

## **BISPHENOL A: INFORMATION SHEET**

### **Discovery and Use**

#### **Background**

Bisphenol A (BPA) is an important industrial chemical that is used primarily to make polycarbonate plastic and epoxy resins, both of which are used in a wide variety of applications. For example, polycarbonate is used in eyeglass lenses, medical equipment, water bottles, digital media (e.g. CDs and DVDs), cell phones, consumer electronics, computers and other business equipment, electrical equipment, household appliances, safety shields, construction glazing, sports safety equipment, and automobiles<sup>1</sup>. Among the many uses for epoxy resins are industrial floorings, adhesives, industrial protective coatings, powder coatings, automotive primers, can coatings and printed circuit boards.

#### **First Synthesis of Bisphenol A**

The first reported synthesis of BPA was from Thomas Zincke of the University of Marburg, Germany. Zincke acknowledged in his paper that the synthesis of BPA, from phenol and acetone, was based on chemical reactions previously reported by others as well as unpublished work (from thesis dissertations) conducted at the University of Marburg. His paper reporting the synthesis of BPA and a number of related compounds was published in 1905<sup>2</sup>. Zincke reported key physical properties of BPA (e.g., molecular composition, melting point, solubility in common solvents) but did not propose any application or use for BPA or the other materials he synthesized.

#### **Commercial Production and Use of Bisphenol A**

In 1953, Dr. Hermann Schnell of Bayer in Germany and Dr. Dan Fox of General Electric in the United States independently developed manufacturing processes for a new plastic material, polycarbonate, using BPA as the starting material. Polycarbonate plastic was found to have a unique combination of very useful properties, in particular optical clarity, shatter-resistance and high heat-resistance, which have made polycarbonate an important part of everyday life in a wide variety of applications. Commercial production began in 1957 in the United States and in 1958 in Europe. About this same time, epoxy resins were developed with the versatility to meet a wide range of industrial and consumer needs. Commercial production of BPA began in the 1950's when large-scale uses for polycarbonate plastic and epoxy resins were developed and has grown worldwide along with the continued growth of the uses for these materials.

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<sup>1</sup> Additional information on the versatility and many uses of polycarbonate plastic is available on the Internet at <http://www.apme.org/polycarbonate>.

<sup>2</sup> Zincke, T., 1905, "Mittheilungen aus dem chemischen Laboratorium der Universitat Marburg," Justus Leibigs Annals Chemie, vol. 343, pages 75-99.