

Anti-vibration Glove Assessment in Relation to Work with Strimmers

The Environment Agency has a duty to undertake all measures reasonably practicable to protect its employees against exposure to Hand-arm vibration and developing Hand Arm Vibration Syndrome (HAVS). A code of practice has been developed on the Control of Vibration on Hand-Held Power Tools. However, there is little information available on the subject of Personal Protective Equipment (PPE) against hand-arm vibration. The Environment Agency therefore commissioned this research to be able to advise on the appropriate PPE for use by Agency staff.

There are three main types of resilient material which are commonly used in anti-vibration gloves; a combination of layers of foam and gelatine, foam, and air (contained in an inflatable air bladder). Three glove types were chosen to be investigated, one to represent each of these material types. The aim was to establish which glove, if any, would be the most suitable for Agency staff use when working with strimmers. Samples of the gloves were tested under laboratory conditions at the Health and Safety Laboratory (HSL). The gloves were tested according to two tests:

1. The ISO 10819:1996 standard test for anti-vibration gloves
2. The HSL developed one-third octave band test.

The one-third octave band test involves simultaneous measurements of the transmissibility of the glove throughout the frequency range of interest for hand-transmitted vibration. During the tests, the grip and feed force of the test subjects were controlled at levels which are believed to be representative of grip and feed forces which might be used by strimmer operators. The test results produced *assumed protection data* for the three glove types, which are the mean plus one standard deviation of the measured transmissibilities in each one-third octave band. The use of the mean plus one standard deviation figures implies that the data generated will apply to approximately 84% of the general population.

Raw vibration data which had been previously collected by RMS Vibration Test Laboratory were supplied to HSL, so that the vibration characteristics of the three main types of strimmer used by the Agency could be identified. The assumed protection data were combined with the vibration spectra for the three main types of strimmer to estimate the potential that each glove type has to protect strimmer operators.

One of the three glove types appeared to provide some reduction in vibration transmitted to the hand, whilst the other two types did not. However, the glove which appeared to provide some reduction produced large variations in test results depending on the subject used for the test. This meant that whilst the glove might provide protection for some operators, it could also cause considerable amplification for others.

Additional tests were carried out on this glove following a period of use by Agency strimmer operators to investigate the durability of the glove. Although the results of

these measurements were inconclusive, the glove was found to be uncomfortable by Agency staff during this investigation, and it could not be recommended for use. The outcome of the investigation is that it cannot be demonstrated that the glove types tested would provide any worthwhile degree of protection for Agency strimmer operators.

This R&D Technical Summary relates to information from project W5B-025 contained in the following output:

R&D Technical Report W5B-025B/TR: Anti-vibration Glove Assessment in Relation to Work with Strimmers (ISBN: 185705596)

Internal Status: Released to Region
External Status: Released to Public Domain

Project Manager: Janet Smith, Environment Agency – Midlands Region
Research Contractor: Health and Safety Laboratory

Copies of the document are available internally from your Regional Information Centre and externally from the Environment Agency's R&D Dissemination Centre at:

WRc Plc
Frankland Road
Blagrove
Swindon
SN5 8YF

Tel: 01793 865138
Fax: 01793 514562

© Environment Agency
Rio House
Waterside Drive
Aztec West
Almondsbury
Bristol BS32 4UD

Tel: 01454 624400
Fax: 01454 624409