

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

CAUTION: Prior to handling test materials, performing equipment setups, and/or conducting this method, testers are required to read “**SAFETY AND HEALTH**” in Section H of this method. It is the responsibility of the user of this method to consult and use departmental safety and health practices and determine the applicability of regulatory limitations before any testing is performed.

A. SCOPE

This test method, an adaptation of California Test 339, describes the procedure for determining the rate at which concrete curing compound is applied to portland cement concrete pavements.

B. APPARATUS

1. Balance, accurate to 0.5 g or less, and having a capacity of about 200 g.
2. Suitable weighing box or wind shield for balance.
3. Stop watch.
4. Specific gravity bottle (pycnometer) of 25 to 100 mL capacity, or hydrometer with range of 0.90 to 1.10 specific gravity.

C. MATERIALS

1. Disposable, absorbent diaper pads with waterproof backing. A medium-small underpad is sold by medical patient care supply businesses. This medium-small size underpad has an absorptive area of 162 580 mm² with dimensions of 355.6 x 457.2 mm. The waterproof backing extends 12 to 25 mm beyond the absorptive area perimeter. The medium size underpad must be trimmed down with a single cut to an absorptive area of 129 032 ± 100 mm² with dimensions of 356 x 362 mm. Not all suppliers carry the above size. Other sizes could be used if cut down to an absorptive area of 129 032 ± 100 mm².
2. Thin plastic sheet, 1 x 350 x 340 mm. This may be cut from sheet plastic, template material, vinyl

or other suitable plastic, and is available in 1 x 508 x 1270 mm sheets from the California Department of Transportation, Office of Purchasing and Warehousing (part number 9330-0010-9).

3. Polyethylene sack, 225 x 380 mm, 100 per package with ties, Office of Purchasing and Warehousing.

D. PREPARATION OF TEST PADS

1. Form test pad by trimming edges of waterproof backing to match dimensions of absorbent pad. Do not detach pad from backing. Discard trimmings.
2. Mark bottom of test pad and a plastic sack with same identification number.
3. Weigh each test pad together with its plastic sack to the nearest gram, to establish tare mass.
4. Insert the 280 x 380 mm plastic sheet between absorbent pad and backing in order to keep pad flat and prevent its being blown aside or turned over by wind or spray.

E. SAMPLING AND WEIGHING

1. Longitudinal Distribution: Place five test pads, with absorbent face up, along the pavement approximately 1 m from the edge at random intervals (2 m to 4 m) over a 15 m length ahead of the spray rig (see Figures 1 and 2).
2. Transverse Distribution: Where fixed nozzles on a distributor bar are used, it is desirable to determine transverse distribution. Place five test pads, absorbent face up, at random intervals across the

slab or under nozzles that appear to be delivering at abnormal rates. Place test pads on the pavement and remove them without stepping on newly placed concrete. Observe whether the curing compound is being applied at its normal rate at the time the spray equipment passes over the test pads.

3. As soon as the spray rig has passed, remove each test pad from the pavement. Wipe off any adhering moisture, curing compound or mortar from the waterproof backing.
4. Remove plastic 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 two minutes after application of curing compound to the test pad.
5. Weigh each test pad in its plastic bag as quickly as possible to the nearest gram. (Consider the test invalid if the weighing operation is not completed within one hour after removing the test specimen from the pavement.) Record as "final mass."

F. CALCULATIONS

1. Calculate the total mass of curing compound applied to each test pad as the final mass less the tare mass. Read the nominal application rate in square meters per liter from Table 1. 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. (If possible, this sample should be taken from a spray nozzle or from the feed line to the spray nozzle. The specific gravity shall be determined by means of a suitable pycnometer or hydrometer.)
2. Calculate the average application rate in square meters per liter, as the sum of the individual corrected rates divided by five.

G. NOTES AND PRECAUTIONS

1. Weigh the wet test pads as soon as possible to reduce errors caused by loss of volatiles.
2. By means of a stopwatch, time the rate of advance of the spray equipment over several 15 m sections to establish the average time of travel for 15 m. 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 over spray from nozzles applying compound to the exposed edge of slip-formed pavement.
4. A test pad may be placed at some distance from the edge of the pavement and later removed by using a pole or lath.

H. SAFETY AND HEALTH

Prior to handling, testing or disposing of any waste materials, testers are required to read: Part A (Section 5.0), Part B (Sections: 5.0, 6.0 and 10.0) and Part C (Section 1.0) of Caltrans Laboratory Safety Manual. Users of this method do so at their own risk.

REFERENCES:

California Test 339

End of Text (California Test 535 contains 3 pages)

TABLE 1
CONVERSION TABLE
Net Mass of Curing Compound
on 318 x 406 mm Test Pads
to Square Meters per Liter

Net Mass of Curing Compound on Test Pads, Grams	Nominal Appl. Rate, Square Meters Per Liter	Net Mass of Curing Compound on Test Pads, Grams	Nominal Appl. Rate, Square Meters Per Liter
10	12.44	30	4.15
11	11.31	31	4.01
12	10.37	32	3.89
13	9.57	33	3.77
14	8.89	34	3.66
15	8.30	35	3.56
16	7.78	36	3.46
17	7.32	37	3.36
18	6.91	38	3.27
19	6.55	39	3.19
20	6.22	40	3.11
21	5.93	41	3.04
22	5.66	42	2.96
23	5.41	43	2.89
24	5.19	44	2.83
25	4.98	45	2.77
26	4.79	46	2.71
27	4.61	47	2.65
28	4.44	48	2.59
29	4.29	49	2.54
		50	2.49

Approximate Rate of Application m^2/L , based on actual measured test pad area 305 x 406 mm assuming a specific gravity for curing compound of 1.00. For specific gravity different from 1.00, multiply "application rate" from Table 1, times the actual specific gravity of the compound.



FIGURE 1
Placing Test Pads on Pavement



FIGURE 3
Spray Equipment Passing Over Test Pads

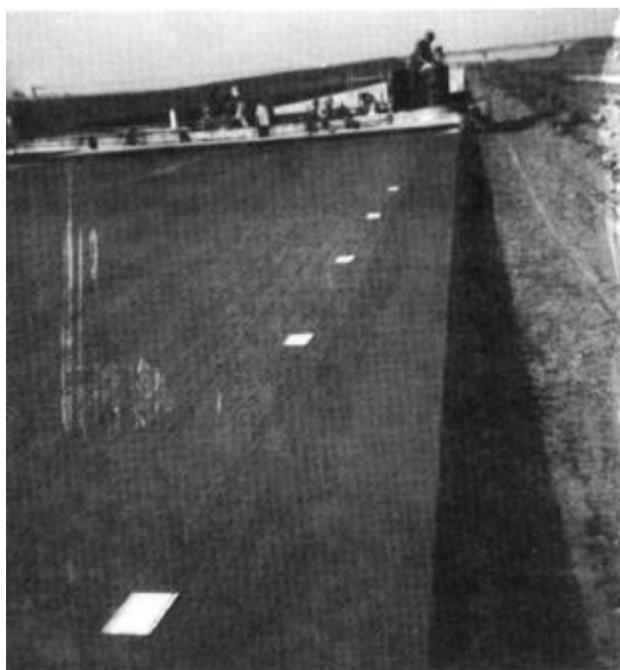


FIGURE 2
Test Pads in Position for Test