

Steiger outlines technical developments for flat knitting

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Vionnaz - Knitting Trade Journal talks to Steiger CEO, Pierre-Yves Bonvin about the company's latest flat knitting machine developments for the burgeoning technical textiles sector.

The latest flat knitting machine from Switzerland's Steiger is said to be ideal for the production of technical textiles for the medical sector.

The Vega 3.130 Trameur is described by the company as the first machine developed specifically for orthopedic applications using compressive yarns.

It is the successor of the best selling Libra 3.130 T, which, with its open carriage and the motorized yarn-guides, has established itself as the standard for this specific industry.

"After listening to our customers suggestions, with the Vega 3.130 Trameur, we have worked mainly to improve the stitch creation and the drop and maintaining of the elastic yarn," explains Steiger CEO, Pierre-Yves Bonvin, adding that upgrading has also taken place on the reliability of the production, improved machine stability and a new take-down control

Applications

Steiger is well-known for its capability when it comes to developing competitive machines that have been adapted for applications in the medical sector.

Up to now though, machines developed for the production of standard knitwear have been modified for the orthopedic market. With the Vega 3.130 T however, the decision was made to design a model exclusively dedicated for the production for these technical applications using in-lay elastic yarns. "This decision has allowed our design team to select all the optimal technical solutions that are required to improve the machine performance for this field," say Bonvin.

The main innovation arises from a completely new sinker system. The perfect guiding of the sinker using a grooved plate and a new activation system has resulted in an optimal maintaining of the elastic yarn during the creation of the stitch. "The outcome," notes Bonvin, "is that we can guaranty that no elastane is knitted together with the base yarn even with an increased production speed. High precision at high speed is our target with the Vega 3.130 T."

Indeed, with the decision to dedicate the machine to the medical sector, Steiger has also designed a totally new cam-box specialising in a single E14 gauge.

Moreover, the brushes position and the single selection system have been optimized which has led to a clear improvement when it comes to machine reliability. Short, light and dynamic, the new electronic drive system and the acceleration and deceleration performances of the cam-box have also been enhanced.

In order to support this increased carriage reactivity, Steiger has also worked on the stiffness of the main frame. Without altering the recognized ergonomics and without increasing the machine dimensions, the resulting frame is by far the most rigid compared to Steiger's previous machines.

In developing the Vega 3.130 Trameur, Steiger was also aware that unplanned maintenance can be critical when a machine is loaded 24 hours a day, seven days a week within a lean organization. Not only is just production speed important, but also machine availability, limiting the down-time of the machine and reducing maintenance costs are all crucial. "Over the last several years, lean management has been widely implemented by our customers," Bonvin explains. "The knitting machines are integrated in a complex production/quality management. All of the above mentioned innovations and developments are intended to increase the overall efficiency of the equipment. With the Vega 3.130 Trameur, all of this has been improved on."

Software

Along with the new machine itself, Steiger has also developed a new software module for the maintenance team. The machine indicates when the necessary maintenance actions must be done and by whom. Information is available not only on the machine itself but also at the production manager's workstation, making it easier to prepare the maintenance program for the relevant team. This preventive maintenance module helps limit the unplanned machine stops and guides operators and technicians to keep the machine running throughout the year, guaranteeing the consistency level of production quality.

To help its customers keep costs down and limit the required workforce, Steiger has also included some innovative elements such as the automatic greasing system for the needle-bed and the ergonomically-designed article collectors placed under the needle-bed to guide knitted articles towards the operator. An integrated ionization system coupled with the article collector further reduces the collection time for the operators. The result is that the Vega3.130 Trameur has been described by its initial users as more user-friendly compared to previous machines.

Orthopedics

In the orthopedic field, many Steiger machines are now operating as automatic, custom-made production systems. For example, the dimensions of the injured limb are taken by the doctor and are inserted in a web-based application developed by Steiger. The doctor selects the compression class in the various sections of the article. The file containing all this data is prepared by the company's Model 9 programming software and is automatically inserted in a preconfigured program.

With no human intervention required, the program is generated and produced on the machine precisely matching the patient's dimensions. Each article is therefore different from the previous one and should be available within 48 hours.

"All pathologies require an exact dimension for the injured limb and a specific compression class," says Bonvin. "In order to guarantee this performance, a system that combines automatic tension control and measure of absorbed yarn length (LFA) is available on the Vega 3.130 Trameur. The compression class, which is ensured through the use of the elastane yarn, is remotely controlled on the yarn feeder by Model 9. Available for the last two years, this system has now proven its efficiency and is being widely introduced in our customer's factories.

"With the Vega 3.130 we go one step further. In order to secure dimensions adapted to the patient limb, we have added an LFA system that calculates the yarn length required to knit each zone of the article. The variation of the stitch quality sets the vertical stitch dimension and guarantees the exact size of the custom made orthotics. The dimension of the article is also widely influenced by the take-down force with a new type of drive using a close loop control helping to set this force with more accuracy."

The LFA combined with the tension control therefore guarantees that the final article corresponds to the specification required by the therapist.

With the Libra 3.130 Trameur, Steiger has developed an innovative machine fully dedicated to the production of orthopedic articles. The multiple innovations on the sinker, on the cam-box and the carriage drive have improved the performance of the machine and even greater attention has ensured that the quality of the final article is guaranteed.

The LFA, the remote control of the yarn tension and the new take-down drive are designed to ensure the geometry and the compression class of the final article. "In the end, the ergonomics of the machine, the preventive maintenance module and the maintenance aids make the Libra 3.130 Trameur one of the most user-friendly machines on the market," says Bonvin.