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Introduction

Plastic pollution is a phenomenon that threatens life on Earth. Most of plastic ever produced are now in dumps and landfill sites, usually in developing countries. Part of this material is collected by waste pickers who sell it to dealers for an insignificant value. In Brazil this unfair business is very strong: 500,000 people make their living collecting garbage in the 3,300 dumps around the country.



“Lixão da Estrutural”: the biggest dump in Latin America is located at 15 Km from the National Congress in Brasília.

At the same time plastic is a big problem, it has excellent mechanical characteristics that make it an incredibly useful material.

Objectives

Our goal is developing machines and methodologies that allow the transformation of the discarded plastic into objects of value by people who collect it, generating positive social and environmental impact.

Development

We have developed 2 types of machines: one for producing flat plates and the other for bars. These machines must be low cost, robust and simple to operate, so that recycling could be performed by people of low education level. To achieve this goal we use components, devices and materials easily found on the market. In order to produce round flat plates, for example, we use kitchen utensils as baking trays. The heating resistance is a Nicrom wire wound in an aluminum piece electrically isolated by a Teflon tissue.



A machine was built with some pizza baking trays to produce little bench seats.

No pressure has to be applied and no kind of electronic monitoring and controlling is needed: the operator just plugs the cable in the electric socket and waits for 45 minutes.

In order to make bars, we use aluminum tubes, Nicrom resistances and parts of silicone applicator guns to pressure the heated plastic.

A machine built with some tubes and a silicone applicator gun produces plastic bars.



With these machines we have produced plates and bars, that were transformed in useful objects.



Key Facts

- Although the technology developed is patentable, we decided to open it. Soon all the draws and blue prints will be published in such a way that whoever wants to produce the machines can do it.
- An Experimental Transformation Workshop is being built by the Municipality of Utinga, a small town in Bahia - Brazil, and will be operated by the local garbage collectors.

Conclusions

The transformation machine prototypes were developed and tested. The plates and bars produced were used to construct useful objects as shelves, tables and chairs. In the Utinga Experimental Transformation Workshop, the machines will be tested in the field, by the garbage collectors themselves. If they work in these conditions as well as in the lab, a scalable technology with the potential to have positive social and environmental impact will be available.