

Coordinator



Partners



Website

<https://www.interreg-duratex.eu/>

Would you like to know more?

For more information on biobased antimicrobial finishes, do not hesitate to contact us.
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Wallonie

The Duratex project was financed by the Interreg V program France-Wallonia-Flanders, a crossborder collaboration program with financial support of the European Fund for Regional Development and cofinanced by the province West Flanders and the Walloon Region.

<https://www.interreg-fwvl.eu>



GoToS3

DURATEX

Within Duratex, an Interreg France-Wallonia-Flanders project, we were able to develop ecofriendly antimicrobial textiles using biobased metal-free additives from animal, vegetal or marine origins.

The antimicrobial additives have been incorporated in the yarn during extrusion, in the fabric via diffusion or applied on the surface of the fabrics by padding and coating.

The antibacterial activity (A) of treated samples was evaluated according to ISO 20743. The antibacterial activity can be interpreted as follows:

- A>3: strong antibacterial activity
- 2<A<3: significant antibacterial activity
- A<2: insufficient antibacterial activity

Tannic acid is a biobased product with antibacterial properties against *Escherichia coli* and *Staphylococcus epidermidis*.

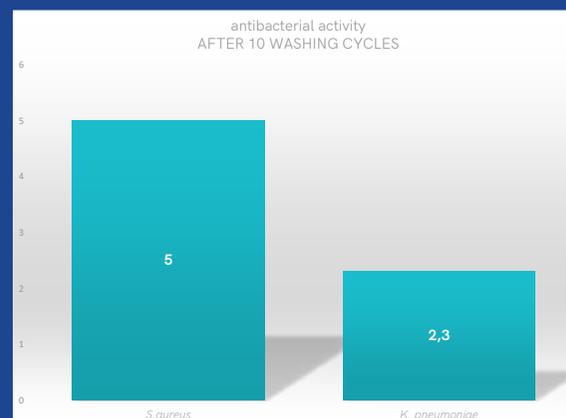
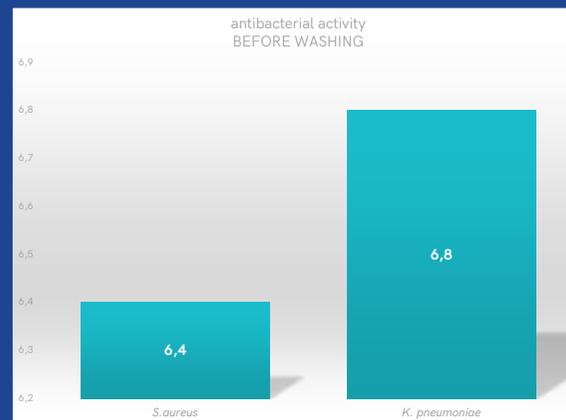
It was incorporated in PP yarn via extrusion where it exhibited a strong antibacterial activity against *Staphylococcus aureus* but proved insufficient against *Klebsiella pneumoniae*.

The incorporation of this additive at levels of < 2% makes it possible to preserve the initial mechanical properties of thermoplastics (PP and PET) in order to withstand their processing into textile structures such as knitted or woven fabrics.

Monolaurin is found in coconut oil and known to have antimicrobial effects in vitro. The antibacterial effect of monolaurin in biobased polyurethane (PU) coating was assessed.

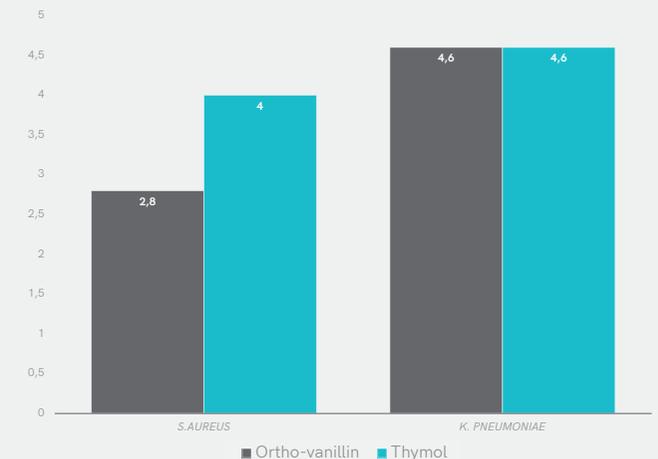
Biobased PU coatings with monolaurin showed strong antibacterial properties, even after washing at 40°C.

The following graphs represent the antibacterial efficiency of the coated samples against gram-negative (*Klebsiella pneumoniae*) and gram-positive (*Staphylococcus aureus*) bacteria before and after washing.



Textile was also treated via the diffusion method. This method allows molecules to enter the core of the fibre and not only to bind to the surface. Different active ingredients, including thymol and ortho-vanillin, were selected to assess the antibacterial activity of functionalised PET.

The graph below shows that PET fabric treated with thymol has a strong antibacterial activity against *Staphylococcus aureus* and *Klebsiella pneumoniae*, whilst PET functionalised with ortho-vanillin acts well against *Klebsiella pneumoniae* and significantly against *Staphylococcus aureus*.



These results show that it is possible to use biobased additives to produce antimicrobial textiles without silver or any other metal.