

# PROGRESS OF SILICON CARBIDE FIBERS AND THEIR APPLICATION TO CERAMIC MATRIX COMPOSITES

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Silicon carbide fibers have high strength and high modulus and they are provided with flexible, multi-filament yarn. Durability test was demonstrated to provide superior property among kinds of ceramic fibers under heat and stress in oxidative environment (Figure 1). It was in 1975 that SiC fiber was invented by converting organosilicon polymer into ceramics by pyrolysis. Thereafter Nippon Carbon industrialized SiC fiber, Nicalon™, in 1983.

Developing the next-generation SiC fibers has been continued. At first, the improved heat-resistant SiC fiber by reduced oxygen content has been developed. Next, the fiber with higher modulus and improved creep resistance has been developed by means of near-stoichiometric SiC composition and higher crystallinity, named Hi-Nicalon Type S.

It has already been passed for more than 30 years since industrialization of SiC fibers, and finally ceramic matrix composites reinforced by our SiC fibers are adopted as a high temperature material in aircraft engine, which provide significantly reduced weight, increased durability, and improved fuel efficiency of engines as compared with traditional heat-resistant super-alloys.

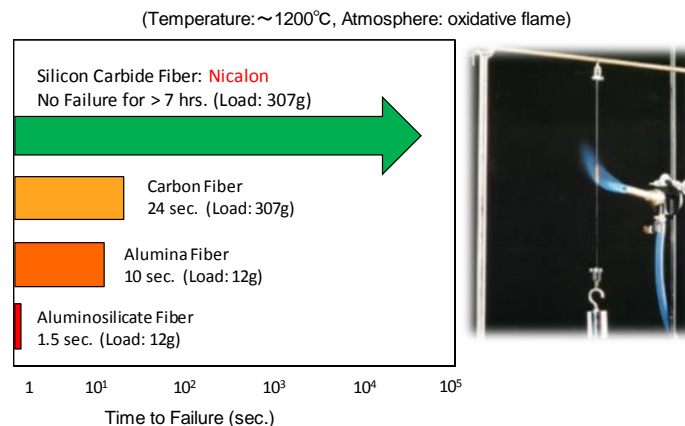


Figure 1 – Durability test of ceramic fibers under a load at high temperature