

# ISO 10300-1:2023-08 (E)

## Calculation of load capacity of bevel gears - Part 1: Introduction and general influence factors

---

<b>Contents</b>		<b>Page</b>
Foreword .....		v
Introduction .....		vii
1	Scope .....	1
2	Normative references .....	1
3	Terms and definitions .....	2
4	Symbols and general subscripts .....	2
5	Application .....	6
5.1	Calculation methods .....	6
5.1.1	General .....	6
5.1.2	Method A .....	6
5.1.3	Method B .....	6
5.1.4	Method C .....	6
5.2	Safety factors .....	7
5.3	Rating factors .....	7
5.3.1	Testing .....	7
5.3.2	Manufacturing tolerances .....	7
5.3.3	Implied accuracy .....	8
5.4	Further factors to be considered .....	8
5.4.1	General .....	8
5.4.2	Lubrication .....	8
5.4.3	Misalignment .....	8
5.4.4	Deflection .....	8
5.4.5	Materials and metallurgy .....	8
5.4.6	Residual stress .....	8
5.4.7	System dynamics .....	9
5.4.8	Contact pattern .....	9
5.4.9	Corrosion .....	9
5.5	Further influence factors in the basic formulae .....	9
6	External force and application factor, $K_A$ .....	10
6.1	Nominal tangential force, torque, power .....	10
6.2	Variable load conditions .....	10
6.3	Application factor, $K_A$ .....	10
6.3.1	Application factor – General .....	10
6.3.2	Influences affecting external dynamic loads .....	11
6.3.3	Establishment of application factors .....	11
7	Dynamic factor, $K_v$ .....	11
7.1	General .....	11
7.2	Design .....	11
7.3	Manufacturing .....	12
7.4	Transmission error .....	12
7.5	Dynamic response .....	12
7.6	Resonance .....	13
7.6.1	General .....	13

7.6.2	Gear blank resonance .....	13
7.7	Calculation methods for Kv .....	13
7.7.1	General comments .....	13
7.7.2	Method A, Kv-A .....	14
7.7.3	Method B, Kv-B .....	14
7.7.4	Method C, Kv-C .....	18
8	Face load factors, KH, KF .....	20
8.1	General comments .....	20
8.2	Method A .....	20
8.3	Method B .....	21
8.4	Method C .....	21
8.4.1	Face load factor, KH-C .....	21
8.4.2	Local face load factor, KH,Y .....	21
8.4.3	Face load factor, KF-C .....	22
8.4.4	Lengthwise curvature factor for bending strength, KF0 .....	22
9	Transverse load factors, KH, KF .....	23
9.1	General comments .....	23
9.2	Method A .....	24
9.3	Method B .....	24
9.3.1	Bevel gears having virtual cylindrical gears with contact ratio $v \leq 2$ .....	24
9.3.2	Bevel gears having virtual cylindrical gears with contact ratio $v > 2$ .....	24
9.4	Method C .....	25
9.4.1	General comments .....	25
9.4.2	Assumptions .....	25
9.4.3	Determination of the factors .....	25
9.5	Running-in allowance, $y$ .....	25
Annex A (normative) Calculation of virtual cylindrical gears -- Method B1 .....		27
Annex B (normative) Calculation of virtual cylindrical gears -- Method B2 .....		43
Annex C (informative) Values for application factor, KA .....		49
Annex D (informative) Contact patterns .....		50
Bibliography .....		54