

**SLOVENSKI STANDARD**  
**SIST EN 25652:1997****01-december-1997**

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**Information processing - 9-track, 12.7 mm (0.5) wide magnetic tape for information interchange - Format and recording, using group coding at 246 cpmm (6250 cpi) (ISO 5652:1984)**

Information processing - 9-track, 12.7 mm (0.5) wide magnetic tape for information interchange - Format and recording, using group coding at 246 cpmm (6250 cpi) (ISO 5652:1984, ed. 2)

Informationsverarbeitung - 9-Spur-Magnetband 12,7 mm (0,5 in) für den Informationsaustausch - Format und Aufzeichnung in GOR-Verfahren mit 246 Zeichen/mm (6250 Zeichen/in) (ISO 5652:1984, Ausg. 2)

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Traitement de l'information - Bande magnétique à 9 pistes de 12,7 mm (0,5 in) de large pour l'échange d'information - Format et enregistrement utilisant des codages de groupe à 246 cpmm (6250 cpi) (ISO 5652:1984, éd. 2)

**Ta slovenski standard je istoveten z: EN 25652:1991**

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**ICS:**

35.220.22      Magnetni trakovi      Magnetic tapes

**SIST EN 25652:1997****en**

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EUROPEAN STANDARD

EN 25652:1991

NORME EUROPEENNE



REPUBLIKA SLOVENIJA  
 MINISTRSTVO ZA ZNANOST IN TEHNOLOGIJO  
 Urad RS za standardizacijo in meroslovje  
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December 1991

UDC 681.3.04:681.327.64

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 PREVZET PO METODI RAZGLASITVE

-12- 1997

Descriptors : Data processing, information interchange, magnetic recording, magnetic tapes, recording tracks, recording characteristics, track formats, codification

## English version

Information processing - 9-Track, 12.7 mm (0.5) wide magnetic tape for information interchange - Format and recording, using group coding at 246 cpmm (6 250 cpi) (ISO 5652: 1984 - edition 2)

Traitement de l'information - Bande magnétique à 9 pistes de 12,7 mm (0,5 in) de large pour l'échange d'information - Format et enregistrement utilisant des codages de group à 246 cpmm (6 250 cpi) (ISO 5652: 1984 édition 2)

Informationsverarbeitung - 9-Spur-Magnetband 12,7 mm (0,5 in) für den Informationsaustausch - Format und Aufzeichnung in GCR-Verfahren mit 246 Zeichen/mm (6250 Zeichen/in) (ISO 5652: 1984 - 2. Ausgabe)

This European Standard was approved by CEN on 1991-12-28 and is identical to the ISO standard as referred to. CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

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CEN

European Committee for Standardization  
 Comité Européen de Normalisation  
 Europäisches Komitee für Normung

Central Secretariat: rue de Stassart 36, B-1050 Brussels

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### FOREWORD

The Technical Board has decided to submit the International Standard ISO 5652:1984, edition 2 "Information processing - 9-track, 12,7 mm (0.5 in) wide magnetic tape for information interchange - Format and recording, using group coding at 246 cpmm (6 250 cpi)

for Formal Vote. The standard has been accepted.

For the time being, this document exists only in the English and French version.

According to the CEN/CENELEC Common Rules, the following countries are bound to implement this standard:

Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxemburg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

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**ENDORSEMENT NOTICE**

The text of the International Standard ISO 5652:1984, edition 2 was approved by CEN as a European Standard without any modification.



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# International Standard 5652

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## Information processing — 9-Track, 12,7 mm (0.5 in) wide magnetic tape for information interchange — Format and recording, using group coding at 246 cpm (6 250 cpi)

*Traitement de l'information — Bande magnétique à 9 pistes de 12,7 mm (0,5 in) de large pour l'échange d'information — Format et enregistrement utilisant des codages de groupe à 246 cpm (6 250 cpi)*

Second edition — 1984-12-01

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UDC 681.3.04 : 681.327.64

Ref. No. ISO 5652-1984 (E)

**Descriptors** : data processing, information interchange, magnetic tapes, 9-tracks, definitions, operating requirements, magnetic recording, data representation, block format, transportation.

## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 5652 was prepared by Technical Committee ISO/TC 97, *Information processing systems*.

ISO 5652 was first published in 1983. This second edition cancels and replaces the first edition, of which sub-clause B.3.2 of annex B has been technically revised.

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# Information processing — 9-Track, 12,7 mm (0.5 in) wide magnetic tape for information interchange — Format and recording, using group coding at 246 cpmm (6 250 cpi)

## 1 Scope and field of application

This International Standard specifies a format and recording standard for 9-track, 12,7 mm (0.5 in) magnetic tape to be used for data interchange between information processing systems, communication systems, and associated equipment utilizing the 7-bit coded character set (see ISO 646), its extension in ISO 2022 where required, and the 8-bit coded character set (see ISO 4873). Magnetic labelling for use on magnetic tape is the subject of ISO 1001. The magnetic tape and reel to be used shall conform to ISO 1864.

NOTE — Numeric values in the SI and/or Imperial measurement system in this International Standard may have been rounded and therefore are consistent with, but not exactly equal to, each other. Either system may be used, but the two should be neither intermixed nor reconverted. The original design was made using the Imperial measurement system.

## 2 References

ISO 646, *Information processing — ISO 7-bit coded character set for information interchange.*

ISO 1001, *Information processing — Magnetic tape labelling and file structure for information interchange.*

ISO 1864, *Information processing — Unrecorded 12,7 mm (0.5 in) wide magnetic tape for information interchange — 32 ftpmm (800 ftpi) NRZ1, 126 ftpmm (3 200 ftpi) phase encoded and 356 ftpmm (9 042 ftpi), NRZ1.*

ISO 2022, *Information processing — ISO 7-bit and 8-bit coded character sets — Coded extension techniques.*<sup>1)</sup>

ISO 4873, *Information processing — 8-bit code for information interchange — Structure and rules for implementation.*<sup>2)</sup>

## 3 Definitions

For the purpose of this International Standard, the following definitions apply.

**3.1 magnetic tape** : A tape which will accept and retain magnetic signals intended for input, output and storage purposes on computers and associated equipment.

**3.2 reference tape** : A tape which has been selected for given properties for use in calibration.

**3.3 secondary reference tape** : A tape intended for routine calibrating purposes whose performance is known and is stated in relation to that of a reference tape.

**3.4 signal amplitude reference tape** : A reference tape selected as a standard for signal amplitude.

NOTE — A master standard (computer amplitude reference) has been established at the US National Bureau of Standards (NBS) based on reference tapes and heads. Secondary signal amplitude reference tapes are available from the NBS<sup>3)</sup> under the part number SRM 6250.

**3.5 typical field** : The minimum recording field which, when applied to a magnetic tape, causes a signal output equal to 95 % of the maximum signal amplitude at the specified physical recording density.

**3.6 reference field** : The typical field of the signal amplitude reference tape at 356 ftpmm (9 042 ftpi).

1) At present at the stage of draft. (Revision of ISO 2022-1982.)

2) At present at the stage of draft. (Revision of ISO 4873-1979.)

3) Office of Standard Reference Materials, Room B 311, Chemistry Building, National Bureau of Standards (NBS), Washington, D.C. 20234, USA.

## ISO 5652-1984 (E)

**3.7 standard reference amplitude** : The average peak-to-peak signal amplitude derived from the signal amplitude reference tape on the NBS measurement system, or equivalent, under the recording conditions specified in ISO 1864.

**3.8 reference edge** : The edge furthest from an observer when a tape is lying flat with the magnetic surface uppermost and the direction of movement for recording is from left to right.

**3.9 in contact** : An operation condition in which the magnetic surface of a tape is in contact with a magnetic head.

**3.10 track** : A longitudinal area on a tape along which a series of magnetic signals may be recorded.

**3.11 row** : Nine transversely related locations (one in each track) in which bits are recorded.

**3.12 position of flux transition** : The point which exhibits the maximum free-space flux density normal to the tape surface.

**3.13 physical recording density** : The number of recorded flux transitions per unit length of track (ftpm or ftpi).

**3.14 data density** : The number of data characters stored per unit length of tape (cpmm or cpi).

**3.15 skew** : The maximum longitudinal deviation in the placement of bits within a row.

**3.16 ECC character** : A character used for error detection and correction within a data group.

**3.17 auxiliary CRC character** : A character used for error detection within the data part of a block.

**3.18 CRC character** : A character used for error detection within a complete block.

**3.19 preamble** : A pattern of signals marking the beginning of each storage block, used primarily for electronic synchronization.

**3.20 postamble** : A pattern of signals marking the end of each storage block.

**3.21 density identification area (ID burst)** : A burst of recording at the beginning of a tape identifying the use of the group-coded-recording method.

**3.22 Automatic Read Amplification (ARA) burst** : A burst of recording at the beginning of a tape which may be used for setting the gain of the read amplifiers.

**3.23 error** : The detection of a missing pulse or an extra pulse in a track. Missing pulse and extra pulse are as defined in ISO 1864 sub-clauses 5.16.1 c) and 5.16.2 respectively.

## 4 Operating and transportation conditions

### 4.1 Operating environment

Tapes used for data interchange shall be operated under the following conditions :

- temperature : 16 to 32 °C (60 to 90 °F);
- relative humidity: 20 to 80 %;
- wet bulb temperature : not greater than 26 °C (78 °F).

Conditioning before operating : If a tape has been exposed during storage and/or transportation to conditions outside the above values, it should be conditioned for a period of 2 to 12 h, depending on the extent of exposure.

### 4.2 Transportation

Responsibility for ensuring that adequate precautions against damage are taken during shipment shall lie with the sender (see annex A).

### 4.3 Wind tension

For interchange, the tape winding tension shall be between 2 N and 3,6 N (7 to 13 ozf).

## 5 Recording

### 5.1 Method of recording

The "non return to zero mark" (NRZ1) method of recording shall be used where a ONE is represented by a change of direction of longitudinal magnetization.

### 5.2 Density of recording

The nominal density shall be 356 ftpmm (9 042 ftpi). Other nominal densities used hereafter for specific measurements shall be

178 ftpmm (4 521 ftpi)

119 ftpmm (3 014 ftpi).

### 5.3 Average flux transition spacings

The following measurements shall be made after interchange using a tape recorded at a density of 178 ftpmm (4 521 ftpi). The nominal flux transition spacing at this density shall be 5,618  $\mu\text{m}$  (221.2  $\mu\text{in}$ ) subject to the following variations.

**5.3.1** The long term average (static) flux transition spacing shall be within  $\pm 4\%$  of the nominal spacing. This average shall be measured over a minimum of  $5 \times 10^5$  successive flux transitions.

**5.3.2** The short term average (dynamic) flux transition spacing, when referred to a particular flux transition spacing, is the average of that flux transition spacing and the preceding flux transition spacing.

The short term average flux transition spacing shall be within the limits of  $\pm 6\%$  of the long term average flux transition spacing.

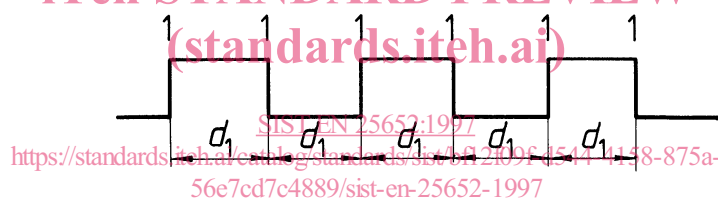
In addition, the rate of change of the short term average flux transition spacing shall not exceed 0,2 % per flux transition spacing.

### 5.4 Instantaneous flux transition spacings

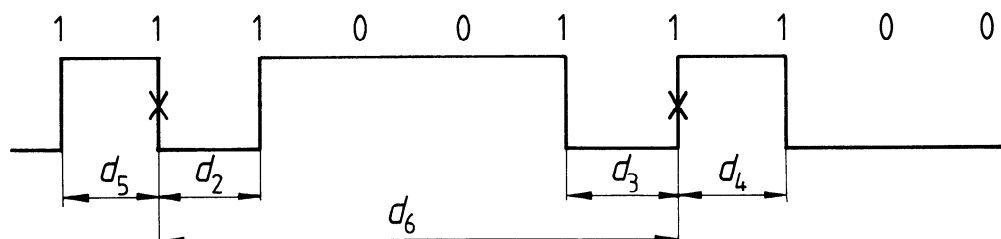
The instantaneous spacing between flux transitions may be influenced by the reading and writing processes, the pattern recorded (pulse crowding effects) and other factors.

Instantaneous spacings between flux transitions shall meet the following conditions, when tested on the reference read chain (see annex B).

**5.4.1** At the nominal maximum density of 356 ftpmm (9 042 ftpi) the spacing  $d_1$  between successive flux transitions shall be between 48 % and 52 % of the corresponding short term average flux transition spacing determined at 178 ftpmm (4 521 ftpi).



**5.4.2** In a sequence of flux transitions defined by the bit pattern 1110011100..., the average displacement of the spacing of the flux transitions on either side of a reference transition, from that reference transition, shall be not more than  $\pm 28\%$  from the average spacing of flux transitions at 356 ftpmm (9 042 ftpi).



Crosses denote reference transitions.

$$1,28 d_1 > \text{average } d_5 > 0,72 d_1$$

$$1,28 d_1 > \text{average } d_2 > 0,72 d_1$$

$$1,28 d_1 > \text{average } d_3 > 0,72 d_1$$

$$1,28 d_1 > \text{average } d_4 > 0,72 d_1$$

The tolerances of long term average spacing and short term average spacing (see 5.3.1 and 5.3.2) are included in this deviation.

The average distance  $d_6$  between actual consecutive reference flux transitions in a sequence defined by the bit pattern 1110011100... and the calculated distance  $5d_1$ , of six flux transitions at nominal maximum density of 356 ftpmm (9 042 ftpi) shall not differ by more than 6 % of  $d_1$ .

$$5,06 d_1 > \text{average } d_6 > 4,94 d_1$$