

ISO/TS 13399-305:2017-01 (E)

Cutting tool data representation and exchange - Part 305: Creation and exchange of 3D models - Modular tooling systems with adjustable cartridges for boring

Contents

Page

Foreword	vi
Introduction	vii
1 Scope	1
2 Normative references	1
3 Terms and definitions	2
4 Starting elements, coordinate systems, planes	2
4.1 General	2
4.2 Reference system	2
4.3 Mounting coordinate system	3
4.4 Coordinate system at the cutting part	4
4.5 Planes	5
4.6 Adjustment coordinate system on workpiece side	6
4.6.1 General	6
4.6.2 Designation of the coordinate system workpiece side	7
4.6.3 Arrangement of coordinate system workpiece side	8
4.7 Design of the pocket seat and cutting reference point (CRP) of the insert	9
5 Design of the model	13
5.1 General	13
5.2 Necessary parameters for the connection interface feature	13
5.3 Necessary properties for insert and pocket seat	14
5.3.1 General	14
5.3.2 Properties for equilateral, equiangular and equilateral, non- equiangular inserts	14
5.3.3 Properties for non-equilateral, equiangular and non-equilateral, non- equiangular inserts	15
5.3.4 Properties for round inserts	15
5.3.5 Design of the pocket seat feature	16
6 Basic shapes for extension bridges, adjustment and assembly parts	16
6.1 Monoblock extension bridges with adaptor	16
6.1.1 General	16
6.1.2 Necessary properties	16
6.1.3 Basic geometry	17
6.2 Bridge tool adaptor	19
6.2.1 General	19
6.2.2 Necessary properties	19
6.2.3 Basic geometry	19
6.3 Bridge tool	20
6.3.1 General	20
6.3.2 Necessary properties	21
6.3.3 Basic geometry	21
6.4 Slide for adjustable units	22
6.4.1 General	22
6.4.2 Necessary properties	22
6.4.3 Basic geometry of slides for adjustable units	22
6.5 Slide element	23
6.5.1 General	23

6.5.2	Necessary properties	24
6.5.3	Basic geometry of slide elements	24
6.6	Balance weight	25
6.6.1	General	25
6.6.2	Necessary properties	26
6.6.3	Basic geometry of balance weights	26
7	Basic shapes for cartridges and insert holders	27
7.1	Adjustable unit	27
7.1.1	General	27
7.1.2	Necessary properties	28
7.1.3	Basic geometry of adjustable units	28
7.2	Boring head for adjustable units	29
7.2.1	General	29
7.2.2	Necessary properties	30
7.2.3	Basic geometry of boring heads for adjustable units	30
8	Basic shapes of rotating boring systems	31
8.1	General	31
8.2	Assembled single-point bridge tool	31
8.2.1	General	31
8.2.2	Necessary properties	32
8.2.3	Assembled model of single-point bridge tool	33
8.3	Assembled single-point bridge tool for reverse internal operations	35
8.3.1	General	35
8.3.2	Necessary properties	36
8.3.3	Assembled model of single-point bridge tool for reverse operations	36
8.4	Assembled multi-point bridge tool	37
8.4.1	General	37
8.4.2	Necessary properties	38
8.4.3	Assembled model of multi-point bridge tool	39
8.5	Assembled single-point bridge tool for external operations	40
8.5.1	General	40
8.5.2	Necessary properties	40
8.5.3	Assembled model of single-point bridge tool for external operations	41
8.6	Assembled multi-point bridge tool for external operations	42
8.6.1	General	42
8.6.2	Necessary properties	43
8.6.3	Assembled model of a multi-point bridge tool for external operations	43
8.7	Single-point bridge tool for axial grooving	44
8.7.1	General	44
8.7.2	Necessary properties	45
8.7.3	Assembled model of single-point bridge tool for axial grooving	46
8.8	Assembled multi-point bridge tool for axial grooving	47
8.8.1	General	47
8.8.2	Necessary properties	47
8.8.3	Assembled model of multi-point bridge tool for axial grooving	47
8.9	Boring head	48
8.9.1	General	48
8.9.2	Necessary properties	49
8.9.3	Assembled model of boring head	49
8.10	Fine boring head with boring bar	50
8.10.1	General	50
8.10.2	Necessary properties	50
8.10.3	Assembled model of fine boring head with boring bar	51
8.11	Boring head with adjustable unit	52
8.11.1	General	52
8.11.2	Necessary properties	52
8.11.3	Assembled model of boring head with adjustable unit	53
9	Design of details	54

9.1	Basis for modelling	54
9.2	Fixing threads for inserts	54
9.3	Contact/clamping surfaces -- Orientation	54
9.4	Chamfers and roundings	54
10	Attributes of surfaces -- Visualization of model features	55
11	Data exchange model	55
Annex A (informative) Information about nominal dimensions		67
Annex B (informative) STP structure		68
Bibliography		73