Introducing laser technology

Lasers in Manufacturing,
J T Luxon, D E Parker, P D Plokowski

The author describes this book as providing an overview of lasers and their applications in manufacturing. The emphasis is directed towards traditional manufacturing rather than for example the micro-electronics and other high technology industries.

They also point out that the book is an introduction to the application of lasers, and not intended for scientists and engineers experienced in this field.

The opening chapters deal with the properties of laser light and describe first what a laser is, and the various types commonly used in manufacturing.

The various terms such as radiance, monochromaticity and coherence are defined in a manner which is reasonably understandable. Chapter four would appear to be the most important chapter in the book, and is entitled 'Identifying Laser Applications'. This contains some very general remarks concerning the factors to be considered for determining whether or not a laser should be used in a particular application. High-power and Low-power laser applications are described, and the major advantages and disadvantages outlined. It is interesting to read that operator training is included under the heading of disadvantages. The authors claim that while only minimal training is required for an operator, it is essential that there is an experienced engineer in charge, as simple mistakes are frequently made because of a lack of understanding of the laser, and/or its associated optical system.

The chapters five to seven deal with laser surface modification (LSM), joining and material removal. While the first of these applications, surface modification, is dealt with briefly, more detailed information is provided on joining and metal removal.

The principles and applications of the laser systems used in inspection, measurement and control are examined in chapters eight and nine. The alignment laser which is probably one of the most well known optical inspection techniques, is discussed in some detail, together with information on laser based triangulation detectors.

The final chapter covers laser systems in materials processing applications. These include manipulation systems for single and multi-axis CNC machine tools and robotic systems.

While this is a relatively small book it does contain a large amount of information on lasers and their application. There are a number of interesting illustrations and diagrams and a bibliography for further reading.

As the book is intended it will be of particular interest to students and engineers requiring an introduction to this technology.

Excellent source of knowledge

Unit Load Handling Technology

This book, by Bob Lee a former Director of Dexion Limited with 30 years experience with the company working as a designer, Executive Engineer, Technical Director and prior to his retirement in 1985, Director of Handling Activities Europe. Whilst written as a reference book for handling planners, distribution facilities managers, production engineers, warehouse and industrial designers, it will also provide an excellent source of detailed knowledge for lecturers and students alike on this subject.

The book in a hardcover A4 format is well presented, includes numerous very good quality photographs and diagrams and in addition to the text is complemented by 10 case studies covering a wide variety of applications. Potential readers should not be put off in believing the book, albeit published in association with Dexion to be 'plugging' that companies products far from it. The book takes a very objective approach to the alternatives available, and their application. The photographs shown in the book are acknowledged as coming from 28 different sources.

The book consists of 18 chapters, the first of which is devoted to the definition of Unit Loads andwarehouses. It is followed with a review of the various types of pallets available and their applications. This is followed by a chapter on industrial trucks the types available and their applications. Three chapters are then devoted to the various forms of pallet racking available, their relative merits and applications. A complete chapter addresses the importance of floors, what is required and the tolerances necessary for successful operation of high stacking equipment. Two chapters are dedicated to discussion small unit loads, their handling and storage needs and this is then followed by a chapter on electronic and mechanical aids for manual systems.

The movement of material is well covered in 5 chapters from a review of the various forms of industrial tow truck and trailers to a comprehensive evaluation of conveyors and their controls.

The final chapter should conventionally conclude this volume with a section relating to expansion and shrinkage, residual stresses and distortion and end by explaining their reduction. The final chapter is on welding safety covered by processes eg gas shielded arc, laser and automatic welding.

To complement the first volume the authors have compiled a 13 page bibliography/reference section. Its translation from the French is not discernable although the odd sentence might have been expressed more simply.

The book is very readable, well constructed with key summaries notes, tables and diagrams, and makes a convenient lightweight reference book for student or 'old hand' alike, although at 128 pages perhaps each volume could have been thicker and the number of volumes reduced. However, the work altogether as indicated by its title makes a good introduction to what promises to be a comprehensive set of volumes.

Translation reads well

Advanced Welding Systems, Vol 1
Jean Cornu

First published in French in 1985 this series of Volumes starts with the fundamentals of fusion welding, and continues with greater detail on the arc and fusion welding processes, characterises welding machines, discusses types and abilities and considers how the elements may be linked—robots process, adaptivity, cell control and management.

Volume 1 deals with fundamentals of fusion welding techniques and covers welding assembly technology, metalurgical concepts, testing, weldability, HT, distortion and safety.

Chapter 1 is a very readable short history with an interesting chart giving the 'first used' dates of 23 of the 100 or so welding processes in use today.

The authors then have two copiously diagramatical chapters on definition and assembly technology, covering grain size effects, the four types of weld and 8 types of joint, weld attitudes, join preparations, weld geometry and symbols, before discussing metallurgical concepts such as mechanical properties, stress and elastic and plastic deformation.

They progress to Mechanical Weld testing which covers tensile bend, nick break, peel and torsion and hardness testing, fracture toughness etc, and the rest of the chapter is devoted to metallographic examination of metal and corrosion behaviour.

Following on with their weldability chapter they start with metallurgical consideration of steels and spell out the effect of the addition of various elements eg Carbon, Chromium etc and end with a discourse on metallicurgical considerations of non-ferrous and alloy metals.

Chapter 7 entitled 'Heat Treatment of Welded Structures' covers thermal operations before, during and after welding—thermal conditioning (pre and post heat) and thermal treatments after welding, and ends with an appendix on points and intervals of transformation.

They complete the technical aspects of this volume with a section relating to expansion and shrinkage, residual stresses and distortion and end by explaining their reduction.

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