

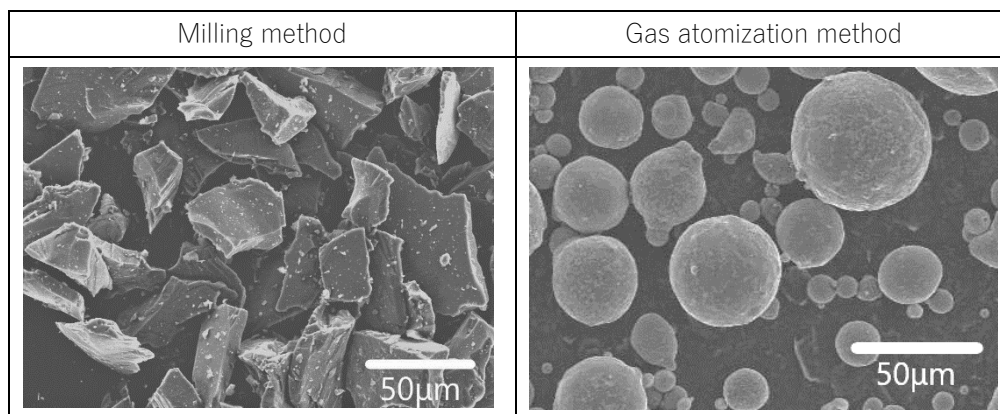
New Production Technology for High-purity, Spherical Silicon Powder

Sanyo Special Steel Corporation (headquartered in Himeji City, Hyogo Prefecture; Katsuhiro Miyamoto, President and CEO) has developed a technology for producing high-purity, spherical silicon (Si) powder. Use of the powder produced with this technology is expected to contribute to stabilization of electrical characteristics of semiconductors and improvement of device reliability.

Silicon is widely used in semiconductor devices and photovoltaic devices because of its semiconductor properties and high temperature stability and chemical stability. When silicon powder is used for thermal spraying or cladding applications, it is often made by milling high-purity ingots of silicon or silicon alloys. However, the milling method has a number of problems, such as low fluidity and nozzle clogging due to the irregular shape of the particles.

The gas atomization method is an effective way to improve the fluidity of the powder, but because silicon has low electrical conductivity, it cannot be induction melted in an ordinary refractory crucible. Therefore, graphite crucibles have generally been used, but it has been difficult to produce high-purity silicon powder due to the reaction between the molten silicon and the graphite in the crucible.

We have now developed a production technology in which silicon and silicon alloys melted in a graphite-free refractory crucible are atomized with inert gas. This new technology enables us to supply silicon powder with high purity, good spherical shape, and excellent fluidity, which can be used in various applications and industries, such as thermal spraying and cladding powders as well as powder molding products.



External view of silicon powder

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