

EDITORIAL

Carbonate Additions to Portland Cement: The Sequel

The issue of allowing 5% carbonate additions to portland cement clinker is back on the table. It was briefly raised at the December meeting of Subcommittee C01.10 and has gone to subcommittee letter ballot. It should lead to some lively discussion at the June meeting, about the time this issue goes to press, as I am sure that there will be some opposition (although I hope its minimal).

It's a concept whose time has come and, if successful, will bring ASTM C 150 cements in line with the cement standards of many other countries including Canada. When this issue was previously raised in the mid-1980's, it was very controversial and went down in defeat, largely due to the concerns raised by voters not being satisfactorily addressed at the time. In fact, I was one of those unsatisfied voters. Paul Kleiger and I subsequently co-chaired the C-1 Symposium in 1988 on the issue (STP 1064). Although planned before the vote, at the time, the symposium seemed somewhat redundant—the issue being effectively dead (until recently).

Since then, substantial performance information and research data has been produced that supports the concept and addresses most, if not all, of the original concerns. Much of this information has been reviewed in the recent PCA Report RP118, "The Use of Limestone in Portland Cement: A State-of-the-Art Review," by R. J. Detwiler and P. D. Tennis. To my knowledge, this report was distributed to every member of Subcommittee C01.10 in January along with a proposal on the exact changes being requested.

In addition to its many technical and energy benefits, intergrinding limestone will reduce the CO₂ greenhouse-gas production, an important issue regardless of the impact if carbon taxes are ever implemented.

The technical benefits of interground limestone are not universal; that is, some cements respond better to limestone additions than others. High tricalcium aluminate cements appear to benefit from



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them most, so even if this change is approved, many Type II and V cements (or some disguised as Type I's) may not end up containing limestone additions for technical reasons. In Canada approximately only half of the portland cement plants incorporate limestone additions, based on technical evaluation. This should not necessarily be a negative, since most companies should have at least some plants that should benefit. However, this issue did affect the voting last time, with some negative votes equating 'pure portland cement' with Mom and apple pie—when in reality, the local competition benefitted more than their cement would have.

The other argument which I recall was from the crushed limestone aggregate suppliers, a few of whom complained that they had to wash limestone crusher dust from their aggregates. To me, this is a non-issue, since regardless of this change, excessive limestone dust will still have to be washed off crushed aggregate to obtain good paste-aggregate bond. Concrete mixers do not effectively remove adhering dust and far more is known now about the importance of obtained good bond for strength and durability of both normal and high performance concretes.

My own previous concerns have been satisfied by the literature and by an additional 15 years of Canadian industry experience (so far, our concrete igloos are standing up well). I now support the 5% carbonate additions change.

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