

TEST REPORT

Client: STEULER-KCH GmbH

Product: Ebonite Vulkodurit 1250

Tests Undertaken: **BS 6920: 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**

Report Number: MAT/LAB 729E/3

Date of Report: 19th February 2014

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Client: STEULER-KCH GmbH
Product: Ebonite Vulkodurit 1250
Test Criteria: BS 6920: 2000

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Client: STEULER-KCH GmbH
 Product: Ebonite Vulkodurit 1250
 Test Criteria: BS 6920: 2000

1. EXECUTIVE SUMMARY

Test	Result
Odour and flavour of water	Pass
Appearance of water	Not applicable
Growth of aquatic microorganisms	Pass
The extraction of substances that may be of concern to public health	Not applicable
Extraction of metals	Pass

Audit Tests were carried out on this material in accordance with the letter from WRAS, dated 03/08/12. Previous approval number 0710556.

This product has satisfied the criteria set out in BS 6920: Part 1: 2000, Clauses 4,6 & 8 and thus is suitable for use with cold water but not hot water.



Mrs Ruth Manning, Materials Testing Project Manager

Date 19/02/14

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 BS 6920: 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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Client: STEULER-KCH GmbH
 Product: Ebonite Vulkodurit 1250
 Test Criteria: BS 6920: 2000

2. SAMPLES FOR TESTING

BS 6920: Part 2: Section 2.1 and in-house method PROC/MAT 001.

Contact name	Dr Johannes Steffen
Name of organisation	STEULER-KCH GmbH
Address	Breggarten 1 D-56427 Siershahn Germany

Product	Ebonite Vulkodurit 1250
Product manufacturer	STEULER-KCH GmbH
Submitting organisation	STEULER-KCH GmbH
Product manufacturing site	Siershahn, Germany
Method of manufacture	Extrusion

Trade name and reference of product	Vulkodurit 1250
Batch number	Not Provided
General nature of product	Natural rubber
Shore hardness	72 D
Typical use of the product	Lining for corrosion protection

Sampling procedure	Random
Receipt conditions	In good condition
Receipt packaging	Plastic bag
Storage conditions	As in BS 6920: Part 2: Section 2.1: Clause 5.2
Description/appearance of the product for testing	Black rubber sheet

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Client: STEULER-KCH GmbH
 Product: Ebonite Vulkodurit 1250
 Test Criteria: BS 6920: 2000

MAT/LAB 729E – original samples

Date of receipt of product for test	18/11/12
Test sample preparation	Product prepared by applicant
Date test sample manufactured	21/08/12
Surface area of one article	14,954 mm ²
Number of articles constituting a sample	1
Inradius	2 mm
Surface area for test	14,954 mm ²
Calibration mark of test container	1 L

MAT/LAB 378G & 379G – samples for repeat odour and flavour and growth of microorganism testing

Date of receipt of product for test	20/05/13
Test sample preparation	Product prepared by applicant
Date test sample manufactured	21/08/12
Surface area of one article	16,480 mm ²
Number of articles constituting a sample	1
Inradius	2 mm
Surface area for test	16,480 mm ²
Calibration mark of test container	1 L

MAT/LAB 672G – samples for repeat odour and flavour testing at the reduced temperature 23 °C

Date of receipt of product for test	12/11/13
Test sample preparation	Product prepared by applicant
Date test sample manufactured	15/10/12
Surface area of one article	16,480 mm ²
Number of articles constituting a sample	1
Inradius	2 mm
Surface area for test	16,480 mm ²
Calibration mark of test container	1 L

Client: STEULER-KCH GmbH
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Test Criteria: BS 6920: 2000

MAT/LAB 740G – samples for the extraction of metals test

Date of receipt of product for test	17/12/13
Test sample preparation	Product prepared by applicant
Date test sample manufactured	05/10/13
Surface area of one article	15,228 mm ²
Number of articles constituting a sample	1
Inradius	2 mm
Surface area for test	15,228 mm ²
Calibration mark of test container	1 L

Client: STEULER-KCH GmbH

Product: Ebonite Vulkodurit 1250

Test Criteria: BS 6920: 2000

3. ODOUR AND FLAVOUR OF WATER

Methodology: BS 6920: Part 2: Section 2.2.1 and in-house method PROC/MAT 004 and 006.

Date leaching tests started: 25/11/12	Date leaching tests finished: 04/12/12
Number of panellists: 3	Temperature of extraction: 50 °C ±2 °C

MAT/LAB 729E

Odour test

Extract	Date of test	Test water	Dilution number*	Odour descriptor
First	26/11/12	Chlorine free	0(3)	Rubber, Burnt
First	26/11/12	Chlorinated	0(3)	Rubber, Burnt, Stale
Final	04/12/12	Chlorine free	0(3)	Rubber, Burnt
Final	04/12/12	Chlorinated	0(2)	Burnt

Flavour test

Extract	Date of test	Test water	Dilution number*	Flavour descriptor
First	26/11/12	Chlorine free	Not suitable for flavour failed odour	
First	26/11/12	Chlorinated	Not suitable for flavour failed odour	
Final	04/12/12	Chlorine free	2(1)	Burnt
Final	04/12/12	Chlorinated	2(1)	Burnt

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

In the basis of these results the samples of this product referred to in this report have been found not to comply with the requirements of BS 6920: Part 1: 2000, Clause 4

Client: STEULER-KCH GmbH
 Product: Ebonite Vulkodurit 1250
 Test Criteria: BS 6920: 2000

Methodology: BS 6920: Part 2: Section 2.2.1 and in-house method PROC/MAT 004 and 006.

Date leaching tests started: 18/06/13	Date leaching tests finished: 27/06/13
Number of panellists: 3	Temperature of extraction: (50 ±2) °C

MAT/LAB 378G

Odour test

Extract	Date of test	Test water	Dilution number*	Odour descriptor
First	19/06/13	Chlorine free	0(3)	Rubber
First	19/06/13	Chlorinated	0(3)	Rubber, Stale
Final	27/06/13	Chlorine free	0(2)	Rubber
Final	27/06/13	Chlorinated	0(1)	Stale

Flavour test

Extract	Date of test	Test water	Dilution number*	Flavour descriptor
First	19/06/13	Chlorine free	Not suitable for flavour; failed odour	
First	19/06/13	Chlorinated	Not suitable for flavour; failed odour	
Final	27/06/13	Chlorine free	1(1)	Stale
Final	27/06/13	Chlorinated	1(0)	None

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

On the basis of these results the samples of this product referred to in this report have been found not to conform with the requirements of BS 6920: Part 1: 2000, Clause 4

WRc-NSF Test Report**Commercial in Confidence**

Client: STEULER-KCH GmbH

Product: Ebonite Vulkodurit 1250

Test Criteria: BS 6920: 2000

Methodology: BS 6920: Part 2: Section 2.2.1 and in-house method PROC/MAT 004 and 006.

Date leaching tests started: 18/06/13	Date leaching tests finished: 27/06/13
Number of panellists: 3	Temperature of extraction: (50 ±2) °C

MAT/LAB 379G

Odour test

Extract	Date of test	Test water	Dilution number*	Odour descriptor
First	19/06/13	Chlorine free	0(3)	Rubber
First	19/06/13	Chlorinated	0(3)	Rubber, Stale
Final	27/06/13	Chlorine free	0(2)	Rubber
Final	27/06/13	Chlorinated	0(1)	Stale

Flavour test

Extract	Date of test	Test water	Dilution number*	Flavour descriptor
First	19/06/13	Chlorine free	Not suitable for flavour; failed odour	
First	19/06/13	Chlorinated	Not suitable for flavour; failed odour	
Final	27/06/13	Chlorine free	1(0)	None
Final	27/06/13	Chlorinated	1(0)	None

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

On the basis of these results the samples of this product referred to in this report have been found not to conform with the requirements of BS 6920: Part 1: 2000, Clause 4

At the customers request the test was repeated at a reduced temperature

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Client: STEULER-KCH GmbH
 Product: Ebonite Vulkodurit 1250
 Test Criteria: BS 6920: 2000

Methodology: BS 6920: Part 2: Section 2.2.1 and in-house method PROC/MAT 004 and 006.

Date leaching tests started: 24/11/13	Date leaching tests finished: 03/12/13
Number of panellists: 3	Temperature of extraction: (23 ±2) °C

MAT/LAB 672

Odour test

Extract	Date of test	Test water	Dilution number*	Odour descriptor
First	25/11/13	Chlorine free	0(1)	Stale
First	25/11/13	Chlorinated	0(0)	None
Final	03/12/13	Chlorine free	0(0)	None
Final	-	Chlorinated	-	-

Flavour test

Extract	Date of test	Test water	Dilution number*	Flavour descriptor
First	25/11/13	Chlorine free	Not suitable for flavour; failed odour	
First	25/11/13	Chlorinated	1(0)	None
Final	03/12/13	Chlorine free	1(0)	None
Final	-	Chlorinated	-	-

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

On the basis of these results the samples of this product referred to in this report have been found to conform with the requirements of BS 6920: Part 1: 2000, Clause 4
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Client: STEULER-KCH GmbH
 Product: Ebonite Vulkodurit 1250
 Test Criteria: BS 6920: 2000

4. GROWTH OF MICROORGANISMS

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

Date testing started: 13/11/12	Date testing finished: 01/01/13
Incubation temperature: 30 °C ±1 °C	

Mean dissolved oxygen difference MDOD (mg L ⁻¹ O ₂)	
Test sample MAT/LAB 729E	2.32
Positive reference (paraffin wax)	6.83
Negative reference (glass)	0.30

Test water control dissolved oxygen (mg L ⁻¹ O ₂)	8.34
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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.
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On the basis of these results the samples of this product referred to in this report have been found not to comply with the requirements of BS 6920: Part 1: 2000, Clause 6

In accordance with BS 6920: Part 1: 2000, Clause 6 the test was repeated in duplicate

Client: STEULER-KCH GmbH
 Product: Ebonite Vulkodurit 1250
 Test Criteria: BS 6920: 2000

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

Date testing started: 21/05/13	Date testing finished: 09/07/13
Incubation temperature: (30 ±1) °C	

Mean dissolved oxygen difference MDOD (mg L ⁻¹ O ₂)	
Test sample MAT/LAB 378G	0.70
Test sample MAT/LAB 379G	0.55
Positive reference (paraffin wax)	6.04
Negative reference (glass)	0.08

Test water control dissolved oxygen (mg L ⁻¹ O ₂)	8.14
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Comments on changes in appearance of test material and any visible microbial growth	At the end of this test, the test sample showed no change in colour or appearance.
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The arithmetical mean result of the three MDOD values is 1.19 mg L⁻¹ O₂
 On the basis of these results the samples of this product referred to in this report have been found to conform with the requirements of BS 6920: Part 1: 2000, Clause 6

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 Test Criteria: BS 6920: 2000

5. THE EXTRACTION OF METALS

Methodology: BS 6920: Part 2: Section 2.6 and in-house method PROC/MAT 006 and ITS method number MT/ELE/23. Metals analysis undertaken in the UKAS accredited laboratory of ITS Testing Services (UK) Ltd, Sunbury-on-Thames, Middlesex. UKAS registration number 1049.

Date leaching tests started: 19/01/14	Date leaching tests finished: 20/01/14
Temperature of extraction: (23 ±2) °C	

MAT/LAB 740G

First Extract

Date of analysis: 24/27/01/14	Report No. RT/ELE 12895
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Metal (µg L ⁻¹)	MAC (µg L ⁻¹)	LOD (µg L ⁻¹)	Blank 1 (µg L ⁻¹)	Blank 2 (µg L ⁻¹)	Sample 1 (µg L ⁻¹)	Sample 2 (µg L ⁻¹)
Aluminium	200	20	<20	<20	<20	<20
Antimony	5	0.5	<0.5	<0.5	<0.5	<0.5
Arsenic	10	1	<1	<1	<1	<1
Barium	1000	100	<100	<100	<100	<100
Cadmium	5	0.5	<0.5	<0.5	<0.5	<0.5
Chromium	50	5	<5	<5	<5	<5
Iron	200	20	<20	<20	<20	<20
Lead	25	1	<1	<1	<1	<1
Manganese	50	5	<5	<5	<5	<5
Mercury	1	0.1	<0.1	<0.1	<0.1	<0.1
Nickel	20	2	<2	<2	<2	<2
Selenium	10	1	<1	<1	<1	<1

Analytical Method - ICPMS Inductively Coupled Plasma Mass Spectrometry

MAC - Maximum admissible concentration

LOD - Required limit of detection

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 conform with the requirements of BS 6920: Part 1: 2000, Clause 8

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NOTES

1. This report is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service (UKAS). WRc-NSF 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 recognised national standards, and to units of measurement realised at the National Physical Laboratory or other recognised national standards laboratories.
3. Opinions and interpretations in this report are outside the scope of UKAS Accreditation.
4. 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.
5. This test report does not constitute approval or endorsement of the product by either WRc-NSF or its parent companies.
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