

A lighter way to  
enjoy glass



**Lightweight glass from Vetropack.** *Glass is durable, impermeable, hygienic, malleable, aesthetically pleasing and natural. This is why, as a packaging material, it remains unbeatable – for food and drinks. Advanced manufacturing techniques now allow glass packaging to be made lighter with no loss of safety or quality. This benefits not only consumers but also the environment.*

*Lightweight glass reduces  
consumption of raw materials  
and CO<sub>2</sub> emissions.*

## Lightweight and stable

Glass has always preserved the value of the products it contains. Now the premium packaging material from Vetropack can do so while using even fewer resources: thanks to advanced production methods, glass bottles and jars are now lighter than before, but with no loss of stability or of their outstanding properties.

**Clear weight reduction.** Thanks to new manufacturing techniques, lightweight glass weighs significantly less:

	Conventional glass	Lightweight glass	Weight reduction
Beer bottle A, 330 ml	205 g	185 g	20 g
Beer bottle B, 330 ml	200 g	175 g	25 g
Beer bottle C, 330 ml	190 g	160 g	30 g
Wine bottle, 250 ml	204 g	180 g	24 g
Wine bottle, 750 ml	400 g	350 g	50 g
Wine bottle, 1000 ml	500 g	420 g	80 g
Glass jar, 720 ml	300 g	280 g	20 g
Spice jar, 99 ml	127 g	116 g	11 g
Glass jar, 3400 ml	1100 g	1050 g	50 g

## Production technology

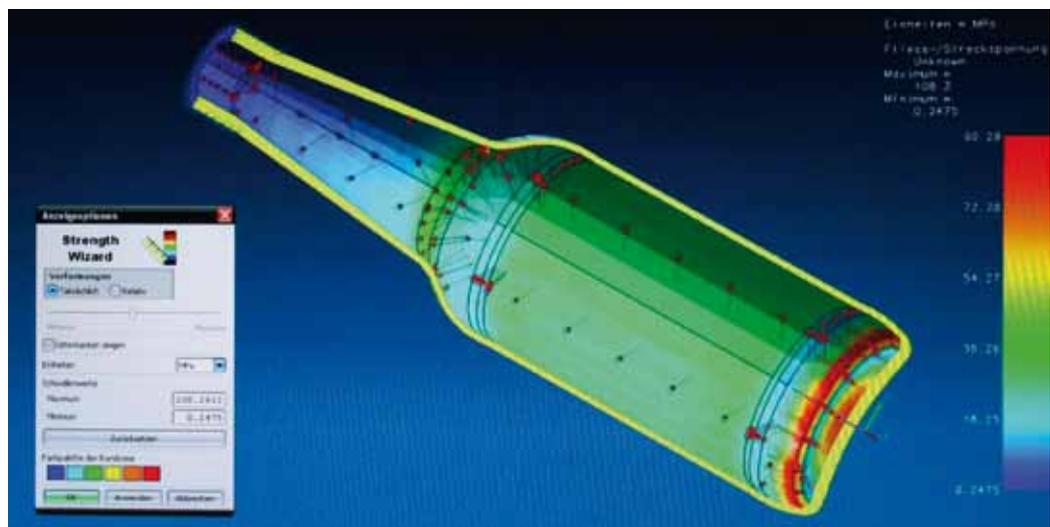
The manufacture of lightweight glass has been made possible by changes in the production process. Instead of the traditional blow-and-blow process, the narrow neck press and blow process is now used: to ensure that the thicknesses of the sides of a glass container are both as uniform as possible and at the same time thinner, a plunger is pressed into the liquid glass in the blank mould.



*The narrow neck press and blow process (right) allows the production of both uniform and thinner glass containers.*

## Thorough analysis

To ensure maximum stability when the weight is reduced, the design phase before production is critical. Before production commences, glass designers use the finite element method (FEM) to calculate which parts of the container are subject to particular stress. This is done by breaking the glass container as a whole down into smaller units (finite elements). It is easier to describe the structural behaviour of these smaller units than of the container as a whole. The shape of the relevant points is changed so that the stress is reduced. Often, this only requires tiny modifications that are barely visible to the naked eye.



**Finite element analysis** reveals where the stresses are greatest: points under particular stress are coloured red.

**Lightweight glass reduces the environmental impact.** Lightweight glass reduces the consumption of raw materials and CO<sub>2</sub> emissions.

	Glass saved per million units	CO <sub>2</sub> saved per million units
Beer bottle A, 330 ml	20	14
Beer bottle B, 330 ml	25	18
Beer bottle C, 330 ml	30	21
Wine bottle, 250 ml	24	17
Wine bottle, 750 ml	50	34
Wine bottle, 1000 ml	80	55
Glass jar, 720 ml	20	12
Spice jar, 99 ml	11	7
Glass jar, 3400 ml	50	31

*To ensure maximum stability when the weight is reduced, the design phase before production is critical.*

## Easy on the environment

Lightweight glass presents a strong case when it comes to environmental issues. Reducing weight creates multiple savings, which in turn benefit the environment: producing lightweight bottles requires fewer raw materials and so saves resources. At the same time, using far fewer materials and a high proportion of recycled glass as a secondary raw material also means a significant reduction in CO<sub>2</sub> emissions, with savings of between 12% and 17% able to be made.

Lightweight glass technology enables thin-sided glass containers to be produced, which stand up well to comparison with conventional glass packaging in terms of stability and strength. All the ecological advantages also remain: lightweight glass is 100% recyclable and is completely neutral in relation to the contents.

## Lightweight glass at a glance

- High stability and strength are maintained even though less material is used.
- The reduced weight of lightweight glass packaging makes it easier to transport for both producers and consumers.
- Lightweight glass cuts energy and material consumption and helps protect the environment.

## Vetropack: top-quality products preserving value for you

The Vetropack Group is one of Europe's leading manufacturers of glass for packaging. It operates seven plants in Switzerland, Austria, the Czech Republic, Croatia, Slovakia and Ukraine, and employs 3,000 staff. The glass factories are certified under ISO 9001 and have a total of 16 melting furnaces with a daily production capacity of 4,000 tonnes of glass for packaging.

**Glass to meet the highest specifications.** The Vetropack Group supplies its customers in the food and drink industry with glass containers that meet the highest specifications. They provide complete protection for the product and also embody product image and marketing strategies. Vetropack's services range from packaging design, production and logistics through to technical consultancy.

**Leading the way in environmental protection.** As long ago as the 1970s, Vetropack introduced a system in Switzerland for recycling used glass, making the group a pioneer in glass recycling. With its commitment to recycling and continuous investment in the latest production facilities, in recent decades Vetropack has succeeded in substantially reducing its consumption of raw materials and energy and its emissions of harmful substances.

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