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Calculation of micropitting load capacity of cylindrical spur and helical gears —

Part 2: Examples of calculation for micropitting

Calcul de la capacité de charge aux micropiqûres des engrenages cylindriques à dentures droite et hélicoïdale —

Partie 2: Exemples de calcul pour micropiqûres

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 60, *Gears*, Subcommittee SC 2, *Gear capacity calculation*.

This corrected version of ISO/TR 15144-2:2014 incorporates the following corrections: errors in symbols and equations have been corrected.

ISO/TR 15144 consists of the following parts, under the general title *Calculation of micropitting load capacity of cylindrical spur and helical gears*:

— *Part 1: Introduction and basic principles*

— *Part 2: Examples of calculation for micropitting*

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Introduction

This part of ISO/TR 15144 provides worked examples for the application of the calculation procedures defined in ISO/TR 15144-1. The example calculations cover the application to spur and helical cyclindrical involute gears for both high-speed and low-speed operating conditions, determining the micropitting safety factor for each gear pair. The calculation procedures used are consistent with those presented in ISO/TR 15144-1. No additional calculations are presented here that are outside of the technical report.

Four worked examples are presented with the necessary input data for each gear set provided at the beginning of the calculation. The worked examples are based on real gear pairs where either laboratory or operational field performance data has been established, with the examples covering several applications. When available, pictures and measurements are provided of the micropitting wear, experienced on the gear sets when run under the conditions used in the worked examples. Calculation details are presented in full for several of the initial calculations after which only summarized results data are included. For better applicability, the numbering of the formulae follows ISO/TR 15144-1. Several of the worked examples are presented with the calculation procedures performed in accordance with the application of both methods A and B.

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Calculation of micropitting load capacity of cylindrical spur and helical gears —

Part 2:
Examples of calculation for micropitting

1 Scope

The example calculations presented here are provided for guidance on the application of the technical report ISO/TR 15144-1 only. Any of the values or the data presented should not be used as material or lubricant allowables or as recommendations for micro-geometry in real applications when applying this procedure. The necessary parameters and allowable film thickness values, λ_{GFP}, should be determined for a given application in accordance with the procedures defined in ISO/TR 15144-1.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 1122-1:1998, *Vocabulary of gear terms — Part 1: Definitions related to geometry*

ISO 6336-1:2006, *Calculation of load capacity of spur and helical gears — Part 1: Basic principles, introduction and general influence factors*

ISO 6336-2:2006, *Calculation of load capacity of spur and helical gears — Part 2: Calculation of surface durability (pitting)*

ISO 21771:2007, *Gears — Cylindrical involute gears and gear pairs — Concepts and geometry*

ISO/TR 15144-1:2014, *Calculation of micropitting load capacity of cylindrical spur and helical gears — Part 1: Introduction and basic principles*

3 Terms, definitions, symbols, and units

3.1 Terms and definitions

For the purpose of this document, the terms and definitions given in ISO 1122-1, ISO 6336-1, and ISO 6336-2 apply.

3.2 Symbols and units

The symbols used in this technical report are given in Table 1. The units of length metre, millimetre, and micrometre are chosen in accordance with common practice. The conversions of the units are already included in the given formulae.

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