

ISO 13041-1:2020-03 (E)

Test conditions for numerically controlled turning machines and turning centres - Part 1: Geometric tests for machines with horizontal workholding spindle(s)

Contents		Page
Foreword		iv
Introduction		v
1	Scope	1
2	Normative references	1
3	Terms and definitions	1
4	Preliminary remarks	2
4.1	Measuring units	2
4.2	Reference to ISO 230	2
4.3	Machine levelling	2
4.4	Testing sequence	2
4.5	Tests to be performed	2
4.6	Measuring instruments	3
4.7	Diagrams	3
4.8	Linear motions	3
4.9	Tool turret and tool spindle(s)	3
4.10	Machine classifications	3
4.11	Software compensation	9
4.12	Tolerances	10
4.13	Axes not under test	10
5	Geometric tests	11
5.1	Workholding spindle	11
5.2	Straightness of axes of motion	13
5.3	Relation between linear motions and/or workholding spindle(s)	16
5.4	Angular error of linear axes of motion	23
5.5	Tailstock	26
5.6	Tool turret and tool spindle	30
5.7	Rotary workholding spindle head or tool turret head	39
Annex A (informative) Error motions of the axis of rotation of workholding and tool spindles		41
Annex B (informative) Terms in non-ISO languages		46
Bibliography		47