

First edition
2016-11-15

Mechanical vibration — Rotor balancing —

Part 11: Procedures and tolerances for rotors with rigid behaviour

Vibrations mécaniques — Équilibrage des rotors —

*Partie 11: Modes opératoires et tolérances pour rotors à
comportement rigide*



Reference number
ISO 21940-11:2016(E)

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Contents

Page

Foreword	v
Introduction	vi
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Pertinent aspects of balancing	1
4.1 General	1
4.2 Representation of the unbalance	1
4.3 Unbalance effects	2
4.4 Reference planes for unbalance tolerances	2
4.5 Correction planes	4
4.5.1 General	4
4.5.2 Rotors which need one correction plane only	4
4.5.3 Rotors which need two correction planes	4
4.5.4 Rotors with more than two correction planes	4
4.6 Permissible residual unbalance	4
5 Similarity considerations	5
5.1 General	5
5.2 Permissible residual unbalance and rotor mass	5
5.3 Permissible residual specific unbalance and service speed	6
6 Specification of unbalance tolerances	6
6.1 General	6
6.2 Derivation of the unbalance tolerances	6
6.3 Balance quality grade G	7
6.3.1 Classification	7
6.3.2 Special designs	7
6.3.3 Permissible residual unbalance	10
6.4 Experimental evaluation	10
6.5 Unbalance tolerances based on bearing forces or vibrations	10
6.5.1 Bearing forces	10
6.5.2 Vibrations	11
6.6 Methods based on established experience	11
7 Allocation of permissible residual unbalance to tolerance planes	11
7.1 Single plane	11
7.2 Two planes	11
7.2.1 General	11
7.2.2 Limitations for inboard rotors	12
7.2.3 Limitations for outboard rotors	12
8 Allocation of unbalance tolerances to correction planes	13
8.1 General	13
8.2 Single plane	14
8.3 Two planes	14
9 Assembled rotors	14
9.1 General	14
9.2 Balanced as a unit	14
9.3 Balanced on component level	14
10 Accounting for errors in the verification of permissible residual unbalances	15
10.1 General	15
10.2 Unbalance tolerance	15
10.3 Combined error of unbalance measurements	15

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10.4	Verification of the permissible residual unbalance.....	15
10.4.1	General.....	15
10.4.2	Unbalance readings within tolerance	16
10.4.3	Unbalance readings out of tolerance.....	16
10.4.4	Region of uncertainty	16
Annex A	(informative) Example of the specification of permissible residual unbalance based on balance quality grade G and allocation to the tolerance planes.....	17
Annex B	(informative) Specification of unbalance tolerances based on bearing force limits	21
Annex C	(informative) Specification of unbalance tolerances based on established experience	23
Annex D	(informative) Rules for allocating unbalance tolerances from tolerance planes to correction planes	25
Bibliography	28

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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

The committee responsible for this document is ISO/TC 108, *Mechanical vibration, shock and condition monitoring*, Subcommittee SC 2, *Measurement and evaluation of mechanical vibration and shock as applied to machines, vehicles and structures*.

This first edition cancels and replaces ISO 1940-1:2003, which has been technically revised. The main changes are deletion of the terms and definitions which were transferred to ISO 21940-2 and a more pronounced explanation of the application of permissible residual unbalances for the processes of balancing a rotor and verifying its residual unbalance. Information on specification of unbalance tolerances based on vibration limits has been removed.

It also incorporates the Technical Corrigendum ISO 1940-1:2003/Cor 1:2005.

A list of parts in the ISO 21940 series can be found on the ISO website.

Introduction

Rotor balancing is a procedure by which the mass distribution of a rotor (or part or module) is checked and, if necessary, adjusted to ensure the unbalance tolerance is met. This document covers the balancing of rotors with rigid behaviour. A rotor is said to be rigid when the flexure of the rotor caused by its unbalance distribution can be neglected with respect to the agreed unbalance tolerance at any speed up to the maximum service speed. For these rotors, the resultant unbalance, and often moment unbalance, are of interest, which when combined are expressed as a dynamic unbalance of the rotor.

The balancing machines available today enable residual unbalances to be reduced to very low limits. Therefore, it is necessary to specify an unbalance quality requirement for a balancing task, as in most cases it would not be cost-effective to reduce the unbalance to the limits of the balancing machine.

In addition to specifying an unbalance tolerance, it is necessary to consider the errors introduced by the balancing process. This document takes into account the influence of these errors to distinguish clearly between the specified permissible residual unbalance and the reduced residual unbalance values to be achieved during the balancing process.