CBE Thermal Comfort Tool

(The tool was developed University of California Berkeley)

Where to get it, and learn about it

The tool can be found at:
http://cbe.berkeley.edu/comforttool

A better place to start is the CBE website, where you can see descriptions and videos of the tool, and link to the tool itself on the right side "Use the Tool"
http://www.cbe.berkeley.edu/research/thermalf tool.htm

A flyer for the tool is on the 2nd page of this document (note that the interface has been updated in the meantime, but the functionality remained the same).

What is it

The new CBE Thermal Comfort Tool is a web-based graphical user interface for predicting thermal comfort according to ASHRAE Standard-55, and includes the standard PMV/ PPD model for conventional building systems, and the adaptive comfort model for naturally ventilated buildings. Both models include the opportunity for elevated temperatures with increased air speeds (for example, when using fans for cooling).

Although the tool is very simple and intuitive and users can likely jump right in and start playing around with it, the CBE website has several video tutorials to provide an overview of the tool's features.

Some of the advantages of this tool compared to the ASHRAE Thermal Comfort Tool are that it is free, cross-platform, and provides a visual and highly interactive and accurate representation of the comfort zone. It has an improved method for applying for the ASHRAE Standard 55 Elevated Air Speed model. It's also important to note that ASHRAE Standard 55 is a continuous maintenance standard, which means that every approved addendum becomes immediately part of the official standard. As a web application, the updates driven by new addenda can be easily deployed and do not oblige the user to update the tool. Finally, it also includes a feature where it automatically generates compliance documentation for LEED thermal comfort credits.

CBE Thermal Comfort Tool for ASHRAE-55

- Web-based tool for thermal comfort calculations
- Compliance with ASHRAE 55-2010 Standard
- Dynamic visualizations of comfort conditions
- PMV/PPD, SET and adaptive methods
- Custom clothing creation and activity table
- LEED documentation creation for IEQ credit
- Local discomfort assessment
- User help and links to Wikipedia

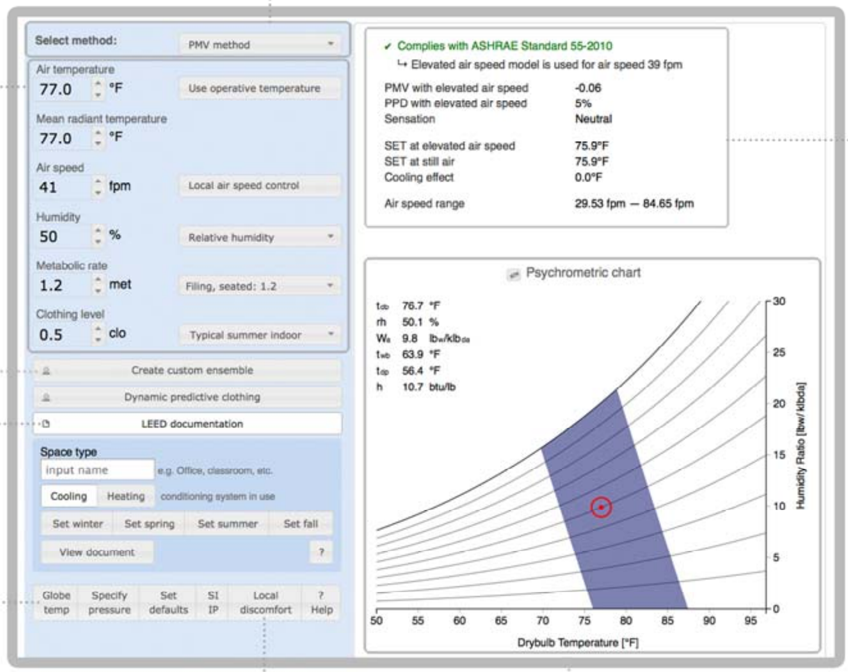
cbe.berkeley.edu/comforttool

Input variables

For the PMV/PPD method six primary factors affect thermal comfort.
In this section the user can input such parameters for the calculations.
For the adaptive method, the two main variables are operative temperature and prevailing mean outdoor temperature.

Select method

The PMV/PPD method can be used for typical indoor environments to verify the compliance with Standard 55.
The adaptive method can be used for occupant-controlled and naturally ventilated buildings.



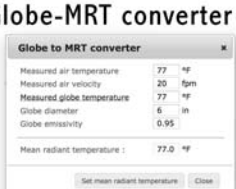
Clothing creator

LEED documentation

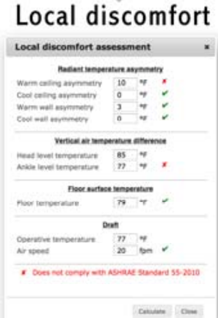
Compliance section

General compliance with the standard is shown in this section of the tool.
For the PMV/PPD method it reports: PMV and PPD indexes, thermal sensation, SET values, the cooling effect and the allowed air speed range if elevated air speed is used.
For the adaptive method it shows: the operative temperature ranges for 80% and 90% acceptability.

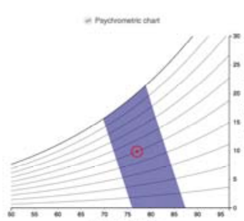
Globe-MRT converter

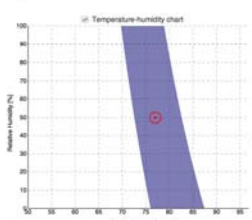


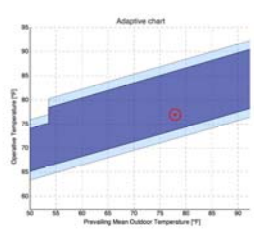
Local discomfort



Dynamic visualizations







PMV/PPD method:
The comfort zone displayed in blue represents the combination of acceptable air temperature and humidity values according to the standard, given the other four parameters that affect thermal comfort. In particular, the comfort boundary contains the conditions with PMV between -0.5 and +0.5, representing 90% of satisfied people in the space.
The red dot represents the air temperature and humidity values in the inputs.

Adaptive method:
The comfort zones displayed in blue represent the 80% and 90% ranges of satisfied occupants, i.e. the acceptable combinations of indoor operative temperature and prevailing mean outdoor temperature.
The red dot is the input condition, which complies with the standard if it is found within the 80% range.

CBE Thermal Comfort Tool for ASHRAE-55 developed by:
Tyler Hoyt, Stefano Schiavon, Alberto Piccioli, Dustin Moon, Kyle Steinfeld

CENTER FOR THE BUILT ENVIRONMENT
UNIVERSITY OF CALIFORNIA, BERKELEY
cbe.berkeley.edu