



Break Detection of Glass Coated with 3M ULTRA600 Film by Intellisense Glassbreak Detectors

by

S. A. Rickman
Glassbreak Lead Engineer
Intellisense/Honeywell

Purpose

This report documents a test of Intellisense acoustic glassbreak detectors with glass coated with 3M ULTRA600 security film. The test was conducted on March 7, 2001, at Intellisense/Honeywell engineering facilities in Folsom, CA.

ULTRA600 Security Film

The tested film is an clear, adhesive-backed security coating which is applied to the inner surface of existing windows. According to the manufacturer, the film material is a polyester laminate with a total thickness of .006 inches.

Intellisense Glassbreak Detectors

Three models of glassbreak detectors were tested: the FG-730, the FG-1025, and the FG-1525. These models are the standard versions of three product lines of Intellisense glassbreak detectors, the FG(W)-7xx, FG(W)-10xx, and FG(W)-15xx. Similar results can be expected with other versions in the same product line, if the detector is installed in accordance with the installation instructions.

The specified ranges for film-coated glass are as follows:

Model	Max Range (coated glass)
FG-730	15'
FG-1025	15'
FG-1525	25'

Test Facility

The test was carried out in the Intellisense glassbreak test room. This room is 30' x 30' with a 10' ceiling. The flooring is a commercial low-pile carpet and pad over concrete, the ceiling is acoustical tile, and the walls are painted drywall. The test break frame is constructed of steel and mounted in a sand-filled concrete block wall.

Glass Preparation

Fifteen samples of glass were coated and broken for this test. The samples included the four major glass types specified for Intellisense detectors: plate, laminated, wired, and tempered. For sealed-insulating glass, results for the glass type used for the inner lite will apply. The size of the glass samples, 12" x 12", is the smallest size specified for the tested detector models.

Quantity	Thickness	Size	Type
4	3/32"	12" x 12"	Plate
4	1/8"	12" x 12"	Laminated
3	1/4"	12" x 12"	Wired
4	3/16"	12" x 12"	Tempered

A sample of the ULTRA600 film and installation instructions were supplied by the manufacturer. The film was applied to the glass samples leaving a 1" wide uncoated area on all sides. The uncoated area ensured that the film was not trapped under the mounting clamp of the test break frame, thus simulating an actual installation on existing window glass.

Detector Setup

A total of 19 detectors were used in the test. The detectors were in three groups mounted at different ranges to the glass. In the table below, "adjacent wall" and "opposite wall" are with reference to the wall in which the break test frame is mounted.

Group	Range to Glass	Mounting	Quantity		
			FG-730	FG-1025	FG-1525
1	12'	Adjacent wall	2	3	3
2	17'	Adjacent wall	2	3	3
3	30'	Opposite wall	--	--	3

Groups 1 and 2 were placed to bracket the specified 15' range of the FG-730 and FG-1025 for film-coated glass. Group 3 at 30' was beyond the specified range of the FG-1525, but it was known that this would not be a problem because opposite wall mounting is optimum for acoustic detectors of this type. All the detectors were mounted at a height of approximately 6.5'.

The FG-730 and FG-1525 were adjusted according to the installation instructions. The FG-730 "flex" control was at maximum in both groups 1 and 2. The FG-1525 sensitivity control was at medium for groups 1 and 2 and at maximum in group 3. The FG-1025 model has no adjustments.

Test Procedure

The break test followed the usual procedure of Underwriters Laboratories for verification of compliance to UL Standard 639, which covers acoustic glassbreak detector performance. Two tools were used to break the glass:

1. A 16-oz. ball-peen hammer, swung by hand with the rounded end striking the glass
2. A 5-lb. steel ball thrown through the glass without touching the frame.

Except for wired glass, two samples of each glass type were broken with the ball-peen hammer and two samples were broken with the steel ball. By oversight, only one sample of wired glass was broken with the steel ball.

In keeping with UL verification practice, each sample was attacked with the tool until the glass and film were penetrated.

Test Results

All units mounted within specified range detected all glass broken. In group 2, one FG-1025 failed to detect one break of 1/4" coated wired glass with the steel ball. Note however, that group 2 was beyond the specified range of the FG-1025 for coated glass.

Conclusion

This test confirmed that Intellisense glassbreak detectors function reliably for glass coated with 3M ULTRA600 film. For the FG-730 and FG-1025, maximum range should be reduced to 15'. For the FG-1525 no range reduction is required.