
Yarns — General requirements

Foreword

This Ethiopian Standard has been prepared under the direction of the Technical Committee for Textile Yarns (TC 68) and published by the Ethiopian Standards Agency (ESA).

This Compulsory Ethiopian Standard cancels and replaces CES 36:2014.
Application of this standard is COMPULSORY with respect to clause 4.

A Compulsory Ethiopian Standard shall have the same meaning, interpretation and application of a "Technical Regulation" as implied in the WTO-TBT Agreement.
Implementation of this standard shall be effective as of 01 March 2021.

DRAFT DOCUMENT

Yarns-General Requirements

1. Scope

This Ethiopian Standard specifies the general requirements for yarns of cotton carded or combed for weaving or knitting purpose.

2. Normative References

The following referenced documents are indispensable for the application of this Ethiopian Standard. Only the latest edition of the documents (including any amendments) shall be applicable.

ES 124, Natural fibers – Terminology

ES 6265 Terminology Related to Textile

ES 6289 Standard Terminology for yarn spinning systems

ES 126, Yarns-Method of sampling.

ES 127, Yarn - Determination of breaking load and elongation by the single strand method.

ES 133, Yarns - Determination of twist by untwist method.

ES 134, Yarns - Determination of twist by direct counting method.

ES 135, Yarns - Determination of commercial weight of a shipment of yarn.

ES 136, Textile yarns- determination of unevenness.

ES 137, Yarn- determination of linear density (mass per unit length) by the skein method.

ES 141, Yarns- designation of the direction of twist.

ES 142, Textiles- universal system for designation linear density (Tex system).

ES 143, Textiles – integrated conversion table for replacing traditional gain numbers by rounded values in the tex system.

3. Definition

For the purpose of this standard the following definition shall apply in addition to those in ES 6265 and ES 6289.

3.1.

breaking elongation

The difference between the length of a stretched test piece at breaking load and its initial length. Usually it shall be as percentage of the latter.

3.2.

Yarn Appearance

The visual effect obtained by viewing a sample wound with a designated on a black board of designated size.

4. Quality

4.1. General Requirement

- 4.1.1. The yarn shall be clean and reasonably free from leaf particles, neps, snarls, slubs, oil stains, dirt marks, signs of mould or rot and other defects, and shall be well and evenly spun.

CES 36

4.1.2. All broken ends shall be properly pieced or spliced, there shall be no loose ends in hanks, cones or chesses.

4.1.3. The winding of bobbins spools and hanks shall be regular, without defects.

4.2. Yarn count

The yarn count (yarn number) shall be mentioned in English count system for trading purpose but for internal system of production it can be used any count system preferred by the manufacturing unit.

4.3. Direction of final twist

The direction of final twist in spun yarn, when tested according to ES 133 or ES 134 shall be S or Z as defined in ES 141.

4.4. Number of Twist

4.4.1. the number of twist per meter or inch (TPM/TPI) shall be specified in the contract depending on the end use of yarn.

4.4.2. the arithmetical mean of the number of twists of a lot when tested according to ES 134 shall not deviate from the declared number of twists more than:

- a) ± 6 percent for single yarns, and
- b) ± 4 percent for ply yarns.

4.4.3. the maximum coefficient of variation of the number of twists, when tested according to ES 134 shall be as follows:

- a) 5 percent for carded yarn, and
- b) 4.5 percent for combed yarn.

4.5. Reference Humidity

Unless otherwise indicated, the mass of the mercerized cotton yarn shall be referred to a humidity maximum of 8.5 percent and that of pure cotton yarn shall be referred to a humidity maximum of 7 percent.

4.6. Grading by appearance

The appearance of cotton yarn, as supplied by the seller, shall be at least equal to the appearance grade specified in ES 132.

4.7. Unevenness of Sliver and Roving (CVm)

The unevenness of sliver and roving (CVm) should lie between USTER statistics 25 and 50%.

The USTER statistics Standard values of Finisher Sliver of carded and combed sliver when tested according to ES 132 shall be according to as specified in Table 1

The USTER statistics Standard values of roving sliver quality level for carded and combed (CVm) when tested according to ES 132 shall be according to as specified in Table 2

4.8. Yarn quality particulars

The Yarn quality particulars should lie between USTER statistics 25 and 50%.

The USTER statistics Standard values of cone yarn quality level for carded knitting when tested according to ES 132 shall be according to as specified in Table 3

The USTER statistics Standard values of cone yarn quality level for combed knitting when tested according to ES 132 shall be according to as specified in Table 4

The USTER statistics Standard values of cone yarn quality level for carded weaving when tested according to ES 132 shall be according to as specified in Table 5

The USTER statistics Standard values of cone yarn quality level for combed weaving when tested according to ES 132 shall be according to as specified in Table 6

The USTER statistics standard values of cone yarn quality level for open end weaving when tested according to ES 132 shall be according to as specified in Table 7

The USTER statistics standard values of cone yarn quality level for open end knitting when tested according to ES 132 shall be according to as specified in Table 8

4.9. Commercial mass of shipment of yarn

Unless and otherwise specified the mass of yarn for shipments shall be done according to the practices specified in standards ES CHS 260-1, ES CHS 260-2 and ES CHS 260-3.

4.10. Sampling

The sampling for testing for yarn should be done according to the practice specified in ASTM D 2258

4.11. Testing

The physical and mechanical tests of cotton yarns and other textile strands shall be performed in the standard atmosphere as specified in ES 146 and the specified method of tests.

4.12. Packing

The yarn shall be marked and packed according to IS 1347.

Table 1: Carded Finisher Sliver Quality Level for Carded and Combed (CVm)

Count (Ne)	Carded		Combed	
	25%	50%	25%	50%
0.091	2.32	2.66	2.04	2.34
0.095	2.32	2.66	2.03	2.33
0.100	2.31	2.65	2.03	2.32
0.105	2.31	2.65	2.02	2.31
0.111	2.31	2.65	2.01	2.30
0.114	2.31	2.64	2.01	2.30
0.116	2.31	2.64	2.00	2.30
0.118	2.30	2.64	2.00	2.30
0.121	2.30	2.64	2.00	2.29
0.126	2.30	2.63	1.99	2.29
0.128	2.30	2.63	1.99	2.28
0.131	2.30	2.63	1.98	2.28
0.141	2.29	2.62	1.97	2.27
0.148	2.29	2.62	1.97	2.26
0.151	2.29	2.62	1.96	2.26
0.16	2.28	2.61	1.95	2.25
0.164	2.28	2.61	1.95	2.24
0.169	2.28	2.61	1.95	2.24
0.174	2.28	2.61	1.94	2.24
0.179	2.28	2.60	1.94	2.23
0.185	2.28	2.60	1.93	2.23
0.19	2.27	2.60	1.93	2.22
0.204	2.27	2.59	1.92	2.21
0.2011	2.27	2.59	1.91	2.21

Table 2: Roving Quality Level for Carded and Combed (CVm)

Count(Ne)	Carded		Combed	
	25%	50%	25%	50%
0.6	4.8	5.2	3.6	4
0.7	4.4	4.9	3.7	4
0.800	5	5.5	3.7	4
0.9	5.1	5.6	3.7	4.1
1	5.1	5.7	3.7	4.1
1.1	5.2	5.7	3.7	4.1
1.2	5.3	5.8	3.8	4.1
1.3	5.3	5.9	3.8	4.1
1.4	4.9	5.4	3.8	4.2
1.5			3.8	4.2
1.6			3.8	4.2
1.7			3.8	4.2
1.8			3.8	4.2
1.9			3.8	4.2
2			3.8	4.2
2.1			3.8	4.2
2.2			3.9	4.2
2.3			3.9	4.2
2.4			3.9	4.3
2.5			3.9	4.3
2.6			3.9	4.3
2.7			3.9	4.3
2.8			3.9	4.3
2.9			3.9	4.3

Table 3: Cone Yarn Quality Level for Carded Knitting

Count (Ne)	14s		16s		18s		20s		24s		26s		28s		30s		32s		34s		36s		40s	
	25%	50%	25%	50%	25%	50%	25%	50%	25%	50%	25%	50%	25%	50%	25%	50%	25%	50%	25%	50%	25%	50%	25%	50%
CVb	0.9	1.2	0.9	1.2	1	1.3	1	1.3	1.1	1.4	1.1	1.4	1.2	1.5	1.2	1.5	1.2	1.5	1.3	1.6	1.3	1.6	1.3	1.7
CVm	12.5	13.5	12.8	13.7	13	14	13.3	14.2	13.7	14.7	13.8	14.8	14	15	14.1	15.2	14.3	15.3	14.4	15.5	14.6	15.6	14.8	15.9
Thin (-50%)	2	5	3	6	3	6	4	8	5	10	5	11	6	12	6	13	7	14	8	16	8	17	10	19
Thick (+50%)	53	93	60	106	67	118	74	130	88	153	94	165	101	176	108	188	115	199	121	211	128	222	141	245
Neps(+200%)	52	95	67	122	84	152	103	185	146	260	170	303	196	348	223	396	253	447	284	500	316	557	387	679
Total	107	193	130	234	154	276	181	323	239	423	269	479	303	536	337	597	375	660	413	727	452	796	538	943
Hairiness	7.3	8.2	7.1	7.9	6.8	7.6	6.6	7.3	6.2	6.9	6.1	6.7	5.9	6.6	5.8	6.4	5.7	6.3	5.6	6.2	5.5	6	5.3	5.8
RKM		14.6		14.6		14.6		14.6		14.6		14.6		14.6		14.6		14.6		14.8		14.8		14.8
RKM CV%	6.3	7.1	6.6	7.4	6.8	7.7	7.1	7.9	7.5	8.3	7.7	8.5	7.8	8.7	8	8.9	8.2	9	8.3	9.2	8.5	9.4	8.8	9.6
Elongation	6.9	6.4	6.8	6.2	6.7	6.2	6.6	6.1	6.4	5.9	6.4	5.9	6.3	5.8	6.2	5.8	6.2	5.7	6.2	5.7	6.1	5.6	6	5.5
Elong CV%	5.4	6.1	5.7	6.4	5.9	6.7	6.1	6.9	6.6	7.4	6.8	7.6	6.9	7.8	7.1	8	7.3	8.2	7.5	8.4	7.6	8.5	7.9	8.8

Table 4: Cone Yarn Quality Level for Combed Knitting

Count in NE	16s		20s		24s		26s		28s		30s		34s		36s		40s		60s	
	25%	50%	25%	50%	25%	50%	25%	50%	25%	50%	25%	50%	25%	50%	25%	50%	25%	50%	25%	50%
CVb	0.8	1.1	0.9	1.2	0.9	1.3	0.9	1.3	0.9	1.3	0.9	1.4	1	1.4	1	1.4	1	1.5	1.1	1.5
CVm	10.7	11.4	11.2	11.9	11.6	12.3	11.8	12.5	12	12.7	12.1	12.9	12.4	13.2	12.6	13.4	12.8	13.6	13.7	14.4
Thin (-50%)	0	0	0	1	1	1	1	2	1	2	1	3	2	4	2	5	3	7	9	16
Thick (+50%)	4	7	7	12	11	19	14	23	16	27	19	32	26	44	30	50	39	65	41	66
Neps(+200%)	8	13	13	20	19	29	22	34	25	39	29	45	37	57	41	63	51	78	62	93
Total	12	20	20	33	31	49	37	59	42	68	49	80	65	105	73	118	93	150	112	175
Hairiness	7.6	8.2	6.8	7.4	6.2	6.8	6	6.6	5.8	6.4	5.6	6.2	5.3	5.9	5.1	5.7	4.9	5.5	4	4.5
RKM		16.7		16.6		16.5		16.5		16.4		16.4		16.3		16.3		16.2		19.8
RKM CV%	5.5	6.2	5.9	6.7	6.4	7.1	6.5	7.3	6.7	7.5	6.9	7.7	7.2	8	7.4	8.2	7.6	8.5	7.8	8.4
Elongation	6.2	5.7	6	5.5	5.8	5.4	5.8	5.3	5.7	5.2	5.6	5.2	5.5	5.1	5.5	5	5.4	5	5	4.6
Elong CV%	4.8	5.4	5.2	6	5.6	6.4	5.8	6.6	6	6.8	6.2	7	6.5	7.4	6.7	7.6	7	7.9	6.4	7.2

Table 5: Cone Yarn Quality Level for Carded Weaving

Count in Ne	14s		16s		18s		20s		24s		26s		28s		30s		32s		34s		36s		40s	
	25%	50%	25%	50%	25%	50%	25%	50%	25%	50%	25%	50%	25%	50%	25%	50%	25%	50%	25%	50%	25%	50%	25%	50%
CVb	0.9	1.3	1	1.4	1	1.4	1	1.4	1.1	1.5	1.1	1.5	1.2	1.6	1.2	1.6	1.2	1.6	1.2	1.7	1.2	1.7	1.3	1.7
CVm	13.5	14.7	13.8	14.9	14	15.1	14.2	15.3	14.5	15.6	14.5	15.8	14.8	15.9	14.9	16	15	16.1	15.1	16.3	15.2	16.4	15.4	16.6
Thin (-50%)	2	4	2	5	3	7	4	8	5	11	6	13	7	14	8	16	9	18	10	20	11	22	13	26
Thick (+50%)	65	108	75	124	85	140	95	156	115	188	125	204	135	221	145	237	155	253	165	269	176	286	196	318
Neps(+200%)	61	107	80	138	100	174	123	212	174	301	204	351	235	405	268	462	304	523	342	587	382	655	468	801
Total	128	219	157	267	188	321	222	376	294	500	335	568	377	640	421	715	468	794	517	876	569	963	677	1145
Hairiness	6.9	7.7	6.6	7.4	6.4	7.1	6.2	6.9	5.8	6.5	5.7	6.3	5.6	6.2	5.4	6	5.3	5.9	5.2	5.8	5.1	5.7	5	5.5
RKM		16.1		16		16		15.9		15.8		15.7		15.7		15.7		15.6		15.6		15.6		15.5
RKM CV%	7	7.9	7.2	8.1	7.4	8.2	7.5	8.4	7.8	8.6	7.9	8.8	8	8.9	8.1	9	8.2	9.1	8.3	9.2	8.4	9.3	8.6	9.5
Elongation	6.7	6.1	6.5	6	6.4	5.9	6.3	5.8	6.2	5.6	6.1	5.6	6	5.5	6	5.5	5.9	5.4	5.9	5.4	5.8	5.3	5.8	5.2
Elong CV%	6.2	7.2	6.3	7.4	6.5	7.5	6.6	7.7	6.8	7.9	6.9	8	7	8.2	7.1	8.3	7.2	8.4	7.3	8.4	7.4	8.5	7.5	8.7

Table 6: Cone Yarn Quality Level for Combed Weaving

Count in NE	16s		20s		24s		26s		28s		30s		34s		36s		40s		50s		60s	
	25%	50%	25%	50%	25%	50%	25%	50%	25%	50%	25%	50%	25%	50%	25%	50%	25%	50%	25%	50%	25%	50%
CVb	0.7	1.1	0.7	1.2	0.8	1.2	0.8	1.3	0.8	1.3	0.8	1.3	0.9	1.4	0.9	1.4	0.9	1.4	1	1.4	1	1.5
CVm	10.3	11	10.9	11.7	11.5	12.3	11.7	12.6	12	12.8	12.2	13.1	12.6	13.5	12.8	13.7	13.2	14.1	13.1	13.9	13.8	14.6
Thin (-50%)	0	0	0	1	1	1	1	1	1	2	1	2	2	3	2	4	2	5	3	5	6	10
Thick (+50%)	9	15	12	20	14	24	15	27	16	29	18	31	20	36	21	38	24	43	26	42	36	57
Neps(+200%)	19	34	25	45	31	57	35	63	38	69	41	75	48	88	52	95	59	109	65	106	83	133
Total	28	49	37	66	46	82	51	91	55	100	60	108	70	127	75	137	85	157	94	153	125	200
Hairiness	7.1	7.8	6.4	7	5.8	6.4	5.6	6.2	5.4	6	5.2	5.8	4.9	5.4	4.8	5.3	4.5	5	3.7	4.1	3.5	3.9
RKM		15.9		16.3		16.6		16.7		16.9		17		17.2		17.3		17.5		19.7		20.2
RKM CV%	6	6.8	6.4	7.2	6.7	7.5	6.9	7.7	7.1	7.8	7.2	8	7.5	8.2	7.6	8.3	7.8	8.6	7.9	8.6	8.6	9.3
Elongation	6.4	5.8	6.2	5.7	6.1	5.6	6	5.5	6	5.5	5.9	5.4	5.9	5.4	5.8	5.3	5.7	5.3	5.6	5.1	5.5	5.1
Elong CV%	5.1	5.8	5.5	6.3	6	6.8	6.1	7	6.3	7.3	6.5	7.5	6.8	7.8	7	8	7.3	8.4	6.7	7.5	7.4	8.2

Table 7: Cone Yarn Quality Level for Open End Weaving

Count in Ne	8s		10s		12s		14s		16s		18s		20s		22s		24s		26s		28s	
	25%	50%	25%	50%	25%	50%	25%	50%	25%	50%	25%	50%	25%	50%	25%	50%	25%	50%	25%	50%	25%	50%
CVb	0.7	1	0.7	1	0.7	1.1	0.7	1.1	0.8	1.1	0.8	1.1	0.8	1.1	0.8	1.1	0.8	1.2	0.8	1.2	0.8	1.2
CVm	12.1	12.8	12.4	13.1	12.7	13.4	12.9	13.6	13.1	13.9	13.3	14	13.5	14.2	13.6	14.4	13.8	14.5	13.9	14.7	14	14.8
Thin (-50%)	1	1	1	2	1	3	2	4	3	5	3	6	4	8	5	10	6	12	7	14	8	17
Thick (+50%)	9	17	12	22	15	26	18	31	22	36	25	41	28	46	32	51	36	56	39	61	43	66
Neps(+200%)	19	37	31	59	45	85	63	116	84	152	108	193	135	239	165	290	199	345	236	406	276	472
Neps(+280%)	2	4	3	7	5	10	6	13	8	17	11	21	13	26	16	31	19	37	22	43	26	50
Total	12	22	16	31	21	39	26	48	33	58	39	68	45	80	53	92	61	105	68	118	77	133
Hairiness	6.3	7	5.7	6.4	5.3	6	4.9	5.6	4.7	5.3	4.4	5.1	4.2	4.9	4.1	4.7	3.9	4.5	3.8	4.4	3.7	4.2
RKM		13.1		12.9		12.7		12.6		12.5		12.4		12.3		12.2		12.2		12.1		12
RKM CV%	5.4	6.2	5.7	6.6	6	6.9	6.2	7.1	6.5	7.4	6.7	7.6	6.9	7.8	7	8	7.2	8.1	7.4	8.3	7.5	8.4
Elongation	8	7.4	7.8	7.1	7.5	6.9	7.4	6.7	7.2	6.5	7.1	6.4	6.9	6.3	6.8	6.2	6.8	6.1	6.7	6	6.6	6
Elong CV%	5	5.7	5.2	6	5.4	6.2	5.6	6.4	5.8	6.6	6	6.8	6.1	6.9	6.3	7.1	6.4	7.2	6.5	7.3	6.6	7.4

Table 8: Cone Yarn Quality Level for Open End Knitting

Count in Ne	8s		10s		12s		14s		16s		18s		20s		22s		24s		26s		28s	
	25%	50%	25%	50%	25%	50%	25%	50%	25%	50%	25%	50%	25%	50%	25%	50%	25%	50%	25%	50%	25%	50%
CVb	0.8	1	0.8	1.1	0.8	1.1	0.8	1.1	0.9	1.2	0.9	1.2	0.9	1.2	0.9	1.2	0.9	1.3	1	1.3	1	1.3
CVm	12.5	13.4	12.9	13.7	13.1	14	13.4	14.2	13.6	14.4	13.8	14.6	13.9	14.8	14.1	14.9	14.2	15.1	14.4	15.2	14.5	15.3
Thin (-50%)	2	4	3	5	3	7	5	9	6	11	7	14	8	16	10	19	11	22	13	25	15	28
Thick (+50%)	14	26	19	34	24	42	28	50	33	58	39	67	44	76	50	85	55	94	61	103	67	112
Neps (+200%)	39	91	53	119	68	148	84	179	101	210	119	242	137	276	156	309	175	344	196	379	216	414
Neps (+280%)	2	5	3	6	4	7	5	10	6	13	8	15	9	18	10	20	12	23	14	26	15	29
Total	18	35	25	45	31	56	38	69	45	82	54	96	61	110	70	124	78	139	88	154	97	169
Hairiness	5.9	6.6	5.6	6.3	5.3	6.1	6.1	5.9	4.9	5.7	4.8	5.5	4.7	5.4	4.6	5.3	4.5	5.2	4.4	5.1	4.3	5
RKM		10.8		10.8		10.7		10.7		10.7		10.6		10.6		10.6		10.6		10.6		10.5
RKM CV%	5.8	6.5	6.1	6.9	6.4	7.2	6.6	7.4	6.8	7.6	7	7.8	7.2	8	7.3	8.2	7.5	8.4	7.6	8.5	7.7	8.7
Elongation	7.4	6.4	7.2	6.3	7.1	6.1	7	6	6.9	5.9	6.8	5.8	6.7	5.7	6.6	5.7	6.5	5.6	6.5	5.5	6.4	5.5
Elong CV%	5.3	6.1	5.6	6.4	5.7	6.6	5.9	6.7	6	6.9	6.2	7	6.3	7.2	6.4	7.3	6.5	7.4	6.6	7.5	6.7	7.6

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.

ESA has the copyright of all its publications. No part of these publications may be reproduced in any form without the prior permission in writing of ESA.

International Involvement

ESA, representing Ethiopia, is a member of the International Organization for Standardization (ISO), and Codex Alimentarius Commission (CODEX). It also maintains close working relations with the international Electro-technical Commission (IEC) and American Society for Testing and Materials (ASTM). It is a founding member of the African Regional Organization for standardization (ARSO).

More Information?

Contact us at the following address.

The Head Office of ESA is at Addis Ababa.

☎ 011- 646 06 85, 011- 646 05 65

☎ 011-646 08 80

✉ 2310 Addis Ababa, Ethiopia

E-mail: info@ethiostandards.org,

Website: www.ethiostandards.org



Standard Mark