

Production of Biodegradable Plates to Reduce Plastic Pollution

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ABSTRACT

In past few decades there is a rapid growth in the rate of urbanization and thus there is a need of sustainable development plans. Now using new age technology and strategic approach, the concept of smart cities is coming up all around the world. A smart city is incomplete without a smart plastic waste management system. This work describes the application of our model of "Biodegradable Plates" in managing the reduction of plastic plates waste of an entire city. Biodegradable plates are produced in a modern eco-responsible manufacturing facility in the world. Its made from pure wheat bran. It disappears beneficially into the environment in 30 days.

Keywords:

Introduction- As the world is in a stage of up gradation there is one stinking problem we have to deal with. Garbage in our daily life, we see the pictures of garbage bins being overfull and all the garbage spills out. This leads to the number of diseases as large number of insects and mosquitoes breed on it. Major effect on environment for expanding cities, increasing population, occupying the forest area for living due to which deforestation occur it leads to global warming. To, reduce the waste we should use biodegradable plates. They are so natural you can even eat them. The plates do not bend like paper or plastic, and are resistant to microwave and oven cooking up to 200 degree centigrade and can be frozen. They will withstand hot liquid thick soups for up to 30 minutes and hot thin soups for about 20 minutes. They have a low carbon footprint of 1.3 g to 1.6 g CO₂/Kg.

Designing of Plates- Plates are defined as plane structural elements with a small thickness compared to the planar dimensions. The typical thickness to width ratio of a plate structure is less than 0.1. A plate theory takes advantage of this disparity in length scale to reduce the full three dimensional solid mechanics problem to a two dimensional problem. The aim of plate theory is to calculate the deformation and stresses in a plate subjected to loads. The numerous plate theories that have been developed since the late 19th Century two are widely accepted and used in engineering these are the Kirchhoff-Love theory of plates (classical plate theory) It is used for thin plates and second. The Mindlin-Reissner theory of plates (first-order shear plate theory) It is used for thick plates. Assumption in Kirchhoff-Love theory are straight lines normal to the mid surface remain straight after deformation, straight lines normal to the mid-surface remain normal to the mid-surface after deformation, the thickness of the plate does not change during a deformation. Assumption in Mindlin-Reissner theory is the normal to the mid-surface remains straight but not necessarily perpendicular to the mid-surface. These plates form in various shapes (rectangular, circular and oval) and sizes (small, medium, large). A full range of biodegradable wheat bran tableware products: 28cm (large), 24cm (medium), 20cm (small) diameter plates; 20cm diameter bowls; 24*16cm oval dishes. It can sustain food weight, distribution of food weight uniformly throughout the plates that's why the cracks of plate not possible during eating.



Fig.-Dia 28cm

Fig.-Dia 24cm

Fig.-Dia 20cm

Advantages- Biodegradable plates and bowls are great for parties or outside catering events, and can be used in a wide variety of catering application. Its products could give a boost to our companies environmental credentials. They have a low carbon footprint of 1.3 g to 1.6 g CO₂ per Kg. The plates do not bend, like paper or plastic and are resistant to microwave and oven cooking up to 200 degree centigrade and can be frozen. It reduce the plastic pollution which effect on the wildlife.

Disadvantages- Peoples with a gluten allergy should not use this product, but use may be possible for those with an intolerance as long as they do not eat the plate.

Conclusions- Urbanization is at its rapid growth stage around the world, as more number of people desire to live in the city lights with more opportunities for growth and success. Cities are expanding so increasing the population due to which increase the pollution because it effect the environment due to deforestation. The parameters like cleanliness and hygiene are the topic of concern in these smart cities and concrete measures should be taken for that. Also, the growth should go hand in hand with the green environment and research should be further done on such technology. Our work is a small but efficient step towards plastic pollution and we believe that this paper would encourage people to do good work on the similar topics . We have successfully made and tested the model of our Biodegradable plates, so we believe with encouragement from the side of government we can successfully transform this model into product.

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