Car Air Conditioner Compressor Division

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The Compressor Technology Department's product development-related environmental initiatives include efforts to improve vehicle fuel efficiency and prevent global warming during air conditioner use as well as the measures listed below aimed at reducing environmental impact.
1. Energy conservation: Developing more compact, lightweight products; promoting the standardization of parts and products; reusing materials; extending product life; and making products easier to recycle
2. Enhancing energy efficiency: Reducing CO_2 emissions by promoting energy-efficient manufacturing practices and making products more energy-efficient during operation
3. Reducing environmental impact: Complying with laws and regulations related to hazardous and restricted substances and taking steps to cut emissions of these substances as well as working to reduce CO_2 emissions associated with the use of HFC refrigerants, which contribute to global warming, and energy use during product operation
We have made product assessments a mandatory part of the design review process in product development and are using these assessments as a tool to promote the creation of environment-friendly products.

Hybrid Compressors

Developed for use in hybrid cars, hybrid compressors comprise two compressor components-a belt-driven unit that is operated by an electromagnetic clutch and powered by engine torque and a motor-driven unit that is powered by an internal motor. These components can operate independently or together to leverage the respective strengths of each component and achieve required vehicle cooling capacity, enabling highly efficient operation, which, in turn, improves vehicle fuel efficiency. In addition, we are developing and manufacturing drivers to control internal motor operation.

Enhanced HFC134a Compressors

Enhanced HFC134a compressors offer reduced HFC134a refrigerant leakage and improved energy efficiency. Open compressors are driven by vehicle engine power and use shaft seals and other sealing materials from which miniscule amounts of HFC134a escape into the atmosphere, directly contributing to global warming. In addition, the engine power and electricity used to drive these compressors is obtained via the combustion of vehicle fuel inside the engine, which results in the emission of CO_2 into the atmosphere as exhaust gas, indirectly contributing to global warming. To reduce the impact of these compressors on the global environment, we are currently developing technologies and materials to minimize HFC134a refrigerant leakage from compressors as well as technologies to improve the energy efficiency of compressors.

Compressors That Use Natural Refrigerants

HFC134a is the refrigerant currently used in automobile air conditioners; however, this substance has a large global warming potential (GWP) score of 1,300 and was designated a greenhouse gas at the Kyoto Conference in 1997.

CO_2 compressors do not contribute to global warming since they use naturally occurring CO_2 as a refrigerant. However, the pressure in automobile air conditioning systems that use CO_2 as a refrigerant is approximately ten times that of systems that use HFC134a. As a result, condensation does not form on the high-pressure side of the system, making high-pressure seal technologies and new control technologies necessary. Another pending task is to leverage the outstanding performance of CO_2 refrigerant during heating.