

No. CRSSA/15801-1/17

CRS Ref. CRSSA/17/3272/Toray

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Date: 04/01/2018

TORAY PLASTICS (M) SDN BHD 2628, MK. 1, SPT., LORONG PERUSAHAAN 4 PRAI FREE INDUSTRIAL ZONE 13600 PRAI, PENANG, MALAYSIA

The following merchandise was (were) submitted and identified by the client as:

Sample Description : TOYOLAC_{TM} 100 322

TOYOLAC_{TM} 100 X01 TOYOLAC_{TM} 250 X10 TOYOLAC_{TM} 500 322 TOYOLAC_{TM} 532 X02 TOYOLAC_{TM} 700 X01 TOYOLAC_{TM} 700 X01 TOYOLAC_{TM} 600 X50 TOYOLAC_{TM} 600 X52

Sample Receiving Date : 27/12/2017

Testing Period : 27/12/2017 to 04/01/2018

Test Requested : Selected test(s) as requested by client

Test Method : Please refer to next page(s).

Test Results : Please refer to next page(s).

Analysts : Tan Mei Ann & Ling Yii Ming

SGS (MALAYSIA) SDN. BHD.

TAY SIAM PINE B.Sc. (HONS) MMIC TECHNICAL MANAGER

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Test results:

Test Part Description:

Sample Description : As per page 1 & 4

RoHS Directive 2011/65/EU Annex II

Test Item(s):	Unit	Test Method	Results	MDL	Limit
Cadmium (Cd)	mg/kg	With reference to IEC 62321-5:2013 (Determination of Cd by ICP-OES)	N.D.	2	100
Lead (Pb)	mg/kg	With reference to IEC 62321-5:2013 (Determination of Pb by ICP-OES)	N.D.	2	1000
Mercury (Hg)	mg/kg	With reference to IEC 62321-4:2013/AMD 1:2017 (Determination of Hg by ICP-OES)	N.D.	2	1000
Hexavalent Chromium (CrVI)	mg/kg	With reference to IEC 62321-7-2:2017 (Determination of CrVI by UV-Vis)	N.D.	8	1000
Sum of PBBs	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBB by GC-MS)	N.D.	-	1000
Monobromobiphenyl	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBB by GC-MS)	N.D.	5	-
Dibromobiphenyl	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBB by GC-MS)	N.D.	5	-
Tribromobiphenyl	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBB by GC-MS)	N.D.	5	-
Tetrabromobiphenyl	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBB by GC-MS)	N.D.	5	-
Pentabromobiphenyl	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBB by GC-MS)	N.D.	5	-
Hexabromobiphenyl	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBB by GC-MS)	N.D.	5	-
Heptabromobiphenyl	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBB by GC-MS)	N.D.	5	-
Octabromobiphenyl	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBB by GC-MS)	N.D.	5	-
Nonabromobiphenyl	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBB by GC-MS)	N.D.	5	-
Decabromobiphenyl	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBB by GC-MS)	N.D.	5	-

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Sum of PBDEs	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBDE by GC-MS)	N.D.	-	1000
Monobromodiphenyl ether	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBDE by GC-MS)	N.D.	5	-
Dibromodiphenyl ether	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBDE by GC-MS)	N.D.	5	-
Tribromodiphenyl ether	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBDE by GC-MS)	N.D.	5	-
Tetrabromodiphenyl ether	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBDE by GC-MS)	N.D.	5	-
Pentabromodiphenyl ether	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBDE by GC-MS)	N.D.	5	-
Hexabromodiphenyl ether	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBDE by GC-MS)	N.D.	5	-
Heptabromodiphenyl ether	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBDE by GC-MS)	N.D.	5	-
Octabromodiphenyl ether	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBDE by GC-MS)	N.D.	5	-
Nonabromodiphenyl ether	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBDE by GC-MS)	N.D.	5	-
Decabromodiphenyl ether	mg/kg	With reference to IEC 62321-6:2015 (Determination of PBDE by GC-MS)	N.D.	5	-

Note: (a) mg/kg = ppm; (0.1wt% = 1000ppm)

- (b) N.D. = Not Detected
- (c) MDL = Method Detection Limit
- (d) = not regulated
- (e) The below information of raw materials or ingredients was provided by the client. SGS has no liability in verifying the authenticity of such information. The testing was carried out using the sample submitted as shown in the photo in page 4.

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Test Part Description:

Sample Description TOYOLAC_{TM} 100 322

> TOYOLAC_{TM} 100 X01 TOYOLAC_{TM} 250 X10 TOYOLAC_{TM} 500 322 TOYOLAC_{TM} 532 X02 **TOYOLAC_{TM} 700 314** TOYOLAC_{TM} 700 X01 TOYOLAC_{TM} 700 SG5 TOYOLAC_{TM} 600 X50 TOYOLAC_{TM} 600 X52

TORAY PLASTICS (M) SDN BHD CRSSA/15801-1/17



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1. DETERMINATION OF CADMIUM CONTENT BY

IEC 62321-5 2013
Sample Receiving and Registration

Cut sample in small pieces

Weight sample (0.2-0.5g) into digestion vessel

Acid digestion (Microwave)

"Totally Dissolved"

Filtration

Analyses by ICP

2. <u>DETERMINATION OF LEAD CONTENT BY</u> IEC 62321-5 2013

Sample Receiving and Registration

Cut sample in small pieces

Weight sample (0.2-0.5g) into digestion vessel

Acid digestion (Microwave)

"Totally Dissolved"

Filtration

Analyses by ICP

3. DETERMINATION OF MERCURY CONTENT BY

IEC 62321-4 2013/AMD 1 2017 Sample Receiving and Registration

Cut sample in small pieces

Weight sample (0.1-0.5g) into digestion vessel

Acid digestion (Microwave)

"Totally Dissolved"

Filtration

Analyses by ICP

4a. <u>DETERMINATION OF HEXAVALENT CHROMIUM</u>
BY IEC 62321-7-2 2017 (Other Materials)

Sample Preparation

Digestion at 150~160 ℃

Separating To Obtain Aqueous Phase

pH Adjustment

Add Diphenyl-Carbazide for Color Development

Analyses by UV- Spectrophotometer (540 nm)

4b. <u>DETERMINATION OF HEXAVALENT CHROMIUM</u> BY IEC 62321-7-2 2017 (Soluble Polymers)

Sample Preparation

Add Digestion Solution

Ultrasonicate Sample

pH Adjustment

Add Diphenyl-Carbazide for Color Development

Analyses by UV- Spectrophotometer (540 nm)

5. <u>DETERMINATION OF PBB/PBDE WITH GC-MS</u>
<u>BY IEC 62321-6 2015</u>

Cut sample in small pieces

Weight sample (0.5-4.0g) into extraction thimble

Soxhlet Extraction with Toluene

Filter through 0.45 um membrane filter

Analyses by GC-MS (with appropriate dilution)

SGS (MALAYSIA) SDN. BHD.

****End of Report****

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TECHNICAL MANAGER

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Date: 05/01/2018

TORAY PLASTICS (M) SDN BHD 2628, MK. 1, SPT., LORONG PERUSAHAAN 4 PRAI FREE INDUSTRIAL ZONE 13600 PRAI, PENANG, MALAYSIA

The following merchandise was (were) submitted and identified by the client as:

Sample Description : TOYOLAC_{TM} 100 322

TOYOLACTM 100 X01
TOYOLACTM 250 X10
TOYOLACTM 500 322
TOYOLACTM 532 X02
TOYOLACTM 700 314
TOYOLACTM 700 X01
TOYOLACTM 700 SG5
TOYOLACTM 600 X50
TOYOLACTM 600 X52

Sample Receiving Date : 27/12/2017

Testing Period : 27/12/2017 to 05/01/2018

Test Requested : Selected test(s) as requested by client

Test Method : Please refer to next page(s).

Test Results : Please refer to next page(s).

Analyst : Ling Yii Ming

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CRS Ref. CRSSA/17/3272/Toray

Test result:

Test Part Description:

Sample Description : As per page 1 & 3

RoHS Directive 2011/65/EU Annex II (amended by Directive (EU) 2015/863)

Test Item(s):	Unit	Test Method	Results	MDL	Limit
Bis (2-ethylhexyl) phthalate (DEHP) (CAS No. 117-81-7)	mg/kg	With reference to IEC 62321-8:2017. Analysis was performed by GC/MS.	N.D.	50	1000
Butyl benzyl phthalate (BBP) (CAS No. 85-68-7)	mg/kg	With reference to IEC 62321-8:2017. Analysis was performed by GC/MS.	N.D.	50	1000
Dibutyl phthalate (DBP) (CAS No. 84-74-2)	mg/kg	With reference to IEC 62321-8:2017. Analysis was performed by GC/MS.	N.D.	50	1000
Diisobutyl phthalate (DIBP) (CAS No. 84-69-5)	mg/kg	With reference to IEC 62321-8:2017. Analysis was performed by GC/MS.	N.D.	50	1000

Note: (a) mg/kg = ppm; (0.1wt% = 1000ppm)

- (b) N.D. = Not Detected
- (c) MDL = Method Detection Limit
- (d) = Not regulated
- (e) On 4 June 2015, <u>Commission Directive (EU) 2015/863</u> was published in the Official Journal of the European Union (OJEU) to include the phthalates BBP, DBP, DEHP and DIBP into ANNEX II of the Rohs Recast Directive. The new law restricts each phthalate to no more than 0.1% in each homogeneous material of an electrical product.
- (f) The restriction of DEHP, BBP, DBP and DIBP shall apply to medical devices, including in vitro medical devices, and monitoring and control instruments, including industrial monitoring and control instruments, from 22 July 2021.
- (g)The restriction of DEHP, BBP, DBP and DIBP shall not apply to cables or spare parts for the repair, the reuse, the updating of functionalities or upgrading of capacity of EEE placed on the market before 22 July 2019, and of medical devices, including in vitro medical devices, and monitoring and control instruments, including industrial monitoring and control instruments, placed on the market before 22 July 2021.
- (h)The restriction of DEHP, BBP and DBP shall not apply to toys which are already subject to the restriction of DEHP, BBP and DBP through entry 51 of Annex XVII to Regulation (EC) No 1907/2006.
- (i) The below information of raw materials or ingredients was provided by the client. SGS has no liability in verifying the authenticity of such information. The testing was carried out using the sample submitted as shown in the photo in page 3.

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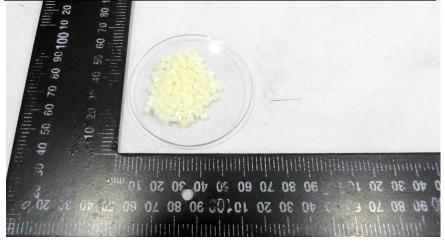
Test Part Description:

Sample Description **TOYOLAC_{TM} 100 322**

TOYOLAC_{TM} 100 X01 TOYOLAC_{TM} 250 X10 TOYOLAC_{TM} 500 322 TOYOLAC_{TM} 532 X02 **TOYOLAC_{TM} 700 314** TOYOLAC_{TM} 700 X01 TOYOLACTM 700 SG5 TOYOLAC_{TM} 600 X50

TOYOLAC_{TM} 600 X52

TORAY PLASTICS (M) SDN BHD CRSSA/15801-2/17



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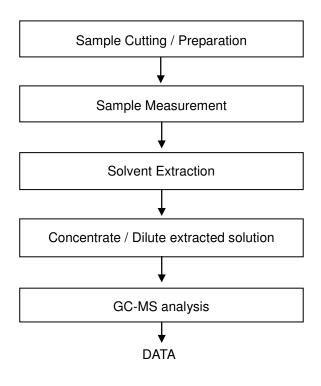
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Flowchart for Phthalates Measurement

Method: IEC62321



****End of Report****

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