

E1-10 : OXIDATION BEHAVIOUR OF HOT ISOSTATICALLY PRESSED SILICON NITRIDE

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High temperature strength, good thermal shock resistance and good resistance to oxidation provide silicon nitride as a prime candidate for high temperature applications.

Oxidation behaviour of Hot Isostatically Pressed (HIPed) silicon nitride with 4wt% Yttria has been examined at 1300°C and 1400°C. The material exhibited excellent oxidation resistance at these temperatures. X-Ray Diffraction (XRD) analysis revealed that the ratio, $\beta\text{Si}_3\text{N}_4:(\alpha\text{Si}_3\text{N}_4 + \beta\text{Si}_3\text{N}_4)$ of the samples oxidized at 1400°C was higher than that at 1300°C which was the same as the as-received material. This indicates the oxidation rate of $\alpha\text{-Si}_3\text{N}_4$ compared to that of $\beta\text{Si}_3\text{N}_4$ is higher. The large aspect ratio of $\alpha\text{-Si}_3\text{N}_4$ grains may be responsible for the higher oxidation