

Test Report

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HAMBURG INDUSTRIES CO., LTD.
6F., NO. 12, LANE 270, SEC. 3, PEISHEN RD., SHEN KENG HSIANG,
TAIPEI HSIEN, TAIWAN 222



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

Sample Description : HEAT SHRINKABLE POLYOLEFIN TUBING (HALOGEN FREE)
Style/Item No. : HAMBURG-A H-2 & H-2 (CB)
Lot No. : 07112338
Sample Receiving Date : 2008/03/25
Testing Period : 2008/03/25 TO 2008/04/07

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

Conclusion : Based on the performed tests on submitted samples, the test results of Cadmium, Lead, Mercury, Hexavalent Chromium Cr(VI), PBBs and PBDEs are **compliant with** the limits of RoHS Directive 2002/95/EC and its subsequent amendments.



Chenyu Kung / Operation Manager
Signed for and on behalf of
SGS TAIWAN LTD.
Chemical Laboratory – Taipei

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Test Result(s)

PART NAME NO.1 : BLACK PLASTIC TUBE

Test Item (s):	Unit	Method	MDL	Result	Limit
				No.1	
Cadmium (Cd)	mg/kg	With reference to IEC 62321/2nd CDV (111/95/CDV) - Clause 8. Determination of Cadmium by ICP-AES.	2	n.d.	100
Lead (Pb)	mg/kg	With reference to IEC 62321/2nd CDV (111/95/CDV) - Clause 8. Determination of Lead by ICP-AES.	2	n.d.	1000
Mercury (Hg)	mg/kg	With reference to IEC 62321/2nd CDV (111/95/CDV) - Clause 7. Determination of Mercury by ICP-AES.	2	n.d.	1000
Hexavalent Chromium Cr(VI) by alkaline extraction	mg/kg	With reference to IEC 62321/2nd CDV (111/95/CDV) - Annex C. Determination of Hexavalent Chromium for non-metallic samples by UV/Vis Spectrometry.	2	n.d.	1000
Antimony (Sb)	mg/kg	With reference to US EPA Method 3050B for Antimony Content. Analysis was performed by ICP-AES.	2	n.d.	-
PFOS	mg/kg	With reference to US EPA 3540C : 1996 method for PFOS Content. Analysis was performed by LC/MS.	1	n.d.	-
Halogen	---	With reference to BS EN 14582:2007. Analysis was performed by IC method for F , Cl , Br, I content.	---	---	---
Halogen-Fluorine (F) (CAS No.: 007782-41-4)	mg/kg	With reference to BS EN 14582:2007. Analysis was performed by IC method for Fluorine content.	50	n.d.	-
Halogen-Chlorine (Cl) (CAS No.: 007782-50-5)	mg/kg	With reference to BS EN 14582:2007. Analysis was performed by IC method for Chlorine content.	50	n.d.	-

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Test Item (s):	Unit	Method	MDL	Result	Limit
				No.1	
Halogen-Bromine (Br) (CAS No.: 007726-95-6)	mg/kg	With reference to BS EN 14582:2007. Analysis was performed by IC method for Bromine content.	50	n.d.	-
Halogen-Iodine (I) (CAS No.: 007553-56-2)	mg/kg	With reference to BS EN 14582:2007. Analysis was performed by IC method for Iodine content.	50	n.d.	-
Sum of PBBs			-	n.d.	1000
Monobromobiphenyl			5	n.d.	-
Dibromobiphenyl			5	n.d.	-
Tribromobiphenyl			5	n.d.	-
Tetrabromobiphenyl			5	n.d.	-
Pentabromobiphenyl			5	n.d.	-
Hexabromobiphenyl			5	n.d.	-
Heptabromobiphenyl			5	n.d.	-
Octabromobiphenyl			5	n.d.	-
Nonabromobiphenyl			5	n.d.	-
Decabromobiphenyl			5	n.d.	-
Sum of PBDEs (Mono to Nona) (Note 4)	mg/kg	With reference to IEC 62321/2nd CDV (111/95/CDV) - Annex A. Determination of PBB and PBDE by GC/MS.	-	n.d.	1000
Monobromodiphenyl ether			5	n.d.	-
Dibromodiphenyl ether			5	n.d.	-
Tribromodiphenyl ether			5	n.d.	-
Tetrabromodiphenyl ether			5	n.d.	-
Pentabromodiphenyl ether			5	n.d.	-
Hexabromodiphenyl ether			5	n.d.	-
Heptabromodiphenyl ether			5	n.d.	-
Octabromodiphenyl ether			5	n.d.	-
Nonabromodiphenyl ether			5	n.d.	-
Decabromodiphenyl ether			5	n.d.	-
Sum of PBDEs (Mono to Deca)			-	n.d.	-

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Test Item (s):	Unit	Method	MDL	Result	Limit
				No.1	
Polycyclic aromatic Hydrocarbons (PAHs)	---	---	---	---	---
Phenanthrene (CAS No.: 000085-01-8)	mg/kg	With reference to ZLS standard ZEK 01-08 method. Analysis was performed by GC/MS.	0.2	n.d.	-
Pyrene (CAS No.: 000129-00-0)			0.2	n.d.	-
Naphthalene (CAS No.: 000091-20-3)			0.2	n.d.	-
Indeno[1,2,3-c,d] pyrene (CAS No.: 000193-39-5)			0.2	n.d.	-
Fluorene (CAS No.: 000086-73-7)			0.2	n.d.	-
Fluoranthene (CAS No.: 000206-44-0)			0.2	n.d.	-
Dibenzo[a,h]anthracene (CAS No.: 000053-70-3)			0.2	n.d.	-
Chrysene (CAS No.: 000218-01-9)			0.2	n.d.	-
Benzo[k]fluoranthene (CAS No.: 000207-08-9)			0.2	n.d.	-
Benzo[g,h,i]perylene (CAS No.: 000191-24-2)			0.2	n.d.	-
Benzo[b]fluoranthene (CAS No.: 000205-99-2)			0.2	n.d.	-
Benzo[a]pyrene (CAS No.: 000050-32-8)			0.2	n.d.	-
Benzo[a]anthracene (CAS No.: 000056-55-3)			0.2	n.d.	-
Anthracene (CAS No.: 000120-12-7)			0.2	n.d.	-
Acenaphthylene (CAS No.: 000208-96-8)			0.2	n.d.	-
Acenaphthene (CAS No.: 000083-32-9)			0.2	n.d.	-
Sum of 16 PAHs			0.2	n.d.	-

- Note :
1. mg/kg = ppm
 2. n.d. = Not Detected
 3. MDL = Method Detection Limit
 4. According to 2005/717/EC DecaBDE is exempt.
 5. " - " = Not Regulated
 6. "---" = Not Conducted

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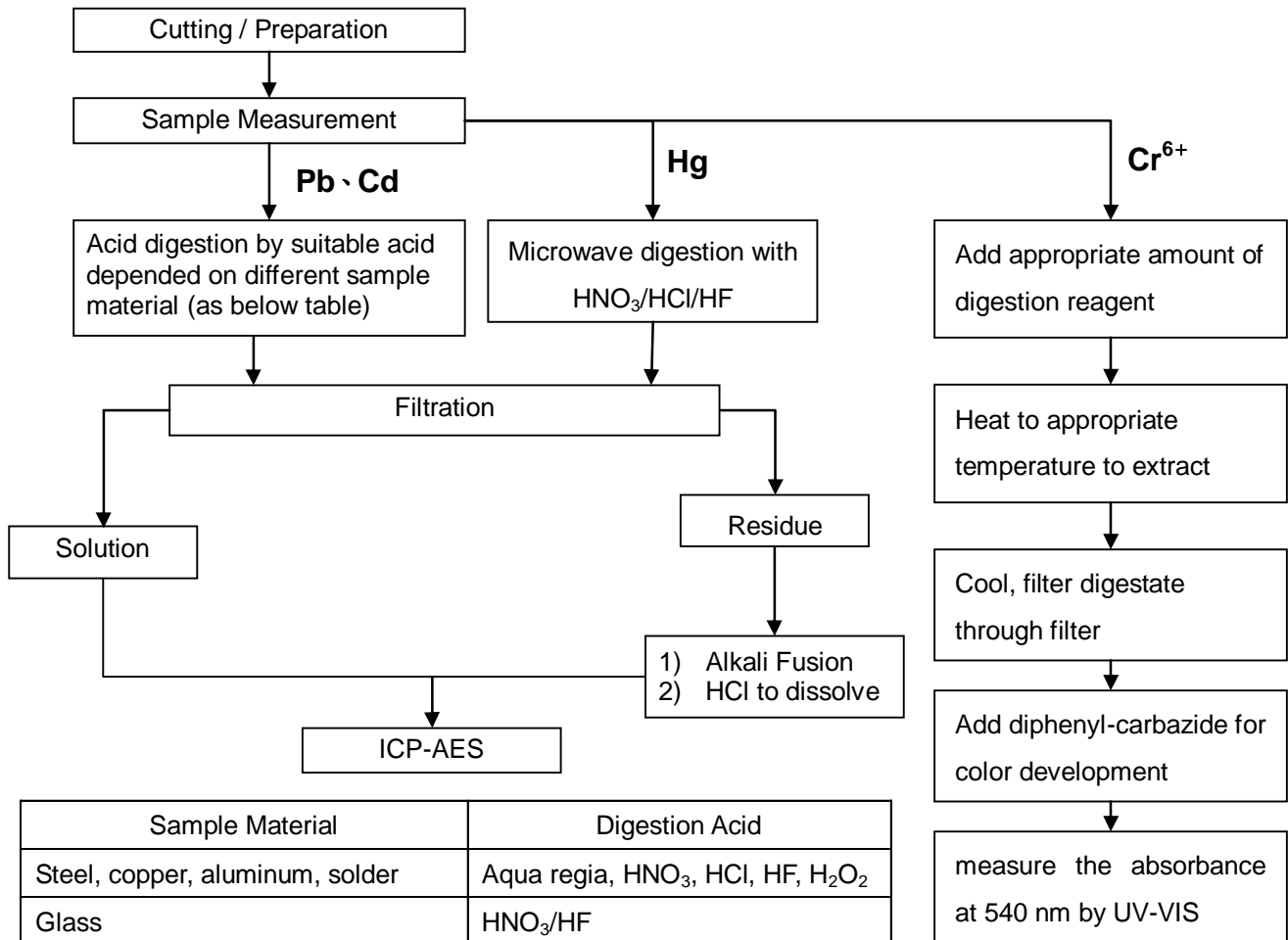
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1) These samples were dissolved totally by pre-conditioning method according to below flow chart.
(Cr⁶⁺ test method excluded)

2) Name of the person who made measurement: Troy Chang

3) Name of the person in charge of measurement: Chenyu Kung



Sample Material	Digestion Acid
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 , HCl
Others	Any acid to total digestion

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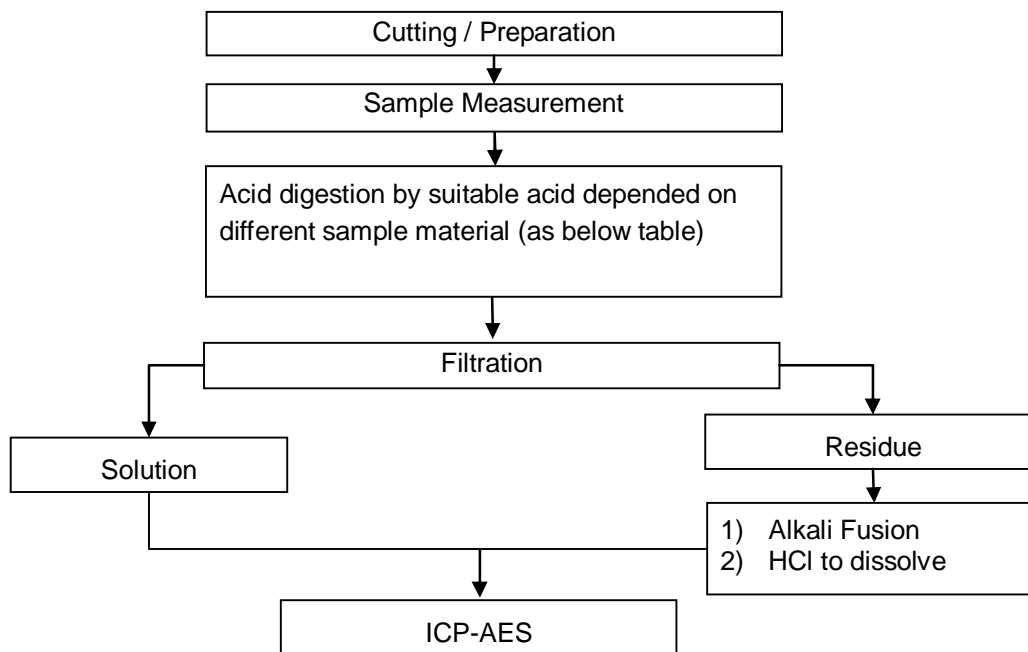
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- 1) These samples were dissolved totally by pre-conditioning method according to below flow chart.
- 2) Name of the person who made measurement: Troy Chang
- 3) Name of the person in charge of measurement: Chenyu Kung

Flow Chart of Digestion for elements analysis



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 , HCl
Others	Any acid to total digestion

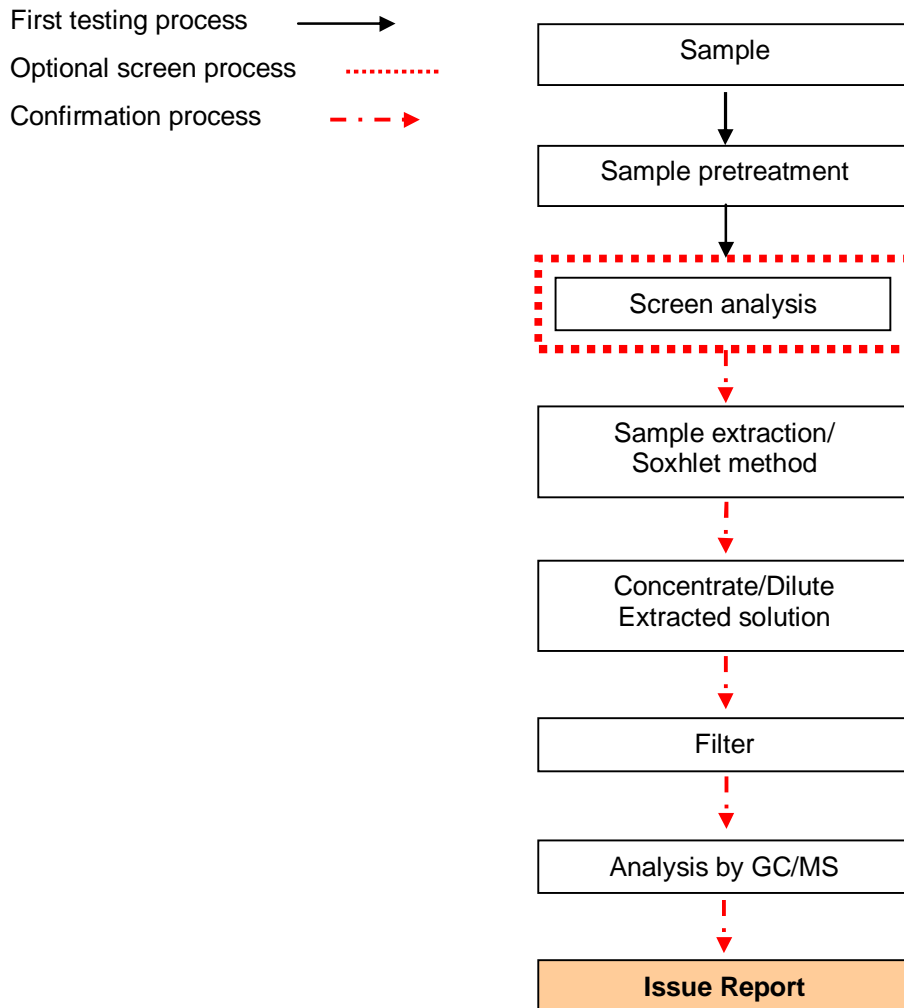
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PBB/PBDE analytical FLOW CHART



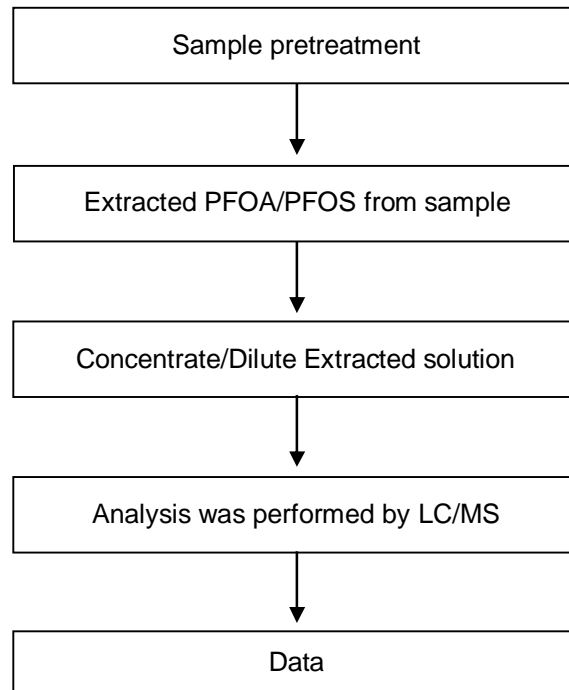
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Analytical flow chart of PFOA/PFOS content



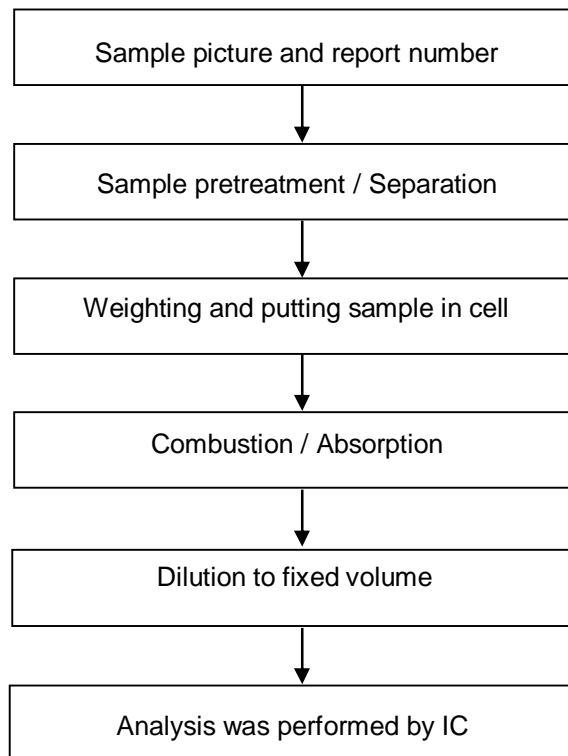
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Analytical flow chart of halogen content



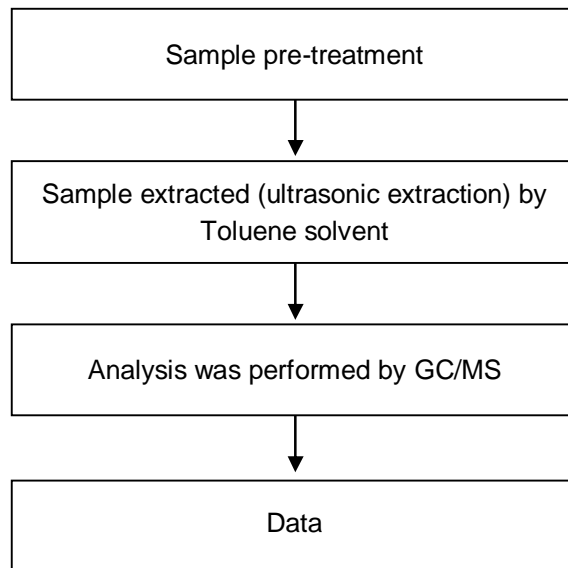
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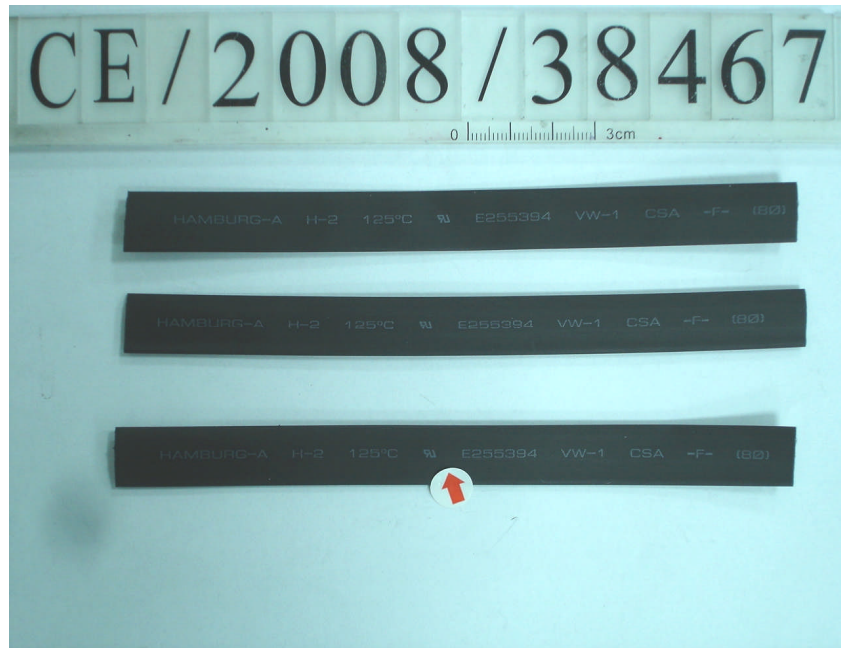
PAHs (Poly Aromatic Hydrocarbons) analytical flow chart



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