SCOPE:

The resistance of portland cement concrete cores when exposed to alternate freezing and thawing is determined.

APPARATUS:

A freezing-thawing chamber consisting essentially of a refrigeration system, coolant circulation, heating elements, and thermostatic controls, capable of maintaining the temperature of the coolant and test samples at $-10 \pm 5^\circ F$ and capable of reaching and maintaining thawing temperatures at $70 \pm 5^\circ F$.

2. Leak-proof sample receptacles with approximate internal dimension of 5 inch diameter by 9 inch high.

3. Balance, capacity not less than 5000 grams, minimum sensitivity 1.0 gram.

PROCEDURE:

The test specimens are immersed in separate leak-proof receptacles containing a ten percent (10%) solution of sodium chloride (NaCl), Specific Gravity approximately 1.071, for a period of 48 hours.

2. After 48 hours, the specimens are removed from the solution and dried to a saturated surface dry condition*, weigh to the nearest 1.0 gram.

3. Immediately after weighing the specimens are replaced in the original receptacles in the 10% NaCl solution, and placed in the chamber maintained at a temperature of $-10 \pm 5^\circ F$. The receptacles remain in the chamber until the brine solution is completely and solidly frozen and the internal temperature of the specimen reaches $-10 \pm 5^\circ F$.

NOTE: To determine the internal temperature, a temperature probe is placed in the center of a dummy specimen.

4. Following complete freezing, the receptacles are thawed at a temperature of $70 \pm 5^\circ F$ until the brine solution and specimens are completely thawed.

5. Freezing and thawing as described in steps 3 and 4 above will constitute one cycle. One complete cycle should not exceed 24 hours.
6. Between the 12th and 13th cycle, the cores are reversed top to bottom, and the brine solution is renewed.

7. At the conclusion of 25 cycles, the specimens are removed from the containers, dried to saturated surface dry condition and weighed to the nearest 1.0 gram.

RESULTS:

1. Report the % loss in weight.

2. Calculate:

\[
% \text{ Loss} = \frac{\text{Loss in weight after 25 cycles}}{\text{Original Weight}} \times 100
\]

a) Loss in weight = Original Weight - Weight after 25 cycles.

3. A description of the condition of the specimen before and after freeze/thaw test may be reported when pertinent.

*Remove specimens from solution and pat dry or roll in a soft absorbent cloth until all visible films of liquid are removed.*