# New Performance of Porous Ceramics as Structural Components

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In structural ceramics, pores are generally believed to deteriorate mechanical properties. However, the presence of pores does not always lead to degradation, but on the contrary, can give rise to improved or unique performance whenever carefully controlling the microstructural factors such as sizes, shapes, and alignments of pores and matrix grains. As an example, 14% porous silicon nitride where large fibrous grains are aligned together with flat-shaped pores is demonstrated. This material shows 7 times larger fracture energy than that of conventional dense silicon nitride, due to grain-pullout *etc*. enhanced by the pores. Another is 24% porous silicon nitride with aligned fine fibrous grains and uniformly dispersed minute pore. This material maintains strength equivalent to that of dense one while the elasticity is lowered almost half, making the strain tolerance about double.
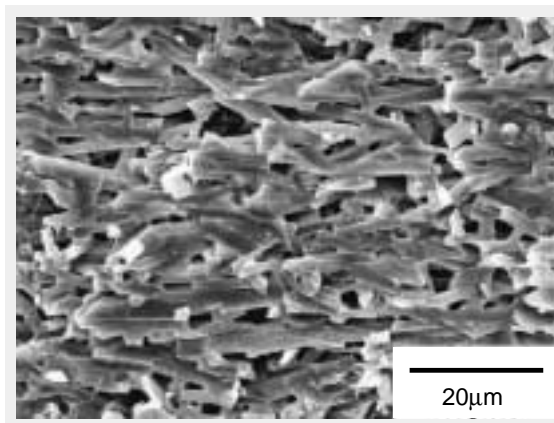
Scanning electron microscopy micrograph of the porous silicon nitride. The fibrous silicon nitride grains are well aligned toward the casting direction, and pores are present between the grains.

A "Remote Speaker" Stands Next to Me (in the HyperMirror)！

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Users of the remote-communication HyperMirror feel as if they are looking into a mirror that displays both their remote selves and anything in the background as an integrated, single image. One user looked by reflex toward the "real" speaker when this speaker started to explain the system. The user soon realized, however, that this was remote communication and turned to the HyperMirror. It took just a second to understand what was happening, clearly demonstrating the "reality" of communication through the HyperMirror even when users understand a virtual image is involved in such remote communication.

A "remote speaker" stands next to me (in the HyperMirror)!