INTERNATIONAL STANDARD

ISO 21940-31

First edition
2013-08-15

Mechanical vibration — Rotor balancing —

Part 31: Susceptibility and sensitivity of machines to unbalance

Vibrations mécaniques — Équilibrage des rotors —

Partie 31: Susceptibilité et sensibilité des machines aux balourds

Reference number
ISO 21940-31:2013(E)

© ISO 2013

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS

Licensee=University of Alberta/5966844001, User=sharabiani, shahramfs
Not for Resale, 11/29/2013 00:54:11 MST

COPYRIGHT PROTECTED DOCUMENT

© ISO 2013

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested 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

© ISO 2013 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS

Licensee=University of Alberta/5966844001, User=sharabiani, shahramfs
Not for Resale, 11/29/2013 00:54:11 MST

Contents

Page

Foreword ... **iv**
Introduction ... **vi**
1 Scope ... **1**
2 Normative references ... **1**
3 Terms and definitions ... **1**
4 Machine susceptibility classification ... **1**
4.1 General ... 1
4.2 Type I: Low susceptibility ... 2
4.3 Type II: Moderate susceptibility ... 2
4.4 Type III: High susceptibility ... 2
4.5 Machine susceptibility correction factors ... 2
5 Modal sensitivity ... **2**
5.1 General ... 2
5.2 Modal sensitivity ranges ... 3
5.3 Characteristics of modal sensitivity ranges ... 3
5.4 Values of modal sensitivity ... 3
5.5 Operating speed ... 7
5.6 Transient speed ... 9
6 Experimental determination of modal sensitivity near resonance speed under operational conditions ... **10**
6.1 General ... 10
6.2 Nyquist diagram procedure ... 10
6.3 Bode diagram procedure ... 10
7 Numerical values for the local sensitivity ... **11**
8 Experimental determination of the local sensitivity ... **12**
8.1 General ... 12
8.2 Procedure ... 12
9 Damped unbalance sensitivity analysis ... **13**
Annex A (informative) **Explanations of terms** ... **14**
Annex B (informative) **Example of polar plot diagram procedure** ... **16**
Annex C (informative) **Examples of classification according to modal sensitivity** ... **17**
Annex D (informative) **Example of mathematical model applied unbalance** ... **18**
Bibliography ... **19**

© ISO 2013 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Licensee=University of Alberta/5966844001, User=sharabiani, shahramfs
Not for Resale, 11/29/2013 00:54:11 MST