

TEST REPORT: 7191327034-CHM24-01A-LSH

Date: 15 MAY 2024

Email: Sihai_LI@tuvsud.com

Client's Ref:

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SUBJECT

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

CLIENT

NORDITUBE Technologies SE
Rue Ernest Solvay 181
4000 Liège
Belgium

Attn : Mr. Viktor Laufer

SAMPLE SUBMISSION DATE / TEST DATE

06 Feb 2024 / 20 Feb 2024

DESCRIPTION OF SAMPLE

One sample as following was submitted.

Product Description	:	Lay flat hose, reinforced by polyester yarn, flow through extrusion
Brand Name	:	IH-Liner
Size	:	DN100, 21cm length
Type of Material	:	PE – reinforcement out of polyester
Manufacturer's Name	:	5 ELEM
Country of Origin	:	China



LA-2007-0380-A
LA-2007-0381-F
LA-2007-0382-B
LA-2007-0383-G
LA-2007-0384-G
LA-2007-0385-E

LA-2007-0386-C
LA-2010-0464-D
LA-2018-0702-B
LA-2018-0703-G
LA-2020-0747-L

The results reported herein have been performed in accordance with the terms of accreditation under the Singapore Accreditation Council. Inspections/Calibrations/Tests marked "Not SAC-SINGLAS Accredited" in this Report are not included in the SAC-SINGLAS Accreditation Schedule for our inspection body/laboratory.

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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 One test panellist reported discernable odour in the first extraction unchlorinated test extracts. All test panellists reported no discernable flavour in the first and second dilutions of the same unchlorinated test extracts.
- 1.2 All test panellists reported no discernable odour in the seventh extraction chlorinated test extracts. All test panellists reported no discernable flavour in the first and second dilutions of the same chlorinated 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 : Specification (Maximum admissible level)
Colour (Hazen units)	< 2.5	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 6.83 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	- 0.04	0.0 ± 0.6
Positive reference	5.24	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 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 at test temperature of 25°C.

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 SS 375 : Part 1 : Specification (Maximum allowable concentration)
Silver, Ag µg/l	0.12	0.16	100
Aluminium, Al µg/l	< 0.32	< 0.32	200
Arsenic As µg/l	0.04	0.04	10
Barium, Ba µg/l	0.52	0.51	700
Cadmium, Cd µg/l	< 0.02	< 0.02	3
Chromium, Cr µg/l	< 0.05	< 0.05	50
Iron, Fe µg/l	< 1.40	< 1.40	200
Manganese, Mn µg/l	0.10	0.09	50
Nickel, Ni µg/l	0.17	0.15	20
Lead, Pb µg/l	< 0.04	< 0.04	10
Selenium, Se µg/l	< 0.24	< 0.24	10
Boron, B µg/l	< 0.07	< 0.07	2400
Antimony, Sb µg/l	0.76	0.75	5
Mercury, Hg µg/l	0.25	0.27	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 : 2015 : Part 1 and Part 2 at test temperature of 25°C and is deemed suitable for use in contact with water intended for human consumption.

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

MS AW HWEE YING
SENIOR TECHNICAL
EXECUTIVE

A handwritten signature in blue ink, appearing to read 'Lishi'.

DR LI SIHAI
ASSISTANT VICE PRESIDENT
CHEMICAL & MATERIALS
PRODUCT SERVICE



APPENDIX

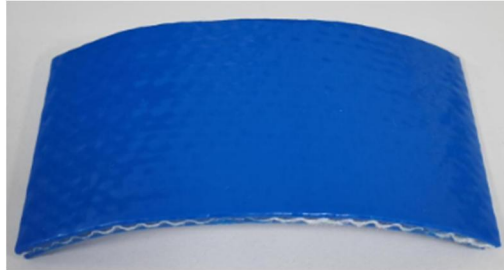


Figure 1: Photograph of sample submitted



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Effective 27 March 2024

