WEEE TEST REPORT

European Directive 2012/19/EU

Evaluation of WEEE Requirements for Electrical and Electronic Equipment

Test report No..... : ETLRD160531.0087

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Applicant's name ..... : Suprema HQ Inc.

Address..... : 16F Parkview Office Tower, Jeongjail-ro, Bundang-gu, Seongnam-si, Gyeonggi-do 248 Korea

Manufacturer's name ..... : FPchip

Address..... : 201102, Dushi Road, Shanghai, China

Product name ..... : BioMini Plus2

Basic Model..... : BioMini Plus2

Multiple Model(s)..... : N.A.

Test Specifications :

Directive..... : WEEE Directive 2012/19/EU, Article 11 - Recovery targets

Test Standard(s)..... : IEC/TR 62635 : 2012

Test Laboratory..... : ETL Inc.

Address..... : # 114 Gasan digital 2-ro, Geumcheon-gu, Seoul, 153-803, Korea

Also this publication represent for the evaluation results of the issued test item only - any type of EEE

The evaluation results means only the tested item is complied with recovery requirement of the WEEE Directive according to the evaluation procedures which is described in this publication.

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1. General product information

Front view

Rear view

1. General product information

Product Category according to Annex Ⅰ of 2012/19/EU		
Type of Category	: Category 3. IT and telecommunications equipment.	
Total weight (g)	: 176 g	
Connection technique	: ► Screw ► Bonding ► Soldering ► Cable connector	► Glue, Adhesive ► Joints – Grip, Snap, Putting etc. ► Welding ► Others
Disassembly tools	: ► Screw driver ► Long nose pliers ► Hand, Awl	► Spanner, wrench ► Cutting knife ► Cutting pliers
Disassembly time (sec)	: 77 sec	
Product disassembly assessment	: See 3 Recycling and recovery rate of calculation table	
Recycling rate (%)	: 64.8 %	
Recovery rate (%)	: 66.9 %	

*** Product Remark**

- ETL Inc tested the BioMini Plus2 was selected by applicant.

- The model BioMini Plus2 is the basic model that was tested.

2. 2012/19/EU Summary

2.1 WEEE Directive 2012/19/EU , Article 11 - Recovery targets

Classification	Recycling rate	Recovery rate
► Large household appliances ► Automatic dispensers	75%	80%
► IT and telecommunications equipment ► Consumer equipment	65%	75%
► Small household appliances ► Lighting equipment ► Electrical and electronic tools ► Toys, leisure and sports equipment ► Medical devices ► Monitoring and control instrument	50%	70%

2.2 Disassembly

The product was disassembled into different parts which were major based on the treatment requirements as a set out in the WEEE Directive Annex Ⅱ.

Material substances,of which a recycling technology is not available or the recycling is not economy and feasible at present, are an assumed to be shredded, incinerated or disposed for landfill without further usage.

2. 2012/19/EU Summary

2.3 Selective treatment
As a minimum the following substances, preparations and components have to be removed from any separately collected WEEE :
► Polychlorinated biphenyls (PCBs) containing capacitors in accordance with Council Directive 96/59/EC of 16 September 1996 on the disposal of polychlorinated biphenyls and polychlorinated terphenyls (PCBs/PCTs)
► Mercury containing component, such as switches or blacklighting lamps
► Batteries
► Printed circuit boards of mobile phones generally, and of other devices if the surface of the printed circuit board is greater than 10 square centimeters
► Toner cartridges, liquid and pasty, as well as colour toner
► Plastic containing brominated flame retardants
► Asbestos waste and components which contain asbestos
► Cathode ray tube
► Chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs) or hydrocarbons (HCs)
► Gas discharge lamps
► Liquid crystal displays (together with their casing where appropriate) of a surface greater than 100 square centimetres and all those back-lighted with gas discharge lamps
► External electric cables
► Components containing refractory ceramic fibres as described in Commission Directive 97/69/EC of 5 December 1997 adapting to technical progress Council Directive 67/548/EEC relating to the classification, packaging and labeling of dangerous substances
► Components containing radioactive substances with the exception of component that are below the exemption thresholds set in Article 3 of and Annex Ⅰ to Council Directive 96/29/Euratom
► Electrolyte capacitors containing substances of concern (Height > 25mm, Diameter > 25mm)

3. Recycling and recovery rate of calculation table

3.1 IEC/TR 62635 Annex D Table D.2 for for Categories 1, 8, 10
- Recycling and recovery rate of product parts which a single recyclable material

Material name	Recycling rate RCR	Recovery rate RVR
ABS (acrylonirtile butadiene styrene)	90	90
PP (polypropylene)	90	90
HIPS (high impact polystyrene)	90	90
GPPS (general purpose polystyrene)	98	98
SAN (styrene acrylonitrile)	98	98
PC (polycarbonate)	90	90
Steel (general)	95	95
Stainless steel (magnetic)	95	95
Stainless steel (non-magnetic)	95	95
Aluminum	95	95
Copper	98	98
Nickel pure	95	95
Zink die casting	95	95
Magnesium	95	95
PMMA (polymethyl methacrylate)*	70	90
EP (EPOXY resin)	0	90
PF (phenol formaldehyde resin)	0	90
PUR (polyurethane foam)	0	90
Glass (door panel)	0	0
Glass (shelf)	0	0

▶ Note
* ; Applied IEC/TR Annex D Table D.4 of PMMA

3. Recycling and recovery rate of calculation table

3.2 IEC/TR 62635 Annex D Table D.3 for Categories 1, 8, 10
- Recycling and recovery rate of product parts difficult to process

Part name	Recycling rate RCR	Recovery rate RVR
Compressors	90	90
AC motor	90	90
Resin motor	0	0
Clutch	90	90
Evaporator	90	90
Transformer (MWO : microwave oven transformer)	90	90
Cement weight balance	0	0
Steel weight balance	90	90

3. Recycling and recovery rate of calculation table

3.3 IEC/TR 62635 Annex D Table D.5
- Recycling and recovery rate of product parts which require selective treatment

Part or material	Recycling rate RCR(5)	Recovery rate RVR(5)
Cable (high current)	33	33
Cable (low current)	24	24
Battery (lead-acid)	60	60
Battery (Ni-Cd) (2 type : portable (<1 kg), non-portable (>1kg))	70	70
Other battery	45	45
PWB (Printed wiring board with components) - Poor	14	57
PWB (Printed wiring board with components) - Intermediate	17	60
PWB (Printed wiring board with components) - Rich	18	61
CRT (cathode-ray tube)	90	90
LCD (liquid crystal display)*	0	0

▶ Note

*; Applied IEC/TR Annex D Table D.1 of LCD

3. Recycling and recovery rate of calculation table

3.4 IEC/TR 62635 Annex D Table D.6 for Categories 2, 3, 4, 5, 6, 7, 9
- Recycling and recovery rate of product parts which a single recyclable material

Material name	Recycling rate RCR	Recovery rate RVR
ABS (acrylonirtile butadiene styrene)	94	95
ABS with any additives	94	95
PP (polypropylene)	94	95
PP + EPDM	94	95
PP - GF (polypropylene + glass fibre)	94	95
PP with natural fibres (e.g. hemp)	0	97
PP with any other addtivies	94	95
HIPS (high impact polystyrene)	94	95
HIPS with any additives	94	95
PE (polypropylene copolymer)	94	95
SAN (styrene acrylonitrile) with and without additives	94	95
ABS-PC with and without additives	94	95
PA (polyamide) with and without additives	94	95
PA-6 with and without additives	94	95
PMMA (polymethyl methacrylate)*	70	90
PET (polyethylene terephalate)*	70	90
Other polymers	0	5
Steel (general)	95	95
Aluminum	95	95
Copper	95	95
Other metal	95	95

▶ Note
* ; Applied IEC/TR Annex D Table D.4 of PMMA and PET

3. Recycling and recovery rate of calculation table

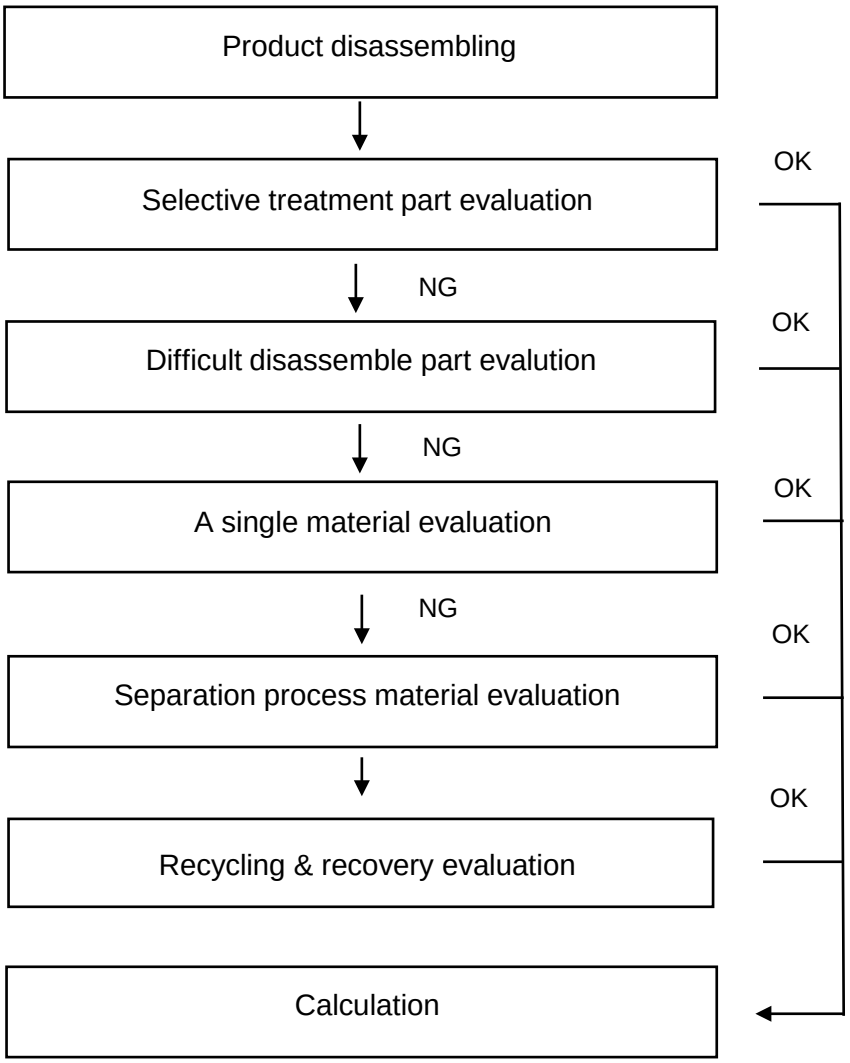
3.5 IEC/TR 62635 Annex D Table D.7 Categories 2, 3, 4, 5, 6, 7, 9
- Recycling and recovery rate of product parts difficult to process

Part name	Recycling rate RCR	Recovery rate RVR
AC motor	85	85
Heatsink	93	93
Cable (optical)	0	0
Bulb	0	0
Cable*	33	33

▶ Note
* ; Applied IEC/TR Annex D Table D.5 of cable (high current)

4. Evaluation flow

4.1 Procedure



4.2 Calculation formula

Recycling Rate (%)	$= \frac{\text{Recycling total weight}}{\text{Product total weight}} \times 100\%$
Recovery Rate (%)	$= \frac{\text{Recovery total weight}}{\text{Product total weight}} \times 100\%$

5. Disassembling results

5.1 Component detailed information

1		Part name ;		Main Body	Connection type	-
		Material type ;		Composite	Evaluation	Further disassembly
		Disassembly tools		-	Disassembly time(sec)	-
		Weight (g)	Recycling rate(%)	Recycling weight (g)	Recovery rate(%)	Recovery weight (g)
		-	N.A.	-	N.A.	-
1.1		Part name ;		FOOT	Connection type	Adhesive
		Material type ;		Other polymer (SILICONE)	Evaluation	Table D.6
		Disassembly tools		Knife	Disassembly time(sec)	4
		Weight (g)	Recycling rate(%)	Recycling weight (g)	Recovery rate(%)	Recovery weight (g)
		2.65	0	0.00	5	0.13
1.2		Part name ;		WEIGHT	Connection type	Putting
		Material type ;		Steel	Evaluation	Table D.6
		Disassembly tools		Hand	Disassembly time(sec)	1
		Weight (g)	Recycling rate(%)	Recycling weight (g)	Recovery rate(%)	Recovery weight (g)
		25.2	95	23.9	95	23.9
1.3		Part name ;		CABLE-FFC	Connection type	Putting
		Material type ;		Cable	Evaluation	Table D.5
		Disassembly tools		Cutting pliers	Disassembly time(sec)	2
		Weight (g)	Recycling rate(%)	Recycling weight (g)	Recovery rate(%)	Recovery weight (g)
		0.26	24	0.06	24	0.06

5. Disassembling results

5.1 Component detailed information

1.4		Part name ;		SFU-PIV _PCB	Connection type	Screw (2ea)
		Material type ;		PCB	Evaluation	Table D.5
		Disassembly tools		Screw driver	Disassembly time(sec)	6
		Weight (g)	Recycling rate(%)	Recycling weight (g)	Recovery rate(%)	Recovery weight (g)
		4.63	14	0.65	57	2.64
1.5		Part name ;		OPV-CIS _PCB	Connection type	Screw (4ea)
		Material type ;		PCB	Evaluation	Table D.5
		Disassembly tools		Screw driver	Disassembly time(sec)	12
		Weight (g)	Recycling rate(%)	Recycling weight (g)	Recovery rate(%)	Recovery weight (g)
		2.20	14	0.31	57	1.25
1.6		Part name ;		Sensor Holder	Connection type	Screw (2ea)
		Material type ;		PC	Evaluation	Table D.6
		Disassembly tools		Screw driver	Disassembly time(sec)	6
		Weight (g)	Recycling rate(%)	Recycling weight (g)	Recovery rate(%)	Recovery weight (g)
		0.25	90	0.22	90	0.22
1.7		Part name ;		Lens Barrel ASSY	Connection type	Screw (1ea)
		Material type ;		Composite	Evaluation	Disposal
		Disassembly tools		Hand	Disassembly time(sec)	3
		Weight (g)	Recycling rate(%)	Recycling weight (g)	Recovery rate(%)	Recovery weight (g)
		0.40	0	0.00	0	0.00

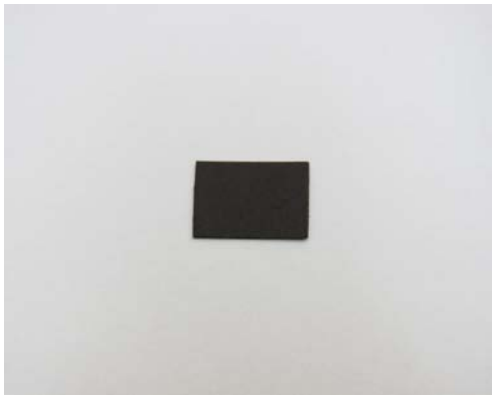
5. Disassembling results

5.1 Component detailed information

1.8		Part name ;		DECO	Connection type	Putting
		Material type ;		ABS	Evaluation	Table D.6
		Disassembly tools		Cutting pliers	Disassembly time(sec)	5
		Weight (g)	Recycling rate(%)	Recycling weight (g)	Recovery rate(%)	Recovery weight (g)
		21.9	94	20.5	95	20.8
1.9		Part name ;		COVER	Connection type	Residue
		Material type ;		ABS	Evaluation	Table D.6
		Disassembly tools		-	Disassembly time(sec)	-
		Weight (g)	Recycling rate(%)	Recycling weight (g)	Recovery rate(%)	Recovery weight (g)
		22.5	94	21.1	95	21.3
1.10		Part name ;		BRACKET	Connection type	Screw (3ea)
		Material type ;		ABS	Evaluation	Table D.6
		Disassembly tools		Screw driver	Disassembly time(sec)	9
		Weight (g)	Recycling rate(%)	Recycling weight (g)	Recovery rate(%)	Recovery weight (g)
		7.16	94	6.73	95	6.80
1.11		Part name ;		Sensor Module	Connection type	Putting
		Material type ;		Composite	Evaluation	Further disassembly
		Disassembly tools		Hand	Disassembly time(sec)	1
		Weight (g)	Recycling rate(%)	Recycling weight (g)	Recovery rate(%)	Recovery weight (g)
		-	N.A.	-	N.A.	-

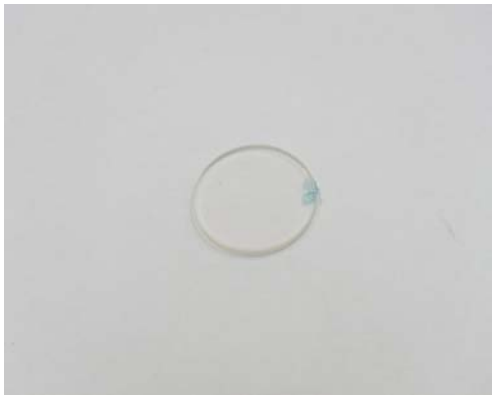
5. Disassembling results

5.1 Component detailed information

1.11.1		Part name ;		LABEL -SERIAL	Connection type	Adhesive
		Material type ;		Label	Evaluation	Disposal
		Disassembly tools		Knife	Disassembly time(sec)	2
		Weight (g)	Recycling rate(%)	Recycling weight (g)	Recovery rate(%)	Recovery weight (g)
		0.01	0	0.00	0	0.00
1.11.2		Part name ;		PC SHEET	Connection type	Adhesive
		Material type ;		PC	Evaluation	Table D.6
		Disassembly tools		Knife	Disassembly time(sec)	1
		Weight (g)	Recycling rate(%)	Recycling weight (g)	Recovery rate(%)	Recovery weight (g)
		0.10	90	0.09	90	0.09
1.11.3		Part name ;		PRISM	Connection type	Putting
		Material type ;		Glass	Evaluation	Disposal
		Disassembly tools		Hand	Disassembly time(sec)	1
		Weight (g)	Recycling rate(%)	Recycling weight (g)	Recovery rate(%)	Recovery weight (g)
		12.06	0	0.00	0	0.00
1.11.4		Part name ;		Main Body	Connection type	Residue
		Material type ;		PC	Evaluation	Table D.6
		Disassembly tools		-	Disassembly time(sec)	-
		Weight (g)	Recycling rate(%)	Recycling weight (g)	Recovery rate(%)	Recovery weight (g)
		5.10	90	4.59	90	4.59

5. Disassembling results

5.1 Component detailed information

1.11.5		Part name ;		G1 LENS	Connection type	Putting
		Material type ;		Glass	Evaluation	Disposal
		Disassembly tools		Hand	Disassembly time(sec)	1
		Weight (g)	Recycling rate(%)	Recycling weight (g)	Recovery rate(%)	Recovery weight (g)
		0.6	0	0.00	0	0.00
1.11.6		Part name ;		LENS BARREL	Connection type	Putting
		Material type ;		PC	Evaluation	Table D.6
		Disassembly tools		Hand	Disassembly time(sec)	2
		Weight (g)	Recycling rate(%)	Recycling weight (g)	Recovery rate(%)	Recovery weight (g)
		1.31	90	1.18	90	1.18
1.11.7		Part name ;		Bracket BOTTOM	Connection type	Putting
		Material type ;		PC	Evaluation	Table D.6
		Disassembly tools		Cutting plier	Disassembly time(sec)	3
		Weight (g)	Recycling rate(%)	Recycling weight (g)	Recovery rate(%)	Recovery weight (g)
		5.09	90	4.58	90	4.58
1.12		Part name ;		LED BOARD Ass`y	Connection type	Putting
		Material type ;		Composite	Evaluation	Further disassembly
		Disassembly tools		-	Disassembly time(sec)	-
		Weight (g)	Recycling rate(%)	Recycling weight (g)	Recovery rate(%)	Recovery weight (g)
		-	N.A.	-	N.A.	-

5. Disassembling results

5.1 Component detailed information

1.12.1		Part name ;		Cable	Connection type	Sodering
		Material type ;		Cable	Evaluation	Table D.5
		Disassembly tools		Cutting knife	Disassembly time(sec)	2
		Weight (g)	Recycling rate(%)	Recycling weight (g)	Recovery rate(%)	Recovery weight (g)
		0.14	33	0.05	33	0.05
1.12.2		Part name ;		LED BOARD	Connection type	Residue
		Material type ;		PCB	Evaluation	Table D.5
		Disassembly tools		-	Disassembly time(sec)	-
		Weight (g)	Recycling rate(%)	Recycling weight (g)	Recovery rate(%)	Recovery weight (g)
		0.16	14	0.02	57	0.09
1.13		Part name ;		COVER-BOTTOM	Connection type	Screw (3ea)
		Material type ;		ABS	Evaluation	Table D.6
		Disassembly tools		Screw driver	Disassembly time(sec)	9
		Weight (g)	Recycling rate(%)	Recycling weight (g)	Recovery rate(%)	Recovery weight (g)
		14.9	94	14.0	95	14.2
1.14		Part name ;		CABLE-USB	Connection type	Screw (1ea)
		Material type ;		Composite	Evaluation	Further disassembly
		Disassembly tools		Hexagon wrench	Disassembly time(sec)	3
		Weight (g)	Recycling rate(%)	Recycling weight (g)	Recovery rate(%)	Recovery weight (g)
		-	N.A.	-	N.A.	-

5. Disassembling results

5.1 Component detailed information

1.14.1		Part name ;		Tie	Connection type	Knot
		Material type ;		Composite	Evaluation	Disposal
		Disassembly tools		Hand	Disassembly time(sec)	2
		Weight (g)	Recycling rate(%)	Recycling weight (g)	Recovery rate(%)	Recovery weight (g)
		0.41	0	0.00	0	0.00
1.14.2		Part name ;		CORE	Connection type	Putting
		Material type ;		FERRITE	Evaluation	Disposal
		Disassembly tools		Hand	Disassembly time(sec)	2
		Weight (g)	Recycling rate(%)	Recycling weight (g)	Recovery rate(%)	Recovery weight (g)
		5.36	0	0.00	0	0.00
1.14.3		Part name ;		CABLE-USB	Connection type	Residue
		Material type ;		Cable	Evaluation	Table D.5
		Disassembly tools		-	Disassembly time(sec)	-
		Weight (g)	Recycling rate(%)	Recycling weight (g)	Recovery rate(%)	Recovery weight (g)
		41.5	33	13.7	33	13.7
1.15		Part name ;		Screw	Connection type	Residue
		Material type ;		Steel	Evaluation	Table D.6
		Disassembly tools		-	Disassembly time(sec)	-
		Weight (g)	Recycling rate(%)	Recycling weight (g)	Recovery rate(%)	Recovery weight (g)
		2.48	95	2.36	95	2.36

5. Disassembling results

5.2 Calculation

Information	Weight (g)	Weight (%)
1. Product total	176	100
2. Recycling	114	64.8
3. Recovery	118	66.9
4. Disposal	18.8	10.7

Other information	**Calculation formula**
Recycling Rate (%)	$= \frac{\text{Recycling total weight}}{\text{Product total weight}} \times 100\%$
Recovery Rate (%)	$= \frac{\text{Recovery total weight}}{\text{Product total weight}} \times 100\%$

5.3 Test result

Item	Target	Test result
Recycling Rate (%)	65%	64.8%
Recovery Rate (%)	75%	66.9%