# Lightweight Al-Fe Alloys for Motor Applications in Battery-Powered Electric Vehicles

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**Abstract**

Iron is the main component of the earth's core, the most abundant element on the earth (about 35%), and it is relatively high in the sun and other stars. Also, it is a common and cheap metal in the manufacturing industry. Recently, with the rapid development of battery-powered electric vehicles, more and more automotive companies are willing to develop new lightweight material for electric motors used in electrical vehicles. The iron–containing aluminum alloys can be considered as a good candidate, due to its great strength and electricity performance. This review describes various properties of aluminum-iron alloys including mechanical properties and electrical conductivities, as well their relation to the Fe contents. Also, metallurgical aspects of aluminum-iron alloys, including phase diagrams, equilibrium and non-equilibriun solidification, microstructure development, and castability. The further research and development work are outlined in terms of developing aluminum-iron alloys for some potential and value-added automotive applications.