



TECHNICAL COMMUNICATIONS

Sieving vs Settling

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ABSTRACT

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Various studies (1977 and later) have shown that sieving, when properly done, is superior to settling tube work. Specific differences in results were listed by Bergmann (1982).



The comparison of sieve and settling tube sand-size data, by DE LANGE *et al.* (1997), is a welcome addition to the scientific literature. It should help to reinforce the findings of COLEMAN AND ENTSMINGER (1977) and BERGMANN (1982, 1983) (also see TANNER, 1995).

Coleman and Entsminger chose not to follow up on their initial research. Bergmann's work, which was by far the more detailed, included a three-way comparison of sand grain size measurements: Sieving, settling tube (rapid settling analyzer) and measurement under the microscope. For the latter work, Bergmann took those grains which appeared on certain sieves and which were not reported in the settling tube work, and put them under a microscope for additional measurements. The uniform result of his many experiments: the sieves were *by far* the more accurate. In the light of that investigation, it is no longer permissible to say, "Well, the two procedures give different results, but one does not know which is the better." One *should* know which is better.

The reason for the superiority of the sieving method appears to be largely that the settling tube adds a further hydrodynamic treatment in the laboratory, which clearly is not wanted, and the sieves do not do this (TANNER, 1983).

The following points have been summarized from the abstract of Bergmann's M.S. thesis:

- (1) The settling tube perceives fine sizes as being coarser than they really are.
- (2) The settling tube fails to detect certain tails in the distributions.
- (3) The settling tube produces numerically smaller standard deviations than the sieves (the latter are correct).
- (4) The settling tube is not capable of detecting small but important differences in the skewness and kurtosis.

All of this does not mean that the sieving procedure cannot be misused. A survey of the literature (SOCCI AND TANNER, 1980) showed that many requirements for getting good results are commonly ignored, perhaps because many of the pertinent papers were not published in widely-circulated journals. There is also the "sticky grain" problem, which is at least conceptually troublesome; this was addressed by BALSILLIE *et al.* (1997).

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