

MANAGEMENT OPTIONS OF GLASS AS WASTE

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Abstract

One of the most desirable waste management options, of course, is reuse of glass or glass packaging as returnable packaging. However, in this case, glass is not classified as waste. Glass, as waste generated after use, instead of landfilling or incinerator can be used as a resource in the recycling process, with a view to obtaining a new same product or other useful product.

In theory, glass can be fully recycled and can be recycled indefinitely, without loss of quality, however, in order to ultimately obtain the best quality product, the material used for recycling must be of high quality [1]. Therefore, large quantities of waste glass originate from demolished buildings, municipal, industrial and medical waste, which mostly ends up in landfills. Packaging glass production accounts for about 82% of total glass production at glass factories in Europe [2, 3]. For this reason, the options for waste glass packaging management will be considered in the paper.

There are two basic options for waste glass packaging management: Recycling waste glass packaging in order to obtain new glass packaging (Closed Loop Recycling) and Recycling waste glass packaging that does not require re-melting. Of all types of glass, glass packaging is the most important during solid waste management and only glass packaging can be recycled by re-melting to obtain a new glass packaging [3]. Other types of glass have different physical properties and because of this, they cannot be used in this type of glass packaging recycling, as glass recycling could not mix well and melting temperatures vary depending on the type of glass, which would cause defects on the glass newly produced material [4]. Waste glass packaging can be mixed with raw materials or, theoretically, it may be the only raw material used to produce new glass packaging, but in practice, crushed glass, at a rate of 80%, is usually used as input material in the production of new glass packaging [5]. However, crushed glass (cullet), before being included in the production process, must be sorted according to the color of the glass and with a certain degree of purity so as not to degrade the production process of the new glass packaging. The color mix of glass recycling fractions must be less than 2% for the production of transparent glass and less than 5% for the production of colored glass [3]. Unfortunately, so far, Serbia has not provided a system for collecting glass packaging from the municipal solid waste stream, nor is glass packaging recycled in order to obtain new glass packaging. Therefore, it would be useful for Serbia to apply the use of the second waste glass packaging management option. The recycling of waste glass packaging that does not require the re-melting of glass, which is necessary in the production of new glass packaging, has been successfully applied worldwide, and some examples are the use of crushed glass recycling as: additives in the production of bricks, blocks and other ceramics, purification filters water, aggregates in construction, abrasive sanding materials, raw materials for the production of glass beads used in reflective paint for highways, for the manufacture of fiberglass and as fractions for lightening ammunition, and others [6, 7].

When waste glass is not recycled, it is stored or disposed of. The most common disposal options for waste glass packaging are disposal or incineration. However, if this is added to the fact that glass, practically does not break down over time, finding a solution for this type of waste is of great importance from the point of view of environmental protection and preservation.

References

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