TEST REPORT

Report No: AR-21-SV-023611-01
Customer: UNISEM (M) BERHAD
Date of Issue: 11/06/2021

Batch No: EUMYBM-00084765
Sample No: 138-2021-06000572

To: **UNISEM (M) BERHAD**
1, Persiaran Pulai Jaya 9,
Kawasan Perindustrian Pulai Jaya,
31300 Kampung Kepayang
Perak MALAYSIA

Attn: Ms Miza

Date Sample Received: 04/06/2021
Date of Testing: 09/06/2021 to 11/06/2021

The following sample was identified by the customer as :
LEADFRAME C7025

Objective (s):
1.Determination of Cadmium (Cd), Hexavalent Chromium (Cr6+), Lead (Pb), Mercury (Hg), Phthalates, Polybrominated Biphenyl (PBBs), Polybrominated Diphenyl Ether (PBDEs) with RoHS Directive 2011/65/EU and (EU) 2015/863 (amendment in Annex II)
2.Determination of Phthalate (USEPA 3540C; GC-MS) for above sample.
3.Determination of Hexabromocyclododecane (HBCDD), Bromine (Br), Chlorine (Cl), Antimony (Sb), Beryllium (Be), Screening of PFOA (as F) and Screening of PFOS (as F) for above sample.

Conclusion :

Test(s) Required	Compliance with Objective(s)
Cadmium (Cd), Lead (Pb), Mercury (Hg), Hexavalent Chromium (Cr6+), Monobromobiphenyl, Dibromobiphenyls, Tribromo biphenyls, Tetrabromo biphenyls, Pentabromo biphenyls, Hexabromo biphenyls,Heptabromobiphenyl, Octabromo biphenyls, Nonabromo biphenyls, Decabromo biphenyls, SumPolybrominated Biphenyles (PBB), Monobromodiphenyl ether, Dibromodiphenylether, Tribromo diphenylethers, Tetrabromo diphenyl ethers, Pentabromodiphenyl ether, Hexabromo diphenyl ethers, Heptabromodiphenyl ethers, Octabromo diphenyl ethers, Nonabromo diphenyl ethers, Decabromo diphenyl ethers, Sum Polybrominated Diphenyl Ether (PBDE), Benzyl butyl phthalate (BBP), Bis(2-ethylhexyl)phthalate (DEHP),Dibutyl phthalate (DBP), Di-isobutyl phthalate (DiBP),	Comply
Hexabromocyclododecane (HBCDD), Di-n-octylphthalate (DNOP), Diisodecyl phthalate (DIDP), Diisononyl phthalate (DINP), Bromine (Br), Chlorine (Cl), Antimony (Sb), Beryllium (Be)	-
Screening of PFOS (as F), Screening of PFOA (as F)	Flourine is not detected thus PFOA & PFOS is absent

Test Result(s):

Analysis	Industrial Products Analysis	Unit	Result	LOQ	Test Method	Specification
SVK51	Cadmium (Cd)	mg/kg	ND(<LOQ)	1	IEC 62321-5	≤100mg/kg
SVL03	Lead (Pb)	mg/kg	ND(<LOQ)	10	IEC 62321-5	≤1000mg/kg
SVK82	Mercury (Hg)	mg/kg	ND(<LOQ)	5	IEC 62321-4	≤1000mg/kg
SVK66	Hexavalent Chromium (Cr6+)	-	negative	-	IEC 62321-7-1	≤1000mg/kg (Refer Note 2)
SVK16	**Polybrominated Biphenyl (PBBs)**				IEC 62321-6	
	Monobromobiphenyl	mg/kg	ND(<LOQ)	20		Refer Note 3
	Dibromo biphenyls	mg/kg	ND(<LOQ)	20		Refer Note 3
	Tribromo biphenyls	mg/kg	ND(<LOQ)	20		Refer Note 3
	Tetrabromo biphenyls	mg/kg	ND(<LOQ)	20		Refer Note 3
	Pentabromo biphenyls	mg/kg	ND(<LOQ)	20		Refer Note 3
	Hexabromo biphenyls	mg/kg	ND(<LOQ)	20		Refer Note 3
	Heptabromobiphenyl	mg/kg	ND(<LOQ)	20		Refer Note 3

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Analysis		Industrial Products Analysis	Unit	Result	LOQ	Test Method	Specification
		Octabromo biphenyls	mg/kg	ND(<LOQ)	20		Refer Note 3
		Nonabromo biphenyls	mg/kg	ND(<LOQ)	20		Refer Note 3
		Decabromo biphenyls	mg/kg	ND(<LOQ)	20		Refer Note 3
		Sum Polybrominated Biphenyles (PBB)	mg/kg	ND(<LOQ)	20		≤1000mg/kg
SVK17		**Polybrominated Diphenyl Ether (PBDEs)**				IEC 62321-6	
		Monobromodiphenyl ether	mg/kg	ND(<LOQ)	20		Refer Note 3
		Dibromodiphenylether	mg/kg	ND(<LOQ)	20		Refer Note 3
		Tribromo diphenyl ethers	mg/kg	ND(<LOQ)	20		Refer Note 3
		Tetrabromo diphenyl ethers	mg/kg	ND(<LOQ)	20		Refer Note 3
		Pentabromodiphenyl ether	mg/kg	ND(<LOQ)	20		Refer Note 3
		Hexabromo diphenyl ethers	mg/kg	ND(<LOQ)	20		Refer Note 3
		Heptabromo diphenyl ethers	mg/kg	ND(<LOQ)	20		Refer Note 3
		Octabromo diphenyl ethers	mg/kg	ND(<LOQ)	20		Refer Note 3
		Nonabromo diphenyl ethers	mg/kg	ND(<LOQ)	20		Refer Note 3
		Decabromo diphenyl ethers	mg/kg	ND(<LOQ)	20		Refer Note 3
		Sum Polybrominated Diphenyl Ether (PBDE)	mg/kg	ND(<LOQ)	20		≤1000mg/kg
SVV1Q		**Phthalates**				IEC 62321-8	
		Benzyl butyl phthalate (BBP)	% (w/w)	ND(<LOQ)	0.02		≤0.1%
		Bis(2-ethylhexyl)phthalate (DEHP)	% (w/w)	ND(<LOQ)	0.02		≤0.1%
		Dibutyl phthalate (DBP)	% (w/w)	ND(<LOQ)	0.02		≤0.1%
		Di-isobutyl phthalate (DiBP)	% (w/w)	ND(<LOQ)	0.02		≤0.1%
SVM48	◆	Hexabromocyclododecane (HBCDD)	mg/kg	ND(<LOQ)	5	In-house Method, GC-MS	-
SV01M		Di-n-octylphthalate (DNOP)	% (w/w)	ND(<LOQ)	0.01	In-House Method based on USEPA 3540C, GC-MS	-
SV01N		Diisodecyl phthalate (DIDP)	% (w/w)	ND(<LOQ)	0.02	In-House Method based on USEPA 3540C, GC-MS	-
SV01R		Diisononyl phthalate (DINP)	% (w/w)	ND(<LOQ)	0.02	In-House Method based on USEPA 3540C, GC-MS	-
SVL43		Bromine (Br)	mg/kg	ND(<LOQ)	50	BS EN 14582 (Calorimetric Bomb/Ion Chromatography)	-
SVL44		Chlorine (Cl)	mg/kg	ND(<LOQ)	50	BS EN 14582 (Calorimetric Bomb/Ion Chromatography)	-
SVL57		Screening of PFOS (as F)	mg/kg	ND(<LOQ)	50	BS EN 14582 (Calorimetric Bomb/Ion Chromatography)	-
SVL56		Screening of PFOA (as F)	mg/kg	ND(<LOQ)	50	BS EN 14582 (Calorimetric Bomb/Ion Chromatography)	-
SVK18		Antimony (Sb)	mg/kg	ND(<LOQ)	10	US EPA 6010C	-
SVK41		Beryllium (Be)	mg/kg	ND(<LOQ)	5	US EPA 6010C	-

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Analysis	Industrial Products Analysis	Unit	Result	LOQ	Test Method	Specification
SVK03	Microwave Assisted Acid Digestion	-	Done	-	US EPA 3052	-

Specification Note
1. RoHS Directive 2011/65/EU and (EU) 2015/863 (amendment in Annex II)
2. Expression result for Hexavalent Chromium
i. Concentration of Hexavalent chromium (<0.10µg/cm2) = Negative (sample coating is consider non Cr(VI) based coating)
ii. Concentration of Hexavalent chromium (≥0.10 and ≤0.13 µg/cm2) = Inconclusive (Unavoidable coating variations may influence the determination)
iii.Concentration of Hexavalent chromium (≥0.13µg/cm2) = Positive (Sample coating is consider to contain Cr(VI))
3. Based on sum amount of PBB/PBDE limit, which is ≤1000mg/kg

Remark
1. The test portion was totally dissolved for cadmium, lead & mercury test by using pre-conditioning method as mentioned above.
2. IEC 62321 flowchart can be obtained from https://admin.apac-websites.eurofins.com/media/606192/efctm001-issue-2.pdf
3. USEPA 3540C/GC-MS Flowchart can be obtained https://cdnmedia.eurofins.com/apac/media/601323/efctm005issue01.pdf
4. BS EN 14582:2007 flowchart can be obtained from https://cdnmedia.eurofins.com/apac/media/601321/efctm003issue01.pdf

This 4 page(s) of report and its attachment(s), if relevant, has/have been validated by

Chow Khim Tan, *M.Sc. in Chemistry*
IKM Registered Chemist
Registered No.:M/3944/6697/13

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EXPLANATORY NOTE

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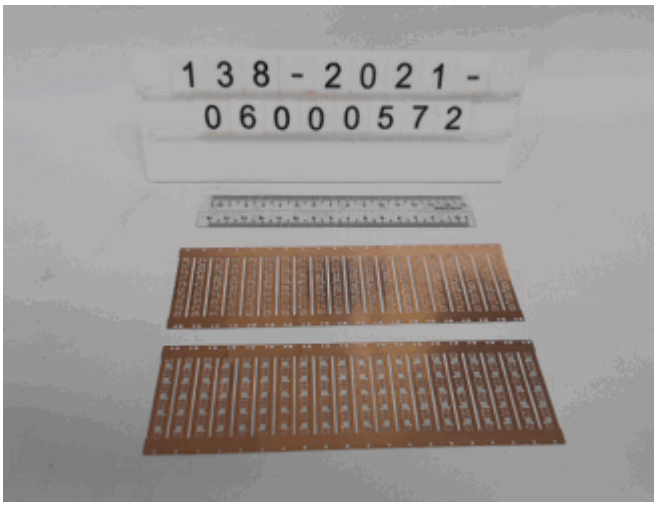
N/A means not applicable.
ND means not detected for value obtained is less than the Limit of Detection (LOD).
<LOD means not detected at or below the Limit of Detection (LOD).
<LOQ means below the Limit of Quantification (LOQ)

Sample Photograph(S)



- End of Report -

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