

CORRECT THREAD TENSION

based on visual characteristics

General

The "correct" thread tension is a result of the interaction of the upper thread tension and the bobbin thread tension.

In all illustrations, the upper thread is always shown in red and the bobbin thread is always shown in white.

The following factors must be taken into account when setting the thread tension:

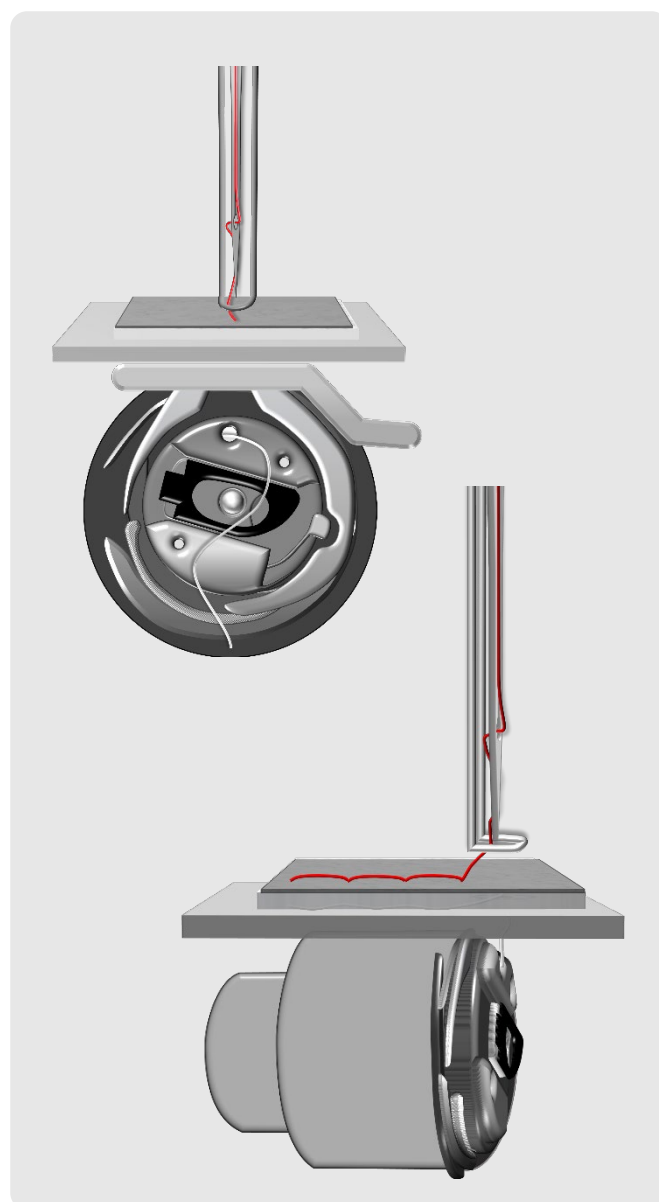
- the application
- the material
- the material height
- the thread thickness
- the use of foam

Therefore, the specified thread tensions should be regarded as recommendations.

In addition to the thread tensions in grams [g], the optical characteristics should also be taken into account.

The embroidery file of the I or H test, you can use to set and check the thread tension on your machine.

In addition, the threading and the quality of the needle should also be checked in the case of unclear seam patterns.



Thread tension in standard embroidery

1. Bobbin thread tension

For conventional embroidery we recommend a thread with a fineness of 150–180 Tex. A tension of 25–30g should be used.

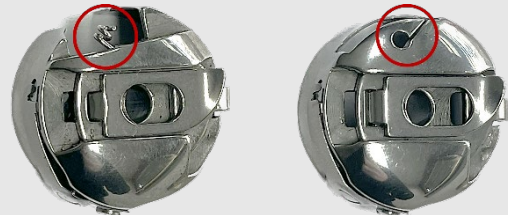
To check and adjust this thread tension, we offer two different thread tension gauges:

- Mechanical: **Art.Nr.: 570.632**
- Electrical: **Art.Nr.: 570.800**



Notes:

The thread should not be taken out of the marked deflection point when measuring the tension.

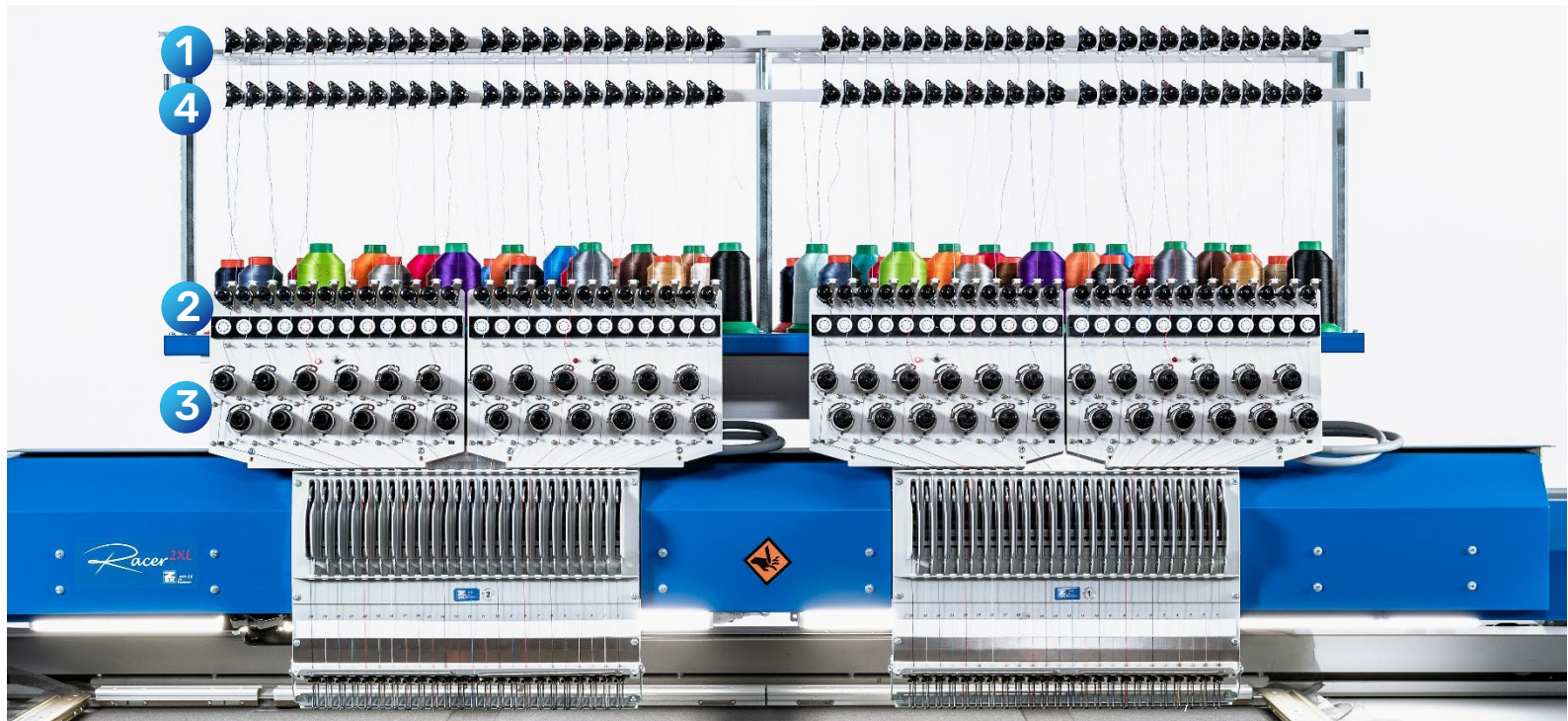


If the so-called prewound bobbins are used, the leaf spring must be removed from the bobbin case.



Here you can get more information about the different bobbin capsules:



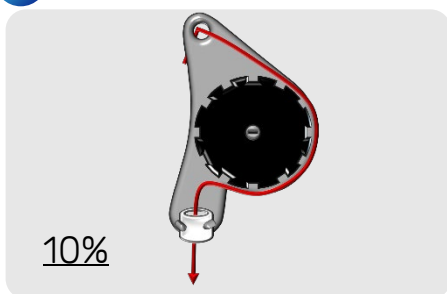


2. Upper thread tension

On current ZSK machines, there are three thread tensions per needle or four thread tensions per needle on leather machines.

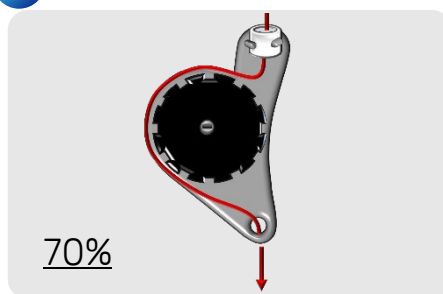
These are threaded as follows and the tensions are distributed as a percentage according to the following rule of thumb.

1 Uppermost thread tension



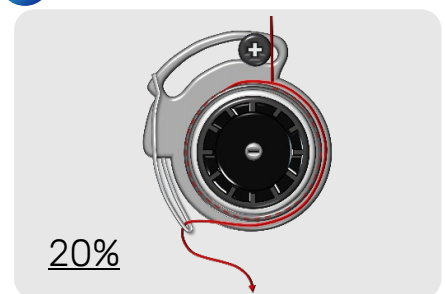
Set this tension just high enough to calm the thread and loosen loops from metal yarns. Metal yarns must not run through hoses between the 1st & 2nd tension, but through white bushings (thread guide).

2 Middle thread tension



The actual thread tension is set here.

3 Roller thread tension



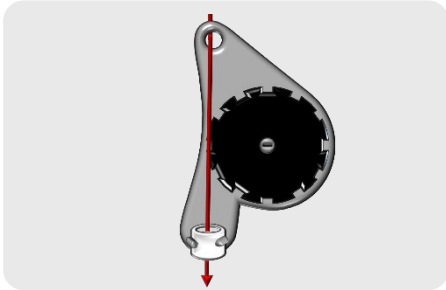
Before this tension, the wheel of the thread break detection must be wound (clockwise). The roller tension should be set as low as possible. This is also called fine tension.



Exception: For the 1st (upper thread tension): 18-needle thread tensions.

Here, the thread is additionally placed in the slot of the thread tension bolt. This prevents the thread from slipping out of the 1st tension.

4 Additional thread tension



On leather machines, there is an additional row of thread tensions between the 1st thread tension and the middle thread tension on the thread stand.

This is not required for standard embroidery with embroidery thread. Therefore, the thread is simply guided past the thread tension using the thread guide eyelet.

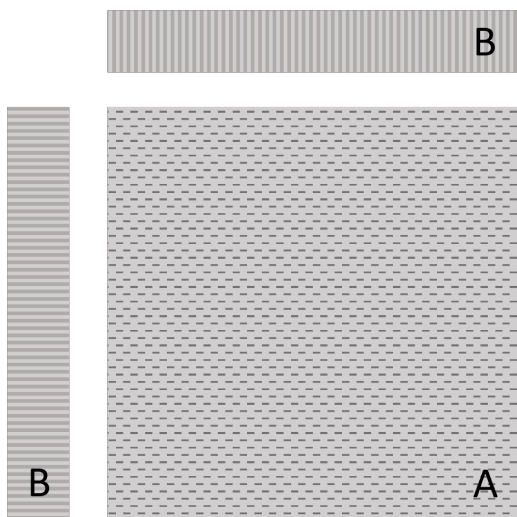
These additional thread tensions are not part of the standard machine design.

I or H test

In this test, a satin stitch is embroidered in two opposite directions. The tension can be checked here.

In addition, a square is embroidered with a backstitch as a filling.

In addition, it should be noted that the embroidery ground is not pulled together.



A: Size 30x30 mm

Stitch length: 3 mm

Rhythm: 2

B: Length: 30 mm

Stitch length: 4,5 mm

Stitch density: 3,6

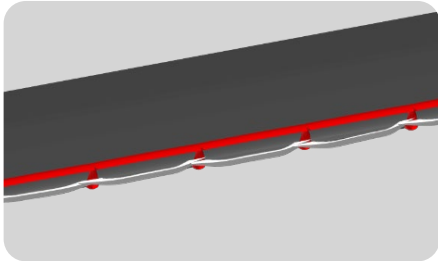
You can find the embroidery file for this test here:



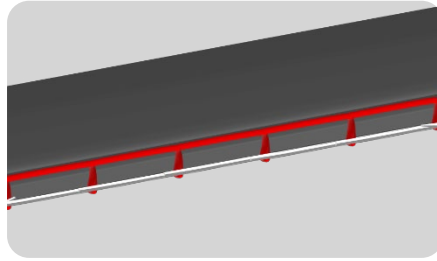
Visual characteristics of the thread tension

Using the example of a simple backstitch. The characteristics described can also be applied to a satin stitch.

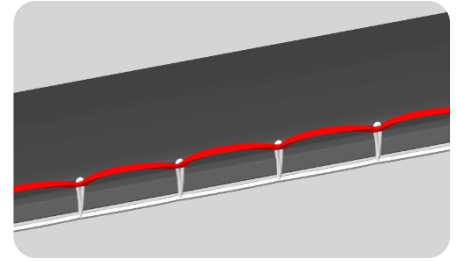
Correct thread tension



Incorrect thread tension



Incorrect thread tension



Right



Left



The upper thread is pulled down and can be seen by light dots on the back.

Upper thread too loose, bobbin thread too tight.

The upper thread is pulled down too much. Large dots are visible.

Solution: Tighten the upper thread or loosen the bobbin thread.

Upper thread too tight, bobbin thread too loose

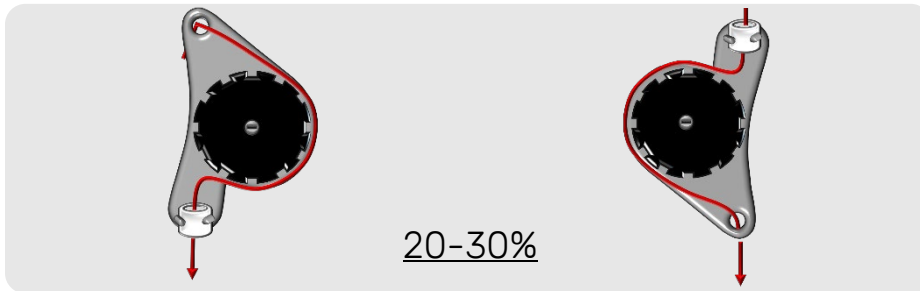
The bobbin thread is visible on the upper side. This can also be only slightly visible.

Solution: Looser upper thread or tighter bobbin thread

3. Upper thread tension with One-Knob-Adjustment (OKA)

In the One-Knob-Adjustment thread tensioning, only the roller tension is used in daily operation. The modified roller tension can be easily identified by the blue ring. After adjusting the upper and middle thread tension once, these remain unchanged throughout the rest of the process.

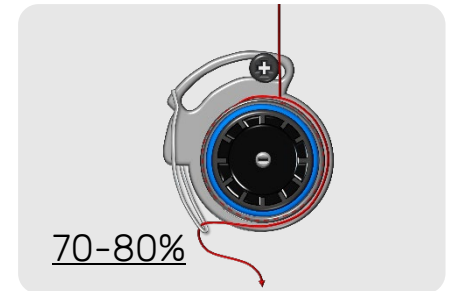
1 Upper thread tension



The upper and middle thread tensions are adjusted so that, together, they provide approximately 20-30% of the required thread tension.

2 Middle thread tension

3 Roller thread tension



The exact thread tension will now only be adjusted using the roller tension.

1. Open the roller tension completely so that no upper thread tension is generated at this point.
2. Set tension 1 and 2 in such a way that they generate approximately 20% ... 30 % of the upper thread tension.
3. Adjust the desired thread tension with the roller tension.
4. **Test:** There must be no jerking when pulling off the upper thread. The thread tension must be very even.
5. From now on, the tensioners 1 and 2 must no longer be turned. The upper thread tension is only adjust using the roller tension. = One-Knob-Adjustment (OKA)