

Requirements for magnetic material used in products for electrified automobiles

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It has been 112 years since the first Japanese gasoline engine car was manufactured in 1907. Today, we are facing a revolution in automotive technology that happens only once in a century. DENSO Corporation, an automotive products manufacturer, has continuously worked to fulfill its mission of developing better products to realize a safe society where people can live in peace and prosperity. Our provision of safe and comfortable mobility has helped enrich people's lives.

Two keywords, CASE (Connected, Autonomous, Shared & service and Electric) and MaaS (Mobility as a Service), represent this revolution. It requires changes in several areas including hardware, software, and infrastructure covering automotive industry processes ranging from development, manufacturing, sales to utilization. To meet requirements, we continuously uphold our mission to contribute to society as we have demonstrated throughout the history of our company. Our product development efforts are aimed at global environment protection realized by increasing the efficiency of electrified products and motor vehicle accident prevention achieved by expanding ADAS (Advanced Driver Assistance Systems) products.

Figure 1 shows an overview of the development of automobile electrical equipment and magnetic material technology through the years. From the 1960s to 70s, DENSO Corporation started applying the concept of "magnetic characteristics" to the components of engine starters and alternators. These components were optimized to work as magnetic circuits taking into account the magnetic saturation and magnetic flux leakage. As the electronic control of engines evolved, the optimization was followed by the development of materials used for magnetic circuits²⁾, which are built into parts such as fuel injection valves, fuel pumps, engine rotation angle sensors, and ignition coils. To utilize these materials, we have also worked on magnetic field analysis^{3),4)} and developed magnetism evaluation technology. In this report, we introduce, with reference to our history, some cases in which magnetic circuit materials were applied to automotive products made by DENSO Corporation. From the viewpoint of an automotive products manufacturer, we propose requests with respect to the development and application of magnetic circuit materials to prepare for the future electrified society.

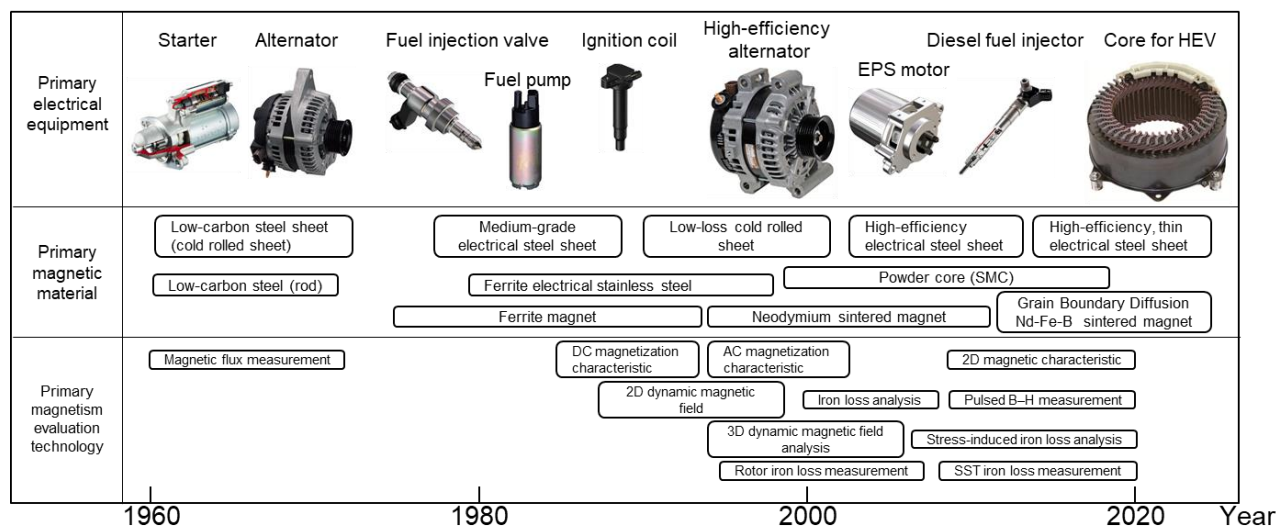


Figure 1. Evolution of automobile electrical equipment and magnetic material technologies at the DENSO Corporation.

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