

PLASTICS FOR ELECTRONICS

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Edited by

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PREFACE

Much of the progress towards ever greater miniaturisation made by the electronics industry, from the early days of valves to the development of the transistor and later the integrated circuit, has only been made possible because of the availability of various polymeric materials. Indeed, many new plastics have been developed specifically for electrical and electronic device applications and as a consequence the plastics and electronics industries have continued to grow side-by-side.

Electronic components are one of the few groups of products in which the real cost performance function has declined significantly over the years, and part of the reason can be directly attributed to the availability and performance of new polymeric materials. The evolution of the personal computer is a specific example, where improvements in polymer-based photoresists and plastic encapsulation techniques have allowed the mass production of high-density memories and microprocessors at a cost which yields machines more powerful than mainframe computers of 30 years ago for little more than the price of a toy.

Today, plastic materials are widely used throughout all areas of electrical and electronic device production in diverse applications ranging from alpha particle barriers on memory devices to insulator mouldings for the largest bushings and transformers. Plastics, or more correctly polymers, find use as packaging materials for individual microcircuits, protective coatings, wire and cable insulators, printed circuit board components, die attach adhesives, equipment casings and a host of other applications.

This book is intended to serve as an introduction to the chemistry, properties and uses of plastics in electrical and electronic component processing and manufacture. No in-depth knowledge of polymer chemistry is assumed and it is aimed at the engineer who wishes to gain a greater understanding of the materials currently in use and to have a guide to the vast number of plastics that may be encountered. The book begins with an introduction to plastics, their structure and important properties, after which several chapters detail the major materials and uses. The very important topic of plastic encapsulated device reliability is also covered and the final chapter discusses a further number of materials and applications for plastics in the electrical and electronics industries.

Martin T. Goosey

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