

## R&D Plan of the Nano Powder Device and the SiC Nano Powder

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Ceramic compositions can be formed using alumina, zirconia, or other powders. Above all things, SiC provides outstanding oxidation resistance of temperatures even above the melting point of steel. It is a high temperature material, and is a very good candidate for breeding blanket material in nuclear fusion.

For sintered ceramics, the average grain size, grain size distribution, and the level and type of porosity are important. Similarly, depending on the application, second phases in the microstructure could occur as separate grains of components dissolved in solid solutions of matrix, so second phases at grain boundaries also become important. The average grain size often closely related to the primary particle size. Typically, ceramics with a small grain size are stronger than coarse grained ceramics. Finer grain sizes help reduce stresses that develop at grain boundaries due to anisotropic expansion and contraction. Normally, starting with finer ceramic raw materials produces a fine grain size. So, we will develop nano powder device using thermal plasma, and research into SiC nano powder and so on. SiC/SiC composite material development is our ultimate goal. SiC/SiC composite is low-activation and high-temperature material, it will be used future blanket and divertor structure materials.