

## Plastic Timeline:

- 1712 John O'Brisset moulds snuff boxes from horn.
- 1823 Macintosh uses rubber gum to waterproof cotton and the 'mac' is born.
- 1839 First deliberate chemical modification of a natural polymer produces vulcanised rubber.
- 1851 Gutta percha used to insulate submarine telegraph cables between England and France.
- 1854 Shellac mixed with wood flour patented in USA as moulding material for making 'union cases', protective frames for daguerreotypes and ambrotypes - early forms of photographs on glass.
- 1855 Soccer ball with vulcanised rubber panels, glued at the seams, designed and produced by Charles Goodyear.
- 1861 to
- 1887 Queen Victoria's mourning for the Prince Consort fuels the production of imitation jet mourning jewellery in such materials as cellulose nitrate, hard rubber and horn.
- 1862 A range of toiletry and household objects, some imitating the appearance of tortoiseshell and ivory, made of an early form of cellulose nitrate, is displayed at the International Exhibition in London. The material was called Parkesine after its inventor Alexander Parkes. Ultimately Parkesine fails as a commercial venture.
- 1870 In USA Hyatt brothers in search of substitute material for ivory billiard balls turn cellulose nitrate into a commercially viable material. Dental palates are one of their good sellers. They register the name 'Celluloid' for their material in 1873.
- 1884 Cellulose nitrate modified to make artificial silk, called Chardonnet silk.
- 1889 Dunlop Rubber Company founded and motor industry revolutionised.
- 1888 First commercially successful celluloid (cellulose nitrate) photographic film introduced by George Eastman Kodak.
- 1890 Thermoforming introduced and used to make babies' rattles from cellulose nitrate.

- 1892 Cellulose acetate modified to make a form of artificial silk, called viscose. By 1904 this was known as rayon.
- 1898 Beginning of mass-production of 78 rpm gramophone records from shellac, for which it remains the most common material until the 1940s.
- 1899 Casein formaldehyde patented as Galalith in Germany.
- 1905 Laminated safety glass, first with gelatine but then with cellulose nitrate inter-layer introduced.
- 1907 First synthetic (lab made) plastic, phenol formaldehyde, better known as Bakelite, later known as 'the material of a 1000 uses' introduced.
- 1910 Viscose stockings begin to be manufactured.
- 1913 Formica invented.
- 1915 Queen Mary orders casein jewellery at the British Industries Fair.
- 1916 Rolls Royce boasts about use of phenol formaldehyde in its car interiors.
- 1920 Hermann Staudinger publishes his realisation that plastics are made up of polymers. Only in 1953 was the value of his work properly recognised when he was awarded the Nobel Prize for Chemistry.
- 1926 Harrods, the London store, mounts a display of Beetle products, made from a form of thiourea-urea formaldehyde. It is a huge success.
- National Grid for electricity is established, fuelling the desire for consumer goods that plug in and switch on, often with plastic housings.
- 1929 Bakelite Ltd receives its largest ever order of phenol formaldehyde for the manufacture of the casing of the Siemens Neophone Number 162 telephone.
- 1930 Scotch Tape, the first transparent (see cellulose acetate) sticky tape, invented.
- 1933 The British Plastics Federation, the oldest national organisation in the world with plastics in its name, is set up.

- 1935 Couturier, Elsa Schiaparelli, begins to use zips made of cellulose nitrate and cellulose acetate in her garments.
- 1936 Acrylic (polymethyl methacrylate) canopies used in Spitfire fighter planes. From 1940 it becomes the most widely used material for aircraft glazing.
- 1938 First toothbrush with plastic tufts manufactured. The tufts were made of nylon (polyamide).
- Introduction of plastic contact lenses. The lenses were made of acrylic (polymethyl methacrylate).
- 1939 First polythene factory opens in Britain. Polythene plays a crucial role in the insulation of British radar cables during World War II. The entire production is for military use.
- Plastic Man, a fictional comic-book hero, first appears.
- 1945 The end of the war releases a range of plastics developed to support the war effort on the commercial market looking for uses.
- 1947 First acrylic (polymethyl methacrylate) paint (dissolved in turpentine) becomes available. Appreciated by artists such as Roy Lichtenstein for its intensity and rapid drying properties.
- Tupperware, with flexible seals made possible by the invention of polythene, patented in the USA.
- 1948 Introduction of long playing vinyl copolymer gramophone records
- 1949 Charles and Ray Eames glass reinforced plastic shell chair showed that plastic could be more than a furniture covering or veneering material.
- First Airfix self-assembly model produced. It was made of polystyrene.
- Kartell, the Italian firm associated with plastic objects of desire for the home, founded.
- 1950 Silly Putty, made from silicon, launched at the New York Toy Fair.

Early 1950s

The ubiquitous polythene bag makes its first appearance.

1951 First polythene bottle made by Szezy.

1953 Commercialisation of polyester fibre introduces the concept of 'wash and wear' for fabrics. Chevrolet Corvette, the first mass-produced car with a glass reinforced plastic chassis, begins manufacture.

1954 Synthesis of polypropylene.

1956 Reliant Regal 111, first commercially successful all glass reinforced plastic bodied car, goes on sale.

Eero Saarinen's Tulip chair, the seat consisting of a glass reinforced plastic moulded shell, launched.

1957 Invention of polyacetal, the first 'engineering' plastic.

The Monsanto Company's House of the Future with 100% plastic structural parts built at the entrance to Disneyland's Tomorrowland.

Polyvinyl chloride road cones used in the construction of the M1 motorway.

1958 Invention of the silicon chip.

American Express launches first plastic credit card in US. Lego decides to concentrate exclusively on plastic toys and patents its stud-and-block coupling system. Originally made of cellulose acetate, it has been made of ABS (acrylonitrile-butadiene-styrene) since 1963.

1959 Birth of the Barbie doll, made mainly of PVC (polyvinyl chloride) and the Lycra (copolymer of polyurethane) bra.

Early 1960s

Acrylic (polymethyl methacrylate) paint (diluted with water) comes on market and is soon widely used by artists such as Warhol, Rauschenberg and Hockney.

- 1963 Mary Quant launches her 'Wet Collection' made of plasticised PVC (polyvinyl chloride). It had taken two years to work out how to bond the seams successfully.
- Robin Day polypropylene one-piece injection moulded chair shell begins manufacture.
- 1965 Twiggy models John Bates's plasticised PVC (polyvinyl chloride) dress.
- 1967 Inflatable PVC (polyvinyl chloride) 'Blow' chair designed by DePas, D'Urbino., Lomazzi and Scolari for Zanotta SpA, launched.
- 1969 Neil Armstrong plants a nylon (polyamide) flag on the moon.
- 1969 Beatles' song 'Polythene Pam', the kind of a girl that makes the News of the World released on Abbey Road album.
- 1970 Verner Panton's cantilevered stackable chair, the first whole chair to be made out of a single piece of injection-moulded plastic becomes a reality. He had been working on the design since 1960. The first pilot production models were made of glass-reinforced polyester resin in 1967. It has since been made of polyester integral foam, polyurethane, styrene acrylonitrile (SAN) and polypropylene.
- 1976 Plastic, in its great variety of types, said to be the material with the most uses in the world.
- Concorde with its nose cone of purpose-made plastic goes into service.
- 1977 PET (Polyethylene terephthalate) drinks bottle introduced.
- 1978 PolyStyrene, lead singer of the Punk band X-Ray Spex, bursts on the scene with 'the day the world turned day glow'.
- 1980 During this decade ICI and Bayer launch PEEK, PES and PPS as the new engineering thermoplastics, Costs are enormous but specialist applications make a lasting market even after ICI retreats from the plastics market.
- 1982 First artificial heart made mainly of polyurethane implanted in a human.

# TCE ENVIS - Plastic Waste Management

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- 1983 The slim Swatch watch launched, its case of ABS (acrylonitrile butadiene styrene) and strap of PVC (polyvinyl chloride). Authentics Ltd., British firm renowned for its sharp, modern designs in various plastics for domestic use, founded.
- 1988 Triangular recycling symbols identifying different types of plastics introduced.
- 1990 First biodegradable plastics launched by ICI
- 1993 Alessi designs its first all plastic product: the Gino Zucchini sugar pourer designed by Guido Venturini.
- 1994 Smart car with lightweight flexible integrally coloured polycarbonate panels introduced.
- 1998 Amorphous free standing Zanussi Oz fridge, with insulation and outer-skins made in one process from polyurethane foam, launched.
- 2000 Issues relating to sustainability and the creation of plastics from renewable sources start gathering momentum.
- 2005 Nasa explores the advantages of a polythene-based material, RXF1, for the space-ship that will send man to Mars.
- 2007 Tate Britain's Christmas tree decorated with plastic Airfix planes.