



DETERMINATION OF COLD ADHESION REQUIREMENTS OF WEATHERSTRIP LOW FRICTION COATINGS TO PAINTED METAL OR GLASS

Application

This method was developed to determine the ice release properties of coatings applied to body seals, such as weatherstrips.

Materials and Apparatus Required

Weatherstrip Ice Release Apparatus (Figure 1)

Model NTS 96148 or equivalent with operating speed of 250 +/- 10 mm/minute.

Apparatus or prints can be supplied by:

Source: National Technical Systems
12601 Southfield Road
Detroit, MI 48223
Telephone: (313) 835-0044
FAX: (313) 272-1190

Weatherstrip Mounting Block

Block designed to hold weatherstrip at proper angle and to fit apparatus.

Force Gage

Chatillon Force Gage Model #DFG-50 or equivalent to fit apparatus.

Environmental Chamber

CSZ Chamber Model #ZH3222H/AC or equivalent front opening chamber capable of -40 °C with wall port approximately 50 mm in diameter.

Contact Panel

Steel Panel painted per FLTM BI 103-02, or as specified, for body closure seals or glass plate for sliding glass seals.

Cleaning Items

Isopropyl alcohol.
Paper toweling, low lint, nonabrasive.

Date	Action	Revisions
2007 02 21	Revised	Updated to reflect general apparatus conditions K. Mueller
2001 09 25	Revised	Editorial – no technical change A. Cockman
1996 11 15		





Conditioning and Test Conditions

All test values indicated herein are based on material conditioned in a controlled atmosphere of 23 +/- 2 °C and 50 +/- 5% relative humidity for not less than 24 h prior to testing and tested under the same conditions unless otherwise specified.

Adequate humidity is required to provide sufficient moisture condensation on the test surfaces, which forms the ice coating interface upon freezing. A front opening environmental chamber, rather than a top opening chamber, is utilized to allow the humid air exchange necessary to establish this condensation.

Procedure

1. Cut five 150 mm sections off the weatherstrip to be tested. Five specimens are to be tested for each weatherstrip coating to obtain a final average value.
2. Mount a cut section of the weatherstrip onto the mounting block, and mount the appropriate contact panel onto the opposing backing plate of the test fixture.
3. After mounting, clean the weatherstrip and contact panel with isopropyl alcohol and paper toweling to remove any contamination from handling.
4. Mount the Ice Release Apparatus through the environmental chamber wall in such a position that the force gauge is vertical/horizontal outside the chamber, and the weatherstrip mounting block holder is vertical/horizontal inside the chamber. Place the test fixture (mounting block and backing plate) into the apparatus. The panel backing plate must be securely locked to the actuator rod so that it separates straight away from the weatherstrip during the test. It shall not be allowed to pivot or tilt, which would result in a peeling type of separation.
5. Adjust the actuator stop bracket on the apparatus so that the test sample compressed position duplicates the in-body closed position. There should be no spacers or adjusting screws between the mounting block and the contact panel or panel backing plate. They may freeze to the surfaces and cause erroneous force readings.
6. With non load on the weatherstrip, zero the force gauge in the tension mode.
7. Fully compress the weatherstrip by running the actuator until it contacts the stop bracket and stops or slips.
8. Close the environmental chamber door and allow the fixture to cool to -40 °C for 1 hour.
9. After 1 hour turn off the chamber and start the actuator motor so that the painted panel separates from the weatherstrip. Note any load from the force gauge.
10. Open the environmental chamber door and allow the painted panel and weatherstrip to accumulate the maximum amount of moisture condensation on the surfaces, which should occur in approximately 15 minutes. The condensing moisture first appears as a uniform coating of frost. When the frost changes to a wet phase, it has achieved the optimum condition. Proceed immediately from this condition. No additional moisture should be required.
11. With no load on the weatherstrip, rezero the force gauge in the tension mode.
12. Fully compress the weatherstrip by running the actuator to the stop bracket again.