

Glass

What is Glass Exactly?

Glass was discovered 5,000 years ago. It is a mix of silica (sand), soda (sodium carbonate) and limestone. Refiners and/or dyes can also be added to the basic mix.

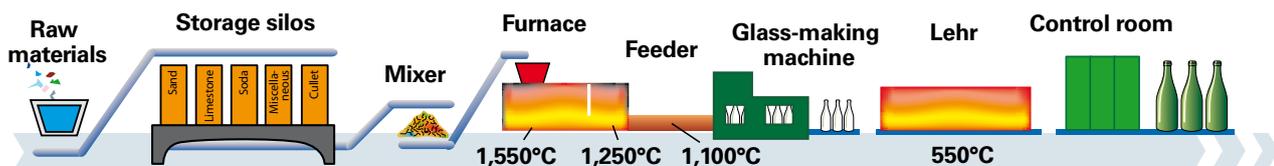
What are the Properties of Glass?

Glass is transparent, hard, and resistant to airborne and chemical agents; it has insulating properties. It has no effect on the taste or smell of the products packed in it. Glass is watertight. Its manufacturing process can give glass an infinite amount of shapes. And finally, glass is endlessly and 100% recyclable.

There are two types of glass-making:

- **Mechanically produced glass:** the process is used for the mass production of glass and includes three sectors:
 - Hollow glass, which is the biggest production tonnage – e.g. bottles, flasks, pots, and jars;
 - Glass fibres, which are mainly used for insulation purposes and to reinforce plastics;
 - Flat glass, which is used for home and car windows.
- **Hand-made glass:** this type of glass making is an art and design craft.

How is Glass Manufactured?



Silica, soda, lime or limestone – as well as the refining agents and dyes – and cullet (recycled glass) are inserted in a tank furnace clad with firebricks and heated to 1,550° C. The molten glass paste comes out of the furnace through heated ducts in order for the paste to stay hot. At the outlet, a gob of paste is cut; its size and temperature vary according to the packaging to be made. The gob in question is called 'blank'. The blank goes into a blank mould, then into a blowing mould where the paste is blown. In order to avoid differences in temperatures, which would make it brittle, the glass is cooled down slowly in a long heated tunnel called a lehr.

Why So Many Ingredients?

Every ingredient has its own properties:

- Silica (quarry sand) provides for vitrification;
- Soda lowers the melting temperature to 1,550°C;
- And limestone is used as stabilizer and prevents glass from crystallizing when cooling.

How is it Possible to Get Different Colours of Glass?

If a metallic oxide is added, coloured glass can be obtained. E.g. adding chromium and/or iron gives a green colour. Adding cobalt oxide gives blue glass. And adding carbon to a paste with low chromium content gives brown glass.



Clear glass



Brown glass



Green glass

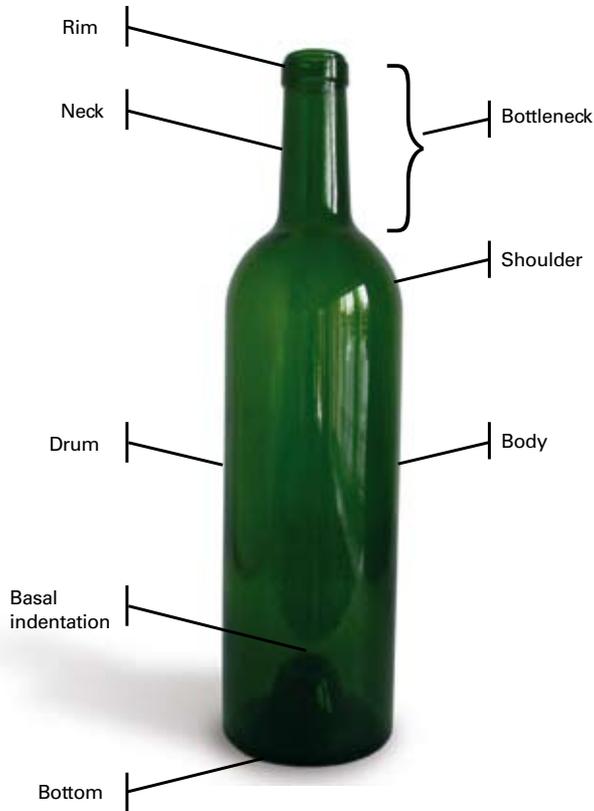


Blue glass

What is Crystal?

The only difference between making crystal and ordinary glass is that for crystal, lead oxide is used as fluxing material. In addition to lowering the melting temperature, lead oxide provides for the clearness, resonance, density and shine of crystal. Lead crystal glass entails 24% lead oxide and full-lead crystal, 30%.

How are the Different Parts of a Bottle Called?



Is Glass Easily Recyclable?

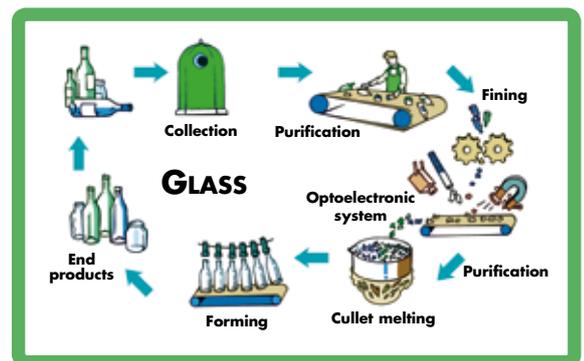
Glass is 100% recyclable, without any loss in quality or quantity. Glass can be recycled indefinitely. For every bottle collected and recycled there will be a new bottle. 25,080 tons of glass packaging have been placed on the market in the Grand Duchy in 2006, i.e. almost half of all packaging and 68.25% of all glass packaging have been collected and recycled.

How is Glass Recycled?

The glass collected is crushed without washing; impurities like labels or corks are eliminated by scraping. It produces what is known as cullet. The cullet is introduced straight into the furnace. No need to add anything. The energy consumption is also lower as cullet melts at 1,000°C instead of 1,500°C. So making glass with cullet saves energy. Moreover, cullet is generally used as fluxing medium to facilitate the melting of a new mix: 80% weight of cullet into the production process can help save 25% energy compared to cullet-free production.

What Can be Made With Recycled Glass?

If the glass collected is mixed – i.e. clear, green and yellow-brown together – the recycled glass produced will be coloured. In order to make clear glass, the cullet can only be made of clear glass.



Source: FOST Plus