

ISO/TR 10064-2:1996-03 (E)

Cylindrical gears - Code of inspection practice - Part 2: Inspection related to radial composite deviations, runout, tooth thickness and backlash

Contents	Page
FOREWORD	IV
1 Scope	1
2 References	1
3 Symbols, corresponding terms and definitions	2
3.1 Lower case symbols	2
3.2 Upper case symbols	2
3.3 Greek symbols	2
3.4 Subscript symbols	2
3.5 Definitions	3
4 Measurement of radial composite deviations	6
4.1 Checking principle	6
4.2 The Utility of radial composite deviation data	7
5 Measurement of runout, determining eccentricity	8
5.1 Measuring principle	8
5.2 Anvil size for measuring runout	9
5.3 Measuring runout	9
5.4 Evaluation of measurement 1	1
5.5 Value of runout measurement	11
5.6 The relation between runout and pitch deviations	11
6 Measurement of tooth thickness, tooth span and dimension over balls or cylinders	14
6.1 Tooth thickness measurement	14
6.2 Span measurement	15
6.3 Control of tooth thickness by determining the dimension over balls or cylinders	17
6.4 Tooth thickness measurement with radial composite measurement	19
6.5 Calculations for radial composite action test measurement	19
7 Gear limits and fits	21
7.1 Introduction	21
7.2 Tooth thickness tolerances	22
Annex A Backlash and Tooth Thickness Tolerance	23
A.1 Purpose	23
A.2 Backlash	23
A.3 Maximum Tooth Thickness	23
A.4 Minimum Backlash	23
A.5 Specifications for Tooth Thickness Measurement	24
A.6 Maximum Backlash	24
Annex B Bibliography	26
TABLES	
Table 1 - Standard pin diameters in mm	17
Table A1 - Recommended values minimum backlash for coarse pitch gears	24

FIGURES

Figure 1 - Span and tooth thickness allowances 4

Figure 2 - Tooth thickness, transverse plane 5

Figure 3 - Relationship between circumferential j_{wt} , normal j_{bn} , and radial j_r backlash 6

Figure 4 - Principle of measuring radial composite deviations 7

Figure 5 - Radial composite deviation diagram 7

Figure 6 - Interpretation of radial composite deviation 8

Figure 7 - Principle of measuring runout 9

Figure 8 - Anvil size for measuring runout..... 10

Figure 9 - Runout from coordinate measuring machine..... 10

Figure 10 - Runout diagram of a gear with 16 teeth 1 1

Figure 11 - Runout and pitch deviations of an eccentric gear 12

Figure 12 - Gear with zero runout, but with considerable pitch and cumulative pitch deviations (all space widths are equal) 12

Figure 13 - Gear with pitch and cumulative pitch deviations and zero runout 13

Figure 14 - Actual gear with little runout and substantial cumulative pitch deviation 13

Figure 15 - Runout measurement with a rider when all space widths are equal and pitch deviations are present 14

Figure 16 - Addendum and chordal tooth thickness 14

Figure 17 - Chordal tooth thickness measurement by gear tooth caliper 15

Figure 18 - Span measurement of helical gears 15

Figure 19 - Limits of span measurement in base tangent plane..... 16

Figure 20 - Dimension over (between) balls or cylinders for spur gear teeth 17

Figure 21 - Ball size 18

Figure 22 - Radical composite action test measurement of tooth thickness 20

Figure 23 - Fit of gear teeth..... 21

Figure A1 - Feeler gauge backlash measurement (normal plane)..... 23