IS 5448 (1980): Dextrins for Textile Industry (Including British Gum) [TXD 7: Textile Sizing and Finishing Materials]

BLANK PAGE

IS : 5448-1980
(Reaffirmed 2004)

Indian Standard

SPECIFICATION FOR DEXTRINS FOR TEXTILE INDUSTRY (INCLUDING BRITISH GUM)

(*First Revision*)

First Reprint AUGUST 1991

UDC 664·161 ; 677·041·611

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

Gr 3 *November* 1980

Indian Standard

SPECIFICATION FOR DEXTRINS FOR TEXTILE INDUSTRY (INCLUDING BRITISH GUM)

(First Revision)

Textile Sizing and Finishing Materials Sectional Committee, TDC 12

Chairman	*Representing*
DR H. C. SRIVASTAVA	Ahmedabad Textile Industry's Research Association, Ahmadabad
Members	
SHRI S. S. TRIVEDI (*Alternate* to Dr H. C. Srivastava)	
SHRI M. S. ASHOK KUMAR	The Mysore Starch Manufacturing Company, Bangarapet
SHRI S. A. BANDEKAR	The Bombay Millowners' Association, Bombay
SHRI S. BANGARUSWAMY	The Southern India Mills' Association, Coimbatore
SHRI B. N. BHARGAVA	Ganesh Grinding Mill, Bombay
SHRI D. N. BHARGAVA (*Alternate*)	
SHRI V. P. CHADHA	Bharat Starch & Chemicals Ltd, Yamuna Nagar
SHRI N. D. SINGHAL (*Alternate*)	
SHRI CHINUBHAI MANIBHAI	All India Starch Manufacturers' Association Private Limited, Bombay
SHRI B. K. SARDANA (*Alternate*)	
SHRI K. P. DAS	Indian Jute Industries' Research Association, Calcutta
SHRI K. S. DESIKAN	Office of the Textile Commissioner, Bombay
SHRIMATI DEVIKABEN NAVNITLAL	Cellulose Products of India Limited, Ahmadabad
SHRI C. D. DHARIYAL (*Alternate*)	
SHRI A. GHOSH	National Test House, Calcutta
SHRI HARSHAVADAN MANGALDAS	Sizing Materials Chemicals & Electronics Private Limited, Ahmadabad
DR KIRIT KUMAR F. PATEL (*Alternate*)	
SHRI R. V. JUNNARKAR	The Anil Starch Products Ltd, Ahmadabad
SHRI R. C. MODY (*Alternate*)	

(*Continued on page* 2)

(*Continued from page* 1)

Members	*Representing*
DR C. R. KRISHNAMOORTHY	Tapioca Market Expansion Board, Trivandrum
SHRI P. N. PURUSHOTHAMAN (*Alternate*)	
SHRI MADHUKANT PRANLAL	Ahmedabad Textile Mills' Association, Ahmadabad
SHRI DARA S. MADON	Laxmi Starch Limited, Bombay
SHRI B. S. MALVI	Association of Merchants & Manufacturers of Textile Stores & Machinery (India), Bombay
DR B. R. MANJUNATHA	Textiles Committee, Bombay
DR (SHRIMATI) G. R. PHALGUMANI (*Alternate*)	
SHRI C. S. PANNALAL	Sooraj Trading Co, Robertsonpet
SHRI C. S. CHAMPALAL (*Alternate*)	
SHRI S. N. RAO	Das & Company, Bombay
SHRI M. N. NAIK (*Alternate*)	
SHRI N. S. SARAIYA	The Bombay Textile Research Association, Bombay
SHRI M. D. DIXIT (*Alternate*)	
DR P. M. SHAH	Maize Products, Ahmadabad
SHRI H. B. TRIVEDI (*Alternate*)	
SHRI K. S. SHANKARANARAYANA	The South India Textile Research Association, Coimbatore
SHRI S. M. CHAKRABORTY, Director (Tex)	Director General, ISI (*Ex-officio Member*)

Secretary

SHRI S. M. AURORA
Deputy Director (Tex), ISI

Textile Starches Subcommittee, TDC 12 : 4

Convener	
SHRI J. R. MODI	Ahmedabad Textile Industry's Research Association, Ahmadabad
Members	
SHRI R. C. MODY	The Anil Starch Products Ltd, Ahmadabad
DR P. M. SHAH	Maize Products, Ahmadabad
DR J. J. SHROFF	The Arvind Mills Limited, Ahmadabad

Indian Standard

SPECIFICATION FOR DEXTRINS FOR TEXTILE INDUSTRY (INCLUDING BRITISH GUM)

(First Revision)

0. FOREWORD

0.1 This Indian Standard (First Revision) was adopted by the Indian Standards Institution on 30 June 1980, after the draft finalized by the Textile Sizing and Finishing Materials Sectional Committee had been approved by the Textile Division Council.

0.2 Dextrin is a modified starch prepared by heat treatment of starch in the dry state, with or without the addition of small quantities of chemical reagents. It is used extensively as textile sizing and finishing agent, especially for finishing of dyed goods, to impart weight and firmness without giving 'starchy' feel to the cloth. It is also used as thickener in printing.

0.2.1 Keeping its end use in view, the material is desired to be as free from dirt, black particles and other extraneous matter as possible.

NOTE — The use of the term 'dextrin' to designate the products resulting from the hydrolytic or enzymatic depolymerization of starch is deprecated.

0.3 This standard was originally published in 1969 covering white and yellow dextrins. In this revision, another variety of dextrin, namely, British gum, has been added. The requirements for British gum are, however, specified to be the same as those for yellow dextrin. Further, for determination of particle size, cold-water solubles, moisture content, free acidity and ash content, the relevant methods prescribed in IS : 4706-(Part I)-1978* and IS : 4706 (Part II)-1978† have been specified in place of the methods detailed in the appendix of the earlier version.

*Methods of test for edible starches and starch products: Part I Physical methods (*first revision*).

†Methods of test for edible starches and starch products: Part II Chemical methods (*first revision*).

0.4 The values specified for reducing sugar are tentative. Investigations are being made to arrive at firm values.

0.5 To familiarize the industry with the International System (SI) units, the recommended SI units for use in the textile industry are given in Appendix B.

0.5.1 The standards of Weights and Measures Act, 1976 also stipulates use of SI units.

0.6 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*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard prescribes requirements and methods of sampling and test for white dextrin, yellow dextrin and British gum used in sizing and finishing of textiles.

2. PHYSICAL REQUIREMENTS

2.1 The material shall be in the form of fine powder, free from dirt and other adventitious impurities.

2.2 The material shall also meet the requirements given in Table 1.

TABLE 1 PHYSICAL REQUIREMENTS OF DEXTRIN

Sl No.	Characteristic	Requirement		Method of Test
		White Dextrin	Yellow Dextrin and British Gum	
(1)	(2)	(3)	(4)	(5)
i)	Colour	White	Yellow to brown	Visual
ii)	Particle size	To pass through 180-micron IS sieve		IS : 4706 (Part I)-1978*
iii)	Cold-water solubles, percent, *Min*	45	80	

*Methods of test for edible starches and starch products: Part I Physical methods (*first revision*).

*Rules for rounding off numerical values (*revised*).

3. CHEMICAL REQUIREMENTS

3.1 The material shall meet the chemical requirements given in Table 2.

TABLE 2 CHEMICAL REQUIREMENTS OF DEXTRIN

Sl No.	Characteristic	Requirement		Method of Test
		White Dextrin	Yellow Dextrin and British Gum	
(1)	(2)	(3)	(4)	(5)
i)	Moisture content, percent, *Max*	10	10	IS : 4706 (Part-II)-1978*
ii)	Free acidity, ml of N/10 NaOH per 100 g, *Max*	50	50	
iii)	Ash content, percent, *Max*	0·4	0·5	
iv)	Reducing sugar, as dextrose, percent, *Max*	7	5	Appendix A

NOTE — The requirements in respect of reducing sugar are tentative.

*Methods of test for edible starches and starch products: Part II Chemical methods. (*first revision*).

4. PACKING

4.1 The dextrin (since hygroscopic in nature) shall be packed in paper- or polyethylene-lined jute or HDPE bags, each containing preferably not more than 50 kg of the material. Bags conforming to IS : 7406 (Part I)-1974*, IS : 7406 (Part II)-1980†, IS : 8069-1976‡ or IS : 8117-1976§ may serve the purpose.

5. MARKING

5.1 Each package shall be marked with:

a) Name of the material;

b) Manufacturer's name or trade-mark;

c) Net mass (kg); and

d) Date of packing.

*Specification for jute bags for packing fertilizers: Part I Laminated bags manufactured from 407 g/m²; 85 × 39 tarpaulin fabric.

†Specification for jute bags for packing fertilizers: Part II Laminated bags manufactured from 380 g/m²; 68 × 39 tarpaulin fabric.

‡Specification for high density polyethylene (HDPE) woven sacks for packing pesticides.

§Specification for DW tarpaulin laminated jute bags for pesticides.

5.1.1 Each package may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI 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 ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformite to that standard as a further safeguard. Details of conditions under which a licency for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

6. SAMPLING

6.1 Unless specified otherwise in the contract, the procedure given in IS : 4662-1977* shall be followed.

APPENDIX A

(*Clause* 3.1)

ESTIMATION OF REDUCING SUGAR

A-1. REAGENTS

A-1.1 Quality of Reagents — Unless specified otherwise, pure chemicals and distilled water (*see* IS : 1070-1977†) shall be employed in tests.

NOTE — ' Pure chemicals ' shall mean chemicals that do not contain impurities which affect the test results.

A-1.2 Fehling's Solution (Soxhlet Modification) — prepared by mixing, immediately before use, equal volumes of Solution A (*see* **A-1.2.1**) and Solution B (*see* **A-1.2.2**).

A-1.2.1 *Solution A* — Dissolve 34·639 g of copper sulphate in water, add 0·5 ml of concentrated sulphuric acid of sp gr 1·84 (conforming to AR grade of IS : 266-1961‡) and dilute to 500 ml in a volumetric flask. Filter the solution through prepared asbestos.

A-1.2.2 *Solution B* — Dissolve 173 g of Rochelle salt (potassium sodium tartrate) and 50 g of soidum hydroxide, analytical reagent (conforming to IS : 376-1976§) in water, dilute to 500 ml in a volumetric flask and allow the solution to stand for 2 days. Filter the solution through prepared asbestos.

*Methods for sampling of starches and starch products (*first revision*).
†Specification for water for general laboratory use (*second revision*).
‡Specification for sulphuric acid (*revised*).
§Specification for sodium hydroxide, analytical reagent (*second revision*).

A-1.3 Acetic Acid — glacial.

A-1.4 Potassium Iodide Solution — 30 percent (*m/v*).

A-1.5 Sulphuric Acid — 6 N.

A-1.6 Sodium Thiosulphate Solution — 0·1 N.

A-1.7 Starch Indicator — Triturate 1 g of maize starch with 10 ml of cold water and pour slowly, with constant stirring, into 200 ml of boiling water. Boil the mixture until a thin translucent fluid is obtained. Allow to settle and use the supernatant liquid as the indicator.

A-1.7.1 The starch indicator shall be prepared afresh for the test.

A-2. PROCEDURE

A-2.1 Weigh accurately about 10 g of the sample, transfer it to a 250-ml conical flask and dissolve it in 200 ml of water. Shake for 30 minutes and then filter it through Whatman filter paper No. 1 or its equivalent, discarding the first, about 10 ml of the filtrate. Accurately pipette out 20 ml of the filtrate in a flask containing 20 ml of Fehling's solution (*see* **A-1.2**) and then rinse the sides of the flask with 10 ml of distilled water to make the volume to 50 ml. Cover the flask with a short-stem funnel and place on a wire gauze over a gas burner. Bring the solution to boil in 3 minutes, as nearly as possible, and keep at gentle ebullition for exactly 2 minutes. Cool quickly to room temperature under a cold water tap or in an ice-bath. Add 2 to 3 ml of acetic acid, 10 ml of potassium iodide and 10 ml of sulphuric acid in the order mentioned, and mix. Titrate immediately with sodium thiosulphate. Near end point add 1 ml of starch indicator and carefully continue the titration without violent agitation until the blue colour of the starch changes to cream colour.

A-2.2 Carry out a blank test using 20 ml of water in place of the filtrate.

A-2.3 Find the difference (*V*) between the volumes of sodium thiosulphate consumed in the test with the sample and in the blank test.

A-3. CALCULATION

A-3.1 Read the mass of dextrose (*m*) in milligrams from Table 3 equivalent to the volume (*V*) of sodium thiosulphate determined as in **A-2.3** and calculate the percentage of reducing sugar as dextrose (anhydrous) by the following formula:

$$P = \frac{m \times 200 \times 100}{1\,000 \times 20 \times M \frac{(100 - R)}{100}}$$

where

m = mass in milligrams of dextrose as read from Table 3,

M = mass in grams of the sample, and

R = moisture content of the sample.

TABLE 3 MASS OF DEXTROSE EQUIVALENT TO SODIUM THIOSULPHATE CONSUMED

(*Clause* A-3.1)

VOLUME (V) OF N/10 SODIUM THIOSULPHATE ($Na_2S_2O_3$) ml	MASS (m) OF DEXTROSE, mg									
	0·0	0·1	0·2	0·3	0·4	0·5	0·6	0·7	0·8	0·9
0	0·0	0·3	0·7	1·0	1·3	1·6	1·9	2·2	2·5	2·8
1	3·2	3·5	3·8	4·1	4·4	4·7	5·0	5·3	5·6	5·9
2	6·3	6·6	6·9	7·2	7·5	7·8	8·1	8·5	8·8	9·1
3	9·4	9·8	10·1	10·4	10·7	11·0	11·4	11·7	12·0	12·3
4	12·6	13·0	13·3	13·6	14·0	14·3	14·6	15·0	15·3	15·6
5	15·9	16·3	16·6	16·9	17·2	17·6	17·9	18·2	18·5	18·9
6	19·2	19·5	19·8	20·1	20·5	20·8	21·1	21·4	21·8	22·1
7	22·4	22·7	23·0	23·3	23·7	24·0	24·3	24·6	24·9	25·2
8	25·6	25·9	26·2	26·6	26·9	27·3	27·6	28·0	28·3	28·6
9	28·9	29·3	29·6	30·0	30·3	30·6	31·0	31·3	31·6	31·9
10	32·3	32·7	3·30	33·3	33·7	34·0	34·3	34·6	35·0	35·3
11	35·7	36·0	36·3	36·7	37·0	37·3	37·6	38·0	38·3	38·7
12	39·0	39·3	39·6	40·0	40·3	40·6	41·0	41·3	41·7	42·0
13	42·4	42·8	43·1	43·4	43·7	44·1	44·4	44·8	45·2	45·5
14	45·8	46·2	46·5	46·9	47·2	47·6	47·9	48·2	48·6	48·9
15	49·3	49·6	49·9	50·3	50·7	51·1	51·4	51·7	52·1	52·4
16	52·8	53·2	53·5	58·9	54·2	54·5	54·9	55·3	55·6	56·0
17	56·3	56·7	57·0	57·3	57·7	58·1	58·4	58·8	59·1	59·5
18	59·8	60·1	60·5	60·9	61·2	61·5	61·9	62·3	62·6	63·0
19	63·3	63·6	64·0	64·3	64·7	65·0	65·4	65·8	66·1	66·5
20	66·9	67·2	67·6	68·0	68·4	68·8	69·1	69·5	69·9	70·3
21	70·7	71·1	71·5	71·9	72·2	72·6	73·0	73·4	73·7	74·1
22	74·5	74·9	75·3	75·7	76·1	76·3	76·9	77·3	77·7	78·1
23	78·5	78·9	79·3	79·7	80·1	80·5	80·9	81·3	81·7	82·1
24	82·6	83·0	83·4	83·8	84·2	84·6	85·0	85·4	85·8	86·2
25	86·6	87·0	87·4	87·8	88·2	88·6	89·0	89·4	89·8	90·2
26	90·7	91·1	91·5	91·9	92·3	92·7	93·1	93·5	93·9	94·3
27	94·8									

APPENDIX B

(*Clause* 0.5)

RECOMMENDED SI UNITS FOR TEXTILES

Sl No.	Characteristic	SI Unit		Application
		Unit	Abbreviation	
(1)	(2)	(3)	(4)	(5)
1.	Length	Millimetre	mm	Fibres
		Millimetre, centimetre	mm, cm	Samples, test specimens (as appropriate)
		Metre	m	Yarns, ropes, cordages, fabrics
2.	Width	Millimetre	mm	Narrow fabrics
		Centimetre	cm	Other fabrics
		Millimetre, centimetre	mm, cm	Samples, test specimens (as appropriate)
		Centimetre, metre	cm, m	Carpets, druggets, durries (as appropriate)
3.	Thickness	Micrometre (micron)	µm	Delicate fabrics
		Millimetre	mm	Other fabrics, carpets, felts
4.	Linear density	Tex	tex	Yarns
		Millitex	mtex	Fibres
		Decitex	dtex	Filaments, filament yarns
		Kilotex	ktex	Slivers, ropes
5.	Diameter	Micrometre (micron)	µm	Fibres
		Millimetre	mm	Yarns, ropes, cordages
6.	Circumference	Millimetre	mm	Ropes, cordages
7.	Threads in fabric:			Woven fabrics (as appropriate)
	a) Lengthwise	Number per centimetre	ends/cm	
		Number per decimetre	ends/dm	
	b) Widthwise	Number per centimetre	picks/cm	
		Number per decimetre	picks/dm	
8.	Warp threads in loom	Number per centimetre	ends/cm	Reeds

(*Continued*)

RECOMMENDED SI UNITS FOR TEXTILES — *Contd*

Sl No.	Characteristic	SI Unit		Application
		Unit	Abbreviation	
(1)	(2)	(3)	(4)	(5)
9.	Stitches in knitted fabric			Knitted fabrics (as appropriate)
	a) Lengthwise	Courses per centimetre Courses per decimetre	courses/cm courses/cm	
	b) Widthwise	Wales per centimetre Wales per decimetre	wales/cm wales/dm	
10.	Stitch length	Millimetre	mm	Knitted fabrics made-up items
11.	Mass per unit area	Grams per square metre	g/m^2	Fabrics
12.	Mass per unit length	Grams per metre	g/m	Fabrics
13.	Twist	Turns per centimetre Turns per metre	turns/cm turns/m	Yarns, ropes (as appropriate)
14.	Test or gauge length	Millimetre, centimetre	mm, cm	Fibre, yarn and fabric specimens (as appropriate)
15.	Breaking load	Millinewton	mN	Fibres, delicate yarns (individual or skeins)
		Newton	N	Strong yarns (individual or skeins), ropes. cordages, fabrics
16.	Breaking length	Kilometre	km	Yarns
17.	Tenacity	Millinewton per tex	mN/tex	Fibres, yarns (individual or skeins)
18.	Twist factor or twist multiplier	Turns per centimetre × square root of tex Turns per metre × square root of tex	$\text{turns/cm} \times \sqrt{\text{tex}}$ $\text{turns/m} \times \sqrt{\text{tex}}$	Yarns (as appropriate)
19.	Bursting strength	Newton per square centimetre	N/cm^2	Fabrics
20.	Tear strength	Millinewton	mN	Fabrics (as appropriate)
		Newton	N	
21.	Pile height	Millimetre	mm	Carpets
22.	Pile density	Mass of pile yarn in grams per square metre per millimetre pile height	g/m^2/mm pile height	Pile carpets
23.	Elastic modulus	Millinewton per tex per unit deformation	mN/tex/unit deformation	Fibres, yarns, strands

BUREAU OF INDIAN STANDARDS

Headquarters :

Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI 110002

Telephones : 331 01 31
331 13 75

Telegrams : Manaksansthe
(Common to all Offices)

Regional Offices :		*Telephone*
Central	: Manak Bhavan, 9, Bahadur Shah Zafar Marg, NEW DELHI 110002	331 01 31 331 13 75
* Eastern	: 1/14 C.I.T. Scheme VII M, V.I.P. Road, Maniktola, CALCUTTA 700054	37 86 62
Northern	: SCO 445-446, Sector 35-C, CHANDIGARH 160036	2 18 43
Southern	: C.I.T. Campus, IV Cross Road, MADRAS 600113	41 29 16
† Western	: Manakalaya, E9 MIDC, Marol, Andheri (East), BOMBAY 400093	6 32 92 95

Branch Offices :

'Pushpak', Nurmohamed Shaikh Marg, Khanpur, AHMADABAD 380001	2 63 48
‡ Peenya Industrial Area, 1st Stage, Bangalore-Tumkur Road, BANGALORE 560058	39 49 55
Gangotri Complex, 5th Floor, Bhadbhada Road, T.T. Nagar, BHOPAL 462003	55 40 21
Plot No. 82/83, Lewis Road, BHUBANESHWAR 751002	5 36 27
Kalai Kathir Building, 6/48-A Avanasi Road, COIMBATORE 641037	2 67 05
Quality Marking Centre, N.H. IV, N.I.T., FARIDABAD 121001	—
Savitri Complex, 116 G. T. Road, GHAZIABAD 201001	8-71 19 96
53/5 Ward No. 29, R.G. Barua Road, 5th By-lane, GUWAHATI 781003	3 31 77
5-8-56C L. N. Gupta Marg, (Nampally Station Road) HYDERABAD 500001	23 10 83
R14 Yudhister Marg, C Scheme, JAIPUR 302005	6 34 71
117/418 B Sarvodaya Nagar, KANPUR 208005	21 68 76
Plot No. A-9, House No. 561/63, Sindhu Nagar, Kanpur Road LUCKNOW 226005	5 55 07
Patliputra Industrial Estate, PATNA 800013	6 23 05
District Industries Centre Complex, Bagh-e-Ali Maidan, SRINAGAR 190011	—
T. C. No. 14/1421, University P. O., Palayam, THIRUVANANTHAPURAM 695034	6 21 04

Inspection Offices (With Sale Point) :

Pushpanjali, First Floor, 205-A West High Court Road, Shankar Nagar Square, NAGPUR 440010	52 51 71
Institution of Engineers (India) Building, 1332 Shivaji Nagar, PUNE 411005	5 24 35

*Sales Office Calcutta is at 5 Chowringhee Approach, P. O. Princep Street, CALCUTTA	27 68 00
† Sales Office is at Novelty Chambers, Grant Road, BOMBAY	89 65 28
‡ Sales Office is at Unity Building, Narasimharaja Square, BANGALORE	22 39 71

Printed at Dee Kay Printers, New Delhi, India