Labeko, s.r.o.
Krajinská cesta 2929, 921 01 Piešťany
Accredited testing laboratories
according to ISO / IEC 17025:2017

SNAS
Reg. No. 070/S-030

Test report no.: 22/00876/SK

Order party (name and address) Peter Bugár - MIR, 925 414 Kráľov Brod č. 415, Slovakia

The date of sample receiving 31.03.22

The date of the test from : 04.04.22
to : 20.04.22

Samples taken : The samples sending by customer

Date of the test report: 20.04.22

The Test Results

Ser.No.	1	**Sample number**	22-001377	**Sample type :**	Materials and products intended into contact with drinking water
Sample identification :	**Pipes for drinking water distribution MIR Studňa, PVC-U pipes, DN113 mm - DN 400 mm** **HASS PIPE Sondaj Boru Imalati Sanayi ve Ticaret A.S. Fevzi Cakmak Mh. 42030 Karatay Konya - Turkiye**				

Description of the samples:
The inner surface of the tested product **Pipes for drinking water distribution MIR Studňa, PVC-U pipes, DN113 mm - DN 400 mm**
Material **:** polyvinyl chloride PVC-U, Dimensions : DN 112mm - DN 400 mm (grey color) is intended into contact with drinking water .
The supplied test sample was tested in accordance with the requirements of the Decree of Ministry of Health of the Slovak Republic No. 550/2007 Coll.

Conditions of migration tests:
Extracts from the submitted sample were prepared according to the Annex to the Decree of Ministry of Health of the Slovak Republic No. 550/2007 Coll.
For migration tests were used two identical samples.
The ratio of the tested surface of the sample to the volume of experimental water : 513,0 cm^2 : 830,0 cm^3 (1,0 cm^2 : 1,62 cm^3)

Description of the tests :
1. Stagnation : (24 ± 0,5) hours at (23 ± 2) °C in tap water and next stagnation (16 ± 0,5) hours at (23 ± 2) °C in tap water.
2. Rinsing with tap water 60 min. with flow (5 ± 2) ml/s and rinsing with experimental water 2 min.
3. Three consecutive extracts - 72 hour at (23 ± 2) °C for each extract by using experimental water

Experimental water : deionised water with the conductivity < 2 mS/m and TOC < 0,2 mg/l
Under the same conditions a blank experiment with the experimental water without the tested sample was carried out.

The test results are shown in the following tables :

Table No.1
The sample No. 22-001377 Pipes for drinking water distribution MIR Studňa, PVC-U pipes, DN113 mm - DN 400 mm
Measured values for the 1st migration test.

Parameter	Unit	Measured values [1]			Uncertainty [2] (k=2)	Methods used	Test [3] type
		Parallel determinations		Blank			
		K_1	K_1	$K_{0;1}$			
Cadmium (Cd)	µg/l	< 0,5	< 0,5	< 0,5		P-01,STN EN ISO 11885	A
Lead (Pb)	µg/l	< 1,0	< 1,0	< 1,0		P-01,STN EN ISO 11885	A
Nickel (Ni)	µg/l	< 2,0	< 2,0	< 2,0		P-01,STN EN ISO 11885	A
Zinc (Zn)	mg/l	< 0,003	< 0,003	< 0,003		P-01,STN EN ISO 11885	A
Chromium (Cr)	µg/l	< 5,0	< 5,0	< 5,0		P-01,STN EN ISO 11885	A
Barium (Ba)	mg/l	< 0,005	< 0,005	< 0,005		P-01,STN EN ISO 11885	A
pH		6,62	6,61	6,53	2 %	P-03, STN ISO 10523	A
Total organic carbon (TOC)	mg/l	0,59	0,55	0,45	20 %	P-37, STN EN 1484	A
Chemical oxygen demand (COD_{Mn})	mg/l	0,35	0,37	< 0,2	18 %	P-15, STN EN ISO 8467	A
Vinyl chloride	µg/l	< 0,05	< 0,05	< 0,05		P-04	A
Colour	mg Pt/l	< 2,0	< 2,0	< 2,0		P-09, STN EN ISO 7887	A
Turbidity	FNU [4]	< 0,5	< 0,5	< 0,5		P-45, STN ISO 7027	A

K_1 – concentration of migrating substances of the 1st parallel migration test for migration time 72 hours and temterature (23 ± 2) °C
$K_{0;1}$ – average value of concentration of migrating substances in parallel blank experiment for migration time 72 hours and temperature (23 ± 2) °C

Table No. 2
The sample No. 22-001377 Pipes for drinking water distribution MIR Studňa, PVC-U pipes, DN113 mm - DN 400 mm
Measured values for the 2nd migration test.

Parameter	Unit	Measured values [1]			Uncertainty [2] (k=2)	Methods used	Test [3] type
		Parallel determinations		Blank			
		K_2	K_2	$K_{0;2}$			
Cadmium (Cd)	µg/l	< 0,5	< 0,5	< 0,5		P-01,STN EN ISO 11885	A
Lead (Pb)	µg/l	< 1,0	< 1,0	< 1,0		P-01,STN EN ISO 11885	A
Nickel (Ni)	µg/l	< 2,0	< 2,0	< 2,0		P-01,STN EN ISO 11885	A
Zinc (Zn)	mg/l	< 0,003	< 0,003	< 0,003		P-01,STN EN ISO 11885	A
Chromium (Cr)	µg/l	< 5,0	< 5,0	< 5,0		P-01,STN EN ISO 11885	A
Barium (Ba)	mg/l	< 0,005	< 0,005	< 0,005		P-01,STN EN ISO 11885	A
pH		6,59	6,61	6,54	2 %	P-03, STN ISO 10523	A
Total organic carbon (TOC)	mg/l	0,52	0,48	0,52	20 %	P-37, STN EN 1484	A
Chemical oxygen demand (COD_{Mn})	mg/l	0,22	0,21	< 0,2	18 %	P-15, STN EN ISO 8467	A
Vinyl chloride	µg/l	< 0,05	< 0,05	< 0,05		P-04	A
Colour	mg Pt/l	< 2,0	< 2,0	< 2,0		P-09, STN EN ISO 7887	A
Turbidity	FNU [4]	< 0,5	< 0,5	< 0,5		P-45, STN ISO 7027	A

K_2 – concentration of migrating substances of the 2nd parallel migration test for migration time 72 hours and temterature (23 ± 2) °C
$K_{0;2}$ – average value of concentration of migrating substances in parallel blank experiment for migration time 72 hours and temperature (23 ± 2) °C

Table No. 3
The sample No. 22-001377 Pipes for drinking water distribution MIR Studňa, PVC-U pipes, DN113 mm - DN 400 mm
Measured values for the 3rd migration test.

Parameter	Unit	Measured values [1]			Uncertainty [2] (k=2)	Methods used	Test [3] type
		Parallel determinations		Blank			
		K_3	K_3	$K_{0;3}$			
Cadmium (Cd)	µg/l	< 0,5	< 0,5	< 0,5		P-01,STN EN ISO 11885	A
Lead (Pb)	µg/l	< 1,0	< 1,0	< 1,0		P-01,STN EN ISO 11885	A
Nickel (Ni)	µg/l	< 2,0	< 2,0	< 2,0		P-01,STN EN ISO 11885	A
Zinc (Zn)	mg/l	< 0,003	< 0,003	< 0,003		P-01,STN EN ISO 11885	A
Chromium (Cr)	µg/l	< 5,0	< 5,0	< 5,0		P-01,STN EN ISO 11885	A
Barium (Ba)	mg/l	< 0,005	< 0,005	< 0,005		P-01,STN EN ISO 11885	A
pH		6,58	6,58	6,53	2 %	P-03, STN ISO 10523	A
Total organic carbon (TOC)	mg/l	0,53	0,54	0,40	20 %	P-37, STN EN 1484	A
Chemical oxygen demand (COD_{Mn})	mg/l	< 0,2	< 0,2	< 0,2		P-15, STN EN ISO 8467	A
Vinyl chloride	µg/l	< 0,05	< 0,05	< 0,05		P-04	A
Colour	mg Pt/l	< 2,0	< 2,0	< 2,0		P-09, STN EN ISO 7887	A
Turbidity	FNU [4]	< 0,5	< 0,5	< 0,5		P-45, STN ISO 7027	A
Odor (TON) [5]	deg.	1	1	1		STN EN 1622	N
Taste (TFN) [5]	deg.	1	1	1		STN EN 1622	N
Organic substances [6]	mg/l	ND	ND	ND		P-04 / P-06	A

K_3 – concentration of migrating substances of the 3rd parallel migration test for migration time 72 hours and temterature (23 ± 2) °C
$K_{0;3}$ – average value of concentration of migrating substances in parallel blank experiment for migration time 72 hours and temperature (23 ± 2) °C

Notes to the tables No.1 - No.3 :

[1] symbol "<" means less than limit of method detection
ND - not detected (the presence of organic substances was not detected by used analytical method)
[2] Uncertainty means expanded combined standard relative uncertainty (extension factor k = 2)
[3] A - accredited test, N- nonaccredited test
[4] FNU (formazine nephelometric unit) - unit for determination of turbidity
[5] TFN (taste threshold), TON (odor threshold)
[6] Organic substances (additives, monomers and others organic substances) identificated by used analytical methods P-04 and P-06 in the 3rd migration test
(deg.) - degree / unit for odor a nd taste according to STN EN 1622
P-01, P-03, P-04, P-06, P-09, P-15, P-24, P-37, P-45 Internal regulation LABEKO,s.r.o.

Table No.4
The sample No. 22-001377 Pipes for drinking water distribution MIR Studňa, PVC-U pipes, DN113 mm - DN 400 mm
Summary results of the testing according to Decree No. 550/2007 Coll.

Parameter	Units	K_{72}^{23} ;1	K_{72}^{23} ;2	K_{72}^{23} ;3	Limit values [1]	Evaluation	M_{24}^{23} ;3 ($mg.dm^{-2}.day^{-1}$) or ($\mu g.dm^{-2}.day^{-1}$)
Cadmium (Cd)	µg/l	< 0,5	< 0,5	**< 0,5**	**5,0**	**meets**	< 0,0270
Lead (Pb)	µg/l	< 1,0	< 1,0	**< 1,0**	**10,0**	**meets**	< 0,0539
Nickel (Ni)	µg/l	< 2,0	< 2,0	**< 2,0**	**20,0**	**meets**	< 0,1078
Zinc (Zn)	mg/l	< 0,003	< 0,003	**< 0,003**	**3,0 ***	**meets**	< 0,00016
Chromium (Cr)	µg/l	< 5,0	< 5,0	**< 5,0**	**50,0**	**meets**	< 0,2695
Barium (Ba)	mg/l	< 0,005	< 0,005	**< 0,005**	**0,7 ***	**meets**	< 0,00027
pH	-	6,62	6,60	**6,58**	**6,5 -9,5**	**-**	-
Total organic carbon (TOC)	mg/l	< 0,2	< 0,2	**< 0,2**	**3,0**	**meets**	< 0,0108
Chemical oxygen demand (COD_{Mn})	mg/l	0,36	0,22	**< 0,2**	**3,0**	**meets**	< 0,0108
Vinyl chloride	µg/l	< 0,05	< 0,05	**< 0,05**	**0,5**	**meets**	< 0,0027
Colour	mg Pt/l	< 2,0	< 2,0	**< 2,0**	**20**	**meets**	-
Turbidity	FNU [2]	< 0,5	< 0,5	**< 0,5**	**5**	**meets**	-
Odor (TON) [5]	deg.	-	-	**1**	**max. 2**	**meets**	-
Taste (TFN) [5]	deg.	-	-	**1**	**max. 2**	**meets**	-

K_{72}^{23} ;1 - concentration of migrating substances expressed as arithemtic mean of parallel determinations after subtraction of blank conc. for the 1st migration test at (23 ± 2)°C and time72 hours
K_{72}^{23} ;2 - concentration of migrating substances expressed as arithemtic mean of parallel determinations after subtraction of blank conc. for the 2nd migration test at (23 ± 2)°C and time72 hours
K_{72}^{23} ;3 - concentration of migrating substances expressed as arithemtic mean of parallel determinations after subtraction of blank conc. for the 3rd migration test at (23 ± 2)°C and time72 hours
M_{24}^{23};3 - migration value of the 3rd migration test calculated from **K_{72}^{23} ;3** for temperature (23 ± 2) °C and for migration time 24 hrs

Notes to the tables No.4 :

[1] limit value according to Annex No.1 to the Decree No. 247/2017 Coll. as amended
[2] FNU (formazine nephelometric unit) - unit for determination of turbidity
[3] TFN (taste threshold), TON (odor threshold)
* limit values for Barium and Zinc according to Decree No. 409/2005 Coll. ,pargraph 3, section 6
symbol "<" means less than limit of method detection
(deg.) - degree / unit for odor and taste according to STN EN 1622

Compliance / non-compliance with requirements :

The evaluation of the product **Pipes for drinking water distribution MIR Studňa, PVC-U pipes, DN113 mm - DN 400 mm** , intended for contact with drinking water was carried out according to the requirements of Decree of Ministry of Health of the Slovak Republic No.550/2007 Coll. and according to the requirements of Decree of Ministry of Health of the Slovak Republic No. 247/2017 Coll. as amended. Verification of health requirements and the evaluation of the test results according to Decree No. 550/2007 Coll., paragraph 3 was perfomed according to the Annex of this Decree.
For the health evaluation of the tested product were used according to annex of Decree of Ministry of Health of the Slovak Republic No. 550/2007 Coll., section 13, concentrations of migrated substances from the 3rd migration test **(K_{72}^{23};3)** . According to the Act No.103/2015 Coll., paragraph 18 (Products intended for contact with drinking water) the amount of released substances from the products intended for the contact with drinking water must not exceed the limit values of these substances for drinking water according to Decree of Ministry of Health of the Slovak Republic No. 247/2017 Coll., Annex 1.

The measured values and results of the determination of migrating substances are given in the Tables 1 to No.3. The calculated concentrations of migrating subsatances from the 3rd migration test **(K_{72}^{23};3)** listed in the Table No.4 **do not exceed** relevant limit values of these subsatances according to Annex 1 of Decree of Ministry of Health of the Slovak Republic No. 247/2017 Coll.
All monitored indicators **meet** the above legislative requirements. The tested product does not affect sensory properties of drinking water.

The results of the assessment according to Decree of Ministry of Health of the Slovak Republic No. 550/2007 Coll. indicate :

The tested product "Pipes for drinking water distribution MIR Studňa, PVC-U pipes, DN113 mm - DN 400 mm" manufactured by HASSBORU PLASTİK MAKİNE METAL NAKLİYAT SAN. VE TİC. LTD. ŞTİ ., YENİ BUĞDAY PAZARI FEVZİ ÇAKMAK MH.10515.SK. BLOK NO: 1, KONYA, TURKEY meets the requirements of Decree of Ministry of Health of the Slovak Republic No.550/2007 Coll. for the products intended to come into contact with drinking water.

Based on the achieved results of the health evaluation we can recommend the tested product for the direct contact with drinking water.

Notice :
Our statement only refers to the materials of the submitted sample of the product. The conclusions resulting from this evaluation may be applied also to other similar products (of this manufacturer) intended into contact with drinking water provided that used materials (direct coming into contact with drinking water) in this products are identical and their composition and properties completely correspond to the sample of the product we tested.

Testing equipment and measuring tools used for testing were calibrated and verified within the meaning of the valid metrological directives.
The test results refer exclusively to the subject of the test and they do not substitute other documents (e.g. of administrative character) which are, under the specific directives, required by the bodies of governmental professional supervision. The protocol may be copied only as a whole; in parts only with the permit of the testing laboratory.

The test report approved by : Ing. Roman Hudec ,
the Head of Ecoanalytic laboratories

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