HFC410A—BEST ALTERNATIVE TO HCFC22 IN RESIDENTIAL AND LIGHT COMMERCIAL PRODUCT

Souhel Stanbouly, Group Leader, Applied Research Department,
Lennox Industries Inc., Carrollton, Texas, USA

ABSTRACT

This is an overview of information, developed from many sources, in the search for a good replacement for the dominant refrigerant used in residential and light commercial air conditioners, HCFC22. The Montreal Protocol proscribes a phase-out timetable for HCFC22. 2010 is the phase-out deadline for HCFC22 in newly manufactured equipment. A variety of potential alternatives have been evaluated. An important consideration in the evaluation of alternates is the potential climate impact of their use. The Life Cycle Climate Performance (LCCP) is a measure of potential climate impact that takes into account the direct release of refrigerant plus the indirect energy impact of the refrigerant's use upon greenhouse gas emissions. The LCCP's of the following candidate HCFC22 replacements are compared: HFC407C, HFC410A, propane and carbon dioxide. It is evident that, with respect to greenhouse gas emissions, the indirect energy impact is many times larger than the direct release effect. The efficiency potential of these different refrigerants turns out to be doubly important. Other important characteristics, such as flammability, toxicity and cost, are also reviewed. Residential and light commercial air conditioning and heat pump products using HFC410A are becoming widely available and some are setting benchmark efficiency levels.