ISO/TR 17243-1:2014-12 (E)

Machine tool spindles - Evaluation of machine tool spindle vibrations by measurements on spindle housing - Part 1: Spindles with rolling element bearings and integral drives operating at speeds between 600 min-1 and 30000 min-1

Contents

Page

Foreword iv

Introduction v

1 Scope 1

2 Normative references 1

3 Termsanddefinitions 2

4 Preliminary operations 3
4.1 General 3
4.2 Process load 3
4.3 Spindle speed 3
4.4 Thermal conditions 4
4.5 Spindle position and orientation 4
4.6 Tool or workpiece balancing 4
4.7 Spindle chuck 4
4.8 Spindle cooling 5
4.9 Drawbar 5
4.10 Background vibration 5
4.11 Idle operation 5

5 Measurement and operational procedures 5
5.1 Measuring instruments 5
5.2 Measurement locations/directions 6
5.3 Sensor mounting procedures 7

6 Evaluation parameters 8
6.1 Vibration velocity parameter 8
6.2 Vibration acceleration parameter 9
6.3 Demodulated vibration spectra bearing analysis methods 10

7 Spindleclassification 10
7.1 General 10
7.2 Classification according to rated power 10
7.3 Classification according to maximum spindle speed 10
7.4 Classification according to bearing type 10

8 Evaluation 11
8.1 General 11
8.2 Criterion I: vibration magnitude 11
8.3 Criterion II: change in vibration magnitude 12
8.4 General zone boundaries 12
8.5 Examples of evaluation zone boundary values 13
8.6 Operational limits 14

Annex A (informative) Introduction to alternative bearing condition assessment techniques 16

Bibliography 18

Bibliography **18**