

## ALUMINUM PRODUCTS

Aluminum foil is a solid sheet of aluminum, or of an appropriate aluminum alloy, rolled very thin, varying from a minimum thickness of about 4.3 microns to a maximum of about 150 microns. From the standpoint of packaging and other principal applications one of the most important characteristics of aluminum foil is its impermeability to water vapor and gases. Bare foil 25 microns and thicker is completely impermeable; much thinner gauges laminated to an appropriate film form impervious composite materials, making them ideal for packaging and general insulation/barrier applications which, with solid foil semi-rigid containers, account for most foil consumption.

Aluminium foil has a shiny side and a matte side. The shiny side is produced when the aluminium is rolled during the final pass. It is difficult to produce rollers with a gap fine enough to cope with the foil gauge, therefore, for the final pass, two sheets are rolled at the same time, doubling the thickness of the gauge at entry to the rollers. When the sheets are later separated, the inside surface is dull, and the outside surface is shiny.

Aluminum has high resistance to most fats, petroleum greases, and organic solvents.

Three different alloy groups are available on the market, each with different properties. It is, therefore, important to select the most suitable alloy for each and every final application by adding up the maximum amount of the desired contribution to the multilayer compound.

Alloys:

- 1235: In this alloy, the aluminum content is high. The softness of pure aluminium enables very good transformation behaviour during the rolling process, making it highly suitable for the production of very thin, 6-9 micron gauges.

The minimum amount of alloying elements results in a very low level of intermetallic phases and, consequently, the number of web break-throughs (pinholes) is reduced.

The softness of the material is not critical for this particular end use because light-gauge foil is never used unsupported, that means without being part of a multilayer compound. Aluminium foil performs the barrier function in the compound, while the paper or plastic layers withstand the mechanical stress.

Typical end uses for this Group of alloys are aseptic liquid packaging, cigarette liner foil or coffee packaging.

- 8079: This is an Aluminium-Iron (Fe) alloy. Iron as an alloying element adds strength to the aluminium foil, which also requires higher transformation forces during rolling. The higher the number and size of Al-Fe intermetallic phases, the greater risk of web break-throughs (pinholes).

For this reason, iron-alloyed products are more frequently used in thicknesses of above 12 microns and are ideal for unsupported applications. On the other hand, a very fine metallic grain structure

is formed with the help of intermetallics, making the product very ductile so that high elongation and burst strength values are reached.

This property is needed for applications where the compound is folded several times and the aluminium foil must have sufficient elongation to deform in the folded area without tearing. The most representative end uses comprise cold-form blister, bottle neck foil and dead fold chocolate wrap.

- 8011: This is an Aluminium-Iron-Manganese alloy. The manganese addition improves the strength of foil. Iron-manganese alloys are suitable when very high strength is required.

Al-Fe-Mn alloys are generally used for products where reduced elongation is not critical but where strength is essential to the compound or needed for the converting process.

As aluminium foil acts as a complete barrier to light and oxygen (which cause fats to oxidise or become rancid), odours and flavours, moisture, and bacteria, it is used extensively in food and pharmaceutical packaging. Aluminium foil is used to make long-life packs (aseptic packaging) for drinks and dairy products, which enables storage without refrigeration. Aluminium foil laminates are also used to package many other oxygen or moisture sensitive foods, and tobacco, in the form of pouches, sachets and tubes, and as tamper evident closures. Aluminium foil containers and trays are used to bake pies and to pack takeaway meals, ready snacks and long life pet foods.

Aluminium foil is widely used for thermal insulation (barrier and reflectivity), heat exchangers (heat conduction) and cable liners (barrier and electrical conductivity).

- Flexible Packaging Foil
- Beer Bottle Wrap Foil
- Toothpaste tube Foil
- Retort Pouch
- Tetra Pack type Foil
- Adhesive Tape Foil
- Household Foil
- Electric Capacitor Foil
- Video Cable Foil
- Gold and other colors
- Thermosealable laquers
- Pharmaceutical Blisters
- Embossed
- PE Extrusion Coated Foil
- Chocolate coins
- Corrugated foil
- Non- Stick primers
- With primers for Cheese apps
- Heaters units

Aluminum foil is supplied in different formats.

Available Alloys:

- 1235
- 8011
- 8079

Gauges: Regular commercial gauges are from 6 microns to 80 microns. Other gauges has to be consulted.

- Different Tempers, being the most used one the H-0 (soft) and H-18 (hard).
- Application: Foils for certain applications like Retort Pouches, pharmaceutical packaging, etc. require a special pinholes specification
- Wettability: Grade A
- Different types of coatings if required. Heatsealable, pigmented, printable, etc.T

## Example products

