

TEXTILE WALL SYSTEMS

The Spacer Textiles Competence Centre developed a textile wall system that offers new functional and decorative design options.

This wall system consists of spacer textiles - warp-knitted or knitted - that are filled with insulating material such as cellulose fibers; as an option, smart functions can be added as well.

Through the use of spacer textiles and the combination of different materials, multi-functional products with innovative sustainable properties can be realized.

Applications are the interior of ships or airplanes, the renovation of old buildings, and the construction of container homes.

This innovative wall system was jointly developed by a total of nine companies along the textile value chain.

ADVANTAGE OVER CONVENTIONAL WALL SYSTEMS

- > Wide range of architectural design options
 - > Aesthetic surface, individual design options, for example using structured fabrics or woven/ knit/printed images
 - > Ambient lighting through integration of lighting systems
 - > Low weight (lightweight construction)
 - > Sound absorption and noise insulation
 - > Thermal insulation
- > Increased thermal comfort while reducing energy costs
 - > Panel heating can be integrated
 - > Moisture management
 - > Easy adjustment
 - > Easy assembly through modular design
 - > Flexibility in use because any size or form can be simply cut out

AESTHETIC AND FUNCTIONAL DESIGN

The textile cover with a knitted spacer material by Mattes & Ammann or a warp-knitted spacer material by Eschler Textil allows an individual optical design of the textile wall elements.

Different fabric structures or warp-knitted/ knitted/printed images can be used for a distinctive interior design.

Furthermore, these technical textiles can contribute to an optimization of interior acoustics, to thermal regulation, and to an optimal interior moisture management.

The German Institutes of Textile and Fiber Research Denkendorf (DITF) can carry out the required calculations and measurements.

Reaching the fire protection classes B1 or B2 is possible when the corresponding yarns and equipment are used.

The individual elements can simply be glued together with special textile glues.

ATMOSPHERIC AMBIENCE THROUGH COMBINATIONS OF LEDS AND TEXTILES

Different colors and lighting effects can be achieved by select combinations of LED strips and different textile structures. For this, LED strips are inserted into ducts in the lower fabric layer. Thus, they do not increase the overall structure.

A uniform warp-knitted spacer fabric by Eschler Textil influences the distribution of the LED light spots to create a more homogeneously lit surface.

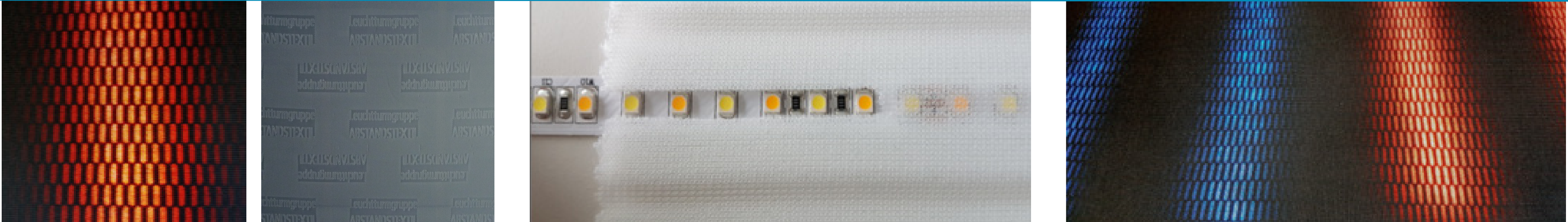
Multicolor LEDs are used on one half of the demonstrator and white LEDs on the other. Where white LEDs are used, the orange-colored cover fabric by Eschler Textil makes the surface appear orange all over. That means that the coloring effect is created by colored LEDs on one half and by an additional colored warp-knitted fabric layer on the other.

The structure of the cover layer influences the final light design. On the demonstrator, a brownish black warp-knitted spacer material was used that allows the structure to appear only when the LEDs are switched on. When the LEDs are off, the surface appears plain black. The LEDs are switched on using a remote control or a smartphone app.

If necessary, a textile heating element is inserted under the cover layer.

The lit surface of the demonstrator was designed in close cooperation with the German Institutes of Textile and Fiber Research Denkendorf (DITF) and the company Escher Textil GmbH in spring 2017.

The structures can customized and designed more transparently, if this is desired.



INDIVIDUAL COMPONENTS FEATURING INDIVIDUAL FUNCTIONALITIES

Essedea´s spacer fabric is breathable (air) and can be filled with different materials (e.g. cellulose fibers). Depending on the customer requirements, it can fulfil various functions, such as sound absorption, noise / thermal insulation and moisture management.

Measure- ment No.	Heat flux (W/m2)	Temperature of the cold sample sur- face (°C)	Temperature of the warm sample sur- face (°C)	Temperature difference at the sample (K)	Medium temperature at the sam- ple (°C)	Thermal conductivity (W/(m*K))
1	8.189	8.7	15.0	6.4	11.9	0.04301
2	11.256	16.5	25.0	8.5	20.7	0.04422
3	13.484	25.1	34.9	9.8	30.0	0.04595

The thermal conductivity of the insulation material (spacer fabric filled with cellulose fibers) in the current demonstrator according to the Lambda test is 0,0426 W/(m*K).

The textile heating elements from roma Strickstoff-Fabrik feature low energy consumption and can be applied flexibly and, if desired, even punctually.

Scientific research at the Universities of Hohenheim and Stuttgart proved that energy consumption can be reduced by 30% (plant cultivation) and up to 50% (electromobility) by reducing the room temperature by 3-4°C while still offering the same thermal comfort.

The Spacer Textiles beacon group is supported by:

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www.afbw.eu

Cluster Technische Textilien Neckar-Alb,
c/o IHK Reutlingen
www.cluster-technische-textilien.de



Spacer Textiles Competence Centre
Your Contacts for textile wall systems:

bullmer GmbH
Heutal 7
72537 Mehrstetten
www.bullmer.de

DITF Denkendorf
Körschtalstraße 26
73770 Denkendorf
www.ditf.de

Eschler Textil GmbH
Max-Planck-Str. 10
72336 Balingen
www.eschler.de

Essedea GmbH & Co. KG
Lothforster Str. 50
41849 Wassenberg
www.essedea.de

Global Safety Textiles GmbH
Höllsteiner Straße 25
79689 Maulburg
www.global-safety-textiles.com

Mattes & Ammann GmbH & Co KG
Brühlstraße 8
72469 Meßstetten – Tübingen
www.mattesammann.de

Perlon Nextrusion Monofil GmbH
Max-Fischer-Straße 11
86399 Bobingen
www.perlon.com

roma-Strickstoff-Fabrik Rolf Mayer GmbH & Co. KG
Hertenwinkelstr. 25
72336 Balingen
www.roma-strickstoffe.de

Zoeppritex Verbundstoffe GmbH
Heuchlinger Straße 34
89547 Gerstetten-Heldenfingen
www.zoeppritex.de

W. Zimmermann GmbH & Co.KG
Riederstraße 7
88171 Weiler-Simmerberg
www.zimsi.com

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