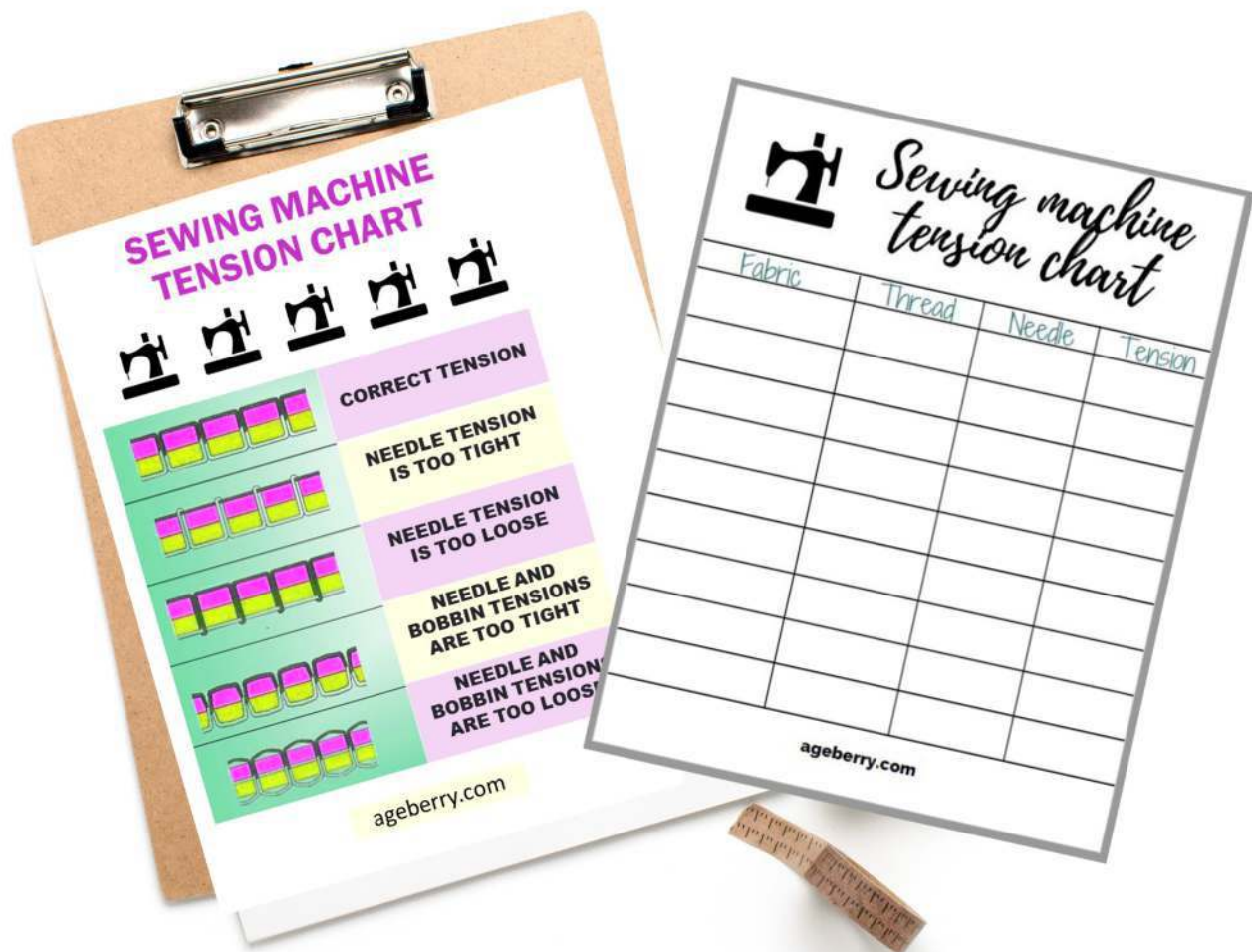


HOW TO *adjust* SEWING MACHINE TENSION

SEWING TUTORIAL (2 FREE PRINTABLES)



Sewing Machine Tension Adjustment

Learning **sewing machine tension adjustment** can seem overwhelming, but it is a foundational sewing skill that every sewist must have in their arsenal. This article will explain what sewing machine tension is, its function, why we need to adjust it, how to find the right tension for your project, and how to solve sewing machine tension problems. Let's get started!



You've probably been in this scenario before:

After a long day of work and daydreaming about a new piece you want to create, you finally get a chance to sit down at your machine. You thread the machine, check your settings, carefully place your fabric, lower the presser foot, and carefully tap down on the pedal. All of a sudden—BAM! You're left with a messy jumble of thread and... well, a broken heart. What a pain!

Yes, there are few things more frustrating than sitting down to sew and dealing with a sewing machine tension problem. So, today I want to talk about this annoying thing that every sewist has dealt with...sewing machine tension.

Ready to learn how to fix sewing machine tension?

Make sure to bookmark this article, or even print it and keep a copy with your sewing machine manual because these tips and tricks will save you a lot of headaches!

What is sewing machine tension?

Sewing machine tension is a fancy way of indicating the amount of thread that can go through your machine at a time. If you have a looser stitch, that means more thread is coming out at once, vs a tight stitch, when the machine is only giving a little thread at a time.

Interestingly enough, it is called sewing machine tension because when it doesn't cooperate it gives the sewist plenty of tension.

Okay, that's a joke, but I could see that being part of the origin, couldn't you?

What does sewing machine tension do?

Despite the tension that it can cause (hah), sewing machine tension serves a necessary function for your machine. As you probably have experienced, sewing machine tension is one of those things we don't really think about too much, until it starts going terribly wrong.

Each fabric has a different weave, and a different weight. This means that the tension will need to change as you switch materials. Without tension, your thread wouldn't be able to feed correctly through the machine, and thus the fabric.

One of the most common sewing problems is the incorrectly adjusted thread tension but adjusting it doesn't mean that you have to rush to a service center. Usually, it is simple to make such adjustments and you will need to do that often, depending on the thread used (type and thickness), fabric, stitch type, and needle size. It is important to have at hand a manual and a lot of patience. Even the most expensive and high-quality sewing machine requires additional thread tension adjustments for different fabrics.

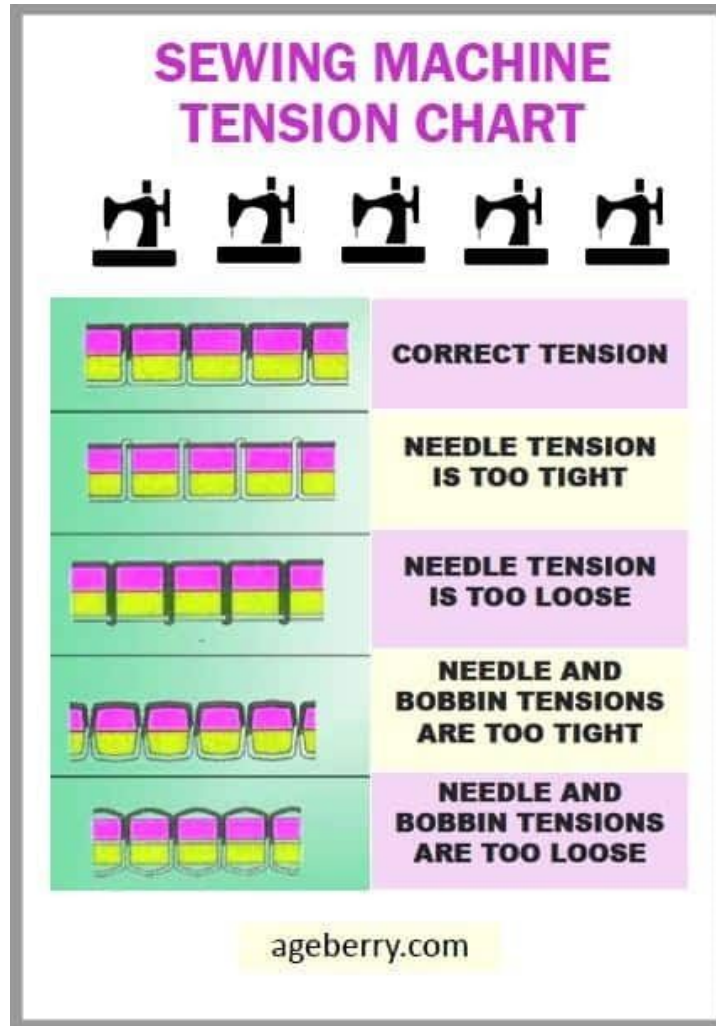
How does sewing machine tension work?

As we talked about above, the tension determines how much thread your machine will give with each stitch. The tension is determined by both the upper and lower parts of your machine—you will want these to be balanced. You will know when you have achieved this as you will not see any loops, **puckering**, knots or loose threads on the top side or bottom of your fabric.

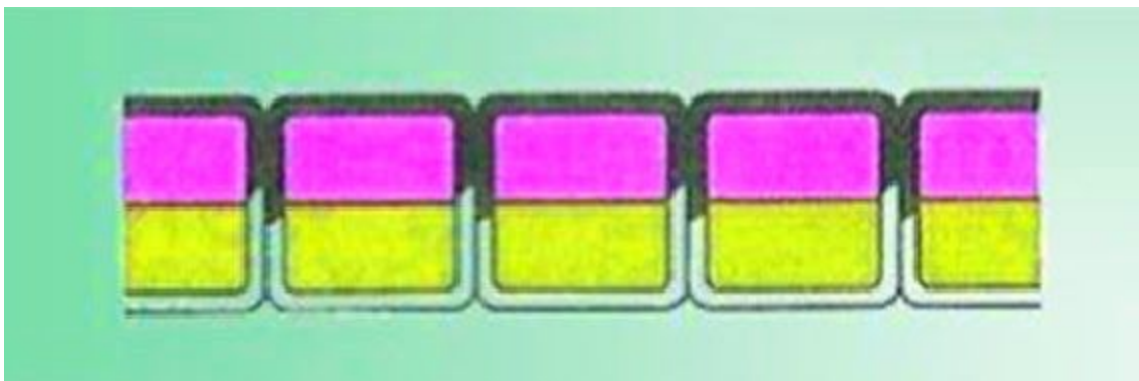
The upper tension is also called thread tension and consists of two metal disks kept together by a coiled spring. The lower tension is called bobbin tension and it's working in conjunction with the upper tension.

When you raise the presser foot the pressure between the metal disks is automatically released and there is no more thread tension and the thread passes through the disks freely without any tension.

Here's a **sewing machine tension chart** you may find helpful when learning how thread tension works. Here we have 2 layers of fabric (pink and yellow) that are sewn together with a straight stitch formed by black and white threads.



1 – Correct tension on a sewing machine



See how the threads fit snugly on the fabric? Also, notice how the upper and lower threads meet at the halfway point. In books, they say that the correct straight stitch has threads locked between two layers of fabric. This is the ideal case. And you can usually see it on heavyweight fabrics. You will only see

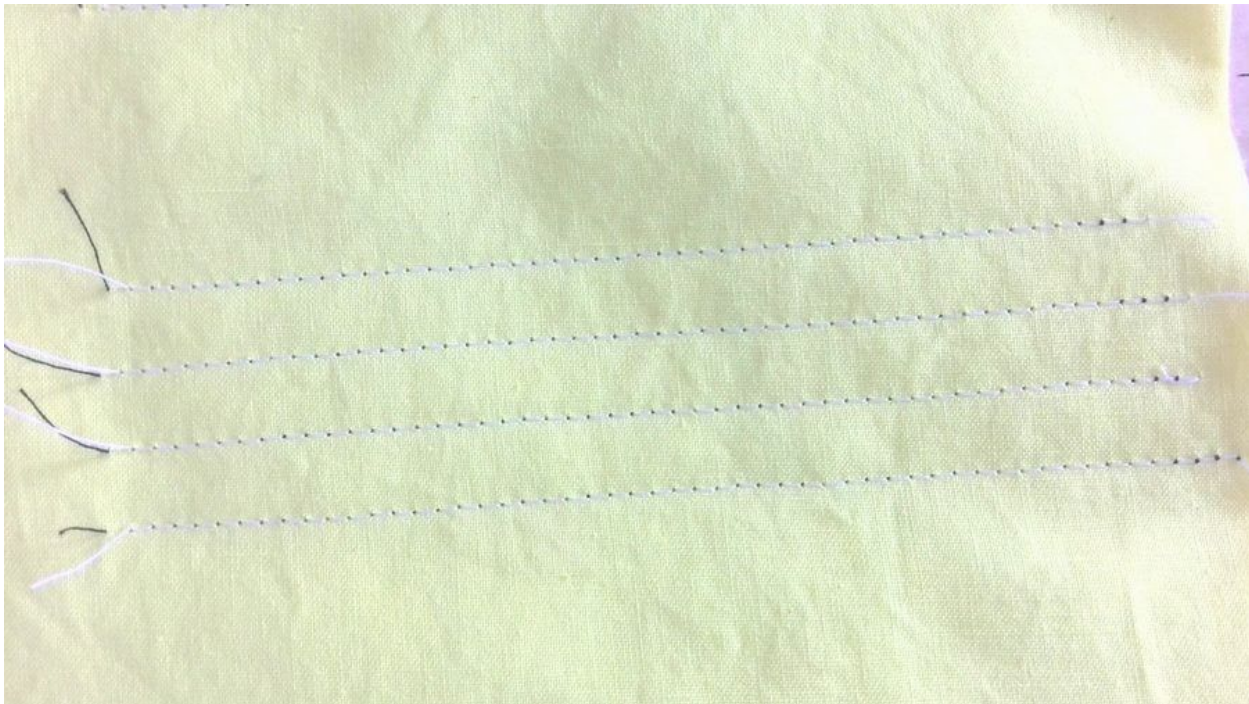
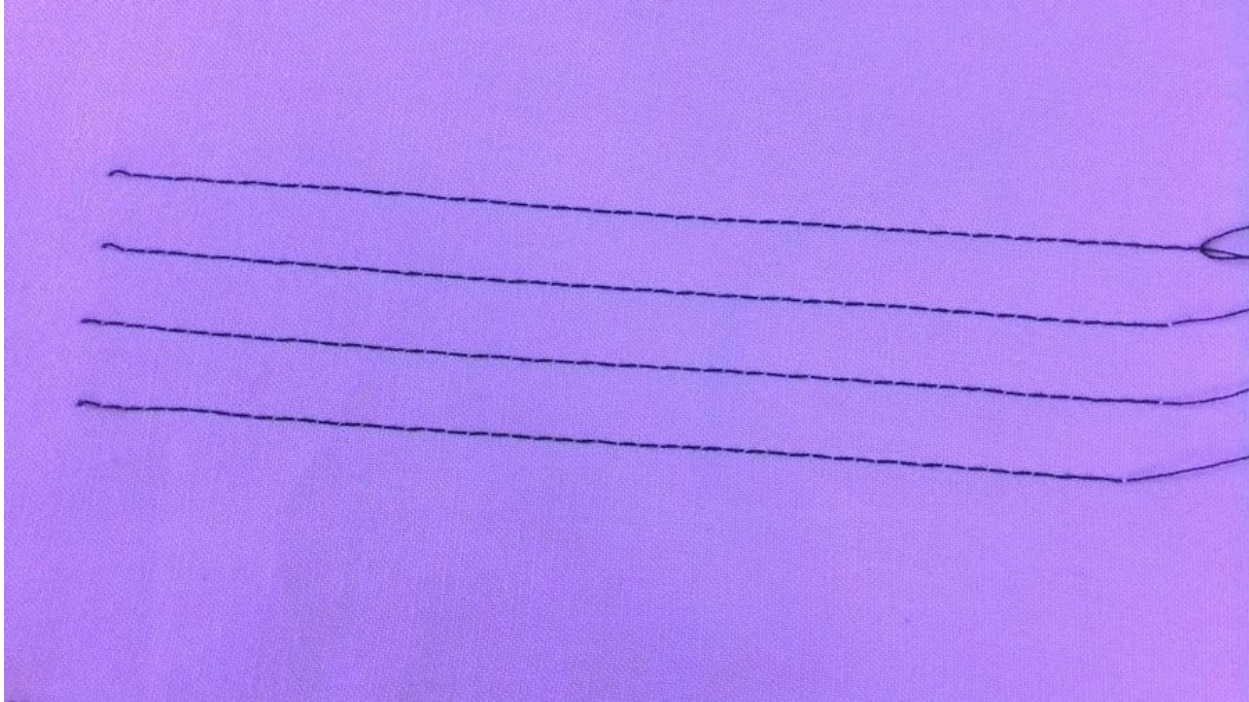
one thread on each side: in this case the black needle thread on the upper side and the white bobbin thread on the lower side. The loops (where the bobbin thread goes around the needle thread) are hidden between the layers of the fabric.

But in reality, this doesn't happen often especially if the fabric is medium weight or lightweight. You will see a different picture: you **might see both threads on both sides** since the fabric is not thick enough to hide the loops, especially if you are not using thin thread appropriate for thin fabric. This does not necessarily mean that the tension is incorrect, **if the stitch is regular, even, tight, without puckers, if it is clearly visible where one individual stitch ends and another begins then all is good.**

Here I have two pieces of quilting cotton, pink and yellow as in the graph above, and I am going to use black and white threads (Gutermann, all-purpose polyester thread) to show you real examples on fabric.



In these seams (in the images below) I have two layers of pink fabric and two layers of yellow fabric (I used two layers of each just to make it thicker), I am using an 80/12 universal needle, and I **still can see both threads on each side**. The loops of black and white threads are **really really small**, but they are clearly visible in the images below.

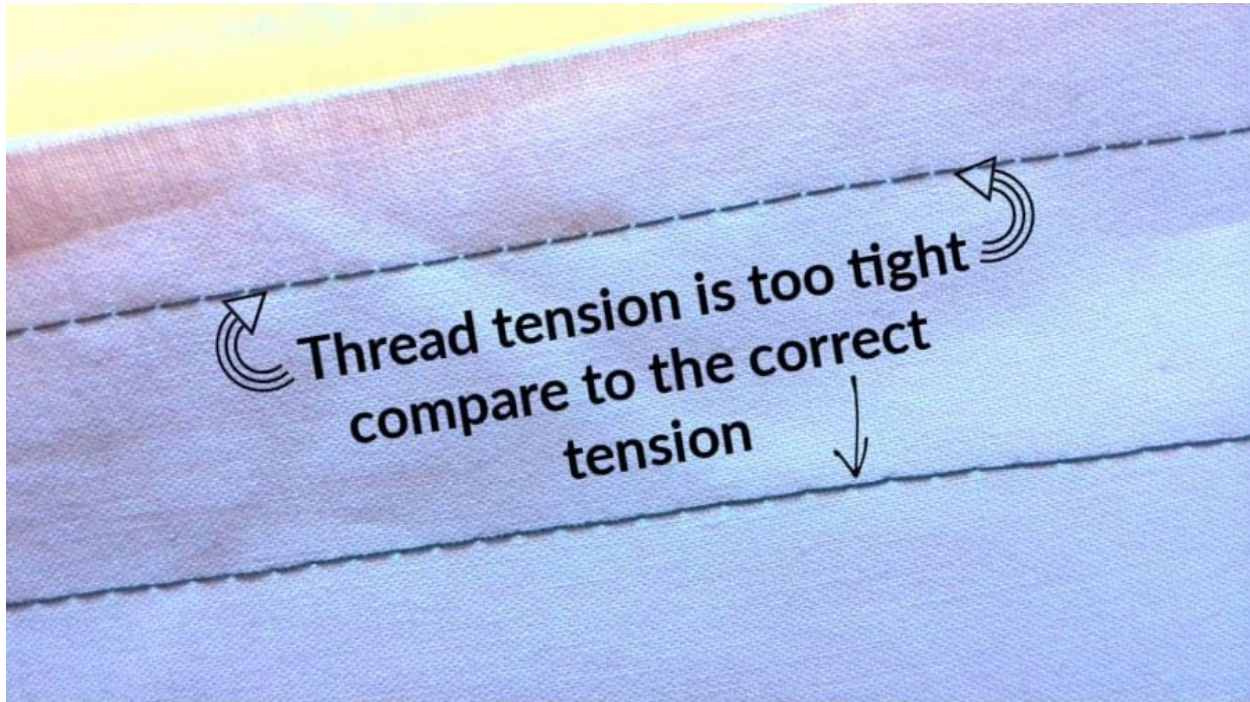


This stitch has correct tension and doesn't need tension adjustments. If you are using threads of the same color in the needle and in the bobbin (which is what we usually do, right?) you will not see any loops and the stitch will look correct.

This is true not only for the straight stitch but also for any other stitches. For example, for zigzag stitch.

2 – Upper tension (or needle tension) is too big

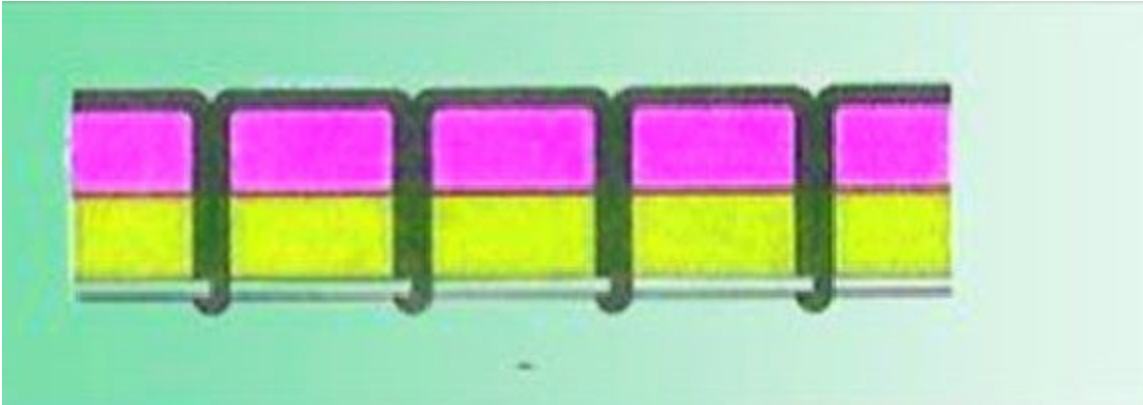
In this case, the needle thread (black) is pulling the bobbin thread (white) to the top fabric and you will see bigger loops of bobbin thread on the top fabric. To adjust the tension you will need to lower the thread tension in his case.



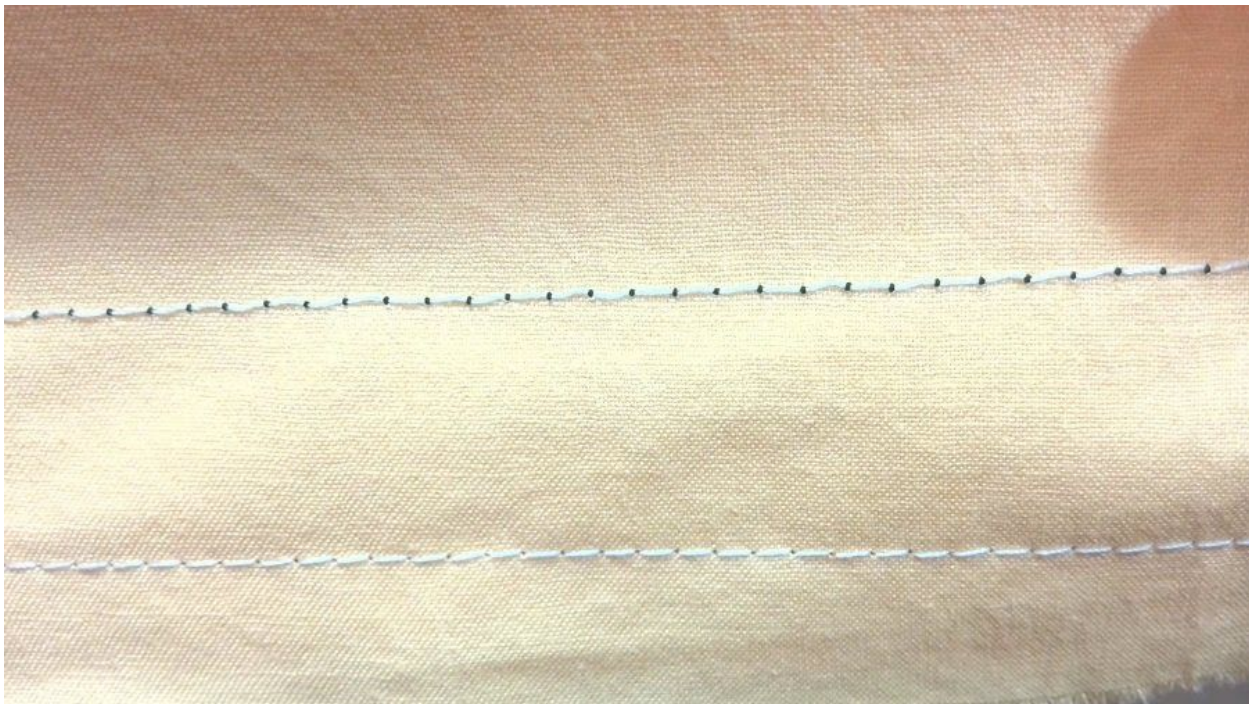
On most sewing machines the default number for the thread tension is set to 4.

In my example, I have the thread tension set to 8.

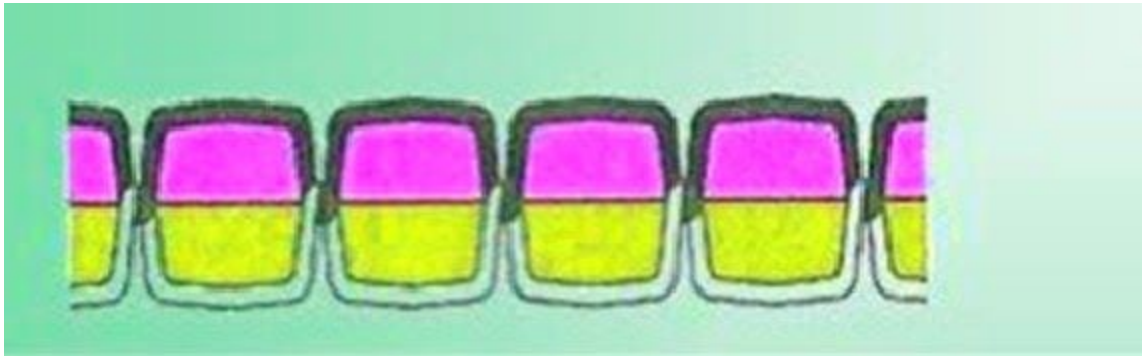
3 – Upper tension (or needle tension) is too small



In this case, we will see the bigger loops of the needle thread (black) on the bottom fabric. You will see again that the upper and lower threads don't interlock halfway between the fabric layers.



4 – Overall tension is too tight



It happens for example when you try to sew some heavyweight fabrics without adjusting the tension first.

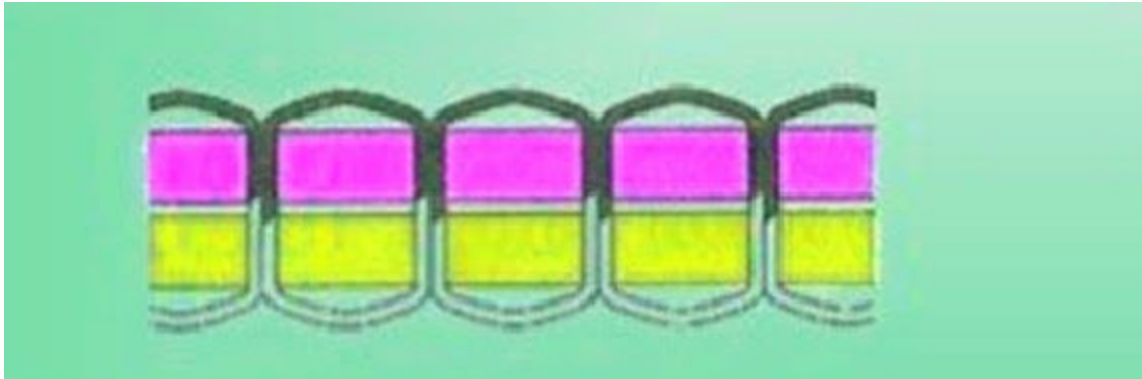
This leads to puckering or the thread breaking. By the way, if you want to sew [without fabric puckering check out my course How to fix or prevent seam puckering.](https://www.ageberry.com/seam-puckering/)
<https://www.ageberry.com/seam-puckering/>



Seam puckering on heavyweight upholstery fabric

In this case you will need to adjust not only the needle thread tension but also the bobbin tension. I have a [separate tutorial on adjusting the bobbin tension, check it out here.](https://www.ageberry.com/bobbin-tension/)
<https://www.ageberry.com/bobbin-tension/>

5 – Overall tension is too weak



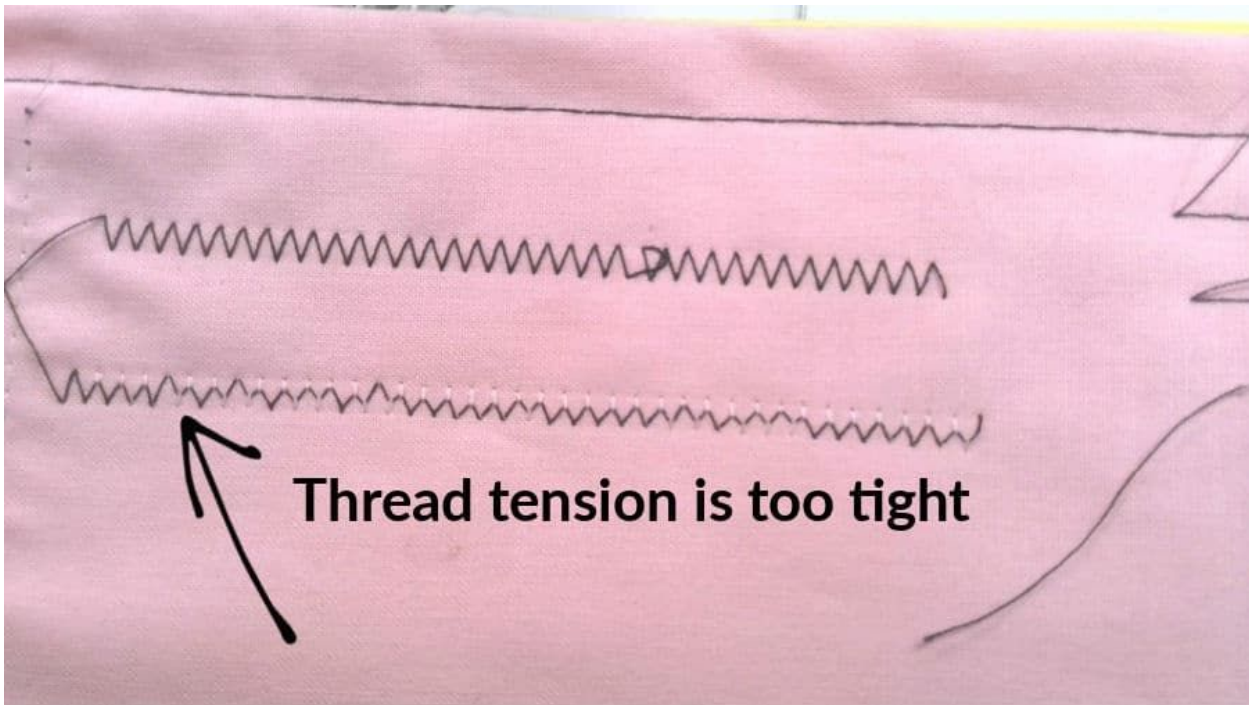
Here is where you will start to see big loops in your fabric on both the bottom and the top. This happens more often when you forget to put the presser foot down and sew with it still in the up position. I can't give you an example with my current sewing machine as it doesn't start with the presser foot up.

Now let me show you some examples with zigzag stitches.

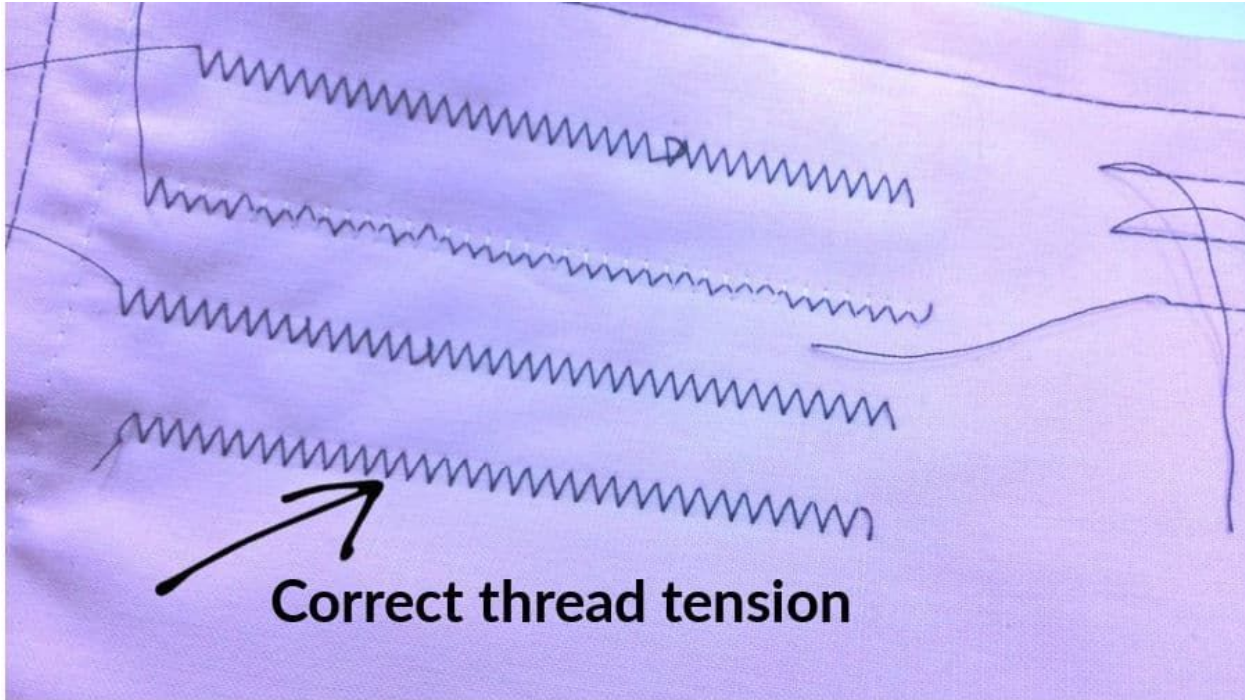
Look at the image below. You can see big loops of black thread on the yellow fabric (bottom fabric). This means that the bobbin tension is too tight and the upper tension (the needle tension) is too loose for this stitch. You will need to make the upper tension bigger in this case.



And here is another example. In the image below we can see that the upper tension is too tight and the white bobbin thread is clearly visible on the top fabric. To adjust the tension, we need to move the upper tension to a lower number.



And this is an example of correct tension for the zigzag stitch: it looks the same on both sides.



When do I need to adjust tension?

If you notice your thread looping, knotting, or fabric is puckering, you may need to adjust the sewing machine tension. Also, uneven, unbalanced stitches that don't lie straight on the fabric are a good indication that you need to make a tension adjustment.

By the way, there are several things that could cause puckering. Learn [how to avoid puckering and become a better seamstress](https://www.ageberry.com/seam-puckering/) here! <https://www.ageberry.com/seam-puckering/>

How to Adjust Tension

What to Check Before You Adjust Tension

Your machine has multiple components to it, so when an error occurs with the thread, it may not *always* be the tension. There are a few other things you'll want to check before you start playing with the tension of your machine.

Dirt and Debris

Your machine interacts with plenty of thread and fabric, both of which can leave behind debris and dust. Take a look around your bobbin and make sure there aren't any clogs that need to be removed.

Thread

As any sewist knows, all thread is not equally created. A lesser expensive thread may seem like a deal at the store, but trust me—it's not worth the trouble it will cause! Cheap threads will lead to breakage. If you have a poor-quality thread in your machine, switch it out for a quality version and see if the issues are resolved. Learn about [different types of threads in my tutorial at this link](https://www.ageberry.com/sewing-thread-types-and-uses/).
<https://www.ageberry.com/sewing-thread-types-and-uses/>

Also, if you have different types and sizes of threads in the needle and in the bobbin you may have big problems with adjusting tension. It's better to use the same types and sizes in the needle and in the bobbin. Of course, there are exceptions, but in general this is the good rule to follow.

Needles

Did you know that needles wear out and need to be replaced? A hard-working needle will lose its sharp point eventually, and will need to be replaced for one that is not blunt.

You should be regularly replacing your machine's needle. A good rule of thumb is to change it out after you have gone through three bobbins of thread, or about every eight hours of sewing.

Bobbin

If your bobbin is wound by hand, it's possible it was done unevenly. This can lead to problems with your sewing machine tension – the tension will be uneven, and you might have irregular stitches. Check out [my tutorial on how to wind a bobbin correctly](https://www.ageberry.com/how-to-thread-bobbin/). <https://www.ageberry.com/how-to-thread-bobbin/>

How to Adjust Sewing Machine Tension

After checking the above, you may realize that you have a true sewing machine tension problem on your hands. Here are some steps to take when you are trying to adjust the machine tension.

First of all, **use a scrap piece of fabric**. Part of adjusting the tension is trial and error. You don't want to practice the tension on your project, so use a scrap piece instead.

Secondly, make sure to **consult your owner's manual**, as every machine is different. While these steps should generally work for any machine, each one has its own idiosyncrasies to consider as well.

Most of the time you will only need to adjust the upper thread tension. The bobbin tension is set by the manufacturer when you get the machine, so the problem is *usually* with the upper tension. Assume the lower tension is correct and the upper tension is the problem—that's usually the case.

How you actually adjust the tension on your machine will vary from brand to brand and model to model. Typically there is either a button or a dial dedicated to tension. The dial (or display screen for digital versions) will have numbers around it. To loosen the upper tension turn the dial to the left towards a lower number. To tighten, turn to the right towards the higher numbers.

On modern computerized machines the tension number is displayed on screen and you need to press + or – to adjust the tension.

Run your scrap fabric through the machine and then recheck tension. If it is still incorrect, you can turn the dial a bit more, then try again. Repeat as necessary.

How to Check Bobbin Tension

If you are still having issues after adjusting the upper tension, it's possible that you will need to adjust the lower tension. This can be a little more tricky, but don't worry. I have an entire article dedicated to showing you [how to adjust the bobbin tension](https://www.ageberry.com/bobbin-tension/). <https://www.ageberry.com/bobbin-tension/>

Manual Tension vs Automatic Tension Adjustments

Most machines have manual tension adjustments, but there are a few that have **automatic tension adjustments**. This generally means that the machine will work to adjust itself to the fabric thickness underneath the presser foot. Some computerized machines have electronic sensors to measure fabric thickness and to adjust the tension accordingly, and some others might set the tension by stitch type. How each brand/model does that can vary and I know only one model that claims to have it – *Janome DC5100*, and I heard that some JUKI models also have this feature.

Sewing Machine Tension Problems and How to Fix Them

If after checking all of the above, the tension is still not correct, here are a few more possible sewing machine tension issues that you'll need to check.

Is the tension still not correct, no matter how much you adjust? **Check the tensioner springs**. These become worn out from time to time, and they can no longer hold the thread between their pressed discs. If this is the case, repair is necessary.

If your thread keeps fraying or breaking, take a look at the upper **tension discs**. They can become slightly rusted, and the thread guides can become damaged. Follow the line of your thread and check carefully for any damaged areas or debris.

The speed of your machine can also affect tension. If the machine tension is set correctly but your machine cannot maintain the right speed, there are possible breaks from hypertension. In this case, it requires repair or even replacement.

If you still have problems after looking at all of the above, it's time to contact a technician and have your machine serviced.

Sewing machine tension chart

Once you get the machine set to the proper tension, these two tricks can save you a lot of time and frustration moving forward.

First of all, I recommend having a printable chart that you keep with your owner's manual or in your sewing room. Write down the tension settings you have for different types of fabric. Think of this as your personal cheat sheet for tension! This is at the end of this document and can be printed separately.



The image shows a printable chart titled "Sewing machine tension chart" with a sewing machine icon. The chart is a table with four columns: Fabric, Thread, Needle, and Tension. The table has 11 rows, with the first row containing the column headers and the remaining 10 rows being empty for data entry. The website "ageberry.com" is printed at the bottom of the chart.

Fabric	Thread	Needle	Tension

ageberry.com

Also, as you are adjusting sewing machine tension, I suggest using two different colored threads but they have to be of the same type though. [Learn all about different types of thread in my tutorial at this link](#). Use a bobbin in one color and your top thread in another so that you can easily see where the problem is, rather than trying to decipher between the two white strands!

<https://www.ageberry.com/sewing-thread-types-and-uses/>

I hope you have found some helpful information in this sewing machine tension guide. Want to remember this tutorial? Post this pin to your favorite Pinterest board so that you can find the instructions later.

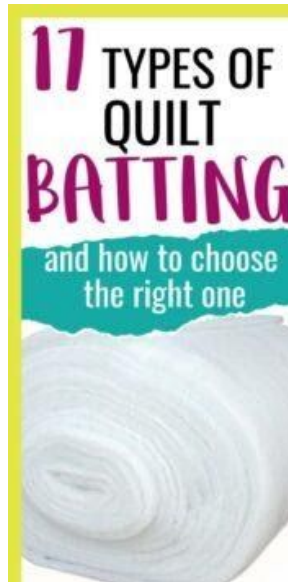
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Ready to take the next step in your sewing journey? Check out more step-by-step tutorials from my blog and don't forget to share!



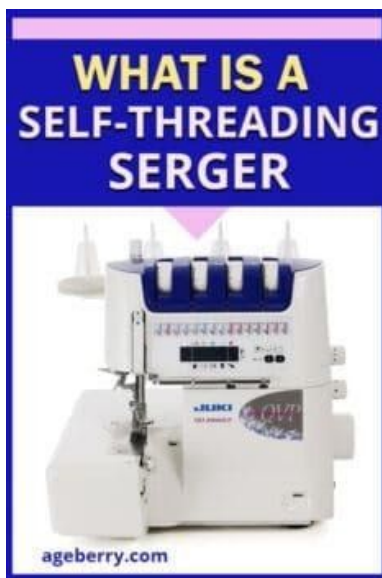
[How to sew sheer fabric using only a bobbin thread for stitching](https://www.ageberry.com/how-to-sew-sheer-fabric-using-only-a-bobbin-thread-for-stitching/)



[Best quilt batting, types of batting and how to choose batting for a project](https://www.ageberry.com/best-quilt-batting-types-of-batting-and-how-to-choose-batting-for-a-project/)



[Serger vs. sewing machine](https://www.ageberry.com/serger-vs-sewing-machine/)



[The Self-Threading Serger Yes, it Exists!](https://www.ageberry.com/the-self-threading-serger-yes-it-exists/)



[Tulle Christmas Tree](https://www.ageberry.com/tulle-christmas-tree/)



[How to square up fabric](https://www.ageberry.com/how-to-square-up-fabric/)

<https://www.ageberry.com/how-to-sew-sheer-fabric-using-only-a-bobbin-thread-for-stitching/>

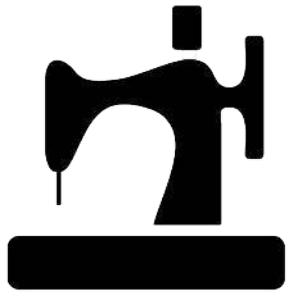
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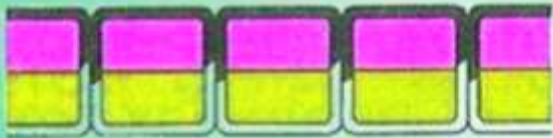
<https://www.ageberry.com/how-to-square-up-fabric/>



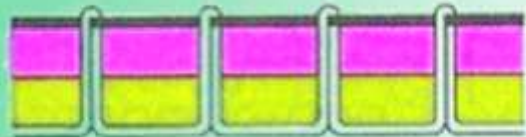
Sewing machine tension chart

Fabric	Thread	Needle	Tension

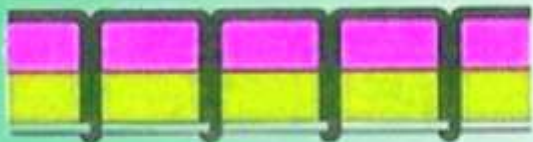
SEWING MACHINE TENSION CHART



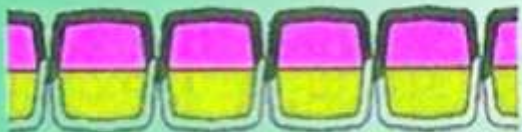
CORRECT TENSION



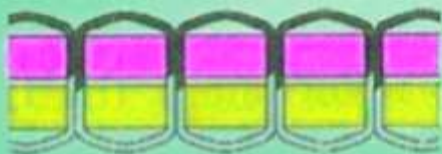
**NEEDLE TENSION
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