



TENSILE, SHEAR, AND PEEL ADHESION OF HEAT-CURING SEALERS AND HEAVY MASTIC ADHESIVES

Application

This method is used to determine the tensile adhesion, shear adhesion, and peel adhesion of heat-curing sealers and heavy mastic adhesives.

Method A	Tensile Adhesion
Method B	Shear Adhesion
Method C	Peel Adhesion
Method D	T-Peel Adhesion

Apparatus Required

Mechanical Convection Oven

Capable of maintaining a temperature up to 250 +/- 2 °C.

Cold Box

Capable of maintaining a temperature of - 40 +/- 2 °C.

Tensile Machine

Capable of a constant rate of jaw separation of 25 mm/minute and with a recording device relating crosshead separation and load.

Temperature Cabinet

Capable of maintaining temperatures between -40 to 150 +/- 2 °C.

Clamps

Spacers (alt. Glasspearls)

Refer to Figure 2 and 4.

Date	Action	Revisions
2007 05 22	Revised	Changed No. of test assemblies/Deleted Addition to FLTM BZ 150-11 "Normal Grade"/Revised Figure 3 page 7 B. Utrecht
2001 04 10	Revised	Editorial – no technical change A. Cockman
1990 02 21		





Materials Required

Steel Body Skin Panels and Steel Buttons

For panel dimensions, see Figure 2 or 3. For button dimensions, see Figure 1.

Preparation - freshly prepared as required by the applicable Engineering Specification, as follows:

Type 1 - Oiled surfaces according to FLTM BZ 150-11

Type 2 - Electrocoated surfaces prepared according to the technique outlined in FLTM BI 120-01, using Engineering approved material. Alternatively, panels/buttons can be electrocoated by use of the normal production process.

Preparation of Test Assemblies

A. For Oiled Surfaces

1. Prepare panels or buttons for 10 test assemblies as shown in Figures 1, 2, or 3 in accordance with FLTM BZ 150-11 or described in the Engineering Material Specification.
2. Apply a sufficient quantity of the material under test to one part of the assembly, so that after placing the other part over the material and clamping (using spacers as shown), thickness X must be as required by the applicable Engineering Material Specification.
3. Condition the assemblies at 23 +/- 2 °C for an open-time of either:
 - a) 4 h for solvent-release materials
 - b) 10 minutes for solvent-free materials
4. Cure 5 of each type assembly in accordance with the minimum curing cycle and 5 of each type assembly in accordance with the maximum curing cycle as outlined in FLTM BV 150-05, Table 2.
5. Remove the test specimens from the oven, cool to room temperature and then remove the spacers and clamps.
6. Test and examine as described under the Procedure.



B. For Primed Surfaces

1. Prepare panels or buttons for 10 test assemblies as shown in Figures 1, 2 or 3 in accordance with the technique outlined in FLTM BI 120-01, using Engineering approved material. Alternatively, panels/buttons can be electrocoated by use of the normal production process.
2. Apply a sufficient quantity of the material under test to 1 part of the test assembly so that after placing the other part over the material and clamping (using spacers as shown), its thickness X must be as required by the applicable Engineering Materials Specification.
3. Condition the assemblies at room temperature for an open-time of 10 minutes.
4. Cure 5 of each type assembly in accordance with the minimum curing cycle and 5 of each type assembly in accordance with the maximum curing cycle outlined in FLTM BV 150-05, Table 2.
5. Remove the assemblies from the oven, cool to 23 ± 2 °C, and then remove the spacers and clamps.
6. Test and examine as described under the Procedure.

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.

Procedure

The tests outlined in Methods "A", "B", and "C" must be carried out after conditioning the assemblies for 2 h at 23 ± 2 °C and an additional conditioning time of 25 - 30 minutes at the following temperatures (the tests must be conducted at these temperatures):

1. 20 ± 2 °C
- or, 2. 90 ± 2 °C
- or, 3. -40 ± 2 °C

respectively, as required in the applicable Engineering Materials Specification.