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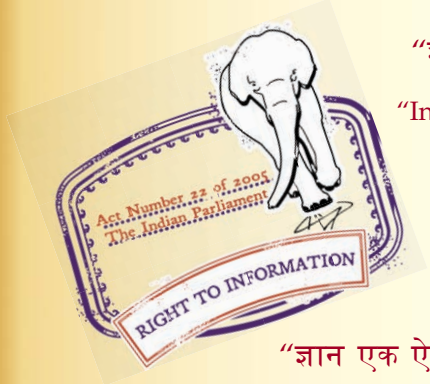
IS 13262 (1992): Pressure sensitive adhesive tapes with plastic base [PCD 12: Plastics]



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Bhartṛhari—Nītiśatakam
"Knowledge is such a treasure which cannot be stolen"

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IS 13262 : 1992
(Superseding IS 2880 : 1986
and IS 3676 : 1986)
(Reaffirmed 2003)

भारतीय मानक

प्लास्टिक आधार वाले दाब संवेदी आसंजक टेप — विशिष्टि

Indian Standard

PRESSURE SENSITIVE ADHESIVE TAPES WITH PLASTIC BASE SPECIFICATION

UDC 621·798·264

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

January 1992

Price Group 2

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Adhesives Sectional Committee had been approved by the Petroleum, Coal and Related Products Division Council.

Pressure sensitive adhesive tapes are manufactured in large quantities in India. These tapes need only a little pressure to cause them to adhere to any clean dry surface. Their main applications are for sealing packages, for bundling together various light and medium mass articles, for mending torn documents, for identification of parts in assemble kits, for carrying advertising messages when printed and in a number of other industrial applications.

Different types of tapes based on cellulose, regenerated cellulose, PVC, unplasticized PVC, polyester, polyethylene, polypropylene, cotton, viscose and paper are available for different applications. Tapes with other film bases, like aluminium foil or glass fibre reinforced plastics are yet not very common in India.

It has been decided to have following four broad groups of pressure sensitive tapes:

a) Tapes with woven cloth base, namely, cotton or viscose; presently covered by IS 3687 : 1987 Specification for pressure sensitive adhesive cloth tapes.
b) Tapes with paper base, presently covered by IS 4185 : 1989 Specification for adhesive paper tapes.
c) Tapes with plastic base, namely, PVC, polyester, polyethylene, polypropylene and cellulose. This standard covers this category of pressure sensitive adhesive tapes and hence is superseding IS 2880 : 1986 Specification for pressure sensitive adhesive cellulose tapes and IS 3676 : 1986 Specification for pressure sensitive adhesive PVC tapes.
d) Tapes with other film bases, like aluminium foils, glass fibre reinforced plastics, etc, would be covered in the near future when their use in our country is substantial.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

PRESSURE SENSITIVE ADHESIVE TAPES WITH PLASTIC BASE — SPECIFICATION

1 SCOPE

This standard specifies requirements and methods of sampling and tests for pressure sensitive adhesive cellulose, plasticized PVC, unplasticized PVC, polyester, polyethylene, polypropylene tapes for closing and sealing inner and outer containers normally used in packages.

2 REFERENCES

The following Indian Standards are necessary adjuncts to this standard:

IS No.	*Title*
265 : 1987	Hydrochloric acid (*third revision*)
1070 : 1970	Water for general laboratory use (*second revision*)
1839 : 1961	Toluene, reagent grade
2316 : 1968	Method of preparation of standard solutions for colorimetric and volumetric analysis (*first revision*)
3073 : 1967	Assessment of surface roughness
3434 : 1984	Glossary of terms for adhesive and pressure sensitive adhesive tapes (*first revision*)
6911 : 1972	Stainless steel plate sheet and strip
8402 : 1987	Methods of sampling and test for pressure sensitive adhesive tapes (*first revision*)

3 TERMINOLOGY

For the purpose of this standard, the definitions given in IS 3434 : 1984 shall apply.

4 TYPES

Various types of tapes covered in this standard are classified in Table 1.

5 REQUIREMENTS

5.1 Description

5.1.1 The pressure sensitive adhesive tape shall consist of a base film, coated uniformly on one side with a suitable pressure sensitive adhesive composition, requiring no moisture, heat or other special preparation prior to application.

5.1.2 The rolls shall be wound uniformly and evenly on cores so that each succeeding turn coincides with the one below it.

Table 1 Requirements for Pressure Sensitive Adhesive Tapes

(*Clause* 4)

Sl No.	Typical Base Material	Minimum Tensile Strength N per 10 mm Width	Minimum Elongation Percent	Minimum Adhesion to Metal and Self N per 10 mm Width
i)	Cellulose	25	—	2·0
ii)	Plasticized PVC	13	100	1·8
iii)	Unplasticized PVC	25	15	2·0
iv)	Polyester	25	50	2·0
v)	Polyethylene	10	100	1·4
vi)	Polypropylene	25	10	2·0
vii)	Heavy duty polypropylene	95	10	1·9

5.1.3 Each roll of tape shall be reasonably free from overlapping, depressions, distortions or telescoping and shall unroll without off-setting of the adhesive mass or tearing of the base. When unrolled the tape should not show transference of the adhesive to the backing of the underlying turn.

5.2 Colour

If required by the purchaser, the tape shall be coloured and shall match the colour as specified.

5.3 Printing

If required by the purchaser, the printing of the tape on the outer side shall be done as specified. In that case, the printing shall be legible and shall not transfer to the adhesive side of the adjacent turn.

5.4 Cores

All tapes shall be normally wound on cores of internal diameters 75·0 ± 1·5 mm, 50·0 ± 0·5 mm or otherwise as agreed to between the purchaser and the supplier and shall have sufficient rigidity to prevent the distortion of the roll under normal conditions of transportation and use.

5.5 Width

The width of the tape shall be as agreed to between the purchaser and the supplier and none of the five observations for width measured shall fall outside the tolerance given below. The width shall be determined by taking five determinations at random in a length of not less than one metre of tape from each sample roll:

Nominal Width (mm)	*Tolerance* (mm)
Up to 25	± 1·0
Over 25	± 1·5

5.6 Length

The length of the rod shall be as agreed to between the purchaser and the supplier and shall not vary by more than one percent from the specified length, when determined by unrolling the roll in a suitable winding machine fitted with a length meter capable of measuring to 0·1 metre.

5.7 Splices

A roll of tape shall not have more than one splice in 20 m and not more than 3 in a roll. The splices shall be so made so as not to separate when unwound from the roll.

5.8 Tensile Strength

When tested as prescribed in **6** of IS 8402 : 1987, the minimum tensile strength of the tape shall be as given in Table 1.

5.9 Elongation at Break

The elongation at break when determined as prescribed in **6** of IS 8402 : 1987 shall not be less than that prescribed in Table 1.

5.10 Adhesion to Metal and Self

The adhesion strength of the tape when tested as prescribed in **5** and **13** of IS 8402 : 1987 shall not be less than that prescribed in Table 1.

5.11 Anchorage

The adhesive mass shall not come off from the plastic film, when tested as prescribed in **7** of IS 8402 : 1987.

5.12 Durability

The tape shall pass the test as prescribed in **12** of IS 8402 : 1987.

5.13 Stability

The tape shall part neatly from the underlayer and shall show no evidence of deterioration in the adhesive or backing so as to make the tape unfit for use when aged as prescribed in **14** of IS 8402 : 1987. The adhesion to metal and self shall not decrease by more than 12 percent when determined by the method prescribed in **5** and **13** of IS 8402 : 1987 respectively.

5.14 Additional Requirements for Tapes for Aeronautical Purposes

When the tapes are required for aeronautical purposes they shall also comply with the requirements given in **5.14.1** and **5.14.2**.

5.14.1 *Freedom from Deleterious Effect on Plastic Sheet*

When tested in accordance with the method given in **8** of IS 8402 : 1987, there shall be no signs of crazing or other deleterious action on the plastics strip and the strip shall be substantially free from transferred adhesive.

5.14.2 *Resistance to Penetration by Paint Solvents*

When tested in accordance with the method given in **9** of IS 8402 : 1987 there shall be no signs of crazing or other deleterious action on the plastic strips and the tape shall strip from it without transfer of adhesive.

5.15 Optional Requirements for Tapes for Defence Applications

5.15.1 *p*H

The tape shall have a *p*H of 5·5 to 8, when tested as prescribed in Annex A.

5.15.2 *Chlorides*

The chloride content of the tape calculated as sodium chloride (NaCl) shall not exceed 0·05 percent, when tested according to the method prescribed in Annex B.

5.15.3 *Sulphates*

The sulphate content of the material calculated as anhydrous sodium sulphate (Na_2SO_4) shall not exceed 0·25 percent, when tested according to the method prescribed in Annex C.

6 KEEPING QUALITY

The rolls when stored on their cut edges in original unopened containers at 27 ± 2°C and 65 ± 5 percent relative humidity shall continue to comply with the requirements prescribed in **5** for a minimum period of one year from the date of manufacture.

7 PACKING AND MARKING

7.1 Packing

The rolls shall be packed in suitable containers so that they are adequately protected from damage in transportation and from deterioration due to climatic conditions and shall not adhere to each other or to the container.

7.2 Marking

Each container shall be marked legibly with the following information:

a) Name and type of the material;
b) Indication of source of manufacture;
c) Month and year of manufacture;
d) Length and width of the tape;
e) Batch number of manufacture; and
f) Directions for storage and use, if necessary.

7.2.1 Each roll may also be marked with the Standard Mark.

8 SAMPLING AND CRITERIA FOR CONFORMITY

8.1 The scale of sampling shall be as prescribed in 3 of IS 8402 : 1987.

8.2 Number of Tests

Tests for the determination of all the requirements of the specification given in 5 shall be performed on each of the individual sample rolls separately.

8.3 Criteria for Conformity

The lot shall be declared as conforming to the requirements of the specification if the different test results as obtained in **8.2** meet the corresponding requirements given in the standard.

ANNEX A
(*Clause* 5.15.1)

DETERMINATION OF *p*H

A-0 OUTLINE OF THE METHOD

*p*H of the water extract is determined by any suitable method.

A-1 PROCEDURE

Add ten grams of tape, cut into small pieces, to 400 ml of boiling water. Stir well and allow it to stand for 18 hours while taking precautions against contamination with atmospheric impurities. Stir the material again and allow it to stand for one hour. Decant off 200 ml of the solution into a 250-ml beaker. Filter if necessary and discard the first 25 ml of the filtrate. Determine the *p*H of the water extract by any suitable method, as agreed to between the buyer and the seller.

ANNEX B
(*Clause* 5.15.2)

DETERMINATION OF CHLORIDES AND SULPHATES

B-1 PREPARATION OF WATER EXTRACT

Take about 10 g of the tape and cut into small pieces. Weigh accurately and add 400 ml of boiling distilled water to it. Allow it to cool with occasional stirring and keep it undisturbed for overnight. Filter the water extract and make the volume to 500 ml with distilled water.

B-2 DETERMINATION OF CHLORIDES

B-2.0 Outline of the Method

Chloride content is determined by titrating the water extract with standard silver nitrate solution using potassium chromate as an indicator.

B-2.1 Reagents

B-2.1.1 *Standard Silver Nitrate Solution,* 0·01 N (*see* **53** of IS 2316 : 1968).

B-2.1.2 *Potassium Chromate Indicator,* Dissolve 5 g of potassium chromate in 100 ml of water.

B-2.2 Procedure

Take 50 ml of water extract in a 250-ml flask. Dilute to 100 ml and add 1 ml of potassium chromate indicator. Titrate slowly with standard silver nitrate solution, swirling the liquid constantly, until a faint blood-red tinge is produced.

B-2.3 Calculation

$$\text{Chlorides (as NaCl), percent by mass} = \frac{5{\cdot}846 \times N \times V}{M}$$

where

N = normality of standard silver nitrate solution,

V = volume in ml of standard silver nitrate solution used in the titration, and

M = mass in g of the material taken for the test.

ANNEX C
(*Clause* 5.15.3)

C-3 DETERMINATION OF SULPHATES

C-3.0 Outline of the Method

Sulphate content is determined gravimetrically by adding barium chloride to the water extract and igniting the precipitate of barium sulphate.

C-3.1 Reagents

C-3.1.1 *Concentrated Hydrochloric Acid,* Conforming to IS 265 : 1987.

C-3.1.2 *Barium Chloride Solution,* 10 percent.

C-3.2 Procedure

Take 100 ml of the water extract (**B-1**) and make it acidic with concentrated hydrochloric acid adding 4 ml of the acid in excess. Dilute in a breaker to about 200 ml with water and heat to boiling. Remove the solution from the source of heat and add barium chloride solution in a fine stream. Add the reagent in slight excess [10 ml will precipitate about 0·6 g of sulphates (as Na_2SO_4)]. Place the beaker on a steam-bath and allow the precipitate to settle for about 4 hours. Filter the precipitate through a weighed Gooch crucible. Wash the precipitate with hot water until it is free from chloride ions. Dry and ignite over a burner or in a muffle furnace for half an hour. Cool in a desiccator and weigh.

C-3.3 Calculation

Sulphates (as Na_2SO_4),

$$\text{percent by mass} = \frac{304{\cdot}3\ M_1}{M_2}$$

where

M_1 = mass in g of the precipitate, and

M_2 = mass in g of the material taken for test.

Standard Mark

The use of the Standard Mark is governed by the provisions of the *Bureau of the Indian Standards, Act, 1986* and the Rules and Regulations made thereunder. The Standard Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well defined system of inspection, testing and quality control which is devised and supervised by BIS and operated by the producer. Standard marked products are also continuously checked by BIS for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

Bureau of Indian Standards

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TO
IS 13262 : 1992 PRESSURE SENSITIVE ADHESIVE TAPES WITH PLASTIC BASE — SPECIFICATION

(*Page* 2, *clause* **5.6**) — Substitute the following for the existing:

'The length of the roll shall normally be 10, 25, 50 or 100 metres unless a specific length has been agreed to between the purchaser and the supplier and shall not vary by more than one percent from the specified length, when determined by unrolling the roll in a suitable winding machine fitted with a length meter capable of measuring to 0.1 metre'.

(PCD 12)

Reprography Unit, BIS, New Delhi, India