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提高形状记忆合金丝工作频率的一种方法

何存富, 陶宝祺, 金江, 熊克

南京航空航天大学智能材料与结构研究所, 南京, 210016

METHOD OF IMPROVING THE WORK FREQUENCIES OF SHAPE MEMORY ALLOY WIRE ACTUATORS

He Cunfu, Tao Baoqi, Jin Jiang, Xiong Ke

Institute of Smart Materials & Structures, Nanjing University of Aeronautics & Astronautics, Nanjing, 210016

摘要 研究了提高形状记忆合金（SMA）工作频率的物理方法——研制细丝。给出了拉拔细丝的工艺流程，从理论上分析了在不同的加热和冷却过程中丝径与响应速度的关系，对2种丝径的SMA丝进行了性能对比测试。同时测定了2种丝径的SMA的响应速度。结果表明，丝径的减小对丝的相变性能，如最大恢复应变、最大恢复应力等影响不大，但可显著提高其动作频率。

关键词： 形状记忆合金 驱动器 响应频率 智能结构

Abstract： A method of improving the work frequency of shape memory alloy wire actuators, developing fine wires, is investigated.The relation between the response frequency and the diameter is analyzed theoretically in different processes of heating and cooling a wire.The theoretical predictions are validated with experiments.The results show that the decrease of the diameter of a wire can not affect its phase transformation properties, but its work frequency can be increased markedly.

Keywords： shape memo ry alloy actuato r wo rk frequency smart st ructure

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