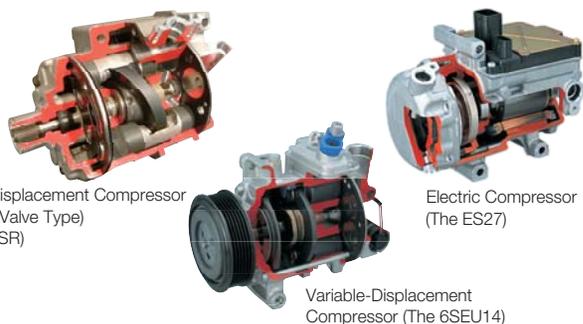




Car Air-Conditioning Compressor Business

In Pursuit of the Ultimate Lightweight Compressor—for Comfort and the Environment



Fixed-Displacement Compressor (Rotary Valve Type) (The 10SR)

Electric Compressor (The ES27)

Variable-Displacement Compressor (The 6SEU14)

Environmental Responsibilities

- To help curb global warming by reducing the level of fuel consumed during operation (low power consumption)
- To help curb global warming by preventing leaking of CFC substitutes
- To help curb global warming by conducting research into natural refrigerants that will replace CFC substitutes and by complying with refrigerant regulations in each country or region

Social Responsibilities

- To maintain and improve the reliability and durability of our products
- To improve driver comfort and fuel efficiency by making compressors more compact and lightweight and reducing noise and vibration

Innovations in Car Air-Conditioning Compressor Technology

Drivers assume that their car air-conditioning will not break down, and if the air-conditioning is not working well, it can reflect badly on the reputation of the car itself. As a specialist in compressors for car air-conditioning systems, it has been Toyota Industries' unswerving goal to ensure that its compressors continue to perform at a high level for as long as possible. Towards this end, we have pursued more power efficient, smaller and lighter compressors with reduced noise and vibration. While the compressor is an indispensable component in maintaining cabin comfort, because it uses the engine's power and is located in the front of the vehicle, the more power-efficient, compact and lightweight and the less noise and vibration it produces the better.

In terms of environmental impact, the vast majority of CO₂ emissions caused by car air-conditioning compressors over their life cycles are due to fuel consumption while the air-conditioning is operating. Compressors need, therefore, to be made more power-efficient to reduce fuel consumption.

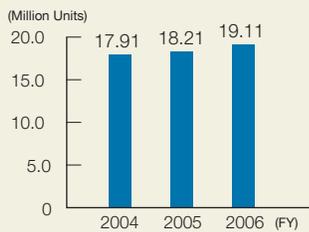
Although CO₂ emissions during the manufacture of compressors are lower than during their use, the majority of emissions that occur during the manufacture stage occur from the manufacture of materials, especially aluminium diecasts. Consequently, by making the compressors smaller and lighter, we can help to reduce CO₂ emissions from the manufacturing process. Looked at in these terms, making our products more compact and lightweight is our greatest responsibility as a compressor manufacturer both in social and environmental terms.

To achieve this, we use computer-aided engineering (CAE) to optimize basic specifications and the dimensions of each part. Specifically, we have reduced excess thickness by optimising die-cast shapes using flow analysis and shape optimization software. Other efforts to reduce the size and weight of our compressors include the development of die-casting methods to cut processing costs and increasing the number of "process-less" parts.

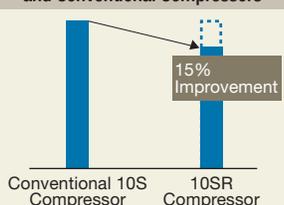
In fiscal year 2006, we developed the 10SR17 fixed-displacement swash-plate type compressor. In this model, a rotary valve is used instead of a suction valve, thus improving efficiency compared to the conventional 10S model and improving fuel efficiency by 15%.

Another important challenge is to prevent leakages of CFC substitutes (greenhouse substances), which are currently used as refrigerants. We are also pursuing a range of research and development activities, including research into natural refrigerants to replace CFC substitutes.

Sales Units of Compressors



Fuel Efficiency Comparison Between the 10SR Rotary Valve Compressor and Conventional Compressors



Topics

Compressor Plant in China Starts Production

The Chinese automobile market is expected to grow significantly in coming years, and in response to the growing demand for local procurement by automakers in China, Toyota Industries established a joint venture company, TD Automotive Compressor Kunshan, Co., Ltd, in Kunshan City, Jiangsu Province in June 2005.



In April 2006, this new company began production of variable-displacement compressors with high fuel efficiency that are supplied to Guangzhou Toyota Motor Co., Ltd for inclusion in Toyota Camry vehicles. Plans are also being made to supply the compressors to General Motors and Daimler-Chrysler.