

9290101 Supplementary Cementitious Materials
COMMENTS FROM INDUSTRY REVIEW

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Comments: (10-16-23)

Testing perspectives: - Proposed concrete/mortar testing requirements are more demanding and will take longer time to get completed compared to current 929 version. This is due to the inclusion of sulfate resistance up to 18 months. Current requirements don't include the sulfate resistance. Is 18 months data critical? Do we have any justification why 18-month data is required? - Chloride content on hardened concrete is a new addition to the testing requirements. As total chloride varies with concrete mix design and constituent materials, it is better to test chloride content of coal ash itself. - 85% strength activity index at 56 days is used (instead of 28 days) in the proposed specifications, which may be beneficial for some harvested coal ash, which is right direction. - Proposed 929-3.2.1 Concrete/mortar testing needs to be more clear what ash type falls under this testing requirement. The proposed section mentioned Class C coal ash for this testing requirement. It is not clear if this applies to only harvested Class C ash or even to unharvested Class C ash (Class C fly ash in old language).

Response: Current requirements do include sulfate resistance, which is being moved from the text under table 929-1 and being inserted into the table. Yes, the 18-month data is critical. The Department's extremely aggressive environmental category covers both the S2 and S3 sulfate exposure categories from ACI 318, which includes an 18-month limit. The provision still exists, in 929-3.2.1 for source acceptance at 6 months, pending the later age readings.

The chloride content requirement in Table 929-1 has been removed from the proposed revision.

Based on previous comments, the 56-day SAI testing requirement has been removed.

The concrete/mortar durability testing applies to Class C Coal Ash, whether it is fresh from utility or harvested. This durability testing was extended to also cover Calcined Clay (929-5.2) and Ground Glass (929-6.2) in previous 929 versions, and both of those sections contain references to Table 929-1. This revision cycle, the durability testing has also been extended to cover the new Natural Pozzolan section (929-7).

Action: The chloride content requirement in Table 929-1 has been deleted.

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Comments: (11-8-23)

The following comments are collected from Ash Grove Cement. Supplementary data supporting these comments will be provided soon. • Bottom ash is the residue from combustion process of coal that is fused into heavy particles that drop out of the furnace gas stream. Unground bottom ash particles are coarser than fly ash, Ground bottom ash could have particles equal or finer than fly ash, meeting the requirements of ASTM C618 Class F or Class C coal ash, and this Section. o Note that in many cases, landfilled coal ash is a comingled ash containing both fly ash and bottom ash. Allowing harvested coal ash should have included bottom ash sources o It is logical to require ground bottom ash to perform similarly to Class F ash, however, for all other pozzolans (calcined clay, ground glass, natural pozzolan) to act similarly as Class F ash, when this material is diminishing, won't help with the supply issue. The acceptance testing only allows small adjustment to the baseline concrete mix containing Class F ash. This will make new pozzolans difficult to be accepted.

Response: Bottom ash - The proposed specification has been clarified to allow the acceptance of coal ash sources containing bottom ash on a case-by-case basis.
Coal ash benchmark - For “other pozzolans,” the specification allows any SCM quantity adjustments to the test mix sufficient to produce properties comparable to those of the control mixes containing 18-22% coal ash.

Action: Bottom ash - The proposed specification has been clarified to allow the acceptance of coal ash sources containing bottom ash on a case-by-case basis.
Coal ash benchmark - No change needed.
