



Material Testing Laboratory
Faculty of Engineering
Chulalongkorn University

Laboratory Test of FERROCEM 500 GP

SPT-39/58



Laboratory Test
of
FERROCEM 500 GP

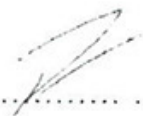
For

Ferro Construction Products Company Limited

Material Testing Laboratory
Department of Civil Engineering
Faculty of Engineering
Chulalongkorn University

Tested by:.....^{พิชชา จ}.....

(Dr. Pitcha Jongvivatsakul)

.....


(Assoc. Prof. Dr. Tirawat Boonyatee)

On Behalf of Head of Civil Engineering Department



Test Product

FERROCEM 500 GP

Mix Proportion

Water-Cement ratio = 0.15

Test Standards

Type of Test	Test Standard
Compressive Strength of Hydraulic Cement Mortars	ASTM C 109
Time of Setting of Hydraulic Cement by Vicat Needle	ASTM C 191
Change in Height at Early Ages of Cylindrical Specimens of Cementitious Mixtures	ASTM C 1090
Test Method for Flow of Grout for Preplaced-Aggregate Concrete (Flow Cone Method)	ASTM C 939



Type of test: Compressive Strength of Hydraulic Cement Mortars

Specimens from: Ferro Construction Products Company Limited

Test product: FERROCEM 500 GP

Mix proportion: W/C = 0.15

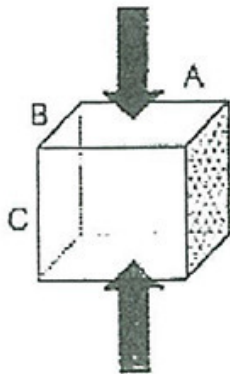
Mixing procedure: As shown in Appendix

Specimen description: 50 mm cubes of FERROCEM 500 GP

Age : 12 hours

Test results:

Dimension (mm)			Weight (g)	Date		Age (hr)	Maximum Crushing Load (kg)	Maximum Crushing Strength (ksc)
A	B	C		Cast	Tested			
51.1	51.0	50.9	290.1	24/7/58	24/7/58	12	10,479	402
50.0	50.5	50.9	280.8	24/7/58	24/7/58	12	4,298	170
50.9	50.1	51.1	282.5	24/7/58	24/7/58	12	7,808	306
Average							7,528.3	293





Type of test: Compressive Strength of Hydraulic Cement Mortars

Specimens from: Ferro Construction Products Company Limited

Test product: FERROCEM 500 GP

Mix proportion: W/C = 0.15

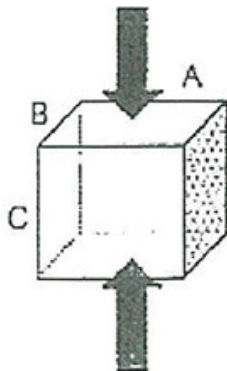
Mixing procedure: As shown in Appendix

Specimen description: 50 mm cubes of FERROCEM 500 GP

Age : 1 day

Test results:

Dimension (mm)			Weight (g)	Date		Age (day)	Maximum Crushing Load (kg)	Maximum Crushing Strength (ksc)
A	B	C		Cast	Tested			
50.0	51.7	51.0	306.9	9/6/58	10/6/58	1	10400.0	402.3
50.4	51.5	51.1	306.0	9/6/58	10/6/58	1	9100.0	350.6
50.1	51.5	51.4	295.0	9/6/58	10/6/58	1	11500.0	445.7
Average							12533.3	399.5





Type of test: Compressive Strength of Hydraulic Cement Mortars

Specimens from: Ferro Construction Products Company Limited

Test product: FERROCEM 500 GP

Mix proportion: W/C = 0.15

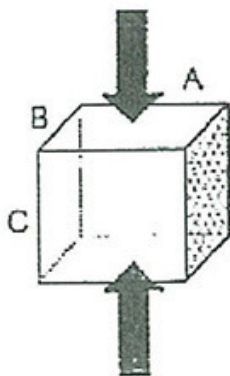
Mixing procedure: As shown in Appendix

Specimen description: 50 mm cubes of FERROCEM 500 GP

Age : 14 days.

Test results:

Dimension (mm)			Weight (g)	Date		Age (day)	Maximum Crushing Load (kg)	Maximum Crushing Strength (ksc)
A	B	C		Cast	Tested			
51.1	52.4	49.8	281.9	9/6/58	23/6/58	14	13100.0	489.2
51.4	51.9	49.9	282.9	9/6/58	23/6/58	14	14600.0	547.3
51.6	52.0	50.0	283.3	9/6/58	23/6/58	14	13900.0	518.0
Average							13866.7	518.2





Type of test: Compressive Strength of Hydraulic Cement Mortars

Specimens from: Ferro Construction Products Company Limited

Test product: FERROCEM 500 GP

Mix proportion: W/C = 0.15

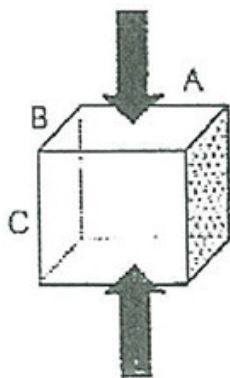
Mixing procedure: As shown in Appendix

Specimen description: 50 mm cubes of FERROCEM 500 GP

Age : 28 days.

Test results:

Dimension (mm)			Weight (g)	Date		Age (day)	Maximum Crushing Load (kg)	Maximum Crushing Strength (ksc)
A	B	C		Cast	Tested			
51.2	51.6	51.6	301.7	9/6/58	7/7/58	28	16700.0	632.1
50.7	49.8	50.1	288.7	9/6/58	7/7/58	28	15700.0	621.8
49.5	51.5	50.0	281.2	9/6/58	7/7/58	28	15800.0	619.8
Average							16066.7	624.6





Type of test: Time of Setting of Hydraulic Cement by Vicat Needle

Specimens from: Ferro Construction Products Company Limited

Test product: FERROCEM 500 GP

Mix proportion: W/C = 0.15

Test procedure: The non-shrink mix was prepared following the procedures recommended by the manufacture as shown in Appendix. After the completion of mixing, apply the paste to the mold under the Vicat apparatus. The specimens were placed without being disturbed for 30 min after molding. Determine the penetration of the 1-mm needle in 30 sec after being released every 15 min until a penetration of 25 mm or less was obtained. No penetration test was made closer than 1/4" (6.4 mm) from any previous penetration or 3/8" (9.5 mm) from the inside of the mold. The time when a penetration of 25 mm was obtained was an initial setting time. The final setting time was when the needle did not sink visibly into the paste.



Test results:

Time of Measurement	Elapsed Time (min)	Penetration (mm)
10:00	0 (Mixing)	40
10:30	30	40
10:45	45	40
11:00	60	40
11:15	75	40
11:30	90	40
11:45	105	40
12:00	120	40
12:15	135	40
12:30	150	40
12:45	165	40
13:00	180	40
13:15	195	40
13:30	210	36
13:45	225	35
14:00	240	33
14:15	255	29
14:30	270	26
14:45	285	23
15:00	300	20
15:15	315	16.5
15:30	330	14
15:45	345	12
16:00	360	7
16:15	375	4
16:30	390	1
16:45	405	0
Initial Setting Time (min)		275
Final Setting Time (min)		405



Type of test: Change in Height at Early Ages of Cylindrical Specimens of Cementitious Mixtures

Specimens from: Ferro Construction Products Company Limited

Test product: FERROCEM 500 GP

Mix proportion: W/C = 0.15

Test procedure: The non-shrink mix was prepared following the procedures recommended by the manufacturer as shown in Appendix . After the completion of mixing, introduce the non-shrink into cylindrical of a 50 by 100 mm. A glass plate of 40 mm diameter and 4 mm thickness was placed on top of specimen. An initial measurement was made to the surface of the glass plate using a deformation gage.

Test results:

Date	Elapsed Time (days)	Expansion (%)	Shrinkage (%)	Remark(s)
9/6/2558	1	0.001	-	
12/6/2558	3	0.007	-	
16/6/2558	14	0.009	-	
7/7/2558	28	0.008	-	End of test



Type of test: Test Method for Flow of Grout for Preplace-Aggregate Concrete (Flow Cone Method)

Specimens from: Ferro Construction Products Company Limited

Test product: FERROCEM 500 GP

Mix proportion: W/C = 0.15

Test procedure: The non-shrink mix was prepared following the procedures recommended by the manufacturer as shown in Appendix. After mixing introduce the non-shrink into funnel until full and start the stop watch. Stop the watch at the first break in the continuous flow of grout from the discharge tube.

Test results:

Date of Measurement	Elapsed Time (min)	Funnel Flow Time (sec)
9/6/2558	0	10:45:58



This report is issued under the following conditions:

This report applies to the specimen of the specific product given at the time of its testing. The results are not used to indicate or imply that they are applicable to other similar items. In addition, such results must not be used to indicate or imply that Chulalongkorn University approves, recommends or endorses the manufacturer, supplier or user of such product, or that Chulalongkorn University in any way “guarantees” the later performance of the product.

The specimen/s mentioned in this report is/are submitted/supplied/manufactured by the client. Chulalongkorn University therefore assumes no responsibility for the accuracy of information on the brand name, model number, origin of manufacture, consignment or any information supplied.

No part in this report shall be interpreted to mean that Chulalongkorn University has verified or ascertained any endorsement or marks from any other testing authority or bodies that may be found on that specimen.

This report shall not be reproduced wholly or in parts and no reference shall be made by the client to Chulalongkorn University or to the report or results furnished by Chulalongkorn University in any advertisements or sales promotion.



Appendix

Mixing Procedures

Specimens from: Ferro Construction Products Company Limited

Test product: FERROCEM 500 GP

วิธีการผสม

1. ควบน้ำประปาสะอาด 3.75 ลิตรเทลงไปก่อน
2. เริ่มปั่นสว่าน OKURA ใช้เกียร์ 1 (หมุน 150-300 รอบ/นาที) สปีด 5 ไว้ตลอดเวลา
3. เริ่มเทปูนเกร้าท์ลงไปเรื่อยๆ ให้หมดถุงภายใน 30 วินาที
4. บั่นต่อเนื่องไปอีก 90 วินาที โดยพยายามบั่นให้ปูนเข้าเนื้อไม่เป็นเม็ด
5. ใช้พายพลาสติกปาดบริเวณด้านข้างและก้นถังภายในให้ทั่ว ภายใน 15 วินาที
6. หลังจากนั้น นำปูนดังกล่าวตั้งทิ้งไว้โดยเปิดฝา 5 นาที ที่อุณหภูมิ 35-40 °C ความชื้น 60-65 %
7. เมื่อตั้งทิ้งไว้โดยเปิดฝารอบ 5 นาที ใช้พายพลาสติกปาดบริเวณภายในด้านข้างและก้นถังจำนวน 10 รอบด้วยมือ แล้วนำไปทดสอบ