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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/SC 3, *Mechanical vibration, shock and condition monitoring/Use and calibration of vibration and shock measuring instruments*.

Methods for the calibration of vibration and shock transducers – Part 1: Basic concepts

AMENDMENT 1

Add the following new term to 3 Terms and definitions

3.7
transverse motion ratio
maximum ratio of the motion within the plane perpendicular to operating axis of the vibration generator to the value of the acceleration 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 formulas:

$$A_{xy}(t) = \sqrt{a_x^2(t) + a_y^2(t)} \quad (1)$$

$$T = \max_t \left\{ \frac{\left(A_{xy}(t)\right)}{a_z} \right\} \times 100\% \quad (2)$$

where

$A_{xy}(t)$	is the magnitude of the transverse motion;
$a_x(t)$ and $a_y(t)$	are the motions of two orthogonal directions perpendicular to the operating axis;
T	is the transverse motion ratio;
a_z	is the magnitude 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 Formula (1). According to Formula (2), 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 some signal processing methods (examples: 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 are suppressed, the transverse motion only at the selected frequency shall be rectilinear, circular or elliptic.

The same signal analysis method should be used for both, calibration data analysis and for transverse motion data analysis.

