BUREAU OF INDIAN STANDARDS
DRAFT FOR COMMENTS ONLY

Doc: PGD 33 (26084) WC
July 2024

भारतीय मानक मसौदा

स्पर और कुंडलित गियरों की भार क्षमता का परिकलन — भाग 3: दाँत मुड़ाव सामर्थ्य की गणना

Draft Indian Standard

Calculation of Load Capacity of Spur and Helical Gears — Part 3: Calculation of Tooth Bending Strength

ICS 21.200

Transmission Device Sectional Committee, PGD 33	Last Date for Comments: **02-09-2024**

NATIONAL FOREWORD

(*Formal clauses will be added later on*)

This standard specifies the fundamental formulae for use in tooth bending stress calculations for involute external or internal spur and helical gears with a rim thickness $s_R > 0{,}5\ h_t$ for external gears and $s_R > 1{,}75\ m_n$ for internal gears. In service, internal gears can experience failure modes other than tooth bending fatigue that is, fractures starting at the root diameter and progressing radially outward. This standard does not provide adequate safety against failure modes other than tooth bending fatigue. All load influences on the tooth root stress are included in so far as they are the result of loads transmitted by the gears and in so far as they can be evaluated quantitatively.

Spur gears offer the simplest design, with straight teeth parallel to the gear axis. Conversely, helical gears have teeth cut in the form of a helix over the cylindrical blank. Both spur gears and helical gears are used to transmit power between a parallel driver and driven shafts.

This standard is published in five parts. The other parts in this series are:

Part 1	Basic principles, introduction and general influence factors
Part 2	Calculation of surface durability (pitting)
Part 5	Strength and quality of materials
Part 6	Calculation of service life under variable load

The text of ISO standard has been approved as suitable for publication as an Indian Standard without deviations. Certain conventions are however not identical to those used in Indian Standards. Attention is particularly drawn to the following

a) Wherever the words 'International Standard' appear referring to this standard, they should be read as 'Indian Standard'.
b) Comma (,) has been used as a decimal marker while in Indian Standards, the current-practice is to use a point (.) as the decimal marker.

In this adopted standard, reference appears to certain International Standards for which Indian Standards also exist. The corresponding Indian Standards, which are to be substituted in their respective places, are listed below along with their degree of equivalence for the editions indicated:

International Standard	*Corresponding Indian Standard*	*Degree of Equivalence*
ISO 53 : 1998 Cylindrical gears for general and heavy engineering — Standard basic rack tooth profile	IS 2535 (Part 1) : 2004/ISO 53 : 1998 Cylindrical gears for general and heavy engineering: Part 1 Standard basic rack tooth profile (*third revision*)	Identical
ISO 1122-1 : 1998 Vocabulary of gear terms — Part 1: Definitions related to geometry	IS 2458 : 2001/ISO 1122-1 : 1998 Vocabulary of gear terms — Definitions related to geometry (*first revision*)	Identical
ISO 4287 : 1997 [1)] Geometrical product specifications (GPS) — Surface texture: Profile method — Terms, definitions and surface texture parameters	IS 18432 (Part 2) : 2023/ISO 21920-2 : 2021)[1)] Geometrical product specifications (GPS) Surface texture: Profile: Part 2 Terms, definitions and surface texture parameters	Identical

[1)] ISO 4287 : 1997 has been superseded by ISO 21920-2 : 2021

The technical committee has reviewed the provisions of the following International Standards referred in this adopted standard and has decided that they are acceptable for use in conjunction with this standard:

International Standard	*Title*
ISO 4288 : 1996/ISO 21920-3 : 2021 [2)]	Geometrical Product Specifications (GPS) — Surface texture: Profile method — Rules and procedures for the assessment of surface texture/Geometrical product specifications (GPS) — Surface texture: Profile Part 3: Specification operators
ISO 6336-1	Calculation of load capacity of spur and helical gears — Part 1: Basic principles, introduction and general influence factors
ISO 6336-5	Calculation of load capacity of spur and helical gears — Part 5: Strength and quality of materials

[2)] ISO 4288 : 1996 has been superseded by ISO 21920-3 : 2021 Geometrical product specifications (GPS) — Surface texture: Profile Part 3: Specification operators

For the purpose of deciding whether a particular requirement of this standard is complied with the final value, observed or calculated, expressing the result of a test or analysis shall be rounded off in accordance with IS 2 : 2022 ‘Rules for rounding off numerical values (*second revision*)’.

NOTE: The technical content of draft standard is not available on website. For details, please refer to ISO 6336-3 : 2019 or contact:

Head
Production and General Engineering Department
Bureau of Indian Standards
9 Bahadur Shah Zafar Marg New Delhi-110002
Email: pgd@bis.org.in
Telefax:011-23234819