

JULY 2013

A S H R A E J O U R N A L

THE MAGAZINE OF HVAC&R TECHNOLOGY AND APPLICATIONS ASHRAE.ORG



Air Terminals, Outlets Sound Advice

Big Plant in a Small Space | Comfort vs. Energy Use | Managing Redundancy
Energy Codes and Standards | Sustainable Products Capabilities

CONTENTS

Vol. 55, No. 7 | July 2013



28



34



40

Features

- 16** **Sound Advice**
Acoustical Specifications for Air Terminals & Air Outlets
By Randy Zimmerman
- 22** **Energy Codes and Standards**
Part 1: Prescriptive vs. Performance Compliance
By John Hogan, P.E.

2013 ASHRAE TECHNOLOGY AWARDS

- 28** **Big Plant in a Small Space**
By Blake E. Ellis, P.E.; and Raymond J. Mosier, P.E.
- 34** **Hospital Quality Control**
By Michael Fullerton, P.E.

Departments

- | | | | | | |
|----|---------------|-----|--------------------|-----|------------------------|
| 4 | Commentary | 14 | Meetings and Shows | 135 | Classified Advertising |
| 6 | Industry News | 132 | Products | 136 | Advertisers Index |
| 12 | Letters | | | | |

Standing Columns

- 40** **Building Sciences**
Deal with Manure & Then Don't Suck
By Joseph W. Lstiburek, Ph.D., P.Eng.
- 121** **Refrigeration Applications**
I'm on You
By Andy Pearson, Ph.D., C.Eng.
- 122** **Data Centers**
Managing Redundancy
By Donald L. Beaty, P.E.
- 126** **IAQ Applications**
Where It All Started
By Andrew K. Persily, Ph.D.
- 130** **Energy Modeling**
District Energy Plants
By Jared A. Higgins, P.E.
- 134** **Engineer's Notebook**
Comfort vs. Energy Use
By Dan Int-Hout

Advertising Section

- 47** Sustainable Products Capabilities

ASHRAE® Journal (ISSN 0001-2491) **MISSION STATEMENT** | ASHRAE Journal reviews current HVAC&R technology of broad interest through publication of application-oriented articles. ASHRAE Journal's editorial content ranges from back-to-basics features to reviews of emerging technologies, covering the entire spectrum of professional interest from design and construction practices to commissioning and the service life of HVAC&R environmental systems. **PUBLISHED MONTHLY** | Copyright 2013 by ASHRAE, 1791 Tullie Circle N.E., Atlanta, GA 30329. Periodicals postage paid at Atlanta, Georgia, and additional mailing offices. **LETTERS/MANUSCRIPTS** | Letters to the editor and manuscripts for publication should be sent to: Fred Turner, Editor, ASHRAE Journal, fturner@ashrae.org. **SUBSCRIPTIONS** | \$8 per single copy (includes postage and handling on mail orders). Subscriptions for members \$6 per year, included with annual dues, not deductible. Nonmember \$79 (includes postage in USA); \$79 (includes postage for Canadian); \$149 international (includes air mail). Expiration dates vary for both member and nonmember subscriptions. Payment (U.S. funds) required with all orders. **CHANGE OF ADDRESS** | Requests must be received at subscription office eight weeks before effective date. Send both old and new addresses for the change. ASHRAE members may submit address changes at www.ashrae.org/address. **POSTMASTER** | Send form 3579 to: ASHRAE Journal, 1791 Tullie Circle N.E., Atlanta, GA 30329. Canadian Agreement Number 40037127.

ONLINE at ASHRAE.org | Feature articles are available online. Members can access articles at no cost. Nonmembers may purchase articles at www.ashrae.org/bookstore. | **MICROFILM** | This publication is microfilmed by National Archive Publishing Company. For information on cost and issues available, contact NAPC at 800-420-NAPC or www.napubco.com. **PUBLICATION DISCLAIMER** | ASHRAE has compiled this publication with care, but ASHRAE has not investigated and ASHRAE expressly disclaims any duty to investigate any product, service, process, procedure, design or the like which may be described herein. The appearance of any technical data, editorial material or advertisement in this publication does not constitute endorsement, warranty or guarantee by ASHRAE of any product, service, process, procedure, design or the like. ASHRAE does not warrant that the information in this publication is free of errors and ASHRAE does not necessarily agree with any statement or opinion in this publication. The entire risk of the use of any information in this publication and its supplement is assumed by the user.