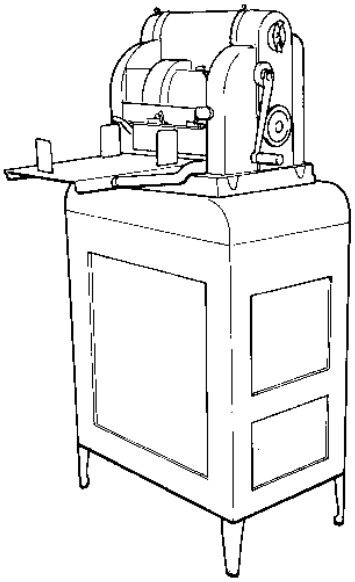
# Development of Plastic Products:

During the 1920's plastics became an increasingly widespread material for use in the manufacture of domestic products, including everything from manicure sets to ear trumpets and fountain pens. In 1929 Raymond Loewy, the American industrial designer became famous for using Bakelite to transform the old, mechanical looking Gestetner duplicator into a sleek, streamlined product. Because of the way Bakelite was moulded, using compression moulding techniques, the products made tended to have round or curved corners, enhancing their streamlined effect. Loewy went on to use streamlining on many products – from kitchen mixers to locomotives.

Figure:



A Gestetner duplicating machine.

Raymond Loewy aboard one of his streamlined trains.

Radio cabinets soon became an obvious medium for plastics even though they were difficult to mould and shape, requiring huge presses. The advantage was that in the 1920s radios were new products without an established identity and plastic cases were therefore more readily accepted.

Wells Coates' circular Bakelite radio, designed for Ekco in 1934, was a radical design, and used the versatility of Bakelite as a mouldable material. Ekco was a major influence in British plastic design and designers such as Wells Coates, Serge Chermayeff and Misha Black demonstrated how plastics could start having an identity of their own instead of simply substituting for other materials.

In August 1929 the research section of the General Post Office was asked to design a small telephone. This project led to the development of the GPO 162, a wonderful, sculptural yet functional telephone that could only have been made out of plastic, and became the model for telephone design for many decades.

Fig.7.

A rare, red Echo radio, normally they were brown or black

A GPO 162 telephone.

The period between the two World Wars has become known as the 'poly era' with the development of some of the most important plastics. In the early 1930's the American chemical company Du Pont produced the first synthetic fibre, nylon 66 whilst at the same time in England ICI, after three years research, produced probably the most common of all plastics found today, polyethylene (known as polythene).

During the Second World War plastics became important and very secret materials. The properties of polyethylene were vital to the wartime development of radar as was polymethyl methacrylate, another important ICI development more commonly known as acrylic or by its trade name of Perspex. The shatter-resistant properties of acrylic when laminated with special resins were ideally suited for use as protective screens, and especially aircraft canopies.

## Designing with plastics:

There have really been three phases in the use of plastics in product design. Early designers using plastics either tried to invent new products or more often copied existing products made originally in other materials such as ebony, alabaster, onyx and amber. This meant that for the first time previously expensive products were affordable by more people. However this copying process also led to most people thinking that plastics were just a cheap substitute for real materials.

The second phase in the use of plastics during the 1940s and 1950s was the mass production of large volumes of cheap, badly made, badly designed, products, often through a manufacturing process called injection moulding. This gave plastics a reputation for poor quality goods. Although there were many plastics goods made which were well designed and of very good quality, by the end of the 1940s the word 'plastics' had come to many people to mean cheap and nasty.

In the 1950s modernist designers began to look again at plastics to produce the new kinds of products that fitted into their idea of a modern world. At this time Gino Colombini working for the Kartell design group in Milan designed a range of everyday domestic objects, such as vegetable baskets, which were very well designed and made to a very high quality. This was one of the starting points for post-war designers who believed that plastics could be used well and as materials in their own right.

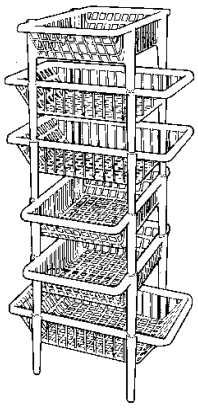


Figure: A polythene vegetable basket.

One of the major successes in exploiting the virtues of plastic was the invention in 1949 of Tupperware. Earl S. Tupper, an American manufacturer, used polyethylene to create inexpensive and lightweight food containers. The key to the success of Tupperware was the re-sealable lid that utilised the elasticity and flexibility of polyethylene.

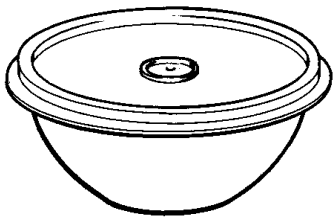


Figure: A Tupperware bowl.

The early 1950s saw the introduction of plastics which were tailor made materials to fit special requirements. A tougher form of polythene called high- density polyethylene (HDPE) was developed and in 1954 polypropylene was introduced. These materials were developed specifically for their material properties, and designed and made in a predetermined way, and nowadays individual plastics are still being developed which may be stronger than steel, withstand high temperatures, be used as glues in resin form or even conduct electricity.

The 1980's saw the development of composites, a new generation of lightweight, yet immensely strong structural materials. Polymer based composites are polymer resins mixed with fibres. The length and material of the fibres alter the nature of the material, for example, glass fibre is flexible whereas carbon fibres are stiff. The defence industry was the main developer of composite materials with the need for light, high performance materials that could withstand the demands of high speed flight.

The use of plastics has been an important part in the history of engineering and product design in the twentieth century. They have given us the ability to develop a range of products in a very wide number of areas, from lightweight unbreakable containers, safe hygienic toys and inexpensive household objects to artificial limbs and life saving medical equipment.