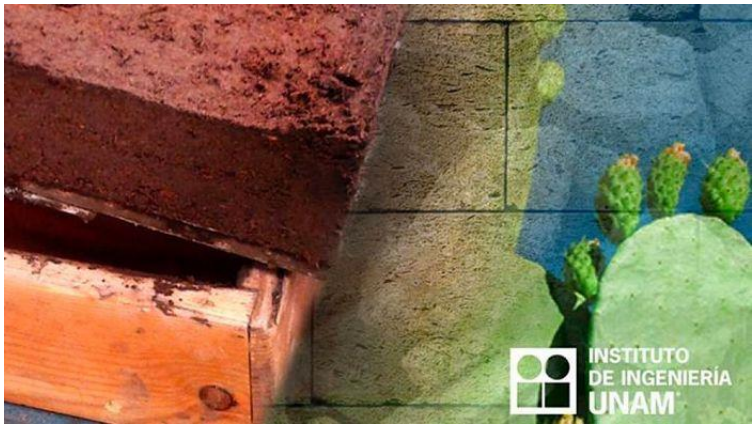
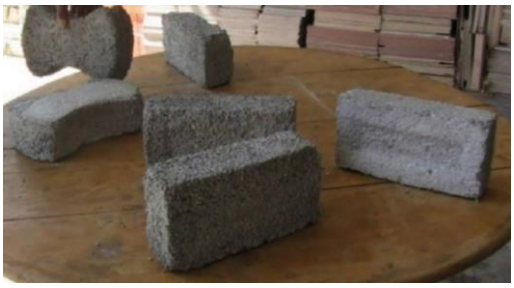
ECO-BRICK MADE BY CONSTRUCTION DEBRIS IN MEXICO

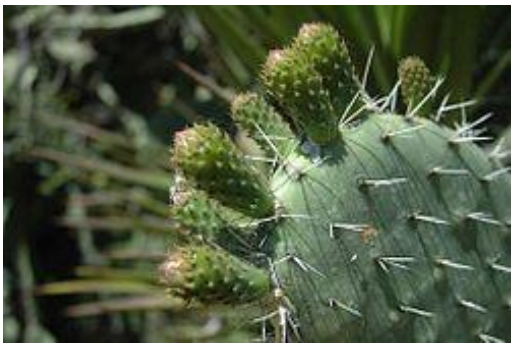
An ecological prototype of brick created by the Engineering Institute of the National Autonomous University UNAM continues to be promoted in Mexico. The technology, which is in the process of being patented, allows to recycle waste using manufacturing methods that are innovative in the construction industry.



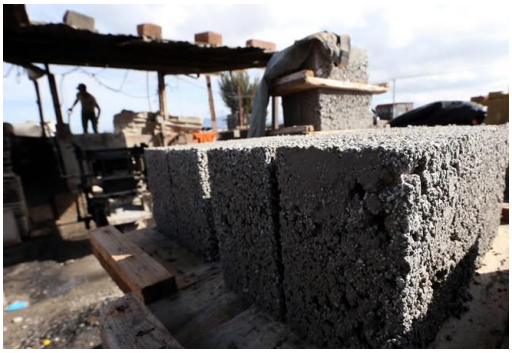
In 2015 the Institute of Engineering of the National Autonomous University of Mexico released official information about the prototype of ecological brick created through a project led by the researcher María Neftalí Rojas Valencia. In the production of the prototype, the composition of an efficient mixture of materials has been studied, performing the necessary tests to ensure a high-quality product.



The Eco-brick is made up of construction or demolition waste, excavation remains (clay) and logging waste (product of cutting trees and branches). The new manufacturing process consists of crushing the waste to be compacted using a natural additive: a liquid mixture of water with *Mucilage* extracted from *Nopal* to bind its components, rescuing a pre-Hispanic technique adopted in antiquity for the construction of various pyramids.



In addition, for the drying of the bricks, the production process takes advantage of solar energy, avoiding the traditional kilns which generates polluting emissions and greenhouse gases. The manufactured bricks can be exposed outdoors, for a drying time of 20 days in environmental conditions even with humidity. A solar powered dryer designed by the UNAM Engineering Institute can also be used, reducing drying time to five days.



The result is a more resistant brick that absorbs less water than conventional ones. The Eco-brick is an excellent thermal insulator, thus reducing the demand for energy at home and in buildings. Its price is 33% cheaper than the conventional red bricks commercialized in the country.

The Eco-brick can be manufactured in standard or particular sizes, in order to be used for interior walls or external buildings. It can replace the conventional bricks in fences, parapets, windows or in construction details of aesthetic purposes.

The creation of the new Eco-brick is inspired by the national legislation which defines minimum environmental standards for ecological buildings and regulates the use of construction and demolitions debris, promoting their use by recycling and

prohibiting to discard them in places other than collection centres, recycling points, or authorized places for final disposal.

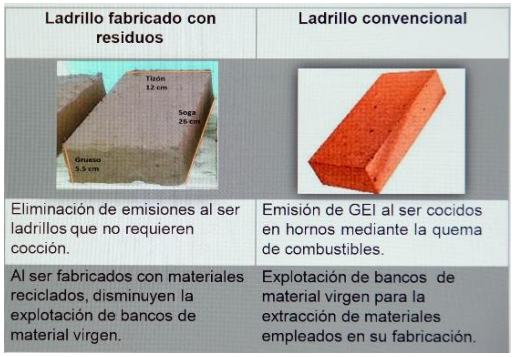
The inventors of the innovative process notice that industrial production and use of Eco-bricks could satisfy part of the national demand for this construction material, estimated in 279.6 million pieces by each State of Mexico.

In particular, the Eco-brick has the following advantages of great economic and environmental impact:

- contributes to reduce overexploitation of banks of virgin materials and the environmental problems caused;
- allows recycling the waste from the thousands of demolished civil works in Mexico. The need for recycling, in terms of raw material that is generated and not used is 7000 tons/day;
- the on-site use of construction waste minimizes the cost of obtaining and transporting the material;
- solar drying allows to reduce air pollution generated by the cooking of traditional bricks (16.953 producers burn today different fuels that emit greenhouse gases);
- thanks to its characteristics of thermal insulation, the Eco-brick allows to reduce the energy costs for heating and cooling the houses.

The manufacturing of the prototypes has required two people to produce ten eco-bricks in one hour, including the preliminary work to select and separate the material and extract the mucilage from *Nopales.* It is estimated that the experience and the production in series will allow to reach the productivity of 25 to 60 units per hour, normally insured by the brick makers. The new production chain could benefit from the collaboration of companies specialized in recovering the construction waste and returning it already shredded to the brick makers for the production of the new Eco-bricks.

Waiting for the positive result of the patent process, the national press specialized in construction and recycling has published articles on the advantages of the innovative technology created by the Engineering Institute of the National Autonomous University of Mexico, which is part of the new world trends for the development of an ecological architecture.



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