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**Gear - Surface temper etch inspection after grinding, chemical
method**

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Foreword

This Document was drafted as per the rules specified in GB/T 1.1-2020 Directives for Standardization - Part 1.Rules for the Structure and Drafting of Standardizing Documents.

This Document replaced GB/T 17879-1999 Gears - Surface Temper Etch Inspection after Grinding. Compared with GB/T 17879-1999, the major technical changes of this Document are

as follows besides the structural adjustments and the editorial modifications.

- a) Add a "Grayscale Contrast Card" (see 4.5 of this Edition);
- b) Change the requirements for reagents of nitric acid and hydrochloric acid (see 5.2 and 5.3 of this Edition; 3.2 and 3.3 of the 1999 Edition);
- c) Add the requirements for reagent "Rust Inhibitor" (see 5.7 of this Edition);
- d) Add a "General Rules" for inspection procedures (see 6.1 of this Edition);
- e) Change the concentrations of pickling and etching solutions (see Tables 2 and 3 of this Edition);
- f) Change the "Removal of Discoloration from Tempering Etching" (see Clause 8 of this Edition; Clause 7 of the 1999 Edition);
- g) Change the "Rework of Surface-Tempered Parts" (see Clause 9 of this Edition; Clause 6 of the 1999 Edition);
- h) Add "Operator Qualifications" (see Clause 10 of this Edition);
- i) Add "Specifications and Documents" (see Clause 13 of this Edition).

This Document equivalently adopted ISO 14104.2017 Gears - Surface Temper Etch Inspection

after Grinding, Chemical Method.

This Document made the following editorial modifications.

--- Delete information involving product names in subclause 4.5, Figure 1, and Figure 3.

Please note some contents of this Document may involve patents. The issuing agency of this

Document shall not assume the responsibility to identify these patents.

This Document was proposed by and under the jurisdiction of National Technical Committee

on Gears of Standardization Administration of China (SAC/TC 52).

Drafting organizations of this Document. Zhengzhou Research Institute of Mechanical Engineering (Zhengzhou) Transmission Technology Co., Ltd.; Nanjing High Speed & Accuracy Gear (Group) Co., Ltd.; Jinhua Xintian Gear Co., Ltd.; Inner Mongolia First Gear - 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

changes 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 quenched 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 final 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.

4.1 Container materials

Container materials shall not react with the solutions contained, nor damage the parts to be

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