BOOK REVIEW

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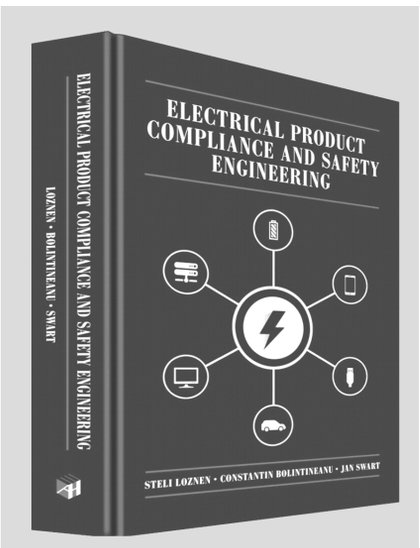
Electrical Product Compliance and Safety Engineering



Artech House, 2017

ISBN 978-1-63081-011-5, 400 pages, $149

Electrical products are increasing in complexity and diversity, leading to an increase in product-related harms. Since electrical products are becoming more sophisticated, there are more complex aspects linked with the *Compliance* and *Safety*. It is unanimous accepted that the manufacturers around the world have responsibility to produce products that satisfy the safety expectations of society.

The growing field of Compliance and Safety, as a global function acts as a cross-functional discipline which has a direct impact on people's lives. The term 'safety' has many different connotations and it can be related to many different concepts such as occupational health and safety, road safety or product safety.

Majority accept that p*roducts safety issues* are important in customer and professional areas, engineering, management and other fields. This aspect is obvious due to the fact that products compliance and safety is now a global issue, because markets are global.

Publishing the book *Electrical Product Compliance and Safety Engineering*, ***Artech House***, a prestigious publisher located in London and Boston, intended to develop an attitude, an approach, and a concept for the professionals in the field.

Actually, a large amount of information related to Product Compliance and Safety can be found, but spread in many sources without a unitary presentation. *Electrical Product Compliance and Product Safety* it is the first book which put together the main information in the field, becoming a comprehensive resource designed to guide professionals in product compliance and safety in order to develop safer and profitable products.

The first goal of the book is to present the basics of *Product Compliance and Safety*, considering the key actions for implementing these issues. There is a second purpose, equally important: to promote the idea that on developing and manufacturing an electrical product need to have developed a *culture of compliance and safety*, to show the importance of this discipline in our days and the necessity to support their goals, as a discipline, in achieving a given level of Safety, as a key characteristic of any electrical product.

Even more important, this book is aimed to show to industry managers the reasons for taking into account the compliance and safety issues, even from the design phase and then during the whole life cycle of any electrical product. It was proved that the only way to promote compliance and safety requirements is top-down, starting from the manager and going down to every worker.

The content of the book, divided into sixteen chapters, was chosen to provide background on why need to know Compliance and Safety Engineering for Electrical Products and how to use the information provided.

Chapter 1 examines **Why Electrical Product Compliance and Safety** need, by referring to Product Compliance and Safety in 21st century, Electrical Product Safety Legislation and Liability, Designing for Safety and Safety Cost Estimation

Chapter 2 makes an introduction to **International Regulations and Global Market Access Regulations**, addressing the Regional regulations and how they differ, CE Marking, National Recognized Testing Laboratories (NRTL), IECEE CB Scheme, Product Certification Marks and the ISO Registration Process.

Chapter 3 addresses the **Products Safety Standards** and Standardization presenting what is a standard and his structure; what means the conformity to standards; which types of Products Safety standards exist and

which are their objectives, grouping in the final of the chapter the main Standards development organizations.

Chapter 4 covers the **Electrical Products Safety Philosophy** analyzing the concepts of Safety, Reliability, Product Safety, Perception of the Risk, Failure, Single Fault Safe, Redundancy, Safety Factors, concluding with the differences between Work Safety and Product Safety.

Chapter 5 introduces the **Methods for Failure Analysis**: FMEA, FTA, HAZOP, AEA and ETA.

Chapter 6 presents the **Risk Management for Product Safety**, by detailing the process: Identification of Hazards, Estimation of the Risk, Risk Evaluation and Risk Control. Dedicated sub-chapters are for Functional Safety and for Standards used for Risk Management.

Chapter 7 deals with the **Electrical Products Safety Concepts**: Means of Protection, Insulation Diagram; Safe Current and Voltages Limits; Leakage Currents, Spacing: Air Clearance and Creepage Distances, Grounding, Fire, Electrical, Mechanical Enclosures; Ratings; Type of Circuits, Normal Load and Abnormal operating conditions.

Chapter 8 is dedicated to **Selection of Components**: Semiconductors, Passive components, Temperature control devices; Motors, Fans, Thermoplastic materials, Terminal Blocks, Connectors, Internal Wiring

Chapter 9 examines the **Batteries**: secondary and primary, including the main applicable standards; a particular attention is paid to Battery Safety Design.

Chapter 10 addresses the **Power Sources** and the associated components: Power Supply Plugs, Connectors and Cord Sets, Fuses, Fuse holders, Power Entry Module, Switches, Varistor, Transformers and Power Supplies

Chapter 11 describes typical **Product Construction Requirements**: Enclosures, Circuit Separation, Grounding and Bonding, Resistance to Fire and Flame Rating, Interlocks, Moving Parts, Part subject to Pressure, Constructive aspects related to EMC. Information about Serviceability makes the object of a special sub-chapter

Chapter 12 looks at **Markings, Indicators and Accompanying Documents** describing the Internal and External marking, Safety labels, Marking of controls and instruments, Color of indicators. User's Manual and Installation Instructions, Safety instructions, cautions and warnings.

Chapter 13 addresses **Human Factors and Product Safety**, pointing in the followings: Operator and Service Personnel, Human Factors, Ergonomic Hazards.

Chapter 14 (the largest part of the book) is dedicated to **Testing for Compliance and Safety** and consists of: Kind of Product Basic Safety and EMC tests, Information typically required for Product Basic Safety and EMC testing, Work Safety in a Product Basic Safety and EMC testing laboratory, Equipment used on Product Basic Safety and EMC Testing, General testing conditions, Product Basic Safety Testing, EMC Testing and Software Testing.

Chapter 15 examines how **Manufacturing a Safe Electrical Product** by referring to: Responsibility of the Manufacturer, Supply chain, Manufacturability, Integration and Routine Tests (Production Line Testing)

Chapter 16 provides some inputs on the **Education and Training for Compliance and Product Safety Professionals** analyzing the Compliance and Product Safety Engineering in Senior Design Courses; Training Resources Development and the Professional Certification.

The **Glossary of Terms** and **Acronyms** included in the Appendix helps as a quick reference to deal with the issues at hand.

The authors have structured this book in an easy to read and follow fashion, from product design considerations, to manufacturing and prototyping, conformity assessment necessities and the sustaining engineering principles. Also, they have provided a logical and meaningful contribution to the overall process of facilitating the entry of safe products into the various global markets.

A strong point which recommends this book are the authors: **Steli Loznen**, **Constantin Bolintineanu** and Dr. **Jan Swart**, three well known specialists and experts in the field, with a long experience in the domain of Compliance and Safety, Standardization, Testing, International Regulations and Failure Analysis.

Electrical Product Compliance and Safety is an essential reference and text book that will prove of great importance for all professionals involved in the design, manufacturing, testing, servicing and marketing of electrical products, as well is intended also for instructors and students on electrical and electronics departments of Engineering Universities, by adding to the training syllabus an issue which was neglected until today.

Consequently, I highly recommend this book, which is among the best ones in its category.

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