钢纤维混凝土断裂过程测试与力学性能

Measurement on fracture process and analysis on mechanical performanceof steel fiber reinforced concrete

中文关键词：钢纤维混凝土　劈裂断裂试验　应变片电测　双K断裂准则　承载力计算

英文关键词：steel fiber reinforced concrete　wedge splitting experiment　fracture process　measurement　double K fracture criterion　bearing capacity

基金项目：

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中文摘要：

　　为了研究钢纤维混凝土的断裂过程和承载力的估算方法，分别对4种不同尺寸的钢纤维混凝土试件进行楔入式劈裂断裂试验，并对其中2个试件粘贴应变片进行断裂过程的跟踪监测。试验得到了一系列荷载位移关系曲线，由数据计算获得各个试件的荷载与张开位移关系曲线，以及断裂损伤区变形随荷载变化曲线。结合黏聚裂纹应力强度因子与断裂准则，对各组试件的承载力进行估计，并将其计算值与试验结果的平均值作比较，两者较吻合。表明用断裂力学原理分析该类材料结构的初期失效，和估计中小尺寸构件的承载能力是可行的。

英文摘要：

　　For investigating the fracture process of steel fiber reinforced concrete and establishing the method for estimating the bearing capacity, a set of wedge splitting experiment with 4 sizes of steel fiber reinforced concrete specimen was carried out, in which the fracture process of two specimens was monitored using strain gauges. A series of experimental curves were obtained. According to these data the relationship between load and displacement of loading point, relationship between load and opening of crack as well as the relationship between load and fracture damaged zone deformation are calculated. The bearing capacity of specimens is estimated by formula for stress intensity factor and double K fracture criterion. The calculated results are in good agreement with the experimental data. It shows that the analysis on this kind of material based on the principle of fracture mechanics and estmating the bearing capacity accordingly is feasible.

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