Unit 30 | Fern Close | Pen-Y-Fan Ind Est | Oakdale | Gwent | NP11 3EH | UK
Tel: +44 (0) 1495 236260 wales@nsf.org | www.nsf.org

# TEST REPORT

**Customer: C0485952**

Formosa Plastics Corporation
No.1, Formosa Industrial Complex
Mailiao Village
Yunlin County
Taiwan

| | |
|---|---|
| **Result** | This product has satisfied the criteria set out in BS 6920: Part 1: 2014 "Specification" and thus is suitable for use with cold water but not hot water. |
| Customer Name | Formosa Plastics Corporation |
| Product | Taisox HDPE Pipes (8001BL) |
| Test Undertaken | BS 6920: 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 |
| Job Number | J-00333699 |
| PAMS Number | 190773 |

**Thank you for having your product tested by NSF Wales Ltd.**

Please contact your Account Manager if you have any questions or concerns pertaining to this report.

**Report Date** 18-JUL-2019

**Report Authorisation**

Michael Bustin - Materials Testing Manager

UKAS TESTING
0626

## Result Summary Section

| Test | Result |
|---|---|
| Odour and flavour of water BS 6920: Part 1: 2014, Clause 4 - 23°C | Pass |
| Appearance of Water BS 6920: Part 1: 2014, Clause 5 | Pass |
| Growth of Microorganisms BS 6920: Part 1: 2014, Clause 6 | Pass |
| Extraction of substances that may be of concern to public health BS 6920: Part 1: 2014, Clause 7 - 23°C | Pass |
| Extraction of Metals BS 6920: Part 1: 2014, Clause 8 - 23°C | Pass |

## Sample Details

| | |
|---|---|
| Date of Receipt of Application Form | 26/03/19 |
| Date of Receipt of Product for Test | 23/04/19 |
| Product | Taisox HDPE Pipes (8001BL) |
| Nature of Material | HDPE |
| Date Test Sample Manufactured | 04/03/19 |
| Batch Number | 85102 |
| Receipt Conditions | Good Condition |
| Receipt Packaging | Clear plastic |
| Product Manufacturer | Formosa Plastics Corporation |
| Product Manufacturing Site | Taiwan |
| Tradename and Reference of Product | Taisox 8001BL |
| Method of Manufacture | Extrusion |
| Typical Use of the Product | Conveyance of potable water |
| Nature of Product | Pipe |
| Sampling Procedure | Random |
| Address of Product Manufacturer | No.1, Formosa Industrial Complex, Mailiao Village, Yunlin County, Taiwan |

## Sample Preparation

| | |
|---|---|
| Description/Appearance of the product | Black, opaque, rigid pipe. |
| Length | 80 mm |
| Max. length | 515 mm |
| Inner diameter | 25.5 mm |
| Outer diameter | 32 mm |
| Surface area of one article | 93617.5 mm2 |
| Number of articles constituting a sample | 0.16 |
| Surface area for test | 15038 mm2 |
| Calibration mark of test container | 1 L |
| Storage Conditions | As in BS 6920: Part 2: Section 2.1: Clause 5.2 |

***Job Attachments:***

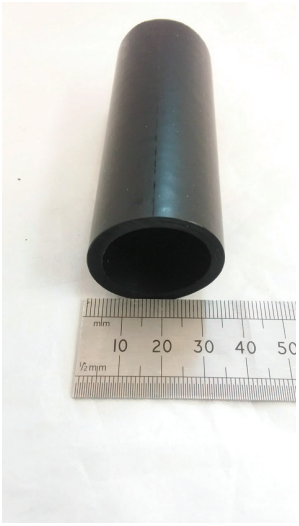


Photo 1

**Odour and flavour of water BS 6920: Part 1: 2014, Clause 4 - 23°C**

**Methodology:** BS 6920: Part 2: Section 2.2 and in-house method PROC/MAT 004 and 006.

Date Leaching Test Started: 26-JUN-2019

***First Extract - Chlorinated Test Water***

| Panellist | Odour Descriptor | Flavour Descriptor | Flavour Dilution Number |
|---|---|---|---|
| **1** | None | None | 1 |
| **2** | None | None | 1 |
| **3** | None | None | 1 |

***First Extract - Chlorine Free Test Water***

| Panellist | Odour Descriptor | Flavour Descriptor | Flavour Dilution Number |
|---|---|---|---|
| **1** | None | None | 1 |
| **2** | None | None | 1 |
| **3** | None | None | 1 |

**On the basis of these results the samples of this product referred to in this report have been found to conform to the requirements of BS 6920: Part 1: 2014, Clause 4.**

### Appearance of Water BS 6920: Part 1: 2014, Clause 5 - 23°C

**Methodology:** BS 6920: Part 2: Section 2.3 and in-house methods PROC/MAT 004, PROC/MAT 027 (colour) and PROC/MAT 030 (turbidity).

Date Leaching Test Started: 4-JUN-2019

***First Extract***

| Name | Blank | Extract | Test Sample Effect |
|---|---|---|---|
| **Colour (Hazen)** | <2 | <2 | <2 |
| **Turbidity (FNU)** | 0.126 | 0.127 | 0.001 |

**On the basis of these results the samples of this product referred to in this report have been found to conform to the requirements of BS 6920: Part 1: 2014, Clause 5.**

## Growth of Microorganisms BS 6920: Part 1: 2014, Clause 6

**Methodology:** BS 6920: Part 2: Section 2.4 and in-house method PROC/MIC 001.

Date Test Started: 30-APR-2019

Incubation temperature: (30 ±1) °C

Units: mg $L^{-1} O_2$

| Mean Dissolved Oxygen Difference | Day 49 |
|---|---|
| Test Sample | 0.7 |
| Positive Reference (paraffin wax) | 6.1 |
| Negative Reference (glass) | 0.0 |

| Mean Dissolved Oxygen | Day 49 |
|---|---|
| Test Water Control | 8.0 |

**Comments:** At the end of this test, the test sample showed no change in colour or appearance.

**On the basis of these results the samples of this product referred to in this report have been found to conform to the requirements of BS 6920: Part 1: 2014, Clause 6.**

**Extraction of substances that may be of concern to public health BS 6920: Part 1: 2014, Clause 7 - 23°C**

**Methodology:** BS 6920: Part 2: Section 2.5 and in-house methods PROC/MAT 004 and PROC/MIC 004.

Date Leaching Test Started: 4-JUN-2019

Cell concentration used: $5 \times 10^5$

Cell morphology: Confluent growth of elongated cells, some round cells and cell debris. Media orange/pink in colour.

| Sample/Control | Cell Morphology | Response |
|---|---|---|
| **Test Sample** | Confluent growth of elongated cells, some round cells and cell debris. Media pink in colour. | Non-Cytotoxic |
| **Blank** | Confluent growth of elongated cells, some round cells and cell debris. Media pink in colour. | Non-Cytotoxic |
| **Negative Control** | Confluent growth of elongated cells, some round cells and cell debris. Media pink in colour. | Non-Cytotoxic |
| **Positive Control** | All cells rounded and mainly still in suspension. Media pink in colour. | Cytotoxic |

**On the basis of these results the samples of this product referred to in this report have been found to conform to the requirements of BS 6920: Part 1: 2014, Clause 7.**

## Extraction of Metals BS 6920: Part 1: 2014, Clause 8 - 23°C

**Methodology:** BS 6920: Part 2: Section 2.6 and in-house methods PROC/MAT 006 (leachate preparation) and PROC/ING 003 (ICPMS analysis).

Date Leaching Tests Started: 25-JUN-2019

***First Extract***

| Metal (µg/L) | MAC (µg/L) | LOD (µg/L) | Blank (µg/L) | Sample 1 (µg/L) | Sample 2 (µg/L) |
|---|---|---|---|---|---|
| Aluminium | 200 | 20 | <20 | <20 | <20 |
| Antimony | 5 | 0.5 | <0.5 | <0.5 | <0.5 |
| Arsenic | 10 | 1 | <1 | <1 | <1 |
| Boron | 1000 | 100 | <100 | <100 | <100 |
| Cadmium | 5 | 0.5 | <0.5 | <0.5 | <0.5 |
| Chromium | 50 | 5 | <5 | <5 | <5 |
| Iron | 200 | 20 | <20 | <20 | 146 |
| Lead | 10 | 1 | <1 | <1 | <1 |
| Manganese | 50 | 5 | <5 | <5 | <5 |
| Mercury | 1 | 0.1 | <0.1 | <0.1 | <0.1 |
| Nickel | 20 | 2 | <2 | <2 | <2 |
| Selenium | 10 | 1 | <1 | <1 | <1 |

Analytical Method - ICPMS Inductively Coupled Plasma Mass Spectrometry
MAC - Maximum admissible concentration
LOD - Required limit of detection

**On the basis of these results the samples of this product referred to in this report have been found to conform to the requirements of BS 6920: Part 1: 2014, Clause 8.**

**<< *Testing Laboratories* >>**

| Flag | Id | Address |
|---|---|---|
| All work performed at: (Unless otherwise specified) | NSF_WALES | NSF Wales Ltd.<br>30 Fern Close<br>Pen-Y-Fan Industrial Estate, Oakdale<br>Gwent, NP11 3EH<br>UK |

## NOTES

1. This report is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service (UKAS). NSF Wales is UKAS accredited against ISO/IEC 17025:2005 for calibration and testing, laboratory numbers 0248 and 0626 respectively. For details of the laboratory Schedule of Accreditation please see the UKAS website (www.ukas.org).
2. The laboratory provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes.
3. Where a measurement reported is outside the specification limit by a margin less than the measurement uncertainty, the result of the test will be reported as indeterminate and the measurement uncertainty for the test will be quoted alongside the result. Measurement uncertainties for tests are held on file by the laboratory and available on request.
4. Opinions and interpretations in this report are outside the scope of UKAS Accreditation.
5. The results specified in this report relate only to the sample(s) of the product submitted for testing. Any change in the source or nature of the product or materials used in the product, method of manufacture or application could affect the performance of the product.
6. This test report does not constitute approval or endorsement of the product by either NSF Wales or its parent companies.
7. 
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11. Materials and products intended for use by public water supply company in the preparation or conveyance of water may need to satisfy more comprehensive toxicological requirements as specified by the Drinking Water Inspectorate. These additional requirements are necessary to ensure water Company usage compiles with Regulation 31 of the Water Supply (Water Quality) Regulations 2010.