

石英纤维及其 Mini复合材料强度及分布规律

韩桂芳, 张立同, 成来飞

西北工业大学超高温结构复合材料国防科技重点实验室, 西安 710072

收稿日期 2006-8-8 修回日期 2006-11-28 网络版发布日期 2007-7-5 接受日期

**摘要** 针对国产石英纤维强度, 本工作采用液相浸渍法(硅溶胶、石英浆料和氮化硅浆料)制得Mini复合材料, 利用两参数Weibull分布, 对其强度及分布进行了研究, 采用Kolmogorov非参数检验对其分布进行了检验.

同时研究了热处理对纤维束强度分布的影响. 结果表明,

可用两参数Weibull分布表征纤维束及其Mini复合材料强度分布. 热处理使纤维强度急剧下降,

且强度分散性变大; 相同处理温度下, 由硅溶胶制得的Mini复合材料强度较高, 分散性较小;

而石英或氮化硅浆料制备的Mini复合材料强度较低.

**关键词** [石英纤维](#) [热处理](#) [Mini复合材料](#) [强度分布](#)

分类号 [TQ174](#)

## Strength Distribution of Silica Fiber and Its Minicomposites

HAN Gui-Fang, ZHANG Li-Tong, CHENG Lai-Fei

National Key Laboratory of Thermostructure Composite Materials, Northwestern Polytechnical University, Xi'an 710072, China

**Abstract** Domestic silica fiber reinforced minicomposites were fabricated by slurry infiltration (including silica sol, silica slurry and silicon nitride slurry). And their strength distributions were analyzed with two parameter Weibull distribution. Then the goodness of fit of the strength distribution was conducted by the Kolmogorov test. Meanwhile, the strength distributions of treated silica fibers were also studied. The results show that two parameter Weibull distribution can be used to express the strength distribution of silica fiber and its minicomposites. It also suggests that the strength of the fiber decreases sharply after heat treatment, and the dispersity of the strength is increased. With the same heat treatment conditions, the strength of minicomposites infiltrated with silica sol is higher, and the Weibull modulus is also increased, while the strength of minicomposites infiltrated by silica or silicon nitride slurry is lower.

**Key words** [silica fiber](#) [heat treatment](#) [minicomposite](#) [strength distribution](#)

DOI:

通讯作者 张立同 [Zhanglt@nwpu.edu.cn](mailto:Zhanglt@nwpu.edu.cn)

扩展功能

本文信息

▶ [Supporting info](#)

▶ [PDF\(513KB\)](#)

▶ [HTML全文\(0KB\)](#)

▶ [参考文献](#)

服务与反馈

▶ [把本文推荐给朋友](#)

▶ [加入我的书架](#)

▶ [加入引用管理器](#)

▶ [复制索引](#)

▶ [Email Alert](#)

▶ [文章反馈](#)

▶ [浏览反馈信息](#)

相关信息

▶ [本刊中 包含“石英纤维”的 相关文章](#)

▶ 本文作者相关文章

· [韩桂芳](#)

· [张立同](#)

· [成来飞](#)