

NEW BUILDING MATERIALS FROM END-OF-LIFE CLOTHES

RECYBUILDMAT

UPCYCLING FIBERS FROM END-OF-LIFE CLOTHES & TEXTILE REMNANTS FOR
SUSTAINABLE BUILDING MATERIALS: CLOSING THE LOOP FOR A CIRCULAR ECONOMY

CONTEXT

Textile sector



35-92 million tons of global production of textile waste

Challenging recycling of end-of-life textiles

Building sector



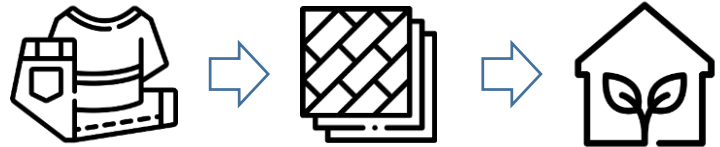
1/3 of the CO₂ emissions

7% of the total worldwide CO₂ emissions correspond to the cement industry

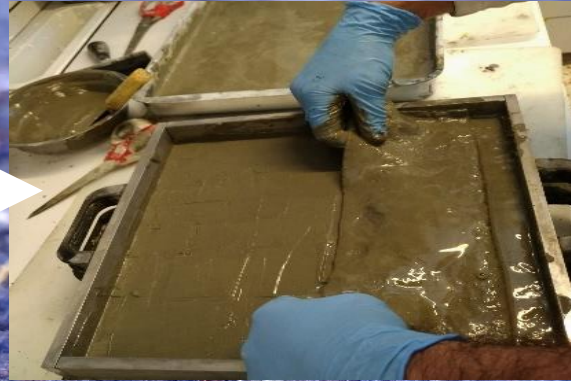


OBJECTIVE

Develop **new sustainable building materials** with a high content of **recycled raw material** from **post-consumer recovered fibres** that, applied in *panels for ventilated facades*, *pavements* and *plates for masonry reinforcement*, will contribute to **improving buildings' energy efficiency** and to **reduce the emissions** generated by both the textile and construction sectors.



SOLUTION



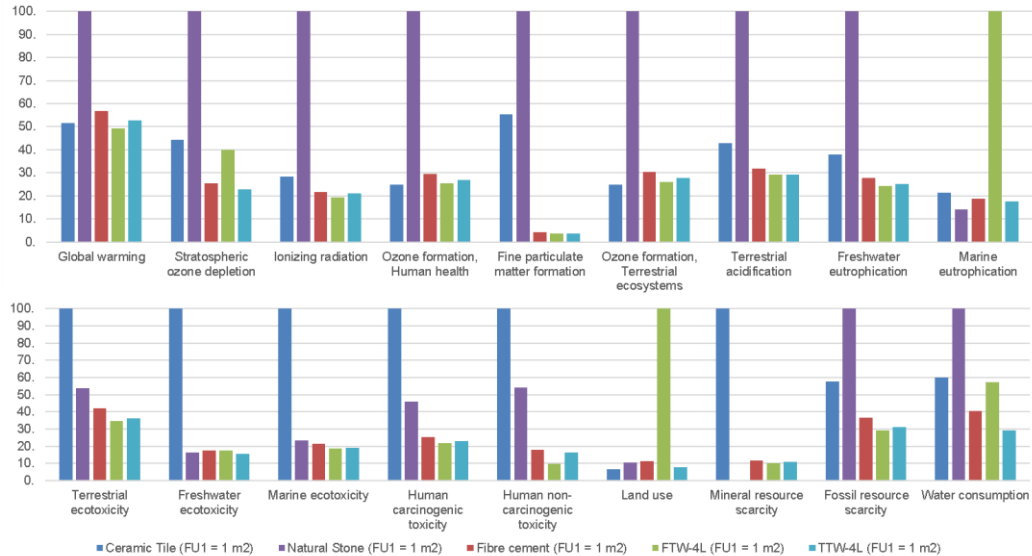
SOLUTION

FLEXURAL STRENGTH ▲ **190%**
HIGH TIGHTNESS
DENSITY ▼ **16%**
FIRE RESISTANCE >950°C
THERMAL AND ACOUSTIC INSULATION ▲ **40%**



SOLUTION

Environmental impact relative values. *Traditional and engineered materials. (FU = 1 m²)*



Environmental impacts for production of 1 m² of:

CERAMIC TILE
 NATURAL STONE
 FIBROCEMENT
 OUR SOLUTIONS

H.Ventura, M.D. Álvarez, L. Gonzalez-Lopez, J. Claramunt, M. Ardanuy, CEMENT COMPOSITE PLATES REINFORCED WITH NONWOVEN FABRICS FROM TECHNICAL TEXTILE WASTE FIBRES: MECHANICAL AND ENVIRONMENTAL ASSESSMENT, Journal of Cleaner Production, 372 (2022) 133652. doi: <https://doi.org/10.1016/j.jclepro.2022.133652>

SOLUTION

FAÇADE PLATES



Portland Cement Binder

low weight, impermeability to water, thermal insulation, dimensional stability to thermal-hygrometric variations, high strength and ductility, and good durability

PAVEMENTS



Portland Cement Binder

with water impermeability, dimensional stability to thermo-hygrometric variations, good resistance to wear, nonslip, high strength and ductility, impact resistance, and durability

MASONRY STRENGTHENING

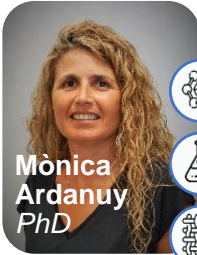


Lime Binder




optimized with a special focus on the tensile strength, and the bonding with the masonry element for in situ placement and for bonding systems

On behalf of the RECYBUILDMAT team...
THANK YOU!

Full professor



Mònica Ardanuy
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-  Material science
-  Chemistry
-  Textile engineering


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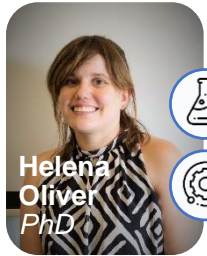
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UPCYCLING FIBERS FROM END-OF-LIFE CLOTHES & TEXTILE REMNANTS FOR SUSTAINABLE BUILDING MATERIALS: CLOSING THE LOOP FOR A CIRCULAR ECONOMY (RECYBUILDMAT)



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