

KOREAN INDUSTRIAL STANDARD

Magnetic Characteristics of Interchangeable Magnetic Eleven—Disk Packs

1. Scope

This Korean Industrial Standard specifies the characteristics for magnetic interchangeability of maximum record density 88 bit / mm (name) and track density 4 pieces / mm in the magnetic disk pack of KS C 5628 (Mechanical Interchangeability of Magnetic Eleven—Disk Packs).

2. Definition

Main definitions used in this standards shall comply with followings besides KS C 5602 (Glossary of Terms Used in Information Processing), KS C 5627 (Magnetic Characteristics of Interchangeable Eleven—Disk Packs and KS C 5628).

(1) Peripheral Erasure

Erasure of the both sides of track recorded by record regeneration head element to be the specified track width. And this method has tunnel erasure and straddle erasure.

(2) Straddle Erasure

The erasure head element of opposite is set up in the rear of the record regeneration head element, magnetic flux is made to be generated at the gap between the record regeneration head element and peripheral erasure is done along normal magnetization to record magnetization direction.

(3) Voltage Standard Output Disk

A magnetic disk used as main standard of magnetic disk's output voltage and its characteristic value is defined by the International Organization for Standardization (ISO).

Related Standards	KS C 5602	Glossary of Terms Used in Information Processing
	KS C 5626	Physical characteristics of Interchangeability of Interchangeable Six-Disk Packs
	KS C 5627	Magnetic Characteristics of Interchangeable Magnetic Six—Disk Packs
	KS C 5628	Physical Characteristics of Interchangeable Magnetic Eleven—Disk Packs
	ISO 3564	Information Processing — Interchangeable Magnetic Eleven—Disk Pack — Physical and Magnetic Characteristics

(4) Voltage Assistant Standard Output Disk

A magnetic disk revised before as voltage standard output disk, used for obtaining recension coefficients of regeneration output voltage test magnetic head.

(5) Data Standard Output Disk

A magnetic disk used as standard of magnetic characteristics other than output voltage of magnetic disk, and its characteristics are specified by the International Organization for Standardization (ISO).

(6) Data Assistant Standard Output Disk

A magnetic disk used for obtaining the recension coefficients (and disintegration ability) of data test magnetic head and revised before as data standard output disk.

3. Recording Surface and Track**3.1 Recording Surface and Number of Recording Surface****3.1.1 Recording Surface and Magnetic Head**

The twenty recording surfaces are numbered orderly from top to bottom. The relation between the type of magnetic head and recording surface comply with the Table 1 and the magnetic head is placed in relation with recording surfaces as Appendix Figure 1.

Table 1.

Recording Surface Number	Magnetic Head Type(')	Recording Surface Number	Magnetic Head Type(')
00	B-U	10	A-U
01	A-D	11	B-D
02	A-U	12	B-U
03	B-D	13	A-D
04	B-U	14	A-U
05	A-D	15	B-D
06	A-U	16	B-U
07	B-D	17	A-D
08	B-U	18	A-U
09	A-D	19	B-D

3.1.2 Number of Recording Surface

The recording surface is numbered with two ciphers of decimal system from 00 to 19 by the order specified in sub-clause 3.1.1.

3.2 Tracks

3.2.1 Number of Tracks

Each of writing surfaces has 203 of independent concentric circular tracks.

3.2.2 Track Numbers

Track numbers are as follows:

(1) Numbers

Tracks of each recording surface are numbered orderly from the most outer side as a number of three ciphers of decimal system from 000 to 202.

(2) Specification of Particular Track in Magnetic Disk Pack

On particular track in magnetic disk pack is indicated in order of the track number and the recording surface number using the number of five ciphers.

3.2.3 Width of Track

After the straddle elimination, the width of tracks must be 0.175–0.025mm, and gaps of adjacent tracks must be eliminated in measurement.

3.2.4 Track Location

Radii of center lines of each track are specified by a related dimensions of mutual magnetic disk which are indicated as follows and its computations are written on Appended Table 1.

And, the place relation of each related measurements is indicated in Appended Figure 1.

(1) Relationship between Magnetic Head and Magnetic Disk Location

The name of the value of head element A is F_A and the value of head element is F_B in the distance between movement trace of the center of record regeneration head element and straight line (center line Y) through the rotation axis of magnetic disk, this line is parallel to the movement trajectory of the center, and its nominal values are 12.125mm, 10.987 mm each other.

(2) Movement Pitch of Magnetic Head

The nominal pitch value(S) of the movement pitch of magnetic head is 0.2567mm.

(3) Relative Angle between the Gap of Head Element and the Movement Track

The relative angle (θ) of the movement trajectory of the gap of head element is $4^{\circ}54' \pm 30'$.

(4) Track Radius of Track 073

The track 073 is used as a standard of track radius and nominal radius value (R073) of a track center line is 148.057mm.

(5) Tolerance of Track Radius

The tolerance of each track radius is measured at $23 \pm 1^{\circ}\text{C}$, and it must be less than $\pm 0.0075\text{mm}$. If the measuring temperature is different, the measured radius value must be compensated by a proper expansion coefficient.

And for the track 073 that is a standard, the tolerance of a nominal value must be less than $\pm 0.0075\text{ mm}$.

3.2.5 Index Point

Each of tracks starts from index point and ends at index point. The index point of each track is on the track of a recording surface corresponding to the center position of recording regeneration head element, when the nominal angle (ϵ) value between the line (straight line L) from the front edge of notch of index disk to the rotation axis of magnation axis of magnetic disk and the movement trajectory of the center of recording regeneration head element corresponding to each of recording surface is $42^{\circ}9'$ (Refer to Appended Figure 2)

4. Test Condition**4.1 General Condition****4.1.1 Temperature**

The surrounding temperature at testing must be $27 \pm 2^{\circ}\text{C}$. When the magnetic disk pack is tested, the air temperature at the vent of air inhalation (filter part) of magnetic disk is specified as a surrounding temperature.

4.1.2 Humidity

The range of a relative humidity at testing must be from 40% to 60%. When the magnetic disk pack is tested, the humidity at the vent of air inhalation (filter part) of magnetic disk pack is specified as a relative humidity.

4.1.3 Number of Rotations

The number of rotations must be 2400 ± 24 rpm(min^{-1}) at testing, and the direction of rotation must be counterclockwise, when it is looked at from above.

4.1.4 Air Flow and Pressure Drop

The flow of air at the filter part of magnetic disk pack must be $0.026 \pm 0.002 \text{ m}^3 / \text{s}$ at testing, and the pressure drop must be less than 50 Pa (5.1mmH₂O).

4.1.5 Conditioning

In order not to entertain a doubt about the results of test when test is performed, the magnetic disk pack must be under the condition specified in sub-clause 4.1.1 and 4.1.2 during 24 hours minimum.

4.2 Testing Condition

4.2.1 Direct Current Erasure

Unless otherwise provided, we make direct current erasure is preformed on time before recording.

4.2.2 Peripheral Erasure

Unless otherwise provided, when all recording surface and track is tested, peripheral erasure according to direct current is performed in parallel. There are a tunnel erasure and a straddle erasure which head is used in peripheral erasure. In case of tunnel erasure using regeneration output voltage testing magnetic head, the current of peripheral erasure (I_{TF}) must be $40 \pm 20 \text{ mA}$. In the case of straddle erasure using data testing magnetic head, the current of peripheral erasure (I_{SE}) must be $35 \pm 1 \text{ mA}$.

4.2.3 Recording Frequency

1f, 2f and 4f of recording frequencies are as follows. The tolerance is $\pm 0.1\%$, but the waveform of recording current is illustrated in Appended figure 3.

$$1f = 0.625 \text{ MHz}$$

$$1f = 1.25 \text{ MHz}$$

$$1f = 2.5 \text{ MHz}$$

4.2.4 Pressing Force on Magnetic Head

When the magnetic head is rising, the practical force pressing the rising pad is $3.43 \pm 0.10 \text{ N}$ ($350 \pm 10 \text{ kgf}$).

4.3 Measuring Condition

4.3.1 Measuring Condition of Regeneration Output Voltage Test

The measuring condition of regeneration output voltage test is as follows:

(1) Writing Current

At a frequency the writing current measured at a part of magnetic head connector is as follows according to the specification of current waveform illustrated in Appendix figure 3.

$$I_w = \frac{I_{w1} + I_{w2}}{2} = 35 \pm 1 \text{ mA}$$

$$\text{where, } |I_{w1} - I_{w2}| < 1 \text{ mA}$$

$$0.05 \times I_w \leq \text{Overshoot} \leq 0.10 \times I_w$$

$$140 \text{ ns} \leq T_R \leq 200 \text{ ns}$$

$$140 \text{ ns} \leq T_F \leq 200 \text{ ns}$$

$$|T_R - T_F| \leq 20 \text{ ns}$$

$$|T_1 - T_2| \leq 0.02 \times T$$

$$\text{where, } T = \frac{T_1 + T_2}{2}$$

(2) Direct Current Erasure Current

In the case that direct current erasure is specified, the direct current erasure current (I_E) which flows one direction of record regeneration of regeneration coil must be $35 \pm 1 \text{ mA}$.

(3) Regeneration Circuit

The differential input impedance of regeneration circuit measured at magnetic head connector part (Refer to Appended Figure 4) is equal to the parallel coupling a differential input impedance $7.5 \pm 0.37 \text{ k}\Omega$ to the sum of distribution capacitance and concentration capacitance $45 \pm 5 \text{ pF}$. The regeneration circuit has a 5% maximum flat characteristics in 0.1 to 2.0 MHz of the frequency range.