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Nota di contenuto	Front Cover; The Handbook of Lithium-Ion Battery Pack Design: Chemistry, Components, Types and Terminology; Copyright; Contents; Figure Captions; Preface; Acknowledgments; Acronyms List; Chapter 1 - Introduction; Factors Influencing Consumer Adoption of Electric Vehicles; Evolving Vehicle Technology Needs; Purpose of the Book; Chapter Outline; Chapter 2 - History of Vehicle Electrification; The History of the Modern Storage Battery; An Electrical Industry Emerges; Early Electric Vehicle Development; Modern Vehicle Electrification; Chapter 3 - Basic Terminology; Vehicle and Industry Terms Stationary and Grid Terminology Battery Terms; Chapter 4 - Battery Pack Design Criteria and Selection; Ohm's Law and Basic Battery Calculations; Converting Customer Requirements into Pack Designs; Power to Energy Ratios; Large Stationary and Grid Systems; Quick Formula Summary; Chapter 5 - Design for Reliability/Design for Service; Design for Reliability/Design for Service; Quality and Reliability; Failure Modes Effects Analysis; Design for Service; Chapter Summary; Chapter 6 - Computer-Aided Design and Analysis; Organizations and Analysis Products; Analysis Tools; Battery Sizing Tools Chapter 7 - Lithium-Ion and Other Cell Chemistries Lead Acid; Nickel Metal-Based Chemistries; Sodium-Based Chemistries; Lithium-Ion Cells; Cathode Chemistries; Anode Materials; Separators; Electrolytes;

Safety Features; Lithium-Ion Cell Types and Sizes; Lithium-Ion Cell Manufacturers; Chapter 8 - Battery Management System Controls; BMS Typologies; BMS Hardware; Balancing; Active versus Passive Balancing; Additional BMS Functionality; Software and Controls; Chapter 9 - System Control Electronics; Contactors/Relays; High-Voltage Interlock Loop; Fuses; Battery Disconnect Unit; Connectors
ChargingChapter 10 - Thermal Management; Why Cooling?; Why Heating?; Active Thermal Management Systems; Passive Thermal Management Systems; Temperature-Protection and Insulation; Thermocouples and Measurement; Chapter 11 - Mechanical Packaging and Material Selection; Module Designs; Use of Metals in Battery Design; Use of Plastics and Composites in Battery Design; Sealed Enclosures; Chapter 12 - Battery Abuse Tolerance; Failure Modes of Lithium-Ion Batteries; Characterization and Performance Testing; Safety and Abuse Testing; Certification Testing
Chapter 13 - Industrial Standards and OrganizationsVoluntary Standards; Research and Development and Trade Groups; Mandatory Standards Organizations; Chinese Standards and Industry Organizations; European Standards and Industry Organizations; Chapter 14 - Second Life and Recycling of Lithium-Ion Batteries; Repairing and Remanufacturing; Refurbishing, Repurposing, and Second Life; Second Life Partnerships; Recycling; Chapter 15 - Lithium-Ion Battery Applications; Personal Transportation Applications; Automotive Applications; Bus and Public Transportation; HD Truck Applications
Industrial Applications

Sommario/riassunto

The Handbook of Lithium-Ion Battery Pack Design: Chemistry, Components, Types and Terminology offers to the reader a clear and concise explanation of how Li-ion batteries are designed from the perspective of a manager, sales person, product manager or entry level engineer who is not already an expert in Li-ion battery design. It will offer a layman's explanation of the history of vehicle electrification, what the various terminology means, and how to do some simple calculations that can be used in determining basic battery sizing, capacity, voltage and energy. By the end of this book the reader