Date :
Ref. No. :

التاريخ : ٢٠٠٤/٧/٢٠
مرجع رقم : م ع / ١٠٦٢/٦٣/١٠٥١

المحترم

المهندس / لافي عبد الله المحيني
المدير التنفيذي
شركة الصناعات الوطنية لمواد البناء
مصانع الصليبية

تحية طيبة وبعد،،،

الموضوع : فحص مواد خاصة لأغراض عزل الخرسانة (Water Proofing)

بالإشارة إلى كتابكم رقم (م.م.ص / 4 / 2246/20) والمؤرخ في 4/17 / 2004 بخصوص الموضوع أعلاه، نفيدكم بأن قد تم إجراء التحاليل الميكروبيولوجية الضرورية لعدد ثلاث عينات من المواد التالية وهي:-

1. Krystol Internal Membrane (KIM)
2. Krystol T1
3. Krystol T2

وقد أثبتت النتائج أنه لم يتبين أي نمو للبكتيريا أو الفطريات في هذه المواد كما هو مبين بالتقرير المرفق.

أما بالنسبة لتحاليل السمية فقد تم تسليمكم النتائج سلفاً.

وتفضلوا بقبول فائق الاحترام والتقدير،،،

المدير العام

د. نادر العوضي
نائب المدير العام لشئون الأبحاث

Date : 18/7/2004
Ref. No. :

التاريخ : ٢٠٠٤/٧/١٨
مرجع رقم: م ع / ١٠٥١ / ٦٣ / ١٠٦٢

BIOTECHNOLOGY DEPARTMENT

Food Resources and Marine Sciences Division

MICROBIOLOGICAL RESULTS	
Sample Description:	1. Krystol Internal Membrane (KIM) 2. Krystol T1 3. Krystol T2
Source:	National Industries Company for Building Materials (SAKC)
Date:	18/7/2004

MICROBIOLOGICAL ANALYSIS OF WATER PROOFING SAMPLES

1. Total mesophilic bacterial counts	Nil
2. Total thermotolerant bacterial counts	Nil
3. Total mesophilic fungal counts	Nil
4. Total thermotolerant fungal counts	Nil

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	Signature		Signature
Mr. Reyad Al-Daher		Dr. Yousif Al-Shayji Dept. Manager	
Ms. Awatif Yateem			

Central Analytical Laboratory

Testing of Concrete Water Proofing Material

Requestor :- National Industries Co.
Job No: 5921-OS
No of Samples: 3
Sample Type :Concrete Cubical blocks
Method Standard :-BS6290

Date Submitted : 8-5-2004
Date finished :-23-5-2004
Analyst : Rabaa,Anwar.

Non-Toxicity Test

Sample blocks with water proofing materials manufactured by KRYTON were soaked in water at 50C for 10 days.Toxic substances releasedinto water are as follow.

Approval Analysis was made on filtered water

Section Head (s) _____ QC/QA Unit Head _____

Toxic substances:

	Amount released into water (mg/l) Samples		
	T1	T2	KIM
Total Organic Carbon (TOC) (mg/l)	5.1	4.9	2.1
Heavy Metals(mg/l)			
Cadmium	<0.005	<0.005	<0.005
Chromium	<0.01	<0.01	<0.01
Barium	0.5	1.01	<0.05
Nickel	<0.01	<0.01	<0.01
Lead	<0.01	<0.01	<0.01
Mercury	<0.001	<0.001	<0.001
Arsenic	<0.005	<0.005	<0.005

*Not:It is observed that water proofing material was extracted out of the concrete block in water after ten days soak at 50C.

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Dr. Ali Al- Om air ,Manger
Central Analytical Laboratory

Civil Engineering Testing Center
College of Engineering & Petroleum
Kuwait University
P.O. Box 5969 Safat, 13060 Kuwait
Tel./ Fax : 4818495

Report No: CETC1707/08/04
Date :29/08/04

To : M P W
From : Civil Engineering Testing Center (CETC)
College of Engineering
Kuwait University

Dear Sir

We here by report the results requested by you according to the following information

Report : CETC1707/08/04
Test : Physical Properties Cementitious Concrete Water Proofing & Chemical Admixture Materials
Test code : N. A.
Standard : AS ENCLOSED
Client name : National Industries Co.
Tested for : M P W
Project name : N. A.
Contract no. : N. A.
No of pages : 2

Samples delivered, state and number:
Three Cementious Materials in Closed Bags

Information provided by supervision :
1) KRYSTOL T1: Cementious Concrete Water Proofing
2) KRYSTOL T2: Cementious Concrete Water Proofing
3) KIM (KRYSTOL INTERNAL MEMBRANE): Chemical Admixture & Water Proofer

Best regards

Eng. Moh'd Rabi Morelly
CETC Manager

Kuwait University, the College of Engineering & Petroleum, and the Civil Engineering Testing Center will not be held liable for any consequent actions based upon the results so obtained in this report. Test results represent the samples submitted for testing only. The CETC assumes that samples supplied by clients are prepared according to the

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Physical Properties Cementitious Concrete Water Proofing & Chemical Admixture Materials

No	Item	KRYSTOL T1[1]	KRYSTOL T2 [2]	KIM[3] (KRYSTOL INTERNAL MEMBRANE)
1	Color	Gray	Gray	Gray
2	Texture	Powder	Powder	Powder
3	Particle Size (micron)	< 150	< 150	< 150
4	Bulk density	1.37	1.24	1.38
5	Ph (when mixed)	12.7	10.2	--

1) KRYSTOL T1: Cementious Concrete Water Proofing
2) KRYSTOL T2: Cementious Concrete Water Proofing
3) KIM (KRYSTOL INTERNAL MEMBRANE): Chemical Admixture & Water Proofer

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Report: CETC1009/05/2004
Date :9/6/2004

To : MPW
From : Civil Engineering Testing Center (CETC)
College of Engineering
Kuwait University

Dear Sir

We here by report the results requested by you according to the following information :

REPORT	: CETC1009/05/2004
TEST	: Water Permeability
TEST CODE	: N. A.
STANDARD	: As Enclosed
CLIENT NAME	: National Industries Co.
TESTED FOR	: MPW
PROJECT NAME	: N. A.
CONTRACT NO.	: N. A.
NO OF PAGES	: 2

SAMPLES DELIVERED. STATE AND NUMBER:
3 200mm concrete cubes

INFORMATION PROVIDED BY SUPERVISION :
Concrete Mixes: -K300V+ T1/T2

Best regards

Eng. Moh'd Rabi Morelly
CETC Manager

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Tests on Hardened Concrete Cubes

Water Permeability - DIN 1048 (K300 V +T1/T2)

Item	Specimen 4	Specimen 5	Specimen 6
Water Penetration (mm)	5.0	4.0	7.0
Average	5.3		

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Report : CETC 1008/05/2004
Date : 30/05/2004

To : Ministry of Public Works
From : Civil Engineering Testing Center (CETC)
College of Engineering
Kuwait University

Dear Sir

We here by report the results requested by you according to the following information :

REPORT	: CETC 1008/05/2004
TEST	: Compressive Strength of Concrete Cubes
TEST CODE	: 101
STANDARD	: BS - 1881 : Part 116/1983
CLIENT NAME	: National Industries Co.
TESTED FOR	: Ministry of Public Works
PROJECT NAME	: N/A
CONTRACT NO.	: N/A
NO OF PAGES	: 2

SAMPLES DELIVERED, STATE AND NUMBER:
- 3 Samples in good condition of concrete cubes 150 x 150 x 150 mm .

Best regards

Eng. Mohd Rabi Morelly
CETC Manager

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COMPRESSIVE STRENGTH OF CONCRETE CUBES

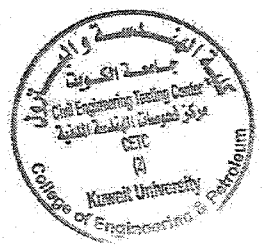
As Per BS - 1881 : Part 116/1983

Client : National Industries Co.
Tested For : Ministry of Public Works
Contract No. : N/A

Rep.# CETC 1008/05/2004
Date : 30/05/2004
Page : 2/ 2

- Specimen No.	- Specimen identification	- Sampling date	- Appearance of concrete *	- Measured width [B]	- Measured depth [D]	- Measured height [H]	- Curing or storage at lab.	- Moisture condition	- Date of test	- Age of the specimen	- Mass of the specimen	- Density	- Failure load	- Cross-sectional area BxD	- Compressive strength
				(mm)	(mm)	(mm)				(Days)	(kg)	(kg/m³)	(kN)	(mm²)	(N/mm²)
1	K-300 V + Kim	01/05/2004	S	150.1	150.2	150.1	WATER TANK	Moist	29/05/2004	28	8.210	2,426	1,384.0	22,545.0	**61.4**
2		01/05/2004		150.0	150.3	150.1			29/05/2004	28	8.180	2,417	1,312.0	22,545.0	**58.2**
3		01/05/2004		150.1	150.1	150.3			29/05/2004	28	8.300	2,451	1,320.0	22,530.0	**58.6**

* S: Satisfactory NS: Not satisfactory (Relates only to the appearance of the specimen as received)



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Report No: CETC 887/05/04
Date : 30/05/2004

To : شركة الصناعات الوطنية
From : Civil Engineering Testing Center (CETC)
College of Engineering
Kuwait University

Dear Sir

We here by report the results requested by you according to the following information

Report : CETC 887/05/04
Test : TEST ON CONCRETE MIXES- SETTING TIME
Test code : N.A
Standard : ASTM C403/C403M-99
Client name : شركة الصناعات الوطنية
Tested for : وزارة الأشغال العامة
Project name : N.A
Contract no. : N.A
No of pages : 2

Information provided by supervision :
The mix designs used in this test were provided by the client.

Best regards

Eng. Moh'd Rabi Morelly
CETC Manager

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Kuwait University
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Tel./ Fax : 4818495

Report No: CETC 887/05/04
Date : 30/05/2004

TEST ON CONCRETE ADMIXTURES- SETTING TIME

As Per ASTM C403/C403M-99

Description	Control Mix	Test Mix
Cement Type V (kg/m^3)	400	400
KIM (kg/m^3)	0	8
Fine Aggrgate (kg/m^3)	690	690
Coarse aggregate content 3/4" (kg/m^3)	695	695
Coarse aggregate content 3/8" (kg/m^3)	460	460
Free water (kg/m^3)	171	171
Admixture (Conplast S. P. 2000)- TYPE G	4 Ltr	4 Ltr
W/C ratio	0.42	0.42
Setting time [HRS: MIN]:		
Initial setting time	7:15	11:25
Final setting time	8:50	12:57



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Report : CETC 847/05/2004
Date : 09/05/2004

To : وزارة الأشغال العامة
From : Civil Engineering Testing Center (CETC)
College of Engineering
Kuwait University

Dear Sir

We here by report the results requested by you according to the following information :

REPORT	: CETC 847/05/2004
TEST	: COMPRESSIVE STRENGTH OF CONCRETE CUBES
TEST CODE	: 101
STANDARD	: BS-1881: Part 116/ 1983
CLIENT NAME	: شركة لصناعات الوطنية
TESTED FOR	: وزارة الاشغال العامة
PROJECT NAME	: لصليبية
CONTRACT NO.	: N/A
NO OF PAGES	: 2

SAMPLES DELIVERED, STATE AND NUMBER:
3 samples in good condition of concrete cubes 150 x 150 x 150 mm

Best regards

Eng. Moh'd Rabi Morelly
CETC Manager

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COMPRESSIVE STRENGTH OF CONCRETE CUBES

As Per BS - 1881 : Part 116/1983

Client : شركة المصنعات الوطنية
Tested For : وزارة الأشغال العامة
Contract No : N/A

Rep.# CETC 847/05/2004
Date : 09/05/2004

• Specimen No	• Specimen identification	• Sampling date	• Appearance of concrete •	• Measured width [II] (mm)	• Measured depth [D] (mm)	• Measured height [H] (mm)	• Curing or storage at lab	• Moisture condition	• Date of test	• Age of the specimen (Days)	• Mass of the specimen (kg)	• Density (kg/m3)	• Failure load (kN)	• Cross-sectional area [AN] (mm²)	• Compressive strength (N/mm²)
1	K-300 V	01/05/04	S	150.4	150.5	150.7	W.T	Moist	08/05/04	7	8.420	2.468	1,112.0	22,635.2	49.0
2	KIM خلط مع	01/05/04	S	150.5	150.9	151.1		Moist	08/05/04	7	8.550	2.500	1,151.0	22,710.5	50.5
3		01/05/04	S	150.3	150.8	151.0		Moist	08/05/04	7	8.440	2.466	1,168.0	22,665.2	51.5

* S Satisfactory NS Not satisfactory (Relates only to the appearance of specimen as received)
W.T Water Tank

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Report: CETC1482/11/2003
Date :1/12/2003

To : MPW
From : Civil Engineering Testing Center (CETC)
College of Engineering
Kuwait University

Dear Sir

We here by report the results requested by you according to the following information :

REPORT	: CETC1482/11/2003
TEST	: Water Permeability
TEST CODE	: N. A.
STANDARD	: As Enclosed
CLIENT NAME	: National Industries Co.
TESTED FOR	: MPW
PROJECT NAME	: N. A.
CONTRACT NO.	: N. A.
NO OF PAGES	: 2

SAMPLES DELIVERED, STATE AND NUMBER:
6 200mm concrete cubes

INFORMATION PROVIDED BY SUPERVISION :
Concrete Mixes: -K300V+KIM
-K300V

Best regards

Eng. Moh'd Rabi Morelly
CETC Manager

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Tests on Hardened Concrete Cubes

Water Permeability - DIN 1048 (K300V+KIM)

Item	Specimen 1	Specimen 2	Specimen 3
Casting Date	16/10/2003	16/10/2003	16/10/2003
Age (Days)	28	28	28
Water Penetration (mm)	4.0	3.0	4.0
Average	3.7		

Water Permeability - DIN 1048 (K300V)

Item	Specimen 1	Specimen 2	Specimen 3
Casting Date	22/10/2003	22/10/2003	22/10/2003
Age (Days)	28	28	28
Water Penetration (mm)	34.0	39.0	37.0
Average	36.7		

