

# TEST REPORT: 7191234258-CHM20-RC

Date: 27 MAY 2020

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Client's Ref: -

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## SUBJECT

Testing of LDPE Panel for Use in Contact with Water Intended for Human Consumption with regard to their Effect on the Quality of the Water.

## CLIENT

Bokju Co., Ltd  
805 Software Venture Tower  
117 Dongbuk-ro, Buk-gu, Daegu  
South Korea

Attn: Mr. Taeyoung Cho

## SAMPLE SUBMISSION DATE / TEST DATE

20 Mar 2020 / 03 Apr 2020

## DESCRIPTION OF SAMPLE

One sample consisting of 15 pieces of LDPE Panels was submitted.  
Dimensions of each piece was 120 mm x 60 mm x 3 mm thickness.

|                     |   |  |
|---------------------|---|--|
| Product Description | : | Panel consisting of an extruded, white coloured LDPE panel |
| Brand Name          | : | SPEP Panel   |
| Model Number        | : | SPEP-L30   |
| Type of Material    | : | LDPE: low-density polyethylene                             |
| Manufacturer's Name | : | BOKJU CO., LTD   |
| Country of Origin   | : | Republic of Korea  |
| Manufacturing Date  | : | 10/02/20   |



LA-2007-0380-A LA-2007-0385-E  
LA-2007-0381-F LA-2007-0386-C  
LA-2007-0382-B LA-2010-0464-D  
LA-2007-0383-G LA-2018-0702-B  
LA-2007-0384-G LA-2018-0703-G

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**TÜV**

## **METHOD OF TEST**

Singapore Standard 375 : 2015 "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"

## **RESULTS**

### **(1) Odour and Flavour of Water**

Extraction temperature : 25°C

- 1.1 All the test panelists reported 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 for the odour and flavour of water test.

### **(2) Appearance of Water**

Extraction temperature : 25°C

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

| Test                 | Sample         | Requirements of SS 375 : Part 1 :<br>Specification (Maximum admissible level) |
|----------------------|----------------|---|
| Colour (Hazen units) | Less than 0.10 | 5   |
| Turbidity (FNU)      | 0.10           | 0.5   |

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

**RESULTS** (cont'd)

**(3) Growth of Aquatic Microorganisms**

Test temperature : 30°C

- 3.1 The mean dissolved oxygen concentration of the control was 7.27 mg/litre.
- 3.2 The mean dissolved oxygen difference (MDOD) of the test and reference materials were as follows:

| Materials \ Test             | MDOD (mg/l) | Requirements of SS 375 : Part 1 : Specification (MDOD, mg/l) |
|------------------------------|-------------|--|
| Negative reference           | 0.39        | 0.0 ± 0.6  |
| Positive reference           | 6.37        | 7.5 ± 2.5  |
| Test product (Single sample) | 1.64        | < 1.69   |

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

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

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 for the cytotoxicity test.

**RESULTS** (cont'd)

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

Extraction temperature : 25°C

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

| Metal                 | Sample 1 | Sample 2 | Requirements of<br>SS 375 : Part 1 : Specification<br>(Maximum allowable concentration) |
|-----------------------|----------|----------|---|
| Silver,<br>Ag µg/l    | < 0.04   | < 0.04   | 100   |
| Aluminium,<br>Al µg/l | 0.88     | < 0.85   | 200   |
| Arsenic<br>As µg/l    | < 0.02   | < 0.02   | 10  |
| Barium,<br>Ba µg/l    | 0.23     | 0.23     | 700   |
| Cadmium,<br>Cd µg/l   | < 0.08   | < 0.08   | 3   |
| Chromium,<br>Cr µg/l  | < 0.03   | < 0.03   | 50  |
| Iron,<br>Fe µg/l      | 3.53     | < 0.13   | 200   |
| Manganese,<br>Mn µg/l | 0.06     | 0.04     | 50  |
| Nickel,<br>Ni µg/l    | 1.34     | 1.56     | 20  |
| Lead,<br>Pb µg/l      | 0.72     | 0.26     | 10  |
| Selenium,<br>Se µg/l  | < 0.05   | 0.05     | 10  |
| Boron,<br>B µg/l      | < 0.07   | < 0.07   | 2400  |
| Antimony,<br>Sb µg/l  | < 0.14   | < 0.14   | 5   |
| Mercury,<br>Hg µg/l   | < 0.03   | < 0.03   | 1   |

**5.2 The results obtained show that the sample complies with the requirements of SS 375 : Part 2:6 for the extraction of metals test.**

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## Notes :

FNU : Formazine nephelometric unit

mg/l : milligrams per litre

µg/l : micrograms per litre

< : Less than

The above test results relate to the sample as received.

## Remarks :

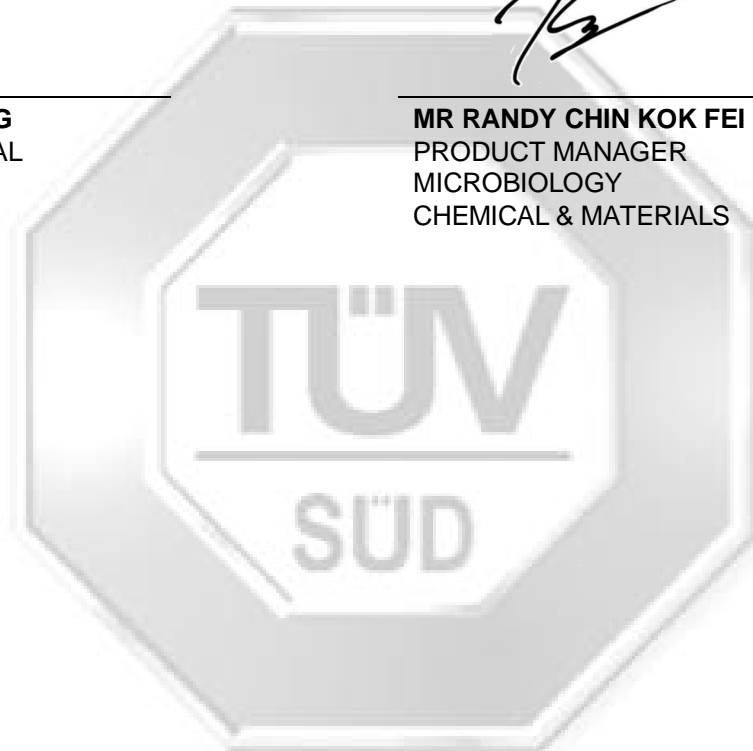
The above results show that the sample complies with the requirements of SS 375 : Part 1 and Part 2 and is deemed suitable for use in contact with water intended for human consumption.

A handwritten signature in black ink, appearing to read 'H. Y. I.'.

**MS AW HWEE YING**  
HIGHER TECHNICAL  
EXECUTIVE

A handwritten signature in black ink, appearing to read 'R. C. F.'.

**MR RANDY CHIN KOK FEI**  
PRODUCT MANAGER  
MICROBIOLOGY  
CHEMICAL & MATERIALS



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July 2011

