

Ls Dyna Thermal Analysis User Guide

These peer-reviewed papers reflect the valuable experience of the authors in the fields of innovation in structural systems and disaster prevention in engineering structures, architectural innovation, sustainable development of buildings, energy and the environment and innovation in, and applications of, building materials. Hot topics and cutting-edge views related to sustainable development in civil engineering are presented.

This book covers the use of accessible natural fibers towards the requirement and compatibility of industrial sustainability. Using natural characteristics of composites through technology and techniques, the inherent qualities of natural fibers are discussed in relation to the design of experiments. This book also elaborates on the durability of composites subjected to environmental conditions, biodegradability, environmental issues, product life cycle assessment and testing methods. Offers detailed coverage of functional aspects of natural fiber composites along with applications Discusses natural fiber inherent character based composite formation techniques Reviews micro-mechanical and macro-mechanical properties and functional use of natural fiber reinforced composites Content based on functional requirements selection and process consideration Discusses product life cycle assessment and recycling techniques This book is aimed at researchers, students, industrialists, and fabricators of composites.

Updated and expanded coverage of the latest trends and developments in fiber composite materials, processes, and applications Analysis and Performance of Fiber Composites, Fourth Edition features updated and expanded coverage of all technical aspects of fiber composites, including the latest trends and developments in materials, manufacturing processes, and materials applications, as well as the latest experimental characterization methods. Fiber reinforced composite materials have become a fundamental part of modern product manufacturing. Routinely used in such high-tech fields as electronics, automobiles, aircraft, and space vehicles, they are also essential to everyday staples of modern life, such as containers, piping, and appliances. Little wonder, when one considers their ease of fabrication, outstanding mechanical properties, design versatility, light weight, corrosion and impact resistance, and excellent fatigue strength. This Fourth Edition of the classic reference—the standard text for composite materials courses, worldwide—offers an unrivalled review of such an important class of engineering materials. Still the most comprehensive, up-to-date treatment of the mechanics, materials, performance, analysis, fabrication, and characterization of fiber composite materials available, Analysis and Performance of Fiber Composites, Fourth Edition features: Expanded coverage of materials and manufacturing, with additional information on materials, processes, and material applications Updated and expanded information on experimental characterization methods—including many industry specific tests Discussions of damage identification techniques using nondestructive evaluation (NDE) Coverage of the influence of moisture on performance of polymer matrix composites, stress corrosion of glass fibers and glass reinforced plastics, and damage due to low-velocity impact New end-of-chapter problems and exercises with solutions found on an accompanying website Computer analysis of laminates No other reference provides such exhaustive coverage of fiber composites with such clarity and depth. Analysis and Performance of Fiber Composites, Fourth Edition is, without a doubt, an indispensable resource for practicing engineers, as well as students of mechanics, mechanical engineering, and aerospace engineering.

Tribology of Metal Cutting deals with the emerging field of studies known as Metal Cutting Tribology. Tribology is defined as the science and technology of interactive surfaces moving relative each other. It concentrates on contact physics and mechanics of moving interfaces that generally involve energy dissipation. This book summarizes the available information on metal cutting tribology with a critical review of work done in the past. The book covers the complete system of metal cutting testing. In particular, it presents, explains and exemplifies a breakthrough concept of the physical resource of the cutting tool. It also describes the cutting system physical efficiency and its practical assessment via analysis of the energy partition in the cutting system. Specialists in the field of metal cutting will find information on how to apply the major principles of metal cutting tribology, or, in other words, how to make the metal cutting tribology to be useful at various levels of applications. The book discusses other novel concepts and principles in the tribology of metal cutting such as the energy partition in the cutting system; versatile metrics of cutting tool wear; optimal cutting temperature and its use in the optimization of the cutting process; the physical concept of cutting tool resource; and embrittlement action. This book is intended for a broad range of readers such as metal cutting tool, cutting insert, and process designers; manufacturing engineers involved in continuous process improvement; research workers who are active or intend to become active in the field; and senior undergraduate and graduate students of manufacturing. · Introduces the cutting system physical efficiency and its practical assessment via analysis of the energy partition in the cutting system. · Presents, explains and exemplifies a breakthrough concept of the physical resource of the cutting tool. · Covers the complete system of metal cutting testing.

New and not previously published U.S. and international research on composite and nanocomposite materials Focus on health monitoring/diagnosis, multifunctionality, self-healing, crashworthiness, integrated computational materials engineering (ICME), and more Applications to aircraft, armor, bridges, ships, and civil structures This fully searchable CD-ROM contains 270 original research papers on all phases of composite materials, presented by specialists from universities, NASA and private corporations such as Boeing. The document is divided into the following sections: Aviation Safety and Aircraft Structures; Armor and Protection; Multifunctional Composites; Effects of Defects; Out of Autoclave Processing; Sustainable Processing; Design and Manufacturing; Stability and Postbuckling; Crashworthiness; Impact and Dynamic Response; Natural, Biobased and Green; Integrated Computational Materials Engineering (ICME); Structural Optimization; Uncertainty Quantification; NDE and SHM Monitoring; Progressive Damage Modeling; Molecular Modeling; Marine Composites; Simulation Tools; Interlaminar Properties; Civil Structures; Textiles. The CD-ROM displays figures

and illustrations in articles in full color along with a title screen and main menu screen. Each user can link to all papers from the Table of Contents and Author Index and also link to papers and front matter by using the global bookmarks which allow navigation of the entire CD-ROM from every article. Search features on the CD-ROM can be by full text including all key words, article title, author name, and session title. The CD-ROM has Autorun feature for Windows 2000 or higher products and can also be used with Macintosh computers. The CD includes the program for Adobe Acrobat Reader with Search 11.0. One year of technical support is included with your purchase of this product.

Uses a Step-By-Step Technique Directed with Guided Problems and Relevant Screen Shots Simulation use is on the rise, and more practicing professionals are depending on the reliability of software to help them tackle real-world mechanical engineering problems. Finite Element Simulations Using ANSYS, Second Edition offers a basic understanding of the principles of simulation in conjunction with the application of ANSYS. Employing a step-by-step process, the book presents practical end-of-chapter problems that are solved using ANSYS and explains the physics behind them. The book examines structure, solid mechanics, vibration, heat transfer, and fluid dynamics. Each topic is treated in a way that allows for the independent study of a single subject or related chapter. What's New in the Second Edition: Introduces the newest methods in modeling and meshing for finite element analysis Modifies ANSYS examples to comply with the newest version of ANSYS Replaces many ANSYS examples used in the first edition with more general, comprehensive, and easy-to-follow examples Adds more details to the theoretical material on the finite element Provides increased coverage of finite element analysis for heat transfer topics Presents open-ended, end-of-chapter problems tailored to serve as class projects Finite Element Simulations Using ANSYS, Second Edition functions as a fundamental reference for finite element analysis with ANSYS methods and procedures, as well as a guide for project and product analysis and design.

This Proceedings contains the papers of the fib Symposium "CONCRETE Innovations in Materials, Design and Structures", which was held in May 2019 in Kraków, Poland. This annual symposium was co-organised by the Cracow University of Technology. The topics covered include Analysis and Design, Sustainability, Durability, Structures, Materials, and Prefabrication. The fib, Fédération internationale du béton, is a not-for-profit association formed by 45 national member groups and approximately 1000 corporate and individual members. The fib's mission is to develop at an international level the study of scientific and practical matters capable of advancing the technical, economic, aesthetic and environmental performance of concrete construction. The fib, was formed in 1998 by the merger of the Euro-International Committee for Concrete (the CEB) and the International Federation for Prestressing (the FIP). These predecessor organizations existed independently since 1953 and 1952, respectively.

The book introduces the finite element method (FEM) that is one of the most powerful numerical tools these days. FEM is the analysis tool in most of CAD/CAM systems and it is critical to understand FEM for engineering design. It begins with underlying variational calculus and moves to variational/FEM formulations. It covers all basic procedures of assembly and solution procedures in several programming practices. Finally, it introduces Ansys and Ansys WB software to apply FEM to advanced topics in various areas of engineering.

Annotation Examines the factors that contribute to overall steel deformation problems. The 27 articles address the effect of materials and processing, the measurement and prediction of residual stress and distortion, and residual stress formation in the shaping of materials, during hardening processes, and during manufacturing processes. Some of the topics are the stability and relaxation behavior of macro and micro residual stresses, stress determination in coatings, the effects of process equipment design, the application of metallo-thermo-mechanic to quenching, inducing compressive stresses through controlled shot peening, and the origin and assessment of residual stresses during welding and brazing. Annotation c. Book News, Inc., Portland, OR (booknews.com)

Ill-posedness. Regularization. Stability. Uniqueness. To many engineers, the language of inverse analysis projects a mysterious and frightening image, an image made even more intimidating by the highly mathematical nature of most texts on the subject. But the truth is that given a sound experimental strategy, most inverse engineering problems can be

The Finite Element Method (FEM) has become an indispensable technology for the modelling and simulation of engineering systems. Written for engineers and students alike, the aim of the book is to provide the necessary theories and techniques of the FEM for readers to be able to use a commercial FEM package to solve primarily linear problems in mechanical and civil engineering with the main focus on structural mechanics and heat transfer. Fundamental theories are introduced in a straightforward way, and state-of-the-art techniques for designing and analyzing engineering systems, including microstructural systems are explained in detail. Case studies are used to demonstrate these theories, methods, techniques and practical applications, and numerous diagrams and tables are used throughout. The case studies and examples use the commercial software package ABAQUS, but the techniques explained are equally applicable for readers using other applications including NASTRAN, ANSYS, MARC, etc. A practical and accessible guide to this complex, yet important subject Covers modeling techniques that predict how components will operate and tolerate loads, stresses and strains in reality

Written for practicing engineers and students alike, this book emphasizes the role of finite element modeling and simulation in the engineering design process. It provides the necessary theories and techniques of the FEM in a concise and easy-to-understand format and applies the techniques to civil, mechanical, and aerospace problems. Updated throughout for current developments in FEM and FEM software, the book also includes case studies, diagrams, illustrations, and tables to help demonstrate the material. Plentiful diagrams, illustrations and tables demonstrate the material Covers modeling techniques that predict how components will operate and tolerate loads, stresses and strains in reality Full set of PowerPoint presentation slides that illustrate and support the book, available on a companion website

Multiphysics Simulations in Automotive and Aerospace Applications provides the fundamentals and latest developments on numerical methods for solving multiphysics problems, including fluid-solid interaction, fluid-structure-thermal coupling, electromagnetic-fluid-solid coupling, vibro and aeroacoustics. Chapters describe the different algorithms and numerical methods used for solving coupled problems using implicit or explicit coupling problems from industrial or academic applications. Given the book's comprehensive coverage, automotive and aerospace engineers, designers, graduate students and researchers involved in the simulation of practical coupling problems will find the book useful in its approach. Provides the fundamentals of numerical methods, along with comprehensive examples for solving coupled problems Features multi-physics methods and available codes, along with what those codes can do Presents examples from industrial and academic applications

ANSYS Workbench 2019 R2: A Tutorial Approach book introduces the readers to ANSYS Workbench 2019, one of the world's leading, widely distributed, and popular commercial CAE packages. It is used across the globe in various industries such as aerospace, automotive,

manufacturing, nuclear, electronics, biomedical, and so on. ANSYS provides simulation solutions that enable designers to simulate design performance. This book covers various simulation streams of ANSYS such as Static Structural, Modal, Steady-State, and Transient Thermal analyses. Structured in pedagogical sequence for effective and easy learning, the content in this textbook will help FEA analysts in quickly understanding the capability and usage of tools of ANSYS Workbench. Salient Features: Book consisting of 11 chapters that are organized in a pedagogical sequence Summarized content on the first page of the topics that are covered in the chapter More than 10 real-world mechanical engineering problems used as tutorials Additional information throughout the book in the form of notes & tips Self-Evaluation Tests and Review Questions at the end of each chapter to help the users assess their knowledge. Table of Contents Chapter 1: Introduction to FEA Chapter 2: Introduction to ANSYS Workbench Chapter 3: Part Modeling - I Chapter 4: Part Modeling -II Chapter 5: Part Modeling - III Chapter 6: Defining Material Properties Chapter 7: Generating Mesh - I Chapter 8: Generating Mesh – II Chapter 9: Static Structural Analysis Chapter 10: Modal Analysis Chapter 11: Thermal Analysis Index

This textbook has emerged from three decades of experience gained by the author in education, research and practice. The basic concepts, mathematical models and computational algorithms supporting the Finite Element Method (FEM) are clearly and concisely developed. The aim of the book is to provide engineers with a practical guide to Finite Element Modelling (FEM) in Abaqus CAE software. The guide is in the form of step-by-step procedures concerning yarns, woven fabric and knitted fabrics modelling, as well as their contact with skin so that the simulation of haptic perception between textiles and skin can be

Computational Inverse Techniques in Nondestructive EvaluationCRC Press

This book presents valuable up-to-date information for active researchers and engineers, and would certainly form a solid basis for any future research, in the field of abrasive technology, aimed at creating new and practical machine tools, systems and processes, or identifying new characteristics.

The thesis investigates a polymeric laminate consisting of poly(methyl methacrylate) (PMMA) and thermoplastic polyurethane (TPU) experimentally and numerically with regard to its impact behaviour and applicability. After a basic characterization of the monolithic materials, PMMA-TPU-PMMA laminates were subjected to impact loadings at velocities up to 5 m/s using threepoint bending and dart impact tests. Based on the experimental basis, different material models for the Finite Element simulation are presented, which are able to capture the time and temperature dependent behaviour of the laminate. Final validation experiments, consisting of head-dummy impacts at 10 m/s on automotive side windows, were conducted for PMMA and the laminate in order to investigate their applicability as glass substitution products.

Sandwich Structural Composites: Theory and Practice offers a comprehensive coverage of sandwich structural composites. It describes the structure, properties, characterization, and testing of raw materials. In addition, it discusses design and process methods, applications and damage assessments of sandwich structural composites. The book:

Offers a review of current sandwich composite lamination processes and manufacturing methods Introduces raw materials, including core materials, skin reinforcements, resin substrates and adhesives Discusses sandwich structure characterization, finite element analysis of the structures, and product design and optimization Describes benefits other than structural, including acoustic, thermal, and fire Details applications in various industries, including aerospace, wind energy, marine ships, recreational boats and vehicles, sport equipment, building construction, and extreme temperature applications The book will be of benefit to industrial practitioners, researchers, academic faculty, and advanced students in materials and mechanical engineering and related disciplines looking to advance their understanding of these increasingly important materials.

Fire Safety Design for Tall Buildings provides structural engineers, architects, and students systematic introductions to fire safety design for tall buildings based on current analysis methods, design guidelines, and codes. It covers almost all aspects of fire safety design that an engineer or an architect might encounter—such as performance-based design, the basic principles of fire development and heat transfer This book also sets out an effective way of preventing the progressive collapse of a building in fire, and it demonstrates 3D modeling techniques to perform structural fire analysis with examples that replicate real fire incidents such as Twin Towers and WTC7. This helps readers to understand the design of structures and analyze their behavior in fire.

Contributed papers presented at the conference organized by Central Mechanical Engineering Research Institute.

COST is an intergovernmental framework for European Cooperation in Science and Technology, allowing the coordination of nationally-funded research on a European level. Part of COST was COST Action C26Urban Habitat Constructions Under Catastrophic Events which started in 2006 and held its final conference in Naples, Italy, on 16-18 September 201

The Wiley Handbook of Science and Technology for Homeland Security is an essential and timely collection of resources designed to support the effective communication of homeland security research across all disciplines and institutional boundaries. Truly a unique work this 4 volume set focuses on the science behind safety, security, and recovery from both man-made and natural disasters has a broad scope and international focus. The Handbook: Educates researchers in the critical needs of the homeland security and intelligence communities and the potential contributions of their own disciplines Emphasizes the role of fundamental science in creating novel technological solutions Details the international dimensions of homeland security and counterterrorism research Provides guidance on technology diffusion from the laboratory to the field Supports cross-disciplinary dialogue in this field between operational, R&D and consumer communities

Since dentistry is a branch of medicine with its own peculiarities and very diverse areas of action, it can be considered as an interdisciplinary field. BIODENTAL ENGINEERING IV contains the full papers presented at the 4th International Conference on Biodental Engineering (BIODENTAL 2016, Vila Nova de Famalicão, Portugal, 21—23 June 2016), and covers the use of new techniques and technologies in dentistry. The contributions provide a comprehensive coverage of the state-of-the art in this area, and addresses the following topics: • Aesthetics • Bioengineering • Biomaterials • Biomechanical disorders • Biomedical devices • Computational bio- imaging and visualization • Computational methods • Dental medicine • Experimental mechanics • Signal processing and analysis • Implantology • Minimally invasive devices and techniques • Orthodontics • Prosthesis and orthosis • Simulation • Software development • Telemedicine • Tissue engineering • Virtual reality BIODENTAL ENGINEERING IV will be of interest to academics and professionals involved or interested in dentistry,

biomechanical disorders, numerical simulation, orthodontics, implantology, aesthetics, dental medicine, medical devices and medical imaging.

This proceedings brings together seventy seven selected papers presented at the 3rd International Conference on Advanced High Strength Steel and Press Hardening (ICHSU2016), which was held in Xi'an, China, during August 25–27, 2016. In this rapidly growing market in advanced high strength steel and press hardening, in particular demand from automotive industry and sustainability community to develop light-weight materials for Body in white or BIW, has motivated us to organize ICHSU2016, soon after the successful conclusion of our ICHSU2015 last year to encourage experts all over the world to get together again to exchange notes and ideas as to how to move the R&D in press hardening technology forward in the new era. The purpose of holding ICHSU2016 is to satisfy the increasingly urgent requirement of reducing the weight of vehicle structures and increasing passenger safety. This conference arouses great interests and attentions from domestic and foreign researchers in hot stamping field, of the articles accepted, covering almost all the current topics of advanced high strength steel and press hardening technology, which includes materials & testing, modeling & simulation, process design, tribology & tools, equipment and product properties.

David Degenhardt develops an elasto-viscoplastic material model in order to predict the temperature and strain rate-dependent deformation and fracture behavior of thermoplastic polymers. The model bases on three supporting ambient temperatures, where a thermoplastic polymer has been characterized profoundly at the stress states 1) uni-axial tension and compression, 2) bi-axial tension and 3) shear. The core of the material model builds a pressure-dependent yield function with a non-associated flow rule. Further, it contains an analytical hardening law and a strain rate-dependent fracture criterion. The model is validated with components subjected to impact loading at different ambient temperatures. The comparison of the simulation and the experiments shows that stiffness, hardening, fractures strain as well as thicknesses can be well captured. About the Author: David Degenhardt is a calculation engineer in the chassis development department of a German automobile manufacturer and earned his doctorate while working at the Technische Universität Carolo-Wilhelmina zu Braunschweig, Germany.

Original research from around the world on weapons-grade projectiles, warheads, missiles, guns and their effects on target materials New information on shaped charges, fire, control strategies, simulation, blast resistance, non-lethal systems and more 190 original presentations in two printed volumes, plus searchable CD The first part of this 2-volume set, part of an ongoing series, presents previously unpublished research on the design and modeling of ballistic devices ranging from shells to missiles, including explosives, propellants and internal components. The second part investigates the effects of ballistic penetrants on a variety of targets, including human models, as well as hard targets and diverse armors made from engineered fibers, ceramics, metal alloys and concrete. Data is included on the modeling and testing of novel devices, explosives and shielding strategies. Papers in this text were presented at a symposium organized by the National Defense Industrial Association with the International Ballistics Society. The CD-ROM displays figures and illustrations in articles in full color along with a title screen and main menu screen. Each user can link to all papers from the Table of Contents and Author Index and also link to papers and front matter by using the global bookmarks which allow navigation of the entire CD-ROM from every article. Search features on the CD-ROM can be by full text including all key words, article title, author name, and session title. The CD-ROM has Autorun feature for Windows 2000 with Service Pack 4 or higher products along with the program for Adobe Acrobat Reader with Search 11.0. One year of technical support is included with your purchase of this product.

Unique single reference supports functional and cost-efficient designs of blast resistant buildings Now there's a single reference to which architects, designers, and engineers can turn for guidance on all the key elements of the design of blast resistant buildings that satisfy the new ASCE Standard for Blast Protection of Buildings as well as other ASCE, ACI, and AISC codes. The Handbook for Blast Resistant Design of Buildings features contributions from some of the most knowledgeable and experienced consultants and researchers in blast resistant design. This handbook is organized into four parts: Part 1, Design Considerations, sets forth basic principles, examining general considerations in the design process; risk analysis and reduction; criteria for acceptable performance; materials performance under the extraordinary blast environment; and performance verification for technologies and solution methodologies. Part 2, Blast Phenomena and Loading, describes the explosion environment, loading functions needed for blast response analysis, and fragmentation and associated methods for effects analysis. Part 3, System Analysis and Design, explains the analysis and design considerations for structural, building envelope, componentspace, site perimeter, and building system designs. Part 4, Blast Resistant Detailing, addresses the use of concrete, steel, and masonry in new designs as well as retrofitting existing structures. As the demand for blast resistant buildings continues to grow, readers can turn to the Handbook for Blast Resistant Design of Buildings, a unique single source of information, to support competent, functional, and cost-efficient designs.

New perspective technologies of genetic search and evolution simulation represent the kernel of this book. The authors wanted to show how these technologies are used for practical problems solution. This monograph is devoted to specialists of CAD, intellectual information technologies in science, biology, economics, sociology and others. It may be used by post-graduate students and students of specialties connected to the systems theory and system analysis methods, information science, optimization methods, operations investigation and solution-making.

This book describes principles, industry practices and evolutionary methodologies for advanced safety studies, which are helpful in effectively managing volatile, uncertain, complex, and ambiguous (VUCA) environments within the framework of quantitative risk assessment and management and associated with the safety and resilience of structures and infrastructures with tolerance against various types of extreme conditions and accidents such as fires, explosions, collisions and grounding. It presents advanced computational models for characterizing structural actions and their effects in extreme and accidental conditions, which are highly nonlinear and non-Gaussian in association with multiple physical processes, multiple scales, and multiple criteria. Probabilistic scenario selection practices and applications are presented. Engineering practices for structural crashworthiness analysis in extreme conditions and accidents are described. Multidisciplinary approaches involving advanced computational models and large-scale physical model testing are emphasized. The book will be useful to students at a post-graduate level as well as researchers and practicing engineers.

Tubular Structures XV contains the latest scientific and engineering developments in the field of tubular structures, as presented at the 15th International Symposium on Tubular Structures (ISTS15, Rio de Janeiro, Brazil, 27-29 May 2015). The International Symposium on Tubular Structures (ISTS) has a long-standing reputation for being the principal

This book is a compilation of papers presented at the Regional Tribology Conference 2011 (RTC2011) - Langkawi, Malaysia on 22 ~ 24 November 2011.

The proceedings contain contributions presented by authors from more than 30 countries at EURO DYN 2002. The proceedings show recent scientific developments as well as practical applications, they cover the fields of theory of vibrations, nonlinear vibrations, stochastic dynamics, vibrations of structured elements, wave propagation and structure-borne sound, including questions of fatigue and damping. Emphasis is laid on vibrations of bridges, buildings, railway structures as well as on the fields of wind and earthquake engineering, respectively. Enriched by a number of keynote lectures and organized sessions the two volumes of the proceedings present an overview of the state of the art of the whole field of structural dynamics and the tendencies of its further development.

The book presents twelve state of the art contributions in the field of numerical modeling of materials subjected to large strain, high strain

rates, large pressure and high stress triaxialities, organized into two sections. The first part is focused on high strain rate-high pressures such as those occurring in impact dynamics and shock compression related phenomena, dealing with material response identification, advanced modeling incorporating microstructure and damage, stress waves propagation in solids and structures response under impact. The latter part is focused on large strain-low strain rates applications such as those occurring in technological material processing, dealing with microstructure and texture evolution, material response at elevated temperatures, structural behavior under large strain and multi axial state of stress.

Recent decades have seen an increase in the number of terrorist attacks, necessitating the development of more efficient global security policies. One of the most important elements of this enhanced security is the protection of critical infrastructure. This book presents edited contributions from the NATO Advanced Training Course (ATC) on Critical Infrastructure Protection - Best Practices and Innovative Methods of Protection, held in Agadir, Morocco, from 6 to 12 May 2018. The main objective of the course was to bring together specialists working in the area of protecting critical infrastructure in NATO Member and Partner countries to share their knowledge and expertise. One lecture block was dedicated to important legal aspects, as these differ from country to country. The other main topic areas included the structural design and protection of critical infrastructure, new materials and material analysis, and material and construction testing at elevated impact velocities via experiment and numerical simulation. New designs for critical infrastructure elements were also demonstrated. The course provided an ideal forum for speakers and participants from government, academia, and military bodies to exchange information and best practice, while at the same time creating links to foster further collaboration and the exchange of ideas about the protection of critical infrastructure, and the book will be of interest to all those whose work involves protecting critical infrastructure from the threat of terrorist attack.

A procedure was developed for performing a postprocessing heat conduction analysis from a CTH solution for a residual penetrator's shape and temperature field. LS-DYNA was employed for the heat conduction analysis. The interface between CTH and LS-DYNA involved the codes EnSight and HyperMesh. The procedure was applied to perforation of a titanium plate by a steel right circular cylinder at 433 m/s, followed by cookoff of an M30A1 grain by contact with the hot steel residual. The temperature field as a function of time within the M30A1 grain was compared with published data for initiation time as a function of temperature. In an appendix, an analytical solution for heat conduction between two semi-infinite layers is used to assess mesh adequacy in the residual-propellant simulation.

Residual Stress, Thermomechanics& Infrared Imaging, Hybrid Techniques and Inverse Problems, Volume 9 of the Proceedings of the 2015SEM Annual Conference & Exposition on Experimental and Applied Mechanics, the ninth volume of nine from the Conference, brings together contributions to this important area of research and engineering. The collection presents early findings and case studies on a wide range of areas, including: Inverse Methods Inverse Methods in Plasticity Varying Length Scales Harsh Environments Opto-Acoustical Methods Hybrid Experimental Residual Stress Modelling and Advances in Measurements Thermomechanics General Material Response Infrared Imaging

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