



INSTITUT PRO TESTOVÁNÍ A CERTIFIKACI, a.s.

třída T.Bati 299, 764 21 Zlín – Czech Republic

TESTING LABORATORY

issues

ATTEST

No. 472105584

On samples:

High impact polystyrene (PS HI) SYNTHOS
type SYNTHOS PS HI 336M, SYNTHOS PS HI 552M, SYNTHOS PS HI 562E

Client - producer:

SYNTHOS Kralupy a.s.,

O. Wichterleho 810, 278 01 Kralupy nad Vltavou, Czech Republic

ID: 28214790

Assessed values and technical parameters evaluation are stated on the pages No. 2., 3, 4

Values obtained and the assessment of the technical parameters:

Evaluated technical parameters of the given types of high impact polystyrene **SYNTHOS PS HI 336M, SYNTHOS PS HI 552, SYNTHOS PS HI 562E** meet requirements of the **Commission Regulation (EU) No 10/2011** on plastic materials and articles intended to come into contact with food in the parameters – overall migration into the food simulants **A, B, C, D2**; specific migration of the antioxidant **Irganox 1076**, specific migration of the substances – Annex II, paragraph 1, content of the primary aromatic amines - Annex II, paragraph 2 – at 40°C for 10 days.

Issued on: July 31, 2012

Valid till: July 31, 2015



Dipl. Ing. Jiří Samsonek, Ph.D.
Head of the testing laboratory

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Table I.: Determination of overall migration into the food simulants A, B, C, D2; primary aromatic amines, specific migration of substance Ref. No. 68320, specific migration of substances - Annex II, ITC sample No. 472105584/1 - high impact polystyrene SYNTHOS PS HI 336M

Evaluated parameter	Unit	Value obtained ¹⁾	Uncertainty ²⁾	Limit value ³⁾
Determination of overall migration into the food simulant - 100 cm²/100 ml of simulant				
Simulant A – 10% ethanol (40°C, 10 days)	mg/dm ²	1,5 1,1 0,8 ø 1,1	1	max. 10
Simulant B – 3% acetic acid (40°C, 10 days)	mg/dm ²	3,0 3,1 3,1 ø 3,1	1	max. 10
Simulant C – 20% ethanol (40°C, 10 days)	mg/dm ²	1,6 0,9 1,3 ø 1,3	1	max. 10
Simulant D2 – olive oil (40°C, 10 days)	mg/dm ²	1,5 1,5 0,7 1,8 ø 1,4	3	max. 10
Determination of primary aromatic amines content	mg/kg	< 0,01	-	max. 0,01
Determination of specific migration of substance ref. No. 68320 ^{4/5)} into the food simulant - 60 cm²/100 ml of simulant				
Simulant A – 10% ethanol (40°C, 10 days)	mg/kg	< 1	-	max. 6
Simulant B – 3% acetic acid (40°C, 10 days)	mg/kg	< 1	-	max. 6
Simulant C – 20% ethanol (40°C, 10 days)	mg/kg	< 1	-	max. 6
Simulant D2-1 – 95% ethanol (40°C, 10 days)	mg/kg	< 1	-	max. 6
Simulant D2-2 – isooctane (20°C, 2 days)	mg/kg	< 1	-	max. 6
Determination of specific migration of substances into the food simulant – 95% ethanol - 60 cm²/100 ml of simulant				
- barium	mg/kg	< 0,5	-	max. 1
- cobalt	mg/kg	< 0,05	-	max. 0,05
- copper	mg/kg	< 0,5	-	max. 5
- iron	mg/kg	< 0,5	-	max. 48
- lithium	mg/kg	< 0,5	-	max. 0,6
- manganese	mg/kg	< 0,5	-	max. 0,6
- zinc	mg/kg	< 0,5	-	max. 25

Notes to the table I.:

¹⁾ Symbol „<“ means LOD (limit of detection) of used analytical method

²⁾ Measurements uncertainty according to the ČSN EN 1186-1

³⁾ Limit value according to the Commission Regulation (EU) No. 10/2011

⁴⁾ Stabilizer Irganox 1076 = Octadecyl 3-(3,5-di-tert-butyl-4-hydroxyphenyl)propionate, REF No. 68320, CAS No. 0002082-79-3, SML = max. 6 mg/kg

⁵⁾ Stabilizer is shown in a positive list of substances that can be used in the manufacture of plastic products, Commission Regulation (EU) No. 10/2011, Annex I, SML = max. 6 mg/kg

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Table II.: Determination of overall migration into the food simulants A, B, C, D2; primary aromatic amines, specific migration of substance Ref. No. 68320, specific migration of substances - Annex II, ITC sample No. 472105584/2 - high impact polystyrene SYNTHOS PS HI 552M

Evaluated parameter	Unit	Value obtained ¹⁾	Uncertainty ²⁾	Limit value ³⁾
Determination of overall migration into the food simulant - 100 cm²/100 ml of simulant				
Simulant A – 10% ethanol (40°C, 10 days)	mg/dm ²	0,9 1,0 1,3 ø 0,9	1	max. 10
Simulant B – 3% acetic acid (40°C, 10 days)	mg/dm ²	2,6 2,5 2,8 ø 2,8	1	max. 10
Simulant C – 20% ethanol (40°C, 10 days)	mg/dm ²	0,4 0,6 0,9 ø 0,6	1	max. 10
Simulant D2 – olive oil (40°C, 10 days)	mg/dm ²	1,6 2,4 1,9 1,3 ø 1,8	3	max. 10
Determination of primary aromatic amines content	mg/kg	< 0,01	-	max. 0,01
Determination of specific migration of substance ref. No. 68320 ^{4/5)} into the food simulant - 60 cm²/100 ml of simulant				
Simulant A – 10% ethanol (40°C, 10 days)	mg/kg	< 1	-	max. 6
Simulant B – 3% acetic acid (40°C, 10 days)	mg/kg	< 1	-	max. 6
Simulant C – 20% ethanol (40°C, 10 days)	mg/kg	< 1	-	max. 6
Simulant D2-1 – 95% ethanol (40°C, 10 days)	mg/kg	< 1	-	max. 6
Simulant D2- 2 – isooctane (20°C, 2 days)	mg/kg	< 1	-	max. 6
Determination of specific migration of substances into the food simulant – 95% ethanol - 60 cm²/100 ml of simulant				
- barium	mg/kg	< 0,5	-	max. 1
- cobalt	mg/kg	< 0,05	-	max. 0,05
- copper	mg/kg	< 0,5	-	max. 5
- iron	mg/kg	< 0,5	-	max. 48
- lithium	mg/kg	< 0,5	-	max. 0,6
- manganese	mg/kg	< 0,5	-	max. 0,6
- zinc	mg/kg	< 0,5	-	max. 25

Notes to the table II.:

¹⁾ Symbol „<“ means LOD (limit of detection) of used analytical method

²⁾ Measurements uncertainty according to the ČSN EN 1186-1

³⁾ Limit value according to the Commission Regulation (EU) No. 10/2011

⁴⁾ Stabilizer Irganox 1076 = Octadecyl 3-(3,5-di-tert-butyl-4-hydroxyphenyl)propionate, REF No. 68320, CAS No. 0002082-79-3, SML = max. 6 mg/kg

⁵⁾ Stabilizer is shown in a positive list of substances that can be used in the manufacture of plastic products, Commission Regulation (EU) No. 10/2011, Annex I, SML = max. 6 mg/kg

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Table III.: Determination of overall migration into the food simulants A, B, C, D2; primary aromatic amines, specific migration of substance Ref. No. 68320, specific migration of substances - Annex II, ITC sample No. 472105584/3 - high impact polystyrene SYNTHOS PS HI 562E

Evaluated parameter	Unit	Value obtained ¹⁾	Uncertainty ²⁾	Limit value ³⁾
Determination of overall migration into the food simulant - 100 cm²/100 ml of simulant				
Simulant A – 10% ethanol (40°C, 10 days)	mg/dm ²	0,7 1,3 1,0 ø 1,0	1	max. 10
Simulant B – 3% acetic acid (40°C, 10 days)	mg/dm ²	2,8 3,0 3,4 ø 3,1	1	max. 10
Simulant C – 20% ethanol (40°C, 10 days)	mg/dm ²	0,6 1,1 0,8 ø 0,8	1	max. 10
Simulant D2 – olive oil (40°C, 10 days)	mg/dm ²	0,9 0,9 0,5 < 0,5 ø < 1,0	3	max. 10
Determination of primary aromatic amines content	mg/kg	< 0,01	-	max. 0,01
Determination of specific migration of substance ref. No. 68320 ⁴⁾⁵⁾ into the food simulant - 60 cm²/100 ml of simulant				
Simulant A – 10% ethanol (40°C, 10 days)	mg/kg	< 1	-	max. 6
Simulant B – 3% acetic acid (40°C, 10 days)	mg/kg	< 1	-	max. 6
Simulant C – 20% ethanol (40°C, 10 days)	mg/kg	< 1	-	max. 6
Simulant D2-1 – 95% ethanol (40°C, 10 days)	mg/kg	< 1	-	max. 6
Simulant D2- 2 – isooctane (20°C, 2 days)	mg/kg	< 1	-	max. 6
Determination of specific migration of substances into the food simulant – 95% ethanol - 60 cm²/100 ml of simulant				
- barium	mg/kg	< 0,5	-	max. 1
- cobalt	mg/kg	< 0,05	-	max. 0,05
- copper	mg/kg	< 0,5	-	max. 5
- iron	mg/kg	< 0,5	-	max. 48
- lithium	mg/kg	< 0,5	-	max. 0,6
- manganese	mg/kg	< 0,5	-	max. 0,6
- zinc	mg/kg	< 0,5	-	max. 25

Notes to the table III.:

¹⁾ Symbol „<“ means LOD (limit of detection) of used analytical method

²⁾ Measurements uncertainty according to the ČSN EN 1186-1

³⁾ Limit value according to the Commission Regulation (EU) No. 10/2011

⁴⁾ Stabilizer Irganox 1076 = Octadecyl 3-(3,5-di-tert-butyl-4-hydroxyphenyl)propionate, REF No. 68320, CAS No. 0002082-79-3, SML = max. 6 mg/kg

⁵⁾ Stabilizer is shown in a positive list of substances that can be used in the manufacture of plastic products, Commission Regulation (EU) No. 10/2011, Annex I, SML = max. 6 mg/kg

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INSTITUT PRO TESTOVÁNÍ A CERTIFIKACI, a. s.
tř. T. Bati 299, 764 21 Zlín, Czech Republic

Accredited Testing Laboratory No. 1004

ATTEST No. 472105584

Sample description and identification:

The samples of polystyrene labeled by their trade mark Synthos were taken for testing:

- high impact polystyrene SYNTHOS type **Synthos PS HI 336M**, size (2x120x120) mm, white, sample number **472105584/1**,
- high impact polystyrene SYNTHOS type **Synthos PS HI 552M**, size (2x120x120) mm, white, sample number **472105584/2**,
- high impact polystyrene SYNTHOS type **Synthos PS HI 562E**, size (2x120x120) mm, white, sample number **472105584/3**.

Sampling method used:

The samples were supplied to the laboratory by the client. The laboratory is not responsible for mistakes caused by the wrong way of sampling.

Work requested:

Evaluation of hygienic parameters according to the Regulation (EU) No 10/2011 in the parameters – overall migration into the food simulants A, B, C, D2; specific migration of the antioxidant Irganox 1076, specific migration of the substances – Annex II, paragraph 1, content of the primary aromatic amines - Annex II, paragraph 2.

Testing method used:

1. Determination of overall migration into the aqueous food simulants (A–10% ethanol, B–3% acetic acid, C–20% ethanol) according to the ČSN EN 1186 part 1 and 3.
2. Determination of overall migration into fatty food simulant (D2–olive oil) according to the ČSN EN 1186 part 1 and 2
3. Determination of specific migration of primary aromatic amines in simulant (acetic acid 3%) according to internal regulation ITC A-07-69
4. Determination of specific migration of substances into food simulant (95% ethanol) according to the Commission Regulation (EU) No 10/2011 Annex II, the internal regulation ITC A-06-61 – method ICP-OES
5. Determination of specific migration of stabilizer Irganox 1076 = Octadecyl-3-(3,5-diterc.butyl-4-hydroxyphenyl) propionate, Ref. No. 68320, CAS 002082-79-3 according to the internal regulation A-96-35 method E

Test equipment used:

ad 1. -5. See Test report of accredited laboratory No. 472105584.

Test conditions:

ad 1.- 5. See Test report of accredited laboratory No. 472105584.

Testing facility:

All tests were performed in Institut pro testování a certifikaci, a.s. Zlín.

Test results:

See the Accredited Laboratory Test Report No. 472105584 and on the pages No. 2, 3, 4 this Attest.

Tested by:

ad 1.-5. See the Accredited Laboratory Test Report No. 472105584.

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tř. T. Bati 299, 764 21 Zlín, Czech Republic

Accredited Testing Laboratory No. 1004

ATTEST No. 472105584

Evaluation of the results:

The assessed samples of the high impact polystyrene SYNTHOS PS HI 336M, SYNTHOS PS HI 552, SYNTHOS PS HI 562E are intended for contact with the foodstuffs.

The amount of substances released into the food simulants was determined according to ČSN EN 1186 Parts 1, 2 and 3. The quantity of the constituents released from the products into the food simulants did not exceed the limit down given in the Commission Regulation (EU) No 10/2011, i.e. 10 mg square decimetre (see the Accredited Laboratory Test Report No. 472105584 and the tables given on pages 2, 3, 4 of this Attest). **Requirements of article 12 of Commission Regulation (EU) No. 10/2011 are met.**

Tests carried out according to the ITC internal regulations A-07-69 and A-10-97 showed that tested products did not exceed the specific migration limits of primary aromatic amines and substances set out in the Annex II of the Commission Regulation (EU) No. 10/2011 (see the Accredited Laboratory Test Report No. 472105584 and the tables given on pages 2, 3, 4 of this Attest). **The requirements of the Commission Regulation (EU) No. 10/2011 Annex II are met.**

The tested high impact polystyrenes contain the stabilizer = octadecyl-3-(3,5-di-tert-butyl-4-hydroxyphenyl) propionate; REF No. 68320, CAS No. 2082-79-3, SML = max. 6 mg/kg. Tests carried out according to the ITC internal regulations A-96-35 showed that tested products did not exceed the value of 1 mg/kg of simulants (see Test report of accredited laboratory No. 472105584 and the tables given on pages 2, 3, 4 of this Attest). **The requirements of the Commission Regulation (EU) No. 10/2011 Annex I are met.**

Comments on and interpretation of the results by:

Dipl. Ing. Miroslav Rafaj, on July 31, 2012

Conclusion:

The comparison of obtained results with the limits and requirements of the Commission Regulation (EU) No. 10/2011 and evaluation of the conformity with these documents are stated on the pages No. 1 to 4 of this Attest.

Dipl. Ing. Věra Vilímková
Head of the Laboratory
of analytical chemistry and microbiology



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