

## How steel is “born again”

Two steel production processes are well-established throughout the world and both require the use of scrap:

- integrated steel-making (using iron ore, coking coal and scrap)
- electric steel-making (from 100% scrap)

Integrated steel mills also use considerable amounts of scrap, but to a lesser extent than in electric steel-making.

In integrated steel-making, used amongst other things in the production of steel for packaging, steel is created from pig iron by the injection of oxygen. Due to its physical properties, pig iron recovered from ore in blast furnaces contains excess levels of phosphorus and carbon, making it brittle as well as hard and therefore unsuitable for shaping processes. However, when it is oxidised, the carbon content of pig iron falls from 3-4% to around 0.02%, while other minor constituents such as phosphorus and silicon burn off.

This oxidation process produces a great deal of heat which is itself used in the steel manufacturing process. And steel scrap plays an important role too at this point, lowering the temperature required for steel production to around 1600°C.

When production is complete, the steel is alloyed in accordance with the metallurgical requirements of the intended application, and the key characteristics of the rolled material to be subsequently processed are also defined. Steel for packaging is a non alloyed, flat steel product.

### STEEL SCRAP - AN ESSENTIAL RAW MATERIAL

Both electric arc and integrated steel-making processes accept all kinds of used steel packaging, including drinks, food and paint cans, as well as aerosols - all of which can be recycled indefinitely into an unlimited range of new steel products without any loss of quality.

Equally, since recovered steel is an essential ingredient of new steel, the demand for recycled steel packaging grows in line with worldwide demand for steel products.

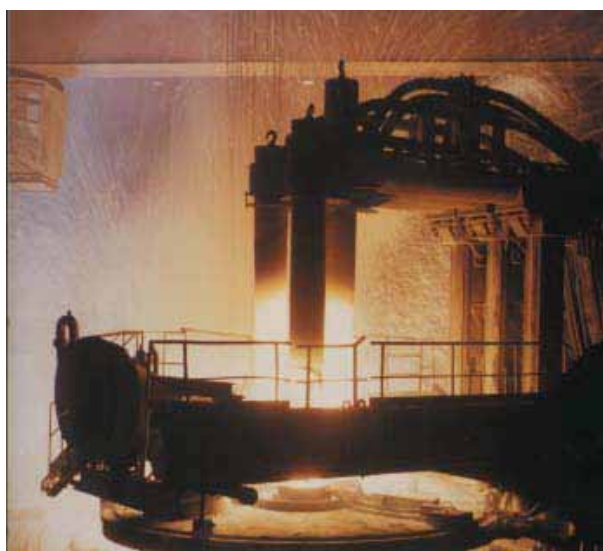
### SHAPING UP FOR RECYCLING

Sooner or later, virtually all scrap returns to the steel mill. Steel's established recycling loop, and the ease with which scrap is reclaimed through steel's natural magnetism, helps today's designers make end-of-life recycling a vital part of product planning.

An upgrading stage is always necessary prior to the smelting of steel scrap. In the case of integral collection and incineration, steel cans are magnetically extracted from the



*Integrated steel-making*



*Electric steel-making*