

July , 2023

Japan Cement Association

● 102P : Reference Material for Fineness Analysis
(Ordinary Portland Cement)

	Analytical value (cm ² /g)
Reference Value	3230
Standard Deviation	17

● 211T : Reference Material for Chemical Analysis
(Portland Cement)

Constituent	Percent by Weight (%)
Ignition loss (ig. loss)	2.66
Insoluble residue (insol.)	0.16
SiO ₂	20.47
Al ₂ O ₃	5.59
Fe ₂ O ₃	3.08
CaO	64.15
MgO	0.76
SO ₃	1.97
Na ₂ O	0.17
K ₂ O	0.38
TiO ₂	0.30
P ₂ O ₅	0.15
MnO	0.06
Cl	0.015

● 301T : Reference Material for Heat of Hydration
(Moderate Heat Portland Cement)

Heat of solution of dry cement		2447.0 (J/g)
Heat of hydration	7 days	261.3 (J/g)
	28 days	321.0 (J/g)

● 601B : Cement Reference Materials for X-ray Fluorescence Analysis

(mass %)

Constituent Sample No.	SiO ₂	Al ₂ O ₃	Fe ₂ O ₃	CaO	MgO	SO ₃	Na ₂ O	K ₂ O	TiO ₂	P ₂ O ₅	MnO	SrO (Information value)
No.1	17.61	5.10	2.37	59.07	1.31	9.83	0.809	1.191	0.282	1.479	0.404	(0.38)
No.2	20.75	5.98	2.90	65.23	1.37	2.34	0.272	0.370	0.299	0.119	0.097	(0.06)
No.3	19.11	4.45	2.37	63.18	2.36	5.97	0.373	0.696	0.222	0.758	0.050	(0.19)
No.4	20.36	5.23	2.77	66.63	0.87	2.70	0.166	0.281	0.333	0.198	0.090	(0.04)
No.5	24.41	3.28	3.37	64.96	1.02	1.79	0.199	0.355	0.189	0.111	0.058	(0.03)
No.6	23.18	3.87	4.13	64.15	0.83	2.20	0.223	0.413	0.201	0.126	0.105	(0.03)
No.7	26.27	2.82	3.14	63.36	0.80	2.57	0.153	0.398	0.164	0.096	0.037	(0.03)
No.8	26.61	2.73	3.05	63.49	0.59	2.48	0.186	0.304	0.143	0.169	0.104	(0.02)
No.9	24.53	7.94	2.07	58.91	2.49	-	0.328	0.320	0.370	0.110	0.081	(0.05)
No.10	26.50	9.47	1.83	54.60	3.22	-	0.239	0.342	0.379	0.154	0.148	(0.05)
No.11	26.11	8.89	1.98	55.64	2.96	-	0.311	0.337	0.399	0.283	0.181	(0.06)
No.12	24.75	8.75	2.14	55.78	3.13	-	0.189	0.319	1.035	0.085	0.620	(0.04)
No.13	28.61	11.03	1.10	50.51	4.20	-	0.348	0.291	0.449	0.055	0.112	(0.05)
No.14	35.03	16.05	0.24	35.85	10.21	-	0.274	0.188	0.435	0.011	0.115	(0.05)
No.15	14.87	2.07	7.01	75.62	0.01	0.02	0.030	0.000	0.004	0.003	0.002	(0.02)

NOTE : The reference values express mass % on the basis of ignited (950°C) sample.

Unit size of each sample: each 20g for No.1 to No.14 and 30g for No.1

● 401L : Reference Material for Strength Test
(Ordinary Portland Cement)

	Compressive Strength (N/mm ²)		
	3 days	7 days	28 days
Certificate Value	30.2	42.9	59.0
Standard Deviation	0.74	1.08	1.29

● 701C : Reference Material for Sieving Method
(Ordinary Portland Cement)

	45 μ m	32 μ m	20 μ m	16 μ m	10 μ m
Certificate Value	10.2	22.1	42.6	51.8	69.9
Standard Deviation	0.24	0.38	0.24	0.36	0.69

● JCA-RM-611 : Reference Material for X-ray Fluorescence Analysis

Constituents	Reference values (mass%)
SiO ₂	21.84
Al ₂ O ₃	5.41
Fe ₂ O ₃	3.20
CaO	66.25
MgO	1.08
SO ₃	0.25
Na ₂ O	0.40
K ₂ O	0.34
TiO ₂	0.30
P ₂ O ₅	0.59
MnO	0.06
SrO	0.28

● JCA-RM-613 : Reference Material for X-ray Fluorescence Analysis

Constituents	Reference values (mass%)
SiO ₂	19.51
Al ₂ O ₃	5.36
Fe ₂ O ₃	2.78
CaO	63.00
MgO	1.07
SO ₃	6.07
Na ₂ O	0.23
K ₂ O	1.20
TiO ₂	0.35
P ₂ O ₅	0.15
MnO	0.08
SrO	0.15

● 621A : Reference Material for X-ray Fluorescence Analysis (for Chlorine)
(Portland Cement)

Reference value for Fused Glass Beads Method (mass%)				
	No.1	No.2	No.3	No.4
Cl	0.0026	0.0193	0.0346	0.0486
Reference value for Powder Briquette Method (mass%)				
	No.1	No.2	No.3	No.4
Cl	0.0026	0.0188	0.0344	0.0478
Apparent ignition loss	0.57	2.71	0.71	1.65

● 631A : Reference Material for X-ray Fluorescence Analysis (for Chlorine)
(Blast-Furnace Slag Cement Type B)

(mass%)				
	No.1	No.2	No.3	No.4
Cl	0.0055	0.0158	0.0350	0.0478
Apparent ignition loss	1.49	0.82	0.89	1.18

● JCA-CRM-2 : Certified Reference Material

(Portland Blast furnace Slag Cement)

Constituents	Certified Values (mass%)
SiO ₂	25.66 ± 0.07
Al ₂ O ₃	8.94 ± 0.04
Fe ₂ O ₃	2.08 ± 0.03
CaO	56.33 ± 0.10
MgO	3.05 ± 0.03
Na ₂ O	0.24 ± 0.01
K ₂ O	0.31 ± 0.02
TiO ₂	0.50 ± 0.01
P ₂ O ₅	0.07 ± 0.01
MnO	0.15 ± 0.01
SrO	0.07 ± 0.01

● JCA-CRM-3 : Certified Reference Material

(Ordinary Portland Cement)

Constituents	Certified Values (mass%)
SiO ₂	20.63 ± 0.11
Al ₂ O ₃	5.42 ± 0.04
Fe ₂ O ₃	3.32 ± 0.03
CaO	65.55 ± 0.19
MgO	1.40 ± 0.02
SO ₃	2.05 ± 0.07
Na ₂ O	0.27 ± 0.01
K ₂ O	0.42 ± 0.03
TiO ₂	0.33 ± 0.02
P ₂ O ₅	0.33 ± 0.00
MnO	0.06 ± 0.00
SrO	0.05 ± 0.00

● Standard sand for the strength test of cement
(JIS R 5201 – 1997)

Particle size distribution of JIS Standard sand

Square mesh size (mm)	Cumulative sieve residue (%)
2	0
1.6	7 ± 5
1	33 ± 5
0.5	67 ± 5
0.16	87 ± 5
0.08	99 ± 1

Moisture content of JIS standard sand

Less than 0.2%

Reference : Chemical analysis (CAJS I-12-1981)

Chemical composition (%)							
Ig.loss	SiO ₂	Al ₂ O ₃	Fe ₂ O ₃	CaO	MgO	Na ₂ O	K ₂ O
0.0	98.4	0.40	0.40	0.20	0.00	0.01	0.01

● JCA-CRM-Cl-1 : Certified Reference Material for X-ray Fluorescence Analysis (for Chlorine) (Portland Cement)

Certified value for Fused Glass Beads Method (mass%)	
Cl	0.0304 ± 0.0003
Reference value for Powder Briquette Method (mass%)	
Cl	0.0301 ± 0.0004
Apparent ignition loss	0.86 ± 0.03

● JCA-CRM-Cl-2 : Certified Reference Material for X-ray Fluorescence Analysis (for Chlorine)
(Blast-Furnace Slag Cement Type B)

(mass%)

Cl	0.0301 ± 0.0002
Apparent ignition loss	1.15 ± 0.05