The aim of this study was to evaluate the present ASHRAE Standard 55-92 draft criteria and to describe how air movement is perceived at thermal sensations slightly cooler and slightly warmer than neutral. At temperatures 18°C, 20°C, 23°C, 26°C, and 28°C (64.4°F, 68°F, 73.4°F, 78.8°F, and 82.4°F), 40 subjects at slightly cool, neutral and slightly warm overall thermal sensation were exposed to air velocities that were increased step-by-step from less than 0.1 m/s to 0.8 m/s (19.7 fpm to 157.5 fpm). Subjects who felt cool or slightly cool perceived air movement as being uncomfortable at lower air velocities than did subjects feeling neutral or warmer. No difference in draft sensitivity between subjects feeling neutral, slightly warm or warm was observed. A smaller percentage of subjects were dissatisfied due to draft than prescribed by ASHRAE Standard 55 guidelines on air movement. The discrepancy could be explained by the effect of thermal sensation and activity level on draft sensitivity. Permissible mean air velocities as recommended by the standard thus provide a conservative upper limit for air velocity that protects occupants who are sensitive to air movement, occupants who feel cooler than neutral or occupants who are occupied mostly with sedentary work. To accommodate all occupants in a given indoor environment, it is therefore recommended that air movement generated by the HVAC system be designed according to the criteria in the current Standard 55 to minimize complaints of draft. To provide comfort for occupants who prefer more air movement, local air movement under individual control is easy to generate, e.g. by a desk fan.

General information
Publication status: Published
Organisations: Department of Mechanical Engineering
Contributors: Toftum, J., Melikov, A. K., Tynel, A., Bruzda, M., Fanger, P. O.
Pages: 187-202
Publication date: 2003
Peer-reviewed: Yes

Publication information
Volume: 9
Issue number: 2
ISSN (Print): 2374-4731
Ratings:
Scopus rating (2003): SJR 1.055 SNIP 1.28
Web of Science (2003): Indexed yes
Original language: English
Source: orbit
Source ID: 25508
Research output: Contribution to journal › Journal article – Annual report year: 2003 › Research › peer-review