

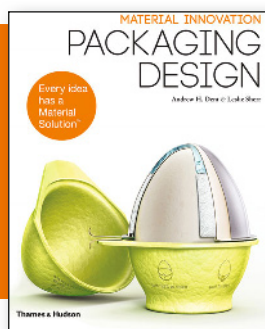
electrochemical corrosion. The material in this section lacks clarity; the references given at the end of this chapter would be more useful for understanding the principles. Chapter 3 includes a survey of the literature on corrosion prevention using conducting polymers based upon recent work. Here, the emphasis is on material synthesis, usefulness of having CPs on the top coat as a protective coating, caution to be applied on the metal substrates, and a consideration of the nature of the corrosive environment. Various protective coatings are covered. Chapter 4

discusses the preparation of those protective coatings. Chapter 5 contains the basics of corrosion-rate measurements through weight loss over time, polarization techniques involving Tafel measurements, potentiodynamic techniques, cyclic polarization, linear polarization resistance, and electrochemical impedance spectroscopy. Chapter 6 deals with strategies adopted for improving the protective efficiency of the CP coatings, followed by a discussion of the problems encountered in CP coatings on corrosion protection. Chapter 7 is a one-page concluding

chapter about the future trends in this emerging technology.

This book is well organized with reasonable coverage of the existing literature. It also contains an index and a list of abbreviations used in the book. There are an adequate number of tables and figures. This is a specialized book that would be useful for researchers in the field of CPs who have knowledge of corrosion.

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Material Innovation: Packaging Design

Andrew H. Dent and Leslie Sherr

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This is a well-designed book filled with two- to four-page case studies of innovations in packaging, a short section on the materials insights used in packaging, and illuminating photographs. Rather than electronic packaging, this book deals more with compression-molded plastic containers for creams and innovative paper packaging for food. It is published in association with the Material ConneXion consulting agency and features how packaging can be used not only to increase sales, but also to add beauty and functionality to a product. This book not only deals with packaging as a marketing tool, but also grapples with how packaging can be used to both improve the human experience and be environmentally friendly.

The book has six chapters. The chapter “Getting to Zero” is focused on making products more environmentally sustainable, for instance, using origami-type folding to create boxes that do not have toxic glues, food containers that are wholly edible, and laser-etched produce

whereby lasers are used to write information about the picking date and freshness of the produce. The chapter “Functional Forms” features a shipping box that can be transformed into a workbench, and the life-saving Aid Pod that provides antidiarrheal medications to developing countries by shipping them for free in Coca-Cola cases in the spaces between bottles. The remaining four chapters focus on dispensing systems, advanced protection, interactive packaging, and “mass craft,” or the attempt to create personalized items that are mass produced.

Some of the concepts are quite ingenious. For instance, an innovative egg package called the Gogol Mogol has multifunctional capability to store, ship, cook, and serve eggs. Pull a tab on the carton, and the egg can be boiled in minutes directly in the container via the exothermic reaction of calcium oxide and water. There are also several features of packaging to improve human hygiene and safety—the XSTAT syringe can be used to insert anticoagulant-coated materials into a wound in seconds to

stop the injured from fatal bleeding. The Drinkable Book provides sheets of silver nanoparticle-embedded paper that can be used to purify and filter 100 liters of water for safe drinking. The PeePoo bag is a low-cost portable toilet for developing countries. The book also describes the packaging of a champagne bottle. On the other end of the technical spectrum, a modular vitrification system is described for the purpose of safely containing nuclear waste in glass. The book concludes with a short section on the recyclability of materials, and then provides a Material ConneXion directory of the materials used in the book’s packaging contents.

The reader will come away with many simple lessons, such as pouches are now popular in packaging because they are lightweight and easy to ship. Most of the featured innovations are created around materials such as low-density polyethylene and cardboard—materials that sell for pennies on the dollar. Those interested in using materials for packaging will find this book fascinating. Anyone interested in the beauty of mechanical design will be inspired. However, materials scientists looking for advanced materials ideas should probably look elsewhere.

Reviewer: Karen Swider Lyons researches fuel-cell and battery materials and their integration into naval systems in Alexandria, Va., USA.