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## Plastics in Electrical and Electronic Applications



Electricity powers almost every aspect of our lives, at home and in our jobs, at work and at play. And everywhere that we find electricity, we also find plastics. In the kitchen, there are the labour-saving devices that we wouldn't be without; washing machines, microwave ovens, kettles.

In the living room is the television, the video or the music system, while at work, we may use a computer, a fax machine or a telephone. Plastics make progress possible, making electrical goods safer, lighter, more attractive, quieter, more environmentally friendly and more durable.

Plastics fall into two broad categories: thermoplastics such as polyethylene, which can be repeatedly melted down and remoulded and thermosets such as urea formaldehyde which, once set, cannot be remelted, making them suitable for applications where heat is encountered. The UK plastics industry provides jobs for around 200,000 people and has a turnover of over £13 billion per annum. In 1992, 367,500 tonnes of plastics were used for electrical and electronic applications.

### Brown Goods

The stylish appearance of modern VCRs, CD players, DVD systems, Personal Computers and TV sets owes much to the design freedom granted by plastics.

### White Goods

Plastics make hygienic and attractive knobs, handles and door facings on cookers; liners, handles and internal fittings on refrigerators and freezers; housings and tops on washing machines and dishwashers.

### Small White Goods

Safety is a key requirement for goods such as food processors, toasters, kettles and hairdryers - and plastics make it possible.

### Tools

Filled, impact- and fire-resistant plastics make tough and durable housings and handles for tools such as drills, paint-strippers, lawnmowers, vacuum cleaners and hedge-trimmers.

### Office Equipment

Essential to the modern office are smart and hard wearing plastic keypads and housings for telephones, machines, photocopiers and computers.

### What Makes Plastics Invaluable?

**Electrical insulation:** Electricity is essential to our standard of living, a valuable and versatile servant — but it is also potentially lethal. Plastics do not conduct electricity and are therefore used in a variety of applications where their insulating properties are needed. PVC is widely used to insulate electric wiring, while thermosets (which can withstand high temperatures) are used for switches, light fittings and handles. Plastics are especially suited to housings for goods such as hairdryers, electric razors and food mixers as they protect the consumer from the risk of electric shock.

**Heat insulation:** Plastics are poor conductors of heat. To reduce the risk of burns, manufacturers have therefore made extensive use of plastics, introducing cool-touch toasters, deep-fat fryers and kettles. To further protect the consumer, plastics can be made fire resistant through the use of special flame retardant additives.

**Lightweight:** If you've ever lifted an old-fashioned, heavy vacuum cleaner you can imagine how much harder housework was before plastics! Substantial weight reductions in tools and equipment can be made by using plastics. And as they are lighter, they use less electricity to run —helping the environment as well as reducing running costs.



**Freedom of design:** Whatever the designer dreams up, plastics can deliver. They can be any colour — transparent, translucent or opaque; any texture — matte to eliminate glare in the office, smooth for easily cleaned kitchen equipment or non-slip for handles. Plastics are ideally suited to the ergonomic curves which make modern tools easy and safe to use.

**Durable:** Plastics are hygienic, hardwearing and easily cleaned and maintained. They do not corrode, like metals, or rot like other organic materials. They are oil- and acid-resistant, an important property for tools and can be made shatter-resistant.

**Energy-efficient:** Plastics consume just 4% of oil production. They take less energy — and therefore fossil fuel — to make than most traditional materials. This makes them cheaper to make and buy, as well as benefiting the environment by conserving resources.

**Recyclable:** When products have reached the end of their useful lives, many of the plastic components can be recycled, to give them a second life and thus save energy and raw materials. ICER (see below) is promoting and developing recycling facilities in the UK. Waste plastics can also be incinerated in purpose-built, clean-burning power stations to generate electricity.

#### Working For The Environment - ICER

The Industry Council for Electronic Equipment Recycling (ICER) was founded in 1992 by a consortium of companies including household names such as Boots, CL, IBM, BT and the BPF. It aims to oversee the development of recycling facilities for electrical and electronic equipment in the UK. Telephones are already recycled in large numbers and computer equipment is following suit.

For further information on ICER - [Click Here](#)

- What Plastics Are Used In Electrical Equipment?
- Acrylonitrile butadiene styrene - telephone handsets, keyboards, monitors, computer housings
- Aikyd resins - circuit breakers, switch gear
- Amino resins - lighting fixtures
- Epoxy resins - electrical components
- Ethylene vinyl acetate - freezer door strips, vacuum lean hoses, handle-grips
- Phenol formaldehyde - fuse boxes, knobs, switches, handles
- Polyacetal - business machine parts
- Polyamide - food processor bearings, adaptors
- Polycarbonate - telephones
- Polyesters - business machine parts, coffee machines, toasters
- Polyethylene - cable & wire insulation
- Polymethyl methacrylate - hi-fi lids, windows on tape decks
- Polymethyl pentane - circuit boards, microwave grills
- Polyphenylene oxide - coffee machines, TV housings
- Polyphenylene sulphide - hairdryer grilles, element bases, transformers
- Polypropylene - kettles
- Polystyrene - refrigerator trays/linings, TV cabinets
- Polysulphone - microwave grills
- Polytetrafluoroethene - electrical applications
- Polyvinyl chloride - cable and wire insulation, cable trunking
- Styrene acrylonitrile - hi-fi covers
- Urea formaldehyde - fuse boxes, knobs, switches



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