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Die Akkreditierung gilt für die in der Urkundenanlage  
D-PL-11217-03-00 aufgeführten Prüfverfahren.

### **Test report PB2024002151**

Client:	Wilo UK
Order date:	20/03/2024
Purpose of test:	Examination of material according to BS 6920: 2014 – Suitability of non-metallic materials and products for use in contact with water intended for human consumption with regard to their effect on the quality of water.
Project number:	S2404004
Product <sup>a)</sup> :	CERAM CT; blue coloured
Sample was taken by:	Sent by the client
Date of sample receipt:	21/05/2024
Period of analysis:	21/05/2024 to 26/07/2024
Laboratory order number:	122400369-0001
This test report was created by:	Elena Samolov

#### *Statement of conformity:*

*The tested sample **has satisfied** the criteria detailed in BS 6920: Part 1: 2014 and therefore **is suitable** for use with cold water.*

26/07/2024, i.V. Kerstin Schubert  
Unit manager  
Environmental and Analytical Kessin/Rostock

The test results relate only on the items tested. Without the written approval of the testing laboratory, a duplication in extracts of the test report is not permitted.

<sup>a)</sup> information of the client. <sup>k)</sup> amendment.

Geschäftsführer: Prof. Dr. Roland Hüttl, Wulf Jannsen, Dr. Gero Schönwaßer  
Amtsgericht Hamburg, HRB 130568, St.Nr.: 46/736/03268

## 1 Examined product <sup>a)</sup>:

Trade name and reference of the product:	CERAM CT
Nature of the product:	Factory applied synthetic coating for drinking water
General composition of the product:	Epoxy coating
Trade name and designation of the material:	CERAM CT
Nature of the material:	Epoxy
Method of manufacture:	Mixing
Method of application:	CERAM CT coating was applied by airless sprayer on both sides of a stainless-steel plate, as 400 µm tick coat. The coating was touch-dry after 14 hours at 20°C, then mechanically cured for 7 days at 20°C. Samples for BS6920 testing were prepared in accordance with manufacturer's application instructions.
Ambient temperature at time of application:	15°C
Curing details:	14 hours at 20°C to obtain touch-dry coating, followed by mechanical curing for 7 days at 20°C
Product manufacturer:	Wilo Hof
Product manufacturing site:	Hof, Germany
Material manufacturer:	Wilo Hof
Submitting organisation:	Wilo UK
Proposed use of the product:	Material in contact with potable water
Sampling:	Random, from stock
Production date:	10 – 11/01/2024
Lot / Batch number:	650635217
Project number:	S2404004
Inspector:	Sent by the client
Date of sample receipt:	21/05/2024
Material photographs:	

Condition of sample on receipt:	Good condition
Packaging in contact with test product:	Plastic bag

## 2 Laboratory sample record

Description of product:	CERAM CT; blue coloured
Description of test piece:	Blue coloured, opaque coating applied on both sides of a stainless-steel plate
Length [mm]:	150
Width [mm]:	50
Thickness [mm]:	2.5
Internal diameter [mm]:	n.a.
External diameter [mm]:	n.a.
In-radius [mm]:	n.a.
Surface area of one test sample [mm <sup>2</sup> ]:	16012
Number of articles constituting a test sample:	1
Surface area for test [mm <sup>2</sup> ]:	16012
Calibration mark of test container [l]:	
Storage conditions:	acc. BS6920: Part 2: Section 2.1: Clause 5.2
Migration process:	Migration water extracts were prepared by in vessel extraction: 1 sample piece was placed in beakers filled up to 1 litre with test water in accordance with BS 6920-2.2.1.

### 3 Result summary

Table 1: Final test results

Test	Result
Odour and Flavour of Water at 23°C	Pass
Appearance of Water at 23°C	Pass
Growth of Aquatic Microorganisms at 30°C	Pass
Extraction of Substances that may be of Concern to Public Health at 23°C	Pass
Extraction of Metals at 23°C	Pass

## 4 Results of testing

### 4.1 Odour and Flavour of Water BS 6920 - Part 1: 2014 Clause 4

#### Methodology: BS 6920 – Part 2: Section 2.2

Table 2: Migration process at 23°C (Odour and Flavour of Water)

	Start	Completion
1 <sup>st</sup> migration period (first extract)	04/06/2024	05/06/2024

#### 4.1.1 Migration temperature at 23°C

Table 3: Results of Chlorinated test water - first extract

Panellist	Odour description	Flavour description	Flavour dilution number
1	Cooked	None	1
2	None	None	1
3	None	None	1

Table 4: Results of Chlorine free test water - first extract

Panellist	Odour description	Flavour description	Flavour dilution number
1	None	None	1
2	None	None	1
3	None	None	1

#### Opinions and Interpretations:

The examined sample **conforms to the requirements** detailed in BS 6920 - Part 1: 2014 Clause 4 when extracted at 23°C.

## 4.2 Appearance of Water BS 6920 - Part 1: 2014 Clause 5

### Methodology BS 6920 – Part 2: Section 2.3

Table 5: Migration process at 23°C (Appearance of Water)

	Start	Completion
1 <sup>st</sup> migration period (first extract)	27/05/2024	28/05/2024
7 <sup>th</sup> migration period (final extract)	04/06/2024	05/06/2024

### 4.2.1 Migration temperature at 23°C

Table 6: Results of Appearance of Water at 23°C, first extract

	Turbidity (FNU)	Colour (mg/L Pt)
Blank	<0.1	<2
Test sample	0.2	<2
Test sample effect	0.2	<2

Table 7: Results of Appearance of Water at 23°C, final extract

	Turbidity (FNU)	Colour (mg/L Pt)
Blank	<0.1	<2
Test sample	<0.1	<2
Test sample effect	<0.1	<2

### Opinions and Interpretations:

The examined sample **conforms to the requirements** detailed in BS 6920 - Part 1: 2014 Clause 5 when extracted at 23°C.

#### 4.3 Growth of Aquatic Microorganisms BS 6920 - Part 1: 2014 Clause 6

##### Methodology BS 6920: Part 2: Section 2.4

Table 8: Incubation temperature:  $30 \pm 1^\circ\text{C}$  (Growth of Aquatic Microorganisms)

	Start	Completion
Incubation period	31/05/2024	19/07/2024

Incubation temperature:  $(30 \pm 1)^\circ\text{C}$

A surface area of  $16012\text{ mm}^2$  for the MDOD test corresponds to 1 piece of test sample. The 1 test piece was placed in the test container, 100 ml inoculum water was added and filled up with test water to the 1 litre mark.

Table 9: Results of Growth of Aquatic Microorganisms after 49 days incubation period

	Mean dissolved oxygen (mg/L $\text{O}_2$ )
Test water control*	8.0
	Mean dissolved oxygen difference (mg/L $\text{O}_2$ )
Negative control (glass)	<0.1
Positive control (paraffin wax)	6.1
Test sample	<b>0.2</b>

\*Test water control represents test water mixed with inoculum water

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

##### Opinions and Interpretations:

The examined sample **conforms to the requirements** detailed in BS 6920 - Part 1: 2014 Clause 6.

#### 4.4 Extraction of Substances that may be of Concern to Public Health BS 6920 -

##### Part 1: 2014 Clause 7

##### Methodology BS 6920: Part 2: Section 2.5

Table 10: Migration process at 23°C (Extraction of Substances that may be of Concern to Public Health)

	Start	Completion
1 <sup>st</sup> migration period	27/05/2024	28/05/2024

##### 4.4.1 Migration temperature at 23°C

Test start date:	28/05/2024
Microscopy examination:	29/05/2024
Cell line used:	Monkey African Green Kidney ATCC-Number CCL 81 (LOT: 605372-818)
Cell concentration used:	5 x 10 <sup>5</sup>
Cell morphology:	Elongated cells form confluent monolayer
Media:	Pink in colour

Table 11: Results of Extraction of Substances that may be of Concern to Public Health at 23°C

Sample/Control	Cell morphology	Response
Blank	Healthy elongated cells, confluent monolayer, media pink in colour	Non-cytotoxic
Positive control (including zinc sulfate solution)	Rounded cells, mainly in suspension, media pink in colour	Cytotoxic
Test sample	Healthy elongated cells, confluent monolayer, media pink in colour	Non-cytotoxic
Negative control	Healthy elongated cells, confluent monolayer, media pink in colour	Non-cytotoxic

##### Opinions and Interpretations:

The examined sample **conforms to the requirements** detailed in BS 6920 - Part 1: 2014 Clause 7 when extracted at 23°C.



#### 4.5 Extraction of Metals BS 6920 - Part 1: 2014 Clause 8

##### Methodology BS 6920: Part 2: Section 2.6

Table 12: Migration process at 23°C (Extraction of Metals)

	Start	Completion
1 <sup>st</sup> migration period (first extract)	27/05/2024	28/05/2024

#### 4.5.1 Migration temperature at 23°C

Table 13: Results of Extraction of Metals at 23°C, first and final extract

Parameter	First extract			Final extract			Detection limit (µg/L)	MAC (µg/L)	Technique
	Blank extract (µg/L)	Sample extract 1 (µg/L)	Sample extract 2 (µg/L)	Blank extract (µg/L)	Sample extract 1 (µg/L)	Sample extract 2 (µg/L)			
Aluminium	<20	<20	27	n.a.	n.a.	n.a.	20	200	ICP-MS
Antimony	<0.5	<0.5	<0.5	n.a.	n.a.	n.a.	0.5	5	ICP-MS
Arsenic	<1	<1	<1	n.a.	n.a.	n.a.	1	10	ICP-MS
Boron	<100	150	150	n.a.	n.a.	n.a.	100	1000	ICP-MS
Cadmium	<0.5	<0.5	<0.5	n.a.	n.a.	n.a.	0.5	5	ICP-MS
Chromium	<5	<5	<5	n.a.	n.a.	n.a.	5	50	ICP-MS
Iron	<20	<20	<20	n.a.	n.a.	n.a.	20	200	ICP-MS
Lead	<1	<1	<1	n.a.	n.a.	n.a.	1	10	ICP-MS
Manganese	<5	<5	<5	n.a.	n.a.	n.a.	5	50	ICP-MS
Mercury	<0.1	<0.1	<0.1	n.a.	n.a.	n.a.	0.1	1	ICP-MS
Nickel	<2	<2	<2	n.a.	n.a.	n.a.	2	20	ICP-MS
Selenium	<1	<1	<1	n.a.	n.a.	n.a.	1	10	ICP-MS

MAC Maximum admissible concentration  
ICP-MS Inductively coupled plasma – mass spectrometry  
n.a. Not applicable

Note: If the measured value from the First extract conforms to the stated Maximum allowable concentrations of specific metal, then the First extract shall be defined as the Final extract.

**Opinions and Interpretations:** The examined sample **conforms to the requirements** detailed in BS 6920 - Part 1: 2014 Clause 8 when extracted at 23°C.

## 5 Analytical Information

Table 14: Overview investigation methods

Parameter	Standard method	Location	Detection limit	Reproducibility in %
Migration for Odour, Flavour <i>Reference water was Rostock tap water</i>	BS 6920-2.2.1: 2000+A3: 2014 *	12	-	-
Migration for Turbidity, Colour <i>Reference water was ultra pure water that originated from a reverse osmosis system</i>	BS 6920-2.3: 2000+A1: 2014	12	-	-
Migration for Aquatic Microorganisms <i>Reference water was Rostock tap water</i>	BS 6920-2-4: 2000+A1: 2014	12	-	-
Migration of Substances that may be of Concern to Public Health	BS 6920-2.5: 2000+A2: 2014*	12	-	-
Cell morphology	BS 6920-2.5: 2000+A2: 2014*	12	-	-
Turbidity	DIN EN ISO 7027-1 (C21):2016-11	12	0.1 FNU	3.4 (concentration level: 0.5 FNU)
Colour	DIN EN ISO 7887 Method C: 2012-04	12	2 mg/L Pt	3.2 (concentration level: 11 mg/l Pt)
Dissolved oxygen	DIN EN ISO 5814 (G 22): 2013-02	12	0.1 mg/l	13 (concentration level: 6.7 mg/l)

By an asterisk (\*) marked methods are not accredited test methods. These methods were audited by an DAkkS-assessor with positive decision, inclusion in accreditation certificate is in preparation.

Client: Wilo Uk  
 Project number: S2404004  
 Test report no.: PB2024002151



Continued Table 14: Overview investigation methods

Parameter	Standard Method	Location	Detection limit	Reproducibility in %
Extraction of Metals Reference water was ultra pure water that originated from a reverse osmosis system	BS 6920-2.6: 2000+A2: 2014	12	-	-
Aluminium	DIN EN ISO 17294-2: 2017-01	03	20 µg/L	9.5 (concentration level: 20 µg/l)
Antimony	DIN EN ISO 17294-2: 2017-01	03	0.5 µg/L	3.1 (concentration level: 0.5 µg/l)
Arsenic	DIN EN ISO 17294-2: 2017-01	03	1 µg/L	5.8 (concentration level: 2 µg/l)
Boron	DIN EN ISO 17294-2: 2017-01	03	100 µg/L	1.5 (concentration level: 100 µg/l)
Cadmium	DIN EN ISO 17294-2: 2017-01	03	0.5 µg/L	4.9 (concentration level: 0.5 µg/l)
Chromium	DIN EN ISO 17294-2: 2017-01	03	5 µg/L	6.5 (concentration level: 5 µg/l)
Iron	DIN EN ISO 17294-2: 2017-01	03	20 µg/L	4.2 (concentration level: 20 µg/l)
Lead	DIN EN ISO 17294-2: 2017-01	03	1 µg/L	1.2 (concentration level: 2 µg/l)
Manganese	DIN EN ISO 17294-2: 2017-01	03	5 µg/L	3.4 (concentration level: 50 µg/l)
Mercury	DIN EN ISO 17294-2: 2017-01	03	0.1 µg/L	4.7 (concentration level: 2 µg/l)
Nickel	DIN EN ISO 17294-2: 2017-01	03	2 µg/L	2.1 (concentration level: 2 µg/l)
Selenium	DIN EN ISO 17294-2: 2017-01	03	1 µg/L	5.6 (concentration level: 2 µg/l)

**Locations:**

03 Kessin  
 12 Rostock

**Client:** Wilo Uk  
**Project number:** S2404004  
**Test report no.:** PB2024002151



## NOTES

The results specified in this report relate only to the sample(s) of this 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 this product for use in contact with wholesome water.

We would draw to your attention that reports issued by the accredited test laboratories do not of themselves constitute approval by either Kiwa Watertec or the Water Regulations Approvals Scheme. Applicants will be formally notified of their KIWA KUKmat4 or WRAS approval number if their application has been successful.

Materials and products intended for use by a public water supply organisation 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 conforms with Regulation 31 of the Water Supply (Water Quality) Regulations 2000/2014.