

CO₂ as a refrigerant

Researchers at Purdue University, the United States, are making progress in perfecting automotive and portable air-conditioning systems that use carbon dioxide (CO₂) as a refrigerant. Some of the latest developments in this field include:

- Creation of the first computer model that accurately simulates the performance of CO₂-based air-conditioners. The model could be used by engineers to design air-conditioners that use CO₂ as a refrigerant.
- Design and construction of a portable CO₂-based air-conditioner that works as well as conventional military “environmental control units”. Thousands of these units, which now use environmentally harmful refrigerants, are currently in operation. The CO₂ unit was designed using the new computer model. A prototype has been built by Purdue engineers and is currently undergoing tests.
- Development of a mathematical “correlation,” a tool that will enable engineers to design heat exchangers – the radiator-like devices that release heat to the environment after it has been absorbed during cooling – for future CO₂-based systems. The tool, developed at Purdue, helps engineers to determine how large a heat exchanger needs to be to provide cooling for a given area.
- Development of a new method, which helps engineers to predict the effects of lubricating oils on the changing pressure inside CO₂-based air-conditioners. Understanding the drop in pressure caused by the oil, which mixes with the refrigerant and lubricates the compressor, is vital to determine how well an air-conditioner would perform.

(Website: <http://www.gnet.org>)