ATTACHMENT 522
EFFICIENT LIGHTING COURSE SUPPLEMENTS AND REFERENCES
Compiled by
AFREPREN/FWD
COGEN FOR AFRICA PROJECT
2017
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1 Introduction
The following is a list of books and websites used as reference to create the course efficient lighting.

1.1 Course outline
INTRODUCTION ................................................................. Error! Bookmark not defined.
Lighting Units ............................................................... Error! Bookmark not defined.
Light Intensity ............................................................... Error! Bookmark not defined.
Reflectance ................................................................. Error! Bookmark not defined.
Light Color ................................................................. Error! Bookmark not defined.
Light color-Rendering Index ............................................. Error! Bookmark not defined.
LIGHTING TECHNOLOGIES .............................................. Error! Bookmark not defined.
Incandescent lamps ...................................................... Error! Bookmark not defined.
Halogen lamps ............................................................ Error! Bookmark not defined.
High intensity discharge ................................................. Error! Bookmark not defined.
Fluorescent lamps ......................................................... Error! Bookmark not defined.
Triphosphor Fluorescent Lamps ........................................ Error! Bookmark not defined.
Ballasted Compact Fluorescent and Self-Ballasted Compact Fluorescent ...... Error! Bookmark not defined.
LED ........................................................................... Error! Bookmark not defined.
LUMINAIRES ................................................................. Error! Bookmark not defined.
Fluorescent Luminaires .................................................. Error! Bookmark not defined.
HID Luminaires ............................................................. Error! Bookmark not defined.
LIGHTING CONTROLS ...................................................... Error! Bookmark not defined.
ILLUMINANCE .............................................................. Error! Bookmark not defined.
Measuring Units Light Level -Illuminance ................................ Error! Bookmark not defined.
Common and Recommended Light Levels Indoor ..................... Error! Bookmark not defined.
ENERGY SAVINGS TECHNIQUES ...................................... Error! Bookmark not defined.
Energy Management opportunities in lighting systems ............... Error! Bookmark not defined.
2 Lighting
Title: Lighting
Author: D C Pritchard
Year: 2014

Abstract
The standard text on the principles and practice of lighting interiors and exteriors. The book introduces all the main principles of light and colour, along with the design of general lighting schemes. It complies with the CIBSE lighting code and guides, covers the main calculations that a lighting designer needs to do and includes worked examples.

Contents
1. The language of light --
2. Units of light --
3. Colour --
4. Lamps --
5. Luminaires --
6. Daylight --
7. Design of general lighting schemes --
8. Lighting of specific building types --
9. Energy management and lighting --
10. Roadway lighting --
11. Floodlighting.
3 Technology reviews : Lighting systems.

Title: Technology reviews : Lighting systems.

Author: Schuman, J.; Lee, E.S.; Selkowitz, S.; Papamichael, K.; Rubinstein, F.; Beltran, L.

Year: 2000


Abstract

We present a representative review of existing, emerging, and future technology options in each of five hardware and systems areas in envelope and lighting technologies: lighting systems, glazing systems, shading systems, daylighting optical systems, and dynamic curtain wall systems. The term technology is used here to describe any design choice for energy efficiency, ranging from individual components to more complex systems to general design strategies. The purpose of this task is to characterize lighting system in the state of the art in envelope and lighting technologies in order to identify those with promise for advanced integrated systems, with an emphasis on California commercial buildings. For each technology category, the following activities have been attempted to the extent possible: Identify key performance characteristics and criteria for each technology. Determine the performance range of available technologies. Identify the most promising technologies and promising trends in technology advances. Examine market forces and market trends. Develop a continuously growing in-house database to be used throughout the project. A variety of information sources have been used in these technology characterizations, including miscellaneous periodicals, manufacturer catalogs and cut sheets, other research documents, and data from previous computer simulations. We include these different sources in order to best show the type and variety of data available, however publication here does not imply our guarantee of these data. Within each category, several broad classes are identified, and within each class we examine the generic individual technologies that fall into that class.
4 Green Lighting.
Title: Green Lighting.
Author: Howard, Brian Clark.; Seth Leitman; William Brinsky
Year: 2010

Contents


5 Light-Emitting Diodes (LEDs) --History and Technological Overview --How Does an LED Work? --Environmental Benefits of LEDs --Concerns with LEDs --Cost --Dimming, Brightness, and Light Quality --Lifespan --Light Pollution --Uses for LEDs --Indicator Lights --Backlighting
5 Energy efficient light bulbs: a bright idea.

Title: Energy efficient light bulbs: a bright idea.


Year: 2000

Publisher: [Washington, D.C.]: Federal Trade Commission, Bureau of Consumer Protection, Office of Consumer and Business Education,

Abstract

6 Energy efficient fluorescent ballasts. Phase I, final report.

Title: Energy efficient fluorescent ballasts. Phase I, final report.

Author: Stevens Luminoptics Corporation; Stevens Luminoptics Corp., Pleasanton, CA (USA);

Year: 1978

Publisher: Berkeley, Calif. : Lawrence Berkeley National Laboratory ; Oak Ridge, Tenn. : Distributed by the Office of Scientific and Technical Information, U.S. Dept. of Energy,

Abstract

The development of a high-frequency electronic (Stevens) ballast for fluorescent lamps is described. It is claimed that use of this ballast could reduce use energy consumption by 1.2 to 2.5 percent. The Stevens ballast has a basic efficiency of 29 percent when used with conventional lamps. With the more efficient lamps, the efficiency increases drastically. The conventional ballast and lamp has an efficacy of approximately 60 to 63 lumens per watt (LPW). With the Stevens ballast the efficacy raises to between 75 and 80 lumens per watt. When the Stevens ballast is utilized with the newer high efficiency lamps the efficacy increases to 90 to 95 lumens per watt or a full 51 percent improvement over conventional coil and core ballasts and 25 percent over the best high efficiency premium coil and core ballasts. In addition to its energy savings capabilities, this high frequency fluorescent lamp ballast has the advantages that it is a true retrofit device that is directly interchangeable with the conventional coil core ballast, and it is dimmable over a wide and continuous range. (LCLC).
7 Contemporary lighting
Title: Contemporary lighting

Author: Sebastian Conran; Mark Bond

Year: 2008

Publisher: London : Conran Octopus ; New York : Distributed in the United States by Sterling Pub., 2008,

Summary

Lighting has a crucial effect on any room. Deciding how to light a home or office requires decisions about the desired atmosphere, the preference for functional as opposed to ambient lighting, and the possibilities for enhancing the décor. This illuminating manual from two renowned designers will help you make these choices and select the best solutions from the wide and changing range available today. Starting with the basics, like the distinction between halogen and fluorescent bulbs, and how down-lighting differs from spot-lighting, this designer resource examines all kinds of fixtures in detail. Whatever your requirements?from information about individual items that inspire or a whole scheme that brings a room to life?you?ll get the help to analyze your needs and identify how to meet them.

Abstract

A comprehensive introduction to the key areas of lighting, it provides answers to questions such as: the difference between halogen and fluorescent light bulbs, or how down lighting differs from spot
Compact fluorescent light bulbs: issues with use and disposal

Title: Compact fluorescent light bulbs: issues with use and disposal

Author: Linda Luther; Library of Congress. Congressional Research Service.

Year: 2008.


Abstract

Compact fluorescent light bulbs (CFLs), a smaller version of fluorescent tubes, are produced with technology that allows them to fit into standard lighting products such as lamps and ceiling fixtures. The bulbs use one-fifth to one-quarter the energy and can provide roughly 10 times the hours of illumination of traditional incandescent light bulbs. These factors have led to a significant increase in the sales of CFLs. According to the U.S. Environmental Protection Agency (EPA), CFL sales doubled in 2007 and now represent 20% of the U.S. light bulb market. Sales may be expected to increase with the implementation of new energy efficiency standards for lighting specified in the Energy Independence and Security Act of 2007 (P.L. 110-140, enacted December 19, 2007). Those standards require certain light bulbs to use 25% to 30% less energy than today's products beginning in 2012. CFLs already meet the standards. The increased use of CFLs has led to concern among some groups over the presence in the bulbs of mercury, a potent neurotoxin. By way of example, EPA has likened the amount of mercury in individual bulbs to that which could fit on the tip of a ballpoint pen -- ranging from 2 to 6 milligrams (mg). At these levels, mercury is virtually harmless to consumers. Still, EPA recommends that caution be taken in cleaning up broken CFLs to minimize potential mercury exposure. EPA also recommends that spent bulbs be recycled, instead of disposed of with household garbage, in areas where CFL recycling is available. (Federal regulations that apply to the disposal of mercury-containing products (e.g., lighting, switches, thermometers) do not apply to households.) Further, EPA has noted that increased CFL use may actually reduce overall mercury emissions to the environment by potentially reducing power use -- coal-fired power plants are the greatest individual source of mercury emissions in the United States. This report discusses reasons why CFL sales have increased dramatically in the past two years, concerns that have arisen regarding their use and disposal, and some media reports that have exaggerated the potential danger associated with the mercury in CFLs.
Principles and applications of organic light emitting diodes (OLEDs)

Title: Principles and applications of organic light emitting diodes (OLEDs)

Author: N Thejo Kalyani; Hendrik Swart; S J Dhoble

Year: 2017

Publisher: Duxford : Woodhead Publishing

Abstract

Light emitting diodes. Organic thin films.TECHNOLOGY & ENGINEERING / Mechanical

Contents

Front Cover; Principles and Applications of Organic Light Emitting Diodes (OLEDs); Copyright Page; Contents; 1 Luminescence: Basic Principles and Applications; 1.1 Introduction; 1.2 Light; 1.3 Mechanism of Light Emission; 1.3.1 Incandescence; 1.3.1.1 Incandescence Sources; 1.3.2 Luminescence; 1.3.2.1 Luminescence in Transition Metal Ions; 1.3.2.2 Luminescence in Rare Earth Metal Complexes; Origin of Luminescence in Lanthanides: Screening Effect; The Antenna Effect: Sensitized Emission; Ligand and Lanthanide Ion Excitation: Jablonski Diagram; 1.3.2.3 Luminescence in Actinides 1.3.2.4 Luminescence in Heavy Metals1.3.2.5 Luminescence in Electron-Hole Centers; 1.3.2.6 Luminescence in Extended Defects; 1.3.3 Classification of Luminescence Based on Time Lag; 1.3.3.1 Fluorescence; 1.3.3.2 Phosphorescence; 1.3.4 Classification of Luminescence Based on the Source of Excitation; 1.3.5 Luminescent Sources; 1.4 Terminology Associated with Luminescence; 1.5 Realm of Luminescent Materials; 1.5.1 Lamp Phosphor; 1.5.2 Lasers; 1.5.3 Nanophosphors; 1.5.4 Super Luminescent Diodes; 1.5.5 Light-Emitting Devices; 1.5.6 Organic Light-Emitting Diodes; 1.5.7 Solid-State Lighting 1.5.8 Displays1.5.8.1 LED Displays; 1.5.8.2 Organic Light-Emitting Diode Displays; 1.6 Conclusion; References; 2 Luminescence in Organic Semiconductors; 2.1 Introduction; 2.2 Organic Compounds; 2.2.1 Classification of Organic Compounds; 2.2.1.1 Based on the Presence of Heteroatoms; 2.2.1.2 Based on Size; Small Molecules; Polymers; 2.2.1.3 Based on Functional Group; 2.2.2 Characterization; 2.2.3 Properties; 2.3 Organic Semiconductors; 2.3.1 Charge Transport in Organic Semiconductors; 2.4 HOMO and LUMO in Organic Semiconductors; 2.5 Charge Transport in Organic Materials and Devices 2.5.1 Band-Transport Mechanism2.5.2 Hopping-Transport Mechanism; 2.5.3 Tunneling-Transport Mechanism; 2.6 Luminescent Organic Materials: An Overview; 2.6.1 Fluorescent Materials; 2.6.2 Phosphorescent Materials; 2.7 Organic verses Inorganic Luminescent Materials; 2.8 Conclusions; References; 3 Evolution of Luminescent Materials for Organic Light-Emitting Diodes; 3.1 Introduction; 3.2 Red-Light-Emitting Materials for OLEDs; 3.3 Green-Light Emitting Materials for OLEDs; 3.4 Blue-Light-Emitting Materials and OLEDs; 3.5 White-Light-Emitting Materials and OLEDs; 3.6 Conclusions; References 4 Artificial Lighting: Origin-Impact and Future Perspectives4.1 Introduction; 4.2 Light; 4.3 Lighting; 4.4 Classification of Lighting; 4.4.1 Ambient Lighting; 4.4.2 Task Lighting; 4.4.3 Accent Lighting; 4.5 Artificial Lighting: Origin and Impact; 4.6
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