Kiwa GmbH
Produktprüfung
Tannenweg 22m, Speicher I
18059 Rostock

Tel. +49 38208 637 0
Fax +49 38208 637 49
www.kiwa.com

Kiwa GmbH, Tannenweg 22m, Speicher I, 18059 Rostock

Linthwaite T/A Davant
Neil Cresswell
Units 9-11, Lower Road Trading Estate
Lebury,
Herefordshire HR8 2DJ
United Kingdom

Deutsche Akkreditierungsstelle D-PL-11217-03-00

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

Test report PB2026001582

Client:	Linthwaite T/A Davant
Order date:	17 Mar 2026
Purpose of test [a)]:	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:	S2603075
Product [a)]:	MDPE PIPE DN20-25-32; MDPE + black masterbatch/ MDPE + blue masterbatch; blue coloured
Sample was taken by:	Sent by the client
Date of sample receipt:	9 Apr 2026
Period of analysis:	9 Apr 2026 to 19 Jun 2026
Laboratory order number:	122600439-0001
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.*

Marie-Luis Hölzel
- Digitally signed | see http://ca.kiwa-deutschland.de for more details -

19/06/2026, i.V. Dr. Marie-Luis Hölzel
Location manager Rostock

[a)] information of the client. [k)] amendment.

1 Examined product [a)]

Trade name and reference of the product:	MDPE PIPE DN20-25-32
Nature of the product:	MDPE pipe
General composition of the product:	Thermoplastic
Trade name and designation of the material:	Inner layer: Polyethylene MDPE Natural coloured + KRITILEN® BLACK 440P Outer layer: Polyethylene MDPE Natural coloured + 93060234 - BLUE
Nature of the material:	Inner layer: MDPE + black masterbatch Outer layer: MDPE + blue masterbatch
Method of manufacture:	Extrusion
Product manufacturer:	MODUS PLASTIK METAL A.S.
Product manufacturing site:	Dilovasi Kocaeli, Kocaeli, Istanbul, Turkey
Material manufacturer:	Inner layer: Hanwha Total Energies Petrochemical Korea + PLASTIKA KRITIS SA Outer layer: Hanwha Total Energies Petrochemical Korea + Senkroma Masterbatches
Submitting organisation:	Linthwaite T/A Davant
Proposed use of the product:	Conveyance of potable water
Sampling:	Random, from stock
Production date:	15 Sep 2025
Lot / Batch number:	XRT70K (A250121)
Project number:	S2603075
Inspector:	Sent by the client
Date of sample receipt:	9 Apr 2026
Material photographs:	
Condition of sample on receipt:	Good condition
Packaging in contact with test product:	Plastic
Storage conditions:	acc. BS 6920: Part 2: Section 2.1: Clause 5.2

2 Laboratory sample record

Description of product:	MDPE PIPE DN20-25-32; MDPE + black masterbatch/ MDPE + blue masterbatch; blue coloured
Description of test piece:	Rigid plastic multilayer pipe Inner layer: black coloured, opaque Outer layer: blue coloured, opaque
Length [mm]:	1000
Width [mm]:	n.a.
Thickness [mm]:	3.5
Internal diameter [mm]:	24.6
External diameter [mm]:	31.6
In-radius [mm]:	n.a.
Surface area of one test sample [mm²]:	177175
Number of articles constituting a test sample:	1
Surface area for test [mm²]:	77283
Number of articles constituting a test sample for MDOD test:	Two segments cut from product
Surface area for MDOD test [mm²]:	15080
Calibration mark of test container [l]:	1
Migration process:	Migration water extracts were prepared by in product extraction of 2 x 1000 mm lengths of pipe with test water per investigated temperature. Resulting leachate was subsequently diluted with fresh test water in accordance with BS 6920-2.2.2. Volume of water contained within the sample during extraction: 475 ml Volume of water extract diluted to 1 L: 92 ml Migration water extracts for MDOD test were prepared by in vessel extraction: two segments cut from product sample were placed in beakers filled up to 1 litre with test water in accordance with BS 6920-2.4. In order to secure that only water-contact layer of the test sample was in direct contact with test water, all non-contact surfaces of the test samples were covered with an inert material.

3 Result summary

Table 1: Final test results

Test	Result
Odour and Flavour of Water Result at 23°C	Pass
Appearance of Water Result at 23°C	Pass
Growth of Aquatic Microorganisms Result at 30°C	Pass
Extraction of Substances that may be of Concern to Public Health Result at 23°C	Pass
Extraction of Metals Result 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
1st migration period (first extract)	27 Apr 2026	28 Apr 2026

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	Musty	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
1st migration period (first extract)	27 Apr 2026	28 Apr 2026
7th migration period (final extract)	5 May 2026	6 May 2026

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	<0.1	<2
Test sample effect	<0.1	<2

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

	Turbidity (FNU)	Colour (mg/L Pt)
Blank	0.11	<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 ± 1°C (Growth of Aquatic Microorganisms)

	Start	**Completion**
Incubation period	14 Apr 2026	2 Jun 2026

Incubation temperature: (30 ± 1)°C

A surface area of 15080 mm^2 for the MDOD test corresponds to two segments cut from product sample. The two segments were 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 O_2)
Test water control*	7.4
	Mean dissolved oxygen difference (mg/L O_2)
Negative control (glass)	0.1
Positive control (paraffin wax)	6.5
Test sample	**0.9**

*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
1st migration period	21 Apr 2026	22 Apr 2026

4.4.1 *Migration temperature at 23°C*

Test start date: 22 Apr 2026

Microscopy examination: 23 Apr 2026

Cell line used: African Green Monkey Kidney VERO CCL 81

Cell concentration used: 5×10^5

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
1st migration period (first extract)	27 Apr 2026	28 Apr 2026

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	<20	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	<100	<100	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 *Reference water was Rostock tap water*	BS 6920-2.2.1: 2000+A3: 2014 *	12	-	-
Migration for Turbidity, Colour *Reference water was ultra pure water that originated from a reverse osmosis system*	BS 6920-2.3: 2000+A1: 2014	12	-	-
Migration for Aquatic Microorganisms *Reference water was Rostock tap water*	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 method is not accredited test method. This method was audited by an DAkkS-assessor with positive decision, inclusion in accreditation certificate is in preparation.

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

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.

- End of test report -