

Establishing Performance Criteria for an ASTM XRF Standard Test Method For Portland Cements

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The use of X-ray fluorescence analysis of hydraulic cements is commonplace today, yet the qualification criteria in ASTM C 114 have their roots in wet chemistry. While these wet chemistry techniques remain, the widespread use of X-ray fluorescence has resulted in a task group effort of the Compositional Analysis Subcommittee toward developing a standard test method specifically for X-ray analysis. The task group decided to follow the qualification approach used in ASTM C 114, where the analyst is required to demonstrate their analytical protocol is able to meet performance criteria for that test method.

To establish the precision of the test method and performance criteria, an inter-laboratory study was initiated. The precision of a measurement is an assessment of the variability one may expect when one or more reasonably competent laboratories apply the test method. Each participant will perform X-ray fluorescence analyses on a set of six cements comprising two ordinary portland cements, two portland cements with limestone, and two hydraulic cements blended with slag. Both fused glass and pressed powder sample preparations are being used by the participants, allowing a comparison of their respective performance. While still in progress, the methodology behind precision calculations will be presented along with tentative data compiled to evaluate within- and between-laboratory precision, establish qualification criteria, and to compare to the current C 114 qualification criteria.