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The Encyclopedia of Electrochemical Power Sources is a truly interdisciplinary reference for those working with batteries, fuel cells, electrolyzers, supercapacitors, and photo-electrochemical cells. With a focus on the environmental and economic impact of electrochemical power sources, this five-volume work consolidates coverage of the field and serves as an entry point to the literature for professionals and students alike. Covers the main types of power sources, including their operating principles, systems, materials, and applications Serves as a primary source of information for electrochemists, materials scientists, energy technologists, and engineers Incorporates nearly 350 articles, with timely coverage of such topics as environmental and sustainability considerations

Dieses Fachbuch bündelt das Wissen von insgesamt 70 Experten aus Wissenschaft und Industrie. Sie beschreiben die Leistungsfähigkeit der Klebtechnik beim Fügen von Kunststoffen mit Kunststoffen oder anderen Werkstoffen. Ohne den Einsatz der industriellen Klebtechnik wäre es heute kaum möglich, kunststoffbasierende Produkte auf den Markt zu bringen. Die branchenübergreifenden Anforderungen an die Fügetechnologie Kleben sind allerdings hoch und wachsen kontinuierlich. Alle für das erfolgreiche Kleben von Kunststoffen wichtigen Aspekte werden behandelt. Zahlreiche Best-Practice-Beispiele aus verschiedensten Industriebranchen beleuchten anschließend die anwendungstechnischen und wirtschaftlichen Möglichkeiten der Klebtechnik beim Fügen von Kunststoffen. Der Anwender in der industriellen Praxis erhält mit diesem Werk anwendungsnahe Unterstützung bei der erfolgreichen Lösung von Klebaufgaben zur Herstellung innovativer Produkte in allen Industriebereichen. Günter G. Seip Electrical Installations Handbook The Third Edition of this classic reference is designed to provide authoritative guidance for engineers and technicians who have responsibility for planning, designing, building and operating electrical installation systems. The extensively revised scope includes a comprehensive overview of conventional and state-of-the-art installation equipment and its current usage. Special emphasis is placed on equipment with communication capability and the way in which this equipment is networked to the instabus(r) EIB bus system for a wide range of applications in residential and commercial buildings. The construction, dimensioning and protection of electrical distribution systems are treated taking into account the latest developments in systems engineering. In view of the electricity market deregulation and globalization and the associated standardization initiatives that are underway, reference has been made, where appropriate, to international, European and German norms, regulations and standards. This single volume edition is extensively illustrated throughout and includes a broad range of example applications of electrical installation systems.

Environmental Requirements for Electromechanical and Electrical Equipment is the definitive reference containing all of the background guidance, typical ranges, details of recommended test specifications, case studies and regulations covering the environmental requirements on designers and manufacturers of electrical and electromechanical equipment worldwide. The recent introduction of the European EMC directive is just one aspect of the requirements placed upon manufacturers and designers of electrical equipment. There are numerous national and international standards and specifications that describe the application environment in which equipment must function. Factors that must be taken into account include temperature, solar radiation, humidity, pressure, weather and the effects of water and salt, pollutants and contaminants, mechanical stresses and vibration, ergonomic considerations, electrical safety including EMC, reliability and performance. A broad range of standard tests exist which must be passed by equipment if it is to fulfil the requirements placed upon it. Ray Tricker is the author of a number of books describing the regulatory framework within which the electronics and electrical equipment industry must function, including Quality and Standards in Electronics, also published by Newnes. This latest volume will give the designer or manufacturer a first point of reference when negotiating the minefield that is the global market for their products. Companion to 'Quality and Standards in Electronics' Covers essential tests and regulations for equipment designers and manufacturers Likely to be of interest to major companies worldwide

From 1894/95-1935/36, pt.6 of each volume is issued separately, with titles, 1894/95-1902/03: Code list of merchant vessels of the United States; 1903/04-1935/36: Seagoing vessels of the United States.

Eine Einführung in das Elastische Kleben für den Praktiker. Neben den Grundlagen werden Kenntnisse der wichtigsten Gruppen der elastischen Klebstoffe dargestellt. Der Schwerpunkt des Fachbuchs liegt auf praktischen Hinweisen, die zu langzeitstabilen Klebungen führen und die der Fehlervermeidung dienen. Zahlreiche Anwendungen erfolgreicher elastischer Klebungen aus der Kfz-Technik, dem Fassaden- und Metallbau illustrieren das Konzept.

In der laseradditiven Fertigung stellen fehlende Vorgaben für die Qualität des Metallpulvers und mangelnde Kenntnisse über den Einfluss der Pulvereigenschaften auf die Qualitätsmerkmale der Bauteile besondere Herausforderungen dar, die die Etablierung der Technologie als (Serien-)Produktionsverfahren erschweren. Gegenstand dieser Dissertation sind grundlegende Untersuchungen zum Werkstoff- und Prozessverhalten von Metallpulvern in der laseradditiven Fertigung. Auf Basis der gewonnenen Erkenntnisse werden Anforderungen an das Eigenschaftsprofil eines Pulverwerkstoffs für die laseradditive Fertigung formuliert, die zum Zwecke der Qualitätssicherung zu prüfenden Pulvereigenschaften vorgeschlagen und Handlungsempfehlungen zum Transport, zur Lagerung und zum Recycling abgeleitet.

This book offers in-depth insights into the photochemical behavior of multicomponent polymeric-based materials, with a particular emphasis on the photodegradation and photostabilization of these materials. Studying various classes of materials bases such as polysaccharides, wood, synthetic polymers, rubber blends, and nanocomposites, it offers a valuable reference source for graduate and postgraduate students, engineering students, research scholars and polymer engineers working in industry.

This book covers the most recent advances in the deformation and fracture behaviour of polymer material. It provides deeper insight into related morphology–property correlations of thermoplastics, elastomers and polymer resins. Each chapter of this book gives a comprehensive review of state-of-the-art methods of materials testing and diagnostics, tailored for plastic pipes, films and adhesive systems as well as elastomeric components and others. The investigation of deformation and fracture behaviour using the experimental methods of fracture mechanics has been the subject of intense research during the last decade. In a systematic manner, modern aspects of fracture mechanics in the industrial application of polymers for bridging basic research and industrial development are illustrated by multifarious examples of

innovative materials usage. This book will be of value to scientists, engineers and in polymer materials science.

Plant Flow Measurement and Control Handbook is a comprehensive reference source for practicing engineers in the field of instrumentation and controls. It covers many practical topics, such as installation, maintenance and potential issues, giving an overview of available techniques, along with recommendations for application. In addition, it covers available flow sensors, such as automation and control. The author brings his 35 years of experience in working in instrumentation and control within the industry to this title with a focus on fluid flow measurement, its importance in plant design and the appropriate control of processes. The book provides a good balance between practical issues and theory and is fully supported with industry case studies and a high level of illustrations to assist learning. It is unique in its coverage of multiphase flow, solid flow, process connection to the plant, flow computation and control. Readers will not only further understand design, but they will also further comprehend integration tactics that can be applied to the plant through a step-by-step design process that goes from installation to operation. Provides specification sheets, engineering drawings, calibration procedures and installation practices for each type of measurement Presents the correct flow meter that is suitable for a particular application Includes a selection table and step-by-step guide to help users make the best decision Cover examples and applications from engineering practice that will aid in understanding and application

This book comprises the proceedings of the conference "Faszination Hybrider Leichtbau 2018", which took place in Wolfsburg. The conference focused on new methods and technologies for the development and production of multifunctional and hybrid lightweight solutions in large-scale vehicle manufacturing. Further, it promoted the exchange of insights and lessons learned between experts from industry and academia. Lightweight design and construction are key technologies for the development of sustainable and resource-efficient mobility concepts. Material hybrid structures, which combine the advantages of different materials (e.g. fiber-reinforced plastics and metals), have a high potential for reducing weight, while simultaneously expanding component functionality. However, the efficient use of functional integrated hybrid structures in vehicle construction, requires innovations and constant developments in vehicle and production technology. There is a great demand for affordable lightweight construction in mass production that takes into account the increasing requirements in terms of variant diversity, safety and quality- particularly with regards to new methods and technologies.

Solid State Gas Sensors - Industrial Application Springer Science & Business Media

Solar PV Power: Design, Manufacturing and Applications from Sand to Systems details developments in the solar cell manufacturing process, including information from system design straight through to the entire value chain of Solar PV Manufacturing. In addition, the book includes aspects of ground mounted grid connected solar PV systems and optimization for solar PV plants, economic analyses, and reliability and performance. The advances and processes of solar product technology and reliability, along with the performance of solar PV plants and operational and maintenance aspects with advance diagnostic techniques are also presented, making this an ideal resource. With rapid change in the manufacturing process, it is crucial for solar cells and solar PV modules to adapt to new developments in solar products, especially with regard to reliability, financial aspects and performance. Includes detailed solar panel module assembly and analysis Offers new concepts for solar PV system design that are presented alongside field related issues and examples Saves time and resources by collecting all pieces of information needed by engineers in the same text

This book shows how to build in and assess reliability, availability, maintainability, and safety (RAMS) of components, equipment, and systems. It presents the state of the art of reliability (RAMS) engineering, in theory & practice, and is based on over 30 years author's experience in this field, half in industry and half as Professor of Reliability Engineering at the ETH, Zurich. The book structure allows rapid access to practical results. Methods & tools are given in a way that they can be tailored to cover different RAMS requirement levels. Thanks to Appendices A6 - A8 the book is mathematically self-contained, and can be used as a textbook or as a desktop reference with a large number of tables (60), figures (210), and examples / exercises^ 10,000 per year since 2013) were the motivation for this final edition, the 13th since 1985, including German editions. Extended and carefully reviewed to improve accuracy, it represents the continuous improvement effort to satisfy reader's needs and confidence. New are an introduction to risk management with structurally new models based on semi-Markov processes & to the concept of mean time to accident, reliability & availability of a k-out-of-n redundancy with arbitrary repair rate for n - k=2, 10 new homework problems, and refinements, in particular, on multiple failure mechanisms, approximate expressions, incomplete coverage, data analysis, and comments on \bar{e} , MTBF, MTTF, MTTR, R, PA.

Der Fortschritt der Elektromobilität durch die erfolgreichen Markteinführungen zahlreicher hochelektrifizierter Fahrzeuge und der ständig steigende Druck zur Verringerung der weltweiten CO₂-Emissionen, der sich durch die Ergebnisse des Pariser Klimagipfels und die aktuellen Diskussionen um Diesel weiter erhöht, beschäftigen die gesamte Automobil- und Zulieferindustrie und die darauf ausgerichtete Forschung und Wissenschaft. Darüber hinaus entstehen Wechselwirkungen mit der fortschreitenden Digitalisierung, die sich speziell auch durch den aktuellen Trend hin zum hochautomatisierten oder autonomen Fahren auf die zukünftige Elektromobilität auswirken wird. Die Konzepte für Elektrofahrzeuge, Plug-In-Hybride, Vollhybride bis hin zu Mikrohybriden und Fahrzeugen mit Start-Stopp-Funktionalitäten nehmen einerseits immer konkretere Formen an, werden aber andererseits hinsichtlich Kosten und Effizienz sowie durch autonomes Fahren mit immer höheren Anforderungen konfrontiert. Die unterschiedlichen Hybridfahrzeugkonzepte ebnen den Weg für reine Elektrofahrzeuge. Die Lösungen dazu entstehen bereits heute in den Köpfen der Forscher und Entwickler. Für die neuen Gesamtkonzepte mit elektrifizierten Antrieben und Nebenaggregaten sowie E/E-Architekturen müssen technisch anspruchsvolle und betriebswirtschaftlich zielführende Konzepte entwickelt und erprobt werden. Nebenaggregaten sowie E/E-Architekturen müssen technisch anspruchsvolle und betriebswirtschaftlich zielführende Konzepte entwickelt und erprobt werden. In diesem Themenband stellen Experten aus der Forschung und der Entwicklung die neuesten Trends dar.

The Performance of Concentrated Solar Power (CSP) Systems: Analysis, Measurement, and Assessment offers a unique overview of the information on the state-of-the-art of analysis, measurement, and assessment of the performance of concentrated solar power (CSP) components and systems in a comprehensive, compact, and complete manner. Following an introductory chapter to CSP systems and the fundamental principles of performance assessment, individual chapters explore the component performance of mirrors and receivers. Further expert-written chapters look at system performance assessment, durability testing, and solar resource forecasting for CSP systems. A final chapter gives an outlook on the actual methods and instruments for performance and durability assessment that are under development. The Performance of Concentrated Solar Power (CSP) Systems: Analysis, Measurement, and Assessment is an essential reference text for research and development professionals and engineers working on concentrated solar power systems, as well as for postgraduate students studying CSP. Presents a unique, single literature source for a complete overview of the performance assessment tools and methods currently used for concentrated solar power (CSP) technology Written by a team of experts in the field of CSP Provides information on the state-of-the-art of modeling, measurement, and assessment of the performance of CSP components and systems in a comprehensive, compact, and complete manner

Gas sensor products are very often the key to innovations in the fields of comfort, security, health, environment, and energy savings. This compendium focuses on what the research community labels as solid state gas sensors, where a gas directly changes the electrical

properties of a solid, serving as the primary signal for the transducer. It starts with a visionary approach to how life in future buildings can benefit from the power of gas sensors. The requirements for various applications, such as for example the automotive industry, are then discussed in several chapters. Further contributions highlight current trends in new sensing principles, such as the use of nanomaterials and how to use new sensing principles for innovative applications in e.g. meteorology. So as to bring together the views of all the different groups needed to produce new gas sensing applications, renowned industrial and academic representatives report on their experiences and expectations in research, applications and industrialisation.

Das Konzept der digitalen Baustelle beschreibt die Abbildung aller bei einem Bauvorhaben anfallenden Daten in einem Baustellenmodell. Es bietet die Grundlage für einen durchgängigen Datenfluss und damit für effizientere Planungs- und Ausführungsprozesse. In dem Band stellen Experten aus Wissenschaft und Industrie Methoden und Technologien zur Umsetzung vor, darunter die 3D-gestützte Planung, die Nutzung von Systemen zur zentralen Datenhaltung, die computergestützte Simulation des Bauablaufs und die Einführung moderner Logistikkonzepte.

A compendium of data extracted from the scientific literature. For each chemical substance indexed in RTECS, six types of toxicity data are included: (1) primary irritation; (2) mutagenic effects; (3) reproductive effects; (4) tumorigenic effects; (5) acute toxicity; and (6) other multiple dose toxicity. Specific numeric toxicity values such as LD50, LC50, TDLo, and TCLo are noted as well as species studied and route of administration used. For each citation, the bibliographic source is listed thereby enabling the user to access the actual studies cited.

Das Buch führt umfassend in die DIN-Normen und deren Anwendung ein. Es gliedert sich nach fertigungstechnischen und funktionalen Gesichtspunkten der Normen, bietet detaillierte Informationen und dient als Nachschlagewerk für Studium und Praxis. Damit stellt es für die Schwerpunkte Maschinenbau und Elektrotechnik Informationen aus erster Hand bereit, ohne die in Konstruktion und Fertigung nicht auszukommen ist. Zu zahlreichen Normen werden thematisch zugeordnete Informationen und Hinweisen auf weitere, den Stoff vertiefende Normen und Normungsliteratur gegeben und der Kontext zum europäischen und internationalen Normenwerk dargestellt. Die neue Auflage wurde mit Blick auf Neuerungen und Änderungen auf dem Gebiet der Normung vollständig überarbeitet. Dies betrifft insbesondere die Abschnitte Konstruktionsgrundlagen, Maschinenelemente, Gewinde, Elektrotechnik sowie den Abschnitt zur Sicherheit und zum Gesundheitsschutz, die von neuen Autoren bearbeitet wurden.

Die Sensorik nimmt im Automobil einen bedeutenden und wachsenden Stellenwert ein. Im Zuge der rasanten Entwicklungen auf dem Gebiet der Fahrzeugtechnik sind immer genauere und robustere Sensorinformationen unabdingbar. Diese Informationen werden in komplexen Regelalgorithmen der Fahrzeugelektronik insbesondere zur Motorsteuerung, Fahrstabilität, Sicherheits- und Komforterrhöhung genutzt. Zur Generierung dieser Informationen gewinnen neben der Optimierung bekannter Sensorprinzipien zunehmend auch neue Sensorkonzepte und -technologien an Bedeutung. Die resultierenden Sensorsysteme unterliegen neben hohen technischen Anforderungen auch immer höheren Ansprüchen hinsichtlich Kosten, Miniaturisierung, Qualität und Zuverlässigkeit. In diesem Fachbuch sind Sensorprinzipien und -technologien beschrieben, die den Trend aktueller Sensorentwicklungen für spezielle Fahrzeug-Anwendungsgebiete widerspiegeln. Der Schwerpunkt dieser Ausgabe liegt auf Sensorsystemen, die ihren Einsatz im Bereich der Batterie-Zellüberwachung, Klimatisierung, Bedienfunktionen, Abgasregelungen, Motorsteuerungen und Fahrwerksdynamik im Automobil finden.

This new edition of the bestselling Measurement, Instrumentation, and Sensors Handbook brings together all aspects of the design and implementation of measurement, instrumentation, and sensors. Reflecting the current state of the art, it describes the use of instruments and techniques for performing practical measurements in engineering, physics, chemistry, and the life sciences; explains sensors and the associated hardware and software; and discusses processing systems, automatic data acquisition, reduction and analysis, operation characteristics, accuracy, errors, calibrations, and the incorporation of standards for control purposes. Organized according to measurement problem, the Second Edition: Consists of 2 volumes Features contributions from 240+ field experts Contains 53 new chapters, plus updates to all 194 existing chapters Addresses different ways of making measurements for given variables Emphasizes modern intelligent instruments and techniques, human factors, modern display methods, instrument networks, and virtual instruments Explains modern wireless techniques, sensors, measurements, and applications A concise and useful reference for engineers, scientists, academic faculty, students, designers, managers, and industry professionals involved in instrumentation and measurement research and development, Measurement, Instrumentation, and Sensors Handbook, Second Edition provides readers with a greater understanding of advanced applications.

Produkte mit Elektronik auszustatten, gibt diesen viele neue Funktionen, Möglichkeiten und Mehrwert. Viele Produkte, für die es in der Vergangenheit noch überhaupt nicht angedacht war sie zu elektronifizieren, werden heute mit Elektronik aufgewertet und verbessert. Dies wird auch in Zukunft so weitergehen. Die Kehrseite ist aber, dass sich Unternehmer, Produktmanager und Projektmanager, die sich in Ihrem Wirkungsfeld bis heute nicht mit Elektronik bzw. elektronischen Systemen auseinandersetzen mussten, sich diesem Thema widmen müssen. Sie müssen Ihr Wissen erweitern und folgende Fragen beantworten können: - Wie beschreibt man Produkte mit Elektronik (Produktvision, Lastenheft, ..)? - Wie findet man den richtige Partner für die Entwicklung und Fertigung des Produktes? - Welche Fallstricke gibt es im Entwicklungsprozess und wie kann man dagegen angehen? - Was ist bei der Auftragsvergabe zu beachten? - Welche Themen gibt es bei der Serienfertigung elektronischer Produkte? - Wie baut man ein elektronik-taugliches Unternehmensumfeld auf (Ausrüstung, Mitarbeiter schulen, ...)? - Wie tickt der Elektronik Bauteilemarkt? welche Risiken gibt es? - Welche Gefahren haben Sie aufgrund der Veränderungen in Ihrem Unternehmen zu erwarten? Die Antworten zu diesen und viele weiteren Fragen finden Sie in diesem Buch. Lesen Sie es und sie werden sich viele Probleme, Unwegbarkeiten und damit Geld sparen! Erarbeiten Sie sich zielgerichtet das Wissen um Ihr mit Elektronik ausgestattetes Produkt bei planbarem und risikominimiertem Investitionsaufwand erfolgreicher zu machen!

The EN ISO 13849-1 standard, "Safety of machinery – Safety-related parts of control systems", contains provisions governing the design of such parts. This report is an update of BGIA Report 2/2008e of the same name. It describes the essential subject-matter of the standard in its third, revised 2015 edition, and explains its application with reference to numerous examples from the fields of electromechanics, fluidics, electronics and programmable electronics, including control systems employing mixed technologies. The standard is placed in its context of the essential safety requirements of the Machinery Directive, and possible methods for risk assessment are presented. Based upon this information, the report can be used to select the required Performance Level PLr for safety functions in control systems. The Performance Level PL which is actually attained is explained in detail. The requirements for attainment of the relevant Performance Level and its associated Categories, component reliability, levels of diagnostic coverage, software safety and measures for the prevention of systematic and common-cause failures are all discussed comprehensively. Background information is also provided on implementation of the requirements in real-case control systems. Numerous example circuits show, down to component level, how Performance Levels a to e can be engineered in the selected technologies with Categories B to 4. The examples provide information on the safety principles employed and on components with well-tried safety functionality. Numerous literature references permit closer study of the examples provided. The report shows how the requirements of EN ISO 13849-1 can be implemented in engineering practice, and thus makes a contribution to consistent application and interpretation of the standard at national and international level.

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