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Methods for the calibration of vibration and shock transducers —

Part 1: Basic concepts

AMENDMENT 1

Méthodes pour l'étalonnage des transducteurs de vibrations et de chocs —

Partie 1: Concepts de base

AMENDEMENT 1

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The committee responsible for this document is ISO/TC 108, *Mechanical vibration, shock and condition monitoring*, Subcommittee SC 3, *Use and calibration of vibration and shock measuring instruments*.

Methods for the calibration of vibration and shock transducers —

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Page 4, Clause 3 Terms and definitions

Add the following new term:

3.7
transverse motion ratio
maximum ratio of the motion quantity (acceleration/velocity/displacement) within the plane perpendicular to operating axis of the vibration generator to the amplitude of the motion quantity along the direction of the operating axis

Note 1 to entry: The transverse motion is the motion within the plane perpendicular to the operating axis of the vibration generator. The magnitude of the transverse motion and transverse motion ratio may be represented by the following formulae:

$$A_{xy}(t) = \sqrt{a_x^2(t) + a_y^2(t)}$$

$$T = \max_t \left\{ \frac{\left[A_{xy}(t) \right]}{a_z} \right\} \times 100\,\%$$

where

$A_{xy}(t)$ is the magnitude of the transverse motion;

$a_x(t)$ and $a_y(t)$ are the accelerations/velocity/displacement along two orthogonal directions perpendicular to the operating axis;

T is the transverse motion ratio;

a_z is the amplitude of the motion along the operating axis.

Note 2 to entry: A tri-axis transducer or an orthogonal block with three or five transducers (three transducers are orthogonally installed, and the other two are used to balance the mass) shall be mounted on the mounting surface to measure the transverse motion. Any two orthogonal directions, within the plane perpendicular to the operating axis, can be selected as the measurement directions of transverse motion. When the transducers have been mounted, at the selected frequencies including the minimum and maximum frequencies in the working frequency range of the vibration generator, $a_x(t)$ and $a_y(t)$ are simultaneously measured. $A_{xy}(t)$ is calculated according to the first formula. According to the second formula, the transverse motion ratio at the selected frequencies can be calculated. The transverse motion can also be measured by laser interferometry.

Note 3 to entry: When signal processing methods (e.g. bandpass filters, tracking filters or spectrum analysers) are used to process $a_x(t)$ and $a_y(t)$, the influence of the harmonics of transverse motion may be suppressed. In this case, the rectilinear, circular or elliptic transverse motion occurring only at the selected frequency shall be analysed. The same method of signal analysis should be used for both calibration data and transverse motion data.

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