

## **The characteristics of aluminium:**

Few people probably know the reasons why aluminium is “the fundamental ingredient in packaging” that we use every day and that we recycle after using. Here is a brief list of the particularities of this material (one of the most common elements in nature, and the third most abundant element after oxygen and silicon; bauxite is the most important form of aluminium ore, amounting to about 8% of the earth’s surface). It is good to remember that these properties remain unchanged even after numerous recycling phases, that is - even when raw aluminium acquires the definition of “recycled aluminium” or “secondary aluminium”.

### **Production costs**

Producing aluminium from raw material has an energy cost of 13 kWh/kg. Producing recycled aluminium lowers this cost by 95%. In the world, about 31 million tons of aluminium are produced yearly, and of these, 7 million tons come from recycling.

### **Recyclability**

Aluminium is 100% recyclable, and can be recycled an infinite number of times without losing its original characteristics. In Italy, a country which does not have bauxite mines that remedied this lack of raw material by building an excellent recycling industry (it holds third place with Germany behind the USA and Japan), 50% of the aluminium in use today is a product of recycling.

### **Lightness**

If equal volumes of aluminium, copper and steel are compared, the aluminium weighs about 1/3 what the others do. This is another reason why most modern means of transportation are built using high percentages of aluminium: the shuttle is up to 90% aluminium and, on average, 80% of the weight of a cargo aircraft is aluminium. The same is true, in different percentages, for ships, yachts, high speed trains, trams, underground transit cars and automobiles: several automobile manufacturers make chassis and coachwork in 100% aluminium. In the '50s and '60s, cars contained an average of about 40 kg of aluminium, but now they contain about 70.

### **Corrosion resistance**

Aluminium oxidises immediately when it comes in contact with air, creating a surface protection that makes it resistant to water and some other chemical substances. This characteristic makes it the preferred metal of the transport, building and construction industries.

### **Ductility and malleability**

Aluminium can be worked easily and it is suitable for manufacturing processes at both high and low temperatures. This is another reason why it is used to make containers and packaging.

### **Good electric, thermal and sound conductivity**

Aluminium allows energy to be transmitted over long distances. In fact, most high voltage conductors are in aluminium, and so are the threaded base of light bulbs. This metal is also an excellent heat conductor, and for this reason it is used to make radiators and thermal containers, thermal-conditioning equipment (refrigerators, air conditioners, etc) and pots and pans for cooking foods. Lastly, it stands apart for its high sound resonance, a reason that it is used in making musical instruments like the violin, the piano, ....

### **Reflective capacity**

Aluminium reflects and diffuses light, reducing dispersion of the luminosity of the source and thereby favouring energy savings.

### **Non-magnetic substance**

This means that aluminium can be used to build equipment like radios, radar and stereos.