

ANNEX

A. HAND-ARM VIBRATION

1. Assessment of exposure

The assessment of the level of exposure to hand-arm vibration is based on the calculation of the daily exposure value normalised to an eight-hour reference period $A(8)$, expressed as the square root of the sum of the squares (rms) (total value) of the frequency-weighted acceleration values, determined on the orthogonal axes a_{hw_x} , a_{hw_y} , a_{hw_z} as defined in Chapters 4 and 5 and Annex A to ISO standard 5349-1(2001).

The assessment of the level of exposure may be carried out on the basis of an estimate based on information provided by the manufacturers concerning the level of emission from the work equipment used, and based on the observation of specific work practices or on measurement.

2. Measurement

When measurement is employed in accordance with Article 4(1):

- (a) the methods used may include sampling, which must be representative of the personal exposure of a worker to the mechanical vibration in question; the methods and apparatus used must be adapted to the particular characteristics of the mechanical vibration to be measured, to ambient factors and to the characteristics of the measuring apparatus, in accordance with ISO standard 5349-2(2001);
- (b) in the case of devices which need to be held with both hands, measurements must be made on each hand. The exposure is determined by reference to the higher value of the two; information for the other hand shall also be given.

3. Interference

Article 4(4)(d) will apply, in particular where the mechanical vibration interferes with the proper handling of controls or reading of indicators.

4. Indirect risks

Article 4(4)(d) will apply in particular when the mechanical vibration interferes with the stability of structures or the security of joints.

5. Individual protectors

Personal protective equipment against hand-arm vibration may contribute to the programme of measures referred to in Article 5(2).

B. WHOLE-BODY VIBRATION

1. Assessment of exposure

The assessment of the level of exposure to vibration is based on the calculation of daily exposure $A(8)$ expressed as equivalent continuous acceleration over an eight-hour period, calculated as the highest (rms) value, or the highest vibration dose value (VDV) of the frequency-weighted accelerations, determined on three orthogonal axes ($1,4a_{w_x}$, $1,4a_{w_y}$, a_{w_z} for a seated or standing worker) in accordance with Chapters 5, 6 and 7, Annex A and Annex B to ISO standard 2631-1(1997).

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The assessment of the level of exposure may be carried out on the basis of an estimate based on information provided by the manufacturers concerning the level of emission from the work equipment used, and based on observation of specific work practices or on measurement.

In the case of maritime shipping, Member States may consider only vibrations of a frequency exceeding 1 Hz.

2. Measurement

When measurement is employed in accordance with Article 4(1), the methods used may include sampling, which must be representative of the personal exposure of a worker to the mechanical vibration in question. The methods used must be adapted to the particular characteristics of the mechanical vibration to be measured, to ambient factors and to the characteristics of the measuring apparatus.

3. Interference

Article 4(4)(d) will apply, in particular where the mechanical vibration interferes with the proper handling of controls or reading of indicators.

4. Indirect risks

Article 4(4)(d) will apply, in particular when the mechanical vibration interferes with the stability of structures or the security of joints.

5. Extension of exposure

Article 4(4)(g) will apply, in particular where, owing to the nature of the activity, a worker benefits from the use of rest facilities supervised by the employer; exposure to whole-body vibration in those facilities must be reduced to a level compatible with their purpose and conditions of use, except in cases of '*force majeure*'.