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## **Draft Clause 10 (for Washing Machines) of the Code of Practice on Energy Labelling of Products**

(April 2009 Version)

(Please read in conjunction with the existing Code of Practice on Energy Labelling of Products.  
Please see [http://www.emsd.gov.hk/emsd/e\\_download/pee/Combined\\_Code\\_of\\_Practice\\_\(200805\)\(Final\).pdf](http://www.emsd.gov.hk/emsd/e_download/pee/Combined_Code_of_Practice_(200805)(Final).pdf))

### **10. Energy Efficiency Labelling for Washing Machines**

#### **10.1 Scope**

10.1.1. Clause 10 of the Code, unless the Director provides otherwise, applies to a washing machine defined in the Ordinance, that is, the products specified in clauses 10.1.2 and 10.1.3.

10.1.2. “Washing machine”, subject to clause 10.1.3 of the Code—

- (a) means an appliance for cleaning and rinsing of textiles using water which may also have a means of extracting excess water from the textiles for household use;
- (b) includes horizontal drum type, impeller type and agitator type washing machines that —
  - (i) use mains electricity as the primary power source;
  - (ii) either have or do not have built-in dryers for drying textiles by means of heating; and
  - (iii) have a rated washing capacity not exceeding 7 kilograms.

10.1.3. “Washing machine” does not include washing machines which —

- (a) may also use other energy sources; or
- (b) have no spin extraction capability.

#### **10.2 Definitions**

This clause provides definitions of terms used in clause 10 of the Code. Unless otherwise specified, the definitions adopted in the clause 10 follow those stipulated in the Ordinance, if any.

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<i>agitator type</i>	means a type of washing machine in which the textiles are substantially immersed in the washing water, the mechanical action being produced by a device moving about or along its vertical axis with a reciprocating motion (an agitator). This device usually extends above the maximum water level.
<i>cycle</i>	means complete washing process, as defined by the programme selected, consisting of a series of different operations (wash, rinse, spin, etc.).
<i>horizontal drum type</i>	means a type of washing machine in which the textiles are placed in a horizontal or inclined drum and partially immersed in the washing water, the mechanical action being produced by rotation of the drum about its axis, the movement being either continuous or periodically reversed.
<i>IEC</i>	means International Electrotechnical Commission (the latest edition of the standard shall be followed for test methodology).
<i>impeller type</i>	means a type of washing machine in which the textiles are substantially immersed in the washing water, the mechanical action being produced by a device rotating about its axis continuously or which reverses after a number of revolutions (an impeller). The uppermost point of this device is substantially below the minimum water level.
<i>JIS</i>	means Japanese Industrial Standard (the latest edition of the standard shall be followed for test methodology).
<i>mains electricity</i>	means the electricity that is supplied in Hong Kong at a voltage of 380/220V and a frequency of 50 Hz.
<i>rated washing capacity</i>	means the washing capacity of a washing machine as determined and declared by the manufacturer or importer of the washing machine in accordance with the standard and requirements specified in the Code.

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## 10.3 Classification of Washing Machines

All washing machines regulated under the Ordinance are classified in accordance with Table 10.1—

**Table 10.1 – Classification of Washing Machines**

<b>Category</b>	<b>Description</b>
1	Horizontal drum type washing machines
2	Impeller type or agitator type washing machines

## 10.4 Tests Required to be Carried Out

The tests specified in this clause are required to be carried out, in accordance with IEC 60456 or JIS C 9606 or other equivalent international standards approved by the Director, in order to find out the energy efficiency and performance characteristics of a washing machine. The importer or manufacturer shall clearly indicate which test standard(s) they follow in testing their washing machines:

- (a) IEC 60456 applies to horizontal drum type washing machines (i.e. category 1)
- (b) JIS C 9606 applies to impeller type or agitator type washing machines (i.e. category 2)

A test report required to be submitted to the Director under section 6 of the Ordinance shall contain the results of these tests:

- (a) Energy consumption;
- (b) Water consumption;
- (c) Washing performance; and
- (d) Spin extraction performance.

## 10.5 Test Methodology and Energy Efficiency Grading

### 10.5.1. Test Conditions

In carrying out the tests as specified in clause 10.4 of the Code, the washing machine shall be tested at a voltage of 380/220V and a frequency of 50Hz with tolerances as specified in the relevant IEC or JIS standards. Moreover, unless the Director

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approves otherwise, the following test conditions shall be followed:

- (a) In testing horizontal drum type washing machines (category 1), the 60 °C cotton programme shall be used without pre-wash in accordance with the manufacturer's instruction.
- (b) In testing impeller type or agitator type washing machines (category 2), at the start of the test, the temperature of water shall be  $30 \pm 2$  °C.

In cases of washing machines without any programmes, the recommended times for washing, rinsing, and spin extracting operations shall be in accordance with the manufacturer's instructions for the rated washing capacity to be tested.

### 10.5.2. Measurement of Energy Consumption

The methodology for measuring energy consumption (kWh) shall be based on:

- (a) IEC 60456;
- (b) JIS C 9606; or
- (c) Other equivalent international standards approved by the Director.

The specified international standards (IEC or JIS) shall be referred to for actual performance requirements and procedural descriptions.

The energy consumption shall be measured as follows:

- (i) For horizontal drum type washing machine with built-in water heating device, the measured energy consumption (E) of the washing machine shall include the energy consumptions of both the washing function (including washing, rinsing and spin extraction processes) and the built-in water heating device for heating water. This measured energy consumption (E) shall be shown on the energy label after it is calculated to annual energy consumption based on 260 washes / year operation.
- (ii) For horizontal drum type washing machine without built-in water heating device, only the measured energy consumption (E) of the washing machine shall be shown on the energy label after it is calculated to annual energy consumption based on 260 washes / year operation.
- (iii) For impeller type or agitator type washing machine, only the measured energy consumption (E) of the washing function (including washing, rinsing and spin extraction processes) shall be shown on the energy label after it is calculated to annual energy consumption based on 260 washes / year operation.

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In cases of washing machines combined with built-in dryers for drying textiles by means of heating, only the energy consumption (E) of the washing machine shall be measured and the drying function is excluded.

## 10.5.3. Measurement of Water Consumption

The water consumption (litres/cycle) shall be measured during the energy consumption test in accordance with IEC 60456, JIS C 9606, or other equivalent international standards approved by the Director.

## 10.5.4. Measurement of Washing Performance and Spin Extraction Performance

The washing performance and spin extraction performance shall be measured and evaluated during the test period in accordance with IEC 60456, JIS C 9606, or other equivalent international standards approved by the Director.

## 10.5.5. Calculation of Specific Energy Consumption

The specific energy consumption of a washing machine shall be calculated as follows:

- (a) For horizontal drum type washing machine with built-in water heating device and impeller type or agitator type washing machine, the specific energy consumption is calculated as follows:

$$\text{Specific Energy Consumption (E}_{sp}\text{)} = \frac{E}{W_r} \dots\dots\dots(\text{eq. 1})$$

where  $E = \text{measured energy consumption per cycle (kWh/cycle)}$

$W_r = \text{rated washing capacity (kg)}$

- (b) For horizontal drum type washing machine without built-in water heating device, the specific energy consumption is calculated as follows:

$$\text{Specific Energy Consumption (E}_{sp}\text{)} = \frac{E + W_h}{W_r} \dots\dots\dots(\text{eq. 2})$$

where  $E = \text{measured energy consumption per cycle (kWh/cycle)}$

$W_r = \text{rated washing capacity (kg)}$

$W_h = \text{calculated hot water energy (kWh/cycle)}$

The calculated hot water energy is the theoretical energy requirement for heating water from 15 °C to 60 °C and shall be calculated as follows:

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$$W_h = \frac{(V_h \times (t_h - 15))}{860} \dots\dots\dots(\text{eq. 3})$$

where  $W_h$  = the calculated hot water energy in kWh for the operation

$V_h$  = the volume of external hot water used in litres during the operation

$t_h$  = the hot water inlet temperature in °C, i.e. 60 °C

10.5.6. Average Specific Energy Consumption

The average specific energy consumption ( $E_{av}$ ) figures for washing machines are shown in Table 10.2.

**Table 10.2 – Average specific energy consumption**

<b>Washing Machine Category</b>	<b>Average Specific Energy Consumption (kWh/kg/cycle)</b>
Category 1	$E_{av} = 0.26$
Category 2	$E_{av} = 0.0264$

10.5.7. Energy Efficiency Grading

(a) Energy Consumption Index ( $I_\epsilon$ )

The energy consumption index ( $I_\epsilon$ ) of a washing machine is defined as the ratio of the specific energy consumption ( $E_{sp}$ ) of the washing machine to the average specific energy consumption ( $E_{av}$ ) (as found from the associated average specific energy consumption in clause 10.5.6 of the Code). The indices are expressed in percentages. Thus, within a category, a washing machine with a lower energy consumption index (i.e. a lower percentage) consumes less energy than a washing machine with a higher energy consumption index (i.e. a higher percentage). The energy consumption index is calculated as follows—

$$\text{Energy Consumption Index } (I_\epsilon) = \frac{E_{sp}}{E_{av}} \times 100\% \dots\dots\dots(\text{eq. 4})$$

where  $E_{sp}$  = specific energy consumption as determined in clause 10.5.5

$E_{av}$  = average specific energy consumption as determined from Table 10.2

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## (b) Energy Efficiency Grading

The energy efficiency grading of a washing machine shall be determined as shown in Table 10.3, with Grade 1 having the best performance and Grade 5 having the worst performance.

**Table 10.3 – Derivation of energy efficiency grades**

<b>Energy Consumption Index: <math>I_e</math> (%)</b>	<b>Energy Efficiency Grade</b>
$I_e \leq 80$	1
$80 < I_e \leq 95$	2
$95 < I_e \leq 110$	3
$110 < I_e \leq 125$	4
$125 < I_e$	5

Note:

*In order to obtain Grade 1 to 4, the washing machine concerned shall also meet all the performance requirements as stipulated in clause 10.6.1(c), i.e. washing performance and spin extraction performance. Only Grade 5 will be accorded if the washing machine does not meet anyone of these performance requirements or  $I_e > 125$ .*

An example illustrating the method on how to determine the energy efficiency grade of a washing machine is shown in Appendix 4A. *(to be provided)*

## 10.6 Performance Requirements

10.6.1. In the test report submitted to the Director under section 6 of the Ordinance, the results of the tests carried out in accordance with IEC 60456 or JIS C 9606 or other equivalent international standards approved by the Director shall show that the concerned model conforms with the following performance requirements—

- (a) The measured energy consumption (kWh/cycle) shall not be greater than the rated energy consumption by more than 15%.
- (b) The measured water consumption (litres/cycle) shall not be greater than the rated water consumption by more than 15%.
- (c) The measured washing performance and measured spin extraction

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performance shall conform with the minimum requirements in accordance with the respective test standards as shown in Table 10.4 for Grade 1 to 4:

**Table 10.4 – Performance Requirements**

Category	Category 1	Category 2
<b>Performance Requirements<sup>Note (1)</sup></b>		
Test Standard	IEC 60456	JIS C 9606
Washing Performance <sup>Note (2)</sup>	$q \geq 0.7$	$C \geq 0.55$
Spin Extraction Performance <sup>Note (3)</sup>	$RM \leq 1.1$	Water extracting efficiency $\geq 0.47$

Note:

- (1) Each of the performance shall be determined in accordance with the test standard of the respective category.
- (2) The washing performance shall be determined in accordance with the following equations (extracted from the respective test standards):

$$q = \frac{\overline{C}_{test}}{\overline{C}_{ref}} \quad \text{or} \quad C = \frac{D_r}{D_s}$$

where  $q$  = ratio of the average sum of the reflectance values

$\overline{C}_{test}$  = average sum of the reflectance values for the washing machine under test

$\overline{C}_{ref}$  = average sum of the reflectance values for the reference washing machine

$C$  = washability ratio

$D_r$  = washability by the washing machine under test

$D_s$  = washability by the reference washing machine

For details on the definitions of the parameters and their calculation, the respective test standards shall be referred to.

- (3) The spin extraction performance shall be determined in accordance with



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*the following equations (extracted from the respective test standards):*

$$RM = \frac{M_r - M}{M} \quad , \text{ or}$$

$$\text{Water extracting efficiency} = \frac{\text{Mass of cloth in dry state}}{\text{Mass of cloth after water extraction}}$$

where  $RM$  = remaining moisture

$M$  = the mass of the conditioned base load

$M_r$  = the mass of the base load after spin extraction

*For details on the definitions of the parameters and their calculation, the respective test standards shall be referred to.*

- (4) *In order to obtain Grade 1 to 4, the washing machine concerned shall also meet all the above performance requirements, i.e. washing performance and spin extraction performance. Only Grade 5 will be accorded if the washing machine does not meet anyone of the above performance requirements or  $I_e > 125$ .*

10.6.2. The rated energy consumption and rated water consumption as declared by the manufacturer or importer shall meet the requirements specified in clause 10.6.1 of the Code.

## 10.7 Safety Requirements

In addition to the energy efficiency performance requirements, all washing machines shall comply with the Electrical Products (Safety) Regulation, Chapter 406G of the Laws of Hong Kong, and the safety standards specified under the Regulation, and all other legislations concerning the safety of the washing machines.

## 10.8 Number of Samples to be Tested

10.8.1. For submission of product information of a model under section 6 of the Ordinance, subject to clause 10.8.2 of the Code, a test report on one sample of the model shall be submitted.

10.8.2. However, if the test results of one sample indicate that the measured energy consumption is greater than the rated energy consumption by more than 10%, the test report shall include the tests of two samples of the same model. In such case, each individual sample shall meet all the performance requirements in clause 10.6 of the Code. Also, the information on the energy label shall be based on the test

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results of the tested sample with a higher energy consumption index ( $I_e$ ).

### 10.9 Energy Label

10.9.1. The specification of the energy label for washing machines shown in Appendix 4B. After a reference number has been assigned to a product model in the name of a specified person and included in the Director's record, the specified person shall produce the energy label for his/her products of the listed model showing the energy efficiency grade and associated information in accordance with the requirements in Appendix 4B.

10.9.2. (a) Subject to clause 10.9.2(c), the energy label is to be attached or affixed to a prominent position of the washing machine and is to be clearly visible.

(b) For the avoidance of doubt, if only part of the washing machine is being exhibited, the energy label is to be attached or affixed to a prominent position of that part and is to be clearly visible.

(c) The energy label may be attached to the washing machine or its packaging in a manner specified by the Director where the Director has approved its being so attached.

10.9.3. The energy label shall be of cardboard, if it is to be attached as a swing tag, or be self-adhesive and shall be cut to the outline shown in Appendix 4B. A trim or die cut margin of up to 2 mm around the energy label is acceptable.

10.9.4. The paper used for the energy label shall be durable with good wear and tear characteristics.

### 10.10 Compliance

10.10.1. During the compliance monitoring testing carried out by the Director, a listed model of washing machine will be accepted as conformance if the test results of a single sample of the listed model meet the following criteria:

(a) The tested energy consumption (kWh/cycle) shall not be greater than the rated energy consumption by more than 15%.

(b) The tested water consumption (litres/cycle) shall not be greater than the rated water consumption by more than 15%.

(c) The tested washing performance and tested spin extraction performance shall conform with the minimum requirements in accordance with the respective test standards as shown in Table 10.4 for Grade 1 to 4.

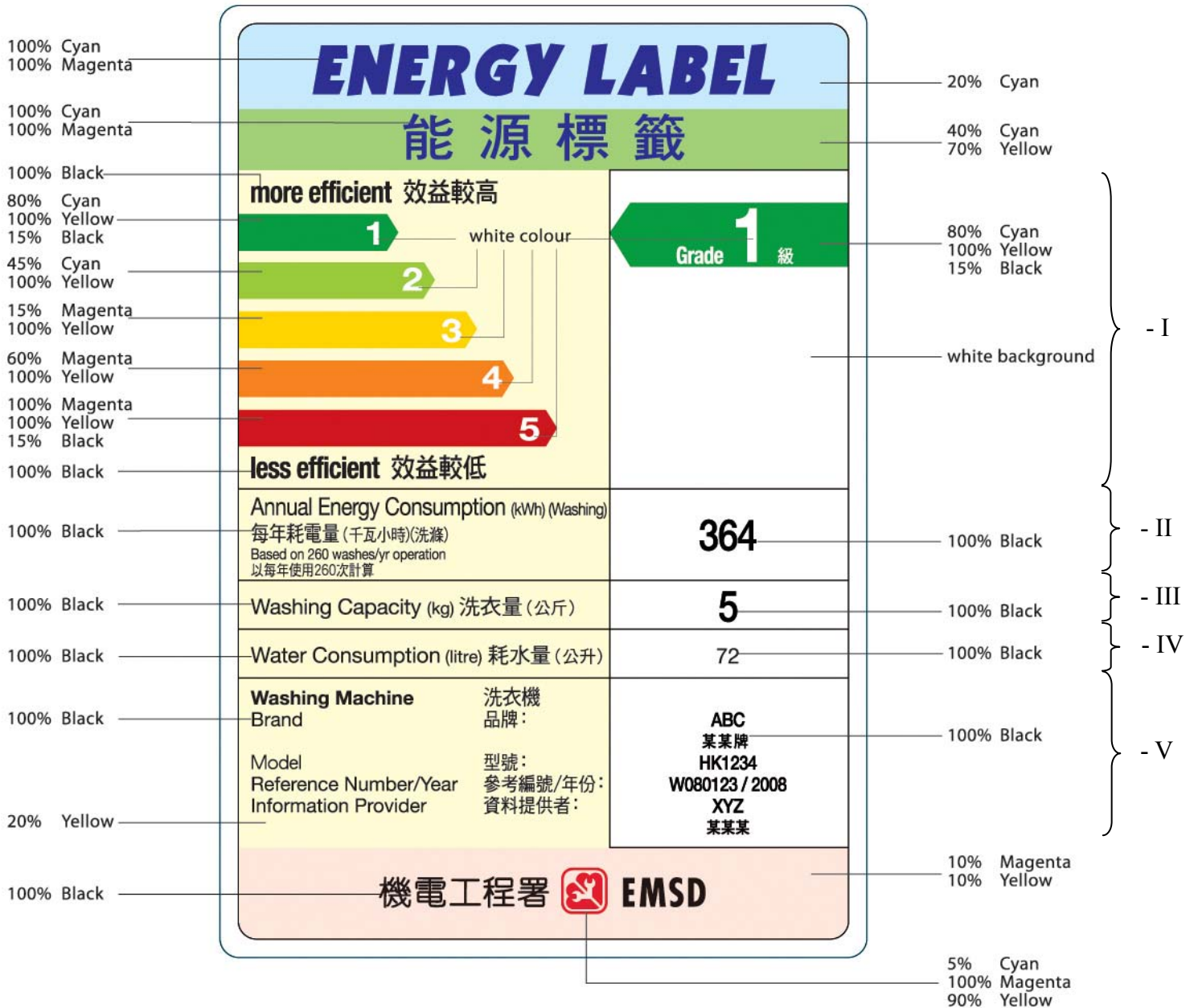
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- (d) The tested energy efficiency grade meeting either one of the following:
  - (i) The energy efficiency grade calculated in the compliance monitoring testing being equal to or better than the energy efficiency grade determined by the test results submitted to the Director by the specified person; or
  - (ii) If the energy efficiency grade calculated in the compliance monitoring testing being not equal to nor better than the energy efficiency grade determined by the test results submitted to the Director, the tested energy consumption index calculated in the compliance monitoring testing being not greater than 115% of the measured energy consumption index calculated by the test results submitted to the Director.

10.10.2. The Director may remove from the record the reference number of a listed model of washing machine, if he has reasonable grounds to believe that the washing machine does not conform with the specified information or a specified document, or their updates if any, submitted to the Director. The specified person may provide explanation on the failure of a product to pass the compliance monitoring testing stipulated in clause 10.10.1 above and apply for further testing of the concerned model for the Director's consideration.

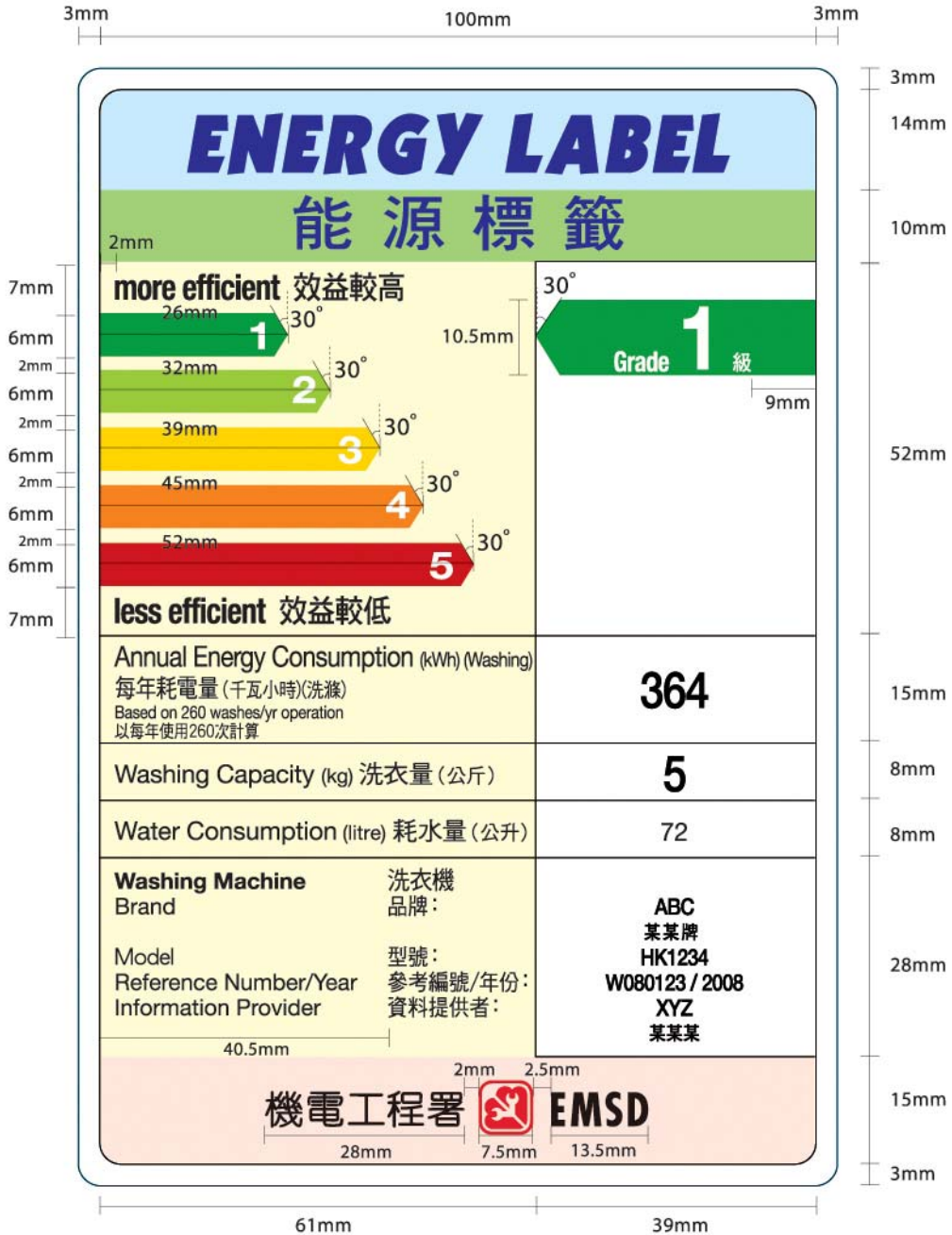
**Specification of Energy Label**

(1) The colour and design of the energy label must be as specified in the diagram below—



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(2) The dimensions of the energy label must be as specified in the diagram below—



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- (3) The energy label under section 1 of Appendix 4B is divided into 5 rectangular areas (marked I, II, III, IV and V by the side of the label). The information to be contained in each area of the energy label is specified in column 2 of the following Table in relation to the area specified opposite to that information in column 1 of the Table.

<u>Area</u>	<u>Information to be contained</u>
I	The energy efficiency grading of the model, calculated in accordance with the Code. The head of the arrow containing the energy efficiency grade number is to be placed at the same level and has the same colour as the head of the relevant arrow on the left.
II	The annual energy consumption, calculated by multiplying the measured energy consumption per cycle by an average of 260 washes per year, determined in accordance with the Code.
III	The washing capacity, which is the rated washing capacity of the model, determined in accordance with the Code.
IV	The water consumption, which is the measured water consumption per cycle, determined in accordance with the Code.
V	The brand name, the product model, the reference number assigned by the Director, the year in which the reference number is assigned or, where the energy efficiency grading is calculated in accordance with the new calculation method under section 12 of this Ordinance, the year in which the new calculation method takes effect and the name of the information provider. The information provider is the specified person who submitted the specified information to the Director.

- (4) The specifications for the font size of the words printed on the energy label are as follows—

<u>Description on the Energy Label</u>	<u>Font and font size</u>
ENERGY LABEL	31 point Italic Kabel Ult BT (English)
能源標籤	24 point DFHeibold (Chinese)

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<u>Description on the Energy Label</u>	<u>Font and font size</u>
more efficient 效益較高	14 point Helvetica Neue Bold (English)
less efficient 效益較低	14 point DFHeiBold (Chinese)
Grade on the left (1, 2, 3, 4, 5)	15 point Helvetica Neue Bold (English)
Grade on the right –	
The word “Grade”	11 point Helvetica Neue Bold Condensed (English)
The figure “1”	35.5 point Helvetica Neue Bold (English)
The word “級”	9.5 point DFHeiBold (Chinese)
Annual Energy Consumption (kWh)(Washing) 每年耗電量（千瓦小時）（洗滌）	11.5 (8) point Helvetica Roman (English) 10 (8) point DFHeiMedium (Chinese)
Based on 260 washes/yr operation 以每年使用 260 次計算	7 point Helvetica Roman (English) 7 point DFHeiMedium (Chinese)
Washing Capacity (kg) 洗衣量（公斤）	10 point Helvetica Roman (English) 10 point DFHeiMedium (Chinese)
Figures of annual energy consumption and washing capacity on the right	20 point Helvetica Medium
Water Consumption (litre) 耗水量（公升）	10 point Helvetica Roman (English) 10 point DFHeiMedium (Chinese)
Figure of water consumption on the right	10 point Helvetica Roman (English)
Washing Machine 洗衣機	9 point Helvetica Bold (English) 9 point DFHeiMedium (Chinese)
Brand	} 9 point Helvetica Roman (English)
Model	
Reference Number / Year	
Information Provider	

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<u>Description on the Energy Label</u>	<u>Font and font size</u>
品牌： 型號： 參考編號 / 年份： 資料提供者：	} 9 point DFHeiMedium (Chinese)
Characters of brand, model, reference number, year and information provider on the right	9 point Helvetica Roman (English) 7.5 point DFHeiMedium (Chinese)
機電工程署 EMSD and its logo	16 point Monotype Yuen (Chinese) 17.9 point Futura Bold Condensed (English)



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## **Draft Clause 11 (for Dehumidifiers) of the Code of Practice on Energy Labelling of Products**

(April 2009 Version)

(Please read in conjunction with the existing Code of Practice on Energy Labelling of Products.  
Please see [http://www.emsd.gov.hk/emsd/e\\_download/pee/Combined\\_Code\\_of\\_Practice\\_\(200805\)\(Final\).pdf](http://www.emsd.gov.hk/emsd/e_download/pee/Combined_Code_of_Practice_(200805)(Final).pdf))

### **11. Energy Efficiency Labelling for Dehumidifiers**

#### **11.1 Scope**

11.1.1. Clause 11 of the Code, unless the Director provides otherwise, applies to a dehumidifier defined in the Ordinance, that is, the products specified in clauses 11.1.2 and 11.1.3.

11.1.2. “Dehumidifier”, subject to clause 11.1.3 of the Code—

- (a) means an encased assembly for removing moisture from its surrounding atmosphere;
- (b) includes self-contained, electrically operated and mechanically-refrigerated dehumidifiers that—
  - (i) use mains electricity as the primary power source;
  - (ii) operate by using the vapour compression cycle;
  - (iii) consist of a refrigerated surface (evaporator) that condenses moisture from the atmosphere; a refrigerating system, including an electric motor; an air circulating fan; and a drain system for collecting and/or disposing of the condensate; and
  - (iv) have a rated dehumidifying capacity not exceeding 87 litres per day.

11.1.3. “Dehumidifier” does not include dehumidifiers which—

- (a) may also operate by using desiccant materials; or
- (b) are room air conditioners having dehumidifying function.

#### **11.2 Definitions**

This clause provides definitions of terms used in clause 11 of the Code. Unless otherwise specified, the definitions adopted in the clause 11 follow those stipulated

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in the Ordinance, if any.

<i>ANSI/AHAM</i>	means American National Standards Institute / Association of Home Appliance Manufacturers (the latest edition of the standard shall be followed for test methodology).
<i>CAN/CSA</i>	means Canada / Canadian Standards Association (the latest edition of the standard shall be followed for test methodology).
<i>dehumidifying capacity</i>	means a measure of the ability of a dehumidifier to remove moisture from its surrounding atmosphere, measured in litres of moisture removed per 24 hours of period.
<i>energy factor</i>	means the energy efficiency of a dehumidifier that is measured in litres of water removed per kilowatt-hour (kWh) of energy consumed at standard test condition.
<i>mains electricity</i>	means the electricity that is supplied in Hong Kong at a voltage of 380/220V and a frequency of 50 Hz.
<i>rated dehumidifying capacity</i>	means the dehumidifying capacity of a dehumidifier as determined and declared by the manufacturer or importer of the dehumidifier in accordance with the standard and requirements specified in the Code.
<i>vapour compression cycle</i>	means a mechanism employed by a dehumidifier throughout which the refrigerant undergoes alternate compression and expansion to achieve the cooling or heating function.

### 11.3 Classification of Dehumidifiers

All dehumidifiers regulated under the Ordinance are classified in accordance with Table 11.1—

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**Table 11.1 – Classification of Dehumidifiers**

<b>Classification</b>	<b>Water Removal Capacity Under Test Conditions (Litres / Day)</b>
Standard Capacity Dehumidifier	Up to 35 litres
High Capacity Dehumidifier	From 35 litres to 87 litres

## 11.4 Tests Required to be Carried Out

The tests specified in this clause are required to be carried out, in accordance with ANSI/AHAM DH-1 or other equivalent international standards approved by the Director, in order to find out the energy efficiency and performance characteristics of a dehumidifier. A test report required to be submitted to the Director under section 6 of the Ordinance shall contain the results of these tests:

- (a) Dehumidifying capacity test for measuring dehumidifying capacity and corresponding energy consumption; and
- (b) Maximum operating conditions test.

## 11.5 Test Methodology and Energy Efficiency Grading

### 11.5.1. Test Condition for the Determination of Dehumidifying Capacity

With respect to the measurement of the dehumidifying capacity of a dehumidifier, the requirements of ANSI/AHAM DH-1 standard test condition as shown in Table 11.2 shall apply.

**Table 11.2 – Test condition for the determination of dehumidifying capacity**

<b>Parameter</b>	<b>Standard test conditions</b>
Dry-bulb temperature	26.7°C
Wet-bulb temperature	20.9°C
Relative humidity	60%

### 11.5.2. Measurement of Dehumidifying Capacity and Energy Consumption

The testing methodology for measurement of the dehumidifying capacity and the corresponding energy consumption of a dehumidifier shall follow ANSI/AHAM

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DH-1 or other equivalent international standards approved by the Director. The dehumidifier shall be tested at a voltage of 380/220V and a frequency of 50Hz with tolerances as specified in the standard.

### 11.5.3. Determination of Dehumidifying Capacity

The dehumidifying capacity of a dehumidifier shall be determined by using the test results of the test as measured in accordance with clause 11.5.2 of the Code and the relevant clause of ANSI/AHAM DH-1. In conversion of the dehumidifying capacity to litres per day, reference shall be made to the relevant clause of CAN/CSA-C749.

### 11.5.4. Determination of Energy Factor (EF)

The energy factor (litres/kWh) is used to measure the energy efficiency of a dehumidifier at the test condition and is calculated as follows—

$$\text{Energy Factor (EF)} = \frac{V}{E} \dots\dots\dots(\text{eq. 1})$$

*Where V = amount of water removed (litres) measured in dehumidifying capacity test.*

*E = corresponding energy consumption (kWh) measured in dehumidifying capacity test.*

### 11.5.5. Energy Efficiency Grading

The energy efficiency grade of the dehumidifier shall be determined as shown in Table 11.3, with Grade 1 having the best performance and Grade 5 having the worst performance.

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**Table 11.3 – Derivation of energy efficiency grades**

Rated dehumidifying capacity ( $D_R$ ) (litres/day)	Energy Factor (EF) (litres/kWh)				
	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
$< 10$	$1.60 \leq EF$	$1.35 \leq EF < 1.60$	$1.15 \leq EF < 1.35$	$1.00 \leq EF < 1.15$	$EF < 1.00$
$10 \leq D_R < 15$	$1.85 \leq EF$	$1.55 \leq EF < 1.85$	$1.35 \leq EF < 1.55$	$1.20 \leq EF < 1.35$	$EF < 1.20$
$15 \leq D_R < 20$	$2.00 \leq EF$	$1.65 \leq EF < 2.00$	$1.45 \leq EF < 1.65$	$1.25 \leq EF < 1.45$	$EF < 1.25$
$20 \leq D_R < 25$	$2.10 \leq EF$	$1.75 \leq EF < 2.10$	$1.55 \leq EF < 1.75$	$1.35 \leq EF < 1.55$	$EF < 1.35$
$25 \leq D_R < 35$	$2.35 \leq EF$	$2.00 \leq EF < 2.35$	$1.70 \leq EF < 2.00$	$1.50 \leq EF < 1.70$	$EF < 1.50$
$35 \leq D_R \leq 87$	$3.30 \leq EF$	$2.75 \leq EF < 3.30$	$2.35 \leq EF < 2.75$	$2.10 \leq EF < 2.35$	$EF < 2.10$

Note:

*In order to obtain Grade 1 to 4, the dehumidifier concerned shall also pass the maximum operating conditions test as stipulated in clause 11.6.1(c). Only Grade 5 will be accorded if the dehumidifier does not pass the maximum operating conditions test or the energy factor falls into Grade 5.*

An example illustrating the method on how to determine the energy efficiency grade of a dehumidifier is shown in Appendix 5A. *(to be provided)*

## 11.6 Performance Requirements

11.6.1. In the test report submitted to the Director under section 6 of the Ordinance, the results of the tests carried out in accordance with the relevant clauses of ANSI/AHAM DH-1 or other equivalent international standards approved by the Director shall show that the concerned model conforms with the following performance requirements—

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- (a) The measured dehumidifying capacity shall not be less than 95% of the rated dehumidifying capacity.
- (b) The measured energy consumption shall not be greater than 105% of the rated energy consumption.
- (c) The dehumidifier shall pass the maximum operating conditions test. Any dehumidifier failing the maximum operating conditions test can only obtain Grade 5.

11.6.2. The rated dehumidifying capacity and the rated energy consumption as declared by the manufacturer or importer shall meet the requirements specified in clause 11.6.1 of the Code.

### 11.7 Safety Requirements

In addition to the energy efficiency performance requirements, all dehumidifiers shall comply with the Electrical Products (Safety) Regulation, Chapter 406G of the Laws of Hong Kong, and the safety standards specified under the Regulation, and all other legislations concerning the safety of the dehumidifiers, e.g. the Gas Safety Ordinance and its subsidiary legislations, as appropriate.

### 11.8 Number of Samples to be Tested

For submission of product information of a model under section 6 of the Ordinance, a test report on one sample of the model shall be submitted.

### 11.9 Energy Label

11.9.1. The specification of the energy label for dehumidifier is shown in Appendix 5B. After a reference number has been assigned to a product model in the name of a specified person and included in the Director's record, the specified person shall produce the energy label for his/her products of the listed model showing the energy efficiency grade and associated information in accordance with the requirements in Appendix 5B.

- 11.9.2. (a) Subject to clause 11.9.2(c), the energy label is to be attached or affixed to a prominent position of the dehumidifier and is to be clearly visible.
- (b) For the avoidance of doubt, if only part of the dehumidifier is being exhibited, the energy label is to be attached or affixed to a prominent position of that part and is to be clearly visible.
- (c) The energy label may be attached to the dehumidifier or its packaging in a

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manner specified by the Director where the Director has approved its being so attached.

11.9.3. The energy label shall be of cardboard, if it is to be attached as a swing tag, or be self-adhesive and shall be cut to the outline shown in Appendix 5B. A trim or die cut margin of up to 2 mm around the energy label is acceptable.

11.9.4. The paper used for the energy label shall be durable with good wear and tear characteristics.

### 11.10 Compliance

11.10.1. During the compliance monitoring testing carried out by the Director, a listed model of dehumidifier will be accepted as conformance if the test results of a single sample of the listed model meet the following criteria:

- (a) The tested dehumidifying capacity shall not be less than 90% of the rated dehumidifying capacity.
- (b) The tested energy consumption shall not be greater than 110% of the rated energy consumption.
- (c) The dehumidifier shall pass the maximum operating conditions test for Grade 1 to 4.
- (d) The tested energy efficiency grade meeting either one of the following:
  - (i) The energy efficiency grade calculated in the compliance monitoring testing being equal to or better than the energy efficiency grade determined by the test results submitted to the Director by the specified person; or
  - (ii) If the energy efficiency grade calculated in the compliance monitoring testing being not equal to nor better than the energy efficiency grade determined by the test results submitted to the Director due to decrease in energy factor, the tested energy factor calculated in the compliance monitoring testing being not less than 90% of the measured energy factor calculated by the test results submitted to the Director.

11.10.2. The Director may remove from the record the reference number of a listed model of dehumidifier, if he has reasonable grounds to believe that the dehumidifier does not conform with the specified information or a specified document, or their updates if any, submitted to the Director. The specified person may provide explanation on the failure of a product to pass the compliance monitoring testing stipulated in clause

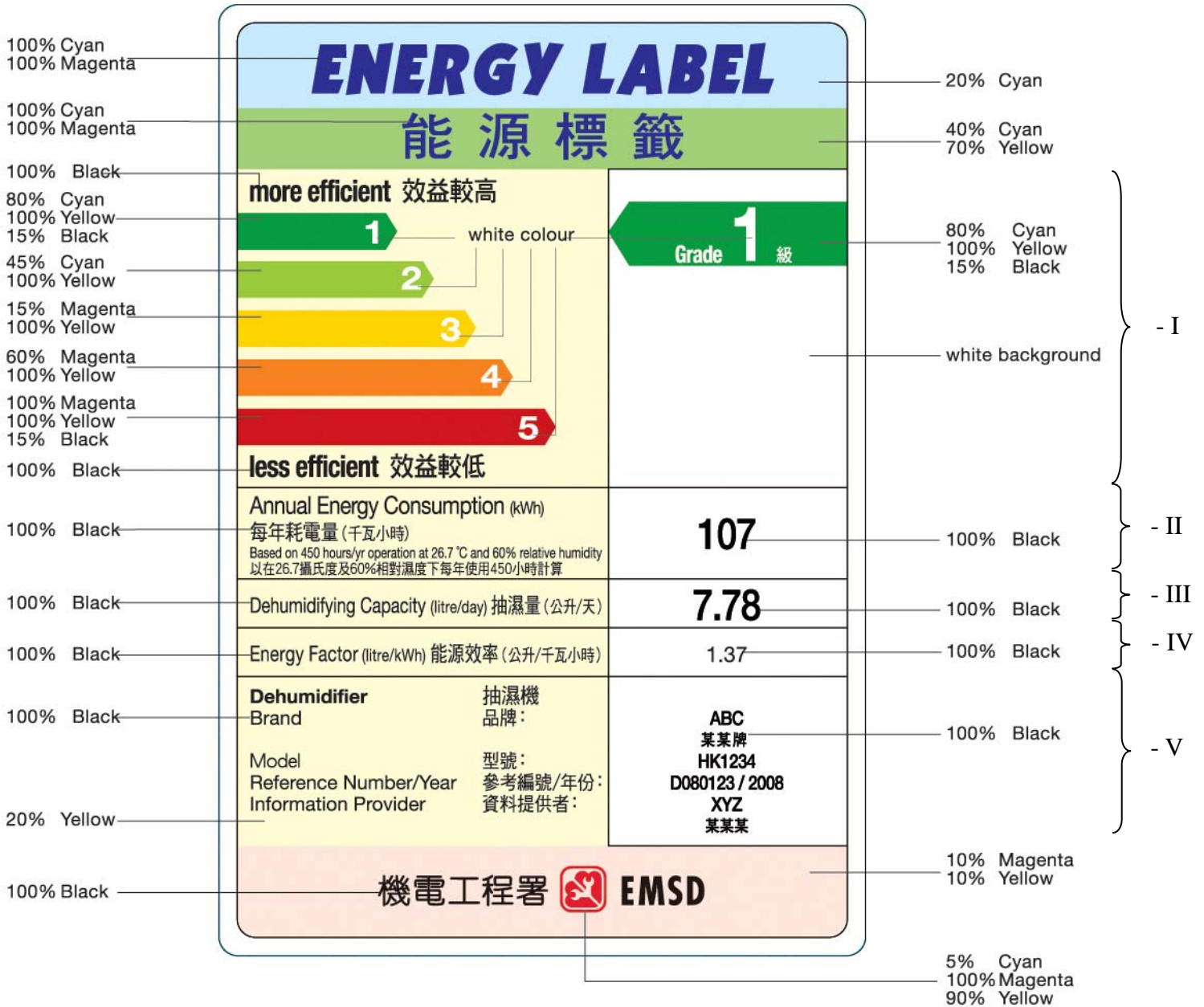
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11.10.1 above and apply for further testing of the concerned model for the Director's consideration.



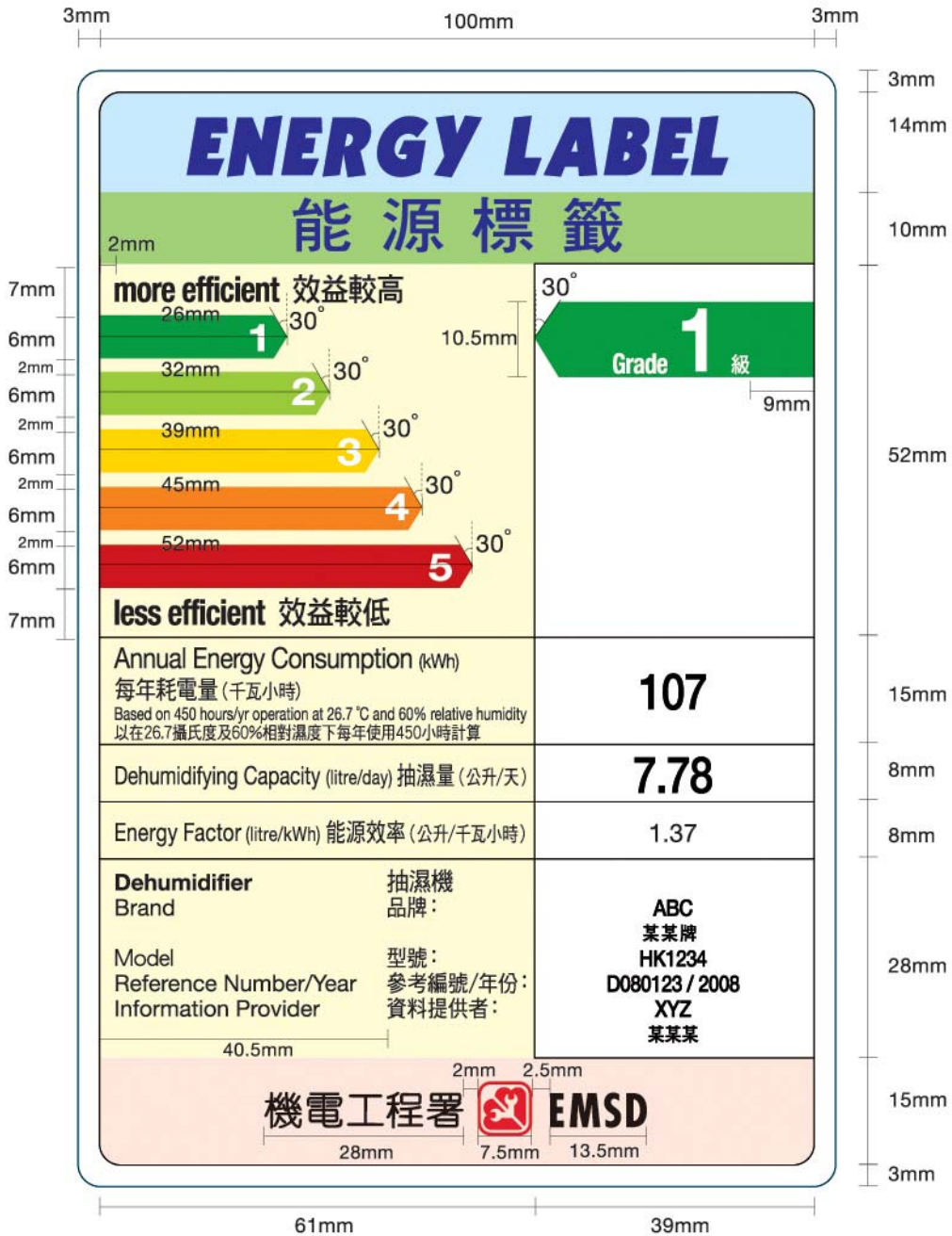
**Specification of Energy Label**

(1) The colour and design of the energy label must be as specified in the diagram below—



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(2) The dimensions of the energy label must be as specified in the diagram below—



Actual Size : 106mm(W) X 156mm(H)

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- (3) The energy label under clause 1 of Appendix 5B is divided into 5 rectangular areas (marked I, II, III, IV and V by the side of the label). The information to be contained in each area of the energy label is specified in column 2 of the following Table in relation to the area specified opposite to that information in column 1 of the Table.

<u>Area</u>	<u>Information to be contained</u>
I	The energy efficiency grading of the model, calculated in accordance with the Code. The head of the arrow containing the energy efficiency grade number is to be placed at the same level and has the same colour as the head of the relevant arrow on the left.
II	The annual energy consumption, calculated by multiplying the measured power consumption at 26.7°C and 60% relative humidity by an average of 450 hours per year, determined in accordance with the Code.
III	The dehumidifying capacity, which is the measured amount of water removed in 24 hours, determined in accordance with the Code.
IV	The energy factor, which is the measured amount of water removed per kilowatt-hour, determined in accordance with the Code.
V	The brand name, the product model, the reference number assigned by the Director, the year in which the reference number is assigned or, where the energy efficiency grading is calculated in accordance with the new calculation method under section 12 of this Ordinance, the year in which the new calculation method takes effect and the name of the information provider. The information provider is the specified person who submitted the specified information to the Director.

- (4) The specifications for the font size of the words printed on the energy label are as follows—

<u>Description on the Energy Label</u>	<u>Font and font size</u>
ENERGY LABEL	31 point Italic Kabel Ult BT (English)
能源標籤	24 point DFHeibold (Chinese)

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<u>Description on the Energy Label</u>	<u>Font and font size</u>
more efficient 效益較高	14 point Helvetica Neue Bold (English)
less efficient 效益較低	14 point DFHeiBold (Chinese)
Grade on the left (1, 2, 3, 4, 5)	15 point Helvetica Neue Bold (English)
Grade on the right –	
The word “Grade”	11 point Helvetica Neue Bold Condensed (English)
The figure “1”	35.5 point Helvetica Neue Bold (English)
The word “級”	9.5 point DFHeiBold (Chinese)
Annual Energy Consumption (kWh) 每年耗電量 (千瓦小時)	11.5 (8) point Helvetica Roman (English) 10 (8) point DFHeiMedium (Chinese)
Based on 450 hours/yr operation at 26.7°C and 60% relative humidity 以在 26.7 攝氏度及 60%相對濕度下每年使 用 450 小時計算	7 point Helvetica Roman (English) 7 point DFHeiMedium (Chinese)
Dehumidifying Capacity (litre/day) 抽濕量 (公升/天)	10 point Helvetica Roman (English) 10 point DFHeiMedium (Chinese)
Figures of annual energy consumption and dehumidifying capacity on the right	20 point Helvetica Medium
Energy Factor (litre/kWh) 能源效率 (公升/千瓦小時)	10 point Helvetica Roman (English) 10 point DFHeiMedium (Chinese)
Figure of energy factor on the right	10 point Helvetica Roman (English)
Dehumidifier 抽濕機	9 point Helvetica Bold (English) 9 point DFHeiMedium (Chinese)

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<u>Description on the Energy Label</u>	<u>Font and font size</u>
Brand Model Reference Number / Year Information Provider	} 9 point Helvetica Roman (English)
品牌： 型號： 參考編號 / 年份： 資料提供者：	} 9 point DFHeiMedium (Chinese)
Characters of brand, model, reference number, year and information provider on the right	9 point Helvetica Roman (English) 7.5 point DFHeiMedium (Chinese)
機電工程署 EMSD and its logo	16 point Monotype Yuen (Chinese) 17.9 point Futura Bold Condensed (English)