DIN ISO 21940-14:2023-04 (E)

Mechanical vibration - Rotor balancing - Part 14: Procedures for assessing balance errors (ISO 21940-14:2012 + Amd 1:2022)

Contents

Page

National foreword ... 3

National Annex NA (informative) Bibliography ... 5

[A1] Foreword to Amendment A1 [A1] ... 6

Introduction ... 7

1 Scope ... 8

2 Normative references ... 8

3 Terms and definitions ... 8

4 Balance error sources ... 8
4.1 General ... 8
4.2 Systematic errors ... 9
4.3 Randomly variable errors ... 9
4.4 Scalar errors ... 10

5 Error assessment ... 10
5.1 General ... 10
5.2 Errors caused by balancing equipment and instrumentation ... 10
5.3 Balance errors caused by component radial and axial runout ... 10
5.4 Assessment of balancing operation errors ... 11
5.5 Experimental assessment of randomly variable errors ... 12
5.5.1 General ... 12
5.5.2 Procedure ... 12
5.6 Experimental assessment of systematic errors ... 13

6 Combined error evaluation ... 13

[A1] 7 Accounting for measurement errors in the balance quality verification process [A1] ... 14

Annex A (informative) Error examples, their identification and evaluation ... 15
A.1 Errors originating from auxiliary equipment ... 15
A.1.1 General ... 15
A.1.2 Errors originating from inherent unbalance and eccentricity ... 15
A.1.3 Errors originating from bearings ... 15
A.1.4 Errors originating from mechanical fits ... 15
A.1.5 Errors associated with balancing equipment mass ... 15
A.2 Errors originating from the workpiece ... 15
A.2.1 General ... 15
A.2.2 Errors originating from loose parts ... 15
A.2.3 Errors originating from the presence of entrapped liquids or small loose particles ... 17
A.2.4 Errors originating from thermal effects ... 17
A.2.5 Errors originating from bearings ... 17
A.2.6 Errors originating from variations in mechanical fit ... 22
A.2.7 Errors originating from runout of the end-drive mounting surface ... 22
A.2.8 Errors originating from magnetic effects ... 22