SEAD Webinar: Low-GWP Refrigerants and Efficiency

October 30, 2014

SUMMARY

There are low-GWP alternative refrigerants and corresponding systems that can be engineered to give acceptable safety and performance (energy efficiency and capacity) comparable to the current leading refrigerants in various applications. Deviations in the performance of alternative refrigerants are not so great that wholly new systems need to be developed. However, many of the leading alternatives being considered are mildly flammable, so may need additional codes/safety standards and training of technicians for maintenance.

Q1: Is the R-32/R152a blend shown on the slide titled "Example of Test Results in Phase 1: Residential HPs" the same as the R32/HFO blend known as DR-5?
A1: No, DR-5 is an R-32/R-1234yf blend. The composition of the refrigerants tested are shown on slides 15–18.

Q2: Were the tests limited to non-hydrocarbon, patented compounds?
A2: No, hydrocarbons such as R1270 were also tested. Many hydrocarbons are tested and results publicly available as part of the literature review conducted by the AREP. For example, Lennox Industries performed tests on hydrocarbon R290 some years ago and published the results. The list of reviewed literature is available on the AREP webpage here.

Q3: Will there be a conference to publish the results of Phase 2 of the AREP, similar to Phase 1?
A3: Yes, AHRI is tentatively planning to hold such a conference in mid-2015.

Q4: I get the importance of COP (or energy efficiency). Why is cooling capacity also important?
A4: Higher capacity means the compressor can be designed with lower displacement and will therefore show improved efficiency. The reverse is also true. Results should be understood in that light.

Q5: Do the results imply that R1234yf performs better than R410A at higher ambient temperatures than were tested?
A5: Yes, R1234yf is "happier", i.e., performs inherently better, at higher ambient temperatures, and the lines for R1234yf and R410A will cross at higher ambient temperatures, which is why R1234yf is used in mobile air-conditioning.

Q6: Is there a public list of the refrigerants that are moving forward with ASHRAE designation?
A6: Yes, this information is available from ASHRAE. However, note that receiving ASHRAE designation does not necessarily mean that a refrigerant is further along the path to commercialization as a refrigerant can be listed but never used commercially.

Key Resources:

- Webinar background and agenda (PDF)
- Webinar presentation slides (PDF)
- AHRI Low-GWP Alternative Refrigerants Evaluation Program (AREP) webpage