

Paper waste used to make bricks

December 19 2012



The bricks come out of the machine "like sausages" and are then cut. Credit: C. Martinez et al., Universidad de Jaén.

Researchers at the University of Jaen (Spain) have mixed waste from the paper industry with ceramic material used in the construction industry. The result is a brick that has low thermal conductivity meaning it acts as a good insulator. However, its mechanical resistance still requires improvement.

"The use of paper industry waste could bring about economic and environmental benefits as it means that material considered as waste can be reused as raw material." – This is one of the conclusions of the study developed by researchers at the Upper Polytechnic School of Linares (University of Jaen), which has been published in the *Fuel [Processing Technology](#)* journal.

The scientists collected cellulosic waste from a paper factory (recycled waste in this case) along with sludge from the purification of its waste water. In their laboratory they then mixed this material with clay used in construction and passed the mixture through a pressure and extrusion machine to obtain bricks.

"Adding waste means that the end product has low [thermal conductivity](#) and is therefore a good [insulator](#)," explains Carmen Martínez, researcher at the University of Jaen. "In addition to the resulting benefit of using these bricks instead of their traditional counterparts made of traditional raw materials."

Another of the advantages of adding waste to the brick prototypes is that they provide energy due to their [organic material](#) content. This could help to reduce [fuel consumption](#) and kiln time required for brick production.

At the moment the prototype's dimensions are small (3 x 1 x 6 cm). But the team has already tested larger bricks and the results are similar. "On the whole, this technique could bring about a saving in energy and raw materials for brick factories along with environmental benefits from the use of waste that is initially discarded," adds Martínez.

The researcher recognises, however, that the 'Achilles heel' of these bricks is their lower mechanical resistance compared to traditional bricks, although this parameter is above the legal minimum. There are

still a few problems to solve in the adherence and shaping of those pieces that have high percentages of paper waste.

The team continues in their search for the happy medium between sustainability and material resistance and is still researching the advantages of adding other products, such as sludge from water treatment plants or residues from the beer, olive and biodiesel industries.

In the *Fuel Processing Technology* journal itself, the researchers have published another study confirming that biodiesel waste can be used for brick manufacture, thus increasing insulation capacity by 40%.

More information: Carmen Martínez, Teresa Cotes, Francisco A. Corpas. "Recovering wastes from the paper industry: Development of ceramic materials". D. Eliche-Quesada, S. Martínez-Martínez, L. Pérez-Villarejo, F. J. Iglesias-Godino, C. Martínez-García, F.A. Corpas-Iglesias. "Valorization of biodiesel production residues in making porous clay brick". *Fuel Processing Technology* 103, 2012. [Doi: 10.1016/j.fuproc.2011.10.017](https://doi.org/10.1016/j.fuproc.2011.10.017) and [10.1016/j.fuproc.2011.11.013](https://doi.org/10.1016/j.fuproc.2011.11.013)

Provided by Spanish Foundation for Science and Technology (FECYT)

Citation: Paper waste used to make bricks (2012, December 19) retrieved 23 April 2024 from <https://phys.org/news/2012-12-paper-bricks.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.