

SIRIM QAS International Sdn.Bhd. (Company No.: 410334-X)
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TEST REPORT

REPORT NO. : 2018CED1043

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Applicant : PLASTICS & COMPOSITE MATERIALS SECTION
Building 20, SIRIM QAS International Sdn. Bhd.
(Attn.: Pn. Nomaizura Zakaria)

Licensee : POLYWARE SDN BHD
7, Jalan Zarib 1, Zarib Industrial Park,
31500 Ipoh, Perak.

Manufacturer : SAME AS ABOVE

Product : Mechanical Fittings for Pressure Piping System

Reference standard / Method of test : MS 1583: Part 1: 2003/ ISO 17885:2015 Clause 8.4.1
Suitability of Non-Metallic Product 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 **Mechanical Fittings for Pressure Piping System** for testing with the following identification:
Sample : MTA 20
Brand: Penguin


Date received of Complete Application : 06th September 2018

Job No. : JD181400810
(J20181460466)

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

Issued date : 22nd November 2018

Approved Signatory :


.....
(NOR AZLIN BT M NOOR ARZMI, *MMIC*)
IKM M/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 : Mechanical Fittings for Pressure Piping System
Sample : MTA 20
Brand : Penguin

No.	Type of Tests	Requirement under MS 1583: Part 1: 2003: Clause 4	Test results after final extraction	
			Unchlorinated extracts	Chlorinated extracts
1.	Odour	No discernable odour	No discernable odour	No discernable odour
2.	Flavour	No discernable flavour	No discernable flavour	No discernable flavour

Note: The final unchlorinated and chlorinated extracts for odour and flavour tests were after 24 hours (1st extraction)

Comment: The sample tested complied with the requirements of MS 1583: Part 1: 2003: Clause 4



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TEST RESULTS

Test : Appearance of Water
Product : Mechanical Fittings for Pressure Piping System
Sample : MTA 20
Brand : Penguin

No.	Type of Tests	Methods Used	Requirement under MS 1583: Part 1: 2003 Clause 5	Test results after final extraction		
				Control	Sample	Net Increase
1.	Colour as Colour Unit*	APHA 2120 B	The increase in colour and turbidity of the water in the final extract shall not be more than 5 standard units (of colour) or 0.5 NTU respectively	Less than 5	Less than 5	Less than 5
2.	Turbidity, NTU*	APHA 2130 B		0.07	0.09	0.02

Note: *The final extracts for colour and turbidity test were the first 24 hours (1st extraction).

Comment: The sample tested complied with the requirements of MS 1583: Part 1: 2003 Clause 5



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TEST RESULTS

Test : Growth of Aquatic Microorganisms
Product : Mechanical Fittings for Pressure Piping System
Sample : MTA 20
Brand : Penguin

Type of Tests	Requirement under MS 1583: Part 1: 2003 : 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	Less than 2.4 mg/L	0.03	0.02	0.02

Comment: The sample tested complied with the requirements of MS 1583: Part 1: 2003: Clause 6



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TEST RESULTS

Test ⁽¹⁾ : Extraction of Substances That May Be Of Concern to Public Health
Product : Mechanical Fittings for Pressure Piping System
Sample : MTA 20
Brand : Penguin

Test Result : Refer Appendix 1 – REPORT NO R551/18/B19/01

Note : ⁽¹⁾ Test subcontracted to Industrial Biotechnology Research Centre, Building 19, SIRIM Berhad



Report No.: 2018CED1043

APPENDIX 1



**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

TEST REPORT

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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 : POLYWARE SDN BHD

Sample/Trade Name : Mechanical Fittings for Pressure Piping System

Reference Standard / Method of Test : 1. MS 1583: Part 2: Section 1: 2003. Suitability of non-metallic products for use in contact with water intended for human consumption with regard to their effect on the quality of water: Part 2: Methods of test: Section 1: Samples for testing.
2. MS 1583: Part 2: Section 5: 2003. Suitability of non-metallic products for use in contact with water intended for human consumption with regard to their effect on the quality of water: Part 2: Methods of test: Section 5: The extraction of substances that may be of concern to public health

Description of Sample : Received one sample consisting of two sample pieces in good condition for testing with the following identification:
1. Model/Brand/Marking: Penguin
2. Product Marking: Not provided
3. Reference No: J181400810
4. Designation: Not provided
5. Date of Manufacture: Not provided
6. Nature of Material: Not provided
7. Storage Condition: Room temperature
8. Colour: Black
9. Shape/Form: Undetermined
10. Dimension: Undetermined
11. Appearance: Solid smooth surface
12. Opacity: Opaque

Date Received : 13 September 2018

Job No. : J551/18

Issue Date : 30 SEP 2018




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KEY PERSONNEL PARTICIPATING IN THIS TESTING

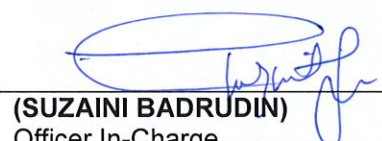
We, the undersigned, declare that the methods, results and data contained in this report faithfully reflect the procedures used and raw data collected throughout the testing.



(NOOR RABIAH AID)
Officer In-Charge
Industrial Biotechnology Research Centre
SIRIM Berhad



Date



(SUZAINI BADRUDIN)
Officer In-Charge
Industrial Biotechnology Research Centre
SIRIM Berhad



Date



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1.0 Test timetable

Receipt of sample: 13 September 2018
Maintenance of cell culture: 24 September 2018 – 26 September 2018
Extraction procedure: 25 September 2018 – 26 September 2018
Growth procedure: 26 September 2018 – 27 September 2018
End of test: 27 September 2018

2.0 Test method

2.1 Test summary

A screening procedure (simple cytotoxicity test) to test leachates from the **Mechanical Fittings for Pressure Piping System** for biologically active compound was carried out according to MS 1583. Leachates from the sample after a 24-hour extraction at (23 ± 2) °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 CCL-1, NCTC clone 929 Areolar Fibroblast Mouse.

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 each sample piece was measured at 5500 mm² to 9500 mm². Each sample group was extracted in 500 mL of reverse osmosis water at (23 ± 2) °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 ± 1) °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.


SUZAIN/BADRUDIN
Senior Researcher
Bioprocess Programme
Industrial Biotechnology Research Centre
SIRIM Berhad



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3.0 Results

The table below shows cytotoxicity effects **Mechanical Fittings for Pressure Piping System**


	Replicates	Effects on cell culture
Extract of sample pieces 1	A	Healthy confluent monolayer
	B	Healthy confluent monolayer
	C	Healthy confluent monolayer
Extract of sample pieces 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 **Mechanical Fittings for Pressure Piping System** exhibited no cytotoxicity response under the conditions of this test.


SUZAIM BADRUDIN
Senior Researcher
Bioprocess Programme
Industrial Biotechnology Research Centre
SIRIM Berhad



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TEST RESULTS

Test : Extraction of Metals
 Product : Mechanical Fittings for Pressure Piping System
 Sample : MTA 20
 Brand : Penguin

No.	Type of Tests	Method Used	Requirement under MS 1583: Part 1: 2003: Clause 8 (maximum allowed)	Test results after 24 hours extraction/final extraction ⁽¹⁾
1.	Aluminium (as Al), mg/L	APHA 3120 B	0.2	0.02
2.	Barium (as Ba), mg/L	APHA 3120 B	0.7	Less than 0.002 ⁽²⁾
3.	Chromium (as Cr), mg/L	APHA 3120 B	0.05	Less than 0.0001 ⁽²⁾
4.	Iron (as Fe), mg/L	APHA 3120 B	0.3	Less than 0.0004 ⁽²⁾
5.	Manganese (as Mn), mg/L	APHA 3120 B	0.1	Less than 0.0001 ⁽²⁾
6.	Nickel (as Ni), mg/L	APHA 3120 B	0.02	Less than 0.0002 ⁽²⁾
7.	Lead (as Pb), mg/L	APHA 3120 B	0.01	Less than 0.001 ⁽²⁾
8.	Silver (as Ag), mg/L	APHA 3120 B	0.05	Less than 0.002 ⁽²⁾
9.	Cadmium (as Cd), mg/L	APHA 3120 B	0.003	Less than 0.0002 ⁽²⁾
10.	Arsenic (as As), mg/L	APHA 3120 B	0.01	0.004
11.	Antimony (as Sb), mg/L	APHA 3120 B	0.005	Less than 0.001 ⁽²⁾
12.	Mercury (as Hg), mg/L	CTS/TP/AE/ In-house 002	0.001	Less than 0.0004 ⁽²⁾
13.	Selenium (as Se) mg/L	APHA 3120 B	0.01	0.005
14.	Cyanide (as CN ⁻) mg/L ⁽³⁾	APHA 4500-CN C & E	0.07	Less than 0.002 ⁽²⁾

Note : ⁽¹⁾ Since result of test after the first 24 hours extraction comply with the requirements, this first extract is defined as the final extract, otherwise will be stated

⁽²⁾ Limit of detection

⁽³⁾ Test subcontracted to SGS (Malaysia) Sdn Bhd

Comment : The sample tested complied with all the requirements of MS 1583: Part 1: 2003: Clause 8

