First edition 2007-07-15

Mechanical vibration — Balancing — Guidance on the use and application of balancing standards

Vibrations mécaniques — Équilibrage — Lignes directrices pour l'utilisation et l'application de normes d'équilibrage



Reference number ISO 19499:2007(E)

PDF disclaimer

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.



COPYRIGHT PROTECTED DOCUMENT

© ISO 2007

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Contents		Page	
Forewe	ord	iv	
Introdu	uction	v	
1	Scope	1	
2	Normative references	1	
3	Terms and definitions	1	
4 4.1 4.2 4.3	Fundamentals of balancing General Unbalance distribution Unbalance representation	1 2	
5 5.1 5.2 5.3 5.4 5.5 5.6	Balancing considerations General Rotors with rigid behaviour Rotors with flexible behaviour Rotors with special behaviour Examples of rotor behaviours Influencing factors	3 4 5 5	
6 6.1 6.2 6.3	Balance tolerances General Permissible residual unbalances Vibration limits	7 7	
7 7.1 7.2	Selection of a balancing procedure	7	
8 8.1 8.2 8.3 8.4 8.5 8.6	International Standards on balancing General Vocabulary Balancing procedures and tolerances Balancing machines Machine design for balancing Machine vibration	13 13 14 15 15	
Annex	A (informative) Mathematical and graphical representation of unbalance	17	
Annex	B (informative) Examples of different rotor behaviours	27	
Annex	C (informative) How to determine rotor flexibility based on an estimation from its geometric design	32	
Riblioc	aranhy	35	

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 19499 was prepared by Technical Committee ISO/TC 108, *Mechanical vibration, shock and condition monitoring*.

Introduction

Vibration caused by rotor unbalance is one of the most critical issues in the design and maintenance of machines. It gives rise to dynamic forces which adversely impact both machine and human health and well-being. The purpose of this International Standard is to provide a common framework for balancing rotors so that appropriate methods will be used. This standard serves essentially as guidance on the usage of other International Standards on balancing in that it categorizes types of machine unbalance. As such, it can be viewed as an introductory standard to the series of International Standards on balancing developed by ISO/TC 108.

Balancing is explained in a general manner, as well as the unbalance of a rotor. A certain representation of the unbalance is recommended for an easier understanding of the necessary unbalance corrections.