STATE OF CALIFORNIA—BUSINESS, TRANSPORTATION AND HOUSING AGENCY

DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
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METHOD OF TEST FOR DETERMINING APPLICATION RATE OF CONCRETE CURING COMPOUND IN THE FIELD

A. SCOPE

This test method describes the procedure for determining the rate at which concrete curing compound is applied to portland cement concrete pavements.

B. REFERENCES

California Test 339 – Field Test for the Determination of Distributor Spread Rate

C. APPARATUS

1. Balance: balance or scale accurate to 0.5 g or less and having a capacity of at least 200 g.

2. Specific Gravity Bottle: specific gravity bottle (pycnometer) of 25 to 100 mL capacity or hydrometer with range of 0.90 to 1.10 specific gravity.

3. Suitable weighing box or wind shield for balance.

4. Stop watch.

D. MATERIALS

1. Absorbent pads with waterproof backing: medical and pet supply stores sell disposable, flat diaper pads, under pads, and training pads with an exposed absorptive area of 200 sq. in. or greater.

2. Test Pad anchor sheet: thin plastic, template material, or vinyl approximately 0.040 in. thick that will serve to "anchor" the absorbent pad during sampling. This sheet will be cut to a size about ½ in. less in both directions than the dimensions of the absorbent pad to be used. For a 12½ in. × 16 in. test pad, the plastic sheet should be cut to approximately 11½ in. × 15 in.

   Caltrans testers can obtain 0.040 in. × 20 in. × 50 in. sheets of template material from the Division of Procurement, Warehouse Catalog (part number 9330-0010-9).

3. Plastic Sack: polyethylene sack measuring 9 in. × 15 in.

   Caltrans testers can obtain sacks with ties from the Division of Procurement, Warehouse Catalog (part number 8105-0060-7).

E. PREPARATION OF TEST PADS

1. Trim absorbent pad and waterproof backing to 200 sq. in. (12½ in. × 16 in.) of exposed absorptive surface. Do not detach pad from backing. Discard trimmings.

   NOTE: Table 1 is the conversion for net weight of curing compound on a 200 sq. in. test pad. If absorptive pads are trimmed to other than 200 sq. in., the nominal application rate will need to be proportioned appropriately.

2. Mark bottom of test pad and a plastic sack with same identification number.

3. Weigh each test pad together with its plastic sack and tie to the nearest gram to establish tare weight.

4. Insert the plastic anchor sheet between absorbent pad and backing in order to keep pad flat and prevent it being blown aside or turned over by wind or spray. Ensure that absorbent pad is attached to waterproof backing on at least 2 sides.

F. SAMPLING AND WEIGHING

Observe that the curing compound is being applied at its normal rate at the time the spray equipment passes over the test pads.

1. Longitudinal Distribution of Testing Pads: Place 5 test pads, absorbent face up, along the pavement approximately 3 ft from the edge at random intervals (6 to 12 ft) over a 50-foot length ahead of the spray rig (Figures 1 and 2).

2. Transverse Distribution of Testing Pads: Where fixed nozzles on a distributor bar are used, it is desirable to determine transverse distribution. Place 5 test pads, absorbent face up, at random intervals across the slab.

   NOTE: Place test pads under nozzles that appear to be delivering at abnormal rates. Place test pads and remove them without stepping on newly placed concrete.

3. As soon as the spray rig has passed, remove each test pad from the pavement. Wipe any adhering moisture, curing compound or mortar off from the waterproof backing.

   NOTE: A test pad may be placed at some distance from the edge of the pavement and later removed by using a pole or lath.

4. Remove plastic anchor sheet and save for reuse. Fold absorbent pad inside its waterproof backing and place in plastic sack. Tie opening of bag firmly to prevent loss of volatiles. Complete this operation within 2 min after application of curing compound to the test pad.

5. Weigh each test pad in its plastic bag as quickly as possible. Weigh to the nearest gram. Record as “final weight.”

   NOTE: Consider the test invalid if the weighing operation is not completed within 1 hr after removing the test specimen from the pavement.

G. CALCULATIONS

1. Calculate the total weight of curing compound applied to each test pad as the final weight minus the tare weight.

2. Read the nominal application rate in sq. ft./gal from Table 1.

3. Calculate the actual rate of application by multiplying the rate from Table 1 by the specific gravity of a well-mixed representative sample of the curing compound.

   NOTE: If possible, this curing compound sample should be taken from a spray nozzle or from the feed line to the spray nozzle. The specific gravity must be determined by means of a suitable pycnometer or hydrometer.

4. Calculate the average application rate in sq. ft./gal, as the sum of the individual corrected rates divided by 5.

TABLE 1.

Conversion Net Weight of Curing Compound on 200 sq. in. Test Pads to sq. ft./gal

Net Weight of Curing Compound on Test Pads, grams	Nominal Application Rate, sq. ft./gal	Net Weight of Curing Compound on Test Pads, grams	Nominal Application Rate, sq. ft./gal
10	504	30	168
11	458	31	163
12	420	32	158
13	388	33	153
14	360	34	148
15	336	35	144
16	315	36	140
17	296	37	136
18	280	38	133
19	265	39	129
20	252	40	126
21	240	41	123
22	229	42	120
23	219	43	117
24	210	44	115
25	202	45	112
26	194	46	110
27	187	47	107
28	180	48	105
29	174	49	103
-	-	50	101

Notes:

- Nominal application rate (sq. ft./gal) is based on a test pad area of 200 sq. in. assuming a specific gravity for curing compound of 1.00.
- For specific gravity different from 1.00, multiply nominal application rate from Table 1 times the actual specific gravity of the compound.
- For test pad areas other than 200 sq. in., proportion the nominal application rate from Table 1 as follows:

$$\text{Application rate} = \text{application rate from Table 1} \times \left(\frac{\text{actual test pad size}}{200} \right)$$

H. PRECAUTIONS

1. Weigh the wet test pads as soon as possible to reduce errors caused by loss of volatiles.

2. Use a stopwatch to time the rate of advance of the spray equipment over several 50-foot sections to establish the average time of travel for 50 ft. Then check the time taken to spray the test section to determine if the spray equipment operator maintains the same forward speed. Similarly, read the pressure gage on the spray equipment during normal operation and when compound is applied to the test section. If the time of travel or pressure varies more than 10 % from the average, consider the tests invalid and repeat the test.

3. Shield test pads placed near the edge of the pavement slab from overspray from nozzles applying compound to the exposed edge of slip-formed pavement.

I. HEALTH AND SAFETY

It is the responsibility of the user of this test method to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use. Prior to handling, testing or disposing of any materials, testers must be knowledgeable about safe laboratory practices, hazards and exposure, chemical procurement and storage, and personal protective apparel and equipment.

Caltrans Laboratory Safety Manual is available at:

http://www.dot.ca.gov/hq/esc/ctms/pdf/lab_safety_manual.pdf

End of Text
(California Test 535 contains 5 Pages)

FIGURE 1. Placing Test Pads on Pavement

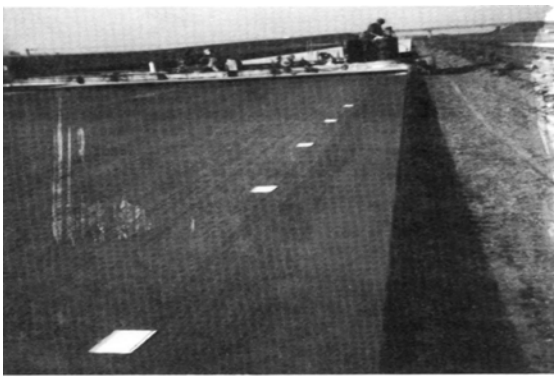

FIGURE 2. Test Pads in Position for Test

FIGURE 3. Spray Equipment Passing Over Test Pads