



## Book review

***Ettringite—the sometimes host of destruction*; B. Erlin (Ed.); American Concrete Institute, SP-177, 1999; 265 pp., tables, figures**

The worst thing about new books is that they keep us from reading the old ones (J. Joubert)

This recent ACI Special Publication comprises 16 papers based on presentations at a special *Delayed Ettringite Formation* (DEF) Session at the Spring 1997 Convention of ACI International in Seattle. They represent the work of academic, industrial, and governmental researchers, as well as some concrete users and consultants.

Several papers representing serious “DEF” research are included in the volume. Of particular interest are quality data on the effects on this internal sulfate attack form of cement sulfate content (Kelham, Klemm, and Miller, and others) and temperature (e.g., Scrivener and Lewis), as well as on mechanical behavior of mortar and concrete produced under adverse curing conditions (e.g., Lawrence, Hobbs). The presented data, together with other recently published works (e.g., published in the latest ASTM’s Cement, Concrete, Aggregate), tend to confirm both the close relationship of the “new” (?) DEF phenomenon to the classical mechanisms of internal sulfate attack, and the complexity of this mechanisms with respect to materials properties and the conditions of concrete processing and use. The presented data support the conclusion that the initiation and ultimate level of expansion, if any, caused by “delayed” ettringite, is

controlled by the rate of hydration reactions during concrete processing. This reaction rate is, in turn, controlled by the total heat input during processing, cement fineness, and reactivity, and the conditions of concrete use (e.g., temperature and humidity changes).

It is unfortunate that a certain number of the presented papers are not truly original, as the data were published earlier by the same authors in somewhat different forms. The interpretation of some of the data presented appears to be incorrect, or not supported by adequate experimental evidence. This is the result of an inadequate use of existing knowledge of the physical chemistry of cement hydration and deterioration, and limited all-around evaluation of the possible damage mechanisms. The inept general use of the term “DEF” does not help either.

Ideally, one would expect the quality of the papers to be controlled by the organizers of the meeting, the volume editors, and by the peer review process. This is, unfortunately, not the case with the ACI International SP-177 volume, which is a collection of papers ranking from excellent to poor. However, it is to the credit of the reviewers and of the Editor, that they did not publish all the work presented at the session in Seattle.

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