

Vibration transmitted to the hand by backpack blowers

ABSTRACT

Backpack machines such as grasscutter and blower produce a vibration that is transmitted to the operator's body and hand. Prolonged exposure to vibration can cause injuries known as Hand-Arm Vibration Syndrome. One of the machines used widely in the agriculture sector is the blower. The objective of this study is to evaluate the level of vibration emitted by blowers according to the method in the International Standard ISO 5349. Vibrations emitted by two backpack machines, mist blower and leaf blower, were acquired on ten subjects who were working and using the tools daily. Vibrations were recorded at operational and idle modes using an accelerometer installed in an aluminium palm adapter that was placed between the hand and the surface of the handle. The study has found that the median weighted Wh vibration magnitudes emitted by blowers to the hand were between 1.71 and 2.91 m/s² r.m.s. acceleration for operational and idle modes, respectively. The mist blower has an idle mode weighted Wh vibration magnitude greater than its operational mode, whilst the leaf blower has an operational mode weighted Wh vibration magnitude greater than in its idle mode. This study suggests that vibrations emitted to the hand from a leaf blower and a mist blower can be greater than the exposure action value set by the European Directive 2002 if used for more than 7 hours (mist blower) or 5 hours (leaf blower) per day. Companies that use both machines should set appropriate actions and regulations to reduce the exposure, especially to workers using the machines daily.

Keyword: Hands; Vibration; Hand-arm; Vibration syndromes; Mechanized blower