

TEST REPORT

REPORT NO : 2015CB2100

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Applicant. : MEG MANUFACTURING SDN BHD
No: 2, Jalan 1M 3/6, Kawasan Perindustrian 1M3,
Bandar Indera Mahkota,
25200 Kuantan
Pahang Darul Makmur

Manufacturer : MEG MANUFACTURING SDN BHD

Product : 2-P Cementitious Waterproofing Slurry

Reference Standard/ : *(1)BS 6920-1: 2014
Method of test : Suitability of non-metallic materials and products for use in contact with
water intended for human consumption with regard to their effect on the
quality of the water
Part 1: Specification

Description of sample : Fifteen (15) pieces of concrete slab (52 mm x 52 mm x 10 mm) coated
with TW 141-Teson slurry were received for testing.
Brand: Teson
Model: TW 141-Teson slurry


Date Received of : 01st December 2015
Complete Application

Job No./Ref. No. : J20151431787/SQAS/CCST/T.REC/CSL/01

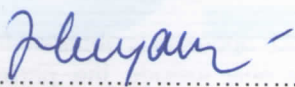
Description of test : The test results of the submitted test samples are described in Page 2 of
results this test report.

Issued date : 04 JAN 2016

Approved Signatory


.....
(HANON NAZIR MOHD BASIR)
Testing Executive




.....
(SYM RAJA NOR SIHA RAJA ABD. HANAN)
Head
Civil & Construction Section
Testing Services Department

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TEST RESULTS:

Product : 2-P Cementitious Waterproofing Slurry
 Brand : Teson
 Model : TW 141-Tesonlurry
 Method of Test : ⁽¹⁾BS 6920-1: 2014

Suitability of non-metallic materials and products for use in contact with water intended for human consumption with regard to their effect on the quality of the water
 Part 1: Specification

NO.	TYPE OF TEST METHODS	TEST RESULT
1.	⁽¹⁾ Determination of effect on the water quality i. Odour and flavour of water ii. Appearance of water iii. Growth of aquatic microorganisms iv. Cytotoxicity v. Extraction of metal	Refer to Report No: 2015CED1078

Note: ⁽¹⁾ Test conducted by Chemical & Consumer Section, Testing Services Department, SIRIM QAS International Sdn Bhd.

04 JAN 2016



TEST REPORT

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Applicant : CIVIL & CONSTRUCTION SECTION
 Building 22, SIRIM QAS International Sdn. Bhd.
 (Attn.: En. Hanon Nazir B. Mohd Basir)

Manufacturer : MEG MANUFACTURING SDN. BHD.
 No. 2, Jalan IM 3/6, Kawasan Perindustrian
 IM 3, Bandar Indera Mahkota, 25200
 Kuantan, Pahang Darul Makmur.

Product : WATER PROOFING

Reference standard / Method of test : BS 6920-1: 2014
 Suitability of non-metallic materials and products for use in contact with water intended for human consumption with regard to their effect on the quality of the water
 Part 1: Specification

Description of sample : Received one (1) sample of **WATER PROOFING** for testing. The sample was identified as: **Marking : TW 141-TESONSLURRY 2-P CEMENTITIOUS WATERPROOFING SLURRY**
Reference : MEG/TW 141


Date received of Complete Application : 21st August 2015


Job No. : JD151400809

Description of test results : The test results of the submitted sample are described in Page 2 to 6 of this test report.

Issued date : 1st December 2015

Approved Signatory :


 (NOR AZLIN BT M NOOR ARZMI, AMIC)
 IKM A/3012/5811/2010
 Testing Executive


 (HAHNAS MAHBUT)
 Head
 Chemical & Consumer Section
 Testing Services Department

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TEST RESULTS

Test : ODOUR AND FLAVOUR OF WATER
Product : WATER PROOFING
Marking : TW 141-TESONSLURRY 2-P CEMENTITIOUS WATERPROOFING SLURRY
Reference : MEG/TW 141

No.	Type of Tests	Requirement under BS 6920-1: 2014 : Clause 4	Test results after final extraction	
			Unchlorinated extracts	Chlorinated extracts
1.	Odour	No discernable odour	Earthy	No discernable odour
2.	Flavour	No discernable flavour	N/A	No discernable flavour

- Note:**
1. The final unchlorinated and chlorinated extracts for odour and flavour tests were after 7th extractions.
 2. N/A = not applicable
 3. Flavour test for unchlorinated extracts was not proceed since odour was detected.

Comment: The sample tested did not comply with the requirements of BS 6920-1: 2014: Clause 4



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TEST RESULTS

Test : APPEARANCE OF WATER
 Product : WATER PROOFING
 Marking : TW 141-TESONSLURRY 2-P CEMENTITIOUS WATERPROOFING SLURRY
 Reference : MEG/TW 141

No.	Type of Tests	Methods Used	Requirement under BS 6920-1: 2014 : Clause 5	Test results after final extraction		
				Control	Sample	Net Increase
1.	Colour, mg/L Pt	APHA 2120 B	The increase in colour and turbidity of the water in the final extract shall not be more than 5 mg/L Pt or 0.5 FNU respectively	Less than 5	Less than 5	Less than 5
2.	Turbidity, FNU	APHA 2130 B		0.05	0.09	0.04

Note : 1. The final extract for colour test was after 24 hours (1st extraction).

2. The final extract for turbidity test was after 7th extractions.

Comment : The sample tested complied with the requirements of BS 6920-1: 2014: Clause 5



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TEST RESULTS

Test : GROWTH OF AQUATIC MICROORGANISMS
Product : WATER PROOFING
Marking : TW 141-TESONSLURRY 2-P CEMENTITIOUS WATERPROOFING SLURRY
Reference : MEG/TW 141

Type of Tests	Requirement under BS 6920-1: 2014 : Clause 6	Test results after final extraction		
		After 5 th week	After 6 th week	After 7 th week
The mean dissolved oxygen difference (MDOD), mg/L	2.39 or less	0.15	0.14	0.15

Comment : The sample tested complied with the requirements of BS 6920-1: 2014: Clause 6



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TEST RESULTS

Test : EXTRACTION OF SUBSTANCES THAT MAY BE OF CONCERN TO PUBLIC HEALTH
Product : WATER PROOFING
Marking : TW 141-TESONSLURRY 2-P CEMENTITIOUS WATERPROOFING SLURRY
Reference : MEG/TW 141
Test Result : REFER APPENDIX 1 – REPORT NO R590/15/B19/01



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TEST RESULTS

Test : EXTRACTION OF METALS
 Product : WATER PROOFING
 Marking : TW 141-TESONSLURRY 2-P CEMENTITIOUS WATERPROOFING SLURRY
 Reference : MEG/TW 141

No.	Type of Tests	Method Used	Requirement under BS 6920-1: 2014: Clause 8 (maximum allowed)	Test results after 24 hours extraction/final extraction ⁽¹⁾
1.	Aluminium (as Al), µg/L ⁽³⁾	APHA 3120 B	200	226
2.	Antimony (as Sb), µg/L	APHA 3120 B	5	Less than 1 ⁽²⁾
3.	Arsenic (as As), µg/L	APHA 3120 B	10	Less than 1 ⁽²⁾
4.	Boron (as B), µg/L	APHA 3120 B	1000	4
5.	Cadmium (as Cd), µg/L	APHA 3120 B	5	Less than 0.1 ⁽²⁾
6.	Chromium (as Cr), µg/L	APHA 3120 B	50	15
7.	Iron (as Fe), µg/L	APHA 3120 B	200	Less than 0.4 ⁽²⁾
8.	Lead (as Pb), µg/L	APHA 3120 B	10	Less than 1 ⁽²⁾
9.	Manganese (as Mn), µg/L	APHA 3120 B	50	Less than 0.1 ⁽²⁾
10.	Mercury (as Hg), µg/L	CTS/TP/AE/ In-house 002	1	Less than 1 ⁽²⁾
11.	Nickel (as Ni), µg/L	APHA 3120 B	20	Less than 0.2 ⁽²⁾
12.	Selenium (as Se), µg/L	APHA 3120 B	10	Less than 3 ⁽²⁾

Note : ⁽¹⁾ The final extraction was the first 24 hours (1st extraction), otherwise will be stated

⁽²⁾ Limit of detection

⁽³⁾ The final extraction was after 7th extractions

Comment: The sample tested did not comply with the requirements of BS 6920-1: 2014: Clause 8



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TEST REPORT



APPENDIX 1



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**INDUSTRIAL BIOTECHNOLOGY RESEARCH CENTRE****Building 19, SIRIM Complex**

1, Persiaran Dato' Menteri, Section 2, P. O. Box 7035

40700 Shah Alam, Selangor Darul Ehsan, MALAYSIA

Tel: 603 - 5544 6953 / 6960 Fax: 603 - 5544 6988

Website: www.sirim.my

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Applicant : SIRIM QAS International Sdn. Bhd.
Chemical and Consumer Section, Building 16,
SIRIM Berhad.
(Pn Nor Azlin M. Nor Arzmi)

Manufacturer / Company : MEG Manufacturing Sdn. Bhd.

Sample/Trade Name: : Water Proofing

Reference Standard / Method of Test : 1. BS 6920-2.1:2014. Suitability of non-metallic materials and products for use in contact with water intended for human consumption with regard to their effect on the quality of the water - Part 2: Methods of test - Section 2.1: Samples for testing.
2. BS 6920-2.5:2000+A2:2014. Suitability of non-metallic products for use in contact with water intended for human consumption with regard to their effect on the quality of the water - Part 2: Methods of test - Section 2.5: The extraction of substances that may be of concern to public health


Description of Sample : Received one sample in good condition consisting of three pieces for testing with the following identification:
1. Model/Brand/Marking: TW 141-Tesonlurry 2-P Cementitious Waterproofing Slurry
2. Reference No : JD151400809
3. Designation: Not provided
4. Date of Manufacture: Not provided
5. Nature of Material: Not provided
6. Storage Condition: Room temperature
7. Colour: Grey
8. Shape/Form: Square
9. Dimension: Approximate length 52 mm, width 52 mm, and thickness 10mm
10. Appearance: Solid rough surface
11. Opacity: Opaque


Date Received : 29 September 2015

Job No. : J590/15

Issue Date : 26 OCT 2015

Approved signatories,


(JUANI MAZMIN HUSIN)
Officer-In-Charge
Industrial Biotechnology Research Centre
SIRIM Berhad


(DR. NEELAM SHAHAB, AMIC)
IKM A/1038/2002/90
Technical Manager
Industrial Biotechnology Research Centre
SIRIM Berhad



MS ISO/IEC 17025
TESTING
SAMM NO.676

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1.0 Test timetable

Receipt of sample: 29 Sept 2015
Maintenance of cell culture: 16 – 21 Oct 2015
Extraction procedure: 20 – 21 Oct 2015
Growth procedure: 21 – 22 Oct 2015
End of test: 22 Oct 2015

2.0 Test method

2.1 Test summary

A screening procedure (simple cytotoxicity test) to test leachates from **Water Proofing** for biologically active compound was carried out according to BS 6920. Leachates from the sample after a 24-hour extraction at $(23\pm 2)^{\circ}\text{C}$ was used to prepare growth medium. The morphology of a mammalian cell line following a 24-hour culture in the growth medium was observed. **NO OTHER TESTS WERE UNDERTAKEN ON THIS PRODUCT.**

2.2 Significance and rationale

This method is only an initial screening test for substances potentially hazardous to health and suitable for all non-metallic materials that may be used in contact with water intended for human consumption. A satisfactory result indicates that the leachate probably does not contain significant amounts of acutely toxic substances, but it does not indicate the absence of small quantities of substances, which may be harmful on prolonged exposure.

2.3 Cell culture

American Type Culture Collection CCL81, Vero (Kidney, African Green Monkey, *Cercopithecus aethiops*).

2.4 Test procedure

The procedure was divided into three stages as follows.

2.4.1 Cell culture maintenance

Cells were grown in tissue culture grade flasks and routinely examined to ensure they remain healthy.

2.4.2 Sample extraction and preparation of growth media

Two sample pieces were selected. The total surface area of two sample pieces was measured at 5500 mm^2 to 9500 mm^2 . Sample pieces was extracted in 500 mL of reverse osmosis water at $(23\pm 2)^{\circ}\text{C}$ for 24 hours. A validation solution (800 mg/L zinc sulfate) and a blank were included in the test. Portions of the sample extracts, validation solution and blank were used to dilute the concentrated growth medium. Freshly trypsinized cells was added to each preparation and transferred into a 24-well tissue culture plate. The extracts were assessed in replicates of three. The plate was incubated at $(37\pm 1)^{\circ}\text{C}$ in a humidified atmosphere of 5 % carbon dioxide and 95 % air for 24 hours.

2.4.3 Effect on cell culture

The condition of cells in each well was examined microscopically. The presence or absence of a confluent cell layer, the presence of any irregular shaped cell or cells showing signs or 'rounding off', and the appearance of any cells floating in the growth medium was recorded.

JUANI MAZMIN BINTI HUSIN
Researcher
Bioprocess Programme
Industrial Biotechnology Research Centre
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3.0 Results

The table below shows cytotoxicity effects of **Water Proofing**

	Replicates	Effects on cell culture
Extract of sample piece 1	A	Healthy confluent monolayer
	B	Healthy confluent monolayer
	C	Healthy confluent monolayer
Extract of sample piece 2	A	Healthy confluent monolayer
	B	Healthy confluent monolayer
	C	Healthy confluent monolayer
Validation solution	A	Cells 'rounding off' and floating. No monolayer
	B	Cells 'rounding off' and floating. No monolayer
	C	Cells 'rounding off' and floating. No monolayer
Blank	A	Healthy confluent monolayer
	B	Healthy confluent monolayer
	C	Healthy confluent monolayer

4.0 Analysis and interpretation

Cell cultures in the extract of sample pieces showed healthy confluent monolayer, comparable to the blank, which indicate a non-cytotoxic response. Monolayer of cell culture was not present in the validation solution. The cells showed severe 'rounding off' and floating in the validation solution preparation, which indicate a cytotoxic response.

5.0 Conclusion

The sample of **Water Proofing** exhibited no cytotoxicity response under the conditions of this test.

JUANI MAZMIN BINTI HUSIN
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