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# INTERNATIONAL STANDARD



# 2947

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INTERNATIONAL ORGANIZATION FOR STANDARDIZATION · МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ · ORGANISATION INTERNATIONALE DE NORMALISATION

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**Textiles — Integrated conversion table for replacing  
traditional yarn numbers by rounded values in the  
Tex System**

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**Descriptors :** textiles, yarns, units of measurement, Tex system, linear density.

## FOREWORD

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO Member Bodies). The work of developing International Standards is carried out through ISO Technical Committees. Every Member Body interested in a subject for which a Technical Committee has been set up has the right to be represented on that Committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work.

Draft International Standards adopted by the Technical Committees are circulated to the Member Bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 2947 was drawn up by Technical Committee ISO/TC 38, *Textiles*, and circulated to the Member Bodies in August 1972.

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It has been approved by the Member Bodies of the following countries :

Australia	India	Spain
Austria	Ireland	Sweden
Belgium	Israel	Switzerland
Canada	Japan	Thailand
Czechoslovakia	Mexico	Turkey
Denmark	Netherlands	United Kingdom
Egypt, Arab Rep. of	New Zealand	U.S.A.
France	Portugal	U.S.S.R.
Germany	Romania	
Hungary	South Africa, Rep. of	

No Member Body expressed disapproval of the document.

# Textiles – Integrated conversion table for replacing traditional yarn numbers by rounded values in the Tex System

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### 0 INTRODUCTION

To facilitate the implementation of the Tex System the conversion table which is the subject of this International Standard has been developed with the collaboration of experts from the following international organizations:

- Association Européenne de Moulinage
- Association of European Jute Industries
- Comité International de la Rayonne et des Fibres Synthétiques (CIRFS)
- Eurocoton
- Fédération Internationale de la Filterie
- International Association of Users of Man-made Fibres (AIUFFAS)
- International Bureau for the Standardization of Man-made Fibres (BISFA)
- International Federation of Cotton and Allied Textile Industries (IFCATI)
- International Wool Textile Organization (IWTO)
- Secrétariat International des Industries de la Maille

In compiling this conversion table, the principle has been to choose rounded values in the Tex System each of which would accommodate as many yarn counts as possible from the traditional systems without encroaching on spinners' tolerances. While in many cases rounding has been determined by purely numerical considerations, account has been taken of existing international practices or agreements. For example, where specific English cotton

counts are related to metric counts, this is reflected in the rounded tex value. The rounded values included for denier numbers form a limited selection from the range of "Continental Rounded Decitex Values", which embraces the bulk of deniers produced and is already in use by the major man-made fibre producers.

To ensure a smooth transition to the Tex System it is necessary to maintain a degree of flexibility in regard to both the choice of unit and satisfying the reasonable requirements of spinners' customers. Adoption of the rounded values in the conversion table would, however, make a substantial contribution to rationalization since 466 traditional yarn counts would be replaced by 205 rounded tex values.

When the Tex System has been fully adopted, it is hoped that a range of tex values will ultimately evolve which will have more rational intervals between linear densities than those determined pragmatically and embodied in this International Standard.

### 1 SCOPE AND FIELD OF APPLICATION

This International Standard is intended to facilitate the changeover by industry and commerce from traditional yarn numbering systems to the Tex System (see ISO/R 1144).

It provides a range of recommended rounded linear densities in the Tex System to replace the yarn numbers in the six main traditional numbering systems referred to in section 6 and covers the great majority of yarns currently produced.

The rounded tex values for count systems not covered by section 6 (e.g. Dewsbury count) may be ascertained by applying the principle on which the conversion table is based, viz. by using the relevant conversion factor from ISO/R 1144 to give the exact Tex System equivalents and then choosing a range of rounded numbers which are, as far as possible, not more than 2 % different from the exact equivalents.

**2 REFERENCE**

ISO/R 1144, *Textiles – Universal system for designating linear density (Tex System)*.

**3 CHOICE OF UNIT**

Although the rounded Tex System values in the conversion table have been expressed in terms of the basic unit, tex, the decitex equivalents have also been included because they can be used throughout the whole count range without employing decimal fractions.

The choice of unit is entirely a matter to be determined by individual sectors (or even between spinner and customer); the decitex unit, for example, is particularly suitable for fine yarns (whether spun or filament) and the tex unit for medium and coarse yarns.

**4 SYMBOLS AND ABBREVIATIONS**

The count systems referred to in the headings of columns 2 to 7 of the conversion table are given in Tables 1 and 2.

**5 APPLICATION OF THE INTEGRATED CONVERSION TABLE**

5.1 While covering the majority of spun and filament yarn production, the rounded values in the six traditional systems are not exhaustive. Where a customer requires a yarn of a specific linear density not included in the conversion table, production of such a yarn should be arranged between spinner and customer. This is particularly relevant to yarns used for the production of sewing threads, where it is necessary to work to especially fine tolerances.

5.2 With a few exceptions, fractional traditional counts have been omitted from the conversion table; the rounded Tex System values for most fractional traditional counts can usually be obtained by taking the rounded value for a count in the table having the same digits and making the necessary adjustment of the decimal sign (this is of particular significance where yarns for the carpet and tyre industries are concerned,  $Ne_c$  0,98 and  $Ne_c$  1,05 being quite common).

5.3 This International Standard is not intended to apply to the product designation of sewing threads, for which special systems are recognized by producers and customers.

TABLE 1 – Indirect systems

Symbolic abbreviation	Yarn count system	Unit of length used	Unit of mass used	Unit of yarn count number
$Ne_c$	Cotton (English)	840 yards	1 pound	840 yd/lb
$Nm$	Metric	1 kilometre	1 kilogram	km/kg
$Ne_w$	Worsted	560 yards	1 pound	560 yd/lb
$Ne_L$	Linen (wet or dry spun)	300 yards	1 pound	300 yd/lb

TABLE 2 – Direct systems

Symbolic abbreviation	Yarn count (number) system	Unit of mass used	Unit of length used	Unit of yarn count number
Tj	Jute, hemp linen (dry spun)	1 pound	14 400 yards (spyndle unit)	lb/14 400 yd
Td	Denier	1 gram	9 kilometres	g/9 000 m
Tt	Tex	1 gram	1 kilometre	g/km

6 INTEGRATED CONVERSION TABLE

Columns A and B are for information only.

1	2	3	4	5	6	7	8	A	B
Rounded value	Traditional counts or numbers						Rounded value	Exact equivalent	Deviation
	Cotton (English)	Metric	Worsted	Linen	Jute	Denier			
tex	Ne <sub>c</sub>	Nm	Ne <sub>w</sub>	Ne <sub>L</sub>	T <sub>j</sub>	T <sub>d</sub>	dtex	dtex	%
1						9	10	10,00	0,0
1,1						10	11	11,11	-1,0
1,2						11	12	12,22	-1,8
1,3						12	13	13,33	-2,5
1,6						14	16	15,56	+2,8
1,7						15	17	16,67	+2,0
2						18	20	20,00	0,0
2,2						20	22	22,22	-1,0
2,6						23	26	25,56	+1,7
2,8						25	28	27,78	+0,8
3						27	30	30,00	0,0
3,1						28	31	31,11	-0,4
3,3						30	33	33,33	-1,0
3,5						32	35	35,56	-1,6
4						35	40	38,89	+2,9
4,4						40	44	44,44	-1,0
4,8						43	48	47,78	+0,5
5	120	200				45	50	49,21	+1,6
	118		50,00	0,0					
5,1	116					51	50,91	+0,2	
	115	51,35	-0,7						
5,2	114				47	52	51,80	+0,4	
5,3	112	190				53	52,22	-0,4	
	110		52,63	+0,7					
5,5	108					55	52,72	+0,5	
		53,68	-1,3						
							54,68	+0,6	

1	2	3	4	5	6	7	8	A	B
Rounded value	Traditional counts or numbers						Rounded value	Exact equivalent	Deviation
	Cotton (English)	Metric	Worsted	Linen	Jute	Denier			
tex	Ne <sub>C</sub>	Nm	Ne <sub>W</sub>	Ne <sub>L</sub>	Tj	Td	dtex	dtex	%
5,6	106 105	180				50	56	55,56 55,71 56,24	+ 0,8 + 0,5 - 0,4
5,7	104						57	56,78	+ 0,4
5,8	102					52	58	57,78 57,89	+ 0,4 + 0,2
5,9	100	170					59	58,82 59,05	+ 0,3 - 0,1
6	98						60	60,26	- 0,4
6,2	96 95					56	62	61,51 62,16 62,22	+ 0,8 - 0,3 - 0,4
6,3	94	160					63	62,50 62,82	+ 0,8 + 0,3
6,4	92						64	64,18	- 0,3
6,6	90	150					66	65,61 66,67	+ 0,6 - 1,0
6,7	88						67	67,10	- 0,1
6,9	86	145					69	68,66 68,97	+ 0,5 0,0
7	85 84						70	69,47 70,30	+ 0,8 - 0,4
7,1	82	140					71	71,43 72,01	- 0,6 - 1,4
7,2						65	72	72,22	- 0,3
7,4	80	135					74	73,81 74,07	+ 0,3 - 0,1
7,5	79						75	74,75	+ 0,3
7,6	78						76	75,71	+ 0,4
7,7	77	130					77	76,69 76,92	+ 0,4 + 0,1
7,8	76					70	78	77,70 77,78	+ 0,4 + 0,3
7,9	75						79	78,73	+ 0,3
8	74	125					80	79,80 80,00	+ 0,3 0,0
8,1	73						81	80,89	+ 0,1

1	2	3	4	5	6	7	8	A	B
Rounded value	Traditional counts or numbers						Rounded value	Exact equivalent	Deviation
	Cotton (English)	Metric	Worsted	Linen	Jute	Denier			
tex	Ne <sub>c</sub>	Nm	Ne <sub>w</sub>	Ne <sub>L</sub>	Tj	Td	dtex	dtex	%
8,2	72						82	82,01	0,0
8,4	71	120					84	83,17	+ 1,0
	70		75	84,36	- 0,4				
8,5	69						85	85,58	- 0,7
8,7	68	115					87	86,84	+ 0,2
					86,96	0,0			
8,8	67						88	88,13	- 0,1
9	66					80	90	88,89	+ 1,2
						89,47		+ 0,6	
9,1	65	110					91	90,85	+ 0,2
								90,91	+ 0,1
9,2	64						92	92,27	- 0,3
9,4	63						94	93,73	+ 0,3
9,5	62	105					95	95,24	- 0,3
9,7	61						97	96,80	+ 0,2
10	60	100				90	100	98,42	+ 1,6
	59		99	100,0	0,0				
				100,1	- 0,1				
10,2	58	98 97					102	101,8	+ 0,2
					102,0	0,0			
					103,1	- 1,1			
10,5	57	96 95 94					105	103,6	+ 1,4
	56		104,2	+ 0,8					
				105,3	- 0,3				
				105,4	- 0,4				
							106,4	- 1,3	
10,8	55	93 92					108	107,4	+ 0,6
					107,5	+ 0,5			
					108,9	- 0,8			
11	54	91 90	80				110	109,4	+ 0,5
						109,9		+ 0,1	
						110,7		- 0,6	
						111,1		- 1,0	
11,2	53	89	79				112	111,4	+ 0,5
						112,1		- 0,1	
						112,4		- 0,4	
11,5	52	88 87	78 77				115	113,6	+ 1,2
						114,9		+ 0,1	
						115,0		0,0	

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1	2	3	4	5	6	7	8	A	B
Rounded value	Traditional counts or numbers						Rounded value	Exact equivalent	Deviation
	Cotton (English)	Metric	Worsted	Linen	Jute	Denier			
tex	Ne <sub>C</sub>	Nm	Ne <sub>W</sub>	Ne <sub>L</sub>	Tj	Td	dtex	dtex	%
11,7	51	86	76				117	115,8 116,3 116,6	+ 1,0 + 0,6 + 0,3
12	50 49	85 84 83	75 74	140			120	117,6 118,1 119,0 119,7 120,5	+ 2,0 + 1,6 + 0,8 + 0,3 - 0,4
12,2		82	73				122	121,3 122,0	+ 0,6 0,0
12,5	48 47	81 80 79	72 71 70			112	125	123,0 123,5 124,4 124,8 125,0 125,6 126,5 126,6 127,2	+ 1,6 + 1,2 + 0,5 + 0,2 0,0 - 0,5 - 1,2 - 1,3 - 1,7
13	46 45	78 77 76	69 68 67				130	128,2 128,4 129,9 130,3 131,2 131,6 132,2	+ 1,4 + 1,2 + 0,1 - 0,2 - 0,9 - 1,2 - 1,7
13,5	44 43	75 74 73	66 65				135	133,3 134,2 135,1 136,3 137,0 137,3	+ 1,3 + 0,6 - 0,1 - 1,0 - 1,5 - 1,7
14	42	72 71	64 63	120		125	140	137,8 138,4 138,9 140,6 140,8	+ 1,6 + 1,2 + 0,8 - 0,4 - 0,6
14,5	41 40	70 69 68	62 61 60				145	142,9 144,0 144,9 145,2 147,1 147,6	+ 1,5 + 0,7 + 0,1 - 0,1 - 1,4 - 1,8
15	39	67 66	59	110		135	150	149,3 150,0 150,1 150,3 151,4 151,5	+ 0,5 0,0 - 0,1 - 0,2 - 0,9 - 1,0



1	2	3	4	5	6	7	8	A	B
Rounded value	Traditional counts or numbers						Rounded value	Exact equivalent	Deviation
	Cotton (English)	Metric	Worsted	Linen	Jute	Denier			
tex	Ne <sub>c</sub>	Nm	Ne <sub>w</sub>	Ne <sub>L</sub>	Tj	Td	dtex	dtex	%
15,5	38	65	58				155	152,7	+ 1,5
		64	57					153,9	+ 0,7
								155,4	- 0,3
								156,3	- 0,8
16	37	63	56				160	158,2	+ 1,1
		62	55			145		158,7	+ 0,8
								159,6	+ 0,3
								161,1	- 0,7
16,5	36	61	54				165	161,3	- 0,8
		60		100				163,9	+ 0,7
								164,0	+ 0,6
								165,4	- 0,2
16,7	35					150	167	166,7	+ 0,2
								167,1	- 0,1
								168,7	+ 0,8
								169,5	+ 0,3
17	34	59	52				170	170,3	- 0,2
		58						172,4	- 1,4
								173,7	+ 0,7
								175,4	- 0,2
17,5	33	57	51				175	177,2	- 1,3
								178,6	+ 0,8
								178,9	+ 0,6
								180,8	- 0,4
18	32	56	49				180	181,8	- 1,0
		55		90				183,7	- 2,0
								184,5	+ 0,3
								185,2	- 0,1
18,5	31	54	47				185	188,5	+ 0,8
								188,7	+ 0,7
						170		188,9	+ 0,6
								190,5	- 0,3
19	30	53	46				190	192,3	- 1,2
		52						192,6	- 1,4
								196,1	- 0,6
								196,8	+ 1,6
19,5	29	51	45				195	200,0	0,0
								201,3	- 0,6
								203,6	+ 0,7
								204,1	+ 0,4
20	28	50	44				200	206,0	- 0,5
								206,7	+ 1,6
								208,3	+ 0,8
								210,9	- 0,4
20,5	27	49	43				205		
21	26	48	42				210		
21	25	47	41				210		