

KOREAN INDUSTRIAL STANDARD

200mm Flexible Disk Cartridge

1. Scope

This Korean Industrial Standard specifies the transaction and information interchange of associated systems of 200mm flexible disk cartridges for information interchange which are recorded on a flux density or double flux density of 13262 flux transitions/rad at one side or both sides. (Hereinafter referred to as the "flexible disk")

2. Definitions

For the purpose of this standard, KS C 5602 (Glossary of Information Processing) and KS C 5627 (Magnetic Characteristics of Magnetic six-Disk Packs) the following principal definition apply.

(1) Flexible Disk

A flexible information convey recording medium which consists of a jacket and an accommodated disk, and accepts and retains on both recording surfaces of the disk information for data processing and associated systems

(2) Master Standard Flexible Disk.

To be used as the standard for reference fields, signal amplitudes, and the characteristic values of which are specified by the ISO (International Organization for Standardization).

(3) Secondary Standard Flexible Disk

A flexible disk the deviation of which in the electromagnetic conversion characteristics from the standard flexible disk to be tested and the standard flexible disk in their electromagnetic conversion characteristics is possible.

(4) Reference Field

The minimum field by which the average signal amplitude becomes 95% of the maximum output value (saturated value) When a signal is recorded on the specified track of the standard flexible disk at the specified frequency of flux transition and then the record is read back.

(5) Average Signal Amplitude

The average value of P-P amplitudes of putout voltage reproduced over one revolution of a track.

3. Structure

The Structure of flexible disk shall be as illustrated in Figs. 1. That is, a disk equipped with a jacket at its center is closed in a case which has a protective sheet positioned liner inside.

4. Shape and Dimensions

4.1 Jacket

Shape and dimension shall be as illustrated in Appendix Fig. 1 and the following :

(1) Size

The jacket shall be square which length of one side (Li) is $203.2 \pm 0.4\text{mm}$, angle is $90^\circ \pm 30'$.

Related Standard

KS C 5602 Glossary of Information Processing

KS C 5627 Magnetic Characteristics of Interchangeable Magnetic Six-Disk Packs

ISO/ DIS/ 5654/1 Information processing—Data interchange on 200mm(8in) flexible disk cartridges using two-frequency recording at 13262 ftprad on one side—Part 1: Dimensional, physical and magnetic characteristics

ISO/ DIS/ 7065/1 Information processing—Data interchange on 200mm(8in) flexible disk cartridge using modified frequency modulation recording at 13262 ftprad on two sides—Part 1: Dimensional, physical and magnetic characteristics

(2) Thickness

The thickness include liner(e_1) shall be illustrated in Appendix. 10.45 ± 0.15 mm as the thickness gauge. The thickness of flexible disk (e_2) shall be 1.2mm min, 2.1mm min. The flexible disk shall fall when inserted in the thickness gauge having vertical walls with a force width 2.6mm depth 150mm.

(3) Central Window

The position of index window(L_2) is 101.6 ± 0.3 mm and the diameter(d_1) shall be 58.40 ± 0.15 mm

(4) Index Window

The position of index window (L_3, L_4) shall be given in Table 1 and the diameter(d_2) shall be 7.7 ± 0.1 mm

Table1. Position of Index Window

Unit : mm

Type	L_3	L_4
One side Type	96.50 ± 0.25	139.40 ± 0.25
Both side Type	85.09 ± 0.25	135.94 ± 0.25

Head window in Appendix Fig. 1 with 2 ending $l_7 = 52.60 \pm 0.25$ mm, ndary length(L_8) all be given shall be 25mm, the surface of it, the radius of $l_3 = 6.35$ mm

(7) Flap

If flap is provided, width (19) shall be below 14mm, thickness shall be below 9mm.

(8) Notch

If notch is provided the position of notch shall be as given the following :

$$l_{10} \geq 81.6 \text{mm}$$

$$l_{11} \geq 94.6 \text{mm}$$

$$l_{13} \geq 108.6 \text{mm}$$

$$l_{13} \geq 121.6 \text{mm}$$

$$l_{14} \geq 2.0 \text{mm}$$

(9) Label Area

The label width (L_{19}) shall be below 58 in Appendix Fig. 3 with shaded portion.

(10) Write—inhibit Notch

If the write—write—inhibit notch is provided, it shall be given in Appendix Fig. 4.

4.2 Liner

Liner shall be covered the effective area [see 4.3(4)] of magnetic layer. However, the liner shall not protrude into the opening of jacket by 2mm or more.

4.3 Disk

The Shape and dimension shall be given in Appendix Fig. 2 and the following :

(1) Diameter

Diameter of flange parts(d_3), diameter of central parts(d_4) shall be as follows :

$$d_3 = 200.2 \pm 0.2 \text{mm}$$

$$d_4 = 38.100 \pm 0.025 \text{mm}$$

(2) Thickness

The thickness of disk(e_3) shall be 0.080 ± 0.010 mm

(3) Index hole

The position of index hold(r_4) shall be 38.1 ± 0.1 mm, radius of it(d_5) shall be 2.54 ± 0.10 mm.

(4) Effective Area of Magnetic Layer

The effective area of magnetic layer shall be given in Appendix Fig. 2 with the area surrounded by circles the radii of (r_5) and (r_6). shall be 51.3mm as one side r_5 style, 49.0mm as both side, r_6 shall be 92.0mm

(5) Recording Surface

The recording surface of the side where the flap exists shall be side 0 and the other 1. (see Appendix Fig.1)

5. Materials

5.1 Jacket

The recording surface of the side where the flap exists shall be side 0 and the other 1. (See Appendix Fig. 1)

5.2 Liner

The liner shall be made from materials which do not damage and can remove dust (for example, non-woven fabric).

5.3 Disk

The disk shall be constructed from suitable base (for example, biaxially oriented polyethylene terephthalate) coated with a strong and flexible layer of magnetic material (For example, γ -Fe₂O₃) and binder.

6. Track

6.1 Number of Track

The recording surface shall have 77 concentric tracks in its effective area of magnetic layer.

6.2 Track Number

The track number shall be expressed by a 2-digit decimal number from 00 to 76 starting at the outermost track.

6.3 Width of Track

The width of a recorded track shall be 0.300 ± 0.025 mm. The area between adjacent tracks shall be erased. The method of measuring width of track shall be as given Appendix 2.

6.4 Track Location The track location shall be as follows :

- (1) Relation between Track Number and Track Radius The nominal value of radius of center line of tracks (R_n) shall be the value calculated from the following formula :

$$R_n = X + 25.4 \frac{76 - n}{48}$$

- (2) Tolerance on Track Radius

The tolerances on radius of centerline of each track at the line of the test are ± 0.025 mm.

7. Physical and Mechanical Characteristics

- 7.1 The materials of disk, jacket, and liner may be ignited by a match flame, but shall not continue to burn in carbon dioxide.

7.2 Coefficient of Linear Thermal Expansion of Disk

It shall be $(17 \pm 8) \times 10^{-6} / ^\circ\text{C}$

7.3 Coefficient of Linear Hygroscopic Expansion of Disk

It shall be $(1 \text{ to } 15) \times 10^{-6} / \% \text{RH}$

7.4 Light Transmittance

The light transmittance of disk, jacket shall be calculated with appendix 3 method, 0.5% max. for one side, 1% max. for both side.

7.5 Torque

The starting torque and running torque shall be as follows :

- (1) Starting Torque The starting torque without the head and pressure pad being in contact with the disk, shall not exceed $0.042 \text{ N} \cdot \text{m}$

(2) Running Torque

When the flexible disk is running, the running thrque necessary to turn the disk shall be 0.028 to 0.088N · m. The speed of rotation shall be $360 \pm 7 \text{ rpm}(\text{min}^{-1})$ It measure that the pressure pad of $690 \pm 10 \text{ mm}^2$ with the power of $1.50 \pm 0.05 \text{ N}$ geing in contect the position of Fig. 3 (L_{15} to L_{18}). Also the position as follows :

$$\begin{array}{ll} L_{15} = 62.0 \text{ mm} & L_{16} = 75.0 \text{ mm} \\ L_{17} = 10.0 \text{ mm} & L_{18} = 64.0 \text{ mm} \end{array}$$

8. Electric and Magnetic dharacteristics

8.1 Average Signal Amplitude

The average signal amplitude shall be in relation with the standard amplitude which is using the master standard reference flexible disk(1) under the same condition with illustrated in table 2.

Table 2. Average Signal Amplitude

Recording Side	Output of Trackw	Regulation value
Side 0	Output 1f of track 90	130% max.
	Output 2f of track 76	80% max.
Side 1	Output 1f of track 00	130% max.
	Output 2f of track 72	80% max.

Note(1) The secondary standard flexible disk may substitute for the standard flexible disk in the measurements of electric and magnetic characteristics.

8.2 Resolution

The value, on track 76 of side 0, no track 72 of side 1, of average signal amplitude at if shall be not less than 80% as one side flux density, not less than 90% as both sides flux density said value measured by using the standard fleyible disk⁽¹⁾

8.3 Overwrite

After erasing with d.c. [see 10.2(3)], recording is done on track 00 at of for one resolution, and the average signal amplitude of 1f is measured. Next, without erasing overwrite is done at 1f is measured. For the measurement of these average signal amplitudes, shall be use frequency seletive levelmeeter(Selective voltmeter). The ratio of of average signal amplitude calculated from the values so measured by means of the fromula below shall not exceed 100% of that obtained on the master standard reference flexible disk.

$$\text{Average Signal Amplitude Ration} = \frac{\text{Residual Average Signal Amplitude at 1f After Overwritin at 2f}}{\text{Average Signal Amplitude af 1f}}$$

8.4 Saturation Characteristics

The minimum field which causes an average signal amplitude equal to 95% of the maximum value (saturated value) when the recording is made on track 00 to 76 side 0 and on track 00 to 72 of side 1 at a test frequency of 1f and the record is read back, shall be within $\pm 20\%$ from the reference field.

8.5 Modulation

The modulation on track at 1f and the modulation on track 76 at 2f shall not exceed 10% each. The modulation is expressed by the following formula :

$$M = \frac{A - B}{A + B} \times 100$$

Where M : Modulation(%)

A : Average output voltage over about 2000 magnetic flux transitions including the maximum output voltage during one revolution of track

B : Average output voltage over about 2000 magntic flux transitions including the minumum output voltage during one revolution of track

8.6 Quality of Track

8.6.1 Missing Pulse

Any pulse the peak value of which at 2f less than 40% of 1/2 of the average signal amplitude over 2000 flux transitions shall be a missing pulse/

8.6.2 Extra Pulse

After recording at 2f followed by d.c. erasing [see 10.2(3)], any playback signal the peak value of the average signal amplitude shall be an extra pulse.

- (1) Recording of one side at a flux density, any playback signal the peak value of which exceed 20% of 1/2 of the average signal amplitude.
- (2) Recording a both sides at a flux density, any playback signal the peak value of which exceed 20% of 1/2 of the average signal amplitude.

8.6.3 Requirements of Tracks

All the tracks by using 2f, shall satisfy the following requirements :

- (1) There shall be neither missing pulse nor extra pulse on track 00.
- (2) As a rule, there shall be neither missing pulse nor extra pulse on all the tracks except track 00.

9. Endurance and Resistance to Climate

9.1 Endurance

The endurance shall be tested in accordance with the method of Appendix 4. The ratio of the average signal amplitude after test to the average signal amplitude before test shall be not less than 0.7 at continuance endurance test, not less than 0.6 at tap endurance test.

9.2 Resistance to Climate

The resistance to climate shall be tested in accordance with the method of appendix 5. on each item specified in 8., and the respective criteria shall be satisfied. Further, number of missing pulses or extra pulses shall not increase due to this test.

10. Testing Conditions

10.1 General Testing Conditions

The general testing conditions shall be as follows : only, the measurements of temperature and relative humidity shall be made around value of flexible disk.

Temperature	: $23 \pm 2^{\circ}\text{C}$
Relative humidity	: 40 to 60%
Conditioning before testing	: 24h minimum

10.2 Electric and Magnetic Testing Conditions

The electric and magnetic testing conditions shall be as follows :

(1) Magnetic Flux Transition Frequency

It shall be as follows :

1f = 250000 ± 250 magnetic flux transitions/s

2f = 500000 ± 500 magnetic flux transitions/s

(2) Test Recording Current

The test recording current shall be used 1f on track 00 at track 00 to 43 and 1f on track 76 at track 44 to 76. The test recording current shall be a recording current equal to 145 to 155% of the test recording current.

(3) Erasing D.C

if it is not special specification, D.C. shall be erased almost equal to designated recording current before the recording.