

ISO/TR 17243-3:2020-02 (E)

Machine tool spindles - Evaluation of machine tool spindle vibrations by measurements on spindle housing - Part 3: Gear-drive n spindles with rolling bearings operating at speeds between 600 r/min and 12 000 r/min

Contents		Page
Foreword		v
1 Scope		1
2 Normative references		1
3 Terms and definitions		2
4 Preliminary operations		3
4.1 General.....		3
4.2 Process load.....		3
4.3 Spindle speed.....		3
4.4 Thermal conditions.....		3
4.5 Spindle position and orientation.....		4
4.6 Gear selection.....		4
4.7 Tool or workpiece balancing.....		4
4.7.1 General.....		4
4.7.2 Spindle vibration measurements with a tool/workpiece mounted in the spindle		4
4.7.3 Spindle vibration measurements without tool/workpiece.....		4
4.8 Spindle chuck.....		4
4.9 Spindle cooling.....		4
4.10 Drawbar.....		4
4.11 Background vibration.....		5
4.12 Idle operation.....		5
5 Measurement and operational procedures		5
5.1 Measuring instruments.....		5
5.2 Measurement locations/directions.....		5
5.2.1 General.....		5
5.2.2 Naming convention for measurement locations.....		7
5.3 Sensor mounting procedures.....		7
6 Evaluation parameters		8
6.1 Vibration velocity parameter.....		8
6.1.1 General.....		8
6.1.2 Resonance exclusion criteria.....		8
6.2 Vibration acceleration parameter.....		9
7 Spindle classification		10
7.1 General.....		10
7.2 Classification according to maximum spindle speed.....		10
7.3 Classification according to bearing type.....		10
8 Evaluation		10
8.1 General.....		10
8.1.1 Overview.....		10
8.1.2 Measurement uncertainty.....		11
8.2 Criterion I: vibration magnitude.....		11
8.2.1 General.....		11
8.2.2 Evaluation zones.....		11
8.2.3 Exemplary evaluation zone boundaries.....		11

8.3	Criterion II: change in vibration magnitude	11
8.4	General zone boundaries	12
8.5	Examples of evaluation zone boundary values	13
8.6	Operational limits.....	13
8.6.1	General.....	13
8.6.2	Setting of alerts	13
8.6.3	Setting of alarms	13
8.6.4	Setting of the threshold for shutdown	14
Annex A (informative) Introduction to alternative bearing condition assessment techniques		15
Bibliography.....		17