

TEST REPORT: S09CHM03871-LYP

Date: 15 OCT 2009

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Client's Ref:

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SUBJECT

Testing of EPDM Rubber Sample for Use in Contact with Water Intended for Human Consumption with regard to their Effect on the Quality of the Water.

CLIENT

Se. Fa s.r.l.
Via del Lavoro 9
48020 – S.ALBERTO (RAVENNA)
Italy
Attn : Mr. Luca Ancarani

SAMPLE SUBMISSION DATE / TEST DATE

11 Aug 2009 / 12 Aug 2009

DESCRIPTION OF SAMPLE

8 pieces of EPDM "SEFA" Membrane (each of dimensions 200mm x 200mm)



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LA-2007-0381-F
LA-2007-0382-B
LA-2007-0383-G
LA-2007-0384-G
LA-2007-0385-E
LA-2007-0386-C

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TEST REPORT: S09CHM03871-LYP
15 OCT 2009



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METHOD OF TEST

Singapore Standard 375 : 2001 "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 1 "Specification"
Part 2:1 "Method of test - Samples for testing"
Part 2:2.1 "Methods of test - Odour and flavour of water - General method of test"
Part 2:3 "Methods of test - Appearance of water"
Part 2:4 "Methods of test - Growth of aquatic microorganisms"
Part 2:5 "Methods of test - The extraction of substances that may be of concern to public health (Cytotoxicity test)"
Part 2:6 "Methods of test - The extraction of metals"

Singapore Standard 375 : 2001 is an adoption of British Standard 6920 : 2000.

RESULTS

(1) Odour and Flavour of Water

Surface area of sample : 15 000 mm²
Extraction temperature : 25°C

- 1.1 All the three test panelists reported that there was no discernable odour in the 24 hour chlorinated and unchlorinated test extract and no discernable flavour in the first and second dilutions of the same chlorinated and unchlorinated test extracts.
1.2 The results obtained show that the sample complies with the requirements of SS 375 : Part 2:2:1 : 2001 and BS 6920-2.2.1 : 2000 for the odour and flavour of water test.

(2) Appearance of Water

Surface area of sample : 15 000 mm²
Extraction temperature : 25°C

- 2.1 Colour and Turbidity of the first extract of single sample

Test	Sample	Requirements of SS 375 : Part 1 : Specification (Maximum admissible level)
Colour (Hazen units)	Less than 5	5
Turbidity (FNU)	0.1	0.5

- 2.2 The results obtained show that the sample complies with the requirements of SS 375 : Part 2:3 : 2001 and BS 6920-2.3 : 2000 for the appearance of water test.

TEST REPORT: S09CHM03871-LYP
15 OCT 2009



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RESULTS (cont'd)

(3) Growth of Aquatic Microorganisms

Surface area of sample : 15 000 mm²

Test temperature : 30°C

3.1 The mean dissolved oxygen concentration of the control was 7.36 mg/litre.

3.2 The mean dissolved oxygen difference (MDOD) of the test and reference materials were as follows:

Test Materials	MDOD (mg/l)	Requirements of SS 375 : Part 1 : Specification (MDOD, mg/l)
Negative reference	-0.03	0.0 ± 0.6
Positive reference	5.17	7.5 ± 2.5
Test product (Single sample)	1.26	< 1.69

3.3 The results obtained show that the sample complies with the requirements of SS 375 : Part 2:4 : 2001 and BS 6920-2.4 : 2000 for the growth of aquatic micro-organisms test.

(4) The Extraction of Substances that may be of concern to public health

Surface area of sample : 15 000 mm²

Extraction temperature : 25°C

4.1 The extracts from the sample and the blank were used to prepare culture media for use with the Monkey Kidney Cell Line (Vero ATCC CCL81).

4.2 The extract from the single sample exhibited confluent growth of cells, thus indicating a non-cytotoxic response.

4.3 The test reagent blank exhibited confluent growth of cells.

4.4 The results obtained show that the sample complies with the requirements of SS 375 : Part 2:5 : 2001 and BS 6920-2.5 : 2000 for the cytotoxicity test.

TEST REPORT: S09CHM03871-LYP
15 OCT 2009



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RESULTS (cont'd)

(5) The Extraction of Metals (Elemental Analysis by ICP-MS)

Surface area of sample : 15 000 mm²

Extraction temperature : 25°C

5.1 Concentration of metals determined in the first extracts of two samples.

Metal	Sample 1	Sample 2	Requirements of SS 375 : Part 1 : Specification (Maximum allowable concentration)
Aluminium, Al µg/l	< 20	< 20	200
Antimony, Sb µg/l	< 0.5	< 0.5	5
Arsenic As µg/l	< 1.0	< 1.0	10
Barium, Ba µg/l	< 100	< 100	700
Cadmium, Cd µg/l	< 0.5	< 0.5	3
Chromium, Cr µg/l	< 5.0	< 5.0	50
Iron, Fe µg/l	< 20	< 20	200
Lead, Pb µg/l	< 1.0	< 1.0	10
Manganese, Mn µg/l	< 5.0	< 5.0	50
Mercury, Hg µg/l	< 0.1	< 0.1	1
Nickel, Ni µg/l	< 2.0	< 2.0	20
Selenium, Se µg/l	< 1.0	< 1.0	10
Silver, Ag µg/l	< 1.0	< 1.0	10

5.2 The results obtained show that the sample complies with the requirements of SS 375 : Part 2:6 and BS 6920-2.6 : 2000 for the extraction of metal test.

TEST REPORT: S09CHM03871-LYP
15 OCT 2009



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Notes :

FNU : Formazine nephelometric unit
mg/l : milligrams per litre
 μ g/l : micrograms per litre
< : Less than

The above test results relate to the sample as received.

Remarks :

The above results show that the sample complies with the requirements of SS 375 : 2001 : Part 1 & Part 2 and BS 6920 : 2000 : Part 1 & Part 2 and is deemed suitable for use in contact with water intended for human consumption.

A handwritten signature in black ink, appearing to read 'Hyei'.

MS AW HWEE YING
TECHNICAL EXECUTIVE

A handwritten signature in black ink, appearing to read 'Yp'.

MRS KAM-LEONG YIN PHENG
PRODUCT MANAGER
MICROBIOLOGY
CHEMICAL & MATERIALS

TEST REPORT: S09CHM03871-LYP
15 OCT 2009



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March 2009