

History

Household foil was successfully introduced in the US in the late 1920s. In the mid-1930s the European alufoil sector began to produce rolls of household foil for the domestic kitchen as either a tear off product on rolls or as loose sheets in bags. Marketed as "sterile, free from bacteria, clean and trouble free and reusable" household aluminium foil quickly gained popularity.

Apart from its many well-known uses in the kitchen – wrapping foods for cooking to retain moisture, for grilling or covering and wrapping food going into the refrigerator or freezer – this versatile material also gained a reputation for other interesting and novel ways it can be used. Some of these are alive and well today: such as wrapping Easter Eggs and soaps; as a strip behind radiators to reflect heat back into the room or to scrub cooking residue from barbecue grills; decoration on serving dishes; and even as a scarecrow with the alufoil strips continuously sparkling in the wind.

The material aluminium

Aluminium, the third most abundant element on the earth's crust after oxygen and silicon, is extracted from an ore called Bauxite. The ore is refined to make 'alumina', a pure aluminium oxide. The aluminium metal is then produced from alumina by passing an electric current through it in a process called 'electrolytic reduction'. The resulting silvery metal is the basis of a wide range of alloys made by adding small amounts of other metals to provide the specific characteristics needed for each application. For most alufoil packaging almost pure aluminium is used. But increasingly alloys are being 'tailored' in order to add strength and allow for reductions in thickness for the same performance.

Making aluminium foil

Alufoil is a very thin sheet of aluminium ranging from about 0.006mm to the upper ISO defined limit of 0.2mm (200µm). It is produced by first rolling heated ingots (hot rolling) down to coils of thickness between 2 and 4mm. The coils are then successively cold rolled to the required foil thicknesses. A second foil rolling method, continuous casting, bypasses the ingot stage and converts molten metal directly into a thick strip which is immediately rolled into the coil from which the foil is then rolled.

To obtain the very thinnest foils, two layers are rolled simultaneously. This 'double rolling' results in the difference between the two surfaces – matt and polished – the matt side being the inner side during double rolling. The two layers of alufoil are then separated. The resulting large reels are slit to the widths needed for further processing for the required end use – flexible packaging, foil containers, lidding foils, household foil, heat exchanger foil, laminations for heat insulation materials, etc.

Market data

Approximately 75% of European production (2013: over 840,000t) is used for packaging and household foil and 25% is used in technical applications. European domestic and professional consumers use more than 120,000t of household foil annually.

Barrier Protection

Alufoil's total barrier to light, gases and moisture is the principal reason for its wide use for food and drink applications. Even when very thin it provides perfect protection and preservation of

aroma and product characteristics. It can help to extend the viable life of sensitive products and helps to prevent spoilage. As a result it also can provide significant energy savings.

Mechanical Properties / Formability and Strength

Light yet strong, alufoil has unique dead fold characteristics which make it ideal for wrapping and re-wrapping many different products and product shapes. When pressed into a shaped dish, the aluminium foil memorises its shape, particularly where the folds and rims occur. Because it is very malleable it can be easily deformed without losing its barrier integrity, making it an ideal material for use in households.

Shape, thickness, alloy and temper can be selected to create exactly the performance characteristics required.

Hygiene:

Once produced, aluminium foil is completely sterile due to the high temperature annealing process. It is safe for use in contact with foodstuffs and it does not harbour or promote the growth of bacteria.

Heat Performance

Alufoil is very conductive to temperatures. It can be heated to a very high temperature without losing its shape or melting and it can withstand sub-zero temperatures without fracturing. This is of great advantage in the various activities at home – from freezing to the extremes of baking and grilling – without distorting, melting or the risk of sudden cracking.

What's more, this conductivity speeds up the process of deep-freezing, refrigerating, and heating the package and its contents, therefore enabling energy savings to be made.

Decorative characteristics:

The metallic sheen of the surface of aluminium and its suitability for all printing techniques, including embossing, enables it to be used in combination with demanding designs for a strong promotional effect. A very important benefit when one considers that aluminium can be easily stamped and formed into attractive shapes.

Safety and Product Security

Alufoil is safe for use in contact with foodstuffs. Uncoated aluminium foil will not react with the vast majority of foods. Very salty and acid foods may occasionally cause holes and discolouration but it is easy to prevent this, lightly coat foil with cooking oil prior to usage.

Recycling and Recovery

Aluminium is fully recyclable, endlessly, without any loss of quality. The recycling process for aluminium requires 95% less energy compared to its primary production, which corresponds to enormous emission savings. Modern separation techniques allow aluminium foil in household waste to be extracted and recycled at a fraction of its original energy cost.

If aluminium foil is not collected for recycling but processed in incinerators the thin, laminated foil material is oxidised and releases energy, which can be recovered. In addition, the remaining non-oxidised aluminium can be extracted from the bottom ashes of the incinerator and subsequently used for recycling purposes.

More information at www.alufoil.org.