

**DESIGN OF SUPPORT MEDIA FOR THE FIXATION OF BIOFILMS IN
ANAEROBIC REACTORS FOR THE TREATMENT OF LEACHATE
BASED ON PRINCIPLES OF BIOMIMETIC**

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LEACHATE MANAGEMENT

The appropriate treatment of leachate is currently one of the priorities of municipalities and large cities for the proper management of solid waste landfills.



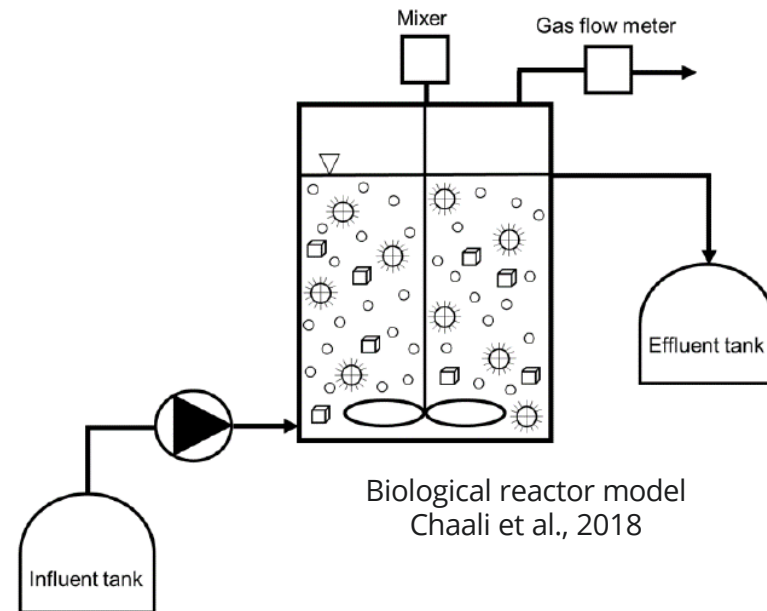
Leachate management represent a risk for public health and a potentially high environmental impact due to the diverse content of pollutants.



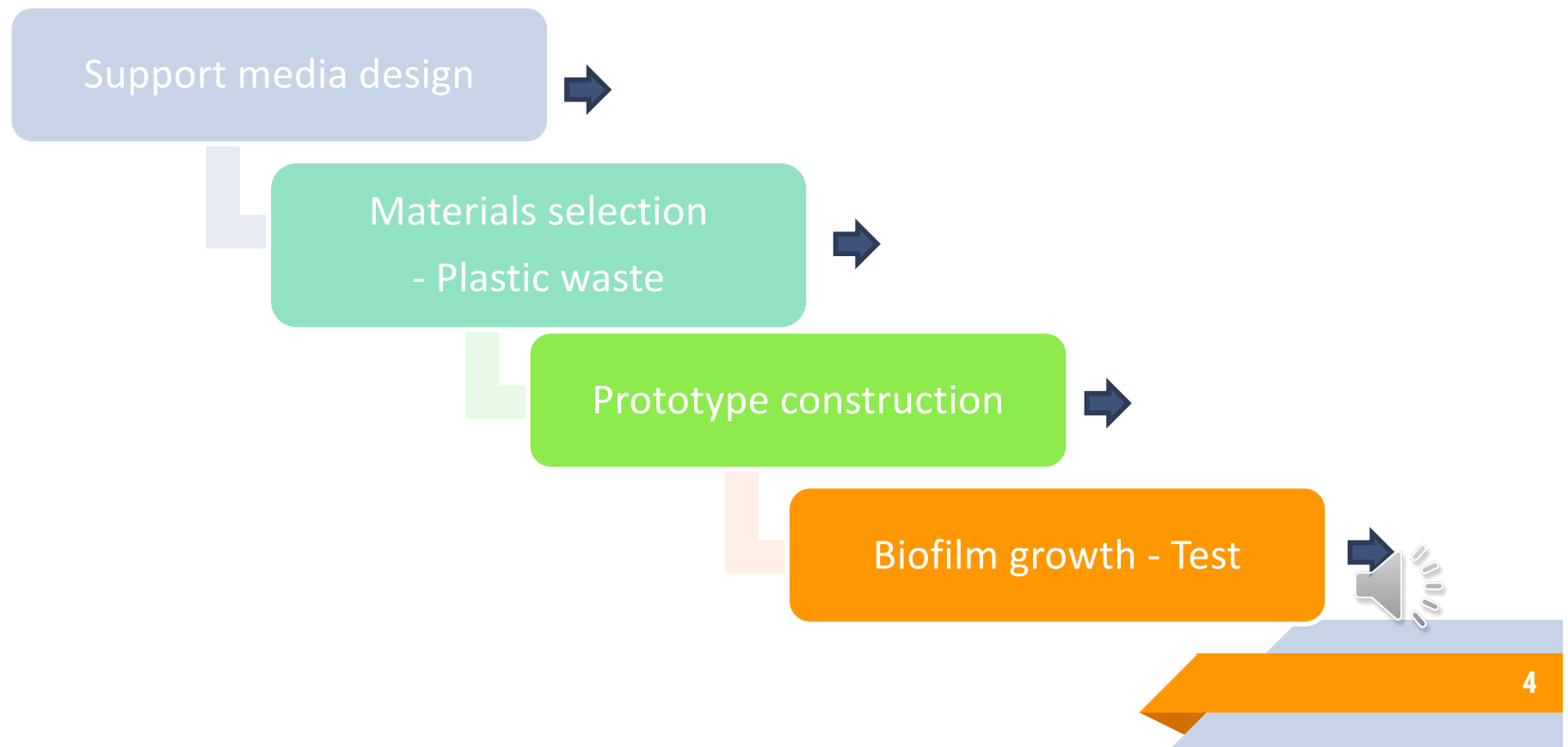
LEACHATE TREATMENT TECHNOLOGY

One technology for leachate treatment is installing biofilm anaerobic biological reactors, in which microorganisms take charge of degrading organic matter, which minimizes the pollutant load of the leachate.

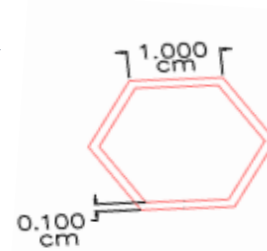
Variables such as pH, temperature, retention time and the support media where the biofilm will be formed must be considered, in addition to its design and the material of which it is made.



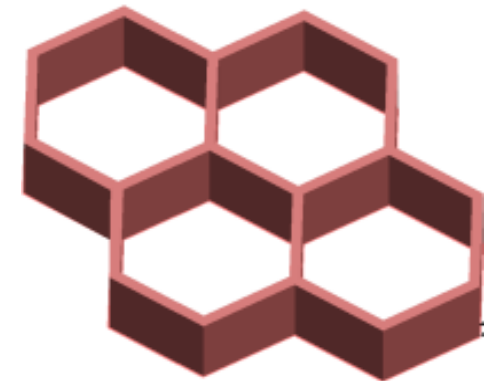
METODOLOGY



SUPPORT MEDIA DESIGN



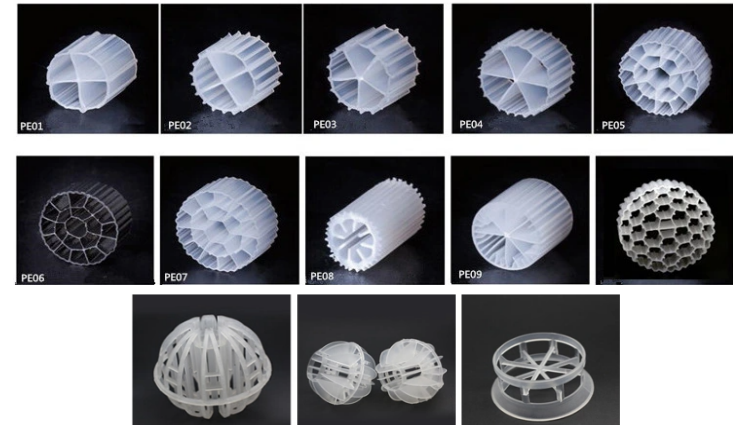
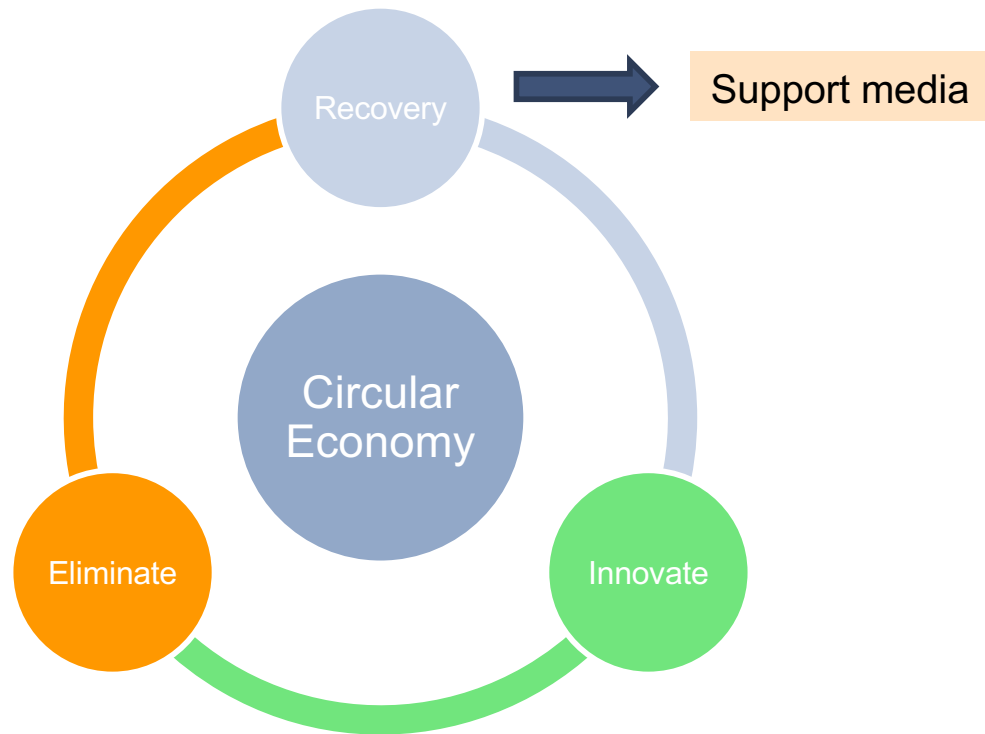
Design Biomimicry - Bee Comb



Given the versatility of different shapes and configurations that nature offers, biomimicry offers great opportunities to adapt them to functional designs, systems, processes and natural elements



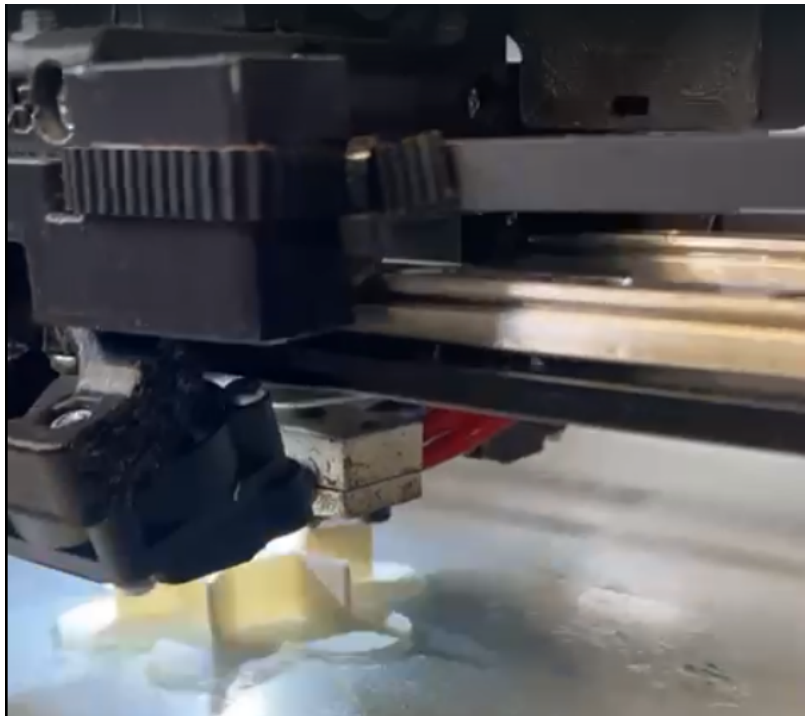
MATERIALS SELECTION - PLASTIC WASTE



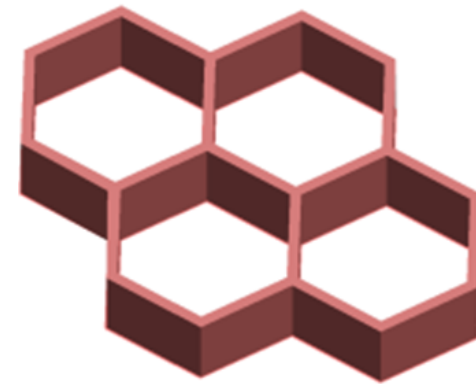
https://es.made-in-china.com/co_bestnpacking



PROTOTYPE CONSTRUCTION



3D Printing Prototype



Bee Comb Prototype



CONCLUSIONS

The biomimicry and biomorphism could allow to obtain more efficient and sustainable designs than the traditional ones.

In the prototype generation process the materials selected for the support material exhibit good adherence, although they are from plastic waste.



References

Chaali, M., Naghdi, M., Brar, S.K. and Avalos-Ramirez, A. (2018), A review on the advances in nitrifying biofilm reactors and their removal rates in wastewater treatment. J. Chem. Technol. Biotechnol., 93: 3113-3124. <https://doi.org/10.1002/jctb.5692>

Solano J., Orjuela D., Betancourt D., 2017, Determination and Evaluation of Flexural Strength and Impact, Flammability and Creep Test through DMA, (Dynamic Mechanical Analysis) for Mixing Expanded Polystyrene and Polypropylene from Municipal Solid Waste, Chemical Engineering Transactions, 57, 1339-1344.





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Thank you

