

Cement Circular

Issue No. : 2/2024

Date : 10-May-2024

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Test results for the following cementitious materials

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* The names of brands/ manufacturers are based on the information provided by the suppliers.

Also named as "China Resources Cement 華潤水泥" in Cement Circular Issue No. 4/2015 and before.

For cementitious materials not included in the Cement Circular, ER may request PWCL to carry out test.

The above test results were uploaded to CEDD's web-site of <https://www.cedd.gov.hk/eng/public-services-forms/geotechnical/laboratory-testing/public-works-laboratories/index.html>

Should you have any questions regarding this Circular, please contact PTO/Lab2, Mr. H.L.Li, at telephone number 2305 1275, or submit your questions in writing to the Public Works Central Laboratory Building, 2B Cheung Yip Street, Kowloon Bay, Kowloon, Hong Kong (Attn: PTO/Lab2).

Laboratory Reference	2300027	2300046	2300061	2300091	2300118	2400001, 2400002	2400029, 2400030	BS EN 197-1:2000/2011 Strength Class 52.5N Specification
Date of Sample Received	10/03/2023	03/05/2023	10/07/2023	11/09/2023	03/11/2023	03/01/2024	01/03/2024	
Country of Origin Stated By Client	Japan	Japan	Japan	Japan	Japan	Japan	Japan	
Physical Properties								
Density (kg/m ³)	3150	3150	3150	3150	3140	3140	3140	Not specified
Fineness : Specific surface (cm ² /g)	3290	3270	3230	3200	3470	3450	3580	Not specified
Consistence : Standard consistence (%)	27.5	27.0	27.0	27.0	27.5	27.5	27.5	Not specified
Setting Time : Initial setting time (min)	150	155	155	150	165	170	185	Min.45 min
	Final setting time (min)	210	210	210	210	225	240	Not specified
Soundness (Le Chatelier) : Expansion (mm)	0.0	0.0	0.0	0.0	0.5	0.5	0.5	Max.10 mm
Compressive Strength (broken mortar prism) :								
Average 2 days strength (MPa)	25.4	24.7	24.0	26.4	27.0	26.2	26.3	Min. 20 MPa
Average 28 days strength (MPa)	62.2	60.4	62.2	68.0	65.8	66.8	67.1	Min. 52.5 MPa
Flexural Strength (mortar prism) :								
Average 2 days strength (MPa)	4.7	4.8	4.9	5.3	5.1	5.6	5.1	Not specified
Average 28 days strength (MPa)	8.8	8.6	8.6	8.6	8.7	8.4	9.2	Not specified
Chemical Composition								
Observed Mass Loss-on-ignition (%)	2.6	2.6	2.4	2.5	2.0	2.8	2.2	Max. 5.0%
Insoluble Residue (%)	<0.5	<0.5	<0.5	0.8	0.6	<0.5	<0.5	Max. 5.0%
Sulphate Content, expressed as SO ₃ (%)	1.8	2.0	1.7	1.9	1.9	1.9	1.7	Max. 4.0%
Chloride Content (%)	0.02	0.03	0.02	0.02	0.01	0.03	0.02	Max. 0.10%
K ₂ O (%)	0.41	0.40	0.40	0.40	0.35	0.39	0.41	---
Na ₂ O (%)	0.23	0.22	0.20	0.20	0.25	0.27	0.26	---
Total Alkali (Na ₂ O Eq.) (%)	0.49	0.49	0.47	0.46	0.48	0.53	0.53	---

2 Champion (一品牌水泥) / Taiwan Cement Corporation
(Portland Cement, Strength Class 52.5N)

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Laboratory Reference	2300028	2300047	2300062	2300092	2300119	2400003, 2400004	2400031, 2400032	BS EN 197-1:2000/2011 Strength Class 52.5N Specification
Date of Sample Received	10/03/2023	03/05/2023	10/07/2023	11/09/2023	03/11/2023	03/01/2024	01/03/2024	
Country of Origin Stated By Client	Taiwan, China	Taiwan, China	Taiwan, China	Taiwan, China	Taiwan, China	Taiwan, China	Taiwan, China	
Physical Properties								
Density (kg/m ³)	3140	3120	3120	3100	3110	3100	3090	Not specified
Fineness : Specific surface (cm ² /g)	3520	3530	3210	3160	3530	3550	3900	Not specified
Consistence : Standard consistence (%)	27.5	27.0	27.0	27.5	27.5	27.5	28.0	Not specified
Setting Time : Initial setting time (min)	180	175	160	190	170	180	150	Min.45 min
	Final setting time (min)	255	225	210	240	225	225	Not specified
Soundness (Le Chatelier) : Expansion (mm)	0.5	0.0	0.0	0.5	0.5	0.5	0.5	Max.10 mm
Compressive Strength (broken mortar prism) :								
Average 2 days strength (MPa)	25.1	30.9	27.7	31.2	27.6	29.6	32.2	Min. 20 MPa
Average 28 days strength (MPa)	56.3	58.7	66.1	65.3	62.6	58.8	62.0	Min. 52.5 MPa
Flexural Strength (mortar prism) :								
Average 2 days strength (MPa)	4.6	5.2	5.0	5.3	4.7	5.2	5.3	Not specified
Average 28 days strength (MPa)	8.5	7.8	7.6	8.4	8.1	8.5	8.8	Not specified
Chemical Composition								
Observed Mass Loss-on-ignition (%)	2.1	3.0	2.9	3.0	3.1	3.2	2.9	Max. 5.0%
Insoluble Residue (%)	<0.5	0.8	0.9	1.4	1.2	0.7	0.7	Max. 5.0%
Sulphate Content, expressed as SO ₃ (%)	2.3	2.6	2.5	2.7	2.5	2.7	2.5	Max. 4.0%
Chloride Content (%)	<0.01	0.05	0.05	0.05	0.05	0.03	0.05	Max. 0.10%
K ₂ O (%)	0.53	0.71	0.69	0.68	0.65	0.78	0.83	---
Na ₂ O (%)	0.31	0.16	<0.1	<0.1	0.15	0.16	0.11	---
Total Alkali (Na ₂ O Eq.) (%)	0.66	0.62	0.55	0.53	0.58	0.68	0.66	---

3 Feng Jiang (峰江牌水泥) / 佛山市高明高力發水泥有限公司
(Portland Cement, Strength Class 52.5N)

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Laboratory Reference	2300030	2300049	2300063	2300093	2300120	2400005, 2400006	2400033, 2400034	BS EN 197-1:2000/2011 Strength Class 52.5N Specification
Date of Sample Received	10/03/2023	03/05/2023	10/07/2023	11/09/2023	03/11/2023	03/01/2024	01/03/2024	
Country of Origin Stated By Client	China	China	China	China	China	China	China	
Physical Properties								
Density (kg/m ³)	3130	3130	3120	3100	3090	3120	3130	Not specified
Fineness : Specific surface (cm ² /g)	3580	3570	3410	3320	3780	3700	3790	Not specified
Consistence : Standard consistence (%)	27.0	27.0	27.0	27.0	27.5	27.5	27.0	Not specified
Setting Time : Initial setting time (min)	155	160	160	175	190	170	160	Min.45 min
	Final setting time (min)	210	210	210	240	225	210	Not specified
Soundness (Le Chatelier) : Expansion (mm)	0.5	0.5	0.0	0.0	0.0	0.0	0.0	Max.10 mm
Compressive Strength (broken mortar prism) :								
Average 2 days strength (MPa)	26.2	26.0	23.1	26.3	24.2	29.1	26.0	Min. 20 MPa
Average 28 days strength (MPa)	57.9	58.2	59.9	62.2	64.2	58.8	61.5	Min. 52.5 MPa
Flexural Strength (mortar prism) :								
Average 2 days strength (MPa)	5.2	5.0	4.7	4.6	5.2	5.9	4.4	Not specified
Average 28 days strength (MPa)	7.4	7.3	7.6	7.6	8.2	7.8	9.1	Not specified
Chemical Composition								
Observed Mass Loss-on-ignition (%)	1.7	1.8	2.8	2.7	3.5	1.8	1.5	Max. 5.0%
Insoluble Residue (%)	<0.5	0.5	0.7	2.2	1.1	0.7	<0.5	Max. 5.0%
Sulphate Content, expressed as SO ₃ (%)	2.2	2.1	1.7	1.4	1.7	1.7	1.3	Max. 4.0%
Chloride Content (%)	0.03	0.04	0.03	0.04	0.04	0.05	0.04	Max. 0.10%
K ₂ O (%)	0.59	0.60	0.56	0.56	0.45	0.55	0.44	---
Na ₂ O (%)	<0.1	<0.1	<0.1	<0.1	<0.1	0.13	0.12	---
Total Alkali (Na ₂ O Eq.) (%)	0.47	0.48	0.44	0.41	0.38	0.49	0.41	---

Laboratory Reference	2300031	2300050	2300065	2300095	2300121	2400007, 2400008	2400035, 2400036	BS EN 197-1:2000/2011 Strength Class 52.5N Specification
Date of Sample Received	10/03/2023	03/05/2023	10/07/2023	11/09/2023	03/11/2023	03/01/2024	01/03/2024	
Country of Origin Stated By Client	Hong Kong SAR, China	Hong Kong SAR, China	Hong Kong SAR, China	Hong Kong SAR, China	Hong Kong SAR, China	Hong Kong SAR, China	Hong Kong SAR, China	
Physical Properties								
Density (kg/m ³)	3110	3130	3110	3090	3080	3100	3110	Not specified
Fineness : Specific surface (cm ² /g)	3030	3020	3280	3520	3840	3780	3660	Not specified
Consistence : Standard consistence (%)	26.0	27.0	28.0	28.0	28.0	27.0	28.0	Not specified
Setting Time : Initial setting time (min)	115	125	115	125	130	130	140	Min.45 min
Final setting time (min)	165	165	165	165	165	165	165	Not specified
Soundness (Le Chatelier) : Expansion (mm)	0.5	0.0	0.0	0.5	0.0	0.5	1.0	Max.10 mm
Compressive Strength (broken mortar prism) :								
Average 2 days strength (MPa)	23.5	24.3	20.8	26.8	21.8	22.8	24.7	Min. 20 MPa
Average 28 days strength (MPa)	60.0	60.8	61.5	57.4	60.8	62.5	60.7	Min. 52.5 MPa
Flexural Strength (mortar prism) :								
Average 2 days strength (MPa)	4.3	4.5	4.2	4.9	4.4	4.8	4.4	Not specified
Average 28 days strength (MPa)	8.5	8.0	7.6	9.1	8.4	8.2	7.8	Not specified
Chemical Composition								
Observed Mass Loss-on-ignition (%)	2.9	2.5	2.5	2.7	3.2	2.8	2.9	Max. 5.0%
Insoluble Residue (%)	<0.5	0.7	<0.5	1.2	1.8	1.2	0.7	Max. 5.0%
Sulphate Content, expressed as SO ₃ (%)	2.7	2.3	1.9	2.7	2.2	2.3	2.3	Max. 4.0%
Chloride Content (%)	0.01	0.02	<0.01	<0.01	<0.01	<0.01	0.01	Max. 0.10%
K ₂ O (%)	0.65	0.74	0.70	0.66	0.63	0.65	0.72	---
Na ₂ O (%)	<0.1	0.15	<0.1	<0.1	<0.1	0.11	0.10	---
Total Alkali (Na ₂ O Eq.) (%)	0.50	0.63	0.52	0.44	0.51	0.54	0.58	---

Laboratory Reference	2300032	2300051	2300064	2300094	2300122	2400009, 2400010	2400037, 2400038	BS EN 197-1:2000/2011 Strength Class 52.5N Specification
Date of Sample Received	10/03/2023	03/05/2023	10/07/2023	11/09/2023	03/11/2023	03/01/2024	01/03/2024	
Country of Origin Stated By Client	Japan	Japan	Japan	Japan	Japan	Japan	Japan	
Physical Properties								
Density (kg/m ³)	3150	3120	3160	3150	3150	3150	3150	Not specified
Fineness : Specific surface (cm ² /g)	3230	3270	3230	3260	3570	3550	3350	Not specified
Consistence : Standard consistence (%)	26.5	27.0	26.5	27.0	27.0	26.5	26.0	Not specified
Setting Time : Initial setting time (min)	130	155	120	145	165	160	155	Min.45 min
Final setting time (min)	180	195	180	225	225	210	210	Not specified
Soundness (Le Chatelier) : Expansion (mm)	0.0	1.0	0.0	0.5	0.5	0.0	0.5	Max.10 mm
Compressive Strength (broken mortar prism) :								
Average 2 days strength (MPa)	23.1	26.2	22.2	25.3	26.0	25.6	22.7	Min. 20 MPa
Average 28 days strength (MPa)	61.0	63.0	62.2	61.5	61.9	60.8	60.9	Min. 52.5 MPa
Flexural Strength (mortar prism) :								
Average 2 days strength (MPa)	4.4	5.1	4.5	4.8	5.5	4.8	4.3	Not specified
Average 28 days strength (MPa)	8.3	8.6	8.3	8.3	9.0	8.7	8.9	Not specified
Chemical Composition								
Observed Mass Loss-on-ignition (%)	2.4	3.1	2.4	2.6	3.0	3.0	2.9	Max. 5.0%
Insoluble Residue (%)	<0.5	<0.5	<0.5	0.9	0.7	<0.5	<0.5	Max. 5.0%
Sulphate Content, expressed as SO ₃ (%)	1.8	2.2	1.5	1.9	2.0	2.0	1.9	Max. 4.0%
Chloride Content (%)	0.03	0.03	0.03	0.03	0.02	0.03	0.02	Max. 0.10%
K ₂ O (%)	0.44	0.45	0.44	0.38	0.41	0.41	0.41	---
Na ₂ O (%)	0.25	0.24	0.21	0.20	0.25	0.29	0.24	---
Total Alkali (Na ₂ O Eq.) (%)	0.54	0.54	0.49	0.45	0.52	0.56	0.51	---

Laboratory Reference	2300034	2300053	2300066	2300096	2300123	2400011, 2400012	2400039, 2400040	BS EN 197-1:2000/2011 Strength Class 52.5N Specification
Date of Sample Received	10/03/2023	03/05/2023	10/07/2023	11/09/2023	03/11/2023	03/01/2024	01/03/2024	
Country of Origin Stated By Client	China	China	China	China	China	China	China	
Physical Properties								
Density (kg/m ³)	3150	3120	3150	3150	3150	3160	3160	Not specified
Fineness : Specific surface (cm ² /g)	3750	3800	3770	3550	3880	3870	3990	Not specified
Consistence : Standard consistence (%)	27.5	25.5	26.0	25.5	26.0	26.5	26.0	Not specified
Setting Time : Initial setting time (min)	160	165	115	140	130	140	170	Min.45 min
	Final setting time (min)	225	210	165	180	165	180	210
Soundness (Le Chatelier) : Expansion (mm)	0.5	0.0	0.5	0.0	0.5	0.5	1.0	Max.10 mm
Compressive Strength (broken mortar prism) :								
Average 2 days strength (MPa)	32.5	30.0	30.9	31.9	29.5	35.2	30.7	Min. 20 MPa
Average 28 days strength (MPa)	62.1	63.0	55.9	59.5	58.9	61.3	58.2	Min. 52.5 MPa
Flexural Strength (mortar prism) :								
Average 2 days strength (MPa)	5.3	5.6	5.7	5.6	5.4	6.1	5.1	Not specified
Average 28 days strength (MPa)	7.9	8.1	8.6	8.3	8.3	8.4	8.2	Not specified
Chemical Composition								
Observed Mass Loss-on-ignition (%)	2.2	1.9	1.7	1.9	2.1	2.0	1.9	Max. 5.0%
Insoluble Residue (%)	<0.5	0.7	<0.5	1.6	0.9	0.6	<0.5	Max. 5.0%
Sulphate Content, expressed as SO ₃ (%)	2.4	2.7	2.1	2.6	2.8	2.9	2.4	Max. 4.0%
Chloride Content (%)	0.04	0.03	0.04	0.01	0.02	0.02	0.04	Max. 0.10%
K ₂ O (%)	0.60	0.63	0.60	0.59	0.60	0.67	0.64	---
Na ₂ O (%)	<0.1	0.19	<0.1	<0.1	<0.1	0.12	<0.1	---
Total Alkali (Na ₂ O Eq.) (%)	0.45	0.61	0.47	0.42	0.46	0.56	0.48	---

Laboratory Reference	2300035	2300054	2300067	2300097	2300124	2400013, 2400014	2400041, 2400042	BS EN 197-1:2000/2011 Strength Class 52.5N Specification
Date of Sample Received	10/03/2023	03/05/2023	10/07/2023	11/09/2023	03/11/2023	03/01/2024	01/03/2024	
Country of Origin Stated By Client	China	China	China	China	China	China	China	
Physical Properties								
Density (kg/m ³)	3150	3160	3160	3140	3150	3130	3140	Not specified
Fineness : Specific surface (cm ² /g)	3810	3770	3670	3730	4180	4220	4230	Not specified
Consistence : Standard consistence (%)	26.5	27.0	26.0	28.0	27.0	26.0	27.0	Not specified
Setting Time : Initial setting time (min)	150	170	115	160	145	150	150	Min.45 min
	Final setting time (min)	225	210	150	225	195	195	225
Soundness (Le Chatelier) : Expansion (mm)	0.5	0.0	0.0	0.0	1.0	1.0	1.0	Max.10 mm
Compressive Strength (broken mortar prism) :								
Average 2 days strength (MPa)	33.5	28.7	26.7	25.5	26.6	25.9	26.6	Min. 20 MPa
Average 28 days strength (MPa)	64.8	59.0	57.7	57.7	65.6	64.7	65.4	Min. 52.5 MPa
Flexural Strength (mortar prism) :								
Average 2 days strength (MPa)	5.6	5.1	4.7	4.1	4.8	4.4	4.9	Not specified
Average 28 days strength (MPa)	8.4	8.1	8.2	8.6	8.7	8.5	8.8	Not specified
Chemical Composition								
Observed Mass Loss-on-ignition (%)	1.6	1.8	1.3	2.2	1.6	2.8	1.9	Max. 5.0%
Insoluble Residue (%)	<0.5	<0.5	<0.5	1.5	0.6	0.9	<0.5	Max. 5.0%
Sulphate Content, expressed as SO ₃ (%)	2.4	2.5	2.7	2.6	2.4	2.3	2.3	Max. 4.0%
Chloride Content (%)	0.03	0.02	0.03	0.04	0.02	0.03	0.04	Max. 0.10%
K ₂ O (%)	0.56	0.33	0.33	0.40	0.29	0.36	0.31	---
Na ₂ O (%)	<0.1	<0.1	<0.1	<0.1	<0.1	0.15	<0.1	---
Total Alkali (Na ₂ O Eq.) (%)	0.44	0.27	0.31	0.32	0.28	0.38	0.29	---

Laboratory Reference	2300036	2300055	2300071	2300098	2300125	2400015, 2400016	2400043, 2400044	BS3892:Part 1: 1997 Specification
Date of Sample Received	10/03/2023	03/05/2023	10/07/2023	11/09/2023	03/11/2023	03/01/2024	01/03/2024	
Country of Origin Stated By Client	Hong Kong SAR, China	Hong Kong SAR, China	Hong Kong SAR, China	Hong Kong SAR, China	Hong Kong SAR, China	Hong Kong SAR, China	Hong Kong SAR, China	
Physical Properties								
Fineness (%)	8.8	9.6	9.4	9.9	9.7	9.5	9.4	Not more than 12% Not less than 2000 kg/m ³ ^Note (1) ^Note (1) --- Not less than the initial setting time of the Portland cement used Not more than 10 mm
Particle Density (kg/m ³)	2430	2570	2550	2670	2400	2650	2590	
Water Requirement (%)	90	90	90	90	90	90	90	
Strength Factor ---	1.02	1.04	1.03	0.86	0.82	0.92	0.90	
Standard Consistence (%)	25.5	23.5	24.5	24.0	25.0	24.0	24.5	
Initial Setting Time (min)	230	205	145	220	245	250	225	
Soundness (mm)	0.5	0.5	0.5	0.5	0.5	0.5	0.0	
Portland Cement used								
Brand	Champion	Special Green Island	Special Green Island	Champion	Champion	Champion	Champion	---
Lab. Reference No.	2200105	2300033	2300033	2300062	2300062	2300119	2300119	---
Initial Setting Time (min)	190	130	130	160	160	170	170	---
Chemical Composition								
Moisture Content (%)	0.3	0.2	0.2	<0.1	0.3	0.2	0.1	Not more than 0.5%
Loss-on-ignition (%)	0.9	0.7	0.9	<0.5	1.4	0.6	0.6	Not more than 7%
Sulphate Content, expressed as SO ₃ (%)	1.2	1.6	1.3	1.3	1.1	1.2	1.3	Not more than 2.0%
Chloride Content (%)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	Not more than 0.1%
Calcium Oxide Content (%)	9.9	14.0	12.0	16.0	7.3	14.0	14.0	Not more than 10.0%
K ₂ O (%)	1.0	1.4	1.2	1.2	1.1	1.2	1.2	---
Na ₂ O (%)	2.3	2.7	2.5	1.4	1.9	2.0	1.7	---
Total Alkali (Na ₂ O Eq.) (%)	2.9	3.7	3.3	2.2	2.6	2.8	2.5	---

^Note: (1) In accordance with GS16.07(b), the criteria for water requirement and strength factor at 28 days shall not apply, but the values of water requirement and strength factor at 28 days shall be reported.

9 Hung Lee (鴻利牌煤灰) / Dongguan Hung Lee PFA Ltd.
(Pulverised-fuel Ash)

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Laboratory Reference	2300037	2300056	2300072	2300099	2300126	2400017, 2400018	2400045, 2400046	BS3892:Part 1: 1997 Specification
Date of Sample Received	10/03/2023	03/05/2023	10/07/2023	11/09/2023	03/11/2023	03/01/2024	01/03/2024	
Country of Origin Stated By Client	China	China	China	China	China	China	China	
Physical Properties								
Fineness (%)	18.1	12.8	16.9	5.9	16.8	10.1	4.9	Not more than 12%
Particle Density (kg/m ³)	2240	2330	2290	2450	2290	2400	2490	Not less than 2000 kg/m ³
Water Requirement (%)	96	97	95	95	93	93	89	^Note (1)
Strength Factor ---	0.86	0.86	0.87	0.71	0.73	0.86	0.88	^Note (1)
Standard Consistence (%)	28.5	28.5	26.0	27.0	26.0	26.0	26.0	---
Initial Setting Time (min)	260	245	140	295	240	260	260	Not less than the initial setting time of the Portland cement used
Soundness (mm)	0.5	0.0	0.0	0.5	0.0	0.5	0.5	Not more than 10 mm
Portland Cement used								
Brand	Champion	Special Green Island	Special Green Island	Champion	Champion	Champion	Champion	---
Lab. Reference No.	2200105	2300033	2300033	2300062	2300062	2300119	2300119	---
Initial Setting Time (min)	190	130	130	160	160	170	170	---
Chemical Composition								
Moisture Content (%)	0.2	0.2	0.2	0.1	<0.1	<0.1	<0.1	Not more than 0.5%
Loss-on-ignition (%)	1.3	2.1	8.9	1.8	8.2	<0.5	0.7	Not more than 7%
Sulphate Content, expressed as SO ₃ (%)	0.7	0.7	<0.5	0.5	<0.5	<0.5	0.8	Not more than 2.0%
Chloride Content (%)	<0.05	<0.05	<0.05	< 0.05	< 0.05	< 0.05	< 0.05	Not more than 0.1%
Calcium Oxide Content (%)	5.2	4.2	4.4	9.9	2.4	13.0	9.1	Not more than 10.0%
K ₂ O (%)	1.3	1.1	2.9	1.4	3.0	1.4	1.5	---
Na ₂ O (%)	0.9	1.0	0.4	0.8	0.5	1.6	1.0	---
Total Alkali (Na ₂ O Eq.) (%)	1.7	1.8	2.3	1.7	2.5	2.5	2.0	---

^Note: (1) In accordance with GS16.07(b), the criteria for water requirement and strength factor at 28 days shall not apply, but the values of water requirement and strength factor at 28 days shall be reported.

Laboratory Reference	2300038	2300057	2300073	2300100	2300127	2400019, 2400020	2400047, 2400048	BS3892:Part 1: 1997
Date of Sample Received	10/03/2023	03/05/2023	10/07/2023	11/09/2023	03/11/2023	03/01/2024	01/03/2024	
Country of Origin Stated By Client	Hong Kong SAR, China	Hong Kong SAR, China	Hong Kong SAR, China	Hong Kong SAR, China	Hong Kong SAR, China	Hong Kong SAR, China	Hong Kong SAR, China	Specification
Physical Properties								
Fineness (%)	9.7	9.8	10.4	10.3	12.1	9.8	10.6	Not more than 12%
Particle Density (kg/m ³)	2370	2400	2330	2420	2390	2390	2410	Not less than 2000 kg/m ³
Water Requirement (%)	95	98	99	95	95	95	93	^Note (1)
Strength Factor ---	0.91	0.83	0.96	0.74	0.77	0.75	0.77	^Note (1)
Standard Consistence (%)	29.0	28.0	28.5	29.0	29.0	28.5	28.5	---
Initial Setting Time (min)	230	215	140	205	240	250	225	Not less than the initial setting time of the Portland cement used
Soundness (mm)	0.5	0.5	0.5	0.5	0.5	1.0	0.0	Not more than 10 mm
Portland Cement used								
Brand	Champion	Special Green Island	Special Green Island	Champion	Champion	Champion	Champion	---
Lab. Reference No.	2200105	2300033	2300033	2300062	2300062	2300119	2300119	---
Initial Setting Time (min)	190	130	130	160	160	170	170	---
Chemical Composition								
Moisture Content (%)	0.3	0.2	0.4	0.3	0.1	0.1	0.2	Not more than 0.5%
Loss-on-ignition (%)	1.6	1.5	2.7	2.7	2.4	2.0	2.1	Not more than 7%
Sulphate Content, expressed as SO ₃ (%)	0.6	0.6	0.5	0.7	0.7	0.6	0.6	Not more than 2.0%
Chloride Content (%)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	Not more than 0.1%
Calcium Oxide Content (%)	5.2	4.5	4.7	6.8	6.8	5.6	6.6	Not more than 10.0%
K ₂ O (%)	1.3	1.4	0.9	1.1	1.0	1.2	1.2	---
Na ₂ O (%)	0.8	0.9	0.8	0.8	0.9	1.2	1.1	---
Total Alkali (Na ₂ O Eq.) (%)	1.7	1.8	1.4	1.5	1.5	2.1	1.9	---

^Note: (1) In accordance with GS16.07(b), the criteria for water requirement and strength factor at 28 days shall not apply, but the values of water requirement and strength factor at 28 days shall be reported.

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Laboratory Reference	2300039	2300058	2300074	2300101	2300128	2400021, 2400022	2400049, 2400050	BS3892:Part 1: 1997 Specification
Date of Sample Received	10/03/2023	03/05/2023	10/07/2023	11/09/2023	03/11/2023	03/01/2024	01/03/2024	
Country of Origin Stated By Client	China	China	China	China	China	China	China	
Physical Properties								
Fineness (%)	11.7	14.6	13.1	6.9	14.1	11.2	8.0	Not more than 12%
Particle Density (kg/m ³)	2280	2320	2240	2310	2290	2270	2470	Not less than 2000 kg/m ³
Water Requirement (%)	93	94	94	93	94	93	91	^Note (1)
Strength Factor ---	0.90	0.82	0.89	0.77	0.78	0.82	0.86	^Note (1)
Standard Consistence (%)	28.0	25.0	26.5	27.0	28.0	27.0	26.0	---
Initial Setting Time (min)	270	260	160	230	250	240	255	Not less than the initial setting time of the Portland cement used
Soundness (mm)	0.5	0.5	0.0	0.5	0.5	0.5	0.5	Not more than 10 mm
Portland Cement used								
Brand	Champion	Special Green Island	Special Green Island	Champion	Champion	Champion	Champion	---
Lab. Reference No.	2200105	2300033	2300033	2300062	2300062	2300119	2300119	---
Initial Setting Time (min)	190	130	130	160	160	170	170	---
Chemical Composition								
Moisture Content (%)	0.2	0.2	0.2	0.1	0.1	<0.1	<0.1	Not more than 0.5%
Loss-on-ignition (%)	1.4	1.0	1.0	1.2	1.3	<0.5	<0.5	Not more than 7%
Sulphate Content, expressed as SO ₃ (%)	0.7	0.7	0.6	0.6	1.0	<0.5	1.1	Not more than 2.0%
Chloride Content (%)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	Not more than 0.1%
Calcium Oxide Content (%)	8.2	6.1	2.8	6.9	5.8	5.7	10	Not more than 10.0%
K ₂ O (%)	1.2	2.0	1.8	1.4	1.2	1.5	1.3	---
Na ₂ O (%)	0.8	1.4	1.1	1.5	0.8	1.3	0.9	---
Total Alkali (Na ₂ O Eq.) (%)	1.6	2.7	2.3	2.4	1.7	2.3	1.7	---

^Note: (1) In accordance with GS16.07(b), the criteria for water requirement and strength factor at 28 days shall not apply, but the values of water requirement and strength factor at 28 days shall be reported.

Laboratory Reference	2300004	2300005	2300010	2300011	2300012	2400001, 2400002	2400003, 2400004	BS EN 15167-1:2006	
Date of Sample Received	12/04/2023	03/05/2023	10/07/2023	11/09/2023	03/11/2023	03/01/2024	01/03/2024		
Country of Origin Stated By Client	Hong Kong SAR, China	Hong Kong SAR, China	Hong Kong SAR, China	Hong Kong SAR, China	Hong Kong SAR, China	Hong Kong SAR, China	Hong Kong SAR, China	Specification	
Physical Properties									
Standard Consistence (%)	29.5	30.0	30.0	30.0	30.0	30.0	30.0	Not specified ≤ twice of initial setting time for Portland cement used	
Initial Setting Time (min)	165	200	170	155	165	180	165		
Density (kg/m ³)	2860	2840	2870	2880	2860	2880	2870		Not specified
Fineness : Specific surface (m ² /kg)	419	439	415	408	478	472	487		≥ 275 m ² /kg
Activity Index :									
7 days (%)	51	60	55	51	50	60	63	≥ 45 %	
28 days (%)	85	94	88	87	86	83	91	≥ 70 %	
Portland Cement used									
Brand	Special Green Island	Champion	Champion	Special Green Island	Special Green Island	Special Green Island	Special Green Island	---	
Lab. Reference No.	2200084	2300028	2300028	2300065	2300065	2300121	2300121	---	
Initial Setting Time (min)	125	180	180	115	115	130	130	---	
Chemical Composition									
Loss-on-ignition (%)	1.3	1.7	1.5	1.2	1.5	1.2	1.3	≤ 3.0%	
Sulphate Content, expressed as SO ₃ (%)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	≤ 2.5%	
Chloride Content (%)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	≤ 0.10%	
Magnesium Oxide Content (%)	6.8	5.6	6.2	6.1	5.6	5.8	5.6	≤ 18%	
Moisture Content (%)	<0.2	0.2	0.2	<0.2	0.2	<0.2	0.2	≤ 1.0%	
Sulphide Content (%)	<0.7	<0.7	0.7	0.8	<0.7	0.8	0.9	≤ 2.0%	