

KTMR-24 PROCEDURES FOR TESTING LIGHTWEIGHT AGGREGATES (Kansas Central Lab Test KTMR-24)

a. SCOPE

This method covers the determination of friable particles occurring as unburned or underburned lumps, the procedure for loss on ignition, and the determination of the drying shrinkage of concrete involving lightweight aggregates.

b. REFERENCED DOCUMENTS

- b.1.** KT 7; Clay Lumps and Friable Particles in Aggregate
- b.2.** AASHTO T 160; Length Change of Hardened Hydraulic Cement Mortar and Concrete
- b.3.** ASTM C 330; Lightweight Aggregates for Structural Concrete

c. UNBURNED OR UNDERBURNED LUMPS IN LIGHTWEIGHT AGGREGATE

c.1. The test for friable particles occurring as unburned or underburned lumps in lightweight aggregate shall be conducted in accordance with the applicable methods listed in KT-7 on plus 4.75 mm (No. 4) material.

d. LOSS ON IGNITION

d.1. The test for loss on ignition for lightweight aggregate shall be conducted in accordance with the applicable methods listed in ASTM C 330.

e. DRYING SHRINKAGE

e.1. This test shall be used to determine shrinkage upon drying of concrete containing lightweight aggregate (Modified) as specified under subsection 1102 of the standard specifications. Testing shall be in accordance with AASHTO T 160 with the exceptions shown below:

e.1.a. The concrete shall be prepared using one part of Portland cement to six parts of aggregate, measured by dry, loose volume. The water content shall be adjusted to obtain a slump of two to three inches. The concrete shall be molded in steel molds 76.2 X 76.2 X 285.7 mm (3" X 3" X 11¼") in size. Vibration shall not be used to consolidate the concrete, but the surface shall be steel trowled.

e.1.b. Immediately after molding, the specimens shall be moist cured in the molds at a temperature of $23 \pm 1.6^{\circ}\text{C}$ ($73.4 \pm 3^{\circ}\text{F}$) for a period of from 20 to 24 hours or longer if necessary to prevent damage to the specimens during removal. All specimens used for comparison during the test shall be subjected to identical conditions of moist curing.

e.1.c. Immediately after the removal of the specimens from the molds, positioning marks shall be painted on one face near one end of each specimen and the length of each specimen shall be measured and recorded.

e.1.d. The specimens shall be moist-cured an additional six days, removed from the moist cabinet and measured to determine their lengths. The specimens shall be stored in a curing cabinet which shall be maintained at a temperature of $37.7 \pm 1.1^{\circ}\text{C}$ ($100 \pm 2^{\circ}\text{F}$) with a relative humidity of approximately 32%.

e.1.e. After storage in the curing cabinet for 28 days remove the specimens and allow them to cool to $23 \pm 1.6^{\circ}\text{C}$ ($73.4 \pm 3^{\circ}\text{F}$). Measure for change in length to the nearest 0.001% of the effective gage length.

f. COMPUTATION

f.1. The difference between the length of each specimen immediately after removal from the mold and after 28 days in the curing cabinet shall be determined. The average percent change in lengths of the three specimens shall be computed and reported as the drying shrinkage of the concrete.