

CORRUGATED



Consumer Products

Corrugated board - often called cardboard - is a strong, durable board made from paper.

Corrugated board has been used as a packaging material since 1871 when an American, Albert L. Jones, first used it for wrapping fragile items such as bottles. The first corrugated boxes were made in Britain in 1895.

The basic ingredients of corrugated board are paper and starch. Many types and weights of paper and board can be used. The outer surface is usually made from recycled papers, which can be brown or white. The starch is a natural adhesive, often obtained from maize. The paper is called "Linerboard" and "Fluting Medium." The "Fluting Medium" is pleated, then sandwiched and glued between flat sheets of paper.

Corrugated board is an ideal packaging material. It is strong, versatile, light, hygienic, flexible and recyclable. More than two thirds of bought and sold goods in the world are packed and transported in it, making it the most popular packaging medium.

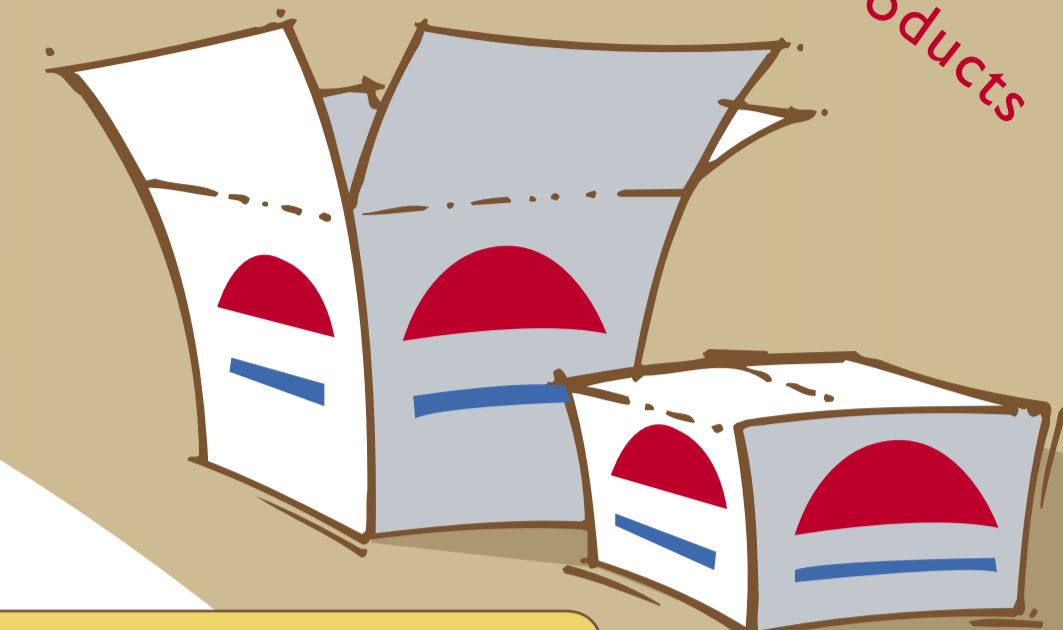
Corrugated board's unique characteristics mean ingenious, floor-standing displays can be made that are easy to assemble, dismantle and recycle, so no extra packaging is needed during delivery.

Corrugated transportation packs, using tiny microflutes, protect goods and can be easily printed, branded and used as display material on shelf or in store. These innovative systems for fast shelf-filling help reduce the amount of material needed for packaging. Standards are being agreed to make products easier to stack, store and unpack.

Tougher, lighter, single-piece boxes reduce storage space, material costs and make disposal and recycling easier. Because corrugated board can be cut with such precision, the contents don't move around, so it's perfect for protecting items such as computers. Another innovation is the 'upside down case'. With the lid at the bottom, when the box is removed the lid forms a tray for the product on the shelf. It's easier to handle and produces less waste.

Corrugated containers can hold heavy industrial products or wet substances more effectively due to advances in engineering design and waterproofing. The designer's role is to choose the right combination of materials to suit the job.

Packaging can incorporate microchips, so deliveries can be identified monitored and tracked for security. From cases for the global trans-shipment of car components weighing hundreds of kilogrammes to gift packaging and take-away food boxes, corrugated board is the world's most versatile packaging material.

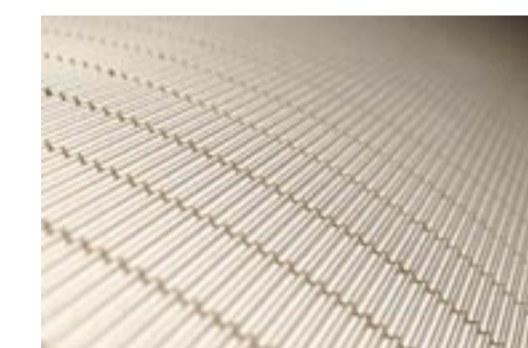
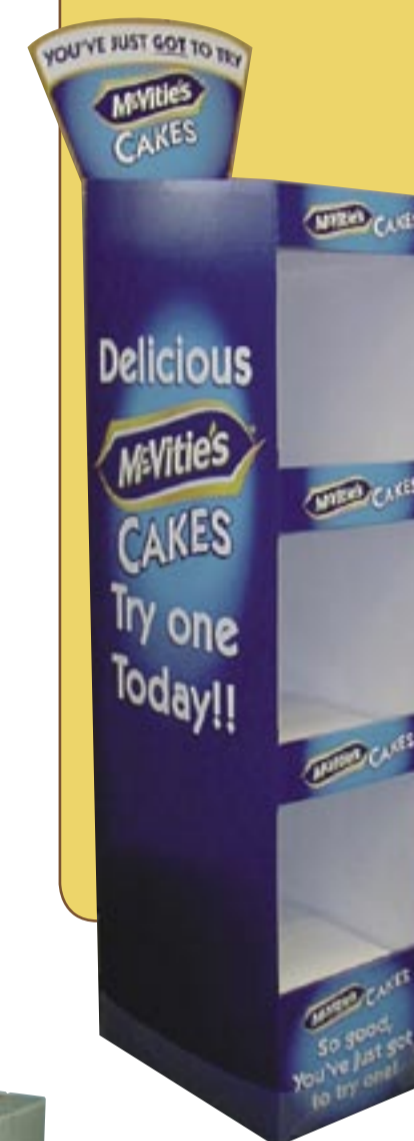


Converting corrugated board into finished packaging

Corrugated board is converted into packaging using a number of processes including cutting, folding, gluing or stapling and printing.

Simple shapes, such as the traditional "four flap" box, are made by slotting, folding and gluing or stapling on machinery that carries out these processes consecutively at high speed. This box is usually printed to promote the brand of the contents. Printing is done by the flexographic process on a print unit incorporated into the converting machine.

More complicated shapes and styles of box are produced by a stamping out process known as diecutting. A "cutting forme" (or die) which is flat (for flatbed diecutting) or mounted on a cylinder (for rotary diecutting) cuts and creases the sheet of corrugated board into the required shapes and sizes. These boxes are also printed, either by the flexographic process or by "litho lamination", where the board is lined with a sheet of paper that has been printed separately.



10 Sheet stacker

Distribution



Centre

Looking after the environment

Corrugated board is one of the most environmentally sound packaging materials.

It is non-toxic, easily recyclable and produced mainly from recycled paper. Advanced technology means its manufacture is energy efficient.

In the UK alone, over 75% of the 2 million tonnes of board produced each year is recycled into new corrugated packaging. That's more than any other packaging material.

Around 25% of the fibre in corrugated packaging comes from woodpulp. The industry uses softwoods such as pine and spruce which provide long strong fibres. Tropical hardwoods are never used.

The industry is increasingly using independent forest certification as a means of demonstrating that the woodpulp it uses comes from well-managed forests.

Making corrugated board ever lighter and stronger is good for the environment.



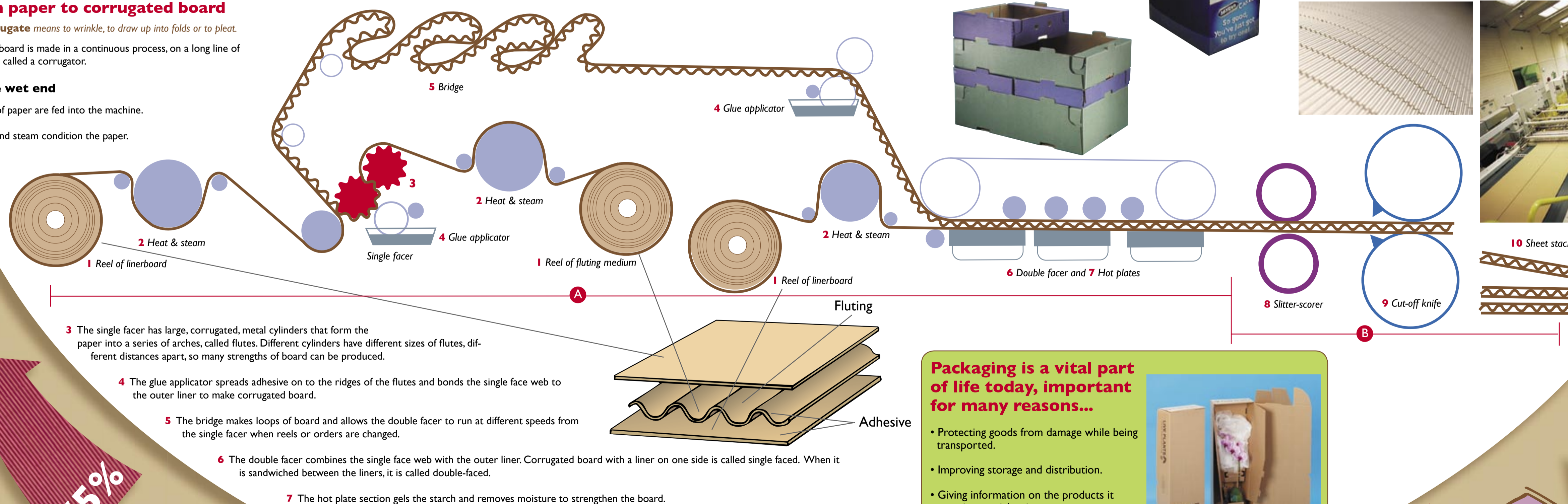
From paper to corrugated board

To corrugate means to wrinkle, to draw up into folds or to pleat.

The cardboard is made in a continuous process, on a long line of machines called a corrugator.

A The wet end

- 1 Reels of paper are fed into the machine.
- 2 Heat and steam condition the paper.



3 The single facer has large, corrugated, metal cylinders that form the paper into a series of arches, called flutes. Different cylinders have different sizes of flutes, different distances apart, so many strengths of board can be produced.

4 The glue applicator spreads adhesive on to the ridges of the flutes and bonds the single face web to the outer liner to make corrugated board.

5 The bridge makes loops of board and allows the double facer to run at different speeds from the single facer when reels or orders are changed.

6 The double facer combines the single face web with the outer liner. Corrugated board with a liner on one side is called single faced. When it is sandwiched between the liners, it is called double-faced.

7 The hot plate section gels the starch and removes moisture to strengthen the board.

B The dry end

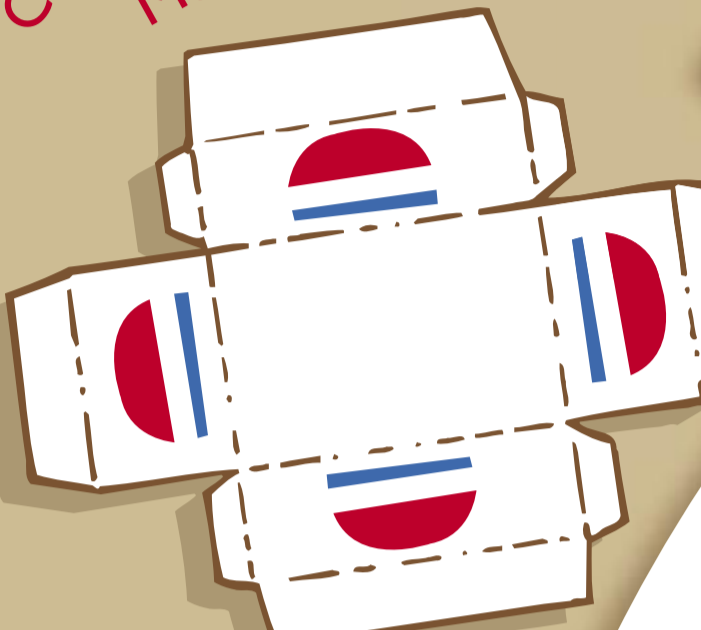
- 8 The slitter/scorer cuts and creases the board.
- 9 The cut-off knives cut the board to the required length.
- 10 The stacker automatically piles up the sheets of board.

Packaging is a vital part of life today, important for many reasons...

- Protecting goods from damage while being transported.
- Improving storage and distribution.
- Giving information on the products it contains - weight, size, amount, usage or assembly instructions.
- Providing nutritional value and ingredients on food packaging.
- Advertising and promoting the product to the customer.



Corrugated Packaging Manufacture



Paper

Manufacturing

Forestry

25%
75%



Recycling

BOARD

Retail

