

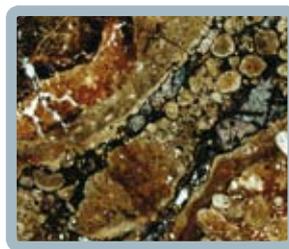
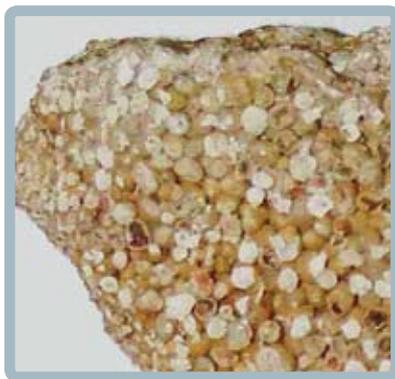
# Aluminium

## What is Aluminium?

Aluminium is a relatively soft material discovered in 1825 by Danish scientist Hans Christian Ørsted (also spelled Oersted). In order to increase its hardness and its toughness, all you need to add to aluminium is less than 1% silicon or iron.

## Where Does Aluminium Come From?

Aluminium is the 3rd most frequent element – 8.23% - of the earth's crust after oxygen with 64.1% and silicon with 28.2%, but it is never found as a metal in nature. It is obtained by electrolyzing a red rock called bauxite discovered by Pierre Berthier near the Baux-de-Provence (France) in 1831. Nowadays, bauxite is mainly extracted in Australia and New Guinea. An average of four tons are necessary to produce one ton of aluminium.



Bauxite

## How Is Aluminium Produced?

Most of the time, aluminium is produced using the "**Bayer process**": bauxite is broken into small pieces, attacked by soda and washed to be turned into pure aluminium hydroxide. The hydroxide is then claimed to remove the water it contains and it turns into a white powder called alumina. Then, thanks to a chemical process that consumes a significant amount of electricity – electrolysis – alumina is turned into aluminium. Depending on the purpose it is intended for, aluminium can be mixed with minute quantities of several metals.

The world's production of aluminium is now almost 28 million tons per annum, one third of which comes from recycling.

## What Are the Advantages of Aluminium?

**Its light weight:** it is three times lighter than steel.

**Its compatibility with food:** it does not alter foodstuffs.

**Its conductivity:** it is an excellent heat and electricity conductor.

**Its malleability** and its stiffness: it can take all possible shapes.

**Its resistance** to corrosion by air and water.

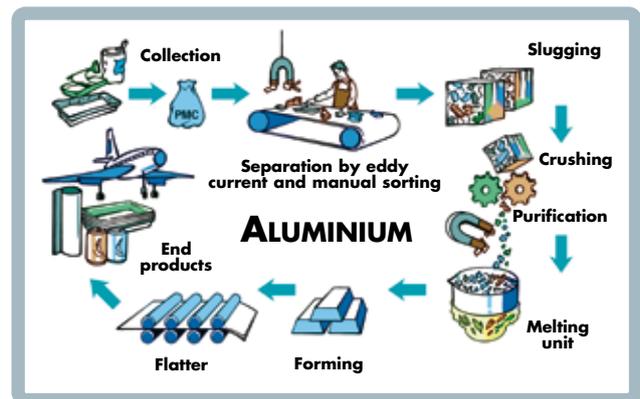
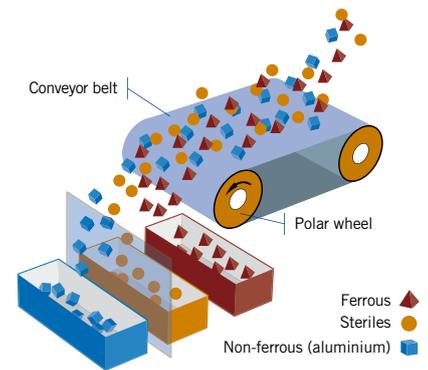
## Why is Aluminium Recycled?

Aluminium is 100% and infinitely recyclable. Every ton of recycled aluminium allows saving 2.3 tons of bauxite. Moreover, recycling this material needs 20 to 25 times less energy than manufacturing it from raw materials. It is therefore a win-win situation: it saves natural resources and it saves energy! 30% of all the aluminium produced therefore comes from recycling. In Luxembourg, 127 tons of aluminium packaging have been collected in 2006.

## How is Aluminium Recycled?

Aluminium is separated from other materials either by manual sorting, as is now the case in Luxembourg, or with eddy current. The latter is comparable to the action of a magnet but instead of attracting ferrous metals, the current will reject non-ferrous metals. Depending on the weight, aluminium waste is ejected horizontally – it is the case of milk cartons that entail an aluminium sheet – or parabolically – as is the case for beverage cans. The sorted products then fall into separate trays to be recycled in different ways.

The collected packaging are then crushed, liquefied and thinned in order to remove impurities before being poured into a mould. The semi-finite products are then rolled in flatters.



## What is Manufactured with Aluminium?

Aluminium is an indispensable material; it is everywhere! Planes, trains, watches, suitcases, electric cables, kitchen utensils, crates, beverage cans and drug packaging are all in aluminium.



= 670 beverage cans