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

**1 Asano  
(Portland Cement, Strength Class 52.5N)**

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<b>Laboratory Reference</b>	0800114	0800132	0900002	0900022	0900043	0900062	0900079	BSEN197-1:2000
Date Sample Received	23/10/2008	22/12/2008	18/02/2009	22/04/2009	26/06/2009	19/08/2009	21/10/2009	Strength Class 52.5N
Country of Origin Stated By Client	Japan	Japan	Japan	Japan	Japan	Japan	Japan	Specification
<b>Physical Properties</b>								
Density (kg/m <sup>3</sup> )	3140	3150	3150	3160	3160	3160	3120	Not specified
Fineness : Specific surface (cm <sup>2</sup> /g)	3340	3420	3560	3430	3340	3390	3320	Not specified
Consistence : Standard consistence (%)	26.5	27.0	26.5	26.5	26.5	27.0	27.0	Not specified
Setting Time : Initial setting time (min)	195	185	180	165	185	175	170	Min.45 min.
Final setting time (min)	255	255	240	225	255	255	255	Not specified
Soundness (Le Chatelier) : Expansion (mm)	0.0	0.5	0.5	0.5	0.5	0.0	0.5	Max.10 mm
Compressive Strength ( broken mortar prism ) :								
Average 2 days strength (MPa)	23.3	23.6	24.5	23.1	22.5	24.0	24.8	Min. 20 MPa
Average 28 days strength (MPa)	61.8	53.3	65.2	64.3	65.2	64.9	67.9	Min. 52.5 MPa
Flexural Strength ( mortar prism ) :								
Average 2 days strength (MPa)	6.0	4.9	5.2	4.8	4.9	5.1	5.4	Not specified
Average 28 days strength (MPa)	8.8	8.5	9.0	8.5	8.2	8.8	10.0	Not specified
<b>Chemical Composition</b>								
Loss-on-ignition (%)	2.1	2.0	1.8	1.7	1.5	1.7	1.5	Max. 5.0%
Insoluble residue (%)	0.1	0.2	0.2	0.2	0.2	0.2	0.1	Max. 5.0%
Sulphate content (%)	2.2	2.1	2.2	2.2	2.1	2.1	2.1	Max. 4.0%
Chloride content (%)	0.01	0.01	<0.01	0.01	0.01	0.01	<0.01	Max. 0.10%

**2 Champion  
(Portland Cement, Strength Class 52.5N)**

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<b>Laboratory Reference</b>	0800115	0800133	0900003	0900023	0900044	0900063	0900080	BSEN197-1:2000 Strength Class 52.5N Specification
Date Sample Received	23/10/2008	22/12/2008	18/02/2009	22/04/2009	26/06/2009	19/08/2009	21/10/2009	
Country of Origin Stated By Client	Taiwan	Taiwan	Taiwan	Taiwan	Taiwan	Taiwan	Taiwan	
<b>Physical Properties</b>								
Density (kg/m <sup>3</sup> )	3130	3140	3150	3150	3140	3130	3130	Not specified
Fineness : Specific surface (cm <sup>2</sup> /g)	3460	3320	3760	3460	3610	3380	3430	Not specified
Consistence : Standard consistence (%)	26.0	26.0	27.0	26.0	26.5	26.0	26.0	Not specified
Setting Time : Initial setting time (min)	170	150	155	180	150	150	200	Min.45 min.
Final setting time (min)	225	240	210	225	210	240	270	Not specified
Soundness (Le Chatelier) : Expansion (mm)	0.5	0.0	0.5	0.0	0.0	0.5	0.5	Max.10 mm
Compressive Strength ( broken mortar prism ) :								
Average 2 days strength (MPa)	24.0	24.9	30.8	27.1	25.7	21.9	28.4	Min. 20 MPa
Average 28 days strength (MPa)	59.4	63.7	57.9	58.2	60.8	61.5	57.3	Min. 52.5 MPa
Flexural Strength ( mortar prism ) :								
Average 2 days strength (MPa)	4.9	5.1	6.0	5.2	5.4	4.6	5.1	Not specified
Average 28 days strength (MPa)	8.7	9.3	9.2	8.7	8.1	8.7	8.6	Not specified
<b>Chemical Composition</b>								
Loss-on-ignition (%)	1.1	0.9	1.0	0.9	0.9	0.9	1.1	Max. 5.0%
Insoluble residue (%)	2.4	2.2	0.3	1.6	1.0	2.6	0.3	Max. 5.0%
Sulphate content (%)	2.3	2.2	2.7	2.5	2.5	2.2	2.3	Max. 4.0%
Chloride content (%)	<0.01	0.01	<0.01	<0.01	0.01	<0.01	0.01	Max. 0.10%

**3 Emerald  
(Portland Cement, Strength Class 52.5N)**

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<b>Laboratory Reference</b>	0800116	0800134	0900004	0900024	0900045	0900064	0900081	BSEN197-1:2000 Strength Class 52.5N Specification
Date Sample Received	24/10/2008	18/12/2008	20/02/2009	24/04/2009	25/06/2009	20/08/2009	23/10/2009	
Country of Origin Stated By Client	Hong Kong	Hong Kong	Hong Kong	Hong Kong	Hong Kong	Hong Kong	Hong Kong	
<b>Physical Properties</b>								
Density (kg/m <sup>3</sup> )	3160	3140	3040	3130	3130	3110	3100	Not specified
Fineness : Specific surface (cm <sup>2</sup> /g)	3430	3200	3180	3310	3310	3560	3400	Not specified
Consistence : Standard consistence (%)	26.0	26.0	26.0	26.0	26.0	26.0	26.0	Not specified
Setting Time : Initial setting time (min)	135	190	190	205	160	150	180	Min.45 min.
Final setting time (min)	195	255	255	270	255	225	255	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)	20.9	24.3	22.4	22.0	21.3	22.2	23.7	Min. 20 MPa
Average 28 days strength (MPa)	61.3	57.7	59.0	58.6	56.5	60.8	61.9	Min. 52.5 MPa
Flexural Strength ( mortar prism ) :								
Average 2 days strength (MPa)	4.7	5.0	5.0	4.5	4.4	4.7	4.8	Not specified
Average 28 days strength (MPa)	8.7	8.7	8.9	8.5	8.3	8.6	8.6	Not specified
<b>Chemical Composition</b>								
Loss-on-ignition (%)	0.8	0.8	1.3	1.2	1.1	1.4	0.8	Max. 5.0%
Insoluble residue (%)	2.1	2.9	3.2	2.7	1.5	3.0	2.7	Max. 5.0%
Sulphate content (%)	2.3	2.3	2.3	2.4	2.3	2.3	2.3	Max. 4.0%
Chloride content (%)	<0.01	0.01	0.01	<0.01	0.01	<0.01	<0.01	Max. 0.10%

**4 Feng Jiang  
(Portland Cement, Strength Class 42.5R)**

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Laboratory Reference	0800117	0800135	0900005	0900025	0900046	0900065	0900082	BSEN197-1:2000
Date Sample Received	24/10/2008	22/12/2008	20/02/2009	24/04/2009	25/06/2009	20/08/2009	23/10/2009	Strength Class 42.5R
Country of Origin Stated By Client	China	China	China	China	China	China	China	Specification
<b>Physical Properties</b>								
Density (kg/m <sup>3</sup> )	3080	3090	3100	3000	3110	3070	3100	Not specified
Fineness : Specific surface (cm <sup>2</sup> /g)	3650	3520	3690	3710	3640	3630	3670	Not specified
Consistence : Standard consistence (%)	26.0	26.5	26.5	28.0	24.5	26.0	25.0	Not specified
Setting Time : Initial setting time (min)	200	195	300	250	160	185	195	Min.60 min.
Final setting time (min)	255	255	420	375	225	285	285	Not specified
Soundness (Le Chatelier) : Expansion (mm)	1.0	1.0	0.0	0.5	0.0	0.5	0.5	Max.10 mm
Compressive Strength ( broken mortar prism ) :								
Average 2 days strength (MPa)	23.4	23.5	23.7	25.6	22.0	20.7	28.7	Min. 20 MPa
Average 28 days strength (MPa)	50.5	51.4	51.2	51.1	52.9	50.3	60.6	Min. 42.5 MPa, Max. 62.5 MPa
Flexural Strength ( mortar prism ) :								
Average 2 days strength (MPa)	4.9	4.5	5.1	5.1	4.5	4.2	5.5	Not specified
Average 28 days strength (MPa)	7.8	8.0	8.1	7.5	7.7	7.9	8.8	Not specified
<b>Chemical Composition</b>								
Loss-on-ignition (%)	3.4	3.2	3.4	4.0	3.1	3.6	2.6	Max. 5.0%
Insoluble residue (%)	4.8	4.8	8.9	10.8	0.5	6.7	0.7	Max. 5.0%
Sulphate content (%)	2.6	2.8	2.5	2.5	3.2	2.3	2.8	Max. 4.0%
Chloride content (%)	<0.01	0.01	<0.01	0.01	0.01	<0.01	0.01	Max. 0.10%

**5 Gold Carp  
(Portland Cement, Strength Class 52.5N)**

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<b>Laboratory Reference</b>	0800071	0800092	0800118	0800136	0900006	0900026	0900047	BSEN197-1:2000
Date Sample Received	19/06/2008	18/08/2008	22/10/2008	15/12/2008	17/02/2009	23/04/2009	22/06/2009	Strength Class 52.5N
Country of Origin Stated By Client	Macau	Macau	Macau	Macau	Macau	Macau	Macau	Specification
<b>Physical Properties</b>								
Density (kg/m <sup>3</sup> )	3150	3150	3140	3130	3160	3150	3170	Not specified
Fineness : Specific surface (cm <sup>2</sup> /g)	3420	3330	3400	3290	3500	3320	3380	Not specified
Consistence : Standard consistence (%)	26.5	26.5	26.5	26.5	26.5	26.5	26.5	Not specified
Setting Time : Initial setting time (min)	155	175	190	195	180	185	190	Min.45 min.
Final setting time (min)	270	255	240	270	255	270	285	Not specified
Soundness (Le Chatelier) : Expansion (mm)	0.5	0.5	0.5	0.5	0.5	0.0	0.5	Max.10 mm
Compressive Strength ( broken mortar prism ) :								
Average 2 days strength (MPa)	22.7	20.2	22.1	21.1	23.3	22.3	22.9	Min. 20 MPa
Average 28 days strength (MPa)	64.5	61.5	65.8	61.7	66.3	62.2	63.3	Min. 52.5 MPa
Flexural Strength ( mortar prism ) :								
Average 2 days strength (MPa)	5.2	4.6	5.0	4.7	5.4	4.8	5.0	Not specified
Average 28 days strength (MPa)	9.6	9.4	8.5	9.6	8.8	8.4	8.1	Not specified
<b>Chemical Composition</b>								
Loss-on-ignition (%)	1.6	1.5	2.2	2.1	1.7	1.9	2.0	Max. 5.0%
Insoluble residue (%)	0.1	0.1	0.1	0.3	0.2	0.2	0.2	Max. 5.0%
Sulphate content (%)	2.0	2.0	2.1	2.1	2.1	2.1	2.1	Max. 4.0%
Chloride content (%)	<0.01	0.01	<0.01	0.01	<0.01	0.01	0.01	Max. 0.10%

Note : No new test data was provided in this cement circular because no sample was received from supplier.



**7 Onoda  
(Portland Cement, Strength Class 52.5N)**

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<b>Laboratory Reference</b>	0800120	0800138	0900008	0900028	0900049	0900067	0900084	BSEN197-1:2000 Strength Class 52.5N Specification
Date Sample Received	22/10/2008	15/12/2008	17/02/2009	23/04/2009	22/06/2009	25/08/2009	20/10/2009	
Country of Origin Stated By Client	Japan	Japan	Japan	Japan	Japan	Japan	Japan	
<b>Physical Properties</b>								
Density (kg/m <sup>3</sup> )	3130	3150	3150	3130	3150	3140	3100	Not specified
Fineness : Specific surface (cm <sup>2</sup> /g)	3450	3380	3360	3370	3430	3390	3430	Not specified
Consistence : Standard consistence (%)	27.0	27.0	27.0	27.0	27.0	27.0	27.0	Not specified
Setting Time : Initial setting time (min)	145	185	185	135	180	190	150	Min.45 min.
	Final setting time (min)	195	255	270	210	285	270	210
Soundness (Le Chatelier) : Expansion (mm)	0.0	0.0	0.0	0.5	0.0	0.5	0.5	Max.10 mm
Compressive Strength ( broken mortar prism ) :								
Average 2 days strength (MPa)	26.6	22.4	22.4	26.1	22.3	25.2	23.1	Min. 20 MPa
Average 28 days strength (MPa)	61.0	60.5	63.4	55.4	64.9	60.5	61.9	Min. 52.5 MPa
Flexural Strength ( mortar prism ) :								
Average 2 days strength (MPa)	5.3	4.9	5.0	5.6	4.7	5.0	5.4	Not specified
Average 28 days strength (MPa)	8.7	8.5	8.5	9.2	8.4	7.9	8.4	Not specified
<b>Chemical Composition</b>								
Loss-on-ignition (%)	2.3	2.0	1.7	2.1	1.5	2.1	1.8	Max. 5.0%
Insoluble residue (%)	0.1	0.3	0.2	0.2	0.2	0.1	<0.1	Max. 5.0%
Sulphate content (%)	2.0	2.1	2.1	2.0	2.2	2.0	1.8	Max. 4.0%
Chloride content (%)	0.01	0.01	<0.01	0.02	0.01	0.02	0.01	Max. 0.10%

**8 Skyscraper  
(Portland Cement, Strength Class 52.5N)**

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<b>Laboratory Reference</b>	0800121	0800139	0900009	0900029	0900050	0900068	0900085	BSEN197-1:2000 Strength Class 52.5N Specification
Date Sample Received	22/10/2008	15/12/2008	17/02/2009	23/04/2009	22/06/2009	25/08/2009	20/10/2009	
Country of Origin Stated By Client	Taiwan	Taiwan	Taiwan	Taiwan	Taiwan	Taiwan	Taiwan	
<b>Physical Properties</b>								
Density (kg/m <sup>3</sup> )	3010	3140	3120	3140	3130	3130	3100	Not specified
Fineness : Specific surface (cm <sup>2</sup> /g)	#	3220	3240	3330	3280	3220	3360	Not specified
Consistence : Standard consistence (%)	30.0	26.5	26.0	26.0	26.0	26.0	26.0	Not specified
Setting Time : Initial setting time (min)	205	160	155	200	155	140	140	Min.45 min.
	Final setting time (min)	270	240	210	255	210	210	Not specified
Soundness (Le Chatelier) : Expansion (mm)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	Max.10 mm
Compressive Strength ( broken mortar prism ) :								
Average 2 days strength (MPa)	23.9	24.1	22.8	23.5	22.7	20.1	23.3	Min. 20 MPa
Average 28 days strength (MPa)	52.9	58.7	61.5	57.3	59.8	59.6	61.0	Min. 52.5 MPa
Flexural Strength ( mortar prism ) :								
Average 2 days strength (MPa)	4.9	5.1	4.9	4.8	4.8	4.3	5.2	Not specified
Average 28 days strength (MPa)	8.2	8.7	8.7	8.7	8.4	8.4	8.0	Not specified
<b>Chemical Composition</b>								
Loss-on-ignition (%)	3.5	0.7	0.8	0.8	0.7	0.7	0.8	Max. 5.0%
Insoluble residue (%)	3.0	2.8	3.2	2.9	2.1	2.7	2.9	Max. 5.0%
Sulphate content (%)	3.1	2.3	2.3	2.3	2.4	2.1	2.3	Max. 4.0%
Chloride content (%)	0.01	0.01	0.01	<0.01	<0.01	<0.01	<0.01	Max. 0.10%

Remark : # The fineness of cement cannot be determined because it was proved difficult to form into a compacted bed of prosrity e=0.500 by this method

**9 Special Green Island  
(Portland Cement, Strength Class 52.5N)**

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<b>Laboratory Reference</b>	0800122	0800140	0900010	0900030	0900051	0900069	0900086	BSEN197-1:2000
Date Sample Received	24/10/2008	18/12/2008	20/02/2009	24/04/2009	25/06/2009	20/08/2009	23/10/2009	Strength Class 52.5N
Country of Origin Stated By Client	Hong Kong	Hong Kong	Hong Kong	Hong Kong	Hong Kong	Hong Kong	Hong Kong	Specification
<b>Physical Properties</b>								
Density (kg/m <sup>3</sup> )	3150	3140	3120	3130	3140	3130	3100	Not specified
Fineness : Specific surface (cm <sup>2</sup> /g)	3440	3240	3340	3320	3330	3210	3390	Not specified
Consistence : Standard consistence (%)	26.0	26.5	26.5	26.0	26.0	26.0	26.0	Not specified
Setting Time : Initial setting time (min)	160	185	200	210	180	180	165	Min.45 min.
Final setting time (min)	240	270	270	270	255	240	210	Not specified
Soundness (Le Chatelier) : Expansion (mm)	0.5	0.0	0.5	0.5	0.5	1.0	0.5	Max.10 mm
Compressive Strength ( broken mortar prism ) :								
Average 2 days strength (MPa)	22.0	23.9	23.4	25.3	22.0	23.2	23.8	Min. 20 MPa
Average 28 days strength (MPa)	62.8	59.2	60.7	58.9	58.6	61.3	62.8	Min. 52.5 MPa
Flexural Strength ( mortar prism ) :								
Average 2 days strength (MPa)	4.9	4.8	5.0	5.0	4.3	4.9	4.7	Not specified
Average 28 days strength (MPa)	8.8	8.7	8.8	8.6	8.0	8.3	8.6	Not specified
<b>Chemical Composition</b>								
Loss-on-ignition (%)	0.8	0.8	0.9	1.0	0.9	1.1	0.8	Max. 5.0%
Insoluble residue (%)	2.0	2.9	3.0	2.6	1.6	2.9	2.9	Max. 5.0%
Sulphate content (%)	2.2	2.4	2.3	2.4	2.2	2.0	2.3	Max. 4.0%
Chloride content (%)	<0.01	0.01	0.01	<0.01	0.01	<0.01	<0.01	Max. 0.10%

**10 Yu Feng  
(Portland Cement, Strength Class 42.5R)**

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<b>Laboratory Reference</b>	0800010	0800032	0800057	0800076	0800097	0900011	0900031	BSEN197-1:2000
Date Sample Received	27/12/2007	19/02/2008	21/04/2008	19/06/2008	18/08/2008	17/02/2009	23/04/2009	Strength Class 42.5R
Country of Origin Stated By Client	China	China	China	China	China	China	China	Specification
<b>Physical Properties</b>								
Density (kg/m <sup>3</sup> )	3130	3110	3110	3110	3120	3110	3080	Not specified
Fineness : Specific surface (cm <sup>2</sup> /g)	3420	3320	3390	3340	3500	3390	3200	Not specified
Consistence : Standard consistence (%)	23.5	23.5	23.5	23.0	23.0	23.5	24.0	Not specified
Setting Time : Initial setting time (min)	235	195	210	195	175	205	265	Min.60 min.
Final setting time (min)	330	285	240	270	210	285	375	Not specified
Soundness (Le Chatelier) : Expansion (mm)	0.5	0.5	0.5	0.0	0.5	0.5	0.5	Max.10 mm
Compressive Strength ( broken mortar prism ) :								
Average 2 days strength (MPa)	20.1	20.4	27.7	23.1	24.9	23.9	18.4	Min. 20 MPa
Average 28 days strength (MPa)	48.3	48.5	55.9	49.4	52.1	58.4	52.5	Min. 42.5 MPa, Max. 62.5MPa
Flexural Strength ( mortar prism ) :								
Average 2 days strength (MPa)	5.0	3.9	5.6	5.1	5.6	5.2	4.1	Not specified
Average 28 days strength (MPa)	8.6	8.1	8.7	8.5	9.3	8.6	7.8	Not specified
<b>Chemical Composition</b>								
Loss-on-ignition (%)	2.4	2.6	2.6	2.9	2.9	2.9	3.7	Max. 5.0%
Insoluble residue (%)	0.4	0.4	0.3	0.3	0.4	0.5	0.5	Max. 5.0%
Sulphate content (%)	2.5	2.4	2.5	2.3	2.6	2.3	2.3	Max. 4.0%
Chloride content (%)	0.01	0.01	<0.01	0.01	<0.01	<0.01	0.01	Max. 0.10%

Note : No new test data was provided in this cement circular because no sample was received from supplier.



Laboratory Reference	0800126	0800143	0900014	0900034	0900054	0900072	0900089	BS3892:Part 1: 1997 Specification
Date Sample Received	24/10/2008	18/12/2008	20/02/2009	24/04/2009	25/06/2009	20/08/2009	23/10/2009	
Country of Origin Stated By Client	Hong Kong	Hong Kong	Hong Kong	Hong Kong	Hong Kong	Hong Kong	Hong Kong	
<b>Physical Properties</b>								
Fineness (%)	6.1	6.0	7.0	7.4	7.8	7.5	5.1	Not more than 12% Not less than 2000 kg/m <sup>3</sup> Not greater than 95% of the PC used alone Min. 0.8 --- Not less than than the initial setting time of the PC Not more than 10 mm
Particle Density (kg/m <sup>3</sup> )	2620	2670	2720	2560	2500	2560	2650	
Water Requirement (%)	93	92	92	92	93	93	92	
Strength Factor	0.87	0.86	0.84	0.99	0.84	0.82	0.95	
Standard Consistency (%)	24.0	24.5	24.5	25.5	25.5	23.5	24.0	
Initial Setting Time (min)	240	280	240	235	225	255	245	
Soundness (mm)	0.5	0.0	0.0	0.5	0.5	0.0	0.0	
<b>Cement used</b>								
Brand	Emerald	Golden Eagle	Golden Eagle	Champion	Champion	Champion	Champion	
Lab. Reference. No.	0800090	0800119	0800119	0900003	09000023	09000063	09000080	
<b>Chemical Composition</b>								
Moisture Content (%)	0.1	0.1	0.1	0.1	0.1	<0.1	0.1	Not more than 0.5%
Loss-on-ignition (%)	1.0	1.4	1.3	1.5	3.7	1.2	1.1	Not more than 7%
Sulphate content (%)	0.9	0.5	0.8	0.8	0.8	1.4	1.1	Not more than 2.0%
Chloride content (%)	0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	Not more than 0.1%
Calcium Oxide content (%)	11.9	6.3	12.3	8.6	7.8	10.2	11.6	Not more than 10.0%
K <sub>2</sub> O (%)	1.47	1.17	1.26	---	---	---	1.42	---
Na <sub>2</sub> O (%)	1.05	0.57	0.45	---	---	---	1.56	---
Total Alkali ( Na <sub>2</sub> O Eq.) (%)	2.02	1.34	1.28	---	---	---	2.49	---

**13 Hung Lee  
(Pulverised-fuel Ash)**

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<b>Laboratory Reference</b>	0800128	0800145	0900016	0900036	0900056	0900074	0900091	BS3892:Part 1: 1997 Specification
Date Sample Received	24/10/2008	18/12/2008	20/02/2009	24/04/2009	25/06/2009	20/08/2009	23/10/2009	
Country of Origin Stated By Client	China	China	China	China	China	China	China	
<b>Physical Properties</b>								
Fineness (%)	6.9	7.9	7.3	8.1	4.2	5.8	5.2	Not more than 12% Not less than 2000 kg/m <sup>3</sup> Not greater than 95% of the PC used alone Min. 0.8 --- Not less than the initial setting time of the PC Not more than 10 mm
Particle Density (kg/m <sup>3</sup> )	2340	2390	2400	2350	2460	2410	2370	
Water Requirement (%)	96	94	94	95	92	91	93	
Strength Factor	0.82	0.79	0.79	0.98	0.85	0.83	0.88	
Standard Consistency (%)	27.0	27.0	26.0	28.0	25.0	24.5	27.0	
Initial Setting Time (min)	200	265	225	265	235	215	250	
Soundness (mm)	0.0	0.0	0.5	0.0	0.0	0.5	0.5	
<b>Cement used</b>								
Brand	Emerald	Golden Eagle	Golden Eagle	Champion	Champion	Champion	Champion	
Lab. Reference. No.	0800090	0800119	0800119	0900003	0900023	09000063	09000080	
<b>Chemical Composition</b>								
Moisture Content (%)	0.1	0.1	0.1	0.1	0.1	<0.1	0.1	Not more than 0.5%
Loss-on-ignition (%)	1.1	1.0	1.3	1.6	1.7	0.9	1.8	Not more than 7%
Sulphate content (%)	0.8	0.9	0.8	0.9	0.8	0.6	0.7	Not more than 2.0%
Chloride content (%)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	Not more than 0.1%
Calcium Oxide content (%)	5.3	4.5	4.5	5.9	3.7	5.8	5.3	Not more than 10.0%
K <sub>2</sub> O (%)	0.98	1.03	1.37	---	---	---	1.13	---
Na <sub>2</sub> O (%)	0.59	0.85	1.46	---	---	---	1.40	---
Total Alkali ( Na <sub>2</sub> O Eq.) (%)	1.23	1.52	2.36	---	---	---	2.14	---

**14 Green Island  
(Pulverised-fuel Ash)**

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Laboratory Reference	0800127	0800144	0900015	0900035	0900055	0900073	0900090	BS3892:Part 1: 1997 Specification
Date Sample Received	23/10/2008	22/12/2008	18/02/2009	22/04/2009	26/06/2009	25/08/2009	21/10/2009	
Country of Origin Stated By Client	Hong Kong	Hong Kong	Hong Kong	Hong Kong	Hong Kong	Hong Kong	Hong Kong	
<b>Physical Properties</b>								
Fineness (%)	6.6	8.2	7.7	10.2	6.9	6.2	6.7	Not more than 12% Not less than 2000 kg/m <sup>3</sup> Not greater than 95% of the PC used alone Min. 0.8 --- Not less than than the initial setting time of the PC Not more than 10 mm
Particle Density (kg/m <sup>3</sup> )	2380	2390	2390	2360	2420	2480	2390	
Water Requirement (%)	99	99	97	100	93	94	97	
Strength Factor	0.83	0.75	0.77	0.81	0.84	0.80	0.81	
Standard Consistency (%)	28.5	28.0	26.5	29.0	26.5	26.0	26.5	
Initial Setting Time (min)	205	235	230	215	250	230	240	
Soundness (mm)	0.0	0.0	0.0	0.5	0.0	0.5	0.0	
<b>Cement used</b>								
Brand	Emerald	Golden Eagle	Golden Eagle	Champion	Champion	Champion	Champion	
Lab. Reference. No.	0800090	0800119	0800119	0900003	0900023	09000063	09000080	
<b>Chemical Composition</b>								
Moisture Content (%)	0.1	0.1	0.1	0.1	0.1	0.1	<0.1	Not more than 0.5%
Loss-on-ignition (%)	1.1	1.2	1.0	2.9	2.2	2.1	2.0	Not more than 7%
Sulphate content (%)	0.7	0.7	0.6	0.6	0.7	0.7	0.6	Not more than 2.0%
Chloride content (%)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	Not more than 0.1%
Calcium Oxide content (%)	4.5	5.0	4.5	5.1	6.2	6.9	5.3	Not more than 10.0%
K <sub>2</sub> O (%)	1.02	0.99	1.18	---	---	---	1.13	---
Na <sub>2</sub> O (%)	0.68	1.02	1.64	---	---	---	1.09	---
Total Alkali ( Na <sub>2</sub> O Eq.) (%)	1.35	1.68	2.41	---	---	---	1.84	---

**15 Redland  
(Pulverised-fuel Ash)**

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<b>Laboratory Reference</b>	0800129	0800146	0900017	0900037	0900057	0900075	0900092	BS3892:Part 1: 1997 Specification
Date Sample Received	22/10/2008	15/12/2008	17/02/2009	23/04/2009	22/06/2009	25/08/2009	20/10/2009	
Country of Origin Stated By Client	China	China	China	China	China	China	China	
<b>Physical Properties</b>								
Fineness (%)	8.0	10.5	7.2	8.9	8.7	7.0	6.0	Not more than 12% Not less than 2000 kg/m <sup>3</sup> Not greater than 95% of the PC used alone Min. 0.8 --- Not less than the initial setting time of the PC Not more than 10 mm
Particle Density (kg/m <sup>3</sup> )	2380	2290	2320	2370	2360	2340	2390	
Water Requirement (%)	96	95	95	96	93	91	93	
Strength Factor	0.81	0.77	0.80	0.89	0.83	0.83	0.85	
Standard Consistency (%)	26.5	27.0	27.0	27.0	26.0	25.5	25.5	
Initial Setting Time (min)	220	230	245	240	250	220	240	
Soundness (mm)	0.5	0.5	0.0	0.0	0.0	0.0	0.0	
<b>Cement used</b>								
Brand	Emerald	Golden Eagle	Golden Eagle	Champion	Champion	Champion	Champion	
Lab. Reference. No.	0800090	0800119	0800119	0900003	0900023	09000063	09000080	
<b>Chemical Composition</b>								
Moisture Content (%)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	Not more than 0.5%
Loss-on-ignition (%)	1.4	0.6	0.9	1.6	2.0	1.1	1.4	Not more than 7%
Sulphate content (%)	0.7	1.4	0.7	0.8	0.7	0.6	0.6	Not more than 2.0%
Chloride content (%)	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	Not more than 0.1%
Calcium Oxide content (%)	4.6	13.0	6.4	4.5	6.7	3.7	5.7	Not more than 10.0%
K <sub>2</sub> O (%)	1.11	1.55	1.23	---	---	---	1.43	---
Na <sub>2</sub> O (%)	0.58	2.38	0.65	---	---	---	1.21	---
Total Alkali ( Na <sub>2</sub> O Eq.) (%)	1.31	3.40	1.46	---	---	---	2.15	---

