Second edition
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Lubricants, industrial oils and related products (class L) — Family C (gears) —

Part 1: Specifications for lubricants for enclosed gear systems

Lubrifiants, huiles industrielles et produits connexes (classe L) — Famille C (engrenages) —

Partie 1: Spécifications des lubrifiants pour systèmes d'engrenages sous carter

Reference number
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Contents

Page

Foreword

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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).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by ISO/TC 28, *Petroleum products*, Subcommittee SC 4, *Specifications.*

This second edition cancels and replaces the first edition (ISO 12925-1:1996), which has been technically revised. It also incorporates the Technical Corrigendum ISO 12925-1:1996/Cor 1:2002.

The main change from the previous edition is that new tables have been added to cover with specifications all the new categories added in ISO 6743-6.

New requirements have been added in terms of elastomer compatibility, low speed wear for the extreme pressures grades

A list of all the parts of ISO 12925 can be found on the ISO website.

Introduction

Lubricants for gear systems are used in diverse types of gear designs, ranging from simple parallel spur gears to bevel gears (straight or helical), worm gears and hypoid gears. Industrial gear systems, which are either of open type or enclosed type, vary in size from small enclosed systems used in machine tools to very large systems used in mining, steel mills and cement plants.

Lubricants for these applications vary in composition from refined straight mineral oils to more complex blends, based on mineral oils, synthetic oils (e.g. poly α-olefins, esters, poly-glycols), to vegetable oils and derivatives and additives friction modifying and/or extreme-pressure. ISO 3448 viscosity grades vary depending on the type of application and range from the low viscosity ISO VG 32 to high viscosity ISO VG 1500, even more for the very low velocities and very high loads. In exceptional cases, viscosity grades may be even higher. Temperature conditions to which the gear systems are exposed also vary considerably, not only due to the ambient conditions of operation, but also depending on the sliding between the gear teeth, on the size of the casings, on the presence on the circulating systems of heat exchangers, on the vicinity of heat sources as in the cement industry or in the steel industry.

Greases may also be used for the splash lubrication of enclosed gears or for the application on open gear teeth.

This document was first published in 1996 and covers the lubricants applied in enclosed gear systems most currently encountered in the industry. Since the first edition (ISO 12925-1:1996), the requirements for lubricants for enclosed gear systems have largely changed to suit to new gear technologies and applications. More demanding requirements have appeared with respect to extreme pressure properties (resistance to micro-pitting, ability to lubricate low velocity mechanisms, resistance to pitting), to foaming and air release characteristics. In addition, the need has also appeared for environmentally acceptable products.

This revision of ISO 12925-1 covers all the grades described in the ISO 6743-6 classification, intended for enclosed gear lubrication; it includes new requirements with respect to lubrication under low speed conditions (DIN 51819-3), resistance to foaming (ISO 12152). With respect to the micro-pitting protection properties, a specification will be introduced when a recognized standard is available. This revision includes also the environmental acceptability of some grades.

This document does not cover the extreme cases of use in terms of gear design, temperature and extreme conditions. For use in exceptional conditions, suppliers and purchasers of lubricants can mutually agree on the testing methods and the acceptability criteria of the products, not covered by this part of ISO 12925.