

Introduction to Symposium on Internal Sulfate Attack on Cementitious Systems

During the past decade, isolated instances of concrete deterioration by crack formation and ettringite infilling of those cracks have raised concerns about the possibility of internal sulfate attack in cement-based systems. This has usually been ascribed to re-formation of ettringite after cooling from temperatures at which ettringite is not stable. Published references indicate that there is a complex relationship of this phenomenon to sulfate and alkali levels in the cement and any supplementary cementitious material, and to potential alkali silica reactions, the curing temperature, prior distress, and other factors related to the composition and exposure.

There is significant disagreement over whether the voluminous ettringite formation frequently seen is necessarily causative or whether, in at least some cases, it occurs as a simple infilling of cracks caused by other destructive phenomena. This symposium had as its primary focus the implications of this phenomenon for

materials standards needs. It is important that members of the ASTM committees responsible for cement and concrete standards understand the scientific basis of this deterioration, in order to judge whether revisions or additions to current standards are necessary and, if so, what direction such revisions or additions should take.

This symposium was held in San Diego in conjunction with the 7–12 December 1997 standards development meetings of Committees C-1 and C-9, the symposium sponsors. This issue contains seven of the 16 papers presented at the symposium. Up to four more are expected to be published in the next issue. Due to the controversial nature of this topic, this symposium was well attended and it is hoped that the published papers will help in better understanding internal sulfate attack and possibly lead to changes in standards to prevent its occurrence.