



## 用超声冲击法消除锚拉板区域的焊接应力

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## Release Welding Residual Stress in Anchorage Area Using Ultrasonic Impact

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**摘要** 针对大跨径钢结构斜拉桥锚拉板区域焊缝较密、连接钢板较厚、焊接残余应力较高且分布不明确等问题<sup>[1]</sup>,对重庆江津观音岩长江大桥索梁锚固区域部分进行足尺比例试件的焊接应力测试,并对其焊缝进行超声波冲击试验,研究超声波冲击法对锚拉板区域各焊缝应力的影响情况.测试和试验研究结果表明,锚拉板区域各焊缝存在着相当大的焊接残余应力,超声波冲击法能有效地减小和消除该区域的焊缝残余拉应力,改善其应力的状态,确保构件连接的受力.超声波冲击方法是一种解决钢结构桥梁中的局部区域焊接应力过大问题的有效方法.

**关键词:** [斜拉桥](#) [锚拉板区域](#) [超声波冲击](#) [焊接残余应力](#)

**Abstract:** To solve problems in anchor plate of long-span cable-stayed bridge such as dense welds, thick connecting plates, and high and unknown distribution of welding residual stress, three full-scale ratio models are proposed. These are applied to cable-beam connection of anchorage area of Chongqing Jiangjin Guanyinyan Yangtze River Bridge. Welding residual stress was tested, and ultrasonic impact imposed on welds of the models. Ultrasonic impact can make weld toe as the center of a certain region producing sufficient deep surface of plastic deformation. It effectively improves welds and baseplates exterior shape of the transitional zone, and reduces stress concentration in the welds. Test results show that there is significant welding residual stress in the anchorage areas of tensile anchor plates, and ultrasonic impact can effectively reduce, even release, welding residual stress and improve the status of stress of welds. Ultrasonic impact can make the stress distribution in the welds more uniform, ensuring safety of the cable beam connection of anchorage area. In conclusion, ultrasonic impact is an effective method for solving the welding residual stress problem.

**Keywords:** [cable-stayed bridge](#), [anchorage area](#), [ultrasonic impact](#), [welding residual stress](#)

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