

Our Ref: MAT/LAB 562M

4th February 2008

Mr Lee Smith
Line-X Protective Coatings Limited
Line-X House, Brannam Crescent
Roundswell Business Park
Barnstaple
North Devon
EX31 3TD

Dear Lee

BS 6920 leaching tests for non-metallic products for use in contact with potable water.

Please find enclosed a copy of our final report for BS 6920 leaching tests on test samples of Aquasurethane Extreme XS 350.

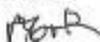
We are pleased to inform you that your product gave satisfactory results in the BS 6920 leaching tests (five separate tests). The enclosed report does not constitute approval and has not been forwarded to the Water Regulations Advisory Scheme (WRAS).

In order to obtain WRAS approval, a letter citing a Directory Reference Number, you will need to send a copy of the enclosed report, a completed copy of the form M2 (issued by WRAS) and a remittance to the WRAS at the following address;

Water Regulations Advisory Scheme
Fern Close,
Pen-y-Fan Industrial Estate,
Oakdale,
Gwent,
NP11 3EH,

If you have any queries or we can be of any further assistance with BS 6920 or other testing please do not hesitate to contact me.

Best regards



Mark Norris
Materials Test Manager
WRc-NSF Ltd
DDI Number: +44 (0) 1495 236268, Reception +44 (0) 1495 236260
Email: mark.norris@wrcnsf.com, Fax Number: +44 (0) 1495 249234
<http://www.wrcnsf.com>
Enc

Offices at: Unit 30, Fern Close, Pen-y-Fan Industrial Estate, Oakdale, Newport, NP11 3EH
Unit 25, Robert Cort Estate, Britten Road, Reading, RG2 0AU



Tel: +44 (0)1495 236260. Fax: +44 (0)1495 249234. E-mail: info@wrcnsf.com Website: www.wrcnsf.com

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WATER REGULATIONS ADVISORY SCHEME

BS6920 TEST ON EFFECT OF WATER QUALITY

FINAL REPORT

Organisation: Line-X Protective Coatings Limited

Product: Aquaurethane Extreme XS 350

WRc-NSF REPORT No MAT/LAB 562M

Date of Report 18th December 2007

Offices at: Unit 30, Fern Close, Pen-y-Fan Industrial Estate, Oakdale, Newport, NP11 3EH
Unit 25, Robert Cort Estate, Britten Road, Reading, RG2 0AU

Tel: +44 (0)1495 236260. Fax: +44 (0)1495 249234. E-mail: info@wrcnsf.com Website: www.wrcnsf.com

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| | |
|--|-----------------------------------|
| WRc-NSF Final Report for the Testing of a Product for Water Regulations Advisory Scheme Approval | WRc-NSF Report No MAT/LAB 562M |
| Name of Organisation: Line-X Protective Coatings Limited | Date of Report 18/12/07 |
| Product: Aquasurethane Extreme XS 350 | |

1. SUMMARY

| Test | Result |
|--|--------|
| Odour and flavour of water | Pass |
| Appearance of water | Pass |
| Growth of aquatic microorganisms | Pass |
| The extraction of substances that may be of concern to public health | Pass |
| Extraction of metals | Pass |

This product has satisfied the criteria set out in BS6920: Part 1: 2000 "Specification" and thus does comply with the requirements of the Water Regulations Advisory Scheme Tests of Effect on Water Quality and is suitable for use with cold water but not hot water.

Mark Norris
Mr Mark Norris, Materials Test Manager

Date 18th Dec 2007

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| Please note the following statements |
| a) The samples of the product referred to in this report have been tested in accordance with the methods specified in BS6920: 2000 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. |
| b) This work has been undertaken in the UKAS accredited laboratory of WRc-NSF Ltd Oakdale, UKAS registration number 0626, unless otherwise stated. Opinions and interpretations expressed herein are outside the scope of UKAS accreditation. |
| c) The results specified in this report relate only to the samples(s) of this product submitted for testing. Any changes in the nature or source of ingredients and the process of manufacturer or application could affect the suitability of this product for use in contact with potable water. |
| d) We draw to your attention that reports issued by the accredited test laboratories do not of themselves constitute approval by the Water Regulations Advisory Scheme or the test laboratory. Only a letter from the Scheme, citing a Directory Reference number can be regarded as indicating approval. |
| e) 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 specified by the Drinking Water Inspectorate. These additional requirements are necessary to ensure Water Company usage complies with Regulation 31 of the Water Supply (Water Quality) Regulations 2000. |

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| Product: Aquaurethane Xtreme XS 350 | Date of Report 18/12/07 |

2. SAMPLES FOR TESTING

BS6920, Section 2.1 and in-house method PROC/MAT 001.

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| Contact name: Mr Lee Smith |
| Name of organisation: Line-X Protective Coatings Limited |
| Address: Line-X House Brannam Crescent Roundswell Business Park Barnstaple North Devon EX31 3TD |

| | |
|--------------------------|------------------------------------|
| Product: | Aquaurethane Xtreme XS350 |
| Product manufacturer: | Line-X Protective Coatings Limited |
| Submitting organisation: | Line-X Protective Coatings Limited |

| | |
|--------------------------------------|--|
| Date of receipt of product for test: | 25/10/07 |
| Trade name and reference of product: | Aquaurethane Xtreme XS350 |
| Batch number | Not known |
| General composition of product: | Polyurea |
| Shore hardness: | Not applicable |
| Typical use of the product: | Lining for water containing structures |

| | |
|--|---|
| Sampling procedure: | Random |
| Receipt conditions and packaging: | In good condition |
| Storage conditions: | As in BS 6920 Part 2 Section 2.1 Clause 5.2 |
| Description/Appearance of the product: | Black coating |

| | |
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| Product: Aquasurethane Extreme XS 350 | Date of Report 18/12/07 |

| | |
|---------------------------|----------------|
| Component name/reference: | Not applicable |
| Component manufacturer: | Not applicable |
| Fitting name/reference: | Not applicable |
| Fitting manufacturer: | Not applicable |

| | |
|--------------------------------|-------------------------------|
| Test sample preparation: | Product prepared by applicant |
| Date test sample manufactured: | Not known |
| Date test sample prepared: | 25/10/07 |

| | |
|---|-----------------------|
| Surface area of one article: | 7500 mm ² |
| Number of articles constituting a sample: | Two |
| Surface area for test: | 15000 mm ² |
| Calibration mark of test container: | 1 Litre |

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| Product: Aquasurethane Extreme XS 350 | Date of Report 18/12/07 |

3. ODOUR AND FLAVOUR OF WATER

Methodology: BS6920, Section 2.2.1 and in-house method PROC/MAT 004 and 006.

Test results

| | |
|---------------------------------------|--|
| Date leaching tests started: 30/10/07 | Date leaching tests finished: 08/11/07 |
| Number of panellists: 3 | Temperature of extraction: 23 ±2 °C |

Odour test

| Extract | Date of test | Test water | Dilution number* | Odour descriptor |
|---------|--------------|---------------|------------------|------------------|
| First | 31/10/07 | Chlorine free | 0(0) | None |
| First | 31/10/07 | Chlorinated | 0(1) | Sweet |
| Final | - | Chlorine free | - | - |
| Final | 08/11/07 | Chlorinated | 0(1) | No descriptor |

Flavour test

| Extract | Date of test | Test water | Dilution number* | Flavour descriptor |
|---------|--------------|---------------|---------------------------------------|--------------------|
| First | 31/10/07 | Chlorine free | 1(0) | None |
| First | 31/10/07 | Chlorinated | Not suitable for flavour failed odour | |
| Final | - | Chlorine free | - | - |
| Final | 08/11/07 | Chlorinated | 1(0) | None |

* figure in brackets is the number of panellists detecting an odour or flavour at this dilution

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| On the basis of these results the samples of this product referred to in this report have been found to comply with the requirements of BS6920, Part 1, Clause 4 |
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| Product: Aquasurethane Extreme XS 350 | Date of Report 18/12/07 |

4. APPEARANCE OF WATER

Methodology: BS6920, Section 2.3 and in-house methods PROC/MAT 004, ING 78 (colour) and ING 100 (turbidity).

Test results

| | |
|---------------------------------------|--|
| Date leaching tests started: 30/10/07 | Date leaching tests finished: 31/10/07 |
| Temperature of extraction: 23 ±2 °C | |

Colour

| Extract | Date of test | Hazen units | | Test sample effect |
|---------|--------------|-------------|---------|--------------------|
| | | Blank | Extract | |
| First | 31/10/07 | <2 | <2 | None |
| Final | - | - | - | - |

Turbidity

| Extract | Date of test | Formazine Nephelometric units | | Test sample effect |
|---------|--------------|-------------------------------|---------|--------------------|
| | | Blank | Extract | |
| First | 31/10/07 | <0.1 | <0.1 | None |
| Final | - | - | - | - |

First extract becomes final extract

On the basis of these results the samples of this product referred to in this report have been found to comply with the requirements of BS6920, Part 1, Clause 5

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| Product: Aquasurethane Extreme XS 350 | Date of Report 18/12/07 |

5. GROWTH OF MICROORGANISMS

Methodology: BS6920, Section 2.4 and in-house method PROC/MIC 001.

Test Results

| | |
|---------------------------------------|--|
| Date leaching tests started: 30/10/07 | Date leaching tests finished: 18/12/07 |
| Incubation temperature: 30 ± 1 °C | |

| Mean dissolved oxygen difference MDOD (mg l ⁻¹ O ₂) | |
|--|------|
| Test sample | 0.94 |
| Positive reference (paraffin wax) | 6.87 |
| Negative reference (glass) | 0.29 |

| | |
|--|------|
| Test water control dissolved oxygen (mg l ⁻¹ O ₂) | 8.79 |
|--|------|

| | |
|---|--|
| Comments on changes in appearance of test material and any visible microbial growth | At the end of this test, the test pieces 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 comply with the requirements of BS6920, Part 1, Clause 6

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| Product: Aquasurethane Extreme XS 350 | Date of Report 18/12/07 |

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

Methodology: BS6920, Section 2.5 in-house methods PROC/MAT 004 and PROC/MIC 004.

Test set-up Date: 31/10/07

| | |
|---|---|
| Cell line: VERO cell line of African green monkey kidney cells (ATCC number CCL 81). | |
| Media preparation date: 28/10/07 | Passage number: 47 |
| Cell concentration in sample: 7.5×10^5 | Positive control: Zinc sulphate Bt 39 |
| Morphology: Confluent growth of elongated cells, some round cells and cell debris. Media orange/pink in colour. | |
| Media log batch numbers | Medium concentrate (CCM): B95 Distilled water (SDW): B40 |

Test results

| | |
|--|--|
| Date leaching tests started: 30/10/07 | Date leaching tests finished: 31/10/07 |
| Temperature of extraction: 23 ± 2 °C | |

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

On the basis of these results the samples of this product referred to in this report have been found to comply with the requirements of BS6920, Part 1, Clause 7

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| Product: Aquasurethane Extreme XS 350 | Date of Report 18/12/07 |

7. THE EXTRACTION OF METALS

Methodology: BS6920, Section 2.6, in-house methods PROC/MAT 006 and INGs, as specified, metals analysis undertaken in the UKAS accredited laboratory of WRC-NSF Ltd Reading, UKAS registration number 1550.

Test results

| | |
|---------------------------------------|--|
| Date leaching tests started: 30/10/07 | Date leaching tests finished: 31/10/07 |
| Analysis Registration No N22467 | Temperature of extraction: 23 ±2 °C |

| Metal ($\mu\text{g l}^{-1}$) | Analytical Method (in-house method) | MAC ($\mu\text{g l}^{-1}$) | LOD ($\mu\text{g l}^{-1}$) | Blank ($\mu\text{g l}^{-1}$) | Sample 1 ($\mu\text{g l}^{-1}$) | Sample 2 ($\mu\text{g l}^{-1}$) |
|--|-------------------------------------|---|------------------------------|--------------------------------|-----------------------------------|-----------------------------------|
| Aluminium | ICPMS (ING113) | 200 | 20 | <20 | <20 | <20 |
| Antimony | HGAAS (ING95) | 10 # | 0.5# | <0.5 | <0.5 | <0.5 |
| Arsenic | ICPMS (ING113) | 50 # | 1# | <1 | <1 | <1 |
| Barium | ICPMS (ING113) | 1000 | 100 | <100 | <100 | <100 |
| Cadmium | ICPMS (ING113) | 5 | 0.5 | <0.5 | <0.5 | <0.5 |
| Chromium | ICPMS (ING113) | 50 | 5 | <5 | <5 | <5 |
| Iron | ICPMS (ING113) | 200 | 20 | <20 | <20 | <20 |
| Lead | ICPMS (ING113) | 50 # | 1# | <1 | <1 | 1.63 |
| Manganese | ICPMS (ING113) | 50 | 5 | <5 | <5 | <5 |
| Mercury | CVAAS (ING75) | 1 | 0.1 | <0.1 | <0.1 | <0.1 |
| Nickel | ICPMS (ING113) | 50 # | 2# | <2 | 3.28 | 3.30 |
| Selenium | ICPMS (ING113) | 10 | 1 | <1 | <1 | <1 |
| Silver | ICPMS (ING113) | 10 | 1 | <1 | <1 | <1 |
| MAC - Maximum admissible concentration | | ICPMS Inductively Coupled Plasma Mass Spectrometry | | | | |
| LOD - Required limit of detection | | CVAAS Cold Vapour Atomic Absorption Spectrometry | | | | |
| | | HGAAS Hydride Generation Atomic Absorption Spectrometry | | | | |
| # - MAC is taken from the 1989 Drinking Water Directive requirements | | | | | | |
| LOD is based on the 1998 Drinking Water Directive requirements. | | | | | | |

First extract becomes final extract

On the basis of these results the samples of this product referred to in this report have been found to comply with the requirements of BS6920, Part 1, Clause 8

