

# ISO 230-10:2011-05 (E)

## Test code for machine tools - Part 10: Determination of the measuring performance of probing systems of numerical ly controlled machine tools

---

<b>Contents</b>		<b>Page</b>
Foreword .....		iv
Introduction .....		v
1	Scope .....	1
2	Normative references .....	1
3	Terms and definitions .....	2
3.1	General terms .....	2
3.2	Terms relating to the probing system .....	2
3.3	Terms relating to probing .....	5
4	Preliminary remarks .....	7
4.1	Influences on the measurement performance of the probing system .....	7
4.2	Measurement units .....	8
4.4	Recommended instrumentation and test equipment .....	8
4.5	Machine conditions prior to testing .....	8
4.6	Testing sequence .....	8
4.7	Tests to be performed .....	8
4.8	Sources of test uncertainty .....	8
4.9	Reporting of test results .....	9
5	Thermal influences .....	10
5.1	General .....	10
5.2	Environmental temperature variation error (ETVE) test .....	10
5.3	Other thermal distortion tests .....	10
6	Probing of workpiece .....	11
6.1	General .....	11
6.2	Probing repeatability .....	11
6.3	Stylus tip offset test, A .....	13
6.4	Probing-tool location repeatability test, RPTL,X, RPTL,Y and RPTL,Z (RProbing- Tool_Location,X,Y,Z) .....	14
6.5	2D probing error test, PFTU,2D (PForm_Tactile_Unique,2D) .....	14
6.6	3D probing error test, PFTU,3D (PForm_Tactile_Unique,3D) .....	16
6.7	Workpiece position and orientation tests, EPLA,Z, ELIN,Y, ECOR,X, ECOR,Y and ECOR,Z, (EPLAne,Z), (ELINe,Y), (ECORner coordinates,X,Y,Z) .....	17
6.8	Combined workpiece machining and location test, ECML,X, ECML,Y, ECML,Z, RCML,X, RCML,Y and RCML,Z (ECombined Machining and Location, X,Y,Z), (RCombined Machining and Location, X,Y,Z) .....	24
6.9	Time delay variation tests .....	25
6.10	Feature size measurement performance tests .....	29
7	Probing of tools .....	31
7.1	General .....	31
7.2	Tool-setting system qualification .....	32
7.3	Tool-setting repeatability .....	33
Annex A (informative)	Alphabetical cross-references and short description of symbols .....	36
Bibliography .....		38