

## Part 223—Safety Glazing Standards-Locomotives, Passenger Cars and Caboose

**Subpart B** Specific Requirements (223.8 - 223.17)

**Appendix A to Part 223** Certification of Glazing Materials

### § 223.3 Application.

(a) This part applies to [railroads](#) that operate rolling equipment on standard gauge track that is a part of the general [railroad](#) system of transportation.

(b) This part does not apply to -

(1) Locomotives, cabooses, and [passenger cars](#) that operate only on track inside an installation that is not part of the general [railroad](#) system of transportation;

(2) Rapid transit operations in an urban area that are not connected with the general [railroad](#) system of transportation.

(3) Except as provided in [paragraph \(c\)](#) of this section:

(i) Locomotives, cabooses, and [passenger cars](#) that are historic or more than 50 years old and, except for [incidental freight service](#), are used only for excursion, educational, recreational, or private transportation purposes; and

(ii) [Cabooses](#) and [passenger cars](#) in a [railroad](#)'s fleet on April 11, 2016 that are used only for the [railroad](#)'s private transportation purposes. Each such [railroad caboose](#) or car that is equipped with glazing that complies with the glazing requirements contained in appendix A to this part as of February 9, 2016, must remain in compliance with those requirements.

(4) [Locomotives](#) that are used exclusively in [designated service](#) as defined in [§ 223.5](#).

(c) Except as provided in [paragraph \(b\)\(3\)](#) of this section, this paragraph (c) applies, as specified, to each [locomotive](#), [passenger car](#), and [caboose](#) built after 1945 that is more than 50 years old and is used only for excursion, educational, recreational, or private transportation purposes.

(1) Each such [passenger car](#) must comply with the [emergency window](#) requirements contained in [§ 223.9\(c\)](#) or [§ 223.15\(c\)](#), as appropriate, when it is occupied and operates in an intercity passenger or commuter train subject to [part 238](#) of this chapter. A tool or other instrument may be used to remove or break an [emergency window](#) if the tool or other instrument is clearly marked and legible and understandable instructions are provided for its use.

(2) Each such [locomotive](#), [passenger car](#), and [caboose](#) that is equipped with glazing that complies with the glazing requirements contained in appendix A to this part as of February 9, 2016, must remain in compliance with those requirements.

[[44 FR 77352](#), Dec. 31, 1979, as amended at [53 FR 28600](#), July 28, 1988; [81 FR 6789](#), Feb. 9, 2016]

**§ 223.11**      Requirements for existing locomotives.

(a) Locomotives, other than yard locomotives, built or rebuilt prior to July 1, 1980, which are equipped in the forward and rearward end facing glazing locations of the locomotive cab windshield with a glazing material that meets the criteria for either portion of the impact testing required for a Type I test under the provisions of appendix A of this part, will not require the installation of certified glazing in the windshield location except to replace windshield glazing material that is broken or damaged.

(b) Locomotives, other than yard locomotives, built or rebuilt prior to July 1, 1980, which are equipped in all locomotive cab side facing glazing locations with a glazing material that meets the criteria for either portion of the impact testing required for a Type II test under the provisions of appendix A of this part, will not require the installation of certified glazing in the side facing glazing location except to replace side facing glazing material that is broken or damaged.

(c) Except for yard locomotives and locomotives equipped as described in paragraphs (a) and (b), of this section, locomotives built or rebuilt prior to July 1, 1980, shall be equipped with certified glazing in all locomotive cab windows after June 30, 1984.

(d) Each locomotive subject to the provisions of paragraph (c) of this section which, as a result of an act of vandalism has a locomotive cab window that is broken or damaged so that the window fails to permit good visibility—

(1) Shall be placed in Designated Service within 48 hours of the time of breakage or damage or

(2) Shall be removed from service until equipped with certified glazing in the following manner:

(i) If the broken or damaged window is a part of the windshield of the locomotive cab, all of the forward and rearward end facing glazing locations of the locomotive cab must be replaced with certified glazing.

(ii) If the broken or damaged window is a part of the side facing window of the locomotive cab, all of the side facing glazing locations of the locomotive cab must be replaced with certified glazing.

(Sec. 209 of the Federal Railroad Safety Act, 94 Stat. 957 ([45 U.S.C. 438](#)); sec. 1.49(m) of the regulations of the Office of the Secretary of Transportation, 49 CFR [1.49\(m\)](#)) [45 FR 49271, July 24, 1980, as amended at 48 FR 24083, May 31, 1983; 48 FR 56956, Dec. 27, 1983]

**§ 223.13**      Requirements for existing cabooses.

(a) Cabooses, other than yard cabooses, built or rebuilt prior to July 1, 1980, which are equipped in the forward and rearward end facing glazing locations of the windshield with a glazing material that meets the criteria for either portion of the impact testing required for a Type I test under the provisions of appendix A of this part, will not require the installation of certified glazing in the windshield location except to replace windshield glazing material that is broken or damaged.

(b) Cabooses, other than yard cabooses, built or rebuilt prior to July 1, 1980, which are equipped in all side facing glazing locations with a glazing material that meets the criteria for either portion of the impact testing required for a Type II test under the provisions of appendix A of this part, will not require the installation of certified glazing in the side facing glazing locations except to replace side facing glazing material that is broken or damaged.

(c) Except for yard cabooses and cabooses equipped as described in paragraphs (a) and (b), cabooses built or rebuilt prior to July 1, 1980, shall be equipped with certified glazing in all windows after June 30, 1984.

(d) Each caboose subject to the provision of paragraph (c) of this section, which, as a result of an act of vandalism, has a window that is broken or damaged so that the window fails to permit good visibility shall be equipped with certified glazing in the following manner:

(1) If the broken window is a part of the windshield, all of the forward and rearward end facing glazing locations must be replaced with certified glazing within 30 days of the date of breakage or damage.

(2) If the broken window is a part of the side facing window, all of the side facing glazing locations must be replaced with certified glazing within 30 days of the date of breakage.

(Sec. 209 of the Federal Railroad Safety Act, 94 Stat. 957 ([45 U.S.C. 438](#)); § 1.49(m) of the regulations of the Office of the Secretary of Transportation, 49 CFR [1.49\(m\)](#))  
[44 FR 77352, Dec. 31, 1979, as amended at 48 FR 24083, May 31, 1983; 48 FR 56956, Dec. 27, 1983]

**§ 223.15**      Requirements for existing passenger cars.

(a) Passenger cars built or rebuilt prior to July 1, 1980, which are equipped in the forward and rearward end facing glazing locations of the windshield with a glazing material that meets the criteria for either portion of the impact testing required for a Type I test under the provisions of appendix A of this part will not require the installation of certified glazing in the windshield location except to replace windshield glazing material that is broken or damaged.

(b) Passenger cars built or rebuilt prior to July 1, 1980, which are equipped in the side facing glazing locations with a glazing material that meets the criteria for either portion of the impact testing required for a Type II test under the provisions of appendix A of this part, will not require the installation of certified glazing except to replace side facing glazing material that is broken or damaged.

(c) Except for passenger cars described in paragraphs (a) and (b), passenger cars built or rebuilt prior to July 1, 1980, shall be equipped with certified glazing in all windows and a minimum of four emergency windows after June 30, 1984.

(d) Each passenger car subject to the provisions of paragraph (c) of this section which as a result of an act of vandalism, has a window that is broken or damaged so that the window fails to permit good visibility shall be equipped with certified glazing in the following manner:

(1) When the broken window is a part of the windshield, all of the forward and rearward end facing glazing locations shall be replaced with certified glazing within 30 days of breakage.

(2) When the broken window is a part of the side facing window, the glazing in that individual side facing glazing location shall be replaced with certified glazing within 30 days of the date of breakage.

(Sec. 209 of the Federal Railroad Safety Act, 94 Stat. 957 ([45 U.S.C. 438](#)); sec. 1.49(m) of the regulations of the Office of the Secretary of Transportation, 49 CFR [1.49\(m\)](#)) [44 FR 77352, Dec. 31, 1979, as amended at 48 FR 24083, May 31, 1983; 48 FR 56956, Dec. 27, 1983]

#### **§223.17**      Identification of equipped locomotives, passenger cars and cabooses.

Each locomotive, passenger car and caboose that is fully equipped with glazing materials that meet the requirements of this part shall be stenciled on an interior wall as follows: "Fully Equipped FRA Part 223 glazing" or similar words conveying that meaning in letters at least 3/8 inch high.

[45 FR 49271, July 24, 1980]

### **223 AppA**

#### **Appendix A to Part 223—Certification of Glazing Materials**

As provided in this part, certified glazing materials installed in locomotives, passenger cars, or cabooses must be certified by the glazing manufacturer in accordance with the following procedures:

#### a. General Requirements

(1) Each manufacturer that provides glazing materials, intended by the manufacturer for use in achieving compliance with the requirements of this part, shall certify that each type of glazing material being supplied for this purpose has been successfully tested in accordance with this appendix and that test verification data is available to a railroad or to FRA upon request.

(2) The test verification data shall contain all pertinent original data logs and documentation that the selection of material samples, test set-ups, test measuring devices, and test procedures were performed by qualified personnel using recognized and acceptable practices and in accordance with this appendix.

#### b. Testing Requirements

(1) The material to be tested (Target Material) shall be a full scale sample of the largest dimension intended to be produced and installed.

(2) The Target Material shall be representative of production material and shall be selected on a documented random choice basis.

(3) The Target Material shall be securely and rigidly attached in a fixture so that the fixture's own characteristics will not induce test errors.

(4) The Target Material so selected and attached shall constitute a Test Specimen.

(5) The Test Specimen will then be equipped with a Witness Plate that shall be mounted parallel to and at a distance of six inches in back of the Target Material. The Witness Plate shall have at least an area which will cover the full map of the Target Material.

(6) The Witness Plate shall be an unbacked sheet of maximum 0.006 inch, alloy 1100 temper O, aluminum stretched within the perimeter of a suitable frame to provide a taut surface.

(7) The Test Specimen will be positioned so that the defined projectile impacts it at an angle of 90 degrees to the Test Specimen surface.

(8) The point of impact of the defined projectile will be within a radius of 3" of the centroid of the Target Material.

(9) Velocity screens or other suitable velocity measuring devices will be positioned so as to measure the impact velocity of the defined projectile within a 10% accuracy tolerance, with test modifications made to guarantee that the stipulated minimum velocity requirements are met.

(10) The Test Specimen for glazing material that is intended for use in end facing glazing locations shall be subjected to a Type I test regimen consisting of the following tests:

(i) Ballistic Impact in which a standard 22 caliber long rifle lead bullet of 40 grains in weight impacts at a minimum of 960 feet per second velocity.

(ii) Large Object Impact in which a cinder block of 24 lbs minimum weight with dimensions of 8 inches by 8 inches by 16 inches nominally impacts at the corner of the block at a minimum of 44 feet per second velocity. The cinder block must be of composition referenced in American Society for Testing and Materials (ASTM) Specification C33L or ASTM C90.

(11) The Test Specimen for glazing material that is intended for use only in side facing glazing locations shall be subjected to a Type II test regimen consisting of the following tests:

(i) Ballistic Impact in which a standard 22 caliber long rifle lead bullet of 40 grains in weight impacts at a minimum of 960 feet per second velocity.

(ii) Large Object Impact in which a cinder block of 24 lbs minimum weight with dimensions of 8 inches by 8 inches by 16 inches nominally impacts at the corner of the block at a minimum of 12 feet per second velocity. The cinder block must be of the composition referenced in ASTM C33L or ASTM C90.

(12) Three different test specimens must be subjected to the ballistic impact portion of these tests.

(13) Two different test specimens must be subjected to the large object impact portion of these tests.

(14) A material so tested must perform so that:

(i) there shall be no penetration of the back surfaces (side closest to Witness Plate) of the Target Material by the projectile. Partial penetration of the impact (front) surface of the Target Material does not constitute a failure; and

(ii) there shall be no penetration of particles from the back side of the Target Material through the back side of the prescribed Witness Plate.

(15) Test specimens must consecutively pass the required number of tests at the required minimum velocities. Individual tests resulting in failures at greater than the required minimum velocities may be repeated but a failure of an individual test at less than the minimum velocity shall result in termination of the total test and failure of the material.

(16) After successful completion of the prescribed set of required consecutive tests, a manufacturer may certify in writing that a particular glazing material meets the requirements of these standards.

c. Material Identification

(1) Each individual unit of glazing material shall be permanently marked, prior to installation, to indicate that this type of material has been successfully tested as set forth in this appendix and that marking shall be done in such a manner that it is clearly visible after the material has been installed.

(2) Each individual unit of a glazing material that has successfully passed the Type I testing regimen shall be marked to indicate:

(i) "FRA Type I" material;

(ii) the manufacturer of the material;

(iii) the type or brand identification of the material.

(3) Each individual unit of a glazing material that has successfully passed the Type II testing regimen shall be marked to indicate:

(i) "FRA Type II" material;

(ii) the manufacturer of the material;

(iii) the type or brand identification of the material.