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**Mechanical vibration — Balance quality  
requirements for rotors in a constant  
(rigid) state —**

**Part 1:  
Specification and verification of balance  
tolerances**

*Vibrations mécaniques — Exigences en matière de qualité dans  
l'équilibrage pour les rotors en état rigide (constant) —*

*Partie 1: Spécifications et vérification des tolérances d'équilibrage*



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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. 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.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 1940-1 was prepared by Technical Committee ISO/TC 108, *Mechanical vibration and shock*, Subcommittee SC 1, *Balancing, including balancing machines*.

This second edition cancels and replaces the first edition (ISO 1940-1:1986), which has been technically revised. The most important change is the introduction of reference planes for balance tolerances instead of using the correction planes as tolerance planes.

ISO 1940 consists of the following parts, under the general title *Mechanical vibration — Balance quality requirements for rotors in a constant (rigid) state*:

- *Part 1: Specification and verification of balance tolerances*
- *Part 2: Balance errors*

## Introduction

A general introduction to balancing standards will be given in ISO 19499 (under preparation). For rotors in a constant (rigid) state, only the resultant unbalance and the resultant moment unbalance (resultant couple unbalance) are of interest, both together often expressed as dynamic unbalance.

The balancing machines available today enable unbalance to be reduced to low limits. However, it would be uneconomical to reduce the unbalances to these limits. On the contrary, it is necessary to specify the balance quality requirement for any balancing task.

Of similar importance is the verification of residual unbalances. For this verification, different balance errors have to be taken into account. An improved procedure to handle errors of the balancing machine is described in connection with ISO 1940-2.

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# Mechanical vibration — Balance quality requirements for rotors in a constant (rigid) state —

## Part 1:

## Specification and verification of balance tolerances

### 1 Scope

This part of ISO 1940 gives specifications for rotors in a constant (rigid) state. It specifies

- a) balance tolerances,
- b) the necessary number of correction planes, and
- c) methods for verifying the residual unbalance.

Recommendations are also given concerning the balance quality requirements for rotors in a constant (rigid) state, according to their machinery type and maximum service speed. These recommendations are based on worldwide experience.

This part of ISO 1940 is also intended to facilitate the relationship between the manufacturer and user of rotating machines, by stating acceptance criteria for the verification of residual unbalances.

Detailed consideration of errors associated with balancing and verification of residual unbalance are given in ISO 1940-2.

This part of ISO 1940 does not cover rotors in a flexible state. The balance quality requirements for rotors in a flexible state are covered by ISO 11342.

### 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 1925:2001, *Mechanical vibration — Balancing — Vocabulary*

ISO 1940-2, *Mechanical vibration — Balance quality requirements of rigid rotors — Part 2: Balance errors*