AGENT

Agent Name _____

Post Office Box No. _____

Street _____

City _____

State _____

Country _____

Zip Code _____

Are you a manufacturer who cuts a section of glazing materials

(Yes__No__)

Are you a distributor who cuts a section of glazing materials?

(Yes__No__)

Agent Contact Person _____

Agent Phone Number _____ Agent Fax Number _____

DOT STAMPS

As described in FMVSS 205, certification and identification of glazing are accomplished by permanently stamping each piece of glazing going into a motor vehicle.

The information required to be on these stamps is outlined in ANSI Z26.1, Section 7 (1996 version) and FMVSS 205 Section S6.

Diagrams of the stamps and associated AS and M numbers for the various Lexan sheet products are on the following pages.

- AS numbers are code numbers that reference the ANSI Z26.1 document under “item designations”. Item designations describe areas within the vehicle where products meeting this group of tests can be used.
- M numbers are manufacturer’s codes that allow for material traceability. M numbers are assigned by Specialty Film & Sheet for its various vehicle-glazing materials.
- A material may qualify for more than one AS number based upon the combinations of tests in the FMVSS205 that it passes. For example, a material in this guidebook which has an AS designation of “4/6” means that the material meets both the AS 4 and AS 6 designations. See pages 14 through 16 for more information on this topic.

Important: Every color, thickness, and coating permutation constitutes a separate product to the DOT. For example, clear MRT sheet in .236” gauge and clear MRT sheet in .250” full gauge are separate products with separate M numbers. Tinted products may have separate AS numbers as well as separate M numbers. Custom colors need unique M designation to differentiate the custom color from the standard colors outlined in this guide. Fabricators are responsible for obtaining and using the appropriate M numbers in each instance. Please contact SABIC Innovative Plastics for more information.

Correct stamping is of the highest importance - proper product codes and other information must be permanently stamped on the glazing material. Improperly stamped or mislabeled glazing can cause vehicles to be denied certification. Inspection can result in a recall or impoundment.

Placing glazing materials into the wrong application can also result in recalls, impoundments, and liability.

STAMP DIAGRAMS

<p style="text-align: center;">AS # M #</p> <p style="text-align: center;">Lexan* MRT Sheet</p> <p style="text-align: center;">(Fabricator Name)</p> <p style="text-align: center;">*SABIC Innovative Plastics TM</p> <p style="text-align: center;">DOT xxx</p>	<p style="text-align: center;">AS # M #</p> <p style="text-align: center;">Lexan* CTG Film</p> <p style="text-align: center;">(Fabricator Name)</p> <p style="text-align: center;">*SABIC Innovative Plastics TM</p> <p style="text-align: center;">DOT xxx</p>
<p style="text-align: center;">AS # M #</p> <p style="text-align: center;">Lexan* FMRT Sheet</p> <p style="text-align: center;">(Fabricator Name)</p> <p style="text-align: center;">*SABIC Innovative Plastics TM</p> <p style="text-align: center;">DOT xxx</p>	<p style="text-align: center;">AS # M #</p> <p style="text-align: center;">Lexan* FMR5XT Sheet</p> <p style="text-align: center;">(Fabricator Name)</p> <p style="text-align: center;">*SABIC Innovative Plastics TM</p> <p style="text-align: center;">DOT xxx</p>
<p style="text-align: center;">AS # M #</p> <p style="text-align: center;">Lexan* 9030 Sheet</p> <p style="text-align: center;">(Fabricator Name)</p> <p style="text-align: center;">*SABIC Innovative Plastics TM</p> <p style="text-align: center;">DOT xxx</p>	

Appropriate "AS" and "M" numbers – See Guidebook pages 8 through 12
 xxx DOT registration number

M Numbers And AS Designations For Current Lexan* MRT Sheet Products

AS#:	AS 4/6	AS 5/7	AS 5/7	AS 4/6	AS 5/7
Colors:	Clear (112)	Gray (713)	Bronze (5109)	Green (31035)	Green (31035)
Thickness	M Numbers				
.118"	118-C	118-G	118-BZ	118-GN	
.125"	125-C	125-G	125-BZ	125-GN	
.177"	177-C	177-G	177-BZ	177-GN	
.187"	187-C	187-G	187-BZ	187-GN	
.236"	236-C	236-G	236-BZ		236-GN
.250"	250-C	250-G	250-BZ		250-GN
.312"	312-C	312-G	312-BZ	312-GN	
.375"	375-C	375-G	375-BZ	375-GN	
.460"	460-C	460-G	460-BZ	460-GN	
.500"	500-C	500-G	500-BZ	500-GN	

M Numbers And AS Designations For Current Lexan* FMRT Sheet Products

AS#:	AS 4/6	AS 5/7	AS 5/7	AS 4/6	AS 5/7
Colors:	Clear (112)	Gray (713)	Bronze (5109)	Green (31035)	Green (31035)
Thickness	M Numbers				
.118"	118-C	118-G	118-BZ	118-GN	
.125"	125-C	125-G	125-BZ	125-GN	
.150"	150-C	150-G	150-BZ	150-GN	
.157"	157-C	157-G	157-BZ	157-GN	
.177"	177-C	177-G	177-BZ	177-GN	
.187"	187-C	187-G	187-BZ	187-GN	
.236"	236-C	236-G	236-BZ		236-GN
.250"	250-C	250-G	250-BZ		250-GN
.375"	375-C	375-G	375-BZ	375-GN	
.460"	460-C	460-G	460-BZ	460-GN	
.500"	500-C	500-G	500-BZ	500-GN	

M Numbers And AS Designations For Current Lexan 9030 & 9034 Sheet Products**

AS#:	AS 4/6	AS 5/7	AS 5/7	AS 4/6	AS 5/7
Colors:	Clear (112)	Gray (713)	Bronze (5109)	Green (31035)	Green (31035)
Thickness	M Numbers				
.040"	040-C	040-G	040-BZ	N/A	N/A
.060"	060-C	060-G	060-BZ	N/A	N/A
.080"	080-C	080-G	080-BZ	N/A	N/A
.090"	090-C	090-G	090-BZ	N/A	N/A
.093"	093-C	093-G	093-BZ	N/A	N/A
.118"	118-C	118-G	118-BZ	118-GN	
.125"	125-C	125-G	125-BZ	125-GN	
.150"	150-C	150-G	150-BZ	150-GN	
.157"	157-C	157-G	157-BZ	157-GN	
.177"	177-C	177-G	177-BZ	177-GN	
.187"	187-C	187-G	187-BZ	187-GN	

** AS and M numbers are per the 1996 edition of ANSI Z26.1, which is the edition currently referenced in FMVSS205.

M Numbers And AS Designations For Current Lexan* FMR5XT Sheet Products

AS#:	AS 4/6
Colors:	Clear (112)
Thickness	M Numbers
.118"	118-C
.157"	157-C
.197"	197-C
.236"	236-C

M Numbers And AS Designations For Current Lexan* CTG Sheet Products

AS#:	AS 6	AS 7
Colors:	Clear (112)	Gray (713)
Thickness	M Numbers	
.040"	040-C	040-G
.060"	060-C	060-G
.080"	080-C	080-G
.090"	090-C	090-G
.093"	093-C	093-G

IMPORTANT Do's AND Don'ts

NOTE: Regardless of the permissible DOT uses of SABIC Innovative Plastics Specialty Film & Sheet materials (based upon their AS numbers), some additional guidelines should be followed:

Don't s

- Do not use Lexan MRT sheet in any formed applications.
- Do not use Lexan FMRT (except motorcycle windshields) or CTG sheet in any exterior application.
- Do not use stamps on any materials other than those specified on the stamp..

Do's

- All finished parts made from safety glazing material covered under FMVSS 205 must be permanently stamped.
- Use products with an abrasion resistant coating (Lexan MRT, FMR, and CTG sheets) when frequent cleaning or human contact is expected.
- Remove all protective masking immediately after installation.
- Store all Lexan sheet in a clean dry area.

SUMMARY GUIDE To ANSI Z26.1 CLASSIFICATIONS

In some cases, the AS numbers relevant to this guide are interrelated. For example, if a material passes AS 4, it automatically will pass AS 5. For this guide, only the most inclusive designations (in the previous example it is AS 4) are called out on pages 8 through 12.

The AS number relationships that are relevant to the AS numbers in this guide are:

- An AS 4 material also meets AS 5 and 12
- An AS 5 material also meets AS 12
- An AS 6 material also meets AS 7 and 13
- An AS 7 material also meets AS 13
- An AS 4/6 material also meets AS 5, 7, 12, and 13

Note: The products in this guide cannot meet AS 1 nor AS 2 designations. A primary reason is that both designations have a very restrictive abrasion resistance requirement - test 18 in ANSI Z26.1 – 1996, which requires a haze change of no more than 2% after 1000 Taber Abrader cycles. The vehicle areas in which these AS designations can be used are: AS 1 – Anywhere in a motor vehicle, and AS 2– Anywhere in a motor vehicle, except windshields.

The following contains specific details for each AS number relevant to this guide:

AS 4 - Safety Glazing Materials for use in motor vehicles only in the following specific locations:

- Interior partitions and auxiliary wind deflectors.
- Folding doors.
- Standee windows in buses.
- Flexible curtains or readily removable windows or in ventilators used in conjunction with readily removable windows.
- Openings in the roof, not requisite for driver visibility.
- Trailers.
- Glazing to the rear of the driver in trucks or truck tractor cabs where other means of affording visibility of the highway to the side and rear of the vehicle are provided.
- The rear window of convertible passenger car tops.
- The rear doors of taxicabs.
- Readily removable windows of buses having a gross vehicle weight rating (GVWR) of more than 4540 kg (10,000 lbs.), which shall include pushout windows and windows mounted in emergency exits that can be manually pushed out of their location in the vehicle without the use of tools, regardless of whether such windows remained hinged at one edge.
- Windows and doors in motor homes, except for the windshields and windows to the immediate right or left of the driver.
- Windows and doors in slide-in campers and pick-up covers.
- Windows and doors in buses except for the windshield, windows to the immediate right or left of the driver, and rearmost windows if used for driving visibility.

AS 5 - Safety Glazing Materials for use in motor vehicles only in the following specific locations at levels not requisite for driving visibility:

- All locations listed for AS 4 products.
- Motorcycle windscreens below the intersection of a horizontal plane 381 mm (15 in) vertically above the lowest seating position.

AS 6 - Safety Glazing Materials for use only in trailers, multipurpose passenger vehicles, slide-in campers, pick-up covers designed to carry persons while in motion, motorhomes, in the rear windows of convertible passenger car tops, in windscreens for motorcycles, in flexible curtains or readily removable windows, or in ventilators used in conjunction with readily removable windows. Safety glazing materials may be used only in following specific locations:

- Trailers.
- The rear windows of convertible passenger car tops.
- Windscreens for motorcycles.
- Flexible curtains or readily removable windows or in ventilators used in conjunction with readily removable windows.
- Windows and doors in motorhomes, except for the windshield, forward facing windows, and windows to the immediate right or left of the driver.
- Windows, except forward facing windows, and doors in slide-in campers and pick-up covers.

AS 7 - Safety Glazing Materials for use only in trailers, multipurpose passenger vehicles, slide-in campers, pick-up covers designed to carry persons while in motion, motorhomes, and at levels not requisite for driving visibility in the rear windows of convertible passenger car tops, in windscreens for motorcycles, in flexible curtains or readily removable windows, or in ventilators used in conjunction with readily removable windows. Safety glazing materials may be used only in following specific locations at levels not requisite for driving visibility:

- The rear windows of convertible passenger car tops.
- Windscreens for motorcycles.
- Flexible curtains or readily removable windows or in ventilators used in conjunction with readily removable windows.
- Windows and doors in motorhomes, except for the windshield, forward facing windows, and windows to the immediate right or left of the driver.
- Windows, except forward facing windows, and doors in slide-in campers and pick-up covers.
- Standee windows in buses
- Interior partitions
- Openings in the roof

Test Matrix Per ANSI Z26.1-1996

Test #	Test Name	AS 4	AS 5	AS 6	AS 7	AS 12	AS 13
2	Light Transmittance	Yes		Yes			
10	Dart Impact	Yes	Yes			Yes	
13	Ball Impact	Yes	Yes			Yes	
16	Weathering	Yes	Yes	Yes	Yes	Yes	Yes
17	Abrasion Resistance	Yes					
19	Chemical Resistance - Non Stressed	Yes	Yes	Yes	Yes	Yes (modified)	Yes (modified)
20	Chemical Resistance - Stressed	Yes	Yes	Yes	Yes	Yes (modified)	Yes (modified)
21	Dimensional Stability (Warpage)	Yes	Yes			Yes	
22	Flexibility			Yes	Yes		Yes
24	Flammability (or test 23 for thin, flexible AS 6, 7, or 13 materials)	Yes	Yes	Yes	Yes	Yes	Yes

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