



Issue Reported

Excessive moisture is often an unintended consequence of increased energy codes, high performance building design and tighter construction.

Type / Construction

Multifamily Housing- New Construction

Location

Lexington, NC

Notes

Conventional split-system air conditioners operate based on sensible temperature input and do not take into account moisture content of the air inside apartments. Tighter building envelopes and oversizing of ACs mean shorter run cycles leading to higher concentrations of moisture which can result in visible mold growth

Background

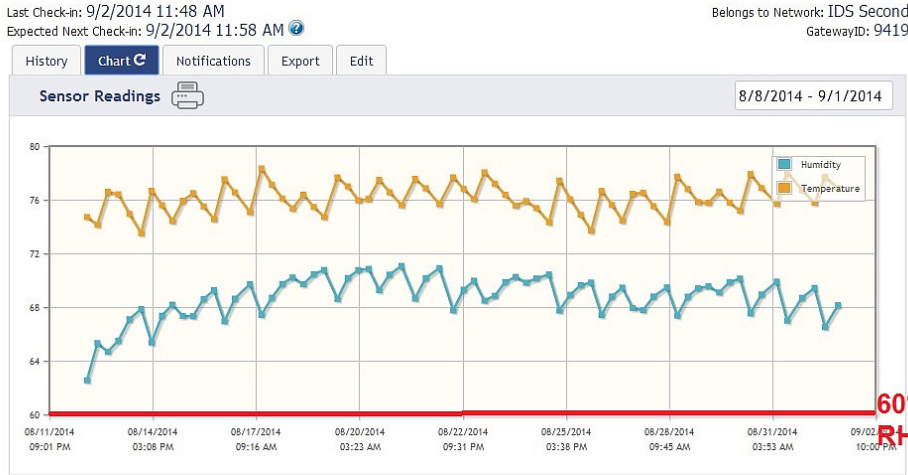
An affordable housing developer in the Southeastern United States reported various levels of moisture-related issues throughout newly constructed apartments in a property built in Southern Pines, North Carolina. An investigation into the causation of visible mold growth led to the conclusion that occupant behavior combined with a tighter building envelope and reduced air conditioning run cycles were causing mold. This led to the design of the IW-25 in-wall dehumidifier.

Purpose

The purpose of this case study was to demonstrate the impact of supplemental dehumidification used in conjunction with a conventional air conditioning system and compare that with the performance of an air conditioning system being operated alone and without the benefit of a dehumidifier. The IW-25, stand-alone dehumidifier was used.



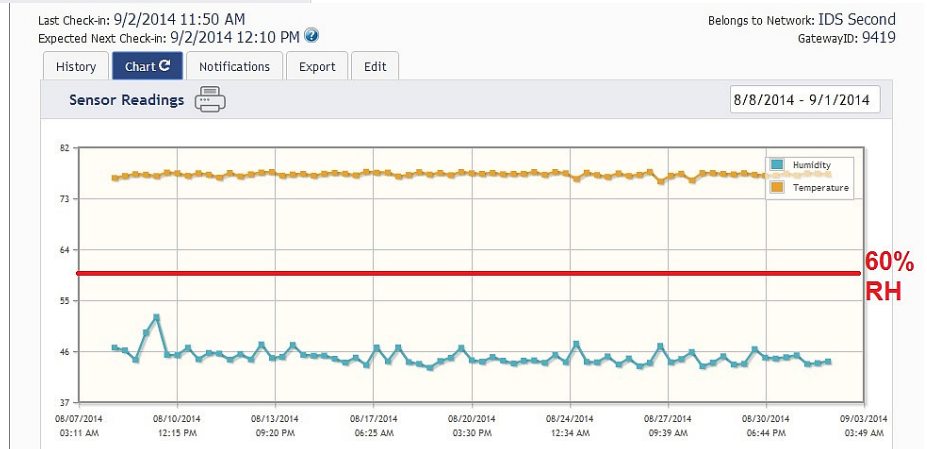
UNIT 210 - UNOCCUPIED



- 1.5 ton split system air conditioner; thermostat set to 76 degrees
- No IW-25 (supplemental dehu)
- Unoccupied apartment meaning no internal moisture generation present
- Temperature range of 74-78 degrees
- Average RH relative humidity 67-71% (max. recommended RH should always remain below 60%)

UNIT 416- OCCUPIED

- 1.5 ton split system air conditioner; thermostat set to 76 degrees
- IW-25 in-wall dehumidifier installed and set to RH of 45%
- Occupied unit producing additional moisture from normal activities
- Average temperature 76-77 degrees
- Average relative humidity 45-47%



Conclusion

The results of this study demonstrate the profound impact of supplemental dehumidification when used in new construction multifamily housing. The conclusion clearly shows how the AC system without the benefit of the IW-25 struggles to maintain a consistent temperature as a result of the latent (moisture) load inside the unoccupied apartment while the system working in conjunction with the IW-25 maintains a steady temperature range; thus proving a reduction in moisture as well as the energy load on the AC.

NOTE: Most residents see a reduction in AC usage as a by-product of the Apparent Temperature Equivalent whereby people experience comfort at a higher sensible temperature when humidity is lower.