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Gears — Surface temper etch inspection after grinding, chemical method

Engrenages — Contrôle par attaque chimique des zones surchauffées lors de la rectification

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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).

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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.

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

This third edition cancels and replaces the second edition (ISO 14104:2014), which has been technically revised. The changes of the corrected version have been incorporated as well as adoptions in the cleaning method of etching procedures shown in Tables 2 and 3.

Introduction

This document explains the materials and procedures necessary to determine, evaluate and describe localized overheating on ground surfaces. A system to describe and classify the indications produced during this inspection is included. However, specific acceptance or rejection criteria are not contained.

An industry-wide survey was conducted to establish common solutions in time that were acceptable to the greatest number of users. The safety and environmental precautions were included therein for those not familiar with storage, handling, use and disposal of concentrated acids, alkalis and solvents. These precautions, however, do not supersede the latest applicable requirements.

Gears — Surface temper etch inspection after grinding, chemical method

1 Scope

This document specifies procedures and requirements for the detection and classification of localized overheating on ground surfaces by chemical etch methods.

The process described in this document is typically used on ground surfaces; however, it is also useful for the detection of surface anomalies that result from post-heat treatment machining such as hard turning, milling and edge breaking (deburring) processes. Surface metallurgical anomalies caused by carburization or decarburization are also readily detectable with this process.

Some methods which have been used in the past are no longer recommended. Specifications are intended to be changed to use the methods in this document. These etching methods are more sensitive to changes in surface hardness than most hardness testing methods.

This document applies to steel parts such as gears, shafts, splines and bearings. It is not applicable to nitrided parts and stainless steels.

NOTE This process, although at times called “nital etch”, is not intended to be confused with other processes also known as “nital etch”.

The surface temper etch procedure is performed after grinding and before additional finishing operations such as superfinishing, shot peening and honing.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at http://www.iso.org/obp

4 Apparatus

4.1 Container materials.

Container materials shall not react with the solutions contained, nor damage the parts to be processed. All containers should be labelled with the solution contained and covered when not in use. Containers should be labelled according to local regulations.

4.2 Inspection area.

The area to be inspected shall be sufficiently illuminated to be free of shadows and reflections. A minimum light intensity of 2 200 lx (~200 foot candles) at the inspection level is recommended.