WEEE TEST REPORT

European Directive 2012/19/EU

Evaluation of WEEE Requirements for Electrical and Electronic Equipment

Test report No……: NICERD220211.0013

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Applicant's name ……: Suprema ID Inc.

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Manufacturer's name ……: Same applicant.

Address……: Same applicant.

Product name ……: BioMini Combo 2

Basic Model……: BMC-2

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……: NICE Certification Co., Ltd.

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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 evaluated with recovery requirement of the WEEE Directive according to the evaluation procedures which is described in this publication.

Approved by :

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1. General product information



Front view



Rear view

1. General product information

Product Category according to Annex Ⅲ of 2012/19/EU		
Type of Category	: Category 6. Small IT and telecommunications equipment (no external dimension more than 50 cm)	
Total weight (g)	: 265.6 g	
Connection technique	: ► Screw ► Bonding, Glue, Adhesive ► Soldering ► Cable connector	► Rotary, Twist ► Joints – Molding, Put in etc. ► Welding ► Others
Disassembly tools	: ► Screw driver ► Long nose pliers ► Hand, Awl	► Spanner, wrench ► Cutting knife ► Cutting pliers ► Jig tools (Special)
Disassembly time (min / sec)	: 87 sec	
Product disassembly assessment	: See 3 Recycling and recovery rate of calculation table	
Recycling rate (%)	: 66.0 %	
Recovery rate (%)	: 71.5 %	

*** Product Remark**

- NICE Certification Co., Ltd. tested the BioMini Combo 2 was selected by applicant.
- The model BMC-2 is the basic model that was tested.

2. 2012/19/EU Summary

2.1 WEEE Directive 2012/19/EU , Annex V

Classification	Recycling rate	Recovery rate
► Temperature exchange equipment ► Large equipment (any external dimension more than 50 cm) including	80%	85%
► Screens, monitors, and equipment containing screens having a surface greater than 100 cm ^{2}	70%	80%
► Small equipment (no external dimension more than 50 cm) including ► Small IT and telecommunication equipment (no external dimension more than 50 cm)	55%	75%
► Lamps	80%	N.A.

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 VII.

Material, 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
- 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

- 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 (%)	Recovery rate RVR (%)
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
- 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

- Recycling and recovery rate of product parts difficult to process

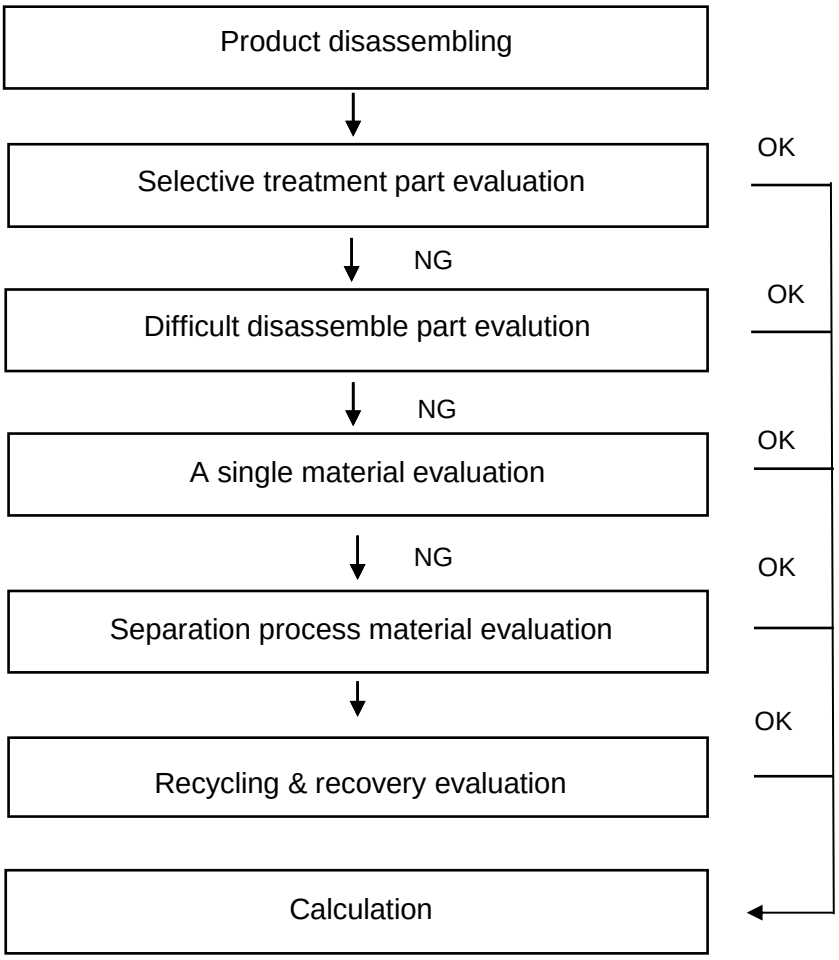
Part name	Recycling rate RCR (%)	Recovery rate RVR (%)
AC motor	85	85
Heatsink	93	93
Cable (optical)	0	0
Bulb	0	0
Cable*	33	33

▶ 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 (%)	=	Recycling total weight / Product total weight	X	100%	
Recovery Rate (%)	=	Recovery total weight / Product total weight	X	100%	

5. Disassembling results

5.1 Component detailed information

1		Part name ;		Main product	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 ;		Rubber Foot	Connection type	Adhesive
		Material type ;		Other polymer (SH5160U)	Evaluation	Table D.6
		Disassembly tools		Knife	Disassembly time(sec)	4
		Weight (g)	Recycling rate(%)	Recycling weight (g)	Recovery rate(%)	Recovery weight (g)
		1.26	0	0.00	5	0.06
1.2		Part name ;		Label	Connection type	Adhesive
		Material type ;		Composite	Evaluation	Disposal
		Disassembly tools		Knife	Disassembly time(sec)	2
		Weight (g)	Recycling rate(%)	Recycling weight (g)	Recovery rate(%)	Recovery weight (g)
		0.08	0	0.00	0	0.00
1.3		Part name ;		Cover SAM	Connection type	Screw (1)
		Material type ;		PC (SC1004A)	Evaluation	Table D.2
		Disassembly tools		Screw driver	Disassembly time(sec)	3
		Weight (g)	Recycling rate(%)	Recycling weight (g)	Recovery rate(%)	Recovery weight (g)
		2.70	90	2.43	90	2.43

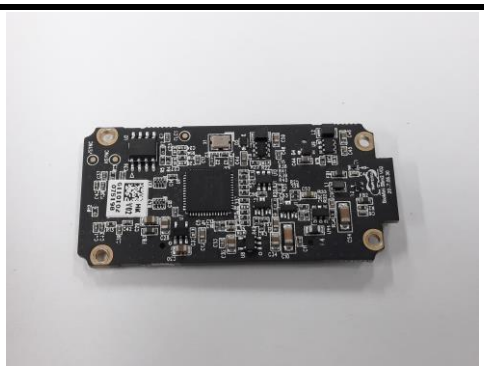
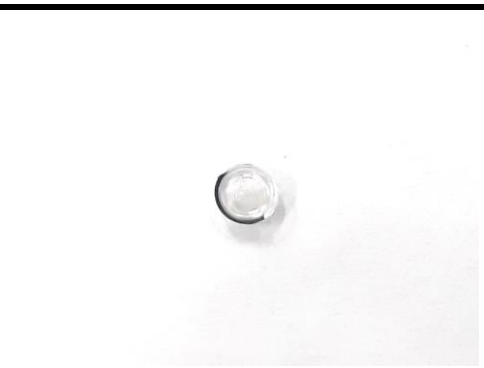
5. Disassembling results

5.1 Component detailed information

1.4		Part name ;		Housing top assy	Connection type	Screw (4) + Cable (2)
		Material type ;		Composite	Evaluation	Further disassembly
		Disassembly tools		Screw driver	Disassembly time(sec)	14
		Weight (g)	Recycling rate(%)	Recycling weight (g)	Recovery rate(%)	Recovery weight (g)
		-	N.A.	-	N.A.	-
1.4.1		Part name ;		LED Lens assy	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.	-
1.4.1.1		Part name ;		LED Cable	Connection type	Putting
		Material type ;		Cable	Evaluation	Table D.5
		Disassembly tools		Hand	Disassembly time(sec)	1
		Weight (g)	Recycling rate(%)	Recycling weight (g)	Recovery rate(%)	Recovery weight (g)
		0.16	33	0.05	33	0.05
1.4.1.2		Part name ;		LED Lens	Connection type	Residue
		Material type ;		PC (3022U)	Evaluation	Table D.2
		Disassembly tools		-	Disassembly time(sec)	-
		Weight (g)	Recycling rate(%)	Recycling weight (g)	Recovery rate(%)	Recovery weight (g)
		0.52	90	0.47	90	0.47

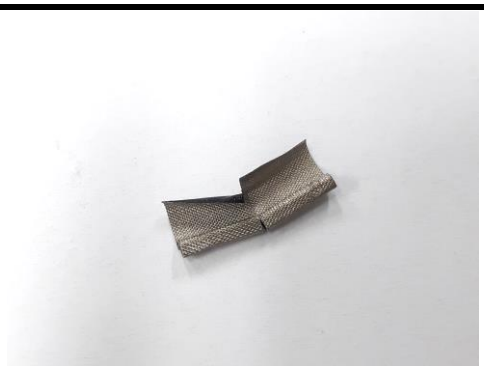
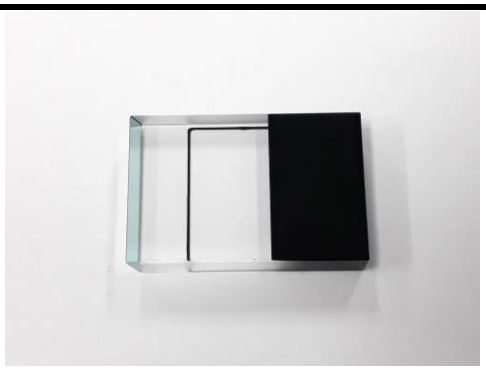
5. Disassembling results

5.1 Component detailed information

1.4.2		Part name ;		BM-Slim2 Main board	Connection type	Screw (4)
		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)
		6.47	18	1.17	61	3.95
1.4.3		Part name ;		BM-Slim2 cover bottom assy	Connection type	Screw (4)
		Material type ;		Composite	Evaluation	Further disassembly
		Disassembly tools		Screw driver	Disassembly time(sec)	12
		Weight (g)	Recycling rate(%)	Recycling weight (g)	Recovery rate(%)	Recovery weight (g)
		-	N.A.	-	N.A.	-
1.4.3.1		Part name ;		Lens Mirror	Connection type	Putting
		Material type ;		PMMA (E48R)	Evaluation	Table D.6
		Disassembly tools		Cutting plier	Disassembly time(sec)	2
		Weight (g)	Recycling rate(%)	Recycling weight (g)	Recovery rate(%)	Recovery weight (g)
		0.45	70	0.31	90	0.40
1.4.3.2		Part name ;		Lens Mirror	Connection type	Residue
		Material type ;		Glass (H-K9L)	Evaluation	Table D.2
		Disassembly tools		-	Disassembly time(sec)	-
		Weight (g)	Recycling rate(%)	Recycling weight (g)	Recovery rate(%)	Recovery weight (g)
		4.53	0	0.00	0	0.00

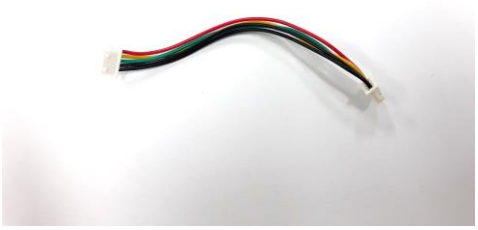
5. Disassembling results

5.1 Component detailed information

1.4.3.3		Part name ;		BM-Slim2 cover bottom	Connection type	Residue
		Material type ;		PC (GR30%)	Evaluation	Table D.2
		Disassembly tools		-	Disassembly time(sec)	-
		Weight (g)	Recycling rate(%)	Recycling weight (g)	Recovery rate(%)	Recovery weight (g)
		4.53	90	4.08	90	4.08
1.4.4		Part name ;		EMI Sheet	Connection type	Adhesive
		Material type ;		Composite	Evaluation	Disposal
		Disassembly tools		Hand	Disassembly time(sec)	2
		Weight (g)	Recycling rate(%)	Recycling weight (g)	Recovery rate(%)	Recovery weight (g)
		0.03	0	0.00	0	0.00
1.4.5		Part name ;		Prism	Connection type	Putting
		Material type ;		Glass (H-K9L)	Evaluation	Table D.2
		Disassembly tools		Hand	Disassembly time(sec)	1
		Weight (g)	Recycling rate(%)	Recycling weight (g)	Recovery rate(%)	Recovery weight (g)
		13.9	0	0.00	0	0.00
1.4.6		Part name ;		BM-Slim2 cover Top	Connection type	Adhesive
		Material type ;		PC (GR30%)	Evaluation	Table D.2
		Disassembly tools		Hand	Disassembly time(sec)	1
		Weight (g)	Recycling rate(%)	Recycling weight (g)	Recovery rate(%)	Recovery weight (g)
		5.04	90	4.54	90	4.54

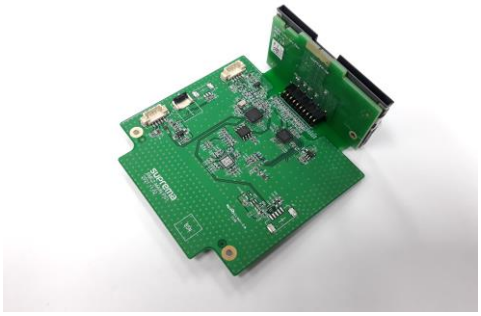
5. Disassembling results

5.1 Component detailed information

1.4.7		Part name ;		WP Tape	Connection type	Adhesive
		Material type ;		Other polymer (WSR200BK)	Evaluation	Table D.6
		Disassembly tools		Knife	Disassembly time(sec)	1
		Weight (g)	Recycling rate(%)	Recycling weight (g)	Recovery rate(%)	Recovery weight (g)
		0.04	0	0.00	5	0.00
1.4.8		Part name ;		Insert nut	Connection type	Putting
		Material type ;		Other metal (BSBM)	Evaluation	Table D.6
		Disassembly tools		Cutting plier	Disassembly time(sec)	4
		Weight (g)	Recycling rate(%)	Recycling weight (g)	Recovery rate(%)	Recovery weight (g)
		0.30	95	0.29	95	0.29
1.4.9		Part name ;		Housing top	Connection type	Residue
		Material type ;		PC (3022R)	Evaluation	Table D.2
		Disassembly tools		-	Disassembly time(sec)	-
		Weight (g)	Recycling rate(%)	Recycling weight (g)	Recovery rate(%)	Recovery weight (g)
		33.1	90	29.8	90	29.8
1.5		Part name ;		Cable	Connection type	Putting
		Material type ;		Cable	Evaluation	Table D.5
		Disassembly tools		Hand	Disassembly time(sec)	1
		Weight (g)	Recycling rate(%)	Recycling weight (g)	Recovery rate(%)	Recovery weight (g)
		0.74	33	0.24	33	0.24

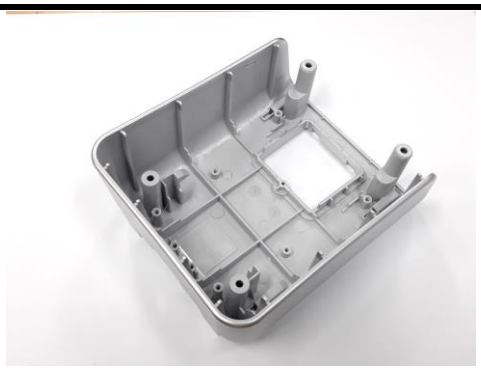
5. Disassembling results

5.1 Component detailed information

1.6		Part name ;		PCB	Connection type	Screw (4) + Cable (1)
		Material type ;		PCB	Evaluation	Table D.5
		Disassembly tools		Screw driver	Disassembly time(sec)	13
		Weight (g)	Recycling rate(%)	Recycling weight (g)	Recovery rate(%)	Recovery weight (g)
		27.4	18	4.93	61	16.7
1.7		Part name ;		Plate weight	Connection type	Screw (2)
		Material type ;		Other metal (SPCC)	Evaluation	Table D.6
		Disassembly tools		Screw driver	Disassembly time(sec)	6
		Weight (g)	Recycling rate(%)	Recycling weight (g)	Recovery rate(%)	Recovery weight (g)
		51.0	95	48.5	95	48.5
1.8		Part name ;		Plate Cable	Connection type	Screw (2)
		Material type ;		Other metal (SPCC)	Evaluation	Table D.6
		Disassembly tools		Screw driver	Disassembly time(sec)	6
		Weight (g)	Recycling rate(%)	Recycling weight (g)	Recovery rate(%)	Recovery weight (g)
		1.47	95	1.39	95	1.39
1.9		Part name ;		Cable	Connection type	Putting
		Material type ;		Cable	Evaluation	Table D.5
		Disassembly tools		Hand	Disassembly time(sec)	1
		Weight (g)	Recycling rate(%)	Recycling weight (g)	Recovery rate(%)	Recovery weight (g)
		41.7	33	13.8	33	13.8

5. Disassembling results

5.1 Component detailed information

1.10		Part name ;		Housing bottom	Connection type	Residue
		Material type ;		PC (SC1004A)	Evaluation	Table D.2
		Disassembly tools		-	Disassembly time(sec)	-
		Weight (g)	Recycling rate(%)	Recycling weight (g)	Recovery rate(%)	Recovery weight (g)
		65.7	90	59.1	90	59.1
1.11		Part name ;		Screw	Connection type	Residue
		Material type ;		Other metal (SWCH18A)	Evaluation	Table D.6
		Disassembly tools		-	Disassembly time(sec)	-
		Weight (g)	Recycling rate(%)	Recycling weight (g)	Recovery rate(%)	Recovery weight (g)
		4.41	95	4.19	95	4.19

~~ The complete disassembly ~~

5. Disassembling results

5.2 Calculation

Information	Weight (g)	Weight (%)
1. Product total	265.6	100
2. Recycling	175.3	66.0
3. Recovery	190.0	71.5
4. Disposal	0.1	0.0

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 (%)	55%	66.0%
Recovery Rate (%)	75%	71.5%