

Cross-sector project enables digitally printed woven PES carpets

admin / PDF / Mon, 01/22/2018 - 12:38

DOMOTEX 2018 | WTiN

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A collaborative project between some of the textile industry's most prominent European machinery manufacturers has led to a new innovative possibility for the carpet industry. At the 2018 edition of Domotex – the foremost exhibition for floor coverings – a project aimed at creating a solution for digitally printed woven polyester carpets came to fruition, causing a stir with visitors.



The project has been spearheaded by heatsetting machinery specialist **Power-heat-set**, carpet weaving technology expert, **Stäubli** and digital printing machine manufacture **ZIMMER AUSTRIA**, whose technology has been harnessed to enable the application. The project is also supported by manmade fibres machinery provider **Oerlikon** Neumag, and spinning machinery specialist, **Saurer**. With machinery from these five providers, a carpet manufacturer is now able to operate an end-to-end vertical solution for woven polyester, printed carpets.

***Picture:** An example of the digatllly printed woven PES carpet*

Polyester has become an increasingly popular fibre for carpet production due to its brilliancy, softness and stain resistancy. Polyester is also one of the most competitively priced staple fibres and can be made from recycled plastic, feeding into the ever important and in-focus sustainability trend.

Despite the growth in polyester carpets, polypropylene and nylon are still the most commonly used synthetic fibres for carpet production. However, polypropylene fibres are not able to take on dyes after setting, needing to be solution dyed prior to spinning at the fibre production stage. And, whilst nylon can be printed using digital technology, this fibre is more expensive than the polyester alternative and mainly used for contract business.



With polyester being a key area for development in the carpet sector, there comes the choice between tufted and woven carpets. Tufted carpets are now the most popular method of carpet production in Europe – a key market for the carpet industry due to its climate and history – as woven carpets tend to be more expensive and manufacturing can be slower, particularly where the carpet design is complex and colorful.

***Picture:** Digitally printed woven PES carpets enable design flexibility*

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However, woven carpets are more durable and don't present the same environmental issues that tufted carpets do due to the chemicals used in backing the finished product. In the area of tufted carpets, the industry is currently trying to remove the use of VOC producing chemicals from the process, however this is proving challenging.

Picture: The back of the printed PES carpet. Penetration of the ink on the carpet is achieved to a level where the back of the carpet resembles a woven carpet

The project from all five companies involved, which was initiated by **ZIMMER AUSTRIA** at the beginning of 2017, looks to bring together the benefits provided by polyester, the benefits and finish of a woven carpet, and the design flexibility afforded by digital print.

Stäubli offers the carpet weaving system ALPHA 500, which has been developed to fulfil the demands of carpet weavers worldwide. With ALPHA 500, down-times are reduced to a minimum, which is an especially important advantage for greige material weaving.

Power-heat-set's GVA machine is equally crucial to the production of a quality woven polyester carpet. The heatsetting stage of the carpet production process ensures that the twisted polyester yarn does not unravel. Executing this correctly ensures that the final design on the carpet remains intact after the carpet is laid, for its lifetime.

Power-heat-set's sales manager Marcus Fink commented at Domotex: "The intent of this project was to work with other companies to showcase all of the processes needed to create a carpet." Power-heat-set's GVA machine utilises superheated steam and a six-channel configuration, which, Fink added, provides unmatched versatility for the customer.

Speaking about the project at Domotex, **ZIMMER AUSTRIA** sales manager, Thomas Kloebl said: "The responsibility of machine manufacturers is not only to provide a new machine but to provide customers with new possibilities."

Zimmer Austria is the most prominent digital printing technology provider for the carpet industry. Its **COLARIS** and **CHROMOJET** printers have been widely used for carpet applications and this project is the next step in the company's providing a complete solution.

For printing on polyester woven carpet, **ZIMMER AUSTRIA** has developed its **COLARIS.SERIES** of digital printers and the company has also created a unique penetration booster system that ensures the digital inks are pushed into the carpet fibres before drying, heat fixation, washing and drying. Penetration of the fibres is crucial as many end markets for carpets consider the back of the carpet to be as important as the front. Woven carpets are held in high esteem thanks to the replication of the carpet design on both of its sides. With **ZIMMER AUSTRIA's** technology, this effect is almost replicated for a reasonable price.