

**Labeko, s.r.o.**Krajinská cesta 2929, 921 01 Piešťany  
Accredited testing laboratories  
according to ISO / IEC 17025:2017**Test report no.: 21/01150**

Page no. 1 out of 4

**Order party** SC TEHNO WORLD SRL  
(name and address) Baia ,1616 DN2E , 727020 Suceava, Romania**The date of sample receiving** 23.04.21**The date of the test from :** 23.04.21  
**to :** 11.05.21**Samples taken :** The samples sending by customer**Date of the test report:** 11.05.21**The Test Results**

<b>Ser.No.</b>	1	<b>Sample number</b>	21-001914	<b>Sample type :</b>	Materials and products intended into contact with drinking water
<b>Sample name :</b>	" PE 100 pipe " Manufacturer : SC TEHNO WORLD SRL, Baia ,1616 DN2E , 727020 Suceava, Romania				

**Description of samples:**

The product " PE 100 pipe" raw material Polyethylene / BorSafe HE3490-LS. Manufacturer of raw material : Borealis AG, Vienna,Wagramerstrasse 17-19, Austria) is used for drinking water distribution .

Tested sample : Black polyethylene pipe, inner diameter Ø=44,0 mm

The manufacturer is certified ISO 9001:2015 (01 100 1521057)

The raw material has sanitary approval no. MO 219/15 TZW , 1704516,WRAS)

**Conditions of migration tests:**

Extracts from submitted samples 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 : 691 cm<sup>2</sup> : 760 cm<sup>3</sup> ( 1 cm<sup>2</sup> : 1,10 cm<sup>3</sup> )**Description of 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 &lt; 0,2 mS/m and TOC &lt; 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**  
**Sample No. 21-001914 "PE 100 pipe". Measured values for the 1<sup>st</sup> migration test.**

Parameter	Unit	Measured values <sup>1)</sup>			Uncertainty <sup>2)</sup> (k=2)	Methods used	Test <sup>3)</sup> type
		Parallel determinations		Blank K <sub>0;1</sub>			
		K <sub>1</sub>	K <sub>1</sub>				
Cadmium (Cd)	µg/l	< 1,0	< 1,0	< 1,0		P-01,STN EN ISO 11885	A
Lead (Pb)	µg/l	< 2,0	< 2,0	< 2,0		P-01,STN EN ISO 11885	A
Nickel (Ni)	µg/l	< 2,0	< 2,0	< 2,0		P-01,STN EN ISO 11885	A
Vanadium (V)	mg/l	< 0,005	< 0,005	< 0,005		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	6,56	2 %	P-03, STN ISO 10523	A
Total organic carbon (TOC)	mg/l	0,59	0,59	0,23	20 %	P-37, STN EN 1484	A
Chemical oxygen demand (COD <sub>Mn</sub> )	mg/l	0,21	0,22	< 0,2	20 %	P-15, STN EN ISO 8467	A
Phenols	mg/l	< 0,01	< 0,01	< 0,01		P-24, STN ISO 6439	A
Colour	mg Pt/l	< 2,0	< 2,0	< 2,0		P-09, STN EN ISO 7887	A
Turbidity	FNU <sup>4)</sup>	0,6	0,6	< 0,5	15 %	P-45, STN ISO 7027	A

K<sub>1</sub> – concentration of determined substances of the 1<sup>st</sup> parallel migration test for migration time 72 hours and temperature (23 ± 2) °CK<sub>0;1</sub> – average value of concentration of determined substances in parallel blank experiment for migration time 72 hours and temperature (23 ± 2) °C

**Test report no.: 21/01150**

**Table No. 2**  
**Sample No. 21-001914 "PE 100 pipe". Measured values for the 2<sup>nd</sup> migration test.**

Parameter	Unit	Measured values <sup>1)</sup>			Uncertainty <sup>2)</sup> (k=2)	Methods used	Test <sup>3)</sup> type
		Parallel determinations		Blank			
		K <sub>2</sub>	K <sub>2</sub>	K <sub>0;2</sub>			
Cadmium (Cd)	µg/l	< 1,0	< 1,0	< 1,0		P-01,STN EN ISO 11885	A
Lead (Pb)	µg/l	< 2,0	< 2,0	< 2,0		P-01,STN EN ISO 11885	A
Nickel (Ni)	µg/l	< 2,0	< 2,0	< 2,0		P-01,STN EN ISO 11885	A
Vanadium (V)	mg/l	< 0,005	< 0,005	< 0,005		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		6,60	6,58	6,54	2 %	P-03, STN ISO 10523	A
Total organic carbon (TOC)	mg/l	0,24	0,25	0,23	20 %	P-37, STN EN 1484	A
Chemical oxygen demand (COD <sub>Mn</sub> )	mg/l	< 0,2	< 0,2	< 0,2		P-15, STN EN ISO 8467	A
Phenols	mg/l	< 0,01	< 0,01	< 0,01		P-24, STN ISO 6439	A
Colour	mg Pt/l	< 2,0	< 2,0	< 2,0		P-09, STN EN ISO 7887	A
Turbidity	FNU <sup>4)</sup>	0,5	0,5	< 0,5	15 %	P-45, STN ISO 7027	A

K<sub>2</sub> – concentration of determined substances of the 2<sup>nd</sup> parallel migration test for migration time 72 hours and temperature (23 ± 2) °C

K<sub>0;2</sub> – average value of concentration of determined substances in parallel blank experiment for migration time 72 hours and temperature (23 ± 2) °C

**Table No. 3**  
**Sample No. 21-001914 "PE 100 pipe". Measured values for the 3<sup>rd</sup> migration test.**

Parameter	Unit	Measured values <sup>1)</sup>			Uncertainty <sup>2)</sup> (k=2)	Methods used	Test <sup>3)</sup> type
		Parallel determinations		Blank			
		K <sub>3</sub>	K <sub>3</sub>	K <sub>0;3</sub>			
Cadmium (Cd)	µg/l	< 1,0	< 1,0	< 1,0		P-01,STN EN ISO 11885	A
Lead (Pb)	µg/l	< 2,0	< 2,0	< 2,0		P-01,STN EN ISO 11885	A
Nickel (Ni)	µg/l	< 2,0	< 2,0	< 2,0		P-01,STN EN ISO 11885	A
Vanadium (V)	mg/l	< 0,005	< 0,005	< 0,005		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		6,60	6,58	6,54	2 %	P-03, STN ISO 10523	A
Total organic carbon (TOC)	mg/l	0,24	0,27	0,22	20 %	P-37, STN EN 1484	A
Chemical oxygen demand (COD <sub>Mn</sub> )	mg/l	< 0,2	< 0,2	< 0,2		P-15, STN EN ISO 8467	A
Phenols	mg/l	< 0,01	< 0,01	< 0,01		P-24, STN ISO 6439	A
Colour	mg Pt/l	< 2,0	< 2,0	< 2,0		P-09, STN EN ISO 7887	A
Turbidity	FNU <sup>4)</sup>	< 0,5	< 0,5	< 0,5		P-45, STN ISO 7027	A
Odor ( TON) <sup>5)</sup>	deg.	1	1	1		STN EN 1622	N
Taste ( TFN) <sup>5)</sup>	deg.	1	1	1		STN EN 1622	N
Organic substances <sup>6)</sup>	mg/l	ND	ND	ND		P-04 / P-06	A

K<sub>3</sub> – concentration of determined substances of the 3<sup>rd</sup> parallel migration test for migration time 72 hours and temperature (23 ± 2) °C

K<sub>0;3</sub> – average value of concentration of determined substances in parallel blank experiment for migration time 72 hours and temperature (23 ± 2) °C

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

<sup>1)</sup> symbol "<" means less than limit of method detection

ND - not detected ( the presence of organic substances was not detected by used analytical method)

<sup>2)</sup> Uncertainty means expanded combined standard relative uncertainty (extension factor k = 2)

<sup>3)</sup> A - accredited test, N- nonaccredited test

<sup>4)</sup> FNU (formazine nephelometric unit) - unit for determination of turbidity

<sup>5)</sup> TFN (taste threshold), TON (odor threshold)

<sup>6)</sup> organic substances ( additives, monomers and others organic substances) identified by used analytical methods P-04 and P-06 in the 3<sup>rd</sup> migration test (deg.) - degree / unit for odor and 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.

**Test report no.: 21/01150**

Page no. 3 out of 4

**Table No.4**  
**Sample No. 21-001914 "PE 100 pipe".**  
**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 <sup>1)</sup>	Evaluation	$M_{24^{23}} ;3$ (mg.dm <sup>-2</sup> . day <sup>-1</sup> ) or ( $\mu$ g.dm <sup>-2</sup> . day <sup>-1</sup> )
Cadmium (Cd)	$\mu$ g/l	< 1,0	< 1,0	< <b>1,0</b>	<b>5,0</b>	meets	< 0,037
Lead (Pb)	$\mu$ g/l	< 2,0	< 2,0	< <b>2,0</b>	<b>10,0</b>	meets	< 0,074
Nickel (Ni)	$\mu$ g/l	< 2,0	< 2,0	< <b>2,0</b>	<b>20,0</b>	meets	< 0,074
Vanadium (V)	mg/l	< 0,005	< 0,005	< <b>0,005</b>	<b>0,05 *</b>	meets	< 0,00018
Chromium (Pb)	$\mu$ g/l	< 5,0	< 5,0	< <b>5,0</b>	<b>50,0</b>	meets	< 0,185
Barium (Ba)	mg/l	< 0,005	< 0,005	< <b>0,005</b>	<b>0,7 *</b>	meets	< 0,00018
pH	-	6,60	6,59	<b>6,59</b>	-	-	-
Total organic carbon (TOC)	mg/l	0,36	< 0,2	< <b>0,2</b>	<b>5,0</b>	meets	< 0,0075
Chemical oxygen demand (COD <sub>Mn</sub> )	mg/l	0,22	< 0,2	< <b>0,2</b>	<b>3,0</b>	meets	< 0,0075
Phenols	mg/l	< 0,01	< 0,01	< <b>0,01</b>	<b>0,05 *</b>	meets	< 0,0004
Colour	mg Pt/l	< 2,0	< 2,0	< <b>2,0</b>	<b>20</b>	meets	< 0,074
Turbidity	FNU <sup>2)</sup>	0,6	0,5	< <b>0,5</b>	<b>5</b>	meets	-
Odor ( TON) <sup>3)</sup>	deg.	-	-	<b>1</b>	<b>max. 2</b>	meets	-
Taste ( TFN) <sup>3)</sup>	deg.	-	-	<b>1</b>	<b>max. 2</b>	meets	-

$K_{72^{23}} ;1$  - concentration of determined substances expressed as arithmetic mean of parallel determinations after subtraction of blank conc. for the 1<sup>st</sup> migration test at (23 ± 2)°C and time 72 hours  
 $K_{72^{23}} ;2$  - concentration of determined substances expressed as arithmetic mean of parallel determinations after subtraction of blank conc. for the 2<sup>nd</sup> migration test at (23 ± 2)°C and time 72 hours  
 $K_{72^{23}} ;3$  - concentration of determined substances expressed as arithmetic mean of parallel determinations after subtraction of blank conc. for the 3<sup>rd</sup> migration test at (23 ± 2)°C and time 72 hours  
 $M_{24^{23}} ;3$  - migration value of the 3<sup>rd</sup> 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 :**

- <sup>1)</sup> limit value according to Annex No.1 to the Decree No. 247/2017 Coll. as amended
- <sup>2)</sup> FNU (formazine nephelometric unit) - unit for determination of turbidity
- <sup>3)</sup> TFN (taste threshold), TON (odor threshold)
- \* limit values for Barium, Vanadium and Phenols according to Decree No. 409/2005 Coll. , paragraph 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 "**PE 100 pipe**", 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 performed 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 3<sup>rd</sup> 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.



**Labeko, s.r.o.**

Krajinská cesta 2929, 921 01 Piešťany  
Accredited testing laboratories  
according to ISO / IEC 17025:2017



**Test report no.: 21/01150**

Page no. 4 out of 4

From measured values and evaluation results presented in Tables 1 to No.4 follows that all controlled parameters **meet** about mentioned legislative requirements. The calculated concentrations of migrated substances from the 3<sup>rd</sup> migration test (K<sub>72<sup>23</sup>;3</sub>) listed in the Table No.4 **do not exceed** relevant limit values of the controlled substances. 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 " PE 100 pipe", manufactured by SC TEHNO WORLD SRL, Baia ,1616 DN2E , 727020 Suceava, Romania **meets** the above-mentioned legislative requirements for the products intended for contact with drinking water. Based on the achieved results of the health evaluation we can recommend the tested product for the 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

