Designation: E 774 – 97

An American National Standard

Standard Specification for the Classification of the Durability of Sealed Insulating Glass Units[1]

This standard is issued under the fixed designation E 774; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This specification is applicable to those sealed insulating glass units, with one or two airspaces.

1.2 The classification of test specimens is based on frost or chemical dew point after the specified test duration(s).

1.3 Qualification under this specification is intended to provide a basis for the classification of the durability of sealed insulating glass units. SIGMA field correlation studies started in 1980 show that units that have achieved a Level A classification have less than 1 % field failure rate in ten years provided the glazing system weeps water away from contact with the unit edge seal. Class C and CB tested units have significantly higher field failure rates in ten years. SIGMA continues to gather correlation data.[2]

1.4 This specification is not applicable to units that are constructed from vision materials other than glass.

1.5 This specification does not cover other physical requirements such as appearance, thermophysical properties, heat and light transmission, and glass displacement.

NOTE 1—Sealed insulating glass units classified according to this specification are not necessarily suitable for structurally glazed applications. Factors such as sealant longevity to long term direct ultraviolet light exposure and sealant tensile strength must be reviewed for these applications.

2. Referenced Documents

2.1 *ASTM Standards:*

E 546 Test Method for Frost Point of Sealed Insulating Glass Units[3]

E 773 Test Method for Accelerated Weathering of Sealed Insulating Glass Units[3]

E 1887 Test Method for Fog Determination[3]

3. Terminology

3.1 Definition:

3.1.1 *sealed insulating glass unit*—a preassembled unit, comprising sealed panes of glass separated by dehydrated space(s), intended for vision areas of buildings. The unit is normally used for windows, window walls, picture windows, sliding doors, patio doors, or other types of windows or doors.

4. Classification

4.1 Sealed insulating glass units tested in accordance with this specification shall be classified into one of three classes based on response to the tests and qualification requirements as shown in Table 1.

5. Performance Requirements

5.1 *Class C*—There shall be no frost or chemical dew point of each specimen when measured at a temperature of −34°C (−30°F) in accordance with Test Method E 546.

5.2 *Class B*—There shall be no frost or chemical dew point when measured at a temperature of −29°C (−20°F) in accordance with Test Method E 546.

5.3 *Class A*—There shall be no frost or chemical dew point when measured at a temperature of −29°C (−20°F) in accordance with Test Method E 546.

5.4 *Fog*—No fog shall be visible after testing in accordance with Test Method E 1887.

6. Test Specimens

6.1 Specimen design and construction for accelerated weathering tests shall be established by Test Method E 773.

7. Test Methods

7.1 Classify the sealed insulating glass units by following Test Method E 773 in accordance with Table 1 of this specification.

7.1.1 *Accelerated Weathering Test*:

7.1.1.1 Test six randomly selected test specimens for durations as shown in Table 1, Class C in accordance with Test Method E 773.

7.1.1.2 If the test specimens qualify for Class C as described in Section 5 of this specification, they may be tested further for durations as shown in Table 1, Class B. Place the specimens in the test racks so that the bearing edge and the weathering or exposed side remain the same as tested in previous class.

7.1.1.3 If the test specimens qualify for Class B as described in Section 5 of this specification, they may be tested further for durations as shown in Table 1, Class A.

7.1.1.4 Breakage of only two specimens is permitted

[1] This specification is under the jurisdiction of ASTM Committee E-6 on Performance of Buildings and is the direct responsibility of Subcommittee E06.22 on Durability Performance of Building Constructions.

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[2] Available from SIGMA, 111 East Wacker Drive, Suite 600, Chicago, IL 60601.

[3] *Annual Book of ASTM Standards*, Vol 04.11.

TABLE 1 Classification and Physical Requirements for Seal Durability Test Method E 773

Classification of Specimen	Record Initial Frost Point and Chemical Dew Point	Accelerated Weathering Test				Fogging Test		
		Number of Specimens	Duration of Test		Final Qualification of Frost Point and Chemical Dew Point	Number of Specimens	Duration of Test, days	Qualification
			High Humidity Test,[A] (days)	Accelerated Weather Cycle Test,[B] cycles				
Class C		6 each	14	140	lower than − 34°C (−30°F)	2 each	7	no visible fog
Class B		6 each	14	56	lower than − 29°C (−20°F)			
Class A		6 each	14	56	lower than − 29°C (−20°F)			

[A] See Procedure section of Test Method E 773.
[B] See Procedure section of Test Method E 773.

throughout the test. Replace any broken specimen with one from the same lot, and test from the beginning.

NOTE 2—Breakage due to laboratory handling, that is dropped units, is not considered to be test breakage. Laboratory broken units shall be replaced and retested from the beginning.

7.1.1.5 If third specimen breakage occurs during the test for any reason, do not qualify this set of test specimens for that tested class.

7.1.1.6 If any specimen has filled with water or shows visible condensation in the air space, do not qualify this set of test specimens for that tested class except as permitted in 7.1.1.4 (that is, breakage).

7.1.2 *Fogging Test*:

7.1.2.1 Select two specimens as shown in Table 1.

7.1.2.2 Test the two test specimens for durations as shown in Table 1, Class C in accordance with Test Method E 1887.

7.2 The test durations as shown in Table 1 are net testing periods. If the test is interrupted for any reason, the remaining portions shall be completed to qualify for the testing class.

NOTE 3—It is suggested that extra units be submitted. Twelve units have been shown to be adequate in many cases.

8. Report

8.1 Report the following information:

8.1.1 Detailed description of test specimen, test durations, and all reportable test data of Test Methods E 773 and E 1887.

8.1.2 Classes for which the test specimens qualified.

9. Acceptance or Rejection

9.1 When all test specimens have met the requirements as described in Section 5 for any particular class, this set of test specimens shall be accepted for that tested class.

9.2 If any specimen fails to meet the requirements as described in Section 5 for any particular class, this set of specimens shall be rejected for that tested class.

10. Keywords

10.1 insulating glass units; sealed insulating glass units

APPENDIX

(Nonmandatory Information)

X1. TEST DATA GATHERING

FIG. X1.1 Test Report for Specification E 774

Date _____

Manufacturer _____ Ref. No. _____ Testing Lab. _____ Ref. No. _____

Address _____ Address _____

Attention _____ Tel. _____ Attention _____ Tel. _____

Description of Test Specimen:

Size (width by height) _____ Type and amount of desiccator _____

Thickness of glass _____ Type of sealant(s) _____

Thickness of air space _____ Other features (band, barrier coat, etc.) _____

Type of spacer _____ Manufactured date (month and year) _____

Test Results

Specimen No.	Class C					Class B			Class A		
	Initial Frost Point	Fogging Test, days	High-Humidity Test,[A] days	Accelerated Weather Cycle Test,[A] cycles	Remark	High-Humidity Test,[A] days	Accelerated Weather Cycle Test,[A] cycles	Remark	High-Humidity Test,[A] days	Accelerated Weather Cycle Test,[A] cycles	Remark
		7	14	140		14	56		14	56	
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											

[A] Actual frost/chemical dew point, or pass/fail.