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# Test Report

**REPORT NO.** **MA5391/K**



## PE

## Elofit ET140

## Borsafe HE3490-IM

**CLIENT:**
Nupigeco S.p.A
Via Stefano Ferrario 8 Z.I Sud-Ovest
21052 Busto Arsizio (VA)
Italy

reported by:

**DEEPA VIJAYAKUMAR**
**ANALYST**

**DATE: 14 AUGUST 2015**

reviewed by:

**CLIENT'S REFERENCE: 15AO-01677**

**GREG STRETTON**
**ACTING SECTION HEAD OF MATERIALS**

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation



1049

**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**
**WRAS TESTS OF EFFECT ON WATER QUALITY (BS 6920: 2014)**
**HIGH TEMPERATURE TESTS (BS6920: PART 3: 2014)**

**INFORMATION AND GUIDANCE NOTE**

**WATER REGULATIONS ADVISORY SCHEME**

The Scheme wishes to draw to the attention of product manufacturers and users that reports issued by accredited test laboratories do not of themselves constitute approval by the Scheme or the test laboratory. Only a letter from the Scheme, citing a Directory Reference Number, can be regarded as indicating approval.

## 1. SAMPLES FOR TESTING

| | |
|---|---|
| General composition of product | PE 100 HD |
| Trade name and reference of material | Borsafe HE3490 - IM |
| Material manufacturer | Borealis AG, Austria |
| Submitting organisation | Nupigeco S.p.A, Italy |
| Component name/ref | Elofit ET140 |
| Component manufacturer | Nupigeco S.p.A |
| Batch number of product | 20B10586 |
| Date of manufacture of product | 21 September 2014 |
| Method of manufacture of sample | injection moulding |
| Sampling procedure | taken from production |
| Description of sample | opaque shiny black plaque cut from fitting |
| Surface area of test piece | 19250 mm² |
| Number of articles constituting a test piece | 1 |
| Dimensions of test piece: length/width/thickness: | 127.00mm/56.80mm/13.12mm |
| Calibration mark of test containers | 1.5 litre |
| Date of application | 26 March 2015 |
| Date of receipt of test samples | 1 April 2015 |
| Condition of samples on receipt | satisfactory |
| Method of packaging | cardboard box |

| | |
|---|---|
| Conditions of storage of the samples between receipt and testing | as instructed in BS6920-2.1: 2014: clause 5.2 |
| Proposed use of the product | water fittings |

## 2. ODOUR AND FLAVOUR OF WATER

Number of tasters in the taste panel – 3

Extraction temperature – **23°C**

Date test commenced – 7 July 2015

Extract 1

(i) chlorine free test water:

| Taster | Odour description | Flavour description | Flavour dilution number |
|---|---|---|---|
| 1 | nil | nil | <1 |
| 2 | nil | nil | <1 |
| 3 | nil | nil | <1 |

(ii) chlorinated test water:

| Taster | Odour description | Flavour description | Flavour dilution number |
|---|---|---|---|
| 1 | nil | nil | <1 |
| 2 | nil | nil | <1 |
| 3 | nil | nil | <1 |

Comment - thus the samples of this product have been found to comply with the requirements of BS 6920: Part 1: clause 4 when extracted at **23°C**.

Extraction temperature – **85°C**

Date test commenced – 7 July 2015

Extract 1

(i) chlorine free test water:

| Taster | Odour description | Flavour description | Flavour dilution number |
|---|---|---|---|
| 1 | nil | astringent | 1 |
| 2 | nil | nil | <1 |
| 3 | nil | nil | <1 |

(ii) chlorinated test water:

| Taster | Odour description | Flavour description | Flavour dilution number |
|---|---|---|---|
| 1 | nil | astringent | 1 |
| 2 | nil | nil | <1 |
| 3 | musty | chalky | 1 |

Extract 7 (final extract)

(ii) chlorinated test water:

| Taster | Odour description | Flavour description | Flavour dilution number |
|---|---|---|---|
| 1 | nil | nil | <1 |
| 2 | nil | nil | <1 |
| 3 | nil | nil | <1 |

Comment - thus the sample of this product has been found to comply with the requirements of BS 6920: Part 1: clause 4 when extracted at **85°C.**

## 3. APPEARANCE OF WATER

Extraction temperature – 85°C

Date test commenced – 30 June 2015

Extract 1

| | Colour (Hazen units) | Turbidity (Formazine nephelometric units) |
|---|---|---|
| Test container (product) | <5 | 0.31 |
| Blank | <5 | 0.05 |
| Net increase | nil | 0.26 |

Comment - thus the sample of this product has been found to comply with the requirements of BS 6920: Part 1: clause 5 when extracted at 85°C.

## 4. GROWTH OF AQUATIC MICROORGANISMS

Date test commenced – 14 April 2015

Mean dissolved oxygen differences –

| | |
|---|---|
| Test container (product) | 0.9 mg/l |
| Negative reference (glass) sample | 0.0 mg/l |
| Positive reference (wax) sample | 5.5 mg/l |
| Mean dissolved oxygen concentration of the test control | 8.0 mg/l |

Note - At the end of this test the test piece showed no changes in colour and appearance.

Comment - thus the sample of this product has been found to comply with the requirements of BS 6920: Part 1: clause 6.

## 5. THE EXTRACTION OF SUBSTANCES THAT MAY BE OF CONCERN TO PUBLIC HEALTH

Extracts were tested using African Green Monkey Cell Line (VERO ATCC CCL 81)

Date test commenced – 30 June 2015

Extraction temperature – **23°C**

| Extract | Growth of cell tissue (monolayer) |
|---|---|
| Reagent blank | healthy, confluent |
| Zinc sulphate validation solution (cytotoxic) | cell death |
| Sample | healthy, confluent |

Comment - thus the sample of this product has been found to give a non-cytotoxic response and therefore it has been found to comply with the requirements of BS 6920: Part 1: clause 7 when extracted at **23°C.**

Extraction temperature – **85°C**

| Extract | Growth of cell tissue (monolayer) |
|---|---|
| Reagent blank | healthy, confluent |
| Zinc sulphate validation solution (cytotoxic) | cell death |
| Sample | healthy, confluent |

Comment - thus the sample of this product has been found to give a non-cytotoxic response and therefore it has been found to comply with the requirements of BS 6920: Part 1: clause 7 when extracted at **85°C.**

## 6. THE EXTRACTION OF METALS

Extraction temperature – 85°C

Date test commenced – 23 June 2015

Number of extracts – 1

All analyses carried out at location A, Sunbury Technology Centre, on duplicate samples of the product as specified below

Aluminium, Antimony, Arsenic, Boron, Cadmium, Chromium, Iron, Lead, Manganese, Mercury, Nickel, Selenium: Inductively coupled plasma – mass spectrometry (ICP-MS)

**Extract 1**

| Metal | Expression of the results | Max. admissible concentration | Reporting limit | Concentration final extract I | Concentration final extract II | Determined reagent blanks |
|---|---|---|---|---|---|---|
| Aluminium | Al µg/L | 200 | 20.0 | 105.0 | 144.0 | < 20.0 |
| Antimony | Sb µg/L | 5 | 0.5 | < 0.5 | < 0.5 | < 0.5 |
| Arsenic | As µg/L | 10 | 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Boron | B µg/L | 1000 | 100.0 | 366.0 | 371.0 | <100.0 |
| Cadmium | Cd µg/L | 5 | 0.5 | < 0.5 | < 0.5 | < 0.5 |
| Chromium | Cr µg/L | 50 | 5.0 | < 5.0 | < 5.0 | < 5.0 |
| Iron | Fe µg/L | 200 | 20.0 | < 20.0 | < 20.0 | < 20.0 |
| Lead | Pb µg/L | 10 | 1.0 | 1.43 | 1.96 | 2.4 |
| Manganese | Mn µg/L | 50 | 5.0 | < 5.0 | < 5.0 | < 5.0 |
| Mercury | Hg µg/L | 1 | 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Nickel | Ni µg/L | 20 | 2.0 | 6.32 | < 2.0 | < 2.0 |
| Selenium | Se µg/L | 10 | 1.0 | < 1.0 | < 1.0 | < 1.0 |

Comment - thus the samples of this product have been found to comply with the requirements of BS 6920: Part 1: clause 8 when extracted at 85°C.

Further Comment - In the Extraction of Metals Test the concentration of Lead found in the reagent blank exceeded the reporting limit of detection for this element. After investigation it was concluded, that the test was valid and that the results obtained for the product conform to the requirements for this test.

## CONCLUSION

The sample of the product referred to in this report has been tested in accordance with the methods specified in BS 6920: Part 2: 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: Methods of test" (including High Temperature Tests in accordance with BS 6920: Part 3: 2014) and the requirements of the Water Regulations Advisory Scheme 'WRAS Materials Guidance, Version 3 dated 10 March 2015

**This product has satisfied the criteria set out in BS 6920: Part 1: 2014 "Specification" and thus complies with the requirements of the Water Regulations Advisory Scheme Tests of Effect on Water Quality (BS 6920: 2014): It is suitable for use with hot water (up to 85°C) and cold water.**

N.B The results specified in this report relate only to the sample of the product submitted for testing. Any changes in the nature or source of ingredients and the process of manufacture or application could affect the suitability of the product for use in contact with potable water.

Materials and products intended for use by a public water supply company in the preparation or conveyance of water may need to satisfy more comprehensive toxicological requirements as set specified by the Drinking Water Inspectorate. These additional requirements are necessary to ensure legal compliance with Regulation 31 of Water Supply (Water Quality) Regulations 2000.