



MORTAR AGGREGATE RATIO TEST

International Masonry Institute

The James Brice House
42 East Street
Annapolis, MD 21401
phone 410.280.1305
fax 301.261.2855
toll free 800.803.0295
www.imiweb.org

Masonry Hotline

800.IMI.0988 (800.464.0988)
masonryquestions@imiweb.org

Training Hotline

800.JOBS.IMI (800.562.7464)
training@imiweb.org

Quality control testing of field-mixed mortar can be contentious, particularly if compressive strength testing is specified. The Mortar/Aggregate Ratio Test is a better test.

The Mortar/Aggregate Ratio Test yields results quickly. This helps address issues early on, and pinpoints any needed adjustment on proportions. Since field-sampled mortar testing determines its aggregate-to-cementitious materials ratio and water content, it helps monitor batching procedures.

Mortar Aggregate Ratio Test Tip

The test is usually done by a laboratory technician, but contractors should check if it is conducted properly, and may have to collect some samples. See ASTM C780, Annex A4 for complete procedures.

Mortar and sand samples are gathered at the site by the following method, and sent to the laboratory for testing. Test apparatus include a 1-quart Mason jar or waterproof sandbag for the sand sample; two 1-quart Mason jars for the mortar samples; a stainless steel spoon; and a No. 100 sieve.

1. Before the job site, label one sample jar as "H" and the other as "a." Add 250 ml of isopropyl or methyl alcohol to each jar, then record the combined weight of each. Seal tightly to prevent evaporation.
2. At the job site, place 500 to 700 g of mortar into each jar with the alcohol, tightly reseal and agitate until no lumps are visible. Record the time the mortar was mixed, the time each sample was placed in the alcohol and where on the project the mortar is being installed.
3. Place a representative sample of sand (more than 500 g) into the sample bag or another Mason jar without alcohol.
4. On returning to the lab, measure and record as "I" the combined weight of the mortar sample, alcohol and jar labeled "H." Then, using water, transfer the entire mortar sample to the No. 100 sieve for wet sieving. Wash with a gentle flow of water until the water runs clear, then oven-dry the material remaining in the sieve. Determine and record the oven-dry weight of the +100-mesh fraction and record it as "Y."
5. Weigh the sand sample, then oven-dry and reweigh it in oven-dry condition and record it as "R." Wet-sieve the sand as described above, then oven-dry, weigh and record as "W" the +100-mesh portion.



**International
Masonry Institute**

The James Brice House
42 East Street
Annapolis, MD 21401
phone 410.280.1305
fax 301.261.2855
toll free 800.803.0295
www.imiweb.org

Masonry Hotline

800.IMI.0988 (800.464.0988)
masonryquestions@imiweb.org

Training Hotline

800.JOBS.IMI (800.562.7464)
training@imiweb.org

6. Measure and record as “b” the combined weight of the mortar sample, alcohol, and jar “a.” Then use water to transfer the entire sample to a weighing pan. Ignite the alcohol within the sample, and then bring the partially dried sample to an oven-dry condition. When the sample has attained constant weight, measure and record its oven-dry weight as “d.”
7. Use the recorded values and the formulas in C780 Annex A4 to calculate the mortar water content (wet and dry basis) and the ratio of aggregate to cementitious materials.