

INTERNATIONAL  
STANDARDS

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## **Mechanical vibration and shock — Mechanical mounting of accelerometers**

*Vibrations et chocs mécaniques — Fixation mécanique des accéléromètres*



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## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 5348 was prepared by Technical Committee ISO/TC 108, *Mechanical vibration and shock*, Subcommittee SC 3, *Use and calibration of vibration and shock measuring instruments*.

This second edition cancels and replaces the first edition (ISO 5348:1987), which has been technically revised.

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International Organization for Standardization  
Case postale 56 • CH-1211 Genève 20 • Switzerland  
Internet central@iso.ch  
X.400 c=ch; a=400net; p=iso; o=isocs; s=central

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## Introduction

The method most commonly used for determining the vibratory motion,  $v_S$ , of a structure or body S is that using an electromechanical transducer T.

Vibration-monitoring transducers fall into two broad classes: contacting and non-contacting transducers. Non-contacting structural response transducers are placed in close proximity to the structure and include such generic types as eddy-current probes and optical proximity probes. Contacting transducers are placed in mechanical contact with the structural system and include such generic types as piezoelectric and piezoresistive accelerometers and seismic velocity transducers. This International Standard is concerned with the contacting type of accelerometers which currently are in wide use. The concern with using such transducers is that the mechanical coupling between the accelerometer and the test structure may significantly alter the response of the accelerometer, the structure, or both. This International Standard attempts to isolate parameters of concern in the selection of a method to mount the accelerometer onto the structure.

This International Standard deals with accelerometers which are connected to the surface of the structure in motion by means of a mechanical mounting F (see figure 1).

The information supplied by such a transducer is the electric signal,  $u$ , generated by the action of its own motion,  $v_T$ . The information desired is the vibratory motion,  $v_S$ , at a specified location on the structure S.

The electric signal,  $u$ , generated by the transducer deviates from what it would have been, if that particular accelerometer effectively measured the vibratory motion,  $v_S$ , of the structure, owing to non-ideal transfer of motion from S to the sensitive elements of the accelerometer T.

Deviations may also occur owing to misalignment of the sensitive axis of the transducer, base bending, temperature transients, mounting torque and cable whip.

The mechanical mounting will change the useful frequency range for a given accuracy with regard to amplitude as well as phase response (see 5.4.5).