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KURARAY CO., LTD. OTE CENTER BLDG., 1-1-3, OTEMACHI, CHIYODA-KU, TOKYO, JAPAN

The following sample(s) was/were submitted and identified by/on behalf of the applicant as :

German ZLS and its amendments.

Sample Submitted By	:	KURARAY CO., LTD.
Sample Description	:	NEW HEAT RESISTANT POLYAMIDE RESIN
Style/Item No.	:	GENESTAR GN2330-1 BK
Sample Receiving Date	:	2013/07/23
Testing Period	:	2013/07/23 TO 2013/07/30

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

 Conclusion
 : Base upon the performed tests by submitted samples, the test results of PAHs comply with the PAHs requirement according to (Category 1) of ZEK 01.4-08 of





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Test Result(s)

PART NAME No.1 : BLACK PLASTIC PELLETS

Test Item(s)	Unit	Method	MDL	Result
Test tieni(s)	Unit	Method	IVIDE	No.1
Cadmium (Cd)	mg/kg		2	n.d.
Lead (Pb)	mg/kg	With reference to IEC 62321: 2008 and performed by ICP-AES.	2	7
Mercury (Hg)	mg/kg		2	n.d.
Hexavalent Chromium Cr(VI)	mg/kg	With reference to IEC 62321: 2008 and performed by UV-VIS.	2	n.d.
Nickel (Ni)	mg/kg	With reference to US EPA Method 3050B. Analysis was performed by ICP-AES.	2	n.d.
Antimony (Sb)	mg/kg	With reference to US EPA Method 3050B. Analysis was performed by ICP-AES.	2	n.d.
Beryllium (Be)	mg/kg	With reference to US EPA Method 3050B. Analysis was performed by ICP-AES.	2	n.d.
DIBP (Di-isobutyl phthalate) (CAS No.: 84-69-5)	%	With reference to EN 14372. Analysis was performed by GC/MS.	0.003	n.d.
BBP (Benzyl butyl phthalate) (CAS No.: 85-68-7)	%	With reference to EN 14372. Analysis was performed by GC/MS.	0.003	n.d.
DEHP (Di- (2-ethylhexyl) phthalate) (CAS No.: 117-81-7)	%	With reference to EN 14372. Analysis was performed by GC/MS.	0.003	n.d.
DIDP (Di-isodecyl phthalate) (CAS No.: 26761-40-0; 68515-49-1)	%	With reference to EN 14372. Analysis was performed by GC/MS.	0.01	n.d.
DINP (Di-isononyl phthalate) (CAS No.: 28553-12-0; 68515-48-0)	%	With reference to EN 14372. Analysis was performed by GC/MS.	0.01	n.d.
DNOP (Di-n-octyl phthalate) (CAS No.: 117-84-0)	%	With reference to EN 14372. Analysis was performed by GC/MS.	0.003	n.d.
DBP (Dibutyl phthalate) (CAS No.: 84-74-2)	%	With reference to EN 14372. Analysis was performed by GC/MS.	0.003	n.d.
PVC	**	Analysis was performed by FTIR and FLAME Test.	-	Negative



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Result Method MDL Test Item(s) Unit No.1 n.d. With reference to IEC 62321: 2008 Hexabromocyclododecane 5 mg/kg (HBCDD) and all major method. Analysis was performed by diastereoisomers identified (a-GC/MS. HBCDD, β - HBCDD, y- HBCDD) (CAS No.: 25637-99-4 and 3194-55-6 (134237-51-7, 134237-50-6, 134237-52-8)) Perfluorooctane sulfonates mg/kg With reference to US EPA 3550C: 10 n.d. (PFOS-Acid, Metal Salt, Amide) 2007. Analysis was performed by LC/MS. With reference to US EPA 3550C: PFOA (CAS No.: 335-67-1) 10 mg/kg n.d. 2007. Analysis was performed by LC/MS. Sum of PBBs mg/kg n.d. -Monobromobiphenyl mg/kg 5 n.d. Dibromobiphenyl 5 mg/kg n.d. Tribromobiphenyl 5 n.d. mg/kg 5 Tetrabromobiphenyl mg/kg n.d. Pentabromobiphenyl 5 n.d. mg/kg 5 n.d. Hexabromobiphenyl mg/kg Heptabromobiphenyl 5 n.d. mg/kg Octabromobiphenyl 5 n.d. mg/kg Nonabromobiphenyl 5 n.d. mg/kg Decabromobiphenyl 5 n.d. mg/kg With reference to IEC 62321: 2008 and Sum of PBDEs performed by GC/MS. _ n.d. mg/kg 5 n.d. Monobromodiphenyl ether mg/kg 5 n.d. Dibromodiphenyl ether mg/kg 5 Tribromodiphenyl ether n.d. mg/kg 5 Tetrabromodiphenyl ether mg/kg n.d. Pentabromodiphenyl ether 5 n.d. mg/kg 5 n.d. Hexabromodiphenyl ether mg/kg Heptabromodiphenyl ether mg/kg 5 n.d. Octabromodiphenyl ether mg/kg 5 n.d. 5 Nonabromodiphenvl ether n.d. mg/kg Decabromodiphenyl ether 5 n.d. mg/kg

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Result Test Item(s) Method MDL Unit No.1 **Polynuclear Aromatic** Hydrocarbons (PAHs) Acenaphthene (CAS No.: 83-32-9) mg/kg 0.2 n.d. Acenaphthylene (CAS No.: 208-0.2 n.d. mg/kg 96-8) Anthracene (CAS No.: 120-12-7) 0.2 mg/kg n.d. Benzo[a]anthracene (CAS No.: 56-0.2 n.d. mg/kg 55-3) Benzo[a]pyrene (CAS No.: 50-32mg/kg 0.2 n.d. 8) Benzo[b]fluoranthene (CAS No.: mg/kg 0.2 n.d. 205-99-2) Benzo[g,h,i]perylene (CAS No.: mg/kg 0.2 n.d. 191-24-2) Benzo[k]fluoranthene (CAS No.: 0.2 n.d. mg/kg 207-08-9) With reference to ZLS standard ZEK Chrysene (CAS No.: 218-01-9) 0.2 mg/kg 01.4-08 method. Analysis was n.d. performed by GC/MS. Dibenzo[a,h]anthracene (CAS No.: mg/kg 0.2 n.d. 53-70-3) Fluoranthene (CAS No.: 206-44-0) mg/kg 0.2 n.d. Fluorene (CAS No.: 86-73-7) 0.2 n.d. mg/kg Indeno[1,2,3-c,d] pyrene (CAS 0.2 n.d. mg/kg No.: 193-39-5) Naphthalene (CAS No.: 91-20-3) mg/kg 0.2 n.d. Phenanthrene (CAS No.: 85-01-8) 0.2 n.d. mg/kg Pyrene (CAS No.: 129-00-0) 0.2 n.d. mg/kg Benzo[j]fluoranthene (CAS No.: 0.2 mg/kg n.d. 205-82-3) Benzo[e]pyrene (CAS No.: 192-0.2 n.d. mg/kg 97-2) Sum of 18 PAHs mg/kg n.d.

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Test Item(s)	Unit	Method	MDL	Result
rest item(s)				No.1
Halogen				
Halogen-Fluorine (F) (CAS No.: 14762-94-8)	mg/kg	With reference to BS EN 14582:2007. Analysis was performed by IC.	50	4240
Halogen-Chlorine (Cl) (CAS No.: 22537-15-1)	mg/kg		50	n.d.
Halogen-Bromine (Br) (CAS No.: 10097-32-2)	mg/kg		50	121000
Halogen-Iodine (I) (CAS No.: 14362-44-8)	mg/kg		50	n.d.

Note :

- 1. mg/kg = ppm ; 0.1wt% = 1000ppm
- 2. n.d. = Not Detected
- 3. MDL = Method Detection Limit
- 4. " " = Not Regulated
- 5. ** = Qualitative analysis (No Unit)
- 6. Negative = Undetectable / Positive = Detectable

PFOS Reference Information : POPs - (EU) 757/2010

Outlawing PFOS as substances or preparations in concentrations above 0.001% (10ppm), in semi-finished products or articles or parts at a level above 0.1%(1000ppm), in textiles or other coated materials above 1µg/m².



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<u>Reference information for PAHs:</u> <u>Requirement of ZEK 01.4-08 : Restraining maximum values for products</u>

Parameter	Category 1	Category 2	Category 3
	in the mouth or toys for	contact to skin for longer	Materials not falling under category 1 or 2 with foreseeable contact to skin for less than 30 seconds (short-term skin contact).
Benzo[a]pyrene (mg/kg)	<mdl (<0.2)**<="" td=""><td>1</td><td>20</td></mdl>	1	20
Sum of 18 PAH (mg/kg)*	<mdl (<0.2)**<="" td=""><td>10</td><td>200</td></mdl>	10	200

Remark :

* = Only PAH substances >0.2 mg/kg are taken into account while calculating the sum of PAHs

** = If the limits of category 1 are surpassed but the limits of category 2 still met, the confirmation of suitability of contact with foodstuff or the oral mucosa can be verified by an additional specific migration test of the PAH components according to EN 1186 ff. and § 64 LFBG 80.30-1. The results of the migration test shall be evaluated according to law criteria for foodstuff.

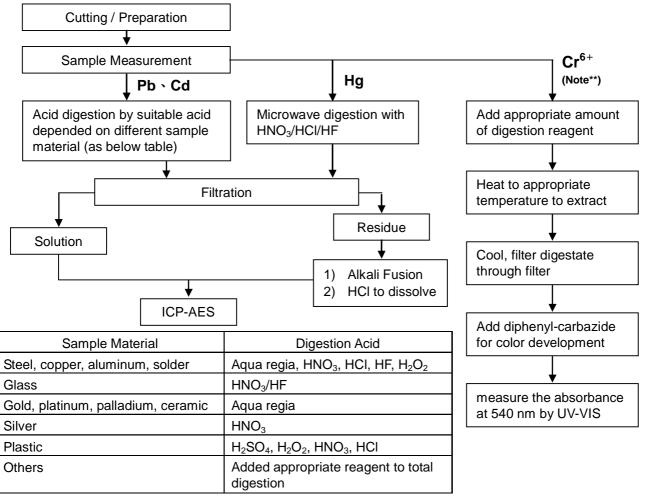


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OTE CENTER BLDG., 1-1-3, OTEMACHI, CHIYODA-KU, TOKYO, JAPAN

- 1) These samples were dissolved totally by pre-conditioning method according to below flow chart. $(Cr^{6+}$ test method excluded)
- 2) Name of the person who made measurement: Climbgreat Yang
- 3) Name of the person in charge of measurement: Troy Chang



Note** : (1) For non-metallic material, add alkaline digestion reagent and heat to 90~95℃.
(2) For metallic material, add pure water and heat to boiling.

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chart.

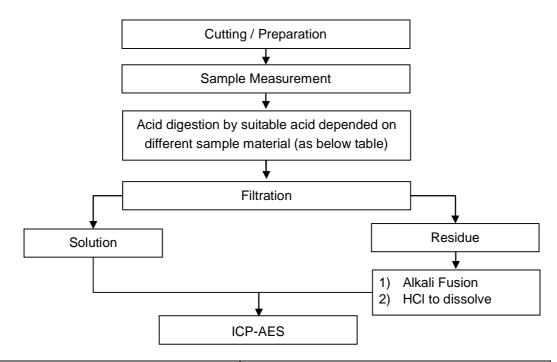
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KURARAY CO., LTD. OTE CENTER BLDG., 1-1-3, OTEMACHI, CHIYODA-KU, TOKYO, JAPAN

1) These samples were dissolved totally by pre-conditioning method according to below flow

- 2) Name of the person who made measurement: Climbgreat Yang
- 3) Name of the person in charge of measurement: Troy Chang

Flow Chart of digestion for the elements analysis performed by ICP-AES



Steel, copper, aluminum, solder	Aqua regia, HNO ₃ , HCl, HF, H ₂ O ₂
Glass	HNO ₃ /HF
Gold, platinum, palladium, ceramic	Aqua regia
Silver	HNO ₃
Plastic	H ₂ SO ₄ , H ₂ O ₂ , HNO ₃ , HCI
Others	Added appropriate reagent to total digestion

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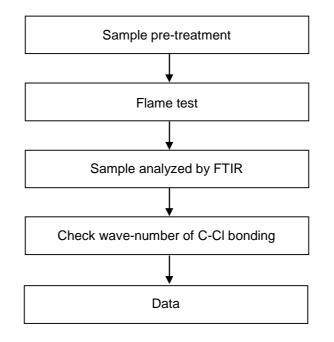


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Analysis flow chart for determination of PVC in material

- Name of the person who made measurement: Ginny Chen
- Name of the person in charge of measurement: Troy Chang



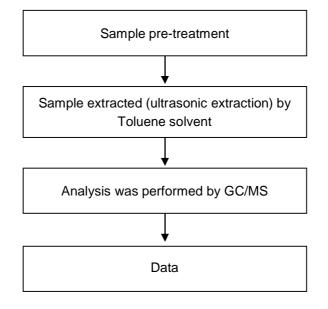


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PAHs (Polynuclear Aromatic Hydrocarbons) analytical flow chart

- Name of the person who made measurement: Roman Wong
- Name of the person in charge of measurement: Troy Chang



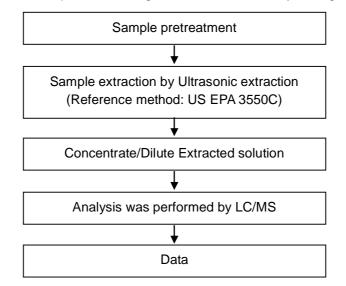


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PFOA/PFOS analytical flow chart of Ultrasonic extraction (LC/MS) procedure

- Name of the person who made measurement: Roman Wong
- Name of the person in charge of measurement: Troy Chang



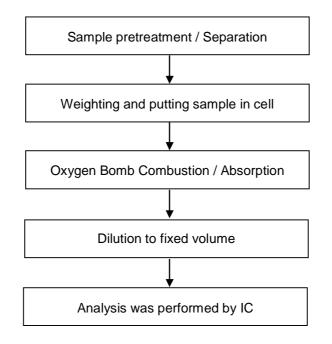


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Analytical flow chart of halogen content

- Name of the person who made measurement: Rita Chen
- Name of the person in charge of measurement: Troy Chang



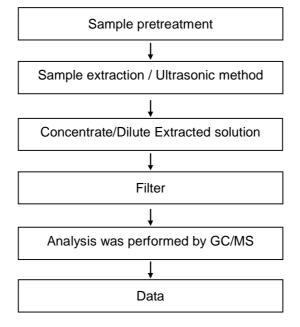


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HBCDD analytical flow chart

- Name of the person who made measurement: Roman Wong
 Name of the person in charge of measurement: Tray Change
- Name of the person in charge of measurement: Troy Chang



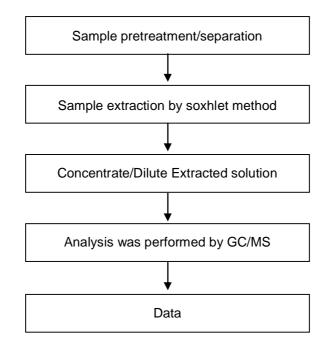


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Analytical flow chart of phthalate content

- Name of the person who made measurement: Roman Wong
- Name of the person in charge of measurement: Troy Chang



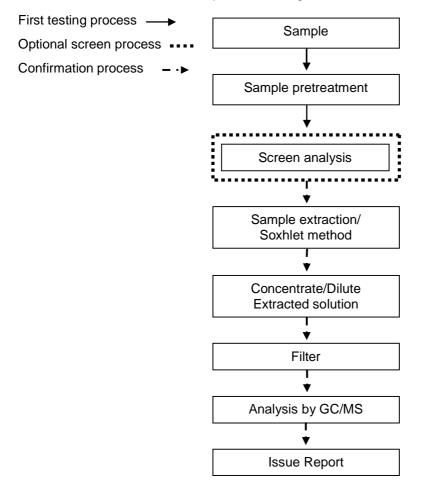


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PBB/PBDE analytical FLOW CHART

- Name of the person who made measurement: Roman Wong
- Name of the person in charge of measurement: Troy Chang





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* The tested sample / part is marked by an arrow if it's shown on the photo. *



** End of Report **