

AGGREGATE THIN SECTION

For aggregate petrography (ASTM C 295), the author uses several 50 × 75 mm thin-sections for preparation of coarse and fine aggregates. Following careful washing, oven drying, and sieve analysis of the aggregates, a representative size fraction retained in each sieve is collected by coning and quartering.

At least 150 particles are examined in each sieve. For the size fractions coarser than $\frac{3}{8}$ in., the author uses one or multiple 50 × 70 mm-thin sections, or a large-area (up to 100 × 150 mm. size) thin section per size fraction to include adequate number of grains. For sizes finer than $\frac{3}{8}$ in., one frosted, 50 × 75 mm glass slide is first covered at four sides and partitioned inside into multiple compartments by gluing several small glass or plastic partitions on the glass slide with a rapid setting commercial resin (e.g., superglue).

Alternately, a plastic, compartmented, disposable sample mold with 4 to 6 compartments placed on a silicone grease-coated glass plate (or glued to a frosted glass slide by superglue) can also be used (e.g., plastic fluorescent-light diffuser panels with multiple square chambers described for preparation of clinker and raw feed thin sections by Campbell [15]). Each selected sieve fraction is mixed with enough epoxy to create a thick paste-like consistency and poured into each labeled compartment on the glass slide and then vacuum impregnated. For fine aggregate, one 50 × 70 mm glass slide can hold up to 5 or 6 different sieve sizes with more than enough grains to examine.

A few minutes in a vacuum chamber removes most air bubbles. The epoxy-encapsulated grains are cured either in air, or in an oven, or on a hot plate at 40-50°C. The hardened sample is then thin-sectioned according to the steps described in thin sectioning.

The hardened sample is first sectioned down to 300 to 500- μ m in a precision saw and then reduced to the final thickness by precision grinding. The frosted glass slide on which the epoxy-mixed grains were poured can be used to make the final thin-section.

The method is similar to grain thin section preparation, which is also recommended by ASTM C 295 for examining particles finer than No. 50 (300- μ m) sieve.