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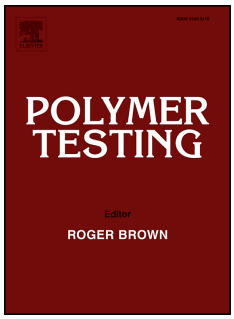


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# Experimental assessment of sound velocity and bulk modulus in high damping rubber bearings under compressive loading

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## ABSTRACT

The present paper deals with the non-destructive evaluation of stressed High Damping Rubber Bearings (HDRB) in civil engineering. Such bearings are commonly made with alternating thin horizontal layers of High Damping Rubber (HDR) bonded to steel laminates. The influence of uniaxial compressive loading on pressure waves' velocity and bulk modulus is investigated for two types of bearings (with and without laminates). In the presence of laminates, bulk modulus increases with the applied compressive loading (e.g. $\Delta K = 20\%$ at a mean stress $\sigma = 16$ MPa). In the absence of laminates, slipping on walls is visually observed in spite of their roughness and is thus confirmed by limitation in the increase of sound velocity. The feasibility of stress measurements using ultrasonic methods in HDRB is proved.