INTERNATIONAL STANDARD

ISO 14635-1

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Gears — FZG test procedures —

Part 1:
FZG test method A/8,3/90 for relative scuffing load-carrying capacity of oils

Engrenages — Méthodes d'essai FZG —

Partie 1: Méthode FZG A/8,3/90 pour évaluer la capacité de charge au grippage des huiles

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this part of ISO 14635 may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 14635-1 was prepared by Technical Committee ISO/TC 60, *Gears*, Subcommittee SC 2, *Gear capacity calculation*.

ISO 14635 consists of the following parts, under the general title *Gears — FZG test procedures*:

— *Part 1: FZG test method A/8,3/90 for relative scuffing load-carrying capacity of oils*

— *Part 2: FZG test method A10/16,6R/90 for relative scuffing load-carrying capacity of lubricants with high EP performance*[1)]

Annexes A and B of this part of ISO 14635 are for information only.

1) Currently a new work item proposal awaiting approval.

Introduction

The types of gear failures which may be influenced by the lubricant in use are scuffing, low-speed wear and the gear-surface fatigue phenomena known as micropitting and pitting. In the gear design process, these gear damages are taken into consideration by the use of specific lubricant and service-related characteristic values. For an accurate, field-related selection of these values, adequate lubricant test procedures are required. The FZG test procedures described in this and other parts of ISO 14635 can be regarded as tools for the determination of the lubricant-related characteristic values to be introduced into the load-carrying capacity calculation of gears.

FZG test method A/8,3/90 for the relative scuffing load-carrying capacity of oils described in this part of ISO 14635 is typical for the majority of applications in industrial and marine gears. ISO 14635-2 will be related to the relative scuffing load-carrying capacity of oils of very high EP properties, as used for the lubrication of automotive driveline components. Other FZG test procedures for the determination of low-speed wear, micropitting and pitting load-carrying capacity of gears are already in a late state of development. They may be added later to ISO 14635 as further parts.

Gears — FZG test procedures —

Part 1: FZG test method A/8,3/90 for relative scuffing load-carrying capacity of oils

1 Scope

This part of ISO 14635 specifies a test method based on an FZG[2)] four-square test machine to determine the relative load-carrying capacity of lubricating oils defined by the gear-surface damage known as scuffing. High surface temperatures due to high surface pressures and sliding velocities can initiate the breakdown of the lubricant films. This test method can be used to assess such lubricant breakdown under defined conditions of temperature, high sliding velocity and stepwise increased load.

NOTE This method is technically equivalent to ASTM D 5182-97, DIN 51354-1 and DIN 51354-2, IP 334/90 and CEC L-07-A-95.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of ISO 14635. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of ISO 14635 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 1328-1, *Cylindrical gears — ISO system of accuracy — Part 1: Definitions and allowable values of deviations relevant to corresponding flanks of gear teeth*.

ISO 4287, *Geometrical Product Specifications (GPS) — Surface texture: Profile method — Terms, definitions and surface texture parameters*.

ISO 4964, *Steel — Hardness conversions*.

ISO 5725-2, *Accuracy (trueness and precision) of measurement methods and results — Part 2: Basic method for the determination of repeatability and reproducibility of a standard measurement method*.

ASTM D 235, *Specification for Mineral Spirits (Petroleum Spirits) (Hydrocarbon Dry Cleaning Solvent).*

2) FZG = Forschungsstelle für Zahnräder und Getriebebau, Technische Universität München (Gear Research Centre, Technical University, Munich), Boltzmannstraße 15, D-85748 Garching, Germany.