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Effectiveness of Anti-Vibration Gloves

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Prolonged, extensive exposure to hand transmitted vibration is strongly associated with hand-arm vibration syndrome (HAVS). As personal protective devices, anti-vibration gloves have been used to help reduce the severity of vibration exposure. In the present study, the effectiveness of anti-vibration gloves is investigated through systematic examination of their vibration transmission characteristics. The study involved evaluations of many different experimental methodologies for assessing anti-vibration glove effectiveness and established a method for accurately measuring the vibration transmissibility of gloves at the palm of the hand. The study also evolved into many improved experimental procedures and data analysis methods. Further, a convenient and cost-effective method for predicting the tool specific vibration isolation effectiveness of anti-vibration gloves was developed and evaluated. The findings of this study indicate that only a few glove designs can reduce vibration transmitted to the palm of the hand, and the effectiveness of anti-vibration gloves is highly dependent upon the tool or the vibration spectrum. Moreover, the anti-vibration gloves yield considerably better vibration isolation when used with high frequency tools than that attained with low frequency tools. Owing to their dependency to the vibration spectrum, the assessment method requires repeatable vibration source. The glove effectiveness for a specific tool could be conveniently estimated from the vibration transmission function of the glove measured under broad-band vibration. The proposed assessment and prediction methods could aid in the selection of appropriate anti-vibration gloves for different tools and working conditions. The information and knowledge developed through this study may also be used to improve upon the relevant national and international standards.

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