

# Resizing Patterns or Threads

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## RESIZING PATTERNS OR THREADS

Occasionally you may wish to work a lace pattern with a different thread from the one specified. But to use a thicker thread you have to enlarge the pattern, and to use a finer thread you have to reduce the size of the pattern. On other occasions you may wish to change the size of the pattern, in which case the size of the thread must be altered. The question is “How much should you alter the pattern or the thread?”

For linen threads I have constructed the table on the next page to help you make the size conversions. This is for linen threads numbered according to the English (Nel) system. For threads numbered according to the metric (Nm) system divide by 0.6 or multiply by 1.67 to convert to the Nel equivalent. (For example, the Nm number of Madeira Tanne 30 is 50/2, which is equivalent to a Nel number of approximately 80/2.)

### Changing the Thread Size

First find the original thread in the left-hand column, then follow the row to the column with the thread you want to use. The intersection between the row and the column gives you the percentage by which you need to change the pattern. For example:

The pattern specifies 50/3 linen thread, but you want to use 40/2 linen thread.

Find 50/3 in the left-hand column, follow the 50/3 row to the 40/2 column.

The value at the intersection is 91%, so you decrease the pattern size to 91% of the original.

### Changing the Pattern Size

First find the original thread in the left-hand column, then follow the row to the column with the percentage by which you want to change the original pattern. The thread at the top of this column is the one you need to use. For example:

You have reduced the pattern which specifies 35/3 linen thread to 85% of the original.

Find 35/3 in the left-hand column, follow the 35/3 row to the nearest value to 85%, which is, in fact, 84%.

Now follow the column containing 84% to the top cell, which is 50/3, the thread size to use.

### Working out Percentages

Some people take fright at the thought of working out percentages, but it is really quite easy. Here is a simple formula which applies both to inches or centimetres:

$$\frac{\text{new length}}{\text{old length}} \times 100 = \text{percentage change in length}$$

Example:

You have a pattern which is 16 cm in length.

You want to reduce it to the new length of 12 cm.

Putting these values in the formula you obtain:

$$\frac{12}{16} \times 100 = 75$$

So you need to reduce your pattern to 75% of the original.

## Thread Size Conversion Table

	16/2	20/2	35/3	40/3	28/2	30/2	50/3	35/2	40/2	50/2	78/3	60/2	70/2	80/2	90/2	100/2	
16/2		89	83	77	76	73	69	68	63	56	55	52	48	45	42	40	16/2
20/2	112		93	87	85	82	77	76	71	63	62	58	53	50	47	45	20/2
35/3	121	108		94	91	88	84	82	76	68	67	62	58	54	51	48	35/3
40/3	129	115	107		98	94	89	87	82	73	72	67	62	58	54	52	40/3
28/2	132	118	110	102		97	92	89	84	75	73	68	63	59	56	53	28/2
30/2	137	122	113	106	104		95	93	87	77	76	71	65	61	58	55	30/2
50/3	144	129	120	112	109	105		98	91	82	80	75	69	65	61	58	50/3
35/2	148	132	122	115	112	108	102		94	84	82	76	71	66	62	59	35/2
40/2	158	141	131	122	120	115	110	107		89	88	82	76	71	67	63	40/2
50/2	177	158	146	137	134	129	122	120	112		98	91	85	79	75	71	50/2
78/3	180	161	149	140	136	132	125	122	114	102		93	86	81	76	72	78/3
60/2	194	173	160	150	146	141	134	131	122	110	107		93	87	82	77	60/2
70/2	209	187	173	162	158	153	145	141	132	118	116	108		94	88	84	70/2
80/2	224	200	185	173	169	163	155	151	141	126	124	115	107		94	89	80/2
90/2	237	212	196	184	179	173	164	160	150	134	132	122	113	106		95	90/2
100/2	250	224	207	194	189	183	173	169	158	141	139	129	120	112	105		100/2
	16/2	20/2	35/3	40/3	28/2	30/2	50/3	35/2	40/2	50/2	78/3	60/2	70/2	80/2	90/2	100/2	copyright Vibeke Ervø 1988

The table is used in the same way as tables for finding distances between towns.

### Changing the Thread Size

First find the original thread in the left-hand column, then follow the row to the column with the thread you wish to use. The intersection between the row and the column gives you the percentage by which you need to change the pattern.

### Changing the Pattern Size

First find the original thread in the left-hand column, then follow the row to the column with the percentage by which you wish to change the original pattern. The thread at the top of this column is the one you need to use.

## Thread Numbering

### Numbering Systems

Threads used in lacemaking are usually made up of several single strands twisted or plied together. The numbering system for threads has two parts: one related to the thickness of the single strand and the other to the number of strands (ply). Whereas the ply is expressed in a straightforward manner, the thickness of the single strand is not specified directly but as a 'count' related to the length per unit weight.



Thus, a 30/2 thread (Nel) is a two-ply thread, and each single strand measures 30 x 300 yd / lb. Note that the 'count' is inversely related to the thickness — the higher the count, the thinner the thread. So a 30/2 thread is thinner than a 20/2 thread. (Obviously, for a thread of a particular count, the thickness will be directly proportional to the ply — the higher the ply, the thicker the thread. So a 35/3 thread is thicker than a 35/2 thread.)

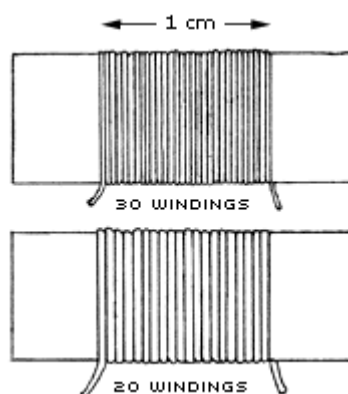
### Comparing threads for changing patterns

The key point in comparing threads for changing patterns is that the thickness of the thread is its diameter. When reducing or enlarging a pattern, the diameter of the thread should be changed by the same amount so as to keep the ratio between the diameter and the size of the pattern constant.

### Measuring the ratio of thicknesses

The most obvious way of comparing the thickness of two threads is by measuring their diameters. It is easiest to do this by winding the thread round a ruler and measuring the number of windings over a certain length. To obtain the diameter divide this length by the number of windings.

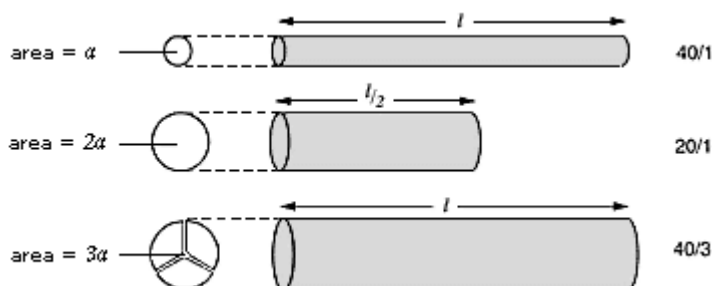
Consider, for example, that we wish to change from a 80/2 thread to a 35/2 thread. When we wind these round a ruler we find that for the 80/2 thread there are 30 windings per cm, whereas for the 35/2 thread there are 20 windings per cm (shown on the right). Thus, the 80/2 thread is thinner than the 35/2 thread by a factor of 20/30, i.e. it is 67% as thick. (Conversely, the 35/2 thread is 150% the thickness of the 80/2 thread.)



Although the method is not exact because one person may wind more tightly or loosely than another, if the same person makes both windings the result will be accurate enough in practice.

### Calculating the ratio of thicknesses for the Table

Instead of measuring the ratio of thicknesses of two threads, this can easily be calculated if they belong to the same numbering system. The diagram may help you to follow the calculation. It shows how the cross-section area of a thread changes with thread number and ply.



You will see that it is easy to find the relative difference in cross-section area of two threads but, as we want to compare the thicknesses, it is the relative difference in diameter of the threads that we need. It may be obvious to some readers that this will be the square root of the ratios of ply/count for the two threads. However others may wish to check the logic of this below.

Area  $a = \pi r^2 = \pi(d/2)^2$  where  $r$  is the radius and  $d$  the diameter

Hence:  $d = 2\sqrt{a/\pi}$

Thus, the ratio of the diameters of two threads, 1 and 2, is:

$$\frac{d_1}{d_2} = \sqrt{\frac{a_1}{a_2}} \quad \text{as the 2 and the } \pi \text{ cancel out.}$$

Now, the area  $a \propto \frac{\text{Ply}}{\text{Count}}$ .

$$\text{Therefore: } \frac{d_1}{d_2} = \sqrt{\frac{\text{Ply}_1 / \text{Count}_1}{\text{Ply}_2 / \text{Count}_2}}$$

As an example, the percentage change in going from a 78/3 to a 35/2 thread is calculated:

$$\frac{d_{78/3}}{d_{35/2}} = \sqrt{\frac{3/78}{2/35}} = \sqrt{\frac{3 \times 35}{2 \times 78}} = \sqrt{\frac{105}{156}} = \sqrt{0.67} = 0.82 = 82\%$$

This is the value that you will find in the table.

### Effect of Thread Type

Comparing thread numbers or windings can only provide guidance on suitable threads for a pattern as other properties also affect the way in which a thread performs. For example, two threads may have the same number (weigh the same per unit length), but if one is tightly spun it will be thinner and work up as if it had a higher number than the loosely spun one. Differences in elasticity will also affect how a thread behaves, and care is necessary when comparing, for example, an elastic one like wool with a non-elastic one like linen.

### Further information about threads and numbering systems

*The Batsford Book of Hand and Machine Knitted Laces*, Tessa Lorant (pp. 41–45)

*Thread and Pricking: a Partnership*, Martina Walter-Kampmann, ISBN 3-9802279-2-8. Originally published as *Faden und Brief: Ein Zusammenspiel*, ISBN 3-9802279-0-1.

*Threads for Lace: a survey and comparison chart of over 600 lacemaking and other threads*, Brenda Paternoster (2001)

*Threads of Lace from Source to Sink*, Pat Earnshaw, ISBN 0-9513891-1-4.

## Mechanics of changing Sizes

### Using a photocopier

The most obvious way to change the size of a pattern is using a photocopier. Most modern machines allow you to enter the percentage by which you wish to enlarge or reduce the original, although older ones may restrict you to a limited number of 'presets'.

Some photocopiers may distort the pattern slightly, so you should check that the proportions are the same as in the original.

### Using a scanner and graphics program

If you have a scanner you can scan the original pattern and then import it into a graphics program for resizing. Even if you don't have a sophisticated program like *Adobe Photoshop* or *Paintshop Pro*, there will probably be a simple image manipulation program bundled with your scanner. Failing that you can use a program that came with your computer, like *AppleWorks* or *Windows Paint*.

Many programs allow you to resize a scan by a specific percentage, but in others (e.g. *Windows Paint*) you may have to specify a new size in inches or centimetres.

## Postscript

Do make sure that it really is a good idea to resize your pattern. Although it is possible to change the size of any pattern, it is not always a good idea to do so. Remember that many traditional laces, e.g. Bucks Point, Tønder, Honiton, owe a great deal of their distinctive character to the fine threads used. If you enlarge these patterns and use thicker threads the lace isn't really Bucks Point, Tønder or Honiton any more.

The 'right' thread for any pattern is partly a matter of personal preference — some people like a fairly solid lace while others prefer a more open structure and would use a finer thread for the same pricking. Everyone works differently, so it is always advisable to make a small sample to check whether the chosen thread is suitable.