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THE WATER QUALITY CENTRE

(Thames Water Utilities Ltd)

Spencer House
Manor Farm Road
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Mr G Dormer-Anderson
Drizoro (UK) Limited
45A Lee Road
Blackheath
London
SE3 9RT

29 August 1996

Dear Mr Dormer-Anderson,

**TESTING OF NON-METALLIC MATERIALS FOR USE WITH POTABLE (DRINKING) WATER.
WATER BYELAWS SCHEME/WRC TESTS OF EFFECT ON WATER QUALITY.**

I enclose our final report for your product.

On behalf of the Water Byelaws Scheme I would remind you that this report does not, of itself, constitute "approval" by the Scheme. To obtain listing/approval by the Scheme you must send a copy of this report to the Scheme at the following address -

WRC Evaluation & Testing Centre, Fern Close, Pen-y-Fan Industrial
Estate, Oakdale, Gwent, NP1 4EH, United Kingdom.
(Tel No +44 (0) 1495 248 454, Fax No +44 (0) 1495 249 234).

NOTES

- - only a letter from the Scheme, citing a Directory Reference Number, can be regarded as indicating approval.
- - if your product(s) is intended for use by a public water supply company in the preparation or distribution of water it may need to satisfy more comprehensive toxicological requirements, as specified by the Drinking Water Inspectorate, to ensure legal compliance with Regulation 25 of the Water Supply (Water Quality) Regulations 1989 - *please see the accompanying details.*

If you have any queries about our report or think you may need the additional Drinking Water Inspectorate testing undertaken on your materials/products please do not hesitate to contact us.

We keep any remaining test samples for a period of one month after issue of our test report, and then dispose of them; if you want any of these samples returned to you (at your expense) please let us know.

We look forward to being of further service to you.

Yours sincerely



Bill. Bala
Senior Consultant



WATER BYELAWS SCHEME/WRC TESTS OF EFFECT ON WATER QUALITY (based on BS 6920) : TEST CRITERIA.

The following test criteria are used to determine whether your product(s) complies with the requirements of the Water Byelaws Scheme Tests of Effect on Water Quality.

TASTE OF WATER.

The first 1:1 dilutions of the final extracts obtained from your product using either chlorine-free or chlorinated (1mg/L) water must be free from taste.

If any taste is detected in the first dilution of these extracts by any of the taste panellists, then the product fails to meet this test criterion *unless* two further set of test samples are assessed and no taste is reported in the first dilution of the final (i.e. seventh) extracts from samples.

APPEARANCE OF WATER.

Any increase in the colour and turbidity of the final (i.e. seventh) extract from your product must be less than 5 Hazen units and 0.5 FNU respectively.

If any colour or turbidity is detected in the final extract, then the product fails to meet the test criteria *unless* two further samples are tested and the mean of the colour and turbidity measurements of the final extracts of *all* of the samples meet the test criteria.

GROWTH OF AQUATIC MICROORGANISMS.

The mean dissolved oxygen difference between the water in contact with your product and the negative control system must be less than 2.4 mg/L. (See Notes 1 and 2 below).

If your product gives a mean dissolved oxygen difference (MDOD) value in the range 1.7 to 2.9 mg/L, then two further samples of your product must be tested, and the arithmetic mean of the three dissolved oxygen differences must be less than 2.4 mg/L for your product to comply with the requirements of this part of these tests.

NOTES.

1. The mean dissolved oxygen difference (MDOD) value obtained for your product is a measure of the ability of your product to support the growth of microorganisms - as the growth of the microorganisms increases oxygen is removed from the test system and this loss compared with the control system. Thus the greater the loss of dissolved oxygen from the water in contact with your product, so the greater the MDOD value.
2. An additional reference system is included for all cementitious products - if this system gives an MDOD that is 0.5 mg/l greater than the MDOD for the positive reference test (Paraffin Wax), the product is reported as showing a bacteriostatic/cidal effect, and does not comply with the test requirements.

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

If the first aqueous extract from your product is free from toxicity to the test cell line, it can be regarded as suitable for use in contact with potable water in relation to this particular test.

There is no provision for any testing of additional samples in this test.

THE EXTRACTION OF METALS.

Any metal present in the final duplicate extracts obtained from your product must be at levels less than the Maximum Admissible Levels (MACs) given in "The Water Supply (Water Quality) Regulations 1989 : Statutory Instrument 1989 No 1147" - HMSO.

If the MACs of any metal is exceeded in either of the final extracts from the test product then the product fails to meet this test criterion *unless* three further samples of the product are tested and the levels of the specified metals in the extracts from all of these additional samples do not exceed the MACs.

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**WATER BYELAWS SCHEME/WRC
TESTS OF EFFECT ON WATER QUALITY
(based on BS 6920).**

Product : Maxseal Cementitious Coating
Report Reference : M101121
Page 1 of 4 Pages.

Drizoro (UK) Limited
45A Lee Road
Blackheath
London
SE3 9RT

Report Date : 29 August 1996

Executive Summary - this product has met the requirements of the Water Byelaws Scheme/WRC Tests of Effect on Water Quality (BS 6920): Cold Water Test Requirements. Audit Test.

NOTES.

1. This test work was undertaken in the NAMAS accredited Spencer House laboratory of Thames Water Utilities Ltd., NAMAS registration number 0677, unless otherwise stated.
2. Opinions and interpretations expressed herein are outside the scope of NAMAS accreditation.

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TESTING OF NON-METALLIC MATERIALS FOR USE WITH POTABLE (DRINKING) WATER. WATER BYELAWS SCHEME/WRC TESTS OF EFFECT ON WATER QUALITY (based upon BS 6920).

1. SAMPLES FOR TESTING.

General Composition of Material	Cementitious Coating
Trade Name/Reference of Material	Maxseal
Material Manufacturer	Drizoro S.A. Spain
Component Name/Reference	n/a
Component Manufacturer	n/a
Fitting Name/Reference	n/a
Fitting Manufacturer	n/a
Submitting Organisation	Drizoro (UK) Limited
Date of Receipt of Test Samples	16th May 1996
Description of Article	Water added to Maxseal powder to give a thick paste like consistency, allowed to stand for 15 minutes then brush applied to sanded glass panels. Final cure 6 days at 7°C.
Appearance of Article	Grey
Surface Area of One Article in mm ²	15000
Number of Articles constituting a Sample	1
Calibration Mark of the Test Container in L	1
Extraction Temperature for Tests 2 and 6	25°C

Preconditioning of Sample : the sample was preconditioned in water (Aggressivity Index > 12) for 3 days until the pH fell below 9.0 on two consecutive days.
Preconditioning Profile (days) : pH 10.2, 8.2, 8.2

2. TASTE OF WATER.

Temperature of Extraction : 25°C

Date Test Started : 11th June 1996.

The extracts detailed below were assessed by a taste panel of Two tasters.

Extract	Water	Taste Descriptor	Dilution
First	Chlorine free	None	<1
First	Chlorinated	Slight Chlorophenolic	2
Final	Chlorine free	--	--
Final	Chlorinated	None	<1

COMMENT. On the basis of these results the samples of this product have been found to comply with the requirements of BS 6920 : Part 1 : Clause 4 when extracted at 25°C.



6. EXTRACTION OF METALS.
Temperature of Extraction : 25°C

Date Test Started : 11th June 1996.

The results obtained for the final (6th) extract are given below -

Element		Unit	MAC	Reporting Limit	Sample 1	Sample 2	Reagent Blank
Aluminium	Al	µg/L	200	20.0	116.0	110.0	<20.0

Analytical methods.

Aluminium - inductively coupled plasma optical emission spectrometry [method SBC 12].

NOTES -

1. The analysis of these extracts was undertaken by NAMAS accredited laboratory registration number 1229.
2. These techniques are in continuous use for analysis of drinking water metals; all of these techniques are fully validated to the requirements of "A Manual on Analytical Quality Control for the Water Industry" (NS 30) and the requirements laid down by the Drinking Water Inspectorate. Each technique has a comprehensive AQC protocol including control solutions and spike recovery testing with each batch of samples for analysis.

COMMENT. On the basis of these results the samples of this product have been found *to comply* with the requirements of BS 6920 : Part 1 : Clause 8 when extracted at 25°C.

CONCLUSIONS.

The samples of the product referred to in this report have been tested in accordance with the methods specified in the Water Byelaws Scheme Tests of Effect on Water Quality (based on BS 6920 : Part 2 : 1988/90 "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"), and the Water Byelaws Scheme Information and Guidance Note No 9-01-02, Issue 1 "Requirements for the testing of non-metallic products for use in contact with potable water".

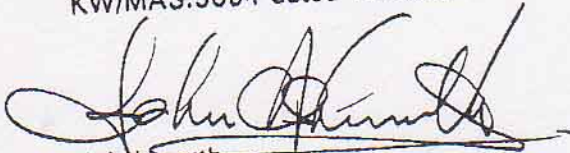
This product has satisfied the criteria of the Water Byelaws Scheme (based upon BS 6920 : Part 1 : 1990 "Specification") and thus complies with the requirements of the Water Byelaws Scheme Tests of Effect on Water Quality, Audit Test.

NO OTHER TESTS WERE UNDERTAKEN ON THIS PRODUCT.

NOTES -

1. The results specified in this report relate to the samples submitted for evaluation. 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.
2. We would draw to your attention that reports issued by the accredited test laboratories do not of themselves constitute approval by the Water Byelaws Scheme or the test laboratory. Only a letter from the Scheme, citing a Directory Reference Number, can be regarded as indicating approval.
3. 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 25 of the Water Supply (Water Quality) Regulations 1989.

Note for the WRc Evaluation and Testing Centre : Audit Tests in accordance with your letter ref KW/MAS.5094 dated 1st June 1996.



J Ashworth
Materials Manager