

Pretty sporty!

Challenges of embroidering stretchy functional clothing

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Whether ultra-light, breathable or water-repellent - functional fabrics differ greatly in their properties from conventional textiles. Their mostly smooth surface and high flexibility often pose challenges for embroiderers. In the following article, you will find out how you can still succeed in realising your ideal embroidery result.



High standards - embroidery on functional clothing must withstand all requirements.

They must be windproof, thermo-regulating, dirt-repellent or UV-resistant to protect their wearers against environmental influences or to support them during sports activities: the demands on functional textiles are high and their constant development always opens up new possibilities. However, for garment manufacturers, textile finishers and embroiderers, the special properties of the materials can be challenging. Especially during the embroidery process, high-tech materials tend to pucker or stretching due to their smooth surface. Due to the stretchiness of the fabric, the finished embroidery can lose its shape and incorrectly selected needles quickly lead to material damage. Although there is no patented remedy for guaranteed perfect embroidery results, with the right adjustment and planning, the ideal result can be achieved. The programming should always be adapted to the fabric, and the right embroidery thread, the right needle and a suitable stabiliser should be chosen.

Customisation - the key to success for embroidery on thin, high-tech textiles

Wrinkling and hard, inflexible embroideries are common problems when embroidering flexible and stretchy fabrics. The following adjustments in the digitisation can help to achieve even results:

- Especially around corners and curves in lettering and small details, the stitch density should be reduced
- Lightweight underlay stitches help to stabilise the shape of the embroidery
- Stitch directions that run slightly diagonally to the warp and weft threads of the fabric prevent puckering
- Starting in the middle of the design, instead of working from left to right, helps protect the fabric and to optimise the result.

Thread recommendations for embroidered sports and performance wear



Lettering and small details in particular can be challenging to embroider.

If you want to realise soft embroidery on high-tech textiles, you should first select a suitable thread in the right weight. With the appropriate embroidery thread, the wearing comfort of the garment also increases noticeably. In general, the thinner the fabric, the finer the thread.

The following threads and thread weights are particularly suitable for embroidering functional textiles:

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- Fine but resistant polyester threads with **dtex 168 (84x2)**, **dtex 110 (55x2)** or **dtex 180 (90x2)**
- Silky and shiny viscose threads with **dtex 168 (84x2)**

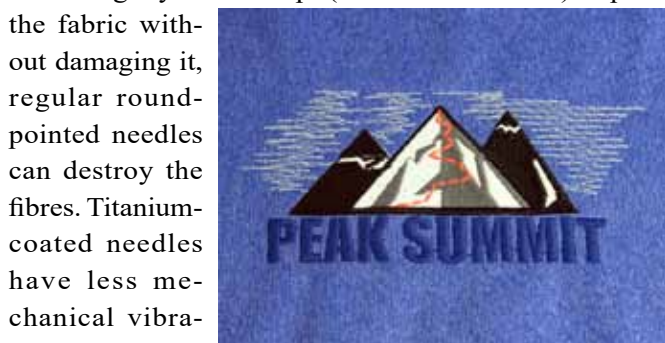
Fine embroidery needles for better results on tightly woven fabrics



There are various reasons for puckering – you can learn how to avoid them

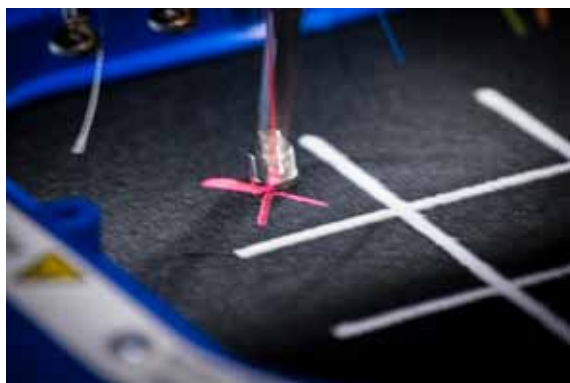
Whenever the needle penetrates the material's structure, fibres shift and the fabric warps. By using thin needles, puckering can be reduced. Needles with size NM 60 or NM 70 are particularly suitable for functional fabrics. The shape of the needle tip is crucial to prevent damage to the material.

While slightly rounded tips (such as RG or FFG) displace the fabric without damaging it, regular round-pointed needles can destroy the fibres. Titanium-coated needles have less mechanical vibration and are ideal for high-precision punctures. They can also be used to produce refined embroidery results on smooth and extra-firm fabrics such as caps, bags and shoes.



Wrinkle-free and even - this is how embroidered high-tech fabrics should look

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A few adjustments while digitising can help you achieve ideal embroidery results.

Backings and toppings for optimal hold

When embroidering functional textiles, it is recommended to use lightweight cut-away backings with **30-55 g / m²**. A structured backing creates an additional advantage, as it does not show through light textiles. Additionally, the usage of a water-soluble embroidery topping reinforces the top of the embroidery and prevents the stitches from sinking into the fabric. Furthermore, the use of toppings supports the stitch constructions of filigree details and lettering and visibly improves the quality of the embroidery. For embroidery on functional fabrics, we recommend the following stabilisers:

- Textured backings are soft and supple and continue to preserve the embroidery even after several washes.
- Water-soluble toppings help to achieve a clean embroidery result with clear contours.

Tip 1: When clamping the garment, tension on the fabric should be avoided to prevent wrinkles on the base fabric.

Tip 2: While the embroidered section is still in the frame, the excess backing can easily be cut away with a seam ripper so you get a clean finish on the back of the embroidery.

About Madeira

Since 1919, the Freiburg family-owned company Madeira Garnfabrik Rudolf Schmidt KG has been producing and distributing high-quality decorative and technical threads and accessories for industrial embroidery machines. In addition to the standard range, Madeira supplies technical threads for the production of so-called smart textiles and provides its customers with the necessary expertise to help them achieve the best possible embroidery results. With its numerous partners and subsidiaries around the world and international sales logistics, the company is now one of the leading embroidery thread manufacturers in the industry.

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