

# EL767. Food Waste Reduction Device

[EL767-2009/1/2009-72]



## 1. Scope

This criteria apply to the dry-type household food waste weight reduction device (hereinafter as "Reduction device").

## 2. Definitions

### 2.1

"Weight Reduction" refers to the operation of final disposal by reducing the weight of the initially disposed food waste to ease the transportation or treatment of food waste.

### 2.2

"Volume Reduction" refers the operation of final disposal by reducing the volume of initially discharged food waste to ease the transportation and treatment of food waste.

### 2.3

"Dry-type" refers to the method of waste reduction. volume reduction by drying food waste with hot air or direct heating using the power energy.

### 2.4

"Monthly consumption power" refers to the converted amount of the total consumption power amount consumed when operating the weight reduction device based on the regulated conditions into the consumption power amount per average annualized one month in accordance with the calculation method.

### 2.5

"Standard Operation Condition" refers to the condition in which a user generally operates the weight reduction device by inputting representative composition, quality and shape food waste by regulated treatment amount.

### 2.6

"Ozone depletion potential (ODP)" refers to the value of relative effects of substances that

affect the depletion of ozone layer when setting the ozone depletion effect of CFC-11 as 1.

## 2.7

“General Dry-type Products” refers to a product which is not operated by physical. chemical operation other than simple dry by hot air, hot heat from the initial input of food waste to the completion of final weight reduction.

## 2.8

“Complex Dry-type Products” is a product equipped with additional functions that would expedite drying such as dehydration, grinding, etc. other than a simple drying by hot air, hot heating, etc. from the input of food waste to the completion of final weight reduction.

## 2.9

“Food waste weight reduction performance” refers to the weight reduction ratio [%] of inputted food waste when operating the food waste weight reduction device at the standard operation conditions.

## **3. Certification Criteria**

### **3.1 Environmental criteria**

#### 3.1.1

The use of chemical substances in the manufacturing process shall conform to the following conditions.

##### 3.1.1.1

ODP of the gas-foaming agent used in heat preservation. insulation materials shall be 0.11 or under.

##### 3.1.1.2

In case of using flame-retardants in the products, the flame-retardants shall not use PBBs: polybrominated biphenyls, PBDEs: polybrominated diphenylethers, and short-chain chlorinated paraffin, C=10~13 with 50% or over of chlorine concentration.

#### 3.1.2

The energy consumption of products at the use stage shall conform to the following

requirements.

### 3.1.2.1

The monthly electric power consumption of the product shall conform to the following requirements.

Type	1 year from official announcement date	After 1 year of the announcement date
Monthly electric power consumption [kWh/month]	≤ 50	≤ 45

### 3.1.2.2

If the weight has been reduced to the target level, the product shall be equipped with the function of transferring to a mode that can reduce the power consumption through the function of detecting the food waste weight reduction proceeding degree. Here, mode transfer means not transferring to a dry mode itself with no separate operation.

Note) these criteria shall be applied after 1 year of the public announcement date.

### 3.1.3

At the use state, the contamination substance discharge and noise generation, etc. shall conform to the following requirements.

#### 3.1.3.1

Noise during the operation of products shall conform to the following requirements.

Type	General Dry-type Product	Complex Dry-type Product
Noise [dB(A)]	≤ 38	≤ 48

#### 3.1.3.2

In case of products generating out flowing water, the outflow rate of solid matters included in the out flowing water shall be 20% or less.

Note) Outflow rate of solid matters included in the out flowing water = (Weight of solid matter included in discharge water ÷ Solid matter weight among food waste inputted in the facility) × 100

#### 3.1.3.3

Regarding unpleasant smell leaked out during the operation of the product, the dilution multiple for complex bad smell shall be 15 times or less.

### 3.2 Quality Criteria:

Food waste weight reduction performance of the product shall be 70% or more.

### 3.3 Consumer information

#### 3.3.1

If using a filter for the deodorization purpose, life of filters and appropriate exchange interval and base of its setting

#### 3.3.2

Information on proper use of product and after service

#### 3.3.3

Standard processing amount or maximum processing amount

#### 3.3.4

Indicate the matters that the product contributes to the certification reasons at the consumption stage of the product

## 4. Test Method

Certification Criteria		Test and Verification Method
Environmental Criteria	3.1.1	Verification of submitted documents
	3.2.1	3.2.1.1 Test report by an accredited testing laboratory in accordance with (1) and (2) test methods'
		3.2.1.2 Test report by an accredited testing laboratory in accordance with '(1) and (5) test method' or verification of submitted documents
	3.2.3	3.2.3.1 Test report by an accredited testing laboratory in accordance with '(1) and (3) test method'
		3.2.3.2 Test report by an accredited testing laboratory in accordance with the waste process test method (Solid matter analysis method)
		3.2.3.3 Test report by an accredited testing laboratory in accordance with bad smell process test method(Air dilution organic functions test) and '(1)

			and (4) test method'
Quality Criteria			Test report by an accredited testing laboratory in accordance with '(1) and (5) test method'
Consumer Information			Verification of submitted documents

#### **4.1 General Matters**

##### 4.1.1

One test sample shall be required for each applied product. Only if more than one test sample is needed, the former requirement may not be met.

##### 4.1.2

Test samples shall be collected at random by eco-label certification body from products in market or those in storage at the production site.

##### 4.1.3

All measurements are tested at the stable status when the product reaches a normal status after being installed as the normal use status.

##### 4.1.4

The change of power voltage and power frequency shall be within  $\pm 1\%$ .

##### 4.1.5

The result of test shall be numerically set according to KS Q 5002 (Statistical interpretation method of the data – Part 1: Statistical description of the data).

#### **4.2 Monthly Power Consumption Measurement Method**

##### 4.2.1

In case of the weight reduction device, the electric power consumption shall be measure for 24 hours under the standard operation condition, and food waste shall be inputted by 0.5 kg twice.

##### 4.2.2

The measurement shall be the average of the two times repetitive measurement results. However, if the difference of two results exceeds 10%, execute additional one-time test and two values except the smallest one shall be averaged for the measurement value.

#### 4.2.3

As soon as the electric power consumption starts to be measured, 0.5 kg food waste with the composition presented in '(5) Food waste weight reduction performance test method' shall be inputted and the weight reduction device shall start to be operated.

#### 4.2.4

Initially, 0.5 kg food waste is inputted and after 10 hours, 0.5 kg food waste made in accordance with the standard composition shall be inputted again.

#### 4.2.5

The electric power consumption [P(kW)] from the start of measurement to 24 hours of passage up to the second digits of decimals.

#### 4.2.6

Monthly electric power consumption shall be calculated up to the second digit of decimals using the following formula.

Monthly electric power consumption (kWh/month) =  $P \times 365 \div 12$

Note1) the weight reduction performance measured after finishing the electric power consumption measurement shall exceed the standards.

Note2) In principle, the test shall be held under the surrounding temperature of  $20 \pm 2^\circ\text{C}$ , and relative humidity of  $55 \pm 5\%$ , and excessive air flow shall not be made surrounding the products at the test.

The surrounding temperature and humidity shall be written down on the test results.

### **4.3 Noise Measuring Method**

#### 4.3.1

Noise should be measured with the following conditions, according to KS I ISO 1996-1 (Acoustics - Description, measurement and assessment of acoustics - Description, measurement and assessment of environment noise - Part 1: Basic quantities and assessment procedures).

#### 4.3.2

In case of a product that discharges smell with the operation of linking discharge hose to the discharge pipe, an exhaust hose with synthetic resin is linked at the discharge hole of the main body and it is located so that the distance of the end of a hose and the microphone of the noise level meter shall become 2m or more.

#### 4.3.3

Noise represents the noise in the biggest direction among the average value of 3 measurements made with the indicator noise level meter at the spots 1 m from the side, front and back center of the product. However, if a single value cannot be made with too high change scale of noise, it can be measured with the same value noise.

#### 4.3.4

If it is not a perfect non-noise room, the distance between the wall and test products shall be far enough so that the reflected sound can be ignored, and the background noise shall be smaller by 10 dB(A) than the measured noise.

#### 4.3.5

For products mounted with cutter, which dries after grinding the bones of fish and meat, the noise shall be measured at the time of grinding after the same initial preparation. operation of the food waste weight reduction test.

### **4.4 Smell Sampling Method during Bad Smell Test**

#### 4.4.1

The measurement room shall be a cubic shape with a size of  $40\text{m}^3 \pm 20\%$  in principle.

#### 4.4.2

Inside finishing shall be made with materials that would make adsorption and discharge of smelling substances difficult and, if not so, the effect on smell shall be minimized by processing the finishing side with films such as PTFE (polytetrafluoroethylene), PVF (polyvinyl fluoride) materials.

#### 4.4.3

It is a principle to test in a place with surrounding temperature of  $20 \pm 2$  °C, and relative

humidity of 55±5 %, and such content shall be written on the test results.

#### 4.4.4

Sampling container and device shall conform to the regulations of air dilution organic functions test in the bad smell process test method and the level in which the background smell does not affect the test (Bad smell plate level 1 degree or less) by adequately executing natural ventilation before weight reduction operation.

#### 4.4.5

Smell sampling is collected after 1 hour of operating the weight reduction device using the standard operation condition and standard food waste composition in a closed space without artificial ventilation operations. At this time, in case of a filter-type product, samples are collected at the place 5 cm away from the final emission hole, and in case of exhaust-type product, samples shall be collected at the spot 5 cm away from the front of the weight reduction device.

### 4.5 Test Method of Food Waste Weight Reduction Performance

#### 4.5.1

Prepare criteria food waste by referring to the processing methods by food materials within the composition ratio scope as following <Table>, Operate the weight reduction device by inputting 0.5 kg standard food waste.

<Table> Composition of standard food waste and processing method by food material

Type	Composition Ratio [Weight%]	Processing Method by Food Material (Reference)	
		Food Material [%]	How to process
Crops	16±2	Rice/Ramyun (16)	
Vegetables	51±5	Chinese Cabbage (9)	Cut with the width of 100mm or under while including the center
		Potato (20)	Divide it with peels and cut into kakduki with size of 5 mm
		Onion (20)	Divide it with peels and cut into kakduki with size of 5 mm
		White Reddish (2)	Divide in 1/4 vertically and cut into kakduki with size of 5 mm



Fruit	14±2	Apple (7)	Vertically divide into 8 while including the center
		Tangerine/Orange (7)	Vertically dividing into 8 while with peels
Fish & Meat	19±2	Meat (4)	Largely cut into a size of 3 cm at raw status
		Fish (12)	Cut in 4 at raw status
		Eggshell (3)	

Note1) Adjust the average water content rate at around 80±5 % by adding or taking out water, and use it within 24 hours.

Note2) Regarding the operation of 'D-(3)-(F)', onions can be substituted with Chinese cabbage or while reddish and fish can be substituted with meat.

#### 4.5.2

Input initial food waste of 0.5 kg and additionally input 0.5 kg food waste in accordance with the standard composition after 10 hours of initial input.

#### 4.5.3

Execute the test until the detection device of food waste weight reduction status operates and completely transfers to the mode of automatically reducing the power consumption while observing the power consumption status, etc. of the weight reduction device.

#### 4.5.4

The reduction performance is calculated as the following formula.

$$\text{Reduction Performance [\%]} = \left[ 1 - \frac{W_t}{W_s} \right] \times 100$$

However, when it is difficult to accurately measure the weight of food waste such as crush-type, in which food waste may remain in the treatment process, the weight shall be calculated based on the following formula.

$$\text{Reduction Performance [\%]} = \left[ \frac{W_s - [D_t - D_s]}{W_s} - 1 \right] \times 100$$

Herein,  $W_s$  : Food Waste Weight at Input [kg]

$W_t$  : Food Waste Weight at Finish [kg]

$D_s$  : Total Weight including the Device before Test [kg]

$D_t$  : Total Weight including the Device at the End of Test [kg]

Note) It is a principle to test them under the surrounding temperature 20±2 °C, relative humidity

55±5 % and the test results are written down.

## **5. Reasons for certification**

“Power-saving, Low noise, Less waste”

## **Common Criteria, Notice No. 2012-36, the Ministry of Environment**

1. Eco-label products must follow the following provisions with regard to the proper treatment of environmental pollution substances, such as air and water wastes and noxious chemical substances emitted in the process of manufacturing or service operation.

A. When first applying for certification, the product manufacturer should observe the environment related laws and agreements pertaining to the region where the production factory or the place of service operation is located for a period of one year prior to the date of application. Any case of violation of the penalty clause will be verified by confirming documents involved during a period of one year to the date of application. Regarding any violation not related to the penalty clause, confirmation will be made on the completion of appropriate measures.

B. A person who has received a certification of eco-labeling shall observe the environment related laws and agreements pertaining to the region where the production factory or the place of service operation is located during the period of certification. However, regarding any violation besides a penalty, confirmation will be made on the completion of appropriate measures.

2. As a general rule, information for consumers shall be indicated on the surface of the product in such a way not to be easily erased. However, in case that indication on the surface of the product is impossible or undesirable, it can be indicated on the appropriate part such as product packaging, product guidebook and user's manual that consumers can recognize. However, the service information should be indicated inside and outside of the place of service operation. In case that indication inside and outside of the place of service operation is impossible or undesirable, it can be indicated on the appropriate part such as an agreement, letter of delivery, letter of guarantee, and PR materials that consumers can recognize.

3. In order to establish fair trade and to protect consumer, the applicant for eco-label and the holder of eco-label license shall observe the Act on the Fairness of Indication and Advertisement with respect to the environmental aspects of the product.

4. For Various standards referred in the certification criteria by target product, the latest revised edition applies at the date of application, if not specified otherwise.

5. In applying the quality related criteria for each target product, if no standard is available that can be applied as the quality criteria, the president of Korea Environmental Industry & Technology Institute (KEITI) (hereafter referred to as "president of KEITI") may establish and operate the quality criteria for the product involved after review by a competent committee.