BeNeutral

AACHEN DRESDEN DENKENDORF
INTERNATIONAL **TEXTILE** CONFERENCE

Recycled Nonwoven Solutions to Close the Loop in Automotive Interiors

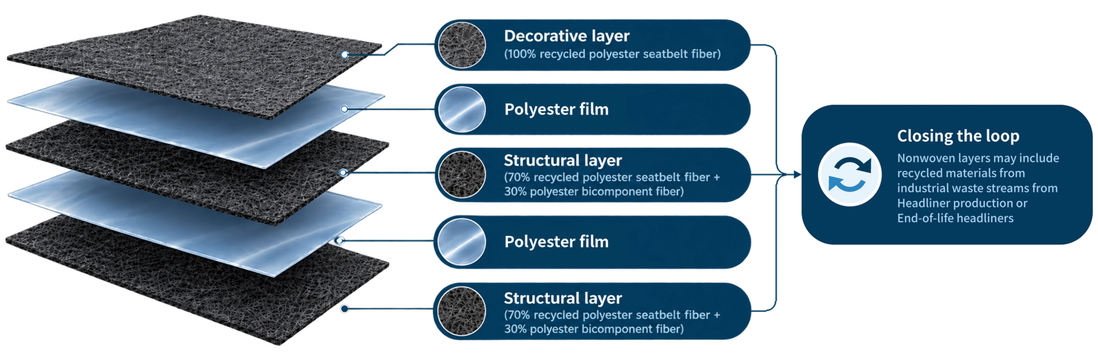
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CONCEPT

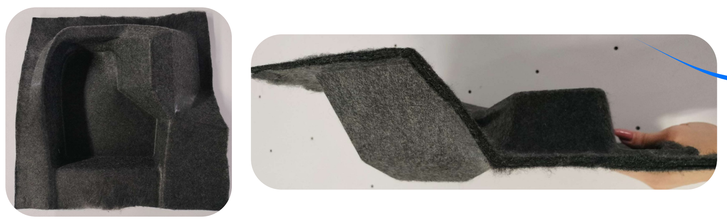
This work develops a circular and sustainable solution for automotive interiors, focusing on a headliner produced from recycled textile waste. The project explored the integration of post-industrial and post-consumer materials, namely End-of-Life automotive seat belts, into high-performance nonwoven structures suitable for thermoforming applications.



Stacking sequence



Thermoformed parts for R&D
Study process parameters
Conformation to complex geometries
Evaluate functional requirements



An extensive validation plan was followed to guarantee that the materials would be compliant with key automotive requirements such as flammability, fogging, odour, and mechanical behaviour, amongst other, before translation into industrial environment.



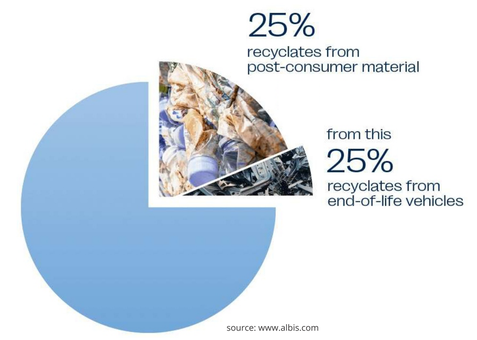
KEY ADVANTAGES

- Valorization of automotive textile waste (61% of component weight originates from recycled seatbelt fibers);
- Monomaterial solution: Fully recyclable and circular;
- 55% LCA reduction compared to conventional solution, based on material composition;
- Built on established industrial processes;
- Adaptable to other componentes and applications.

ACKNOWLEDGEMENTS

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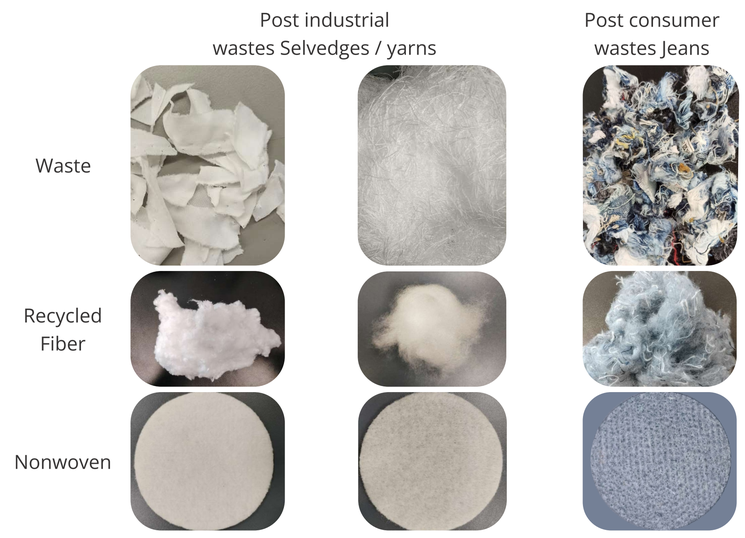
European Commission



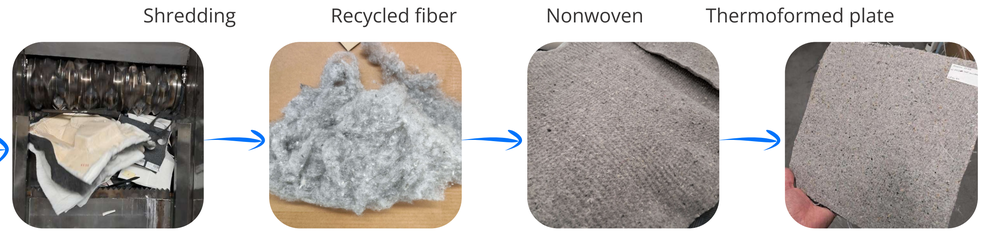
Regulation (EU) 2026/1738: Regulation on Circularity Requirements on Vehicle Design and on Management of End-of-Life Vehicles defines mandatory targets for recycled plastic content of 15% from 2032 and 25% from 2036. 25% of the total recycled content must originate from End-of-Life vehicles.

A comprehensive process chain was established, including waste collection, sorting, washing, and mechanical recycling for fiber recovery. Recycled fibers were processed into different nonwoven formulations by carding and needle punching including 100% recycled polyester and blends with bicomponent fibers to enhance mechanical integrity and processability.

Other possible waste sources



Complete circularity assessment



Definition of an end-of-life strategy for the component:Preliminary tests revealed that the recycling process of the components is able to generate new fiber that can be reintroduced in the production process of a new component.

CONCLUSION

BEYOND RECYCLING: CLOSING THE LOOP ON AUTOMOTIVE TEXTILES
The results demonstrate a viable pathway towards circular economy practices in the automotive sector, highlighting the potential for valorization of textile waste from automotive sources, reduce resource consumption, minimize environmental impact, and support the transition to more sustainable mobility solutions.



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