



# BS6920 Test Report

REPORT NO.: MA6581/F

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**Two component epoxy coating**

**HEMPADUR 85671**

<b>CLIENT:</b>		Hempel A/S Lundtoftegaardsvej 91 2800Kgs. Lygby Denmark
<b>CLIENT'S REFERENCE:</b>		Helle Fiedler
<b>DATE</b>		<b>14 May 2019</b>
<b>REPORTED BY:</b>  <b>MILLEY KABALI ANALYST</b>		<b>REVIEWED BY:</b>  <b>HANNAH TODD TECHNICAL SPECIALIST</b>

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**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)  
FACTORY APPLIED PRODUCTS; 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.

<b>1. SAMPLES FOR TESTING</b>		
<b>General composition of product</b>		two component amine adduct cured phenolic epoxy coating
<b>Trade name and reference of material</b>		HEMPADUR 85671: base: 85675 curing agent: 97371
	<b>Coat 1</b>	HEMPADUR 85671 Light red (50900)
	<b>Coat 2</b>	HEMPADUR 85671 Light grey (11150)
<b>Material manufacturer</b>		Hempel Manufacturing (Poland) Sp. Zoo
<b>Submitting organisation</b>		Hempel A/S Denmark
<b>Batch number of product</b>	<b>Coat 1 – Base</b>	85675:048091101
	<b>Coat 1 – Curing Agent</b>	97371:048091876
	<b>Coat 2 – Base</b>	85675:048011567
	<b>Coat 2 – Curing Agent</b>	97371:048091876
<b>Date of manufacture of product</b>		November 2018
<b>Method of manufacture of sample</b>		airless application
<b>Sampling procedure</b>		pecially prepared test pieces
<b>Description of sample</b>		grey opaque matt smooth coated panel
<b>Surface area of test piece</b>		15295mm <sup>2</sup>
<b>Number of articles constituting a test piece</b>		1
<b>Dimensions of test piece:</b>	<b>length/width/thickness:</b>	119.71mm/60.23mm/2.43mm
<b>Calibration mark of test containers</b>		1 litre
<b>Date of application</b>		7 December 2018
<b>Date of receipt of test samples</b>		12 Decemebr 2018
<b>Condition of samples on receipt</b>		satisfactory
<b>Method of packaging</b>		paper
<b>Conditions of storage of the samples from receipt to testing</b>		as instructed in BS6920-2.1: 2014: clause 5.2
<b>Proposed use of the product</b>		for potable water pipes and tanks

## FACTORY APPLIED PRODUCTS

The samples were prepared in accordance with manufacturer's application instructions.

<b>Samples prepared by</b>	Hempel A/S
<b>Nature of test plates</b>	glass panels
<b>Mode of preparation of the product</b>	base and curing agent mixed in an 8.9:1.2 volume ratio and applied to the test panel using airless spray application
<b>Number of coats</b>	2
<b>Wet film thickness of each coat</b>	150µm
<b>Application conditions</b>	20°C
<b>Curing conditions</b>	5 days at 20°C followed by 7 hours @ 50°C (28 Novemeber 2018)
<b>Date of preparation of the samples</b>	19 November 2018 – 28 November 2018

## 2. ODOUR AND FLAVOUR OF WATER

Number of tasters in the taste panel – 3

Extraction temperature - 23°C

Date test commenced - 19 March 2019

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	solvent	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 - 60°C

Date test commenced - 12 March 2019

Extract 1

(i) chlorine free test water:

TASTER	ODOUR DESCRIPTION	FLAVOUR DESCRIPTION	FLAVOUR DILUTION NUMBER
1	solvent	N/A	N/A
2	benzene	N/A	N/A
3	fuel/marzipan	N/A	N/A

(ii) chlorinated test water:

TASTER	ODOUR DESCRIPTION	FLAVOUR DESCRIPTION	FLAVOUR DILUTION NUMBER
1	solvent	N/A	N/A
2	chlorophenolic	N/A	N/A
3	solvent	N/A	N/A

Extract 7 (final extract)

(i) chlorine free test water:

TASTER	ODOUR DESCRIPTION	FLAVOUR DESCRIPTION	FLAVOUR DILUTION NUMBER
1	solvent	N/A	N/A
2	solvent	N/A	N/A
3	fuel/solvent	N/A	N/A

(ii) chlorinated test water:

TASTER	ODOUR DESCRIPTION	FLAVOUR DESCRIPTION	FLAVOUR DILUTION NUMBER
1	solvent	N/A	N/A
2	solvent	N/A	N/A
3	solvent	N/A	N/A

Comment - thus the sample of this product has been found NOT to comply with the requirements of BS 6920: Part 1: clause 4 when extracted at 60°C.

### 3. APPEARANCE OF WATER

Extraction temperature - 60°C

Date test commenced - 12 February 2019

Extract 1

	COLOUR (HAZEN UNITS)	TURBIDITY (FORMAZINE NEPHELOMETRIC UNITS)
Test container (product)	<2.5	0.16
Blank	<2.5	0.03
Net increase	0.0	0.13

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 60°C.

### 4. GROWTH OF AQUATIC MICROORGANISMS

Date test commenced - 18 December 2018

Mean dissolved oxygen differences –

Test container (product)	1.66mg/l
Negative reference (glass) sample	0.7mg/l
Positive reference (wax) sample	8.2mg/l
Mean dissolved oxygen concentration of the test control	10.1mg/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.

Further Comment - The Mean Dissolved Oxygen Difference for the negative (glass) reference container was 0.7mg/l and thus outside the range specified in Section 2.4 of BS6920. After investigation it was concluded, however, that the test system was valid and the test results obtained could be accepted.

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

Extracts were tested using Monkey African Green Kidney CITES (Lot 10F019)

Extraction temperature - **23°C**

Date test commenced - 12 February 2019

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 - **60°C**

Date test commenced - 19 March 2019

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 **60°C**.

## 6. THE EXTRACTION OF METALS

Extraction temperature - 60°C

Date test commenced - 12 February 2019

Number of extracts - 1

All analyses carried out 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		DETERMINED REAGENT BLANKS
				I	II	
Aluminium	Al µg/L	200	20.0	< 20.0	< 20.0	< 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	< 100.0	< 100.0	<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	< 1.0	< 1.0	< 1.0
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	< 2.0	< 2.0	< 2.0
Selenium	Se µg/L	10	1.0	< 1.0	< 1.0	< 1.0

Comment - thus the samples of this product ha been found to comply with the requirements of BS 6920: Part 1: clause 8 when extracted at 60°C.

## CONCLUSION

The samples of the products referred to in this report have 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 Version 4.4 dated 21 November 2016'.

**On the basis of these test results the sample of product has been found NOT to comply with the requirements of BS 6920: 2014: Part 1: Clause 4; Odour & Flavour of Water / High Temperature Tests. However the 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): Odour & Flavour of Water / Appearance of Water / Growth of Aquatic Microorganisms / Cytotoxicity / Extraction of Metals /Cold Water Tests. It is suitable for use with cold but not hot 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.

## NOTES FOR WRAS

This coating system has not been tested for use in conjunction with any other products, including primers and undercoats and has not been shown to be suitable for use with any other coatings or material.

This product has been previously tested using a differing post cure and number of coats covered by our test report MA6018/O dated 24 August 2017.

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