岩石力学与工程学报 2005 24 (2005-S1): 4887 ISSN: 1000-6915 CN: 42-1397/O3

外贴玻璃纤维钢筋混凝土双向板抗爆性能研究

周布奎1，王安宝1，杨秀敏1，汪忠新1，王 朝2

(1. 总参工程兵第四设计研究院，北京 100850；2. 解放军理工大学 工程兵工程学院，江苏 南京 210007)

收稿日期 2005-4-28 修回日期 2005-6-24 网络版发布日期 2008-2-18 接受日期 2005-8-15

摘要 玻璃纤维材料具有强度高，韧性好，耐腐蚀，施工工艺简单等诸多特点，已被广泛应用于一般民用建筑结构的加固改造，以提高其承载力，延长使用寿命。与此同时，有关粘贴玻璃纤维钢筋混凝土复合结构在静载条件下的受力性能研究逐渐受到国内外相关学者的广泛关注，并取得了一定的研究成果。但是，有关动载条件下的应用和研究尚属起步。为探讨抗爆条件下玻璃纤维对钢筋混凝土结构的增强机理和效果，对粘贴玻璃纤维条带钢筋混凝土复合板以及普通钢筋混凝土板同时进行抗爆性能试验，对两者的受力变形过程进行研究，并将两者的结果进行对比分析。结果表明，玻璃纤维能够有效阻止混凝土裂缝的发展，能提高钢筋混凝土板的抗爆能力。研究结果可以为玻璃纤维加固机理研究及复合结构的抗爆设计提供依据和参考。

关键词 结构工程；玻璃纤维；抗爆性能；复合结构；承载力

分类号

STUDY ON CHEMICAL EXPLOSION RESISTING PERFORMANCE OF TWO-WAY RC SLAB REINFORCED WITH GFRP RIBBON EXTERNALLY

ZHOU Bu-kui1，WANG An-bao1，YANG Xiu-min1，WANG Zhong-xin1，WANG Zhao2

(1. Building Design and Research Academy of Canbao，Beijing 100850，China；
2. Engineering Institute of Engineering Corps，PLA University of Science and Technology，Nanjing 210007，China)

Abstract

The glass fiber reinforced(GFRP) plastic material has many characteristics such as high intensity，large ductility，resisting erosion，simple construct technology，etc.. In order to improve bearing capacity of structure and extend the expiration date，the GFRP is used to rebuild and reinforce common civil building structures. In the same time，the domestic and overseas scholars pay more attention to the characteristics about the complex structure of GFRP and reinforced concrete under static loading gradually，and have obtained many achievements. The application of complex structure characteristics of GFRP and concrete under dynamic loading is initiated. In order to study the strengthening effect and mechanism of GFRP on RC (reinforced concrete)structures under explosion load，the explosion resisting performance of RC slabs reinforced with GFRP ribbon and that the common RC slabs are simultaneously studied. The deforming processes of GFRP reinforced concrete slabs and those of the common concrete slabs under explosion loading are also studied. The test results indicate that GFRP can control the development of concrete flaw effectively and enhance the explosion resisting performance of RC slab，which can provide reference to reinforcement mechanism study of GFRP and explosion resisting design of RC slabs reinforced with GFRP.

Key words structural engineering；glass fiber reinforced plastic(GFRP)；explosion resisting performance；combination structure；bearing capacity

DOI:

通讯作者