

RECYCLING GLASS

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The subject under discussion is glass recycling. We don't want to be buried under tons of empty bottles and food containers. Besides, being environmentally friendly we think it's time to stop depleting our natural resources (as glass is a natural product) and to save energy needed for production. The manufacture of glass is a process which is far from being energy-saving.

Each day nearly 13 million glass jars and bottles are recycled in America, but not all types of glass can be recycled. Most soda bottles, food containers, beer, wine, and liquor bottles, and juice containers can be recycled - either through curbside recycling programs or community drop-off centers.

Nowadays glass is much less expensive and is taken for granted as a packaging material in addition to its use in windows and other applications. New glass is made from a mixture of four main ingredients: sand, soda ash, limestone and other additives. These additives include iron for colour (brown or green), chromium and cobalt for colour (green and blue respectively).

The manufacture of glass uses energy in the extraction and transportation of the raw materials, and during processing as materials have to be heated together to a very high temperature. Large amounts of fuel are used and the combustion of these fossil fuels produces carbon dioxide - a greenhouse gas. In 2002 the glass industry consumed a total of 8611,000,000 kWh of energy including electricity and carbon dioxide emissions totalled 1.8 million tonnes from the fossil fuels burnt in the factories. An efficient furnace will require 4 GJ of energy for each tonne of glass melted.

Glass can be recycled indefinitely as part of a simple but hugely beneficial process, as its structure does not deteriorate when reprocessed. In the case of bottles and jars, up to 80% of the total mixture can be made from reclaimed scrap glass, called "cullet". Cullet from a factory has a known composition and is recognised as domestic cullet from bottle banks it is known as foreign and its actual properties will not be known.

If recycled glass is used to make new bottles and jars, the energy needed in the furnace is greatly reduced. After accounting for the transport and processing needed, 315kg of CO₂ is saved per tonne of glass melted.

Glass cullet can be used in the production of new glass bottles. The rise in recycling means that in 2003 the average jar or bottle made in the UK contained 38 per cent recycled glass, four per cent up on 2002. There is also the option of reusing bottles and jars as storage containers for home made wine, beer or jam.

And now we would like to call the most important steps of glass production.

Glass and what it is made of:

Glass is a natural product. It's most important raw materials are quartz, sand, lime and sodium carbonate. To manufacture its glass products, the UK uses primarily recycled glass - depending on the colour, up to 80%.

The melting process:

The recycled glass, with the addition of new raw materials, is melted down at a temperature of 1'580°C. The most important source of energy for this process, depending on the glass works, is either natural gas or heavy oil.

Moulding the glass container:

Glowing-hot drops of glass, cut off from the continuously flowing mass of molten glass, are channeled through a gutter into the preliminary, or parison, mould. In the final mould, the preformed glass is given its definitive shape by adding air pressure.

Annealing:

The moulded bottle - still glowing red-hot - is then slowly and uniformly cooled off in the annealing oven, with adjustments made for any material imbalances. With a surface finishing process, the containers are given some additional protection from scratches, and their resistance to breaking is also improve.

Quality control checks:

After leaving the annealing furnace, all the glass containers are checked - optically, mechanically and electronically - for defects. If the quality is not up to standard, the run is returned to the melting furnace, no questions asked, and melted down once more.

Transport packaging:

After the quality control checks are completed, the glass containers are then loaded onto pallets in an automated process and then shrink-wrapped.