



**Director & General Manager,  
Foundry & Aluminum Division  
Masafumi Kato**

Melting iron and aluminum and molding them into cast metal products require considerable energy, and the amount of waste generated is significant. The Foundry & Aluminum Division has been continually doing its utmost to develop and introduce new world-class technologies for iron and aluminum casting. Drawing on these technologies, the division strives to increase material utilization efficiency through recycling activities and lower the environmental impact of its operations through productivity-boosting measures.

The Foundry & Aluminum Division manufactures cast components that are used in engines, compressors, textile machinery, and other products.

Since the division's establishment, we have been accumulating sophisticated technologies for production line automation, specialized computer simulation, and the manufacture of components characterized by high levels of precision and lightness. Our ability to manufacture cast products featuring superlative rigidity and precision provides a solid foundation for the supply of numerous superior products.

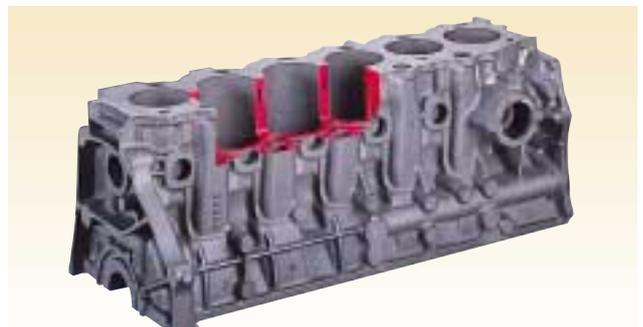


▲Remote-control station designed to provide a more comfortable work environment

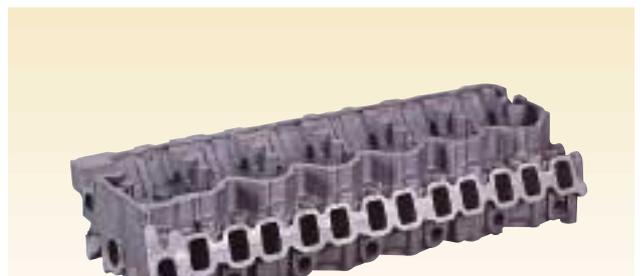
## Development and Design

### High-Precision Casting Technology Makes It Possible to Reduce the Weight of Iron and Aluminum Engine Components

Effectively increasing automotive fuel efficiency and reducing CO<sub>2</sub> emissions require measures to lower vehicle weights, and one key to achieving this objective is the development of lightweight versions of such relatively heavy components as engines and compressors. We are using technologies which were created over many years for cast aluminum compressor components to progressively introduce aluminum versions of such large components as engine blocks and oil pans. With regard to existing cast iron engine blocks, we make use of such high-precision casting technologies as the cold box method, which reduces thermal strain, to supply relatively compact and thin-walled components that promote lower vehicle weights.



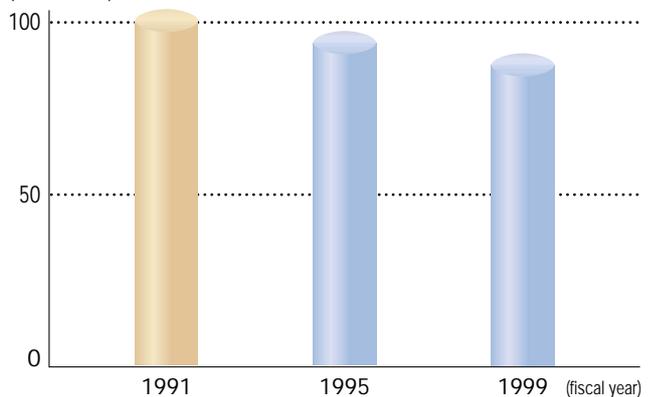
▲Cast iron engine block



▲Cast aluminum engine head

### ■Engine Block Weight per Unit of Engine Displacement

(1991 = 100)



## Production

### Separation and Reuse of Shotblast Sand

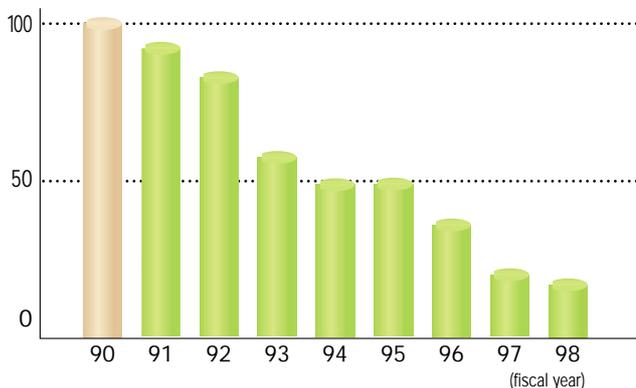
The shotblast process polishes the surface of castings by pelting small steel balls. The process generates the by-product of used shotblast sand containing a considerable amount of iron.

At its production lines that produce large amounts of shotblast sand, our division has long operated special equipment that separates and recycles the iron and sand components of shotblast sand. However, shotblast sand from lines that produce only small amounts of such sand has continued to be disposed of in landfills.

Aiming to boost the volume of recycled shotblast sand and reduce the volume of waste product, we have reappraised its facilities and processes and worked to recycle shotblast sand from even those facilities that produce very little sand. As a result, the volume of shotblast sand that is disposed of in landfills rather than being recycled has fallen greatly.

### ■ Volume of Shotblast Sand Disposed of in Landfills

(fiscal 1990 level = 100)



▲ Shotblast sand separation unit

### Recycling Foundry Dust by Blowing into Cupola Furnaces

The casting process generates considerable amounts of dust particles containing carbon, iron, silicon dioxide, zinc, and other substances. This dust was previously disposed of in landfills. An analysis of the dust revealed that it could be recycled into both raw materials and fuel. Based on this finding, we restructured a portion of our facilities to allow dust to be blown into cupola furnaces and reduced the amount of waste 20 tons per month.



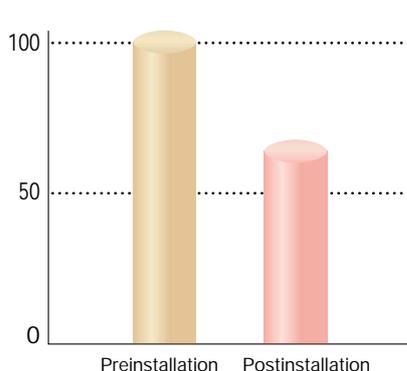
▲ Insertion of dust into a cupola furnace

### Odor Reduction Measures for Aluminum Engine Head Casting

Having already proceeded with diverse measures to counter problems associated with noise, vibration, and dust, we began implementing odor countermeasures in fiscal 1998. The first step was the installation of equipment for capturing exhaust gas from aluminum casting operations and deodorizing it through a chemical scrubbing process. We plan to continue taking steps to improve our employees' work environments as well as the environment of the communities in which our facilities are located. In addition, while the power level of some existing ventilation units is adjusted using dampers, we reduced the electric power consumption of those units by installing inverter-based fan controllers.

### ■ Electric Power Consumption of Ventilation Systems

(preinstallation = 100)



▲ Exhaust gas deodorizing facility