

ISO

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

ISO RECOMMENDATION R 1729

INFORMATION PROCESSING

PROPERTIES OF UNPUNCHED PAPER TAPE

1st EDITION

March 1971

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Printed in Switzerland

Also issued in French and Russian. Copies to be obtained through the national standards organizations.

BRIEF HISTORY

The ISO Recommendation R 1729, *Information processing – Properties of unpunched paper tape*, was drawn up by Technical Committee ISO/TC 97, *Computers and information processing*, the Secretariat of which is held by the American National Standards Institute (ANSI).

Work on this question led to the adoption of Draft ISO Recommendation No. 1729, which was circulated to all the ISO Member Bodies for enquiry in March 1969. It was approved, subject to a few modifications of an editorial nature, by the following Member Bodies :

Belgium	Iran	Switzerland
Brazil	Italy	Thailand
Canada	Japan	Turkey
Czechoslovakia	New Zealand	U.A.R.
France	Romania	United Kingdom
Germany	Spain	U.S.A.
Greece	Sweden	

No Member Body opposed the approval of the Draft.

This Draft ISO Recommendation was then submitted by correspondence to the ISO Council, which decided to accept it as an ISO RECOMMENDATION.

INFORMATION PROCESSING

PROPERTIES OF UNPUNCHED PAPER TAPE

1. SCOPE

This ISO Recommendation specifies the physical properties of paper tape to be used for data interchange, when the tape is in the unpunched condition.

2. TEST CONDITIONS AND METHODS OF TEST

2.1 Sampling

Sampling shall be carried out in accordance with the procedures described in Annex A unless otherwise agreed between customer and supplier.

NOTE. — It is important to recognize that the majority of the physical properties will be tested by the paper maker and the paper tape coil converter. Since the quantity of paper involved is usually quite large it is necessary to adopt a balanced sampling procedure and often to report the result in terms of a mean value and a permissible deviation.

2.2 Test conditions

The test conditions for measurement shall be the following :

Relative humidity (R.H.) $50 \pm 2 \%$

Temperature $23 \pm 2 \text{ }^{\circ}\text{C}$ ($73 \pm 3.5 \text{ }^{\circ}\text{F}$)

2.3 Conditioning of test samples

Samples shall be conditioned prior to test in accordance with the procedures described in Annex B.

2.4 Methods of test

Tests shall be carried out in accordance with the methods standardized by Technical Committee ISO/TC 6, *Paper, board and pulps*. Until the appropriate ISO Recommendations are published, the test methods specified in Annexes C to L shall apply.

3. DIMENSIONS

3.1 Width

The width of the unpunched tape shall be :

	mm	in
Nominal width	25.40	1.000
Tolerance :		
95 % of samples	± 0.05	± 0.002
100 % of samples	± 0.08	± 0.003

3.2 Thickness

The thickness of the unpunched tape shall be :

	mm	in
Nominal thickness	0.100	0.0040
Tolerance :		
95 % of samples	± 0.008	± 0.0003
100 % of samples	± 0.010	± 0.0004

4. CHEMICAL PROPERTIES OF PAPER TAPE

4.1 Hydrogen ion concentration

pH = 6 ± 1.5 .

NOTE. — It is desirable that the pH value of the paper be as high as possible within these limits.

4.2 Ash content

maximum 1 %.

4.3 Grit content

maximum 0.04 %.

4.4 Lubricating additives

In order to ensure the minimum wear of the punch elements, the tape may have lubricating additives. The percentage of lubricating additives will depend largely on the type(s) of lubricant(s) used. It is important that the lubricant should not adversely affect the properties of the paper tape as defined elsewhere in this ISO Recommendation.

NOTE. — It has been observed that silicone oils can cause paper tape to have corrosive properties.

4.5 Composition and quality

The paper shall be free from mechanical (ground wood) pulp, holes, slime spots, shives, unbeaten fibres, fluff, dust, grit and abrasive particles. In addition it is important that the lignin content be kept to a minimum and that the tapes be free from translucent spots and any other defects which would interfere with reading or punching.

5. PHYSICAL PROPERTIES OF PAPER TAPE

5.1 Basic weight

76 to 94 g/m² (0.25 to 0.31 oz/ft²). This refers only to uncoiled paper tape.

5.2 Strength

5.2.1 *Static tensile strength* shall be measured in the machine direction. The mean value shall be not less than 177 N (18.1 kgf) per 25.4 mm of width (40 lbf per inch of width). In addition the arithmetic mean of the results less twice the standard deviation shall be not less than 156 N (15.9 kgf) per 25.4 mm of width (35 lbf per inch of width).

5.2.2 *Internal tear resistance* in both the machine direction and the cross direction shall be not less than 0.56 N (55 gf).

5.3 Dimensional stability

5.3.1 The maximum variation of the dimension in the cross direction when the relative humidity is varied from 20 % to 75 % and also when it is varied from 75 % to 20 % shall not exceed 1 % of the length measured at 50 % R.H.

5.3.2 Under the same changes of relative humidity the maximum variation of the dimension in the machine direction shall not exceed 0.5 % of the length measured at 50 % R.H.

5.4 Percentage of light transmission

The maximum value of light transmission shall not exceed 50 %. The method of measurement is described in Annex M.

5.5 Electrical properties

Bulk conductivity. For the purpose of sensing, the paper shall act substantially as an insulator when placed between two low-voltage sensing contacts.

5.6 Printability

The surface of the oiled tape shall legibly accept and retain interpretive printing, handwriting by means of ordinary pen nib or ball point pens using commercial quality inks, lead or coloured pencils, and rubber stamping. The legibility of both manuscript and print shall not be adversely affected by either the type of material or the finish.

5.7 Colour

The paper tape may be of any colour, provided that all the specifications of this ISO Recommendation are satisfied.

5.8 Pre-printing

Tapes may be pre-printed if required provided that each tape after printing meets all the requirements of this ISO Recommendation.

5.9 Quality

The paper shall be free of slime spots, pin holes, translucent spots, holes, tears, wrinkles and creases. The paper shall also be as free of lint, fuzz and dust as the best manufacturing practices permit.

6. COILING OF UNPUNCHED TAPE

6.1 Inner diameter

The inner diameter of the core shall be :

	mm	in
Nominal	50.8	2.000
Tolerance	+1.6 0	+0.063 0

6.2 Outer diameter

The outer diameter of a coil of unpunched tape shall be :

	mm	in
Nominal	203	8.00
Tolerance	0 - 3	0 - 0.12

6.3 End of paper tape marker

6.3.1 Each coil of tape shall be marked with a pink or red warning mark (but a contrasting colour on pink or red tapes).

6.3.2 The length of this mark shall be about 6 m (20 ft) and there shall be an unmarked length of about 3 m (10 ft) from the inner end of the coil.

6.3.3 The colouring matter of the marker shall be non-adhesive, non-abrasive and non-poisonous.

6.4 If the tape is fastened to the core, it shall not require a tension of more than 4 N (400 gf or 14 ozf) to pull it off the core.

6.5 The face of the coils shall be as clean and smooth, free from dust and undamaged as the best manufacturing process will permit. The coils shall unwind freely without sticking.

6.6 Tightness of coiling

Each coil shall be wound evenly and sufficiently tightly on the core that it does not telescope with normal handling.