

CRD-C 547-88

**STANDARD METHODS OF TESTING FOR JET-FUEL AND HEAT
RESISTANCE OF PREFORMED POLYCHLOROPRENE ELASTOMERIC
JOINT SEALS FOR RIGID PAVEMENTS**

1. Scope

1.1 These methods cover acceptance testing of jet-fuel- and heat-resistant preformed polychloroprene elastomeric joint seals for use in portland-cement concrete pavements.

1.2 This standard may involve hazardous materials, operations, and equipment. This standard does not purport to address all of the safety problems associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

2. Referenced Documents**2.1 ASTM Standards**

D 471	Test Method for Rubber Property Effects of Liquid (CRD-C 533)
D 2628	Specification for Preformed Polychloroprene Elastomeric Joint Seals for Concrete Pavements (CRD-C 531)

2.2 Corps of Engineers Handbook for Concrete and Cement

CRD-C 526 Federal Specification:
Sealants, Joint, Two-Component, Jet-Blast-Resistant, Cold-Applied, for Portland Cement Concrete Pavement, SS-S-200E.

3. Significance and Use

3.1 These methods are to be used to test samples of preformed polychloroprene elastomeric joint seals to determine if they comply with the provisions of relevant acceptance specifications.

4. Sampling

4.1 Samples for testing shall be taken as specified in ASTM D 2628 except a minimum of 3 lin ft (1 m) shall constitute one sample for testing purposes. The purchaser may obtain samples for testing at the point of manufacture or at the delivery destination or both.

5. Laboratory Conditions

5.1 Laboratory standard conditions shall be $23 \pm 2^\circ \text{C}$ ($73.4 \pm 3.6^\circ \text{F}$) temperature and 50 ± 5

percent relative humidity. Specimens shall be stored and tested at standard conditions unless otherwise specified.

6. Specimen Preparation

6.1 Jet-fuel resistance: The samples shall be cut from the manufactured seals. Three samples shall be tested from each lot or batch submitted for testing. Each specimen shall be rectangular having dimensions of 60 ± 1 mm by 20 ± 1 mm by 2 ± 0.1 mm. Specimens shall be the thickness of the seal as received when they are less than 2 mm thick. When the as received sample is greater than 2 mm thick, it shall be buffed to a thickness of 2 ± 0.1 mm.

6.2 Heat resistance: The samples shall be cut from the manufactured seal. Three samples shall be tested from each lot or batch submitted for testing. Each specimen shall be cut to a length of 50 ± 1 mm. The width and depth of the seal shall be as received. The manufacturer's recommended lubricant shall be applied to both sides of the seal using a small paint brush. The specimens shall be placed between two concrete blocks so that the surface of the seal is even with the top surface of the concrete block. The specimens shall be clamped together so that the seal is compressed 30 ± 5 percent of its nominal width and allowed to cure for 48 ± 4 h. The concrete blocks shall be prepared as specified in CRD-C 526 under "Bond to Concrete." When the depth of the as received sample is greater than the depth of the concrete block, the seal shall be allowed to extend to its natural depth.

TEST METHODS**7. General**

7.1 Samples taken and prepared as specified above shall be tested as specified below.

8. Jet-Fuel-Resistance Test

8.1 The mass of each test specimen shall be determined to the nearest 0.01 g and then immersed for 24 ± 0.25 h in clean test fuel maintained at $49 \pm 1^\circ \text{C}$ ($120 \pm 2^\circ \text{F}$). The test fuel shall be in accordance with ASTM D 471, reference B test

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fuel. The specimens shall be vertically suspended in the reference fuel so that there is a minimum of 12 mm above and below the specimens. The container for the reference fuel and the specimens shall be semiclosed to reduce fuel evaporation and eliminate pressure build-up. The overall dimensions of the container shall be deep enough to allow the specimens to be suspended by wire or string. Several specimens of the same material may be immersed in the same container provided each test specimen is separated from any adjacent test specimen and the container walls by a minimum of 6 mm and the minimum fuel cover is maintained. A constant temperature water bath shall be used to maintain the reference fuel and specimens at $49 \pm 1^\circ\text{C}$ ($120 \pm 2^\circ\text{F}$). Immediately after the 24-h fuel immersion, the specimens shall be removed from the test fuel and dried in a forced draft oven at $70 \pm 1 \text{ deg}^\circ\text{C}$ ($158 \pm 2^\circ\text{F}$) for $24 \pm 0.25 \text{ h}$. After oven drying, the specimen shall be allowed to cool for 30 min at room temperature and then its mass shall be determined to the nearest 0.01 g. The forced air shall be maintained at an air velocity of 150 to 500 ft per min. The change in mass shall be calculated as follows:

$$\text{Change in mass, percent} = ((W1 - W2)/W1) \times 100$$

where: W1 = Initial specimen mass, g

W2 = Final mass after fuel immersion
and drying, g

The average of the three specimens shall be reported as the percent change in mass.

9. Heat Resistance

9.1 Assemble the apparatus as specified in CRD-C 526 "Flame Test." Use a tripod or similar support for the primary shield to place the top of the centered burner in the same plane as the bottom of the primary shield. With the specimen support centered on top of the primary shield, support a laboratory thermometer in a horizontal position, laid on the support with the bulb in the center. Regulate the burner to produce a thermometer reading of $260 \pm 11^\circ\text{C}$ ($500 \pm 20^\circ\text{F}$) for a 2-min period. Substitute the specimen for the thermometer with the top surface of the seal perpendicular to the flame and parallel to and resting on the long support rods. Apply the stabilized burner heat to the specimen for $120 \pm 1 \text{ sec}$. Observe the specimen for evidence of ignition, hardening, flow, or charring. Remove the burner at the end of the 120-set exposure and allow the specimen to cool at room temperature. Examine the specimen and report any of the above mentioned defects.