



Test method T1178

Adhesive strength in tension of cold applied joint sealing compound

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Revision Summary

Ed/Rev Number	Clause Number	Description of Revision	Authorisation	Date
		Reformatted and Generally Revised	D.Dash	February 2000
		Revision Summary Added	D.Dash	June 2001
Ed 2/ Rev 0	All	Reformatted RMS template	J Friedrich	November 2012

Note that Roads and Maritime Services is hereafter referred to as 'RMS'.

The most recent revision to Test method T1178 (other than minor editorial changes) are indicated by a vertical line in the margin as shown here.

Test method T1178

Adhesive strength in tension of cold applied joint sealing compound

1. Scope

This test method sets out the procedure for determining the adhesive strength in tension of cold applied joint sealing compounds. The test method includes the adhesive strength after water immersion and heat ageing.

2. Apparatus

- (a) An extension testing machine so designed that the prepared samples, held in appropriate holding jaws, may be pulled apart at a uniform rate of 5 to 6.5 mm per minute.
- (b) Holding jaws designed to hold the test specimens and to be fitted into the tensile testing machine.
- (c) Machined metal spacer bars 20 mm by 13 mm by 50 mm.
- (d) Clamp or clamping devices to hold the test assembly together while casting the test specimens.
- (e) Wire probe 1.625 mm in diameter.

3. Test Surface

Units otherwise stated test the adhesion of the compound to the following surfaces:

- (a) Polished glass plate 50 mm by 50 mm.
- (b) Aluminium alloy 50 mm by 50 mm.
- (c) Portland cement blocks 50 mm by 50 mm by 25 mm thick prepared from concrete mortar consisting of one part Portland cement and three parts of clean fine aggregate (sand) and cured for 28 days (7 days for high early strength cement).

4. Preparation of Test Assemblies

- (a) Clean the surface of the test assemblies as follows:
 - (i) Plate glass. Wash with warm tap water followed by methyl-ethyl-ketone (MEK) and wipe dry with a clean soft cotton cloth.
 - (ii) Aluminium. Wash with MEK and wipe dry with a clean soft cotton cloth.
 - (iii) Concrete. Wet grind the test surface with No. 60 silicon carbide or aluminium oxide abrasive grain. Allow to air dry and wash with benzene to remove all traces of shutter oil. Then wash in methylated and finally in water. Allow to air dry thoroughly. Prime the surface when so required by the sealant manufacturer's directions.

5. Preparation of Test Samples

- (a) Allow 250 grams of base compound with the appropriate quantity of accelerator to condition for a minimum period of 16 hours at $23\pm 2^{\circ}\text{C}$.
- (b) Mix the compound and accelerator by hand for a period of five minutes.
- (c) Treat the spacer bars with a non-migrating mould release agent such as paraffin to prevent adhesion of the compound to the spacer bars. Place the spacer bars in position between two similar test blocks to provide specimens 13 mm by 13 mm by 40 mm. Three specimens are required for each surface type.
- (d) Apply the material in the space provided between the spacer bars making sure that the bead so formed is in intimate contact with the test surfaces.
- (e) Cure the test assemblies for a period of 7 days at a temperature of $23\pm 2^{\circ}\text{C}$ and 50 per cent humidity before testing or further conditioning.

- (f) Scribe the specimens with a sharp knife or marking pencil along the lines where the sealant comes into contact with the test surface in order to record the original bonded area.

6. Procedure

Three samples for each test surface are to be tested as follows:

6.1 Initial adhesion and adhesive strength

- (a) Position the test assembly in the holding jaws of the testing machine.
- (b) Pull apart at a rate of 5 to 6.5 mm per minute to 150 per cent of the original width and record the maximum force required to extend the material.
- (c) Transfer the extended specimen to a jig where it is maintained at 150 per cent extension for a period of 24 hours at $23\pm 2^{\circ}\text{C}$ and 50 per cent humidity.

6.2 Three test assemblies are required to undergo the following

- (a) Immerse the test assemblies in distilled water for four(4) days at $23\pm 2^{\circ}\text{C}$ and then immediately test for adhesion as in 6.1(b) above and record the maximum force required to extend the material.

6.3 Adhesion and adhesive strength after heat ageing

Three test assemblies are required to undergo the following:

- (a) Place the test assemblies in a circulating hot air oven at $70\pm 1^{\circ}\text{C}$ for a period of 96 hours.
- (b) Remove the assemblies from the hot air oven and condition for not less than 4 hours at $23\pm 2^{\circ}\text{C}$.
- (c) Test for adhesion by pulling apart as in 6.1(b) above to 100 per cent extension and record the maximum force required to extend the material.
- (d) Maintain at 100 per cent extension for a period of 24 hours at $23\pm 2^{\circ}\text{C}$ and 50 per cent humidity.

7. Assessment and Reporting

- (a) Examine each extended specimen for cohesive or adhesive separation measuring the depth of separation with the wire probe.
- (b) Report the depth of any failures that occur in cohesion for adhesion and record the mean maximum pressure in kPa required to extend the material.