

memo

HSU Environmental Resources Engineering

From: Zach Kirchman
Date: 11/15/2016
Re: Carbon Dioxide ventilation

Purpose: The purpose of this experiment was to measure the ventilation rate of an HSU dorm room after it had been filled to the recommended capacity of 1500 ppm (parts per million) of CO₂. There were 6 people in the room when we started the experiment.

Discussion: In the 8'x11'X13' dorm room, our group was told that we could expect to fill the room to capacity in about 15 minutes. Our HOBO meter (the device we used to measure ppm of CO₂) showed 1600 ppm CO₂ after about 22 minutes. Once we reached our maximum recommended concentration all of us quickly left the room and shut the door to allow the CO₂ to escape the room. We waited about 45 minutes for the dorm room to air out and we grabbed our HOBO meter and left to retrieve the results.

After retrieving the data for our analysis, our group discovered that, without the windows open or the air conditioning on, the ventilation rate is .26/h which translates to the air circulating 100% once every four hours.

Analysis: Based on the data our HOBO meter logged, the ventilation rate for the dorm room we tested is very poor. The room is very well insulated with little draft. To put this into context, if a volatile chemical (which typically takes 3 times as long to ventilate out of the room) was introduced, then the inhabitants of the room would have to open the windows and leave the room for approximately 11 hours before the chemical completely left. To ensure that the CO₂ the inhabitants were breathing ventilated quicker than they breathed, the students should keep the air conditioning on at all times.