

Bentall finds the comfort zone for its tenants

Application Note



Air Quality Case Study

At the Bentall 5 office building complex in Vancouver, BC checking on the day to day health of the air quality and heating and cooling systems is a full time job for maintenance technicians. In recent months, Operations Manager Ian Thomson and his team have decided to explore better ways to get the job done. So they've started working with the Fluke 975 AirMeter® test tool to perform a variety of indoor air monitoring functions.

This device combines five test tools in one to measure temperature, velocity, humidity, CO₂ and CO. Thomson says that kind of versatility comes in handy given that his maintenance staff of 15 has to cover 2 million sq. ft. of space in a five-tower office complex that houses more than 200 tenants. "They have to deal with everything from heavy equipment maintenance and lights, to addressing complaints about air quality and HVAC systems. I'd say up to 70 percent of their role is dedicated to ensuring client comfort."

As part of the company's core policy, the team performs air quality testing on a continuous basis in randomly selected areas throughout the complex. The results from these are recorded on a weekly basis for auditing purposes. Test equipment is also used to provide static seven-day recordings of designated areas when required, as well as for testing sections of the complex when they received a complaint from an occupant.

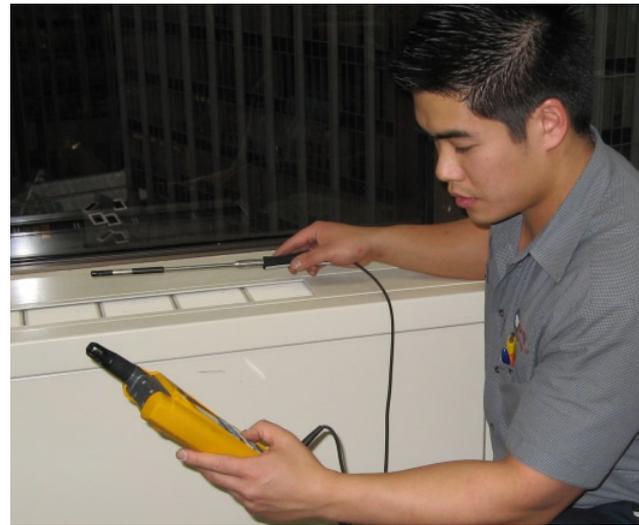
"When a tenant complained, a technician would have to plug the old test device in at the location and leave it there to record readings," explains Thomson. "We were pretty much operating in a reactive mode. On top of that, the test equipment we had was fragile and cumbersome. In many cases we weren't able to make accurate measurements on the spot so ended up manually 'tweaking' equipment with a screwdriver until we got the right setting."

Tools: Fluke 975 Air Meter® test tool

Tester: Bentall 5 Operations Manager, Ian Thomson

Tests: Air quality and comfort (temperature, humidity), HVAC balancing (pressure, velocity, % outside air)





Bentall technician Kerry Cheung taking air velocity measurements.

With the Fluke 975 however, team members have a much more portable, rugged tool that makes these day-to-day tasks easier and much more efficient says Thomson. "This meter has the potential to do all the jobs we need, from on-the-spot testing to general maintenance tasks."

For example, a team member can record detailed balancing specifications (air velocity and flow rates, pressure drop and % outside air), for equipment so they can see if everything is working the way it should and make the appropriate adjustments. "We no longer have to make crude adjustments and use reverse engineering to fix a problem based on minimum/maximum readings alone," says Thomson. "We can have a calculated value that allows us to adjust heating and cooling systems with accuracy. It's like adjusting the volume on your TV. Instead of just pressing the button until it sounds right, you get the numbers to tell you what your actual volume levels are."

Bentall technicians currently have three Fluke 975s in inventory that are shared by the technicians. "The 975 has improved the ability of anyone on a call to get more information respond more quickly," says Thomson. "Sometimes a complaint about air conditioning may not require fixing. It might be just a comfort issue for the tenant. But if something is broken, we know right away because we can test things with more finesse and get the information we need to accelerate a resolution."

Accurate testing can also help to remove the strain from a tense situation if occupants are off the mark with their assessment of a heating or cooling situation. "If someone has 35 people in a room for example, we'll get a complaint that the air conditioning is not working," explains Thomson. "With the Fluke 975 we can immediately test the temperature and air quality and demonstrate that everything is within the accepted range. Knowing that takes away the tension when dealing with tenants."

Thomson adds that more efficient air quality testing is especially important for building management in an age where energy efficiency is top of mind. Bentall is a part of the Building Owners and Managers Association's 'Go Green' program, a national environmental recognition and certification program for existing commercial buildings. Among other benefits, accurate testing allows the technicians to see if systems are running past occupancy hours and adjust HVAC settings accordingly. "If a space is empty after 6:00, we can pull back on the air conditioning [or heating] for those hours and save a lot of energy costs," says Thomson.

Although testing out the Fluke 975 is still in its early stages, Thomson is pleased with the results to date. "We're just really getting a handle on using it. When I first saw it in an engineering magazine, I recognized it had good potential. Almost right away we noticed that it could deliver on its promises."

He adds that if all goes well—and by all reports it's so far so good—Bentall will be stocking up on more Fluke 975 units. "If the memory is long enough, the tool is robust enough and it's as idiot proof as it seems, I'd like to see everyone on the team with one."

Building diagnostics applications

Building diagnostics involves identifying and troubleshooting anomalies throughout the building, which can affect overall performance. A number of separate yet inter-related conditions should be checked on a regular basis to identify potential problems in the way the building or its systems are operating. Following are some key areas to consider:

Moisture intrusion – Moisture in joints and cracks can lead to structural rot and mold. A thermal imager can be used to locate areas of accumulated moisture. Where mold is suspected, a temperature humidity meter can determine whether suspected areas have fallen below dew point levels.

Heat loss – The quality of insulation inside the building, as well as cracks or breaks in building seals can lead to significant heat loss. An infrared thermometer can be used to scan along ceilings, floors, walls, windows, doors, vents and pipes to pinpoint problem areas. A thermal imager will help to locate specific sources of heat loss.

Indoor air quality – Required measurements for IAQ include air temperature, relative humidity, airborne particle concentrations, and levels of CO₂ or carbon monoxide gases. Temperature, humidity and ventilation levels can be checked using an indoor air quality meter. A particle counter measures will confirm

if indoor air particulate levels are less than outdoor levels. An air flow meter measures the pressure and movement of air within the building to locate leaks in ducts as well as malfunctioning ventilation and exhaust systems.

Furnaces and boilers – A variety of measurements are required when inspecting heating system performance. A true-rms HVAC clamp meter will verify that flue gas temperatures are within acceptable ranges. An indoor air quality meter will identify excess levels of CO₂ and harmful carbon monoxide in the area around boilers and furnaces. A thermal imager can be used to scan the furnace or boiler exterior for hot spots.

HVAC system performance – For greater efficiency and extended equipment life, it is important to verify the proper operation of building HVAC systems. A thermal imager or infrared thermometer will locate hot spots on operational components, while a true-rms clamp meter can be used to check electrical connections.



Thermal Imagers are becoming indispensable for identifying airflow and moisture problems and air leaks by their tell-tale changes in temperature. By using a thermal imager to scan a building, techs can quickly zero in on problem areas and then investigate further with other tools.



Many HVAC techs are finding that logging power usage of HVAC systems gives them the data they need to convince clients to upgrade to new, more efficient systems. This tech is using the Fluke 1735 Power Logger.

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1/2008 3239565 A-EN-N Rev A