
**Specification for Dextrins for Textile
Industry (Including British Gum)**

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Foreword

This Ethiopian Standard has been prepared under the direction of Technical Committee for Sizing & Finishing material, Dye stuff & Pigments (TC 71) and published by the Ethiopian Standards Agency (ESA).

This Ethiopian Standard cancels and replaces ES 3328:2007(Reaffirmed 2018) *Specification for Dextrins for Textile Industry (Including British Gum)* .

In preparing this Ethiopian Standard reference has been made to the following document:

IS 5448:1980 "Specification for Dextrins for Textile Industry (Including British Gum)", published by Indian Standard Institution.

Acknowledgment is made for the use of information from the above publication.

Specification for Dextrins for Textile Industry (Including British Gum)

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

Sr. 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, <i>Min</i>	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, <i>Max</i>	10	10	IS : 4706 (Part-II)-1978*
ii)	Free acidity, ml of N/10 NaOH per 100 g, <i>Max</i>	50	50	
iii)	Ash content, percent, <i>Max</i>	0.4	0.5	Appendix A
iv)	Reducing sugar, as dextrose, percent, <i>Max</i>	7	5	

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:

- Name of the material;
- Manufacturer's name or trade-mark;
- Net mass (kg); and
- 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 conformance to that standard as a further safeguard. Details of conditions under which a licence 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 sodium 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 THIOSUL- PHATE ($\text{Na}_2\text{S}_2\text{O}_3$) 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	33.0	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	53.9	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.	CHARACTER- ISTIC	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)	μ m	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)	μ m	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 (3)	Abbreviation (4)	
(1)	(2)			(5)
9.	Stitches in knitted fabric			Knitted fabrics (as appropriate)
	a) Lengthwise	Courses per centimetre	courses/cm	
		Courses per decimetre	courses/cm	
	b) Widthwise	Wales per centimetre	wales/cm	
		Wales per decimetre	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/cm	Yarns, ropes (as appropriate)
		Turns per metre	turns/m	
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/cm × $\sqrt{\text{tex}}$	Yarns (as appropriate)
		Turns per metre × square root of tex	turns/m × $\sqrt{\text{tex}}$	
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

Organization and Objectives

The Ethiopian Standards Agency (ESA) is the national standards body of Ethiopia established in 2010 based on regulation No. 193/2010. ESA is established due to the restructuring of Quality and Standards Authority of Ethiopia (QSAE) which was established in 1998.

ESA's objectives are:-

- ❖ Develop Ethiopian standards and establish a system that enable to check whether goods and services are in compliance with the required standards,
- ❖ Facilitate the country's technology transfer through the use of standards,
- ❖ Develop national standards for local products and services so as to make them competitive in the international market.

Ethiopian Standards

The Ethiopian Standards are developed by national technical committees which are composed of different stakeholders consisting of educational institutions, research institutes, government organizations, certification, inspection, and testing organizations, regulatory bodies, consumer association etc. The requirements and/or recommendations contained in Ethiopian Standards are consensus based that reflects the interest of the TC representatives and also of comments received from the public and other sources. Ethiopian Standards are approved by the National Standardization Council and are kept under continuous review after publication and updated regularly to take account of latest scientific and technological changes. Orders for all Ethiopian Standards, International Standard and ASTM standards, including electronic versions, should be addressed to the Documentation and Publication Team at the Head office and Branch (Liaisons) offices. A catalogue of Ethiopian Standards is also available freely and can be accessed in from our website.

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