



# INTERNATIONAL WORKSHOP ADVANCES IN CLEANER PRODUCTION

"KEY ELEMENTS FOR A SUSTAINABLE WORLD: ENERGY, WATER AND CLIMATE CHANGE"

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## LEGOLEVE Blocks

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### Abstract

Topics like the urban solid waste management, the housing deficit, the increasing consumption of natural resources and the waste generation in the building industry are concerning for the majority of countries. The development of LEGOLEVE project is presented as a potential solution to minimize these problems. The use of EPS (styropor) and PET bottles as components of material for constructions shows several advantages, such as: reduces of natural resources consumption (ex. sand); reduce the urban solid waste volume to be disposed; it has a low production cost, reduces the overall time for completing the project and its application can be conducted by anyone with some technical habilities. Finally, these materials do not need nesting mortar. The proposal of this work is discuss about the properties of the LEGOLEVE blocks, which is made of lightweight concrete using recycled EPS aggregate and joined by PET bottles. The development of LEGOLEVE blocks has been based on the following definitions: the amount of EPS in the light concrete, the casting mould design and the processes of casting and setting point, using in this stage cylindrical specimens. After defining the best composition (amount of EPS) and the process parameters, several blocks had been prepared and analyzed, comparing the results with values from ceramic blocks. The water absorption level and mechanical results show that LEGOLEVE blocks partially reach the values set by NBR 15270/2005, although the LEGOLEVE has no specific standard to be evaluated. Additionally, it was observed that the blocks are horizontally connected by bottles, substituting with advantages the lime-based mortar. Comparing ceramic blocks with LEGOLEVE blocks, in regards to productivity and costs of masonry, shows the following advantages of the last one: use 75% less of constructive elements, very low consume of mortar (about 100 times less) and allows executing the task in 75% less time with reduced effort of the workman.

*Keywords: Lightweight Concrete Blocks, Styropor, PET*

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