IS 9738 (2003): Polyethylene Bags for General Purposes [PCD 21: Plastics Containers]

BLANK PAGE

भारतीय मानक

सामान्य प्रयोजन के लिए पौलीइथाईलीन के थैले—विशिष्टि

(दूसरा पुनरीक्षण)

Indian Standard

POLYETHYLENE BAGS FOR GENERAL PURPOSES — SPECIFICATION

(Second Revision)

ICS 55.080;83.080.20

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

December 2003

Price Group 4

FOREWORD

This Indian Standard (Second Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Plastics Containers Sectional Committee had been approved by the Petroleum, Coal and Related Products Division Council.

The polyethylene bags are most commonly used retail packs for general consumer goods, like coarse grains, pulses, household goods and dry chemicals in powder or in granular form.

Critical requirements like compatibility of the material of the bag with the product packed and the shelf-life studies of the product when packed in such bags are not covered by this standard. However, these two aspects require to be established by the packer while selecting particular grade of polyethylene material for the product to be packed.

This standard was first published in 1981 and subsequently revised in 1990. In this revision, the following changes have been made:

a) Material clause has been modified to incorporate more polymeric materials;

b) More sizes of U-shaped bags have been included; and

c) New variety namely, bottom seal flat bag having gusset has been included.

Since the choice and size of a bag is not merely related to the mass of the contents going into it, an effort has been made to rationalize the sizes of these bags along with the nominal thickness of films as a guideline for the use of these bags. However, the user of these bags is required to make assessment of his requirements regarding nominal thickness and choice of the material before ordering for these bags in accordance with this standard.

The composition of the Committee responsible for formulation of this standard is given in Annex B.

In reporting the result of a test or analysis made in accordance with this standard, if the final value, observed or calculated, is to be rounded off, it shall be done 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
POLYETHYLENE BAGS FOR GENERAL PURPOSES — SPECIFICATION
(Second Revision)

1 SCOPE

This standard specifies the requirements and methods of sampling and test for polyethylene bags used for packing commercial items and used as carry-home bags for household items and open ended bags by nurseries.

2 REFERENCES

The following standards contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

IS No.	*Title*
2500 (Part 1) : 2000	Sampling inspection procedures: Part 1 Attribute sampling plans indexed by acceptable quality level (AQL) for lot-by-lot inspection (*third revision*)
2508 : 1984	Specification for low density polyethylene films (*second revision*)
7019 : 1998	Glossary of terms in plastics and flexible packaging, excluding paper (*second revision*)
10889 : 1984	High density polyethylene films
14500 : 1998	Linear low density polyethylene (LLDPE) films
14534 : 1998	Guidelines for recycling of plastics

3 TERMINOLOGY

For the purpose of this standard, the definitions given in IS 7019 shall apply.

4 DEFINITION AND CLASSIFICATION

4.1 Definition — Carry bag means polyethylene bags which have a self-carrying feature commonly known as vest type bag and / or D punched bags used to carry commodities. The bags shall be classified into two classes of flat bag and U-shaped bag according to structure and shape.

4.2 Classification — The bags shall be classified into two classes of flat bag and U-shaped bag according to structure and shape.

5 STRUCTURE AND SHAPE

The standard structure and shape of bags are given in Table 1, Fig. 1 and Fig. 2.

Table 1 Structure and Shape of Bags

(*Clause* 5)

Sl No.	Class	Structure	Shape
(1)	(2)	(3)	(4)
i)	Flat bag	Bottom seal, side seal bottom and centre seal, bottom seal and gusseted	Rectangular
ii)	U-shaped bag	Gusseted	U-Shape

6 MATERIAL

The materials used for the bags shall be polyethylene films of LDPE, LLDPE, HDPE, HMHDPE and blends thereof (*see* IS 2508, IS 10889 and IS 14500).

7 DIMENSIONS AND TOLERANCES

7.1 Recommended width (b), length (l) and nominal thickness (in μm), of bags used principally for commercial packaging, carry-home household bags and plantation nursery bags are given in Tables 2, 3, 4 and 5 respectively. These may be changed, depending upon the purchaser's requirement and shall be specified by him.

7.2 Tolerances of Dimensions

The tolerance on width dimensions shall be as given in Table 6 and the tolerance on length dimensions shall be ± 5 mm. The length and width dimensions of the bag shall be measured at the central part of the bag spread out flat. In case of gusset bag the width shall be measured under a state in which the gusset is spread. Further, the length of U-shaped bag is measured at an optional end part.

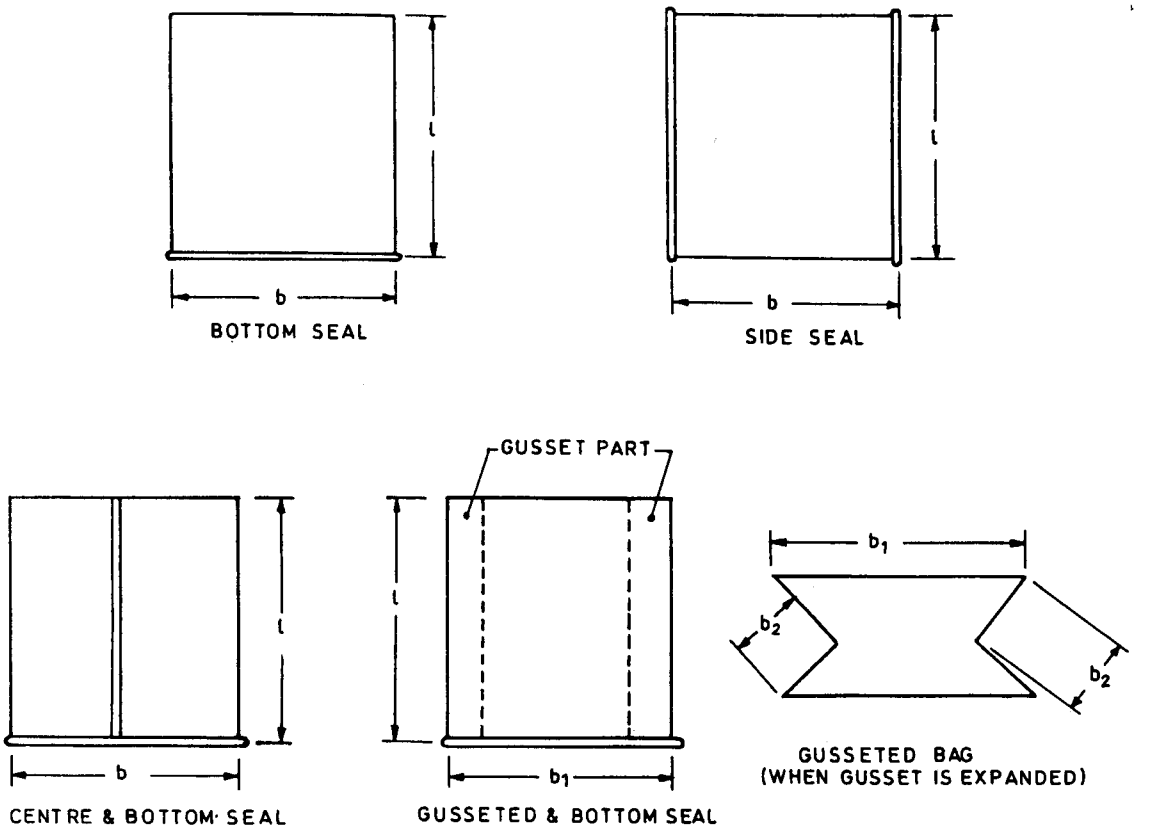

FIG. 1 FLAT TYPE BAGS

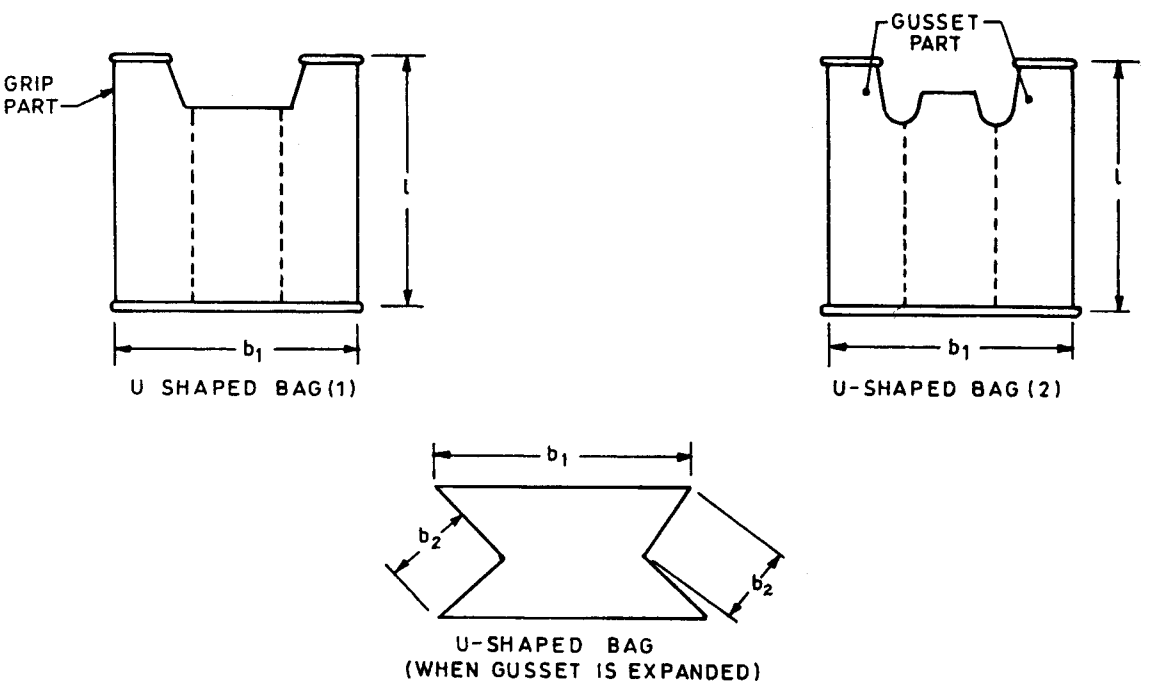

FIG. 2 U-SHAPED BAG GUSSETED TYPE

Table 2 Recommended Dimensions of Flat Bags

(*Clause* 7.1)

Sl No.	Size $b \times l$ mm	Nominal Thickness of Film, μm	
		LDPE/LLDPE/Blends	HMHDPE
(1)	(2)	(3)	(4)
i)	50 × 80	30	20
ii)	70 × 100	30	20
iii)	80 × 120	30	20
iv)	50 × 1 500	30	20
v)	90 × 170	30	20
vi)	100 × 190	30	20
vii)	100 × 210	30	20
viii)	120 × 230	30	20
ix)	130 × 250	40	25
x)	150 × 250	40	25
xi)	180 × 270	40	25
xii)	200 × 300	40	25
xiii)	230 × 340	40	25
xiv)	260 × 380	40	25
xv)	280 × 410	40	25
xvi)	300 × 450	40	25
xvii)	340 × 480	50	25
xviii)	360 × 500	50	25
xix)	380 × 530	50	25
xx)	400 × 550	50	25
xxi)	460 × 600	50	25

NOTE — The bag sizes given are principally used for commercial packing.

Table 3 Recommended Dimensions of Flat Bags

(*Clause* 7.1)

Sl No.	Size $b \times l$ mm	Nominal Thickness of Film, μm	
		LDPE/LLDPE/Blends	HMHDPE
(1)	(2)	(3)	(4)
i)	160 × 200	40	25
ii)	180 × 250	40	25
iii)	250 × 300	40	25
iv)	250 × 350	40	25
v)	300 × 300	40	25
vi)	300 × 400	40	25
vii)	320 × 300	40	25
viii)	320 × 320	40	25
ix)	320 × 380	40	25
x)	380 × 530	40	25
xi)	400 × 500	50	30
xii)	480 × 650	50	30
xiii)	490 × 490	50	30
xiv)	500 × 500	50	30
xv)	500 × 600	50	30
xvi)	500 × 700	50	30
xvii)	520 × 600	50	30
xviii)	560 × 700	50	30
xix)	650 × 700	50	30
xx)	650 × 750	50	30
xxi)	650 × 800	75	40
xxii)	650 × 850	75	40
xxiii)	700 × 700	75	40
xxiv)	750 × 800	75	40
xxv)	800 × 900	75	40
xxvi)	850 × 950	75	40
xxvii)	900 × 1 000	75	40
xxviii)	930 × 1 000	75	40
xxix)	1 000 × 1 050	75	40
xxx)	1 000 × 1 300	75	40

NOTE — The bag sizes given are principally used for carry-home household bags.

Table 4 Recommended Dimensions of U-Shaped Bags (Gusseted)

(*Clause* 7.1)

Sl No.	Size $b \times l$ mm	Nominal Thickness of Film, μm		Nominal Finish Width b mm
		LDPE/LLDPE/Blends	HMHDPE	
(1)	(2)	(3)	(4)	(5)
i)	250 × 350	40	25	150
ii)	300 × 400	40	25	180
iii)	350 × 450	50	30	220
iv)	400 × 500	50	30	260
v)	450 × 550	50	40	300
vi)	500 × 600	75	40	350
vii)	600 × 750	75	50	450
viii)	750 × 900	75	50	600

Table 5 Recommended Dimensions of Bottom Seal Flat Bags

(*Clause* 7.1)

Sl No.	Size $b \times l$ mm	Nominal Thickness of Film, μm	
		LDPE/LLDPE/Blends	HMHDPE
(1)	(2)	(3)	(4)
i)	120 × 250	30	25
ii)	150 × 250	37	30
iii)	200 × 300	50	37

NOTE — The bag sizes given are principally used as nursery bags.

Table 6 Tolerances of Width of Bags

(*Clause* 7.2)

Sl No.	Width b mm	Tolerance of Width b mm
(1)	(2)	(3)
i)	50 to 100	± 3
ii)	120 to 200	± 4
iii)	230 to 300	± 5
iv)	320 to 400	± 6
v)	450 to 560	± 8
vi)	650 to 800	± 12
vii)	850 to 1 000	± 15

7.3 Tolerance on Nominal Thickness

When tested in accordance with **A-2** of IS 2508, tolerance on nominal thickness at any given point and the average thickness of the film shall be as follows:

Sl No.	*Thickness,* μm	*Tolerance,* Percent
(1)	(2)	(3)
i)	Up to 50	± 20
ii)	> 50	± 15

8 REQUIREMENTS

8.1 Appearance

Bags shall be homogeneous and free from defects such as foam, unevenness, crease, fish eye, mixture of foreign matter, pinhole, etc. The shape of the bags shall be uniform and the finish of cut portions shall be of good workmanship.

8.1.1 For printed bags, the printing shall be uniform and free from printing defects.

8.2 Water Leak Test

Put water into a specimen bag to a height of about one-fifth of the length thereof and quietly keep it as it is for 1 min. Thereafter, confirm that no water drop falls from the bottom part of bag. In the event of a side seam bag, level of water shall be up to 50 percent height and there shall be no leakage from side seams or the bottom seam.

8.3 Printing Ink Adhesion Test

There shall be no significant removal of the print from the printed surface of a bag when tested in accordance with the method given in Annex A.

8.4 Drop Test

For bags to be used for packing of solid powder or granular products, their strength shall be determined by filling them with the actual product to be packed and subjecting them to a flat drop from a height of 1.2 m on a flat hard surface. The filling product can be the product itself or any other material simulating the actual product in density and flow. The test shall be performed on 5 bags of the same design and material and each sample shall be subjected to one drop only. If not more than one bag shows any bursting or tearing in the drop test, the consignment shall be taken as passing in the test.

9 SAMPLING

9.1 Lot

In a consignment all the polyethylene bags of the same class and size manufactured from the same material under similar conditions of production shall be grouped together to constitute a lot.

9.2 For ascertaining the conformity of the lot, the procedure for sampling and inspection as given in IS 2500 (Part 1) shall be followed. The type of sampling plan, inspection level and acceptable quality level (AQL) to be followed for various characteristics shall be as given in **9.2.1** and **9.2.2**.

9.2.1 For ascertaining the conformity for dimensional requirements and appearance, a single sampling plan with general inspection level II and AQL of 1.5 percent as given in Tables I and II-A of IS 2500 (Part 1) shall be followed.

9.2.2 For all other requirements a single sampling plan with special inspection level S-4 and AQL of 1.5 percent as given in Tables I and II-A of IS 2500 (Part 1) shall be followed.

10 PACKING AND MARKING

10.1 Packing

The packing packets shall be marked with the following information:

a) Dimensions of the bags;

b) Quantity;

c) Indication of the source of manufacturer;

d) Made from virgin polymers; and

e) Recycling mark as per IS 14534.

10.2 BIS Certification Marking

10.2.1 The bags may also be marked with the Standard Mark.

10.2.1.1 The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act,* 1986 and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of the Standard Mark may be granted to manufacturer or producers may be obtained from the Bureau of Indian Standards.

11 ORDERING DATA

The purchaser while procuring bags shall specify the following:

a) Classification structure and shape of the bag (*see* **4.2** and **5**);

b) Size and nominal thickness of the bag along with its material; and

c) Colour of the bag.

ANNEX A

(*Clause* 8.3)

TEST FOR PRINTING INK ADHESION

A-1 Apply two strips 25 mm wide transparent pressure sensitive tape or cello-tape to the printed area of the bag, one piece down the length of the bag and the other along the width.

A-2 Press the tape firmly on to the bag and leave for 15 s.

A-3 Remove the tape by pulling slowly at about 1 cm from one end at about 90° to the pouch surface.

A-4 There shall be no significant removal of the print from the surface of the bag and the printed material shall be still readable.

ANNEX B

(Foreword)

COMMITTEE COMPOSITION

Plastics Containers Sectional Committee, PCD 21

Organization	*Representative(s)*
Indian Institute of Packaging, Mumbai	SHRI RAJIV DHAR (***Chairman***) SHRI HARI IYER (*Alternate*)
Britannia Industries Ltd, Delhi	SHRI S. K. CHAKRABORTY DR K. L. GABA (*Alternate*)
Central Institute of Plastics Engineering & Technology, Chennai	SHRI D. H. RAIKER DR S. K. NAYAK (*Alternate*)
Directorate General of Health Services (DGHS), New Delhi	ASSISTANT DIRECTOR GENERAL (PFA) DEPUTY ASSISTANT DIRECTOR GENERAL (PFA) (*Alternate*)
Directorate of Vanaspati, Vegetable Oils and Fats, New Delhi	DR R. A. KHAN DR P. K. SARDAR (*Alternate*)
Gujarat State Fertilizers Chemicals Ltd, Vadodara	SHRI C. S. SHAH SHRI S. P. PATEL (*Alternate*)
Hindustan Lever Ltd, Mumbai	SHRI M. K. LAHIRI SHRI D. C. AGARWAL (*Alternate*)
Indian Petrochemicals Corporation Limited, Vadodara	SHRI A. K. KHERA SHRI ASHISH SHRIVASTAVA (*Alternate* I) SHRI ANUPAM DESI (*Alternate* II)
Indian Toxicological Research Institute, Lucknow	DR V. P. SHARMA DR A. K. AGRAWAL (*Alternate*)
Ministry of Food Processing Industries, New Delhi	SHRI R. GOPALAN SHRI R. K. BANSAL (*Alternate*)
Mipak Plastics Ltd, New Delhi	SHRI ARVID TIBREWALA
National Dairy Development Board, Anand	SHRI B. DATTA SHRI S. K. KHANDELWAL (*Alternate*)
Nestle India Ltd, New Delhi	SHRI V. K. SOOD
New Delhi Municipal Council, New Delhi	DR G. S. THIND
Nilkamal Crates & Containers, Mumbai	SHRI H. V. PAREKH SHRI V. S. IYER (*Alternate* I) SHRI A. K. KHARBANDA (*Alternate* II)
Pearl Polymers Ltd, New Delhi	SHRI CHAND SETH SHRI HARISH SETH (*Alternate* I) SHRI S. SARIN (*Alternate* II)
Pesticides Association of India, New Delhi	SHRI PRADIP SAGAR DR L. C. ROHELA (*Alternate*)
Reliance Industries Ltd, Mumbai	SHRI K. RANGAN SHRI A. S. AGHARKAR (*Alternate* I) DR R. S. BASARGEKAR (*Alternate* II)
Sabarkantha District Co-operative Milk Producer's Union Ltd, Himatnagar	SHRI MAYUR N. VYAS SHRI M. J. BHAVSAR (*Alternate*)
The Vanaspati Manufacturers' Association of India, New Delhi	SHRI V. G. FERNANDEZ SHRI S. GURUMOORTHI (*Alternate*)
Voluntary Organization in Interest of Consumer Education (VOICE), New Delhi	SHRI S. K. MATHUR SHRI H. WADHWA (*Alternate*)
BIS Directorate General	SHRI ANJAN KAR, Director & Head (PCD) [Representing Director General (*Ex-officio*)]

Member Secretary
SHRI H. S. SIDHU
Director (PCD), BIS

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act*, 1986 to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

Copyright

Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Catalogue' and 'Standards: Monthly Additions'.

This Indian Standard has been developed from Doc: No. PCD 21 (1771).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002
Telephones: 2323 0131, 2323 3375, 2323 9402

Telegrams: Manaksanstha
(Common to all offices)

Regional Offices:		Telephone
Central	: Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI 110002	2323 7617, 2323 3841
Eastern	: 1/14 C.I.T. Scheme VII M, V.I.P. Road, Kankurgachi, KOLKATA 700054	2337 8499, 2337 8561, 2337 8626, 2337 9120
Northern	: SCO 335-336, Sector 34-A, CHANDIGARH 160022	60 3843, 60 9285
Southern	: C.I.T. Campus, IV Cross Road, CHENNAI 600113	2254 1216, 2254 1442, 2254 2519, 2254 2315
Western	: Manakalaya, E9 MIDC, Marol, Andheri (East), MUMBAI 400093	2832 9295, 2832 7858, 2832 7891, 2832 7892

Branches : AHMEDABAD. BANGALORE. BHOPAL. BHUBANESHWAR. COIMBATORE. FARIDABAD. GHAZIABAD. GUWAHATI. HYDERABAD. JAIPUR. KANPUR. LUCKNOW. NAGPUR. NALAGARH. PATNA. PUNE. RAJKOT. THIRUVANANTHAPURAM. VISAKHAPATNAM.

Printed at Simco Printing Press, Delhi