

Authors' Manual



This is a contextual document. It is not meant to be read straight from beginning to end. Instead, navigate the pages via the **blue** hyperlinks as you would a Web page.

Some pages include key words in **orange**. Mouse over these words to see additional information about a relevant topic.

This manual should not be used when writing for *ASHRAE Journal*.
Please contact the editor for guidance when writing for that publication.

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Obtaining Permissions

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 - Submit the request letter to the copyright holder and ask for a reply within 30 days. The organizations should reply directly to you.
 - To request permission to use ASHRAE copyrighted content, visit **ASHRAE'S website**.
3. Permission to use/reproduce material **must be obtained** during the writing stage.
4. Submit permission-granted letters with the **completed manuscript**. ***No editing or layout work will begin on the manuscript until all permissions have been received.***

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- to allow use of the paper by the author's employer for posting on the employer's Web site, for use by the employer in training or educational courses offered by the employer, for internal research work that is conducted by the employer, and for internal publications published by the employer;
- to include the paper in full or in part in a thesis or dissertation;
- to include the paper in a printed compilation of works of the author, such as collected writings or lecture notes; and
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Formatting Figures

1. Original figures or other artwork should be submitted with the manuscript whenever possible. For information on reprinting a figure from another source, see [Obtaining Permissions](#).
2. Use only 1 point (0.014 in. [0.35 mm]) or thicker lines—smaller lines will not reproduce well.
3. Figures to be reproduced in black and white should use [patterns or shapes](#) to distinguish sections instead of coloring and shading. Figures to be reproduced in color should have [touching colors that differ significantly](#) so that there can be no confusion in understanding the data.
4. Each figure should have a brief legend or [descriptive labels](#), as appropriate. **Any text included in a figure (except the figure caption) should be embedded as part of the image file and not contained in a separate text box that is not part of the image file.**
5. Provide [dual units](#) for all [measurements](#), preferably as two sets of figures. Figure files should be clearly labeled (i.e., Figure1.tif, Fig2.tif, Fig3-2, etc.). Multiple-part figures, such as a figure with [parts](#) (a) and (b), must be submitted as [one file](#) with all parts included.
6. All figures must be provided to ASHRAE as individual TIF (preferred) or EPS files in either CMYK mode (for color) or Grayscale mode (for black and white) saved at high resolution (600 dpi or greater) and at least 4 in. size or greater. See [Converting Excel Graphics](#) or [Converting Word Graphics](#) for instructions on graphic conversion.
7. Every figure must be referenced in the text by name/number, where “Figure” is capitalized (e.g., “...as shown in Figure 2.”).
8. Figures must be numbered consecutively as they appear in the text.
9. Prepare a list of captions for figures and place it at the end of the manuscript (**this applies to papers only!**).

Formatting Tables

1. All **table** titles should be descriptive but concise.
2. Original tables should be submitted with the manuscript whenever possible. For information on reprinting a table from another source, see [Obtaining Permissions](#).
3. Titles appear above the tables, and every major word in the title is capitalized.
4. Number tables consecutively and in the order they are mentioned in the text.
5. Tables used in the manuscript should **not** be **image files** but *alterable* tables (such as those created in Word, Excel, Framemaker, InDesign, etc.).
6. Use only 1 point (0.014 in. [0.35 mm]) or thicker lines—smaller lines will not reproduce well.
7. Vertical and horizontal lines should be avoided except to delineate the top and bottom of a table and to separate the heading row from the data unless lines are otherwise necessary for clarity or organization of the data.
8. Label each column with a heading and include units of measurement and other necessary qualifying information. Units should be set off with a comma (e.g., “Velocity, m/s”).
9. Provide **dual units** for all **measurements**.
10. Every table must be referenced in the text by name/number, where “Table” is capitalized (e.g., “as provided in Table 5”).

Units of Measurement

ASHRAE policy requires dual units of measurement—inch-pound (I-P) and International System of Units (SI). You are required to provide dual units when submitting the manuscript; ASHRAE staff will not convert units for you. Some **guidelines** are as follows:

1. The units used in calculating the work being reported shall be listed first with the alternate system of units **following in parentheses**.
2. Always spell out all units when they are used without a number.
3. Do not mix **symbols and names** in the same expression.
4. Do not express **plurals** by adding an “s”
5. Do not use **periods** with units of measurement:
 - **EXCEPTION:** in. for inch
6. Leave a **space** between the numerical value and the unit of measurement:
 - **EXCEPTION:** There is no space between number and degree of plane angle or degrees of temperature (45°, 62°F, 20°C) or the number and the percent symbol (5%)
7. “L” is the symbol for liter, not lowercase “ell” or script “ell.”
8. “Centi-” is not an acceptable SI prefix, and **the use of cm should be avoided**.
9. For currency, include the monetary unit of the country where the research is based followed by the US dollar conversion in parentheses.

Each significant **equation or formula** should be displayed on a separate line. Center equations and place consecutive equation numbers flush right in parentheses.

EXAMPLE:

$$a^2 + b^2 = f^2 \quad (1)$$

where

a^2 = apples

b^2 = bananas

f^2 = fruit salad

If an equation requires more than one line, break it before an **operational sign**, and align the operational signs on the left.

EXAMPLE:

$$E = (a + b + c)/(m + n + o) \quad (2)$$
$$\times d + e + f$$

If two or more displayed equations are grouped together, leave space between the individual equations:

$$a + b = c \quad (3)$$

$$D = f - ab^2 \quad (4)$$

$$mon + rst \quad (5)$$

Spell out the word “equation” and capitalize it in the text when **referring** to specific, numbered equations. In a highly mathematical or theoretical work, consider developing equations in appendices rather than in the body of the manuscript.

Please note that all equations must be retyped in our pagemaking program—this is one reason we require a hard copy of the manuscript—and therefore should be checked thoroughly by the author at the proofreading stage.

Most books are the result of an **ASHRAE research project**. A subcommittee may be designated to handle the review process of a **committee-sponsored** project, utilizing committee members or other persons with expertise in the area of concern.

The ASHRAE submittal, review, and publication process proceeds as follows:

1. Author(s) indicate intent to submit a manuscript to **Special Publications** and receive the **Authors' Manual**.
2. Author(s) prepare the manuscript, including artwork, according to this Authors' Manual and send the manuscript to **Special Publications**.
3. Cognizant Technical Committee selects qualified reviewers.
4. Reviewers send **reviews and comments** to the author(s).
5. Author(s) revise manuscript and/or rebut comments and provide revised manuscript or rebuttal to the reviewers/cognizant Technical Committee.
6. Reviewers complete an additional review.
7. Review process continues until the manuscript is accepted or rejected for publication by the cognizant Technical Committee.
8. After the manuscript is approved for publication, author(s) submit a final Microsoft Word file and separate figure files on a CD to **Special Publications**, and the author(s) are informed of a tentative publication schedule.
9. Special Publications editors edit the book for grammar, punctuation, clarity, and consistency with ASHRAE policies. It is then put into pages, with the figures and tables incorporated into the text.
10. Editors send a PDF to the author(s). Author(s) proofread the manuscript—changes should be minor at this stage—within a mutually agreed upon (hopefully, short) timeframe.
11. Book is published and offered for sale in ASHRAE's bookstore as both the physical, printed book and a PDF available for download.
12. Each author receives a complimentary copy of the published book.

All **papers** undergo critical, **double-blind** review by at least three competent **specialists** to ensure high quality of content.

The *HVAC&R Research* review process is coordinated by the journal's **Editor-in-Chief**. The *Transactions* paper review activity is coordinated by the **ASHRAE Conference Program Administrator**. The **IAQ Conference** review activity is coordinated by the **Assistant Manager of Research and Technical Services**.

The ASHRAE submittal, review, and publication process proceeds as follows:

1. Author(s) indicates intent to submit a paper to the appropriate publication contact person (see above) and receives instructions and the Author's Manual.
2. Author **prepares** the paper, including artwork, according to the **Author's Manual** and posts the paper online at **Manuscript Central**.
3. The appropriate publication contact person selects qualified reviewers.
4. Reviewers carefully review paper and then submit online review to the appropriate publication contact person.
5. The publication contact person sends **reviews and comments** to the author.
6. Author revises paper and/or rebuts comments and posts revised paper or rebuttal online.
7. The publication contact person notifies reviewers that a revised paper requires an additional review.
8. Review process continues until the paper is accepted or rejected by the Conferences and Exposition Committee (or topical conference organization committee) for publication.
9. After the paper is approved, author submits a final Microsoft® Word for Windows file and separate figure files online at Manuscript Central, and the paper is scheduled for a print issue, for presentation at an ASHRAE meeting, or for presentation at an IAQ conference.
10. Editors edit and format paper and send a PDF to author. Author **proofreads** the paper.
11. Paper is **published** in either *HVAC&R Research* or *ASHRAE Transactions* and, if for an ASHRAE meeting, as an individual preprint paper available on a CD and at the meeting.
12. For ASHRAE meeting papers: Editor sends any written **comments and questions** (generated at the meeting) to author. Author returns responses to Editor.

The following materials are required for manuscript **submission**:

1. A CD with the complete manuscript in **Microsoft® Word for Windows** and the **figures** provided as separate TIF or EPS files saved at **high resolution**. **Tables should be editable and NOT submitted as images.**
2. A laser printout of the complete manuscript including text, tables, and graphics. With the printout, include a cover sheet with the following information:
 - Proposed title of book
 - Sponsoring ASHRAE group and/or number of ASHRAE research project, if applicable
 - Author names in desired order with (if applicable) ASHRAE membership grade, academic degrees at the **doctoral level**, and professional **certification** for each author
 - An “About the Authors” **paragraph**
 - Complete contact information for the corresponding author, including mailing address, phone and fax numbers, and e-mail address
 - Three to five key words from the **Key Word List** and a paragraph describing the book (to be used on the back of the book, in the bookstore, and in marketing materials)
3. The completed **Marketing Questionnaire**
4. See **Document Formatting** and **Book Organization** for additional requirements.

Manuscripts should be submitted to:

Mark Owen
Editor/Group Manager, ASHRAE Handbook and Special Publications
1791 Tullie Circle, NE
Atlanta, GA 30329 USA
Telephone: 678-539-1187
Fax: 678-539-2160
mowen@ashrae.org

ASHRAE Authors' Manual

HVAC&R Research Submission Guidelines

Manuscripts submitted to *HVAC&R Research* should represent original work of lasting significance. They should be submitted exclusively to *HVAC&R Research*, should not be under consideration for publication elsewhere, and should not have been previously published.

1. There is no **page limit** or maximum number of figures for papers submitted to *HVAC&R Research*.
2. The paper should include an **abstract** of 100 to 200 words.
3. An author's list should be submitted as a separate file and must include the following:
 - The **title** of the paper
 - Author names in desired order, principal author first, with (if applicable) ASHRAE membership grade and professional designations (e.g., PE, PhD, PEng, DSc, CEng, DrIng, etc.) for all authors
 - An **author note** with job title, affiliation, and **address** for each author.
 - Complete **contact information** for the corresponding author
 - Authors should NOT identify themselves in manuscript files to enable reviewers to maintain a blind review.
4. See [Document Formatting](#) for additional requirements.
5. Download the [Authors' Template](#) for an example paper.

Submit *HVAC&R Research* papers online at ASHRAE [Manuscript Central](#). Please follow the Submission Instructions in the "Instructions & Forms" section. Instructions for uploading files to Manuscript Central are also available there. Reviews will be done using ASHRAE's online review process. The corresponding author of a paper will receive complimentary copies of the issue in which the paper appears for distribution to all authors.

Assistance can be obtained from:

Dr. Reinhard Radermacher
Editor in Chief, *HVAC&R Research*
Department of Mechanical Engineering, University of Maryland
College Park, MD 20742-3035
E-mail: raderm@umd.edu

ASHRAE Authors' Manual

Conference Papers Submission Guidelines

1. The typewritten manuscripts for papers submitted to ASHRAE conferences and the IAQ Conference (including references and tables) **must not** exceed 30 double-spaced pages, and manuscripts can contain a **maximum** of 12 figures.
2. An author's list should be submitted as a separate file and must include the following:
 - The **title** of the paper
 - Author names in desired order, principal author first, with (if applicable) ASHRAE membership grade, academic degrees at the **doctoral level**, and professional **certification** for all authors.
 - An **author note** with job title, affiliation, and **address** for each author.
 - Complete **contact information** for the corresponding author.
 - Authors should NOT identify themselves in manuscript files to enable reviewers to maintain a blind review.
3. See [Document Formatting](#) for additional requirements.
4. Download the [Authors' Template](#) for an example paper.

Submit *Transactions* and IAQ Conference papers online at [Manuscript Central](#). Instructions for uploading files to Manuscript Central are available in the “Instructions & Forms” section. Reviews will be done using ASHRAE’s online review process. The corresponding author of a paper will receive complimentary copies of the issue in which the paper appears for distribution to all authors. Assistance and information can be obtained from the following:

ASHRAE Transactions

ASHRAE Conference Program Administrator
Tiffany Cox
E-mail: tcox@ashrae.org
Telephone: 678-539-1137

IAQ Conference

ASHRAE Assistant Manager of Research and Technical Services
Steve Hammerling
E-mail: shammerling@ashrae.org
Telephone: 678-539-1158

Keyword List

Please use this list as an aid in selecting a minimum of three and up to a maximum of five key words.

A

agricultural applications
air cleaning equipment
air conditioning accessories
air conditioning units
air distribution equipment
air handlers
air pollution control equipment

B

boilers
building automation & controls
building envelope

C

certification programs
chillers
chimneys
clean spaces/areas/rooms
coils
commercial buildings
commissioning
compressors
computers
condensing units
consulting services
controls
cooling towers

D

dehumidifiers
dormitories
drives
ducts

E

economic development
economizers
education
educational facilities
electrical components
energy management systems

energy recovery
environmental test facilities
evaporators

F

fans
filters
fire safety systems
food processing
furnaces

G

gaskets
geothermal products

H

health care facilities
heat exchangers
heat pumps
heat recovery units
heaters
heating accessories
hotels and motels
humidifiers
hydronic heating equipment

I

ice makers
ice rinks
ice storage equipment
indoor air quality equipment & products
industrial facilities
instruments & meters
insulation

J

justice facilities

K

kitchen ventilation systems

L

laboratories
libraries and archives

M

motors

museums

O

oil

P

pipes
power plants
public assembly buildings
pumps

R

radiant heating equipment
refrigerant control equipment
refrigerants
refrigerated facilities
refrigerating equipment
research & development
residential buildings
restaurants and hospitality facilities
retail space

S

software
solar equipment
soldering, welding, and brazing equipment
supermarkets

T

testing laboratories
thermal storage
tools
training

U

utilities

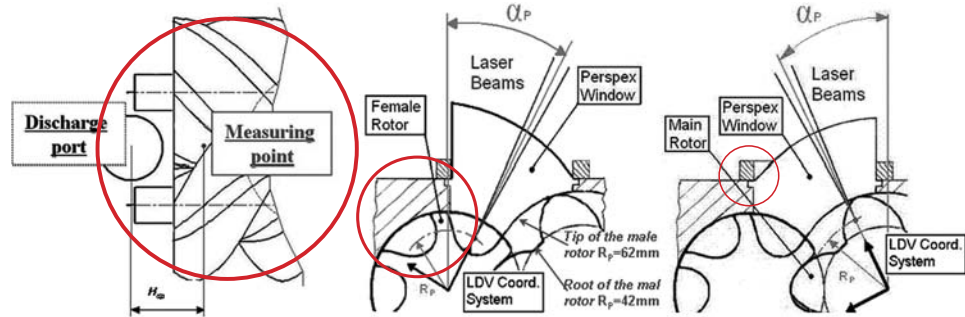
V

valves
VAV equipment
vibration & noise control

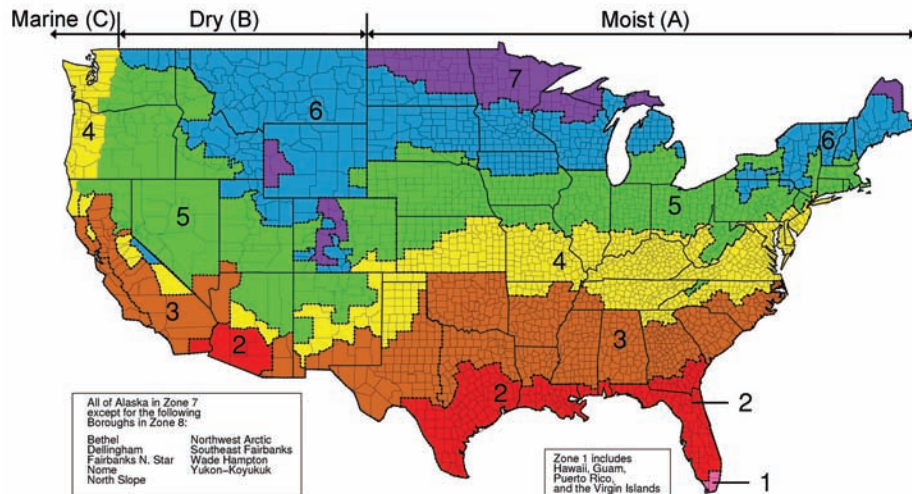
W

warehouse refrigeration
water heaters
water treatment

“Figures to be reproduced in black and white should use **patterns** or **shapes** to distinguish sections instead of coloring and shading.”



“Figures to be reproduced in color should have **touching colors that differ significantly** so that there can be no confusion in understanding the data.”



Sample Table

Table 1. Review of the Research on the Two-Phase Heat Transfer at Micro Scale

Researcher	Working Liquid	Dimension of the Channel	Single/Array of Microchannel(s)	Heat Transfer Coefficient, $W/(cm^2/K)$
Munkejord et al. (2002)	Peopane	63–155 μm	Array of microchannels	7.1 ~ 8.4
Cuta et al. (1996)	Water	Width: 100~300 μm Depth: 1 mm	Array of microchannels	1 ~ 2
Darabi and Ekula (2003)	HFE-7100		Single channel	1.8
Qu and Ma (2002)	Water	About 10 μm	Single channel	25
Brooks et al. (1999)	Water	Width: 50~200 μm Depth: 0.5~3 mm	Array of microchannels	25 W/cm^2 (heat flux)
Park and Lee (2003)	Water	150 μm	Single channel	1.4
Tran et al. (1996)	R-12	2.46 mm	Single channel	0.2 ~ 1
Bao et al. (2000)	R-11	1.95 mm	Single channel	0.7~1.4
Bao et al. (2000)	R-123	1.95 mm	Single channel	0.5~1.4
Lin et al. (2001)	R-141b	1.1 mm	Single channel	0.2~0.6
Lazarek and Black (1982)	R-113	3.1 mm	Single channel	0.7-1.1
Wambsganss et al. (1993)	R-113	2.92 mm	Single channel	0.1~0.5

PERFORMANCE EVALUATION FUNCTION

First Level

The performance of any air-conditioning system depends on two factors:

- a. thermal comfort
- b. energy consumption

Second Level

Thermal Comfort

The most important variables that influence the condition of thermal comfort are air temperature, water vapor pressure in ambient air, relative air velocity, mean radiant temperature, activity level (heat production in the body), thermal resistance of the clothing, and purity of the air. Fanger (1970) defined a thermal sensation index by considering air temperature, water vapor pressure in ambient air, relative air velocity, mean radiant temperature, activity level, and thermal resistance of the clothing. PMV is the thermal sensation index given by Fanger (1970) and is internationally standardized. It is easy to use PMV when controlling an air-conditioning system because PMV is an index of human thermal sensation with one value for all seasons and is effective for all temperatures that are neither extremely high nor extremely low. PMV ranges from -3 (cold) to $+3$ (hot). When PMV is zero, then thermal sensation will be neutral, i.e., neither cold nor hot. Broadly speaking, when PMV approaches zero then thermal comfort increases.

The first term on the right-hand side of Equation 14 indicates the mass of moisture in the incoming air, which comes in contact with the evaporator wall, and the mass of moisture in the outgoing air. The humidity of the incoming air is calculated from a psychrometric chart with the help of the second-order curve-fitting method. The multiplying factor, $(1 - b)$, corresponds to the bypass factor of the evaporator. The second term amounts to mass of moisture in the incoming air bypassed through the evaporator and the mass of moisture in the outgoing air. The multiplying factor b corresponds to the bypass factor of the evaporator. The rate of change of specific humidity of supply air when the evaporator wall temperature is more than the dew-point temperature is given by

$$(\rho_a V_d) dW_s / dt = v \rho_a ((1 - \xi) W_3 + \xi W_0 - W_s) . \quad (1)$$

The first two terms on the right-hand side of Equation 15 correspond to absolute or specific humidity of incoming air, and the third term corresponds to outgoing supply air humidity.

Specific Humidity of Thermal Space. The rate of change of the specific humidity of the thermal space is given by

Third Level

ASHRAE Authors' Manual

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ASHRAE requires previously [unpublished papers](#) in all its publications. Prior publication of technical papers in publications that are indexed or widely available from retrievable sources (including *ASHRAE Journal* and *HVAC&R Research*) usually precludes consideration for presentation at Society meetings or publication in *ASHRAE Transactions*.

Commercialism Policy (Recent as of March, 2 2009)

Commercialism is the inclusion of visual, apparel, written, or verbal references to any organization for the promotion or commercial advantage of that organization or the commercial disadvantage of a competing organization.

The Conferences and Expositions Committee will strictly enforce this policy for ASHRAE papers, presentations, and/or research documentation at the ASHRAE Winter and Annual Conferences.

What Is Not Allowed

- a. References or displays of trade names, logos or products provided by an HVAC&R related **commercial organization**, except as allowed in part (b) below.
- b. Inference that **ASHRAE** approves or endorses any product, software or system for any reason, even if the product, software or system complies with an ASHRAE standard.
- c. Copies of papers or portions thereof, draft position papers or recommendations, brochures, or other information SHALL NOT be made available at ASHRAE transaction sessions, seminars, or forums.

What Is Allowed

- d. First slide or presentation **introductions**.
- e. Bibliographies shall be restricted to the last slide or closing remarks.
- f. Research, programs, case studies, statements, policy, and/or legislation from any organization may be **referenced** only in order to maintain presentation clarity and relevance. Research, programs, policy, legislation or name of organizations, software, government agencies and government-sponsored agencies may be **referenced** only in order to maintain presentation clarity and relevance. **Reference** to Universities, Research agencies, Government agencies, Government-sponsored agencies, and/or non-profit organizations shall be allowed as long as the reference is non-biased in nature, germane to the focus of the publication/presentation, and does not imply an ASHRAE endorsement of a product and/or service.
- g. The **names** of computer hardware, computer software, operating systems, browsers, word processing programs, spreadsheets, presentation programs, etc.
- h. Trade or company names and/or logos of **historical nature** may be allowed.
- i. Trade or company names and/or logos **NOT related** to the HVAC&R industry may be allowed.
- j. Specific **reference** may be made to industry-related standards, test methods, and codes.
- k. Make, model or sole source of critical test instrumentation, engineering software, reagents or apparatus may be identified as a footnote, so that others may duplicate the testing.
- l. The last **slide** may contain your name.

Policy Enforcement

- m. The Conferences and Expositions Committee coordinates the **review** of all papers prior to publication or presentation. Nonconforming items within the audio-visual material will be deleted from the material or the material will not be allowed to be shown at the presentation.
- n. The **technical programs** Issues Updates Seminar and Public Session are not reviewed for commercialism since they are subject to current topics of general interest.
- o. Exemptions for special cases will require the written approval of the Program Committee Chair prior to the start of the Annual or Winter Conference.

Below are steps for converting figures created in Microsoft Excel into .TIF files. For additional information see [Formatting Figures](#).

1. In Excel, select the chart or graph to be converted.

If using Excel 2007:

- From the menu options select “Copy.”

If using an older version of Excel:

- Hold down the Shift key and from the menu options select “Edit.”
- Choose “Copy Picture” from the drop-down Edit menu.
- Select “As shown when printed,” then “OK.”

2. Minimize Excel; open PowerPoint.

3. *If using PowerPoint 2007:*

- On the Home tab, click “layout” and choose “blank.”
- Before you paste anything, from the PowerPoint menu options, under the Design tab, select “Page Setup.”
- In Page Setup, set 32 in. width and 24 in. height or 24 in. width and 32 in. height.
- Choose “OK.”
- From the PowerPoint menu options, choose “Paste.”

If using an older version of PowerPoint:

- Choose “Blank Presentation,” then “OK.”
- Choose the icon showing a completely blank slide (or page).
- Choose “OK.”
- Under the File menu options, choose “Page Setup.”
- In Page Setup, set 32 in. width and 24 in. height or 24 in. width and 32 in. height.
- Choose “OK.”
- From the PowerPoint menu options, choose “Edit, Paste Special.”
- Choose “Picture (Enhanced Metafile).”

4. Select the image you pasted into PowerPoint. When you click on the image, it will show small squares on all four corners. These are handles. Hold down the shift key and ***use the corner handles only*** to resize your image. (**Using the corner handles to adjust size maintains the proper proportions.**)

5. Under the File menu option, choose “Save As.”

6. In the “Save As” dialog box, choose “Tag Image File Format (*.tif, *.tiff)” from the Save As Type drop-down list. Give the file a name and click “Save.” PowerPoint will ask if you want to save all slides or the current slide only; choose to save the current slide.

Below are steps for converting figures created in Microsoft Word into .TIF files. For additional information see [Formatting Figures](#).

1. In Word, select the image to be converted.
2. *If using Word 2007:*
 - From Word's menu options, choose "Copy."*If using an older version of Word:*
 - From Word's menu options, choose "Edit," then "Copy."
3. Minimize Word; open PowerPoint.
4. *If using PowerPoint 2007:*
 - On the Home tab, click "layout" and choose "blank."
 - Before you paste anything, from the PowerPoint menu options, under the Design tab, select "Page Setup."
 - In Page Setup, set 32 in. width and 24 in. height or 24 in. width and 32 in. height.
 - Choose "OK."
 - From the PowerPoint menu options, choose "Paste."*If using an older version of PowerPoint:*
 - Choose "Blank Presentation," then "OK."
 - Choose the icon showing a completely blank slide (or page).
 - Choose "OK."
 - Under the File menu options, choose "Page Setup."
 - In Page Setup, set 32 in. width and 24 in. height or 24 in. width and 32 in. height.
 - Choose "OK."
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Indent **items in a list**, preceded by a number and period.

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Separate items in a list within text using numbers in parentheses.

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Journal Article

Arun, M., and E.G. Tulapurkara. 2005. Computation of turbulent flow inside an enclosure with central partition. *Progress in Computational Fluid Dynamics* 5:455–65.

Standards

ASHRAE. 2001. *ANSI/ASHRAE Standard 52.2-2001, Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size*. Atlanta: American Society of Heating, Air-Conditioning and Refrigeration Engineers, Inc.

ASHRAE Handbook

ASHRAE. 2005. *2005 ASHRAE Handbook—Fundamentals*. Atlanta: American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.

Book

Axley, J. 2006. *Ventilation Systems: Design and Performance*, 2nd Ed. Chapter 4.3, Macroscopic methods. H.B. Awbi, ed. London: Taylor & Francis Books, Ltd.

Report

Emmerich, S. 1997. Use of computational fluid dynamics to analyze indoor air quality issues. Report NISTIR 5997, National Institute of Standards and Technology, USA.

ASHRAE Transactions

Chen, Q., and Z. Jiang. 1992. Significant questions in predicting room air motion. *ASHRAE Transactions* 98(1):929–39.

Conference Proceedings

Dhinsa, K., C. Bailey, and K. Pericleous. 2005. Turbulence modelling for electronic cooling: A review. *Proceedings of the 7th International Conference on Electronics Materials and Packaging, Tokyo, Japan*, 5:275–81.

Software

LBNL. 1993. DOE-2, Version 2.1E. Lawrence Berkeley National Laboratory, Berkeley, CA.

Seminar or Presentation at a Conference

Lu, D.W., X.N. Xu, H.B. Wu, and X. Jin. 2005. A permanent magnet magneto-refrigerator study on using Gd/Gd-Si-Ge alloys. First International Conference on Magnetic Refrigeration at Room Temperature, September 27–30. Montreux, Switzerland.

Internet

Rice, K. 2006. DOE/ORNL heat pump design model, Mark VI Version. www.ornl.gov/~wlj/hpdm/MarkVI.shtml.

Personal Communication

Zimm, C.B., V.K. Pecharsky, K.A. Gschneidner, Jr., S.A. Nikitin, and A.M. Tishin, with Astronautics Inc., Madison, WI. Telephone conversation with the author, April 17, 2006.



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