

COMPARISON OF DIFFERENT METHODS FOR VIBRATION MEASUREMENTS ON HAND-HELD VIBRATING TOOLS

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SUMMARY

Vibration measurements have been done on hand-held tools in a group of 48 platers by evaluating the individual vibration acceleration and absorption of vibration energy. The measurement of acceleration has been done frequency-weighted and frequency-unweighted in accordance with ISO 5349 and NIOSH (USA) recommendations for hand-arm vibration standards, respectively. The acceleration and the energy absorption have been measured simultaneously in the three orthogonal directions, the latter by using a specially designed adapter. The exposure time has been determined by both subjective rating and objective measurements. Individual energy-equivalent accelerations and vibration dosages have been calculated from these data.

The outcome shows that the type of tool was critical to vibration load when the different measures for determining vibration levels were used. Of the methods used, the evaluation specified by ISO 5349 makes most consideration of low frequencies of vibration (< 50 Hz), absorption of vibration energy middle frequencies (50-200 Hz) and NIOSH of high frequencies (> 200 Hz). The results show a poor correlation between the three methods used. Close agreement between mean subjective rating and objective measurement of the average exposure time was found. Further studies of the relation between results presented here and generated disturbance will be conducted, which may clarify any exposure-response relationship.

Key words: vibration, measuring, methods, exposure time, energy

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