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ZSK STICKMASCHINEN Customer Magazin

Spring 2019 - N°2

The ZSK Embroidery Technology Magazine

Embroidery | News | Technology | People | Trends | ZSK Worldwide



Young Embroidery

Traditional textile finishing technique meets young ideas.

The Art of Embroidery - India

An introduction into the embroidery culture and industry of India.

Technical Embroidery

Additive Manufacturing with TFP

About Leather Embroidery

Leather is a material that can be more difficult to embroider

Embroidery!

Multi-Color,
Kettle and Moss,
Ribbon, Coiling and Cording.
In any Combination.

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by

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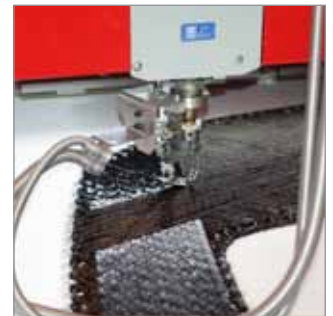
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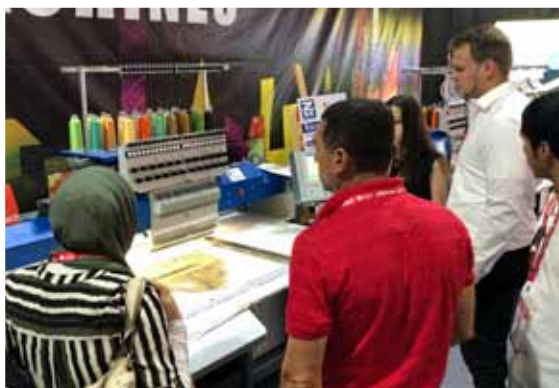
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Stars Innovation: A present for the Prime Minister



StarsInnovation created a unique embroidery gift for the Prime Minister Saad Hariri.

In 2018 Stars Innovation S.A.L., ZSK Distributor in Lebanon, prepared a special embroidery on a RACER 1XL with 24 thread colours at the fair Project Lebanon.

The Prime Minister of Lebanon, Mr. Saad Hariri, visited Project Lebanon and the booth of Stars Innovation and was amazed by the embroidery showing Beirut, capital and largest city of Lebanon.

Most recently Ghassan Madhoun, his family and department heads of Stars Innovation were invited by Mr. Hariri to bring the embroidered artwork to his office.

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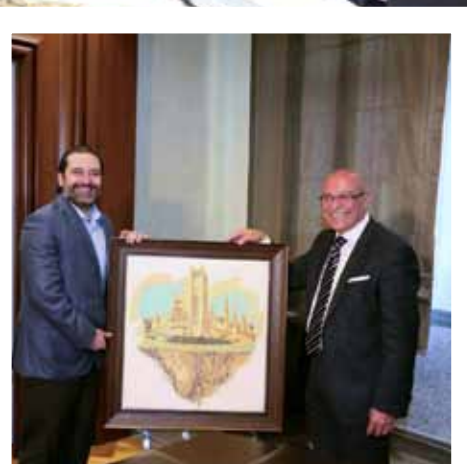
email: info@starsinnovation.com



Prime Minister of Lebanon Mr. Saad Hariri visited the booth of STARS INNOVATION and was welcomed by Mr. Ghassan Madhoun (Stars Innovation) and Mr. Frank Giessmann (ZSK STICKMASCHINEN Germany)

Next Project Lebanon 2019

18- 21 June 2019
Seaside Arena
Beirut New Waterfront
Lebanon



Prime Minister of Lebanon, Mr. Saad Hariri (r) and Mr. Ghassan Madhoun from STARS INNOVATION (l)

April 2019 Germany Reissued: BasePac Usermeetings



ZSK STICKMASCHINEN and the Distributor for Germany and the Netherlands, Heinz Walz GmbH hosted user meetings for BasePac users at Germany in April 2019

More than 120 BasePac user from Germany and adjacent countries took the chance to visit the reissued ZSK BasePac User Meeting 2019.

The free meetings in six different places were organized by ZSK's german representative Heinz Walz GmbH from Pfullingen and supported by ZSK trainer for digitizing Mrs. Britta Sanders.

The user were given first-hand information on the new BasePac 10, such as his new simple program structure. Various application examples completed the introduction to the new program version.

The afternoon were filled with a Q&A session regarding the correct digitizing for different fabrics and practical demonstrations on a ZSK embroidery machine.

We are sure that the series of BasePac User Meetings will be continued.

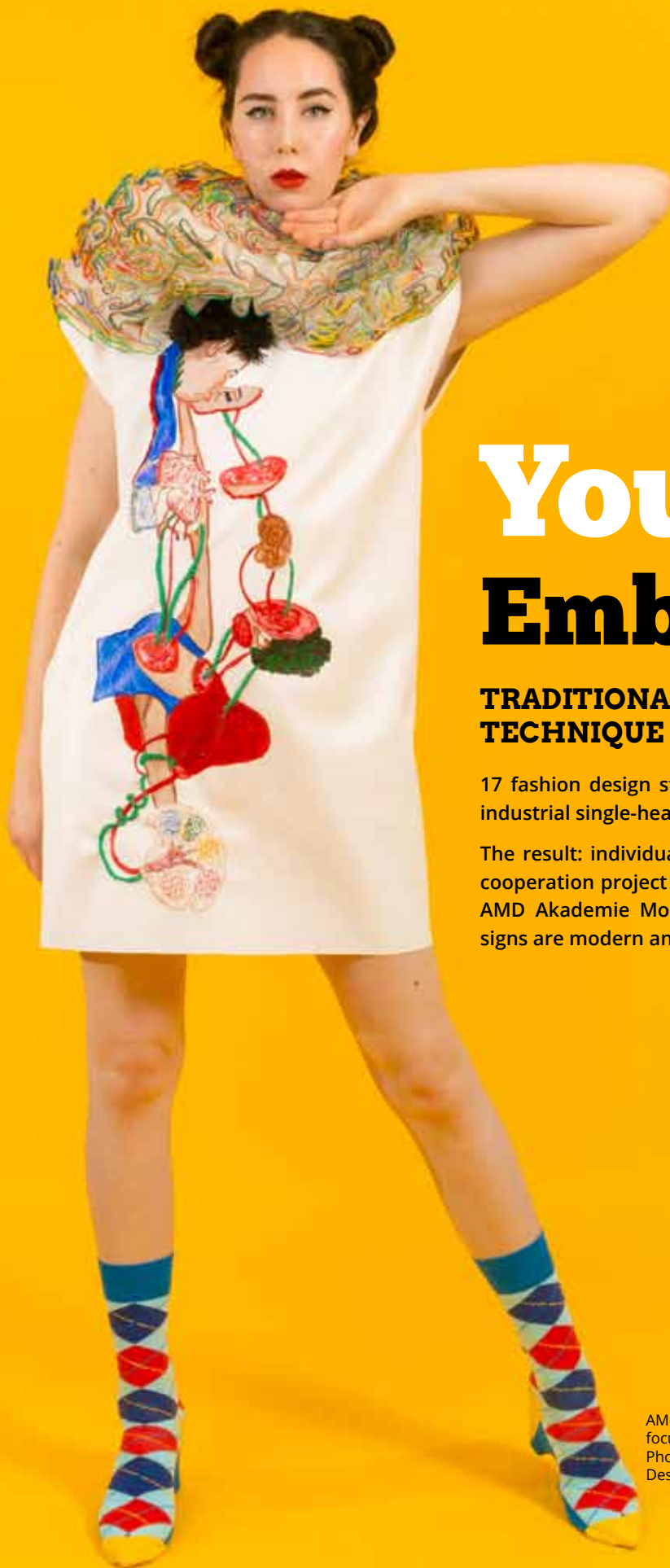


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Young Embroidery

TRADITIONAL TEXTILE FINISHING TECHNIQUE MEETS YOUNG IDEAS

17 fashion design students and a ZSK STICKMASCHINEN industrial single-head embroidery machine.

The result: individual and unusual individual pieces. The cooperation project of the MADEIRA yarn factory and the AMD Akademie Mode & Design shows: embroidery designs are modern and hot.

AMD student Helena El Malek
focuses on artists with strong emotions.
Photo: Isabel Winckler
Design: Helena El Malek, AMD Akademie Mode & Design

A look into the shop windows of the fashion capitals reveals: embroidery is in! The image of the dusty relic of grandmother's time has long since become a cool design element. The co-operation project "Embroidery & Fashion" of the yarn factory in Freiburg and the AMD Akademie Mode & Design shows what happens when traditional craft meets curiosity and the impulse to develop.

The Framework

What began as a planned series of lectures by the family business from Freiburg at the AMD Akademie Mode & Design, developed into a creative embroidery design project in the course of the past summer semester. Within the topic "Fashion & Pain", which was set for the semester, the pieces newly designed for the project were inspired by the environment of Mexican artist Frida Kahlo. Another prominent personality, chosen by the students themselves, was supposed to be a modern contrast figure for the painter.

In order to prepare the members of the Academy for the project, MADEIRA held several lectures about embroi-

ery threads and accessories, provided material and especially supervised the embroidery design programming. The technology used for this is called "punching" and means the digitalizing of the embroidery design for the machine. Due to time and budget constraints, the patterns were produced by a specialist, which required the students to communicate their ideas for the desired result.

The use of needle and thread is part of the student's education. But the assumption, that the young designers had embroidered with their own hands, is wrong: the embroidery work was carried out on a professional industrial embroidery machine. ZSK STICKMASCHINEN, the manufacturer of the embroidery machine, has made this possible to AMD Akademie Mode & Design for free. More, ZSK STICKMASCHINEN is pleased to provide AMD Akademie Mode & Design with the embroidery machine for an additional year beyond the project.

However, industrial embroidery involves many more aspects: for example, choosing the right yarn in the right thickness depends on the nature of

the fabric, selecting the right embroidery fleece for stabilization and setting the machine correctly.

"I underestimated the topic," says Ulrike Nägele, Dean of Fashion and Design at AMD Akademie Mode & Design. "Embroidering requires careful and technically demanding preparatory work. But I have seen the students as very open and precise in dealing with the subject, and I am very proud and happy that they have made it their own topic. "To promote this commitment, the project was announced as a competition by the representatives of the yarn factory and the lecturers of the project group - Ulrike Nägele, Shirin Seyed and Monika Hutter.

The three participants with the most extraordinary designs were given the unique opportunity to show their exhibits at major fashion and textile fairs such as the MUNICH FABRIC START. "Priority was the coherent concept idea and its feasible implementation such as sewing technology, choice of materials and material mix as the criteria to select the winners," explains MADEIRA's stitching expert Jürgen Korge. Some of the students would also use



Embroidery turns fashion creations into individual pieces.
Photo / Design: Alisa Neu, AMD Akademie Mode & Design



Photo / Design: Pia Leberfinger,
AMD Akademie Mode & Design



Frida x Steve – the „iPhone“ robe of Lukas Burkia combines functionality and extravagance. Photo / Design: Lukas Burkia, AMD Akademie Mode & Design

their embroidery design as a decorative accessory for matching handbags. Others combined machine embroidery with print or added individual elements such as hand embroidery. At the same time, the entire planning always took the industrial and financial feasibility into consideration. "In reality, each additional finishing has to be cost-checked. It was important for us, to communicate this for the students' later daily work", says Korge.

Idea to design

Apart from the technical challenges, the students had to develop the design. It was necessary to work out a coherent overall concept, which should reflect the personality of the main character, as well as the characteristics of their prominent counterpart.

"A lot of research was necessary in order to find congruences." says young designer Helena El Malek, who was also inspired by Lady Gaga: "Both artists reflect their feelings in art. Frida Kahlo has worked her life in paintings, Lady Gaga expresses herself through fashion and her stage performances. Both use the art to reflect their mental pain."

The young designer reveals about her dress: "The cut is inspired by the straight cut as in traditional Mexican tops. White artificial leather looks modern and should resemble a canvas. For the embroidery design I have modified Frida's paintings and adapted them to Gaga's provocative performances with blood and raw meat."



Quite different is the performance of contest winner Lukas Burkia: He emphasizes the physical condition of the characters: "My embroidery design links Frida Kahlo and Steve Jobs. Both are connected by their serious medical histories. Both of them have iconic images. I absolutely wanted to include this in my designs. The idea of merging facial features was developed on these thoughts."

Burkias embroidery design shows Frida Kahlo hair accessories and underneath the well-known "thinker pose" of the Apple founder with his hand on his chin. "I used different material to distinguish the personalities of the two muses," explains Burkia, whose "iPhone dress" is exhibited at PREMIÈRE VISION in Paris.

He wanted to show up the elegance of the iPhone and its functionality with the extravagance of Frida Kahlo, which in turn is reflected in the many colors of the embroidery and the dress. "In future I would like to continue to work with embroidery as a decorating finishing for clothing," the young designer concludes: "The cooperation with MADEIRA is a great opportunity and I am very glad that my whole study group and I were allowed to have this experience."



Photo / Design: Sarah Rademacher, AMD Akademie Mode & Design

Supervising lecturers

Monika Hutter, Ulrike Nägele, Shirin Seyed and for MADEIRA Garnfabrik: Jürgen Korge, Patrick Ruf, Sebastian Schade

The participants in alphabetical order

Amira, Lukas Burkia, Johanna Goess-Saurau, Theresa Höbarth, Celine Kronbeck, Pia Leberfinger, Sophia Lindner, Marietta Leist, Helena El Malek, Alisa Neu, Noemi Lorenz, Mohamed Noor, Sarah Rademacher, Laura Sagebiel, Claudia Scharf, Constanze Schiessl, Mareike Seegers

Machinery

ZSK Single-Head Embroidery Machine SPRINT 6



Photo / Design: Theresa Höbarth, AMD Akademie Mode & Design

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SMAKE EPS Jump

New Functionality in SMAKE TouchBOX

The workflow software specialist SMAKE has introduced a software upgrade for the EPS JUMP Series that makes the EPS JUMP an even more useful accessory in any embroidery factory. The software updates aims at operations where the EPS JUMP is used a stand-alone unit and not connected to a SMAKE workflow environment.

In the past, the EPS JUMP (in a stand-alone environment) would only show squares, circles and patches, where the operator could choose the dimen-

sion and the system would help the operator to place the embroidery at the correct position.

The new software update (available for the latest TouchBox hardware) includes the following new functionality:

- Loading of designs via Network (SMB)
- Loading of design via Barcode (from Network)
- HSP Lines (Virtual Measurement Lines)
- Margin Lines
- Loading of .DST files
- Loading of .Z00 files (under development)
- Inverter Functionality
- Statistics – Size and Stitches
- Frame turn yellow when design does not fit into the frame

The EPS JUMP system can be connected to the ZSK PoolBox. The embroidery machine and the EPS JUMP could access the ZSK PoolBox and load their files from the same environment.

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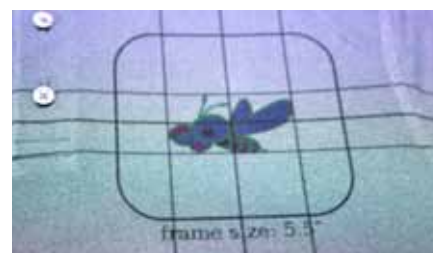
Loading of designs via network (SMB)



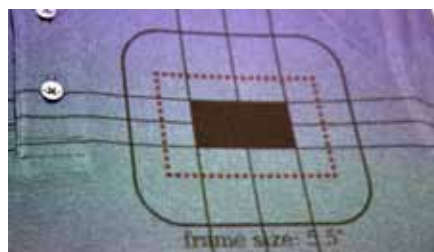
HSP Lines (Virtual Measurement Lines)



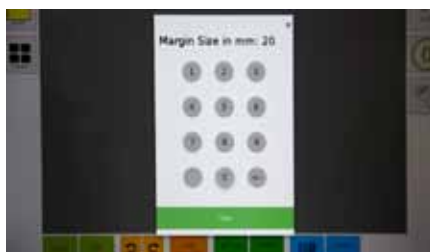
Statistics – size and stitches



Information about defined frame size



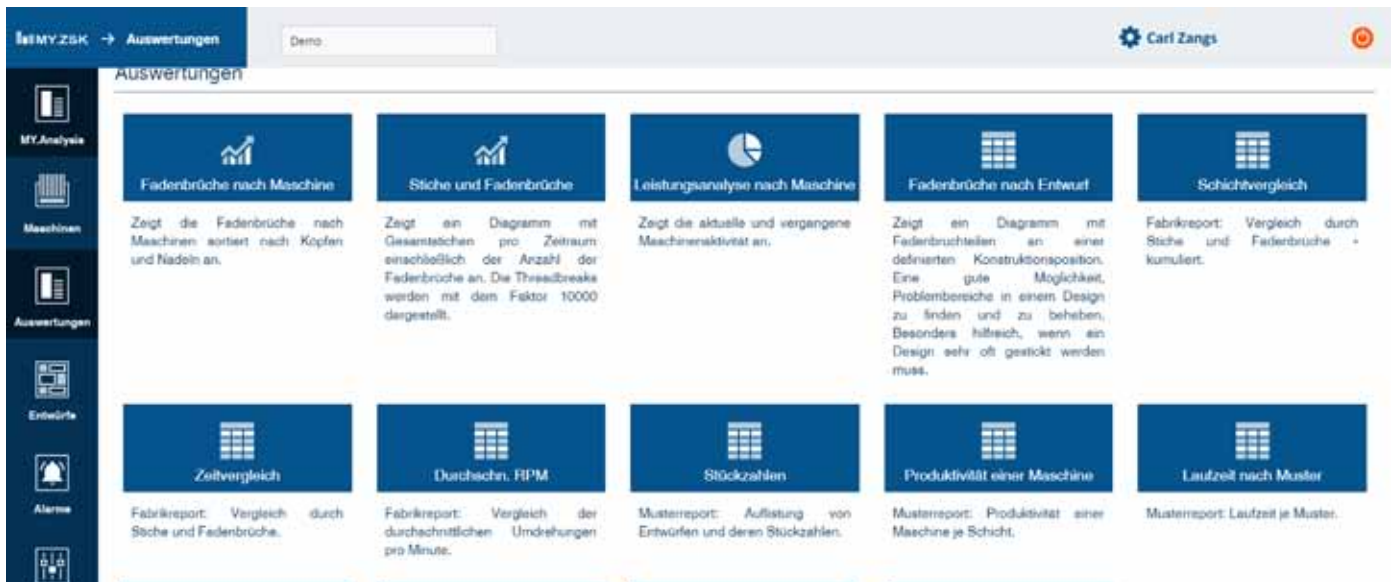
Displays adjusted margin lines



Change adjusted margin lines



Frame turn yellow when design does not fit into the defined frame



MY.ZSK 4.0

New features introducing the new version

The latest version of MY.ZSK 4.0 was introduced at the Open House 2018 in Krefeld, Germany. The introduction of the new system started side by side with the previous version.

Users were able to access the old layout as well as MY.ZSK 4.0 until end of February 2019. Since beginning of March 2019 only MY.ZSK 4.0 is available. We have received fantastic feedback from our user base how to make the system even more powerful. Our programmers of MY.ZSK are introducing new features step by step into the live system. By extending your MY.ZSK license you always have access to the latest version of MY.ZSK.

MY.ZSK is a cloud solution and so is the purchase process different to other ZSK products. The initial MY.ZSK package (incl. the ZSK PoolBox), annual license extensions as well as the ZSK PoolBox can only be purchased in the MY.ZSK Online Shop.

Please visit the online shop via the following link for your purchases: <https://shop.zsk.de>.

In the near future we will introduce a free trial version of MY.ZSK which can be installed on your Windows PC. For the trial period your computer will act as a DataCollector. The computer has to be switched on and connected to the internet when collecting data.

ZSK is offering on premise solutions of MY.ZSK. Customers that do not want their data to be in the Cloud, can request further information about the on premise solutions at ZSK. For these systems, ZSK installs the software on a server that runs without access to the internet and data can only be accessed from inside the factory. On Premise systems can include customer specific reports and adjustments and are prepared for individual solutions. Please contact ZSK if you are interested in on premise solutions.

MY.ZSK 4.0 supports the OPC UA standard.



The new MY.ZSK shop online at <https://shop.zsk.de>.

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ZSK's Bead Device

The Single Bead Device for ZSK STICKMASCHINEN embroidery machines was first presented during the Open House in September 2018. The device can be installed on ZSK machines with MCP-30 and MCP-35 electronics. ZSK STICKMASCHINEN currently recommends the left and right Bead Device for embroidery machines with up to 14 heads.

The device has been successfully installed in customer premises in several countries since the Open House 2018. The feedback after the Open House was overwhelming. Other manufacturers offer bead devices, where the beads are placed in plastic roles. Beside the environmental and cost impact, customers have quickly understood the huge benefit of the ZSK STICKMASCHINEN accessory – a higher freedom of shape. The plastic roles can only hold beads with a flat surface, whereas the ZSK STICKMASCHINEN device can handle beads with a curved surface shape as well as the flat surface.

The ZSK bead devices can handle certain dimensions of beads. Prior to testing beads, it is important to check that the chosen beads are compliant with the following parameters:

- Outside Diameter: 2.0 – 3.0mm
- Inside Hole Diameter: >0.9mm
- Height: 1.5 – 1.8mm

Quality

The most common issue found is the bead quality. We have dealt with a variety of glass bead manufacturers from Europe, Japan and China. In all cases we have found a certain number of beads to be not in line with the advertised characteristics.

In many cases we have found that suppliers have a certain percentage of beads with deviations >0.25mm off the advertised specification or deformed shapes. Best results were achieved where tolerances stay within +/- 0.15mm.

In case of large deviations within the beads, the device cannot compensate for such deviations or production faults and it will lead to missing beads that afterwards can be fixed by hand.



Recommendations

When working on multi-colour designs, ZSK STICKMASCHINEN recommends to use embroidery machines with the D-feature, so that up to 4 colours can be automatically introduced into one design.

A second option is the manual switching of beads within one design. Here it is recommended to stay within one dimension of beads for each device, so that no settings require an adjustment.

A third solution is to work with the Z-200/Z-360 connection system and wooden hoops. One first embroiders the first parts of a design and hoops the garment in a wooden hoop. After completion of a certain batch size, the bead devices are set up for the next colours and the same process is repeated.

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The Art of Embroidery India

Embroidery is defined as the art of using stitches to adorn the fabric or other materials by incorporating designs and other embellishments such as luxurious metal strips, pearls, beads, quilts and sequences. In the Indian subcontinent, embroidery has a high social status attached to it. Since the olden days, embroidery was used to accentuate the adept nature of work on fabric worn by the elite royalty.

Different forms of embroidery have been conceptualized and practised in India from 500BC. As time passed, technology advanced, the dynasty expanded, knowledge of embroidery was transferred from region to region. Thus each region has its own unique adaptation of embroidery style.

India is a country with abundant human labour, hence, the styles of embroidery practised are more labour intensive. The advent of new technological reforms in the textile industry, embroidery methods got transformed.

However, the transformation from labour to machines are only successful in the areas where machines were able to replicate the accuracy and intricacy of the designs. In many places across India, hand embroidery is still rather popular and has positioned itself in a different market segment which attributes to higher costs for the produced garment.

Let us have a look at the most popular embroidery styles that work in amalgamation with the machine embroidery in the Indian textile industry.

Kashida of Kashmir

The origin of this style of embroidery is suggested in the name itself. It comes from the northernmost province in India. The valley is famous for its intricate style of embroidery done especially in shawls. This type of adept craft is done by the men of the families for commercial purposes. This is in contrast to the practice seen in the rest of the country, where

embroidery is usually done by women. This embroidery style was influenced and propagated by the Mughal rulers in India. There are few things about this type of embroidery that stands out and makes it unique. The cloth while doing embroidery is not pulled and only one thread is used in the production. This makes the design wearable from both sides, making it a *recherché* piece of work.

With the rise in demand, machines were introduced to replicate the work done. However, the cost of machine-made shawls and saris with Kashida style of embroidery differs from the handmade ones. The production of the garments is dependent on the style of stitches that are being used to make the design. Stitches like "Doria" open work, cannot be made by machine and thus are done by hand. Design in which chain stitch or satin stitch are used, embroidery machines like ZSK STICKMASCHINEN are more efficient and superior with its results.

Aari Work

A prominent style of embroidery which is common in the parts of Gujrat and Kashmir is now completely taken over by industrial embroidery machines.

ZSK embroidery machines are able to replicate this type of embroidery for a lot of its clients in the Home furnishing industry. The embroidery styles are accentuated by the use of sequins and beads devices made by ZSK STICKMASCHINEN.

Many apparel exporters which use ZSK embroidery machines have been able to make an impact in the international market due to the quality of work the machine is able to execute while producing Aari designs along with embellishments.



Kashida work from Kashmir on shawls



Street markets selling various embroidered designs and products.



Ethnic Indian wear with Zari work.

Zardozi

Zardozi is one of the most popular embroidery styles of India, across the world. This embroidery practice began around 500 BC, and further flourished during the Mughal period. This form of embroidery uses gold and silver metal threads.

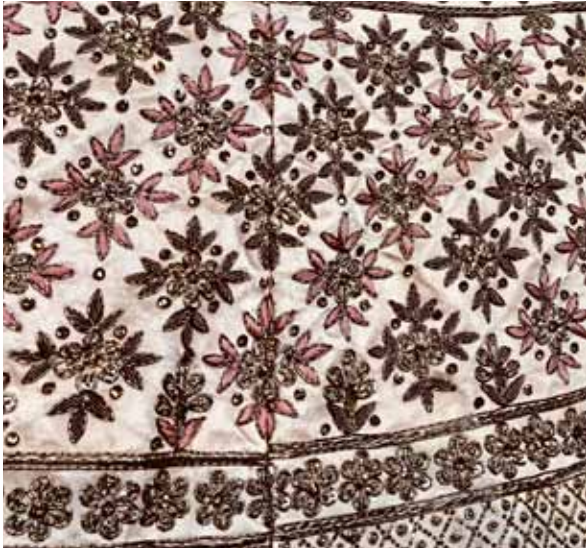
In the olden times, this form of embroidery was traded with the merchants from across the land and thus gained popularity. Mughals used such forms of embroidery in the habiliments of the royal family.

Later, an adaptation of this style, Zari, was used by the fashion labels to make exclusive bridal wear, bags, purses, belts and shoes. Zari is the form of embroidery that can be done through machines. ZSK STICKMASCHINEN cording devices provide a range of metallic threads that can be used, enabling the production of such work on different garments, fabrics and products.

One of ZSK STICKMASCHINEN major client in the ethnic apparel sector in India envisions new designs and application of Zari across its products every year for the famous fashion shows across the world. These are the few of the many embroidery styles that can now be mass produced due to the use of machines. However, embroidery styles such as Phulkari (Punjab), Gota (Rajasthan), Kantha (Bengal), remain indigenous to the craftsman of the places where they are made at. The modern-day embroidery machines are not able to replicate the adept intricacy of these artworks.

ZSK Indian Journey

The Indian textile sector is estimated to be US\$ 108 billion, with a growth prospect valued at US\$ 223 billion by 2021. It's the second largest employment sector in the country, proving employment to 105 million people, directly and indirectly.



Traditional Zardozi Work



A disappearing artform - embroidering a spiral zari design

From the late 20th century, ZSK STICKMASCHINEN has become a prominent player in the Indian textile market. In a country where the cost of capital is a high determinant in setting up production facilities, ZSK has poised itself as a quality maker in the market. Its presence has been seen in all parts of the country.

In the early 21st century, ZSK embroidery machines were a part of all export houses spanning across the country. The quality and durability of the machines helped it gain popularity and was thus able to annex new industries as well.

With the onset of the second decade in the 21st century, ZSK embroidery machines have seen a steadfast growth in the home décor industry in India. Its dominance in the apparel sector is unquestionably strong and with new accessories such as bead device, it will be fighting for more market share from the hand embroidery market, in the coming months to come. In a geographical spread of ZSK STICKMASCHINEN foothold in the country, one can realise that ZSKs presence is spread across all regions of the country.

In the north, ZSK STICKMASCHINEN tends to the needs of export houses dealing in apparel wear. This apparel wear is an amalgamation of modern and ethnic wear. In the west coast of the country, ZSK embroidery machines cater to different industries and market segment. Home furnishing and Indian ethnic wear production houses are present over here. As we move to the south, ZSK embroidery machines are used to embroider on children's garments and highly exclusive home furnishing products. The apparel market in the south is mainly concentrated on making children's clothes. The east coast of the country uses ZSK machines to

do embroidery on leather products. This industry is new and developing for ZSK STICKMASCHINEN. Other players in the market use the machine to make children's wear also. Thus concluding the diverse usage of ZSK machines in the country.

ZSK embroidery machines have always been the front runners in the face of development, in the textile market. Its advanced level of technology has given the home décor sector a dynamic change. In the apparel wear, ZSK embroidery machines are used by prominent fashion labels, making "Sari" an ethnic dress of India.

The work done from ZSK embroidery machines are now representing India at major fashion shows across the world, setting style statements for the millennial generation. ZSK STICKMASCHINEN zeal for sustainable innovation, where its new products can be retrofitted has played a pivotal role in its growth in the subcontinent. The new devices such as bead device, vision system, hot air cutting devices are paramount in its diversification of the new market sectors.

ZSK STICKMASCHINEN perseverance to stand out in the crowded competition can be seen by its new projects in the fields of technical and leather embroidery, for which the new and dynamic India, is an emerging market and a place to watch in the upcoming years.

Contact Details

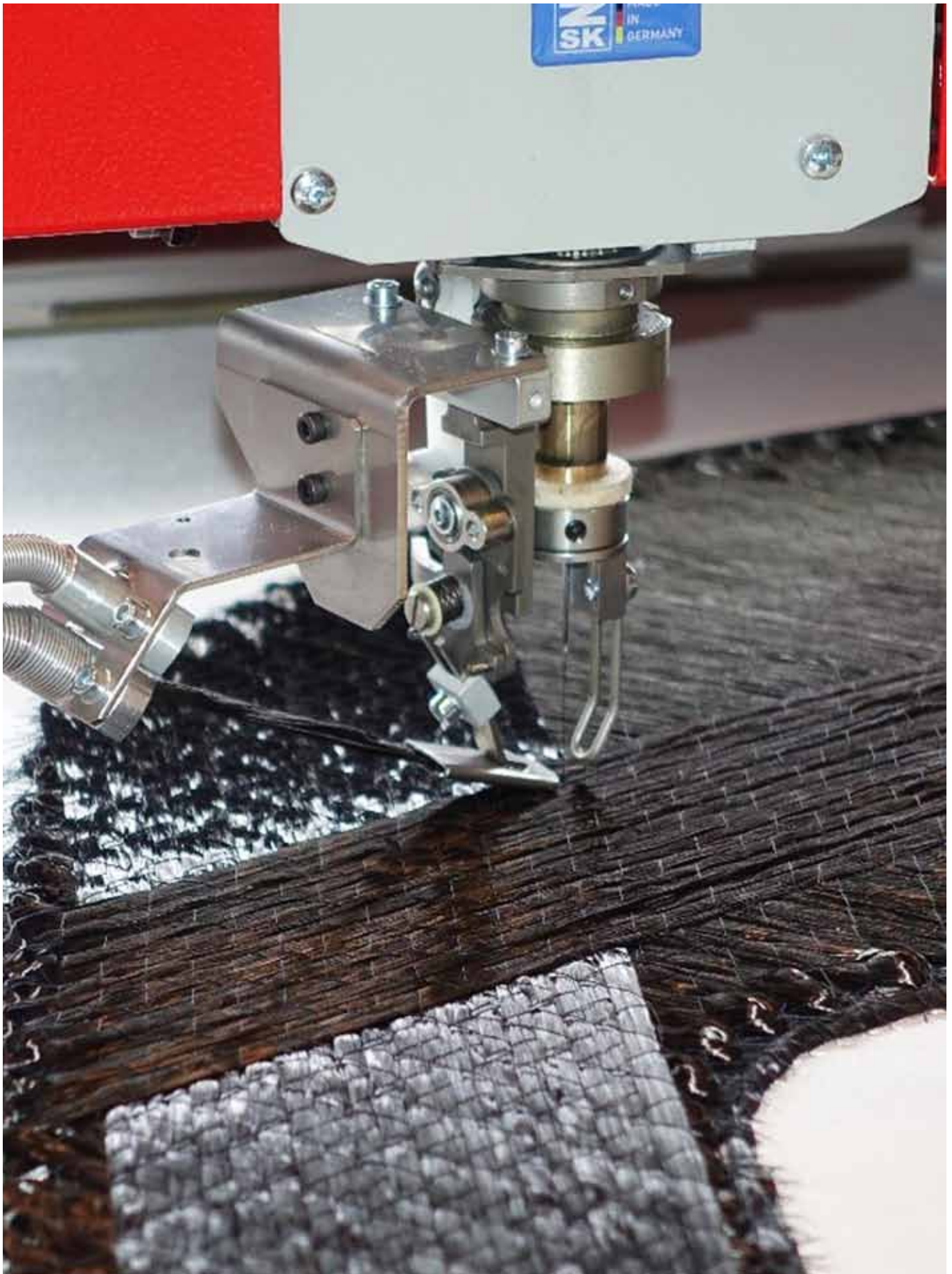
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TFP allows the composites engineer to build up layers and variable thicknesses of multi-material composite preforms.

Additive manufacturing with TFP is an additional tool for the composite designer that allows increased control over mechanical properties such as fiber orientation, drapability, thickness, and other material optimizations.



Additive Manufacturing with Tailored Fiber Placement

Tailored Fiber Placement, or TFP, is a new and highly disruptive technology for additive manufacturing of composites that utilizes a stitching technique to place fibrous materials in controlled paths. Traditionally, carbon fiber 3D printing has been investigated for its applicability in both prototyping and manufacturing of composite parts.

However, 3D printing methods such as fused deposition modeling (FDM) with embedded carbon fiber filaments is a slow process often with a low fiber volume fraction (FVF) that can be prohibitively expensive when used for medium sized parts greater than a few volumetric centimeters.

Additionally, thermal profiles in carbon fiber 3D printing can cause significant warping while being harder to tailor for mechanical optimizations of the material. TFP removes many these complications and drawbacks.

Additive manufacturing with TFP is an additional tool for the composite designer that allows increased control over mechanical properties such as fiber orientation, drapability, thickness, and other material optimizations. By using three dimensions of stitching placement and additively layering materials, composites with high fiber volume fraction can be quickly produced with minimal waste material. Existing molding can often be used with this process further reducing the initial exploration and production costs.

Material freedom

3D fiber-reinforced stitching allows for a wide range of materials to be used both with the composite fibers and also as supporting matrix materials. By using fiber tow directly from the manufacturer, additional cost can be saved by not relying on other textile processes such as weaving. Thermoset and thermoformed materials can easily be accommodated as well as material changes throughout a single preform.

Multiple fibrous materials can be used in the same preform. This can allow for complex areas of localized stiffness. Cheaper materials like glass fiber can be used to create areas in a preform to hold shape, while more expensive materials, such as carbon reinforcement, occur only in localized areas where they are most needed mechanically. Additionally, the same machine setup can be used to run natural fibers, thermoplastic fibers, wires, and wide range of other materials, opening development possibilities for the composite designer.



Multiple materials can be stitched into the same preform in patterns that can tailor stiffness, drapability, and other mechanical properties.

Multiple companies are now investing in the creation of comingled fibers. These are engineered fibers consisting of carbon fibers that have been additionally mixed with various thermoplastic fibers in set FVF. This material behaves mechanically like a traditional fiber tow that can be placed by TFP machine, however consolidates quickly when heat and pressure is applied in an engineered mold. This process can allow for rapid molding and increased production.

Machine flexibility and freedom

Like most additive manufacturing technology, TFP machinery is easily reconfigured to be able to run different parts. Instead of purchasing customized equipment for each part in a composite design, the same machine can often be retooled to run a different material and design in under 10 minutes. This allows the same production machines to maximize both their manufacturing and prototyping potential.

Tailored mechanical support

Additive technologies, such as TFP, allow for the composite designer to optimize various mechanical properties of the part to the applied forces. Other 3D additive manufacturing processes often rely on short fibers to create the mechanical reinforcement. However, TFP maintains the carbon fiber tow allowing

for long fibers to be placed in complex geometries increasing mechanical properties. Circular patterns can be used to mechanically reinforce holes, while unidirectional fibers can be placed in supporting regions to resist tensile loads. Other design techniques can be used to increase properties like toughness, stiffness, and localized crack resistance. Design and corresponding optimization possibilities are nearly limitless due to the ability to highly control the fibers orientation and placement.



Unlike many tape laying systems, TFP allows for circular reinforcement to easily be integrated into a composite part.



Tailored drapability

As the preforms created with TFP maintain their compliant textile attributes, complex drapability can be engineered and built into the composite. By designing stitch lines in combination with areas of lower fiber density, complex bendable and foldable areas can be created. These origami-like structures can function to allow more complicated three dimensional design possibilities with little waste material.

Typical preform dimensions

TFP allows for material to be controllably placed in three axes. Standard machine sizes currently can accommodate parts 1.5 x 2 m with variable thickness of 0.1 to 1 cm per preform layer. In creative designs, this Z axis height can be used as ribbing in the composite to create improved stiffness while continuing to optimize material usage. Additional thickness can be created by stacking interlocking preforms in molds designed to build further height. TFP fits a specific size niche between tape laying machines for large parts, and 3D printing for smaller parts. The upfront cost of a TFP machine is considerably less than most tape laying machines and allows additional curvilinear fiber paths and complex drapability.

Scalability

TFP has an additional advantage over many other additive manufacturing technologies when it comes to scalability. Smaller prototyping machines for TFP can be used to create and test different preform geometries for various optimizations in early development. However, once the design is selected, additional production machines can quickly repeated those designs in scale in an automated manufacturing process.

Conclusion

TFP has a place in the composite manufacturer's toolkit, especially for medium sized parts or parts with complex loading or curvilinear patterns. The low barrier to entry with this type of additive prototyping machine allows for the composites designer to experiment with different material selections and tailorable placement options for mechanical optimizations. When a design is found to be acceptable, larger production machines can quickly scale that prototype into a manufacturable product and assembly line reducing manual processes like trimming. TFP is a powerful additive manufacturing tool for medium sized composite parts.



Initial designs developed on low cost single head prototyping machines can quickly be scaled to production machines for an automated additive manufacturing process.

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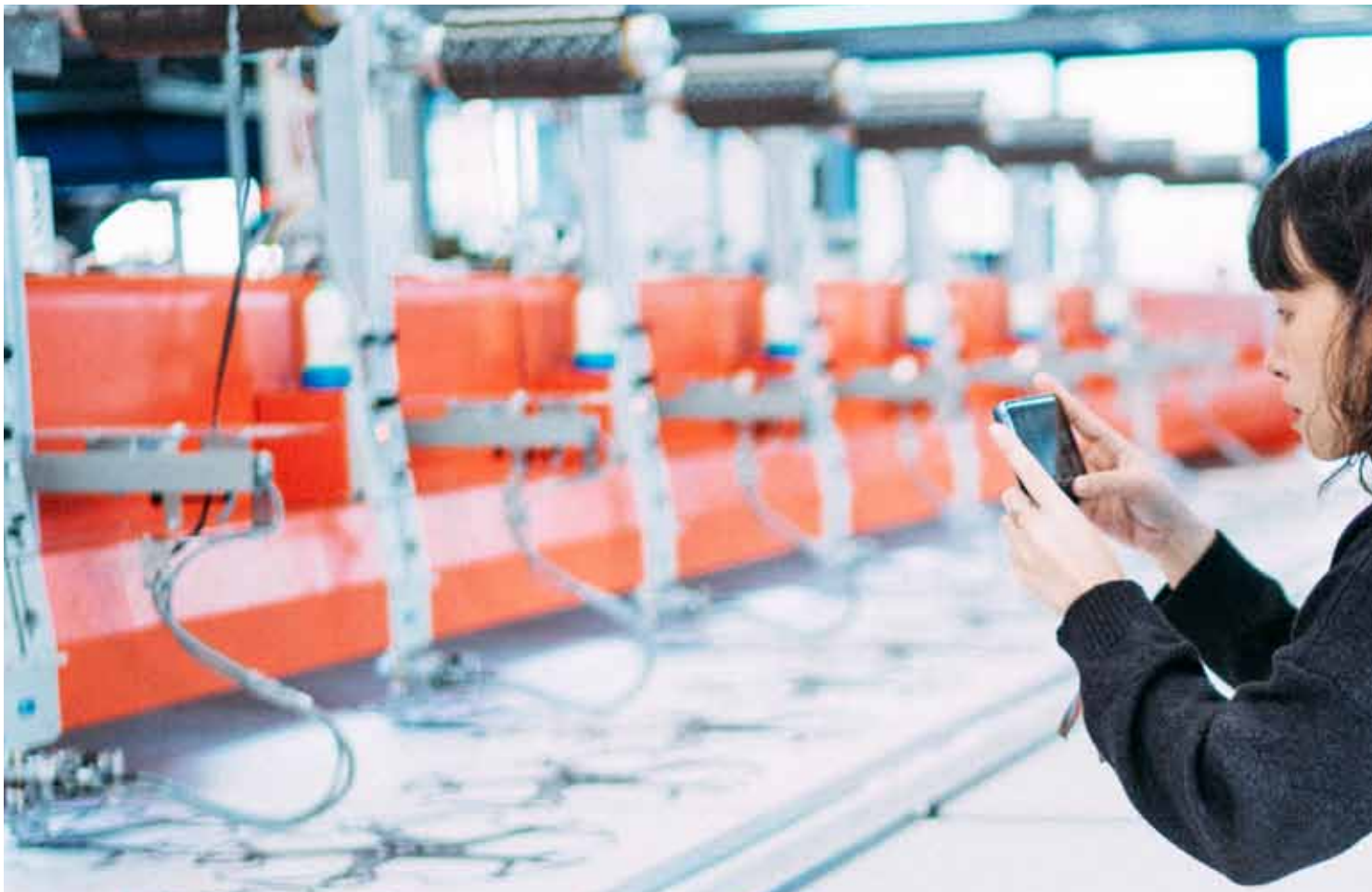
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Composite processes: When to consider Tailored Fiber Placement?

Tailored fiber placement, or TFP, serves a unique role in the composites manufacturing process. While it does not fit every application, TFP is a versatile process that can be used for many applications.

This article attempts to review and compare a few of the most used composites processes such as tape laying, hand layup, braiding, and filament winding to TFP and examines the advantages and disadvantages of the technology for those selected processes. The outcomes drawn are for general cases and may not fit every application. Talk to a TFP composites expert for further recommendations and evaluations for your specific test case.

Tape laying

Tape laying is a competing technology to TFP for composite production with its own set of advantages and disadvantages. Tape laying uses a robotic head to place thin tapes usually of resin impregnated composite material onto a mold. An infrared heater on the head secures the tape to the mold and cures the epoxy in a rapid process. This technique works incredibly well for large shell-like shapes. Large aerospace shells for fighter jets, boat shells, and even bathtubs have historically been created with tape laying. Since tape laying creates a very thin oriented fiber structure, there can be mechanical advantages if the composite is properly designed and the loading scheme simple.

However, tape laying is not generally as effective as TFP when it comes to medium sized parts with a surface area smaller than a surfboard and larger than a postage envelope. Additionally, as tapes are laid flat against the mold, they do not have the same amount of mechanical tailor-ability specifically regarding curved structures, variable heights, or circular hole reinforcement. TFP allows the composites engineer to create curvilinear paths to best resist the complex applied mechanical loading. While these tailored models are generally more complex to calculate than classical laminate theory, they can reduce the amount of composite materials used to create the composite preform.

Tape laying machines are also considerably more expensive to purchase and setup than TFP machines. Additionally, tape laying machines generally create



A worker completes a composite layup for a small sized complex geometry. While the infrastructure cost is initially less, success for this technique is dependent on the skill of the labor.

a single part per machine at a time while TFP can create many copies of the same part at once increasing scalability. Finally, TFP allows for the inclusion of wires and other sensors into the composite turning the composite fabric itself into a Smart Textile. TFP preforms can also be made in advance and shipped to another location potentially allowing more supply chain flexibility.

In short: Both TFP and tape laying are highly automated technologies. Consider tape laying if you have very large parts such as boat shells that have simplified loading structures. Consider TFP if you have medium sized parts with complicated loading, internal curvilinear structures, or want to add sensors directly to the composite.

	TFP Thermoset Preforms	TFP Thermoplastic Preforms	Prepreg Tape Laying	Hand Layup	Spray Layup	Braiding/Winding Dry Tow
Available Matrix Materials	Very High	High	Low	Very High	Medium	Very High
Available Fibrous Materials	Very High	High	Low	Very High	Very High	High
Amount of Material Waste	Very Low	Very Low	Very Low	High	Medium	Very Low
Optimal Part Size	Medium to Small	Medium to Small	Large to Medium	Large to Small	Medium	Large to Medium
Integration of Inserts, Hardware	High	Medium	Low	Very High	Medium	Low
Integration of Complex Sensors	Very High	Very High	Low	Very High	Low	Low
Infrastructure Cost	Medium	Medium	Very High	Very Low	Low	Very High
Touch Time	Low	Low	Very Low	Very High	Very High	Low
Complex Geometries	Very High	Very High	Medium	Very High	Medium	Medium

Figure 2: A brief analysis and comparison of TFP to alternative composites techniques.



A worker sprays chopped fiberglass into the resin stream for fast composite construction. However, the resulting mechanical properties are less controlled and optimized when compared with TFP on medium to small geometry parts.

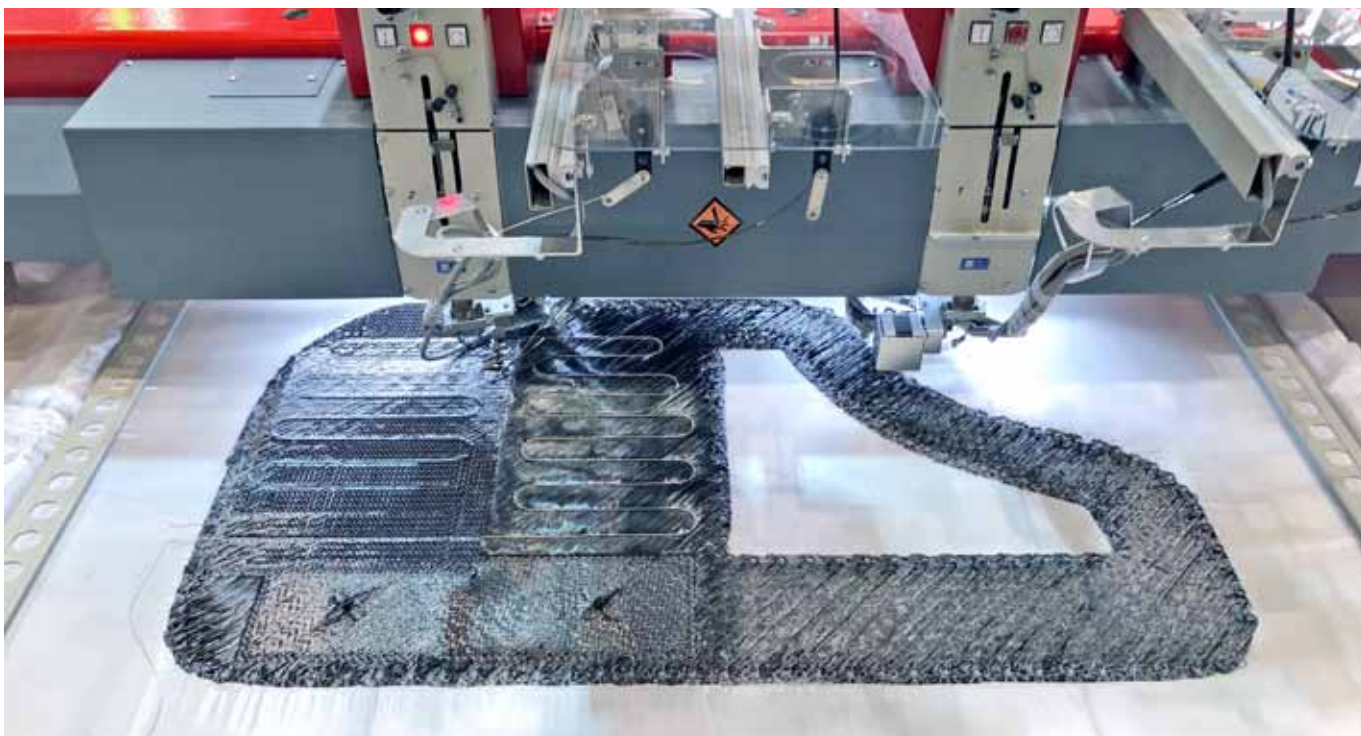
Hand layup of wovens

Hand layup using cut woven laminates is one of the most widely used techniques to create a wide variety of composites. In this process, carbon fibers are woven in to a fabric which is then cut to fit a specific mold. Sheets of fabric are oriented to help resist and distribute loading across the form. These sheets are layered into the mold by hand and then set into place with a matrix material. Hand layup of wovens requires minimal equip-

ment investment making it attractive for early prototypes or one-off products.

However, the process of hand layup using wovens is highly labor intensive and the quality depends on the skill of that labor. TFP can reduce some of the touch time by creating a preform that is handled more easily and does not lose internal fiber orientations when put into the mold as all orientations are stitched into the preform itself. The process of weaving these carbon fibers into a workable fabric additionally adds cost to the material making hand lay up with the wovens more expensive than the individual cones of carbon fiber tow used in TFP. Significant waste material of this expensive woven composite material is generated in the cutting process which further reduces material efficiency. TFP utilizes carbon fiber tow directly from the cone which is cheaper than woven fabrics as it has not gone through the additional weaving process. Controlling the placement of a carbon fiber tow in the preform with TFP can also result in significantly increased mechanical advantages at further decreased material usage.

In short: consider hand layup of woven materials if you have access to skilled labor and are going to produce one-off products or replacements. Consider TFP if you're going to make more than a few pieces, need higher mechanical properties and accuracy, or want to reduce the amount of waste and corresponding cost of expensive woven fabrics.



Spray layup

Spray layup is a sister technique to hand layup of laminates. In spray layup, short fibers are mixed with a low viscosity resin in a mixing tank, and then sprayed directly into a mold where they cure. This process is low cost as it relies on minimal equipment, has limited waste, and requires limited skilled labor. However, this process has multiple disadvantages when compared with other techniques. As short fibers are used, the mechanical properties of the resulting composite are not as desirable as other techniques with long fibers. Additionally, composites made with spray layup tend to be heavy due to their increased use of resin to help propel the fibers into the spray. This further compromises mechanical properties leading to a less engineered composite. Available resins are more limited due to viscosity requirements, potentially removing materials from the available selection. Additionally, there can be health and environmental impacts of the vaporized droplets of resin that could potentially cause added long-term costs.

In short: the benefits of TFP to spray layup are application specific. If the part is a medium or small sized part that requires reduced mass, TFP might be considered especially for high cost materials or unique resins. However, the vast majority of large parts that utilize spray lay-up and do not require further mechanical optimization, will not be good candidates for TFP.

Braiding and filament winding

Braiding and filament winding are two separate techniques that can occasionally compete with TFP. Both processes can be considered covering or wrapping processes in which a mandrel is covered with the composite materials. In general, these techniques are extremely cost effective and work best for long, tubular shapes, or pressure vessels. Both processes are extremely cost efficient, quick, and provide good mechanical properties to the composite. However, the shape of the mandrel significantly limits the type of composite products that can be made this way. Additionally, surface finish is more difficult to control unless exterior molding is used.

TFP competes with this technology only for medium to small size bar reinforcement. In these applications, the TFP preform is wrapped around the mandrel and set. This can provide adequate flexural stiffness, however does not provide good burst strength. Therefore, it should not be used for storage vessels.



Dry carbon fiber preform created by TFP allows for control of radial and curvilinear reinforcement.

Additionally, parts for TFP based wrapping will generally be sufficiently smaller than that in filament winding.

In short: If you have medium to small sized reinforcement bracket, designing it for TFP manufacture could possibly provide some scalability benefits. Using TFP as a replacement for braiding or filament winding for vessels that store pressure is not recommended.

Summary

Tailored fiber placement can provide interesting benefits and cost reduction in the manufacture of composite products. The benefits are further maximized when introduced early in the composites design process. Additional new technologies such as sensors and inserts can be utilized easily in TFP. The wide range of available materials that can run in TFP, including carbon, glass, natural, and biomedical fibers, further increases design possibilities. However, TFP does not always provide the best composites solution especially for larger parts. Consult a TFP expert at ZSK to inquire if your part is compatible.

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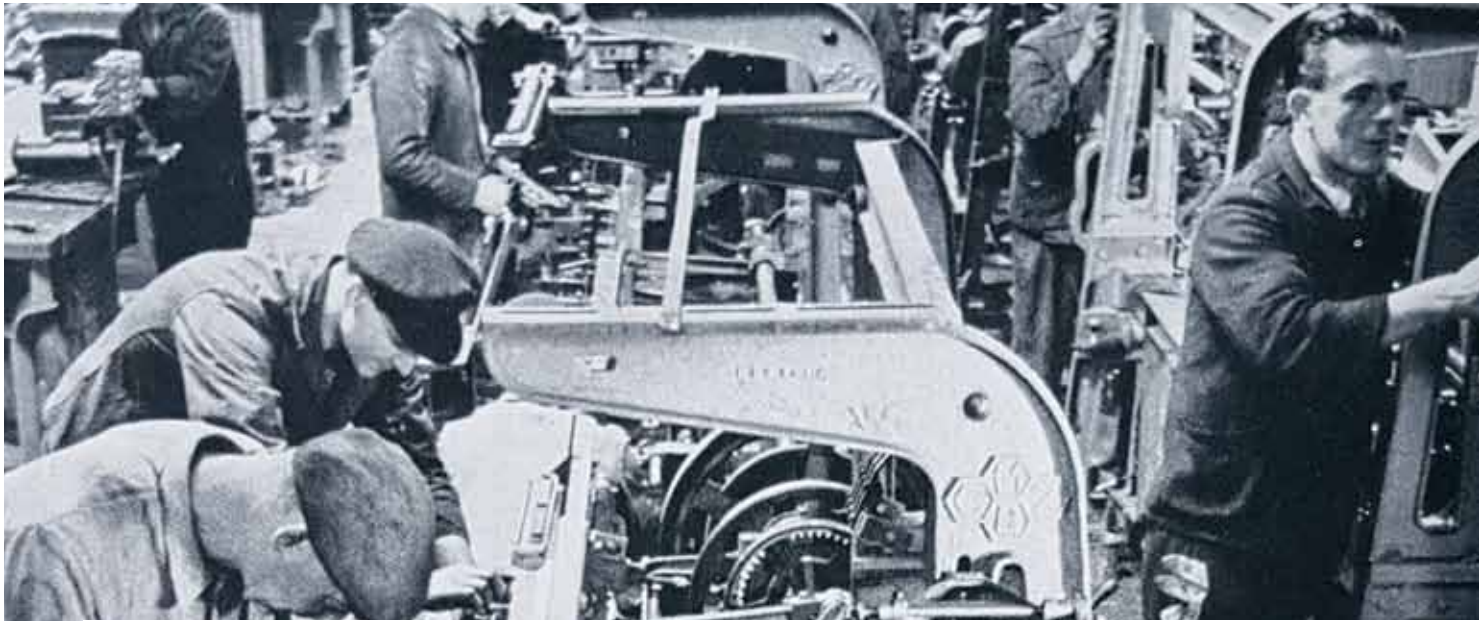
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TFP for industrial production needs

Tailored Fiber Placement is still at the beginning of its possibilities.



At Montauban, not far from Toulouse and situated in the heart of the Midi-Pyrénées, the headquarter of the French start-up NOBRAK, the latest cooperation partner of ZSK STICKMASCHINEN in the field of technical embroidery systems, is located.

NOBRAK develops innovative technologies for technical textiles and composite materials since 2016. The company also proposes its technologies to third party companies to produce textiles and/or composite parts.

The technology-based company is successfully operating with the design, production and sale of objects produced after the tailored fiber placement method. Additionally, the company produces its products environmentally friendly and sustainable by using natural fibers and recycled materials and the use of energy-efficient processes. An examples for this promising activity, an "Attaché Case", which structure was made with natural fiber flax was exhibited at the ZSK In-House Show 2018.



"Attaché Case" at the ZSK In-House Show 2018

For the production according to the TFP method, the NOBRAK founders Aymeric Azran and Bertrand Laine - both designated experts as engineers of material science - use the ZSK technical embroidery system SGZA 0109-825.

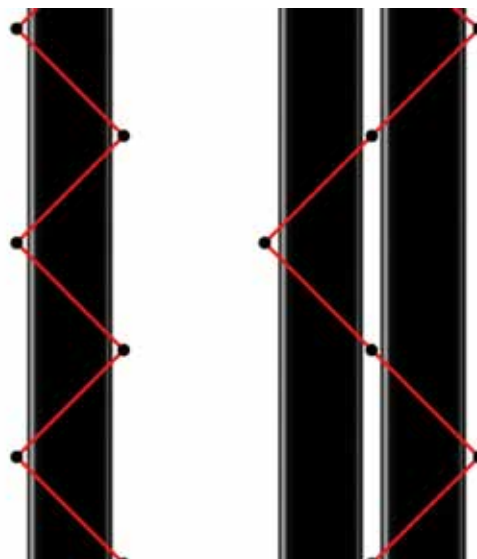
The SGZA offers the company two different embroidery heads with different embroidery technologies, the W-head and the F-head. With the W-Head, fibers and wire are laid down and fixed precisely according to the structural requirements. In addition, up to nine different, even conductive, yarns can be applied with the F-Head.

"Tailored Fiber Placement or TFP is still at the beginning of its possibilities. Especially if recognizing the great potential for the use in mass production for automotive, sports and consumer goods." Aymeric Azran explains, "For efficient use on an industrial scale, this technology must be further developed."

And NOBRAK did so. Based on this promising conviction, NOBRAK developed the idea of High Volume - Tailored Fiber Placement, or HV-TFP for short. In cooperation with ZSK STICKMASCHINEN the HV-TFP method was technically realized exclusively for ZSK TECHNICAL EMBROIDERY SYSTEMS.

First filed HV-TFP technology allows multiplying the productivity of ZSK TECHNICAL EMBROIDERY SYSTEMS for TFP by a factor of two or more. The new placement technology allows to feed two or more rovings in parallel.

The principle of HV-TFP technology is rather simple, and illustrated by the picture below where two rovings are laid down simultaneously, each being stitched with a linear distance two times wider than in the actual process, thus leading to a twofold productivity increase.



Standard Technology for laying one roving

New HV-TFP Method for laying multiple rovings, here doubling amount of laid rovings with same number of stitches

This new functionality could be combined with other options like "Fast Laying" in order to multiply the productivity of the machines of ZSK TECHNICAL EMBROIDERY Systems, thus increasing the benefit and potential of TFP.



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Case Study:

ESE Carbon Company Successful implementation of Tailored Fibre Placement

ESE Carbon Company is an advanced carbon fibre manufacturing company founded in 2011. ESE has developed a one-piece, one-cure, carbon fibre wheel and has issued patents relating to the manufacturing process. ESE's mission is to deliver performance carbon fibre products with quality, consistency and affordability, while achieving mass production capability. The aim for ESE Carbon Company's wheel is to be the world's highest strength-to-weight automotive wheel available.

Carlos Hermida, CEO of ESE Carbon Company, early on recognized the automotive industry trend of necessary weight savings and efficiency enhancement, and that the use of carbon fibre is the solution for these ambitious goals. Carlos found that the perception of carbon fibre components often was that they are high priced, not widely available and technically challenging to manufacture. The ESE team designed a process integrating TFP that allows fast paced, high volume manufacturing of carbon fibre components with excellent mechanical properties and a low-cost structure.

TFP - a benefiting step forward

Every wheel that ESE Carbon Company manufactures today is made 100% from TFP stitched carbon fibre. ESE originally manufactured with traditional carbon fibre fabrics before transitioning to the ZSK STICKMASCHINEN TFP technology.

Carlos Hermida is convinced that "for my application TFP is a perfect match - the more complex the design is from a layup and engineering perspective, the more substantial the benefits that TFP will allow you to materialize."

ESE Carbon Company first established their partnership with ZSK STICKMASCHINEN by investing in a sample machine to better understand the capability of the TFP technology. This allowed ESE's team to have familiarity with the EPCwin digitizing software, along with understanding the benefits and limitations of the stitched TFP technology, prior to receiving their first production machine.



Carlos Hermida, CEO of ESE Carbon Company,

Facts

The manufacturing benefits found using the ZSK technology are a 50% reduction of pieces that make up the wheel, 50% reduction in layup times, an improved layup quality, optimized carbon fibre orientation, a carbon fibre waste reduction and overall cost reduction. The carbon fibre waste was reduced from 50% with traditional carbon fibre fabrics to just 5% with TFP, and by consolidating the supply chain for carbon fibre, substantial savings on raw material were also achieved.

Significant savings

One of the most significant cost savings arises from the layup improvements. The reduction of layup times not only reduces the labour cost of the part itself, but it makes the use of moulds more efficient, as reduced layup times allows for more parts per mould to be made each day. The number of moulds required is reduced and this has a huge impact on the overall investment costs per wheel design.

A reduction in the number of carbon fibre plies needed for a design, as well as more control in how they are formed, brings considerable improvement in the quality of layups.

Analytical testing and CT scans prove that it has helped ESE reduce resin rich areas and therefore improve mechanical properties of the wheels.

Flexibility and quality

A key point recognized by Carlos is that "with traditional fabrics the orientation of your carbon fibre plies is limited. On the other hand, with TFP, there is almost unlimited ability to create straight or curved patterns in any direction. This flexibility allows you to design plies that are optimized to manage loads and stresses much more effectively than possible with traditional fabrics." Because carbon fibre and resin have different rates of thermal expansion as the carbon composite heats and cools, the end may result in residual stresses and cracks without proper engineering and design. The design possibilities that TFP offers enabled the ESE engineers to customize the carbon fibre direction, providing reduction of residual stresses and risk of cracks.

The future is bright for TFP

TFP has yielded ESE Carbon Company significant efficiency and operational benefits by simplifying the manufacturing process and improving quality control. After recognizing the benefits of TFP, Carlos summarized "I continue to be amazed with ZSK and TFP technology. There is no question that this technology will be widely adopted within the Carbon Fibre Industry over the coming years. As awareness increases, I see TFP becoming much more prevalent within our marketplace." The ZSK TFP technology has been a great addition to ESE Carbon Company, supporting their growth and development. The future remains bright for ESE Carbon Company and TFP development.



A ESE a one-piece, one-cure, carbon fibre wheel



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About Leather Embroidery

ZSK embroidery machines are known since decades to be workhorses and very strong and precise on heavy materials. Leather is a material with its variety of thicknesses and densities that can be a more difficult material to embroider. ZSK has invested many efforts during the past three years to increase its capabilities in the field of leather embellishment. The embellishment of leather is found in trim shops, seat manufacturers, leather good companies, shoe manufacturers, fashion ateliers and furniture manufacturers. The capabilities of ZSK include very fine designs, sequins, cording and taping as well as heavy sewing.

Design chair by RS-Möbel-Collection, Germany

Perforation and Quilting

When using sewing machines, the operation is limited to one colour and thickness of yarn. A combination of quilting with delicate designs is not possible. ZSKs technology allows combination of quilting / sewing and embroidery on each embroidery head with a variety of colours by using different needle sizes on the needle bars. ZSK machines can embroider sewing yarns such as AMANN Serafil #10, 15 and 20 without issues. Designers enjoy the capabilities as one part can include a variety of sewing yarn colours and can be combined with logos in one process.



Sample embroidered with thin and thick yarn

The biggest challenge is the perfect combination of sewing, embroidery and perforation. Beside design reasons, there are technical reasons such as airflow why perforation is seeing a growing demand in the seat industry.



Bag - Leather embroidered on a RACER 1XL

The ZSK Vision System is the answer to this issue. The ZSK Vision System can recognize perforation, shapes and colour differences. The EPCwin Digitizing System is used to create an embroidery file and an automation file (ZEPL), which allows the ZSK Vision System to compare location of perforation holes with the engineering file. The embroidery machine can place the embroidery at the suitable position on the material to stay within tolerances. The system is also capable to stretch and shrink designs to compensate for shrinkages and elongation in the leather i.e. after the lamination process.

It is important to note that the system cannot compensate for non-linear changes during the perforation or lamination process. If changes are linear or design components do not pass across the entire design, the placement can still allow a successful completion of the design.

Choice of Equipment

ZSK offers an extensive range of possibilities in terms of equipment choices. Applications requiring the ZSK Vision System only work with single head machines, as it is assumed that each work piece is different and behaves different. Otherwise, any quantity of heads can be upgraded to handle thick sewing yarns for upper and bobbin yarns.



ZSK Vision System

A speciality of ZSK is the 18 and 24 needle embroidery head. The head allows a wide variety of colours and yarn sizes to be combined in one design. Single Head machines are offered with field dimensions of 500x500mm, 700x700mm, 1.100x700mm or 1.300x1.500mm. For special applications, ZSK can offer field depths of up to 2.000mm and 2.500mm. Special requirements can always be discussed with ZSK and in some cases it might be necessary to design a new machine model to fulfil the purpose.

Beyond standard embroidery machines, ZSK offers combination machines with a W-Head (Cording, Coiling and Taping) and K-Head (Moss- and Chain-Stitch) that can be used to embroider leather strings i.e. for the fashion or furniture industry.



Design chairs by RS-Möbel-Collection, Germany





Embroidery on leather to control embroidered functionality

Design

The capability of up to 24 choices per head make ZSK the leader in terms of design capabilities.

The choices include:

- Thread Colours
- Thread Sizes (Thin to Thick)
- Thread Types
(Embroidery Yarn, Sewing Yarn, Fancy Yarn)
- Cording
- Taping
- Sequins
- Beads

In combination with conductive yarns, embroidered leather goods cannot only make a visual impact, but can include smart functionality as well. In 2018 ZSK presented a leather dashboard which controls fully embroidered capacitive sensors.

Customization

In many projects the embroidery machine is only one aspect of the overall project. Customer specific requirements for Health

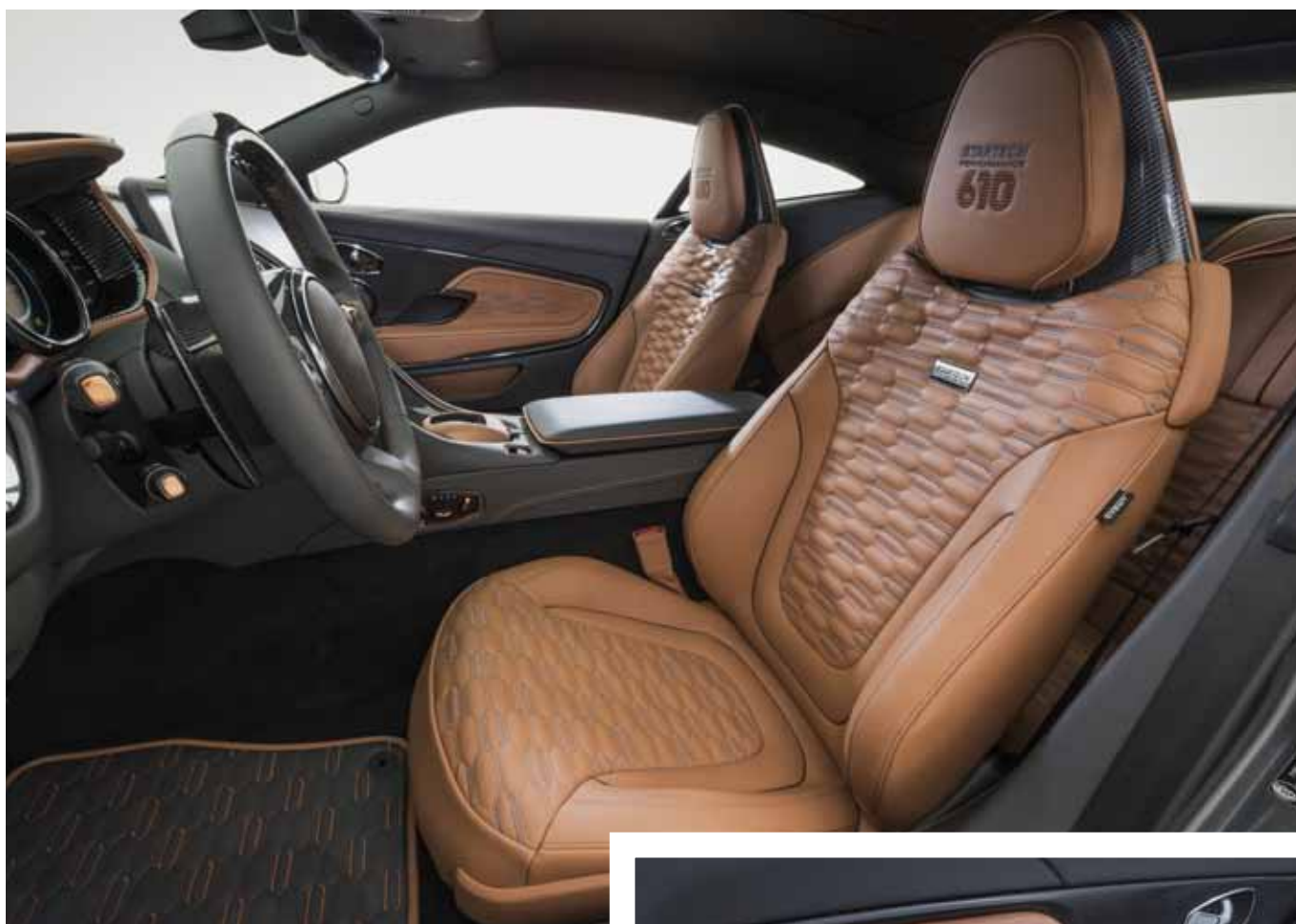
& Safety, production tracking or environment tracking can be of high importance.

The ZSK R&D department offers solutions that go well beyond a light barrier. Customized solutions can include light curtains, special table plate designs (incl. entry doors in the table), needle protection, take up lever protection, noise protection, key control of machine, sensors for work environment control (humidity, temperature etc.), operator tracking, production analysis (My.ZSK) and many other features.

ZSK is known to analyse specific and unique customer requirements and to design solutions to fulfil the requirements.

Auto Select Bobbin Changer

In 2017 ZSK introduced the Auto Select Bobbin Changer for up to 8 bobbins. The previous generation would replace one bobbin after the other. The Auto Select Bobbin Changer matches the bobbin number with the needle number. This allows matching of upper and bobbin yarn colour and thicknesses. Beyond using different bobbin yarn thicknesses,



Interior car design • Photo: Startech - Member of the Brabus Group

the bobbins can also have different tensions, which is required when working with thick and thin yarn. The bobbin tension that holds thick yarn is usually higher compared to bobbin tensions for normal embroidery yarn. ZSK offers a variety of bobbin cases with different tension settings. The right choice of the bobbin case will be important to ensure a very good embroidery quality.

The right Needle

ZSK recommends Groz-Beckert needles for leather applications. ZSK distributes 90 and 110 DH needle for embroidery machines. This needle system is part of the secret of straight sewing lines. This needle allows embroidery of sewing yarn in all directions with straight lines. Design requests might require different looks, where embroidery machine needles do not offer sufficient design choices. For these applications ZSK can offer needle bars that can hold needles for sewing machines. In case of special requirements, it is always worth contacting ZSK to discuss if a specific solution is available.



Photo: Startech - Member of the Brabus Group

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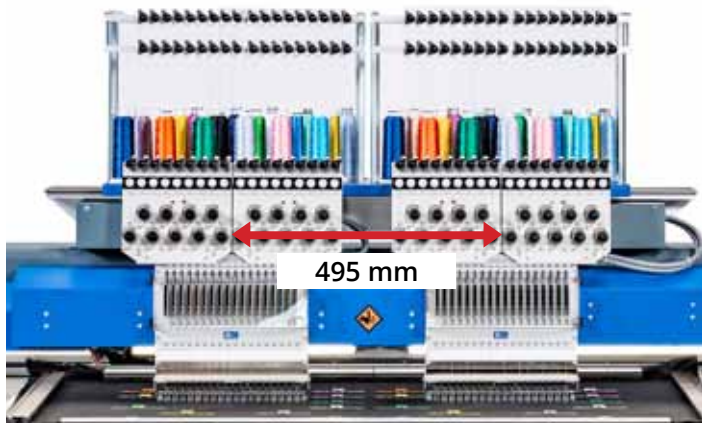
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RACER II Series

World Presentation at texprocess



Graphic representation of a RACER II



RACER II machines have a head distance of 495 mm / 19,488"

After the successful start of the SPRINT 7 with 18 needles, ZSK STICKMASCHINEN introduces the RACER II Series. ZSK continues the production of the RACER Series and the offering is now extended by models of the RACER II Series.

All models of the RACER II Series are equipped with 18 needles. Due to the width of the tension unit for 18 needles, RACER II Series models always come with a wide head distance of 495mm.

Start April 2019

Starting from April 2019, ZSK STICKMASCHINEN is offering the following models for the RACER II Series:

- RACER 1WL II
- RACER 2W II
- RACER 4W II
- RACER 6W II

The following advanced features have been included into the RACER II Series as standard features:

- Fast Colour Change
- as presented during the ZSK Open House 2018
- Fast Catcher Motor
- Head Selection
- New Cooler Control
- reduced noise when matching is not stitching

Beside the benefit of an increased needle number and reduced thread changes, the fast colour change and catcher motor increase the production efficiency of the RACER II Series and therefore make it a perfect partner for any embroidery house that wants to increase its output on the same space.

4 x ZSK at texprocess / techtextil

14 - 17 May 2019 • Frankfurt am Main

- ▶ texprocess 2019 / Hall 5.0 / Booth B13
- ▶ techtextil 2019 / Hall 3.0 / Booth H40
- ▶ Smart Textile Micro Factory / In Transit Halls 4.1 & 5.1 / Booth C02
- ▶ Automotive Seating / Hall 4.0 / Booth A41/A51

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The EPS Project

Aligning Print and Embroidery in All-Over Productions

At Heimtextil 2019 in Frankfurt ZSK STICKMASCHINEN and SMAKE have presented the new EPS Project. The system is the solution to solve alignment issues of printed fabrics and embroidery in all-over production.

EPS Project includes at least two projectors with special lighting (to deal with light and dark fabrics) and a SMAKE control box. The projectors are installed on the outside heads of the embroidery machine. If more than two projectors are installed, they can also be in the center of the machine.

The SMAKE control box can access files from the server via network or files can be placed into the hotfolder of the SMAKE control box.

Depending on the height difference of the projector and the fabric, the projector is capable to handle a variety of head distances and field depths. The system can project embroidery files and therefore enables the machine operator to fix the fabric in the border frame at the perfect position.

The combination of print and embroidery has grown in popularity during the last years and the perfect placement of the design has always been a time consuming activity. The EPS Projector reduces the setup time and therefore increases the productivity of the machine and allows a higher precision in design placement. The projectors can be installed either on a bridge going across the machine, or directly on a bar hanging from the roof.

Contact Details



SMAKE GmbH

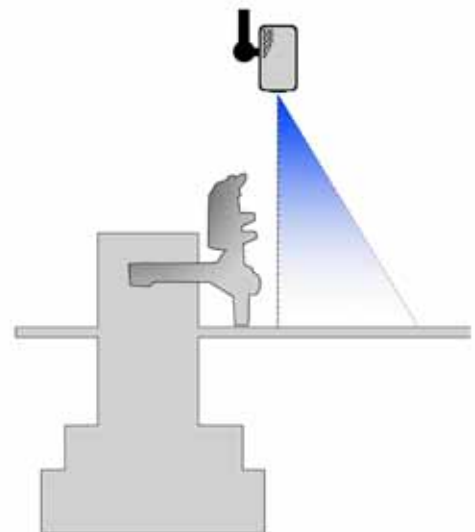
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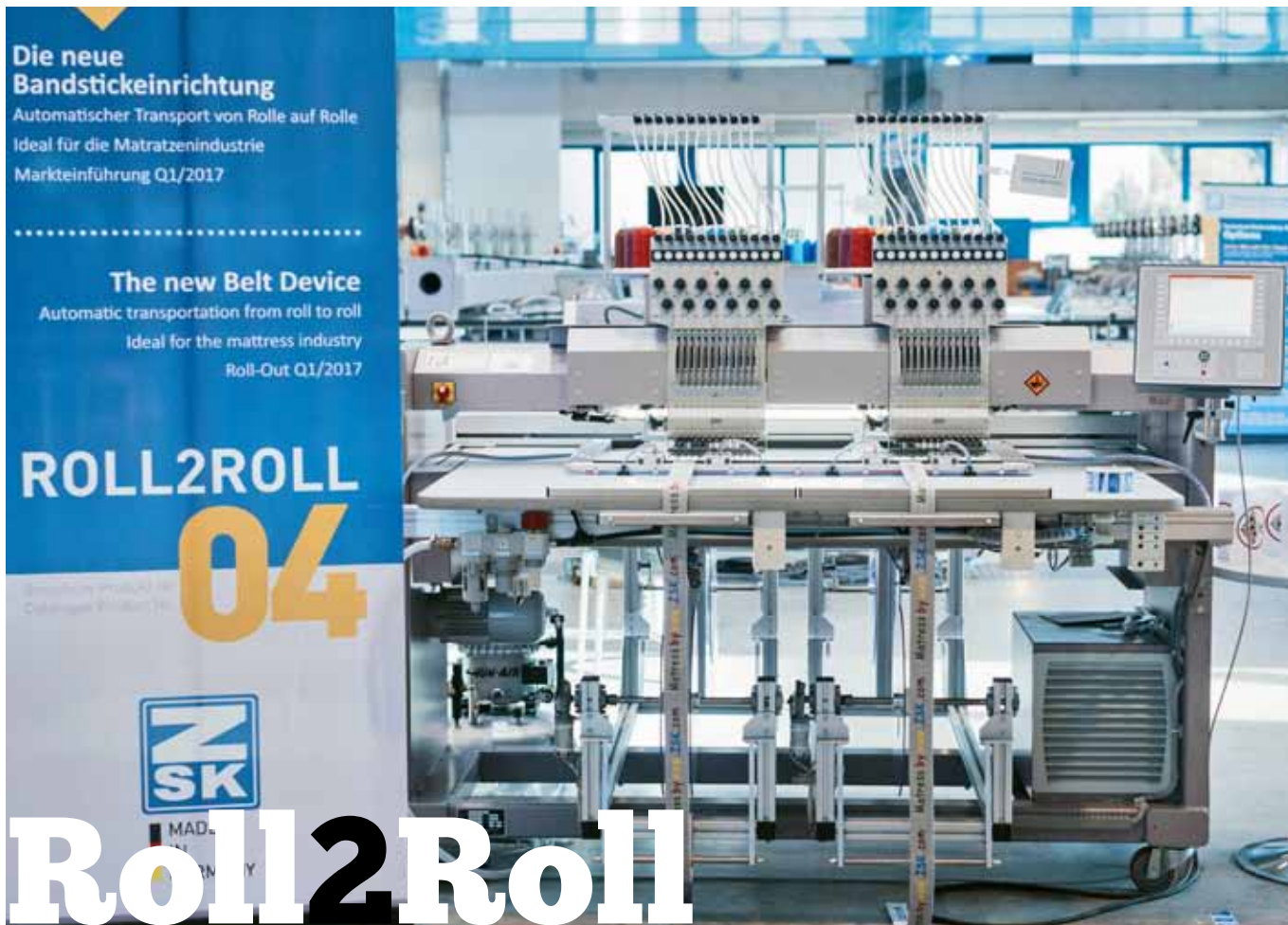
email: info@smake.com



Projectors installed on a bridge over the embroidery machine.



Different head distances and field depths can be adjusted by changing the distance between projector and fabric.



To install on Jafa/JNFA and RACER with border frame and 495mm head spacing.

ROLL2ROLL is a Pull Through Device developed for semi- and fully automated embroidery on tapes and fabric reels.

The system allows feeding of up to three materials that can be combined in the process (i.e. fabric and backings). At the front one material is rolled up.

Material Handling

When handling the material in the device, we differentiate between two methods:

1. **Clamping:** the maximum material width is 190mm and 140mm can be embroidered.
2. **Guiding:** the maximum material width is 190mm and 160mm can be embroidered

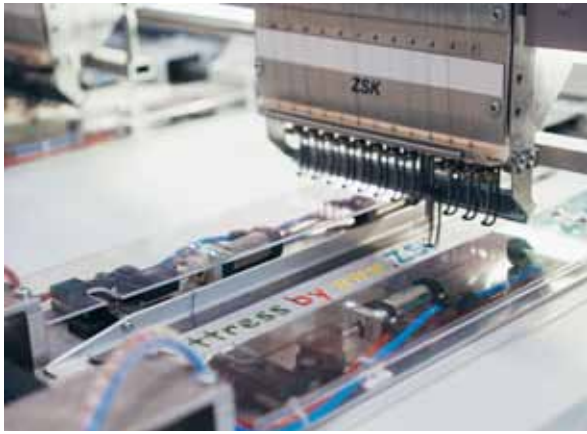
N.B.: upon request ZSK can develop similar devices for her measurements.

Products (Examples)

- Mattress Handles
- Office Curtains
- Mattress Borders
- Emblems and Patches

Keyfeatures

- Device for semi- and fully automated embroidery of tapes and fabric reels
- For ZSK embroidery machines of Jafa / JNFA and RACER Series
- Pneumatic Clamping
- Automatic Pull Through from back to front
- Pull Through for up to three materials
- Can be combined with ZSK Automatic Bobbin Changer
- Automatic Positioning of Design in x and y direction (optional)



Pneumatic Clamping Frame of ROLL2ROLL

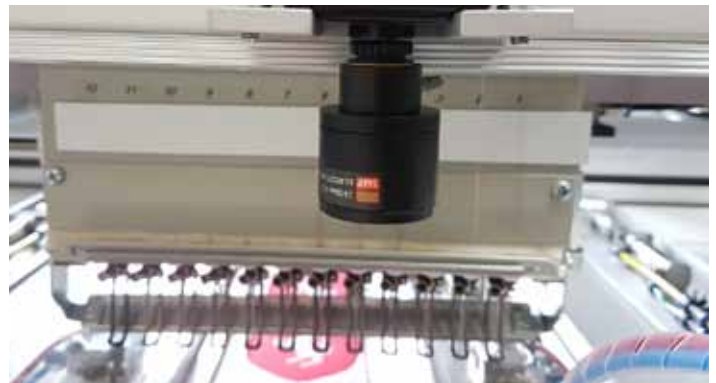


Automatic Winding Unit of ROLL2ROLL

Optical Sensor Optical Positioning System I

The OPS I can recognize specific markings on fabric or (woven, printed) design elements. The software positions the design and the frame in x and y direction to allow perfect positioning.

Potential applications are ribbons or tapes where weaving or printing defines an embroidery area and perfect placement is important.



Optional Optical Positioning System I

Technical Data

Material / Embroidery Field

Max. Embroidery Depth. 320 mm

Clamping

Max. Material Width 190 mm

Max. Embroidery Width 140 mm

Guiding

Max. Material Width 190 mm

Max. Embroidery Width 160 mm

Embroidery Speed

Up to 1000 min⁻¹ max.

Pull Through System

Diameter of Rolls (max). 400 mm

Machine Overview

The ROLL2ROLL system is developed for JAJFA / JNFA and RACER Series with a head spacing of at least 495mm.

The device has been implemented on 1, 2 and 6 head machines.

Note: The Roll2Roll device **cannot** be retrofitted on an existing machine.

Applications in the Mattress Industry

Embroidery is the method to embellish high end mattresses. The Roll2Roll device allows the automated embroidery of handles and borders in large quantities or by connecting the machine to the GiS BasePac, even production of personalized handles presents no longer a difficulty.

The BasePac template function can be used to produce handles or borders with personalization from one piece onwards. The efficiency will be the same as producing 100 times the same logo.

Beckmann Automation offers fully automated solutions that take an embroidered roll of handles from the ZSK machine and automatically cut and sew them onto mattress borders.

Contact Details

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**ZSK STICKMASCHINEN
OPEN HOUSE**
The Embroidery Technology Show
21. + 22. SEPTEMBER 2018
KREFELD • GERMANY

ZSK OPEN HOUSE 2018 - a retrospective

ZSK STICKMASCHINEN invited to its biennial ZSK OPEN HOUSE on 21 and 22 September 2018. About 1,500 customers and prospects from 48 countries across the globe followed the invitation to the two-day event at the ZSK headquarter at Krefeld, Germany.

And the visit was worth it: on 2.800 square meters in two halls, ZSK STICKMASCHINEN gave an impressive overview of its wide portfolio of embroidery machines, applications and software offers for the embroidery industry. Additionally, 24 companies and university institutes presented their products and services, all of which revolved around textile and embroidery.

NEW SPRINT 7 SERIES

The main interest of the visitors, however, was initially the new developments in the field of ZSK embroidery machines.

Amongst others, ZSK presented a new model of their single-head embroidery machine series "SPRINT". With the "SPRINT 7", "SPRINT 7L" and "SPRINT 7XL" three new machines extended the popular series.

The SPRINT 7 series offer some features, which are unique for this machine class. All SPRINT 7 models are equipped with 18 needles for more flexibility i.e. at the use of colours and yarn thickness.

The SPRINT 7L and 7XL have drive systems located on the upper part of the machine body. The models come without side-walls and enable embroidery of extra wide products. Additionally powerful servo motors and, with the models "7L" and "7XL", much larger embroidery fields than the SPRINT 6 are strong arguments for the new SPRINT 7 models.

The SPRINT 7L and 7XL offers a new maximum embroidery field depth of 400 mm. With that the new maximum embroidery fields are in a class of one's own:

SPRINT 7L - max embroidery field 600 mm x 400 mm

SPRINT 7XL - max embroidery field 1.400 mm x 400 mm

Last but not least, the new SPRINT 7 series offers a Home Function to return to centre position after each job and the capability to save the design starting point.



A SPRINT 7 with a triple combination of ZSK's Twin Sequin Device offering 6 different sequins.



ZSK STICKMASCHINEN new SPRINT 7XL with an max. embroidery field of 1.400 mm width and 400 mm depth.



A separate area for the presentation of ZSK's embroidery solutions for leather

NEW BEAD DEVICE

ZSK STICKMASCHINEN presented an innovative unit for the processing of beads. With the new bead embroidery device, the ZSK STICKMASCHINEN customers can expand the design options of their ZSK machines and thus their own variety of offers.

Advantages of the new bead device like processing glass beads as bulk material and different forms and sizes from 2 to 3 mm promise a successful future.

TIME IS MONEY

A new shirt collar frame, showed at the ZSK OPEN HOUSE for the first time will offer great time and processing advantage for embroidery operators. The new frame allows the embroidery of shirt collars



The new ZSK Shirt Collar Frame

in the package. For thus in future, no shirt has to be unpacked, folded and packed again.

Time plays a major role in another development as well: ZSK's flat embroidery flagship series "CHALLENGER" now offers a new option called "Fast Color Change" that reduce the time needed for a color change significantly. The extension is useful in productions with rapid pattern change and frequent color change and leads to a considerable production advantage.



ZSK flagship series CHALLENGER



World premiere at ZSK Open House 2018 of Ercigoj's new artwork Dancing Bears, an embroidered installation, motif by Vladimir Leben.



ZSK Technical Embroidery Systems Sales Director Michael Metzler explains the finesse of the embroidered working keyboard.

TECHNICAL EMBROIDERY SYSTEMS ON FOCUS

The exhibition space for Technical Embroidery Systems emphasized the importance of the trend-setting embroidery technology for the company from the Lower Rhine. A whole third of the show dealt with ZSK's technical embroidery machines, live productions and information from industry and science. Many consider this field as the next revolution in the textile industry.

For example a ZSK TECHNICAL SYSTEM "CZCW", a 8-head machine, demonstrated the laying of carbon fibers according to the distribution of forces within a structural component by producing car rims.

GARDENING THE FUTURE at ZSK OPEN HOUSE 2018



A symbolic check for the donation and the embroidered artwork "Blue Horse" were presented to Nancy Gasper from stups Children Center by Frank Giessmann and Holger Bien from ZSK STICKMASCHINEN.

GARDENING THE FUTURE supports stups KINDERZENTRUM, Krefeld, Germany.

At ZSK Open House 2018 the visitors donated 1338.80 EUR for ZSK STICKMASCHINEN's global charity project "GARDENING THE FUTURE". The donations were collected this time for the stups Children's Center at Krefeld, Germany.

In October 2018 the donation was handed over to Nancy Gasper of DRK Schwesternschaft (German Red Cross Nursery) Krefeld, which runs the stups Childern Center. In addition, stups Childern Center receives a valuable embroidered image with the motif "Blue Horse" after Franz Marc.



Michael Sibben receives his prize from Frank Giessmann at ZSK STICKMASCHINEN headquarter.

Any visitor who donated to "GARDENING THE FUTURE" at ZSK Open House 2018 had the chance to win an embroidered piece of art created by ERCIGOJ, Slovenia.

The lucky winner Michael Sibben is very happy about the "Water Lillies" after Claude Monet.



A ZSK Technical Embroidery System JGVA 0109

Another on-site production showed the possibilities for embroidering electrical connections with integrated circuits on textiles by embroidering an “electric piano”.

The British company SHAPE (www.shape-group.com) established a small production of carbon made “bottle openers” at their booth to explain the process. The preforms were laid and additionally decorated with an embroidered logo in one process on a ZSK “JCZA 0109”. Finally, the preforms and added resin get in final shape in a small vacuum press.

Apologies

For everything else that remains unmentioned here, such as our co-exhibitors, whose support always make ZSK Open House to something special, or the catering, which cared for us and our guests excellently, we apologize. This short retrospective does not claim to completeness.

We hope that all of you enjoyed the ZSK OPEN HOUSE 2018. We hope to welcoming you again in 2020 when we invite to the next ZSK OPEN HOUSE.



The ZSK Spare Part Team at a table booth for Mighty Hoop and the Hoop Master hooping aid.



Nice Instagramm motif from our “Embroidery Buddy” G&B



Drawing of a donator to “GARDENING THE FUTURE” as the winner of an embroidered artwork.



A RACER 2W embroidering the game board for Snakes and Ladders

Hooping Caps - Made Easy



The new ZSK Cap Framing Station can be placed near the embroidery machine or works as a central working station.

The hooping station offers sufficient space for hooping caps and hooping shirt pockets. It is a good investment to have more cap frames in an embroidery house than just a set per machine. This way a lot of caps can be hooped in advance and all machines can remain running for production at any time.

Parts

Cap Framing Station	PartNo.: 361028935
Cap Frame	PartNo.: 361028928
Cap Framing Jig	PartNo.: 361028903

In many embroidery houses we find that embroidery machines have a lot of idle time when the operator hoops garments or caps. All cap embroidery machines are delivered with a framing jig for caps that can be installed on a table edge. The result is usually that the operator has to bend towards the table, which brings him in a less than optimal position. Valuable seconds are wasted for moves, where cap framing could be done a lot quicker and leaner.

ZSK is introducing a cap and shirt pocket framing station where the hooping of caps can be moved away from the machine operator to a hooping station. The machine operator can look after more embroidery machines and keep them running (and earning income). The framing station can focus on supplying sufficient hooped caps to the machine.



The Cap Framing Station can be adjusted to a comfortable and healthy height for your operator to avoid causes for back pain.

New T8-2 Function

Design Placement with the help of reference points

This option is only available for CHALLENGER, SPRINT 7 and most recent RACER with pantograph absolute encoders.

The latest version of the T8 software introduces a feature that supports the operator in placing a design at the designated position. In many cases the embroidery design is located at a position, where it dependent on a print position or characteristics of a garment. So far the operator had to hoop the garment very precisely or required a longer setup time for the perfect positioning of the starting point of the design.

The new feature allows the operator to choose two points and to place the embroidery design according to their choice. The embroidery design can be placed in the centre of these two points or next to point A or B. The software feature also allows the turning of the design to fit the angle of the selected points.

A typical situation could be a towel where the embroidery should be placed in the center of woven elements. Another example are situations where a print on a product and the embroidered design have to match perfectly.

How to do

In the photo right the border or pattern of the towel is not straight in the hoop. A logo or other embroidery design would be embroidered obliquely at the wrong angle. The desired pattern needs to be aligned on the course of the border in the frame.

At T8-2 control unit start with loading a design.

Once it is loaded start the aligning process by typing R1 and then U1 for "More ..."



In order to align the design with the garment now, we will set two reference points which will change the alignment of the design.

Here the embroidery design should be aligned to the border of the towel. Move the needle to a point on the border. Mark the point by typing U5 at the T8-2 control unit.



Icon at U5 marking point 1



Icon at U6 marking point 2

Move the needle to a second point at the border of the towel. Mark this second point by typing U6.

The embroidery design will now aligned at an imaginary line between points P1 and P2.



Once the two points have been set, various options are available at the U row. These options are suggesting the placement of the design after realigning the design. The options suggest the design could be placed from far right to far left corner of the two aligned points. They also suggest the possibility of the design being made above or below the set point.

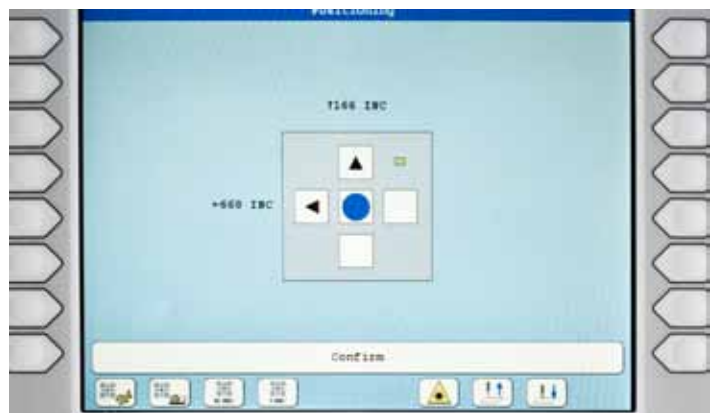
Important point to note, U10 options suggests that the machine should just realign the design. The placement of the design will be made by you separately. This is usually done when the aligning points are not where the design is supposed to be placed.

In our example, we have used setting U2.



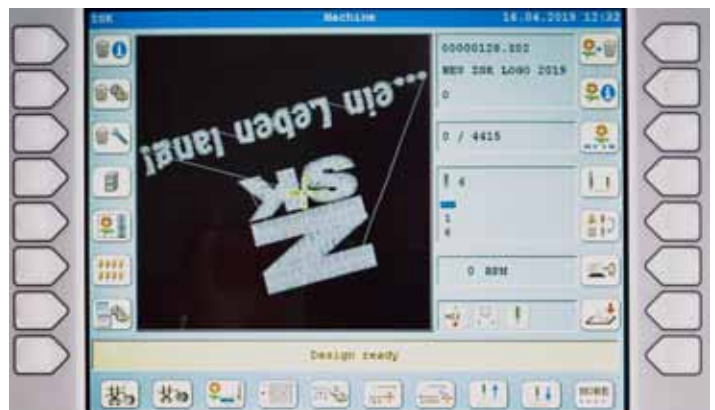
The T8-2 monitor shows certain measurements; these measurements are in lieu of the realignment of the design.

Once you move the pantograph with respect to the measurements on the screen, you will be brought to the point where you don't have to reposition the design. The machine's software has already done that for you.



This is the final step, if you look at the photo, you will see how the two points have helped the design to realign itself. The two points that were set were used to calculate the degree and the direction in which the design has to be moved towards.

Now the embroidery can start.



The resulting embroidery design is perfectly aligned!





SPRINT 6
12 Needles



SPRINT 7
18 Needles

The SPRINT Series - a growing Family

ZSK Stickmaschinen is manufacturing the SPRINT 6 and SPRINT 7 Series.

Models of the **SPRINT** Series are the ideal solution for small shops and large factories. The machine is ready for mobile use and can be operated at events and trade fairs, it can be integrated into store concepts, used for sampling, personalization and is of course ideal for workflow integration.

ZSK is currently offering the following selection of models:

SPRINT 6

Max. embroidery field (W x D) 460 mm x 310 mm

SPRINT 6L

Max. embroidery field (W x D) 600 mm x 280 mm

SPRINT 6XL

Max. embroidery field (W x D) 1.200 mm x 280 mm

SPRINT 7

Max. embroidery field (W x D) 460 mm x 310 mm

SPRINT 7L

Max. embroidery field (W x D) 600 mm x 400 mm

SPRINT 7XL

Max. embroidery field (W x D) 1.400 mm x 400 mm

The advanced features of the SPRINT 7 vs. SPRINT 6 Series include the following features:

- 18 Needles
- Servo Drives
- Increased Efficiency (higher speeds at longer stitch lengths)
- Home Function (Return to Centre Position)
- Save of Design Starting Point
- 7L and 7XL models have drives located on the upper part of the body.
- 7L and 7XL models are without side walls and enable embroidery of extra wide products (i.e. golf bags)
- 7L and 7XL models do not require a separate machine stand

Applications



Cap



Tubular



Border Frame

The **SPRINT** Series is the ideal equipment for workflow integration. The T8-2 control unit can be easily integrated into a network environment. The operation of the machine can be simplified by using barcode commands (see separate article in this Carl Magazine).

The machine is ready for the Thread Cone Matching system of ZSK. The information can be accessed by external workflow systems and help to ensure efficient production organisation. As the software of the T8-2 is developed at ZSK In-House, even special requests and features can be integrated to fulfil customer requirements.

Variants



SPRINT 6 / SPRINT 7



SPRINT 6L / SPRINT 7L



SPRINT 6XL / SPRINT 7XL

The **SPRINT 7L** and **SPRINT 7XL** have drive systems that are mounted on the upper part of the machine body. The frames are therefore hanging on the upper side of the frame and there are no side walls or drives in the way, when one wants to embroider extra wide items such as golf bags, suitcases etc.

The **SPRINT 7L** and **SPRINT 7XL** have a machine stand integrated into the machine concept. The machine is placed on wheels and the upper part and stand cannot be taken apart.

A popular accessory for the **SPRINT** Series is the Quick Change Kit. It allows minimal change over times when switching between different frame systems. For more information, please have a look at the article in this Carl Magazine.

Contact Details

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User Tip

Control Unit T8 / T8-2 - Loading of designs via network using bar code control

Software settings

With the function Loading designs via network using bar code control of the T8 control unit, designs can be loaded into the machine via barcode scanner from a network-shared directory.

Basics

Download the latest Software-Updates:

www.zsk.de -> "Service" -> Downloads-T8

Requirements

- **Bar code scanner with USB-access.**
With the machine off, connect the scanner to the back of a USB port on the T8 control unit. If necessary, set the scanner to Add return.
- **T8-2 Release 16.04.2018**
(only available for machines with MCP35 and MCP31, so CON-Modul respectively ARM-Modul).
- **Established network connection for loading designs via network.**

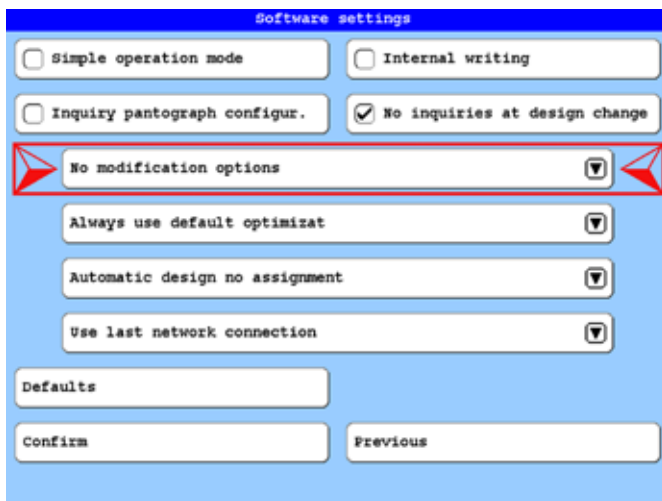
Note

All discribed functions of the control unit T8-/T8-2 will be started at the Base Screen (BS).

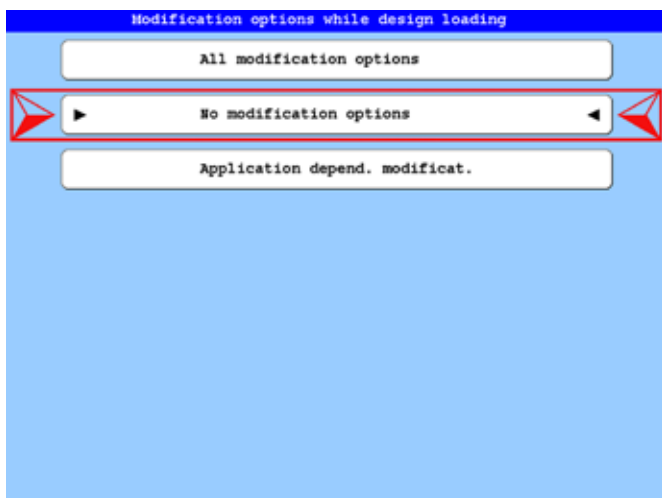
Variante 1: No modification options

Switch on the function **No modification options**. Starting from the base screen of the T8 control unit, press the following buttons:

- [L7] Software-/Hardware settings
- [R4] Software settings
- [L3/R3] No modification options



If the function is not yet displayed in the dialog, press the button [L3 / R3] and select the option [L2 / R2] **No modification options** in the dialog **Modification options while design loading**.

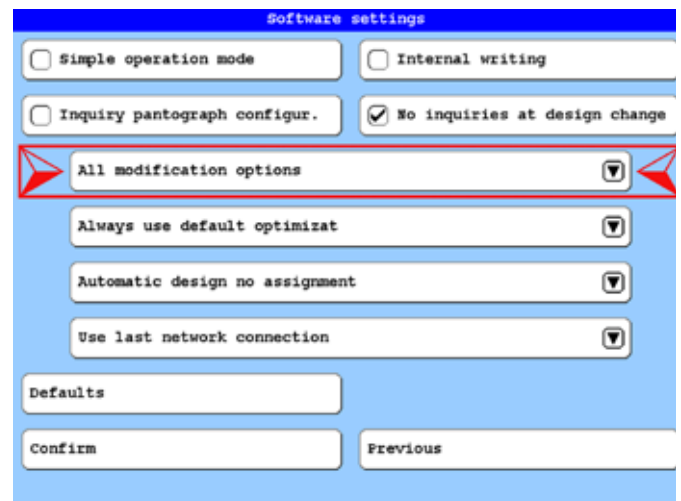


If the button **No modification options** is active, the modification dialog will be switched off and will not appear when loading a design.

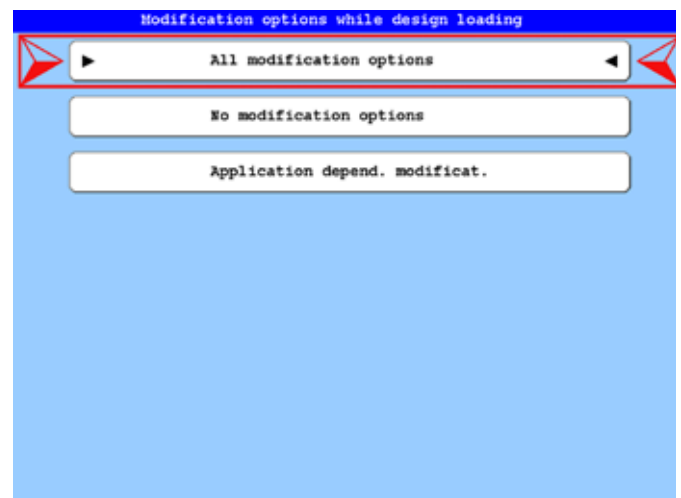
Variante 2: All modification options

Switch on the function **All modification options**. Starting from the base screen of the T8 control unit, press the following buttons:

- [L7] Software-/Hardware settings
- [R4] Software settings
- [L3/R3] All modification options



If the function is not yet displayed in the dialog, press the button [L3/R3] and select the option [L2/R2] **All modification options** in the dialog **Modification options while design loading**.



If the button **All modification options** is active, the modification dialog will be switched on and will appear when loading a design.

Loading of designs via network using bar code control

Starting from the base screen of the T8 control unit:

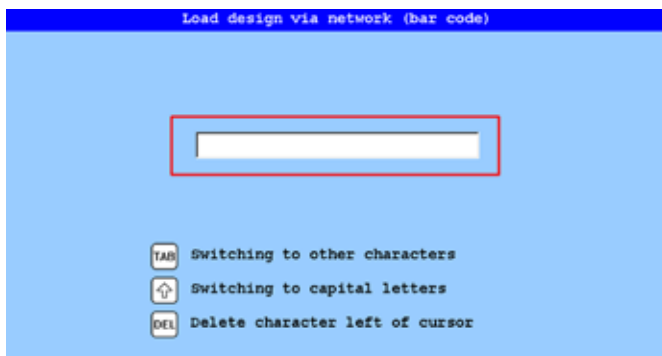
Scan the bar code

Load design from network via bar code.



The dialog

Load design via network (bar code) is displayed.



Scan now the barcode, that contains the design number or design name from your order form.

In the software settings are according to **Variant 1**, the design is now loaded directly, optimized and assigned to the machine. It can be embroidered directly.

If the software settings have been selected according to **Variant 2**, then the design can be loaded normally or rotated.



Scan the appropriate barcode for the function. The design is loaded, modified, optimized and assigned to the embroidering machine according to the selection.

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Extensions T8-2

News 09/2018 - 04/2019

The control unit T8-2 is the main control of ZSK embroidery machines.

ZSK embroidery machines are valued and used all over the world. Of course, the T8-2 supports this with a user interface that can be viewed and operated in 13 different languages.

The languages are:

German, English, Italian, French, Russian, Portuguese, Dutch, Spanish, Turkish, Polish, Hungarian, Greek and Bulgarian.



T8-2 supported Data formats

Just as diverse as the available languages are the data formats with which the T8-2 can work with:

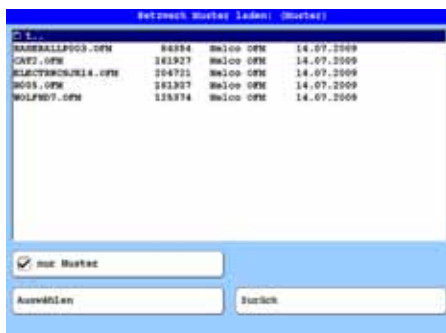
- Barudan (*.DSB)
- Barudan (*.Uxx)
- Brother (*.PEC)
- Brother (*.PES)
- Fortron (*.DSG)
- Melco (*.EXP)
- Pfaff (*.KSM)
- Tajima (*.TBF)
- Tajima (*.DST)
- Tajima (*.EXX)
- Zangs / Marco (*.DSZ)
- Zangs / Marco (*.FXX)
- Zangs / Marco (*.ZSK)

New T8-2 supported Data formats

Melco OFM Code (*.OFM)

Tajima PSF Code (*.PSF)

Fortron PAT Code (*.PAT)



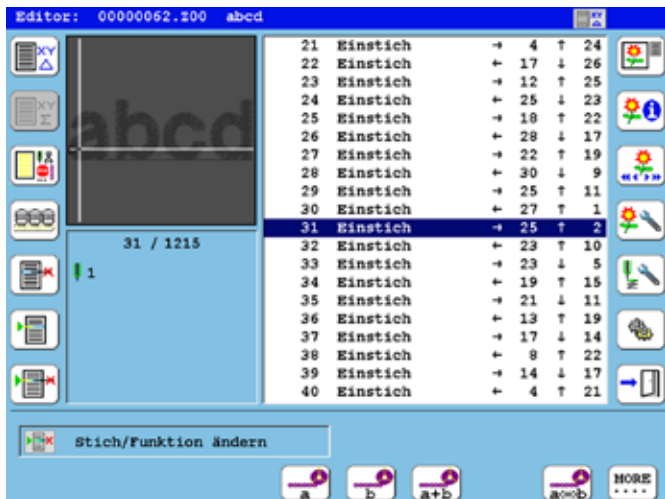
Aligning of pattern

Aligning of a pattern by defining two reference points



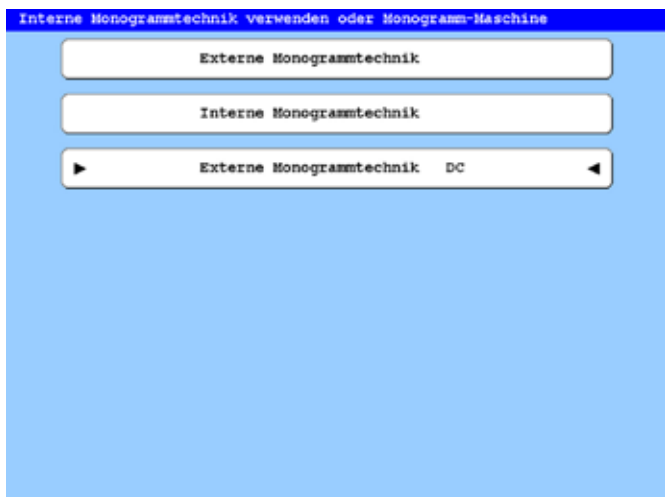
Extension editor

Function for exchanging the sequin belts extended



Option external Monogram Technique DC

Option to generate less network access while embroidering



Extension software settings



Extension ZSK Writing

Additional option "Centered".

This option leads to horizontally centered letter designs.



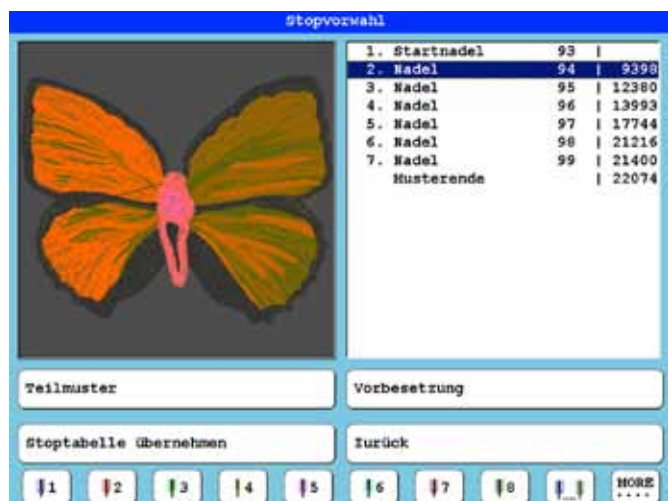
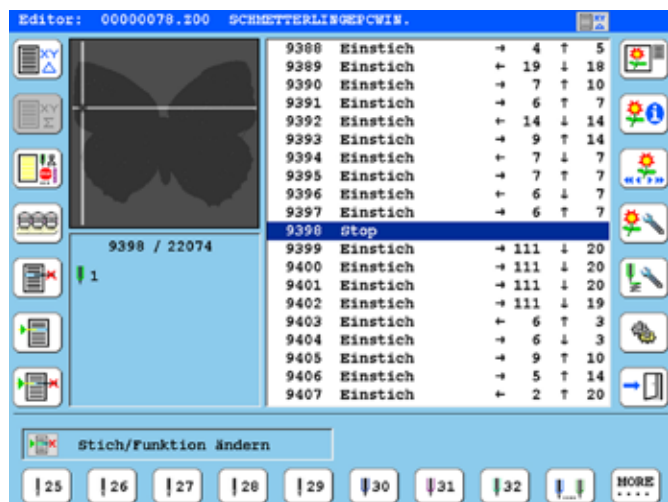
Search by pattern name

The alphabetical selection is now possible



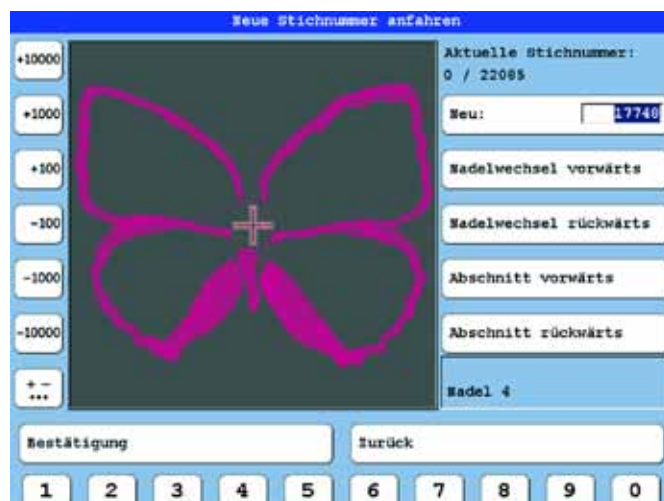
Support of virtual needles 25 to 99

Division of the pattern into sections in the editor and at the preselection of stops



Extensions stitch start

Additional stitch positioning by means of +/- 1 and +/- 10 as well as the graphical presentation of the pattern section



Free download of T8-2 Software at www.zsk.de

Online at the ZSK STICKMASCHINEN company website at www.zsk.de, ZSK always provides the latest version of the machine software T8-2 for free download.

Updating your T8-2 on a regular base will benefit your embroidery business with the latest improvements ZSK STICKMASCHINEN offers its customers several times a year.

Where to go at www.zsk.de?

On the ZSK company website you will find the item "SERVICE" in the main menu. Under this menu item please select the item "DOWNLOADS-T8".

Underneath we keep the current T8 software for you to download.

Need help?

If you have questions related to the download or installation the machine software please send an email to: zsk@zsk.de with the subject "Download T8 software. If you provide a valid communication possibility we will contact you.

ZSK's new Shirt Collar Frame



Prior to introducing the ZSK Shirt Collar Frame, we have seen a variety of processes how the shirt collar frames are embroidered. Customers usually charge for the embroidery and the folding and packing of the embroidered shirt after the embroidery process. To understand the improved process of our shirt collar frame, we have prepared a short video on YouTube, which you can view following this link: <https://www.youtube.com/watch?v=FJapmMGUssl>

The Shirt Collar Frame can be installed on any SPRINT and RACER tubular embroidery machine.

For the SPRINT Series we are offering a Service Table where the shirt can rest during the embroidery process.

The Shirt Collar Frame has two holders of different length. For mass production they can be set for the left and right collar. The benefit of ZSKs Shirt Collar Frame is that the shirt can remain folded in the back and just the collar is being pulled out of the bag and embroidered.

Parts

Shirt Collar Frame	PartNo.: 360.010.910
Service Table for SPRINT 5/6/7	PartNo.: 360.010.913

TOWA Digital Tension Gauge



TOWA digital tension gauges were known for mechanical measurement of bobbin case tensions.

TOWA introduced a tension gauge that can be used for measuring the bobbin case and upper thread tension digitally in one device.

The TOWA device is a very affordable tool to check the setting of the machine and to adjust it where necessary. For specialists there is Hans Schmidt & Co GmbH in Germany offering highly precise tension meters starting at 1,000 Euro and upwards. For everyday use the TOWA tension gauge is a great and very affordable tool that every beginner and advanced embroidery house should have in their shop.

The device can be ordered from the ZSK Stickmaschinen spare part department or from your local ZSK distributor.

Parts

Towa Digital Tension Gauge	PartNo.: 570.800
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SPRINT Series

Changing Frames

Quick & Easy



Especially SPRINT customers focus on low volume orders and in many cases the quantity per order is 1. ZSK offers the benefit of a huge variety of accessories to embroider a large variety of products. When flexibility is demanded, set-up times for each job should be as short as possible. ZSK offers for the SPRINT Series (5/6/7) a Quick Change System. Instead of requiring a screw driver, all frames get equipped with a centring and the change of frames is possible by just flipping up and down two levers.

Parts

Quick Change System	PartNo.: 360.998.901
Centring	PartNo.: 360.010.209

Purchasing original ZSK Spare Parts and Accessories

The parts and accessories introduced in the Carl magazine can be ordered at the ZSK Spare Part Department or via you regional ZSK Distributor.

Contact data of all ZSK distributors are available at the ZSK STICKMASCHINEN company website at www.zsk.de.

At the website choose menu item "Company" and there menu item "Representations".

Thick Yarns - a method to reduce production costs

In home textiles, single designs with very high stitch numbers are the everyday challenge of embroidery factories. The ready product is afterwards sold by meters and not by the number of stitches.

The requests from customers and changing trends in fashion request new features constantly. The machine setup developed by ZSK for sewing yarns for leather has been successfully introduced to different home textile factories in India.

The machine upgrade kit allows the factory to use machines with a high number of embroidery heads for both normal embroidery and embroidery of thick yarns. The introduction of thick yarns into the design creates a new and interesting look and heavily reduces the number of stitches and production time for each meter of fabric.

The pictures show an example, where the same design has been embroidered with Polyneon 40 (10.226 stitches) and with Serafil 20 (5.847 stitches).



Polyneon 40 - Sample with 10.228 stitches



Serafil 20 - Sample with 5.849 stitches



1.2.3. STICKJAM

The new and indispensable tool for all embroidery shops

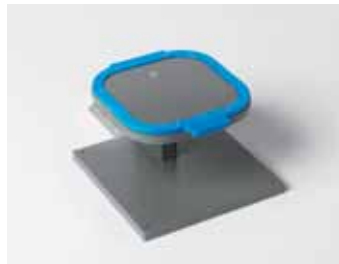
Who does not know them, the tedious clamping, tight-seamed textiles. Johnny Steiner aka StickJoe from Allschwil, Switzerland has developed a helpful tool for this problem: the 1.2.3. STICKJAM.

1.2.3. STICKJAM makes it very easy to clamp tight or small-format textiles such as stuffed animals, children's body suits, trouser legs, sleeves, outside pockets, backpacks and pillowcases.

And that's how it works



Different attachments can be mounted on the 1.2.3. StickJam's freestanding base.



The hoop is placed on top.



The backing can be conveniently fixed to the hoop to prevent it from shifting.



Tight textiles can easily be put on without overstretching.



The textile can easily be stretched when closing the hoop.

The well thought-out aid was developed out of an emergency for the company's own production to facilitate clamping and save valuable time. Over time Johnny Steiner perfected his idea and created finally the 1.2.3. STICKJAM.

Today the STICKJAM is distributed worldwide and enjoys increasing popularity. The existing model is suitable for a magnetic frame 5.5" x 5.5" (135 x 135 mm).

In 2019, some more popular magnetic frame sizes will be on sale.

Standard attachment

- 5.5" x 5.5" / 135 mm x 135 mm

New attachments in 2019 (coming soon)

- 4.25" x 4.25" / 108 mm x 108 mm
- 6.5" x 6.5" / 165 mm x 165 mm
- 7.25" x 7.25" / 184 mm x 184 mm
- 10" x 10" / 245 mm x 245 mm
- 9" x 5" / 127 mm x 203 mm
- 4.25" x 13" / 108 mm x 330 mm

The advantages

- Time saving and easy to use
- Small, handy and stackable
- Sturdy and durable
- Compatible with conventional magnetic hoops

Further information about the 1.2.3. STICKJAM can be found online at reseller.stickjoe.ch. The new online shop for this helpful tool will be starting on 12.05.2019.

stickjoe.ch
UNLIMITEDSTICKEREI

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2019 Exhibition Dates

14.05. - 17.05.2019

texprocess 2019

Messe Frankfurt
Hall 5 • Booth B13
Frankfurt am Main • Germany

14.05. - 17.05.2019

techtexsil 2019

Messe Frankfurt
Hall 3.0 • Booth H40
Frankfurt am Main • Germany

14.05. - 17.05.2019

Fespa 2019

Messe Munich
Hall A6 • Booth A65
Munich • Germany

21.05. - 24.05.2019

interzum

Messe Cologne
Hall 10.0 • Booth H065
Munich • Germany

21.05. - 23.05.2019

automotive interiors

Messe Stuttgart
Hall 4 • Booth A4305
Stuttgart • Germany

18.06. - 23.06.2019

FIA 2019

Palais des Expositions
Alger • Algérie

20.06. - 26.06.2019

ITMA

Fira de Barcelona
Hall 3 • Booth E102
Barcelona • Spain

10.09. - 12.09.2019

Composite Europe

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Anaheim Convention Center
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30.10. - 31.10.2019

Advanced Engineering

NEC Birmingham
Booth P16
Birmingham • UK

13.11. - 15.11.2019

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Legals

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