



FLOW TESTING FOR FLOWABLE ADHESIVE AND SEALER MATERIALS

Application

This method is used to evaluate the flow properties of adhesives and sealers. These properties can be used to determine the amount of flow required to structurally bond metal-to-metal components, such as the inner and outer panels of doors.

Apparatus RequiredScale

A scale equipped with a minimum readability of 0.1 g.

Oven

An oven capable of achieving temperatures of 35 °C to 185 °C

Materials RequiredAdhesive

Material obtained from requestor

Test Panels

Oiled 60E steel panels, with dimensions of 4" x 12"

Conditioning and Test Conditions

All test values indicated herein are based on material conditioned in a controlled atmosphere of 23 +/- 4 °C and 50 +/- 5% relative humidity for not less than 24 h prior to testing. Materials will be tested at the following temperatures: 35 °C, 40 °C, 50 °C, 55 °C, 60 °C and 65 °C.

Procedure

1. Place a 3 cc volume daub on the top of a 4" x 12" oiled steel test panel. Daub volume should be measured on a scale, using specific gravity to convert from weight to volume. See Figure 1 for placement of daub onto test panel. A minimum of 43 test panels, with one 3 cc daub per panel, are required.
2. Place one panel vertically (with daub on top) into a 180 °C oven for 30 minutes. Remove panel and record the flow, from the top of the daub to the bottom edge of the flow. Record this as 'Initial'. See Figure 2 for flow measurement details.
3. Place seven test panels vertically (with daub on top) into a 35 °F oven.
4. After one day (24 hours), remove panel and place into a 180 °C oven for 30 minutes. Remove panel and record the flow, from the top of the daub to the bottom edge of the flow. Record this as 'One Day'. See Figure 2 for flow measurement details.

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Documents

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5. Repeat step 4 for two days, three days, four days, five days, six days and seven days in a 35 °C oven.
6. Repeat steps 3, 4 and 5 at the following oven temperatures: 40 °C, 50 °C, 55 °C, 60 °C and 65 °C. No movement or flow after baking in a 180 °C oven should be recorded as 'No Flow'. An example of a 'No Flow' panel is shown in Figure 3. Testing at a given temperature can be stopped once the 'No Flow' condition is reached.
7. At the lower temperatures (35 °C, 40 °C, 50 °C), a 'No Flow' condition may not be reached in seven days. In this case, continue testing on a daily basis, until the 'No Flow' condition is reached.
8. Record all of the flow data in a table format. See Figure 4 for an example.

Report

1. Adhesive identification including: Manufacturer, code number, type, date manufactured, etc.
2. Conditioning procedure for material prior to testing.
3. Test conditions including: oven temperature, days in oven, etc.
4. Flow data for each test condition (see Figure 4).

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| Figure 2 | Flow Measurement Details |
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