



Green Flag:

At the end of this month INDYCAR marks their 100th running of the Indianapolis 500 which is often referred to as the "Greatest Spectacle in Racing" (some of us probably feel our business is the great spectacle as the AC season race starts). Rawal Devices' is reminded of how humidity can cause more than tenant discomfort; it can destroy a manufacturing company's production. Specialty applications and the auto manufacturing industry is a great example of how lack of humidity control can rust away profits!

Yellow Flag:

Car manufacturers have controlled facilities to test and develop their parts to withstand rigorous conditions, but the wrong conditions in the facility itself can present a major risk. For example, if a development facility's lab shows high humidity conditions, the parts being tested inside could rust, and within minutes! Rusted parts means a manufacturer loses time and money on both the scrapped parts and the associated labor costs.

One such INDYCAR manufacturer experienced said condition; they found that the relative humidity exceeded 80% in a small space that was serviced by a 3 ton packaged unit. Further investigation showed that the humidity levels were disproportionately high due to the fact that the area outside of (surrounding) the lab was also being cooled but had considerable infiltration as a result of regular space use as an auto shop, including exhaust systems and regularly open overhead doors. Sensible load on the systems serving the lab space was very low leading to very short runtimes and the inability of the system to remove humidity building up in the lab. The lab space also lacked a vapor barrier to keep humidity infiltration to a minimum. As a result the high humidity (latent load) of the surrounding shop area had an additional impact on the lab.

Checkered Flag:

The initial solution suggested starting with the installation of the Rawal Devices, Inc. APR Control on the direct expansion (dx) refrigeration circuit of the 3 ton package unit. The APR Control would extend the run time of the basic air conditioning equipment while maintaining the evaporator coil below dewpoint, thereby improving the humidity level in the space.

The APR Control that was used was capable of providing approximately 1.75-2 tons of modulation, or the equivalent of around 60-65% modulation of the total system capacity, from 3 tons down to around 1 ton at low load conditions, which resulted in a more responsive system.

Reduced airflow allowed the relationship of latent to sensible capacity of the air conditioning unit's evaporator coil (normally around 70/30) to be increased closer to 50/50. By installing and adjusting the APR Control for system capacity modulation, as well as introducing a percentage of fresh air to positively pressure the space, the issue has been resolved. The relative humidity in the test lab does not exceed 55% RH, and ranges from 47%-53% thanks to a wall-mounted humidistat, which gives the machine shop confidence that the failure rate is no longer in question.

The APR Control provided efficiencies and savings through all phases of lab operation for this auto part manufacturer, including labor costs, maintenance, energy savings, and quality assurance.