

NBS Standard Reference Material

633 - 639

Portland Cements

(INTERIM SUMMARY REPORT)

The following table gives the proposed interim changes (February 1975) to the Certificate of Analysis for the Portland Cement SRM's. Final report from the Portland Cement Association due by July 1, 1975.

SRM No.	633	634	635	636	637	638	639
CAP COLOR	RED	GOLD	BLUE	YELLOW	PINK	GREEN	CLEAR
Constituent	Percent by Weight						
Al ₂ O ₃	3.7 ₄ 3.79	5.2 *	6.2 *	3.1 3.06	3.3 *	4.5 4.46	4.3 4.30
CaO	64.5 64.47	62.6 *	59.8 *	63.5 63.49	66.0 *	62.1 *	65.8 *
MgO	1.0 ₄ *	3.4 3.33	1.2 ₅ *	4.0 3.98	0.7 ₂ 0.68	3.8 ₄ 3.86	1.2 ₉ 1.28
TiO ₂	0.24 ✓	0.30 ✓	0.32 ✓	0.17 ✓	.21 ✓	0.25 ✓	0.31 ✓
SiO ₂	21.9 21.88	20.7 20.73	18.5 18.41	23.2 23.22	23.1 23.07	21.4 21.48	21.6 21.61
SO ₃	2.1 ₈ 2.20	2.1 ₆ 2.21	7.0 7.07	2.3 2.31	2.3 ₃ 2.38	2.3 2.35	2.4 2.48
P ₂ O ₅	0.24 ✓	0.10 ✓	0.17 ✓	0.09 ✓	0.25 ✓	0.06 ✓	0.08 ✓
Mn ₂ O ₃	.04 ✓	.28 ✓	.09 ✓	.12 ✓	.06 ✓	.05 ✓	.08 ✓
K ₂ O	.16 ₅ *	.43 ✓	.45 ✓	.57 ✓	.24 ₅ *	.59 ✓	.05 ✓
Na ₂ O	.6 ₁ *	.14 ✓	.07 ✓	.10 ✓	.13 ✓	.12 ✓	.6 ₅ *
SiO	.31 ✓	.12 ✓	-.22 .21	.04 ✓	-.10 .09	.07 ✓	.15 ✓
Fe ₂ O ₃	4.2 *	2.8 ₇ 2.85	2.6 ₅ 2.62	1.6 ₂ 1.61	1.8 ₀ 1.80	3.5 ₈ *	2.4 ₂ 2.40
ZnO	< 0.01 ✓	0.02 ✓	0.01 ✓	0.03 ✓	0.01 ✓	0.09 ✓	0.01 ✓
B	< .01 ✓	< .01 ✓	ND ⁺ ✓	ND ✓	ND ✓	< .01 ✓	ND ✓
F	.08 ✓	.07 ✓	.03 ✓	.05 ✓	.04 ✓	.04 ✓	.02 ✓
Ign. loss	.7 ₅ ✓	1.6 ₁ ✓	3.2 ₅ ✓	1.1 ₆ ✓	1.6 ₈ ✓	.9 ₅ ✓	1.0 ✓

— Definitive analyses program by PCA complete (✓ indicates no change from original certification.)

* Further work under way.

+ Not detected.

The value listed for a constituent is the present best estimate of the "true" value based on the results of the analytical program. The value listed is not expected to deviate from the "true" value by more than + 1 in the last significant figure reported; for a subscript figure, the deviation is not expected to be more than + 5. Based on the results of homogeneity testing, maximum variations within and among samples are estimated to be less than the uncertainty figures given above.

February, 1975

R. E. Michaelis, Chief Coordinator
Office of Standard Reference Materials

INTERIM REPORT
"DEFINITIVE ANALYSES" PROGRAM FOR SEVEN NEW NBS CEMENTS
SRM's 633 THROUGH 639

The Portland Cement Association has a vital interest in providing the cement industry with the means for controlling the quality of the more than 400 million barrels of cement produced and sold annually in the United States. Quality control can be assured only by the availability of reliable, accurate methods of analysis and SRM's. This necessarily involves the close interaction of PCA, NBS, and ASTM.

For the original preliminary certification of SRM's 633 through 639, dated June 11, 1973, eighteen sets of data were provided by the laboratories participating in the analytical program for certification. The values certified were determined by critical evaluations of the analytical methods and the reported data. More than 3,000 individual determinations were made for the constituents contained in the seven cement SRM's. The certificate was stated as being "Preliminary" because additional analytical work was planned to improve the accuracy of some of the listed values. This improved accuracy is required to satisfy new and more rigid precision and accuracy specifications included in ASTM methods of analysis.

A proposal for the "Definitive Analyses" program on the NBS cement SRM's was received from the Portland Cement Association in October, 1973, and the contract was consummated in January, 1974.

Although not complete, an Interim Summary Report is issued at this time and is attached. The "Definitive Analyses" program is scheduled for completion by July 1, 1975, following which final certification of the Portland Cement SRM's will be made. In addition, it is planned to prepare a 260 Series Special Publication covering the characterization of these SRM's.

February, 1975

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