

DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
Transportation Laboratory
5900 Folsom Boulevard
Sacramento, California 95819-4612



METHOD OF TEST FOR THE APPLICATION RATE OF CONCRETE CURING COMPOUND IN THE FIELD

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. REFERENCES

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

C. APPARATUS

1. Balance, accurate to 0.5 g or less, and having a capacity of about 200 g.
2. 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. 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 252 in² with dimensions of 14 in. x 18 in. The waterproof backing extends ½ to 1 in. beyond the absorptive area perimeter. The medium size underpad must be trimmed down with a single cut to an absorptive area of 200 ± 0.2 in² with dimensions of 14 in. x 14¹/₄ in. Not all suppliers carry the above size. Other sizes could be used if cut down to an absorptive area of 200 ± 0.2 in².
2. Thin plastic sheet, 0.040 in. x 13³/₄ in. x 13¹/₂ in. This may be cut from sheet plastic, template material, vinyl or other suitable plastic, and is available in 0.040 in. x 20 in. x 50 in. sheets from the California Department of Transportation, Office of Purchasing and Warehousing (part number 9330-0010-9).
3. Polyethylene sack, 9 in. x 15 in., 100 per package with ties, from the Office of Purchasing and Warehousing (part number 8105-0060-7).

E. 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 13^{3/4} in. x 13^{1/2} in. 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.

F. SAMPLING AND WEIGHING

1. Longitudinal Distribution: Place five test pads, with absorbent face up, along the pavement approximately three feet from the edge at random intervals (6 ft to 12 ft) over a 50 ft 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 2 min 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."

G. 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 feet per gallon, as the sum of the individual corrected rates divided by 5.

H. 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 50 ft 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 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.

I. SAFETY AND HEALTH

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)

TABLE 1
CONVERSION TABLE
Net Mass of Curing Compound
on 14 in. x 14¹/₄ in. Test Pads
to Square Feet per Gallon

Net Mass of Curing Compound on Test Pads, Grams	Nominal Appl. Rate, Square Feet Per Gallon	Net Mass of Curing Compound on Test Pads, Grams	Nominal Appl. Rate, Square Feet Per Gallon
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

Approximate Rate of Application ft²/gal, based on actual measured test pad area 14 in. x 14¹/₄ in. 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

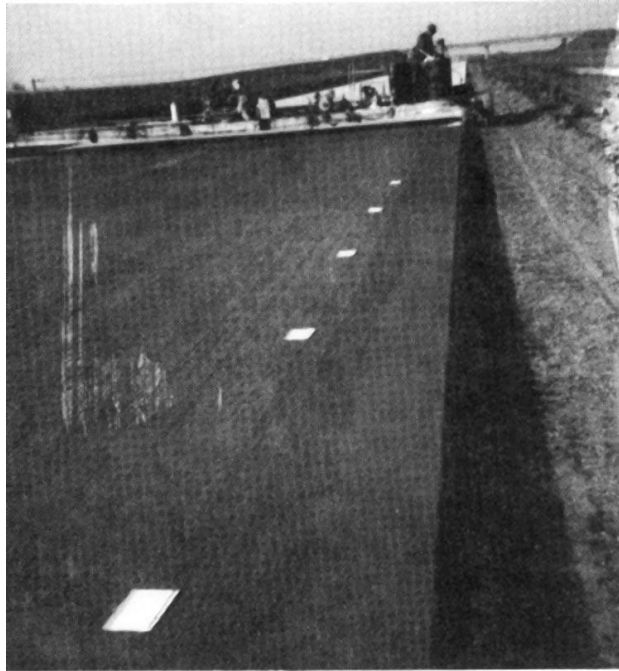


FIGURE 2
Test Pads in Position for Test



FIGURE 3
Spray Equipment Passing Over Test Pads