DIN ISO 15242-1:2018-07 (E)

Rolling bearings - Measuring methods for vibration - Part 1: Fundamentals (ISO 15242-1:2015)

Contents

Page

National foreword ... **3**

National Annex NA (informative) **Bibliography** ... **4**

Foreword ... **5**

Introduction ... **6**

1 Scope ... **7**

2 Normative references ... **7**

3 Terms and definitions ... **7**

4 Fundamental concepts ... **9**
4.1 Bearing vibration measurement ... 9
4.2 Characteristics of an axis of rotation ... 10
4.3 Bearing error motion ... 11
4.4 Bearing vibration ... 12

5 Measurement process ... **12**
5.1 Basic principle of vibration measurement ... 12
5.2 Rotational frequency ... 12
5.3 Orientation of bearing rotational axis ... 12
5.4 Bearing load ... 13
5.5 Transducers ... 13

6 Measurement and evaluation methods ... **13**
6.1 Physical quantity measured ... 13
6.2 Frequency domain ... 13
6.3 Time domain ... 13
6.4 Transducer response and filter characteristics ... 13
6.5 Method of time-averaging ... 15
6.6 Measurement sequence ... 15

7 Conditions for measurement ... **16**
7.1 Bearing conditions for measurement ... 16
7.1.1 Prelubricated bearings ... 16
7.1.2 Non-prelubricated bearings ... 16
7.2 Conditions of the measurement environment ... 16
7.3 Conditions for the measuring device ... 16
7.3.1 Stiffness of the spindle/mandrel arrangement ... 16
7.3.2 Loading mechanism ... 16
7.3.3 Magnitude and alignment of the external load applied to the bearing ... 16
7.3.4 Axial location of transducer and direction of measurement ... 16
7.3.5 Mandrel ... 16
7.3.6 Others ... 17

8 Calibration and reference evaluation of the measuring system ... **17**
8.1 General ... 17
8.2 Calibration of the system components ... 17
8.3 System performance evaluation ... 18

Annex A (informative) **Contact resonance considerations for spring-loaded transducers** ... **19**

Annex B (informative) **Correlation of amplitudes of displacement, velocity and acceleration** ... **20**

Annex C (informative) **Measurement of radial run-out and axial run-out of the mandrel** ... **21**

Bibliography ... **22**