

**Revisions of the Ministerial Ordinance and the Notification
of the Ministry of Economy, Trade and Industry (METI)
under the Act on the Rational Use of Energy**

Energy Efficiency Division
Agency of Natural Resources and Energy
Ministry of Economy, Trade and Industry

1. Background

Under the Act on the Rational Use of Energy (Law No. 49 of 1979; hereinafter referred to as the “Energy Efficiency Law”), the Minister of Economy, Trade and Industry shall establish and publicize standards for manufacturers/importers (hereinafter referred to as the “manufacturers, etc.”), with regard to the improvement of the energy efficiency performance for the respective equipment which is specified in Cabinet Order under the Energy Efficiency Law including magnetic disc units.

The Minister also shall specify the matters to be labeled by manufacturers, etc. with regard to energy efficiency of specified equipment including magnetic disc units.

In addition, the energy efficiency standards shall be established taking into consideration the highest level of energy consumption performance of the respective specified equipment and other related factors (as it is called the "Top Runner Program").

The Minister proposes new energy efficiency standards for magnetic disc units to promote rationalization of energy use pertaining to magnetic disc units in Japan in order to cope with the recent increase of energy consumption in the business sector, climate change, and so forth.

2. Outline of amendment

(1) Scope

Magnetic disk unites

Magnetic disk units below are excluded.

- [i] Those whose use rate in markets is extremely small;
i.e., Those whose storage capacity is one gigabyte or less.
- [ii] Those of which no measurement method has been established and in which it is difficult to set any target standard;
i.e., Those which work only based on power feeding through direct-current power sources, e.g., USB cables, not through alternative-current power sources.

(2) Energy consumption efficiency and measurement method

[i] Energy consumption efficiency

Energy consumption efficiency should be a numerical value representing measured electricity consumption by watt, which is divided by a value representing storage capacity by gigabyte.

[ii] Major measurement method of energy consumption efficiency

In conformity with international standards (ISO/IEC24091), energy consumption efficiency should be measured based on the following conditions.

- A. The ambient temperature should be from 18 to 28 degrees Celsius, while the ambient humidity should be from 15 to 80%.
- B. The range of power source voltage should be $\pm 1\%$ of the voltage if the rated electricity consumption is 1,500W or less, while it should be $\pm 5\%$ if the rated electricity consumption is over 1,500W.
- C. The frequency of the power source should be a rated frequency.
- D. Magnetic disk units on which 12 or more disk drives can be mounted should be measured when they comprise a necessary power source, a cache memory for buffer and a control device and they have a structure in which a storage capacity connectable to the control device reaches the maximum (hereinafter referred to as “maximum structure”). Manufacturers are permitted to calculate energy consumption efficiency by making use of calculation formulae if they face difficulties in conducting an actual measurement of the efficiency by making use of the maximum structure.

(electricity consumption of the basic housing) + (electricity consumption of the expansion housing) \times (the number of expansion housings)

(3) Target fiscal year

The target fiscal year is FY2023.

(4) Categories and target standard values

Categories and target standard values of magnetic disk units are stipulated as below.

Target standard values of magnetic disk units

Number of mountable disk drives	Style and performance of disk drives		Category names	Standard energy consumption calculation formulae
	External dimensions of disk drives	Number of disks		
1	-	1	I	$E = \exp(2.98 \times \ln(N) - 30.8)$
		2 or 3	II	$E = \exp(2.98 \times \ln(N) - 31.2)$
		4 or more	III	$E = \exp(2.11 \times \ln(N) - 23.5)$
2 to 11	-	-	IV	$E = \exp(1.56 \times \ln(N) - 17.7)$
12 or more	Having structures containing 3.5-inch disk drives	-	V	0.00170
	Having structures consisting of 2.5-inch	-	VI	$E = \exp(0.952 \times \ln(N) - 14.2)$

	disk drives alone			
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Note 1: The letters “E” and “N” in the respective target standard values refer to the numerical values represented by the following items.

E: Energy efficiency standards (unit: watt/gigabyte)

N: Number of revolutions (unit: rate per minute)

Note 2: The term “ln” refers to logarithm having “e” as the base.

Note 3: When multiple disk drives with different revolution rates are mounted in one device, the revolution rate (N) should be the weighted average of the revolution rates of the respective disk drives based on the number of installed drives.

(5) Method to determine achievement

Concerning magnetic disk devices shipped to domestic markets in each fiscal year following the target fiscal year, the respective manufacturers and other businesses should ensure that the weighted average based on the number of shipped magnetic disk units per category (as for a unit having multiple disk drives, the number of basic housings) should not exceed the weighted average of the energy efficiency standards based on the number of shipped magnetic disk units.

(6) Labeling requirement

These revisions include requirements that manufacturers, etc. should indicate on their catalogs with regard to energy consumption efficiency etc.

4. Proposed date of entry into force

Around April of 2021* (except labeling requirement**).

*Target fiscal year for achieving the new standard is set to be FY2023.

**As for labeling requirement, proposed date of entry into force is around March of 2022.