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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 16840.4-2021

Replacing GB/T 16840.4-1997

**Technical determination methods for electrical fire evidence -
Part 4: Metallographic analysis method**

电气火灾痕迹物证技术鉴定方法 第4部分：金相分析法

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Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for Standardization Work Part

1. Structure and Drafting Rules of Standardization Documents" Drafting. This document is the fourth part of GB/T 16840 "Technical Appraisal Method for Electrical Fire Trace Material Evidence". GB/T 16840 has been released The following parts.

2. Remanence detection method;

3. Auger analysis method;

4. Metallographic Analysis;

5. Identification and extraction methods of electrical fire material evidence;

---Part 6: SEM microscopic morphology analysis method;

---Part 7: EDS component analysis method;

8. Thermal analysis method. This document replaces GB/T 16840.4-1997 "Technical Appraisal Method of Electrical Fire Cause Part

4. Metallographic Analysis Method". and Compared with GB/T 16840.4-1997, in addition to structural adjustments and editorial changes, the main technical changes are as follows:

--- Changed the scope of application (see Chapter 1, Chapter 1 of the.1997 edition);

--- Added a chapter "Normative Reference Documents" (see Chapter 2);

--- Deleted all the terms and definitions of the.1997 edition, and added "short-circuit melting mark", "short-circuit splashing molten bead", "electric melting mark" and "non-electrical melting mark". The terms and definitions of "heat traces" (see Chapter 3, Chapter 2 of the.1997 edition);

---Change and improve the relevant content of the principle of metallographic analysis (see Chapter 4, Chapter 3 of the.1997 edition);

1 Scope

GB/T 16840.4-2021 is the Chinese national standard on technical determination methods for electrical fire evidence - part 4: metallographic analysis method, in the field of environment and health protection, safety. The /T suffix marks it as a recommended standard: it is not compulsory by itself, but it becomes binding as soon as a contract, a tender or a customer specification calls it up - which in practice is how most foreign buyers meet it. It was issued on 20 August 2021 by the State Administration for Market Regulation; Standardization Administration of China, and has been in force since 20 August 2021. Classification: ICS 13.220.20, CCS C80/89. This page is published from the official record of the standard held by the Chinese standards administration: the identification, the dates, the classification and the issuing body are taken from there. The clause text, the tables and the numeric limits are in the document itself, which is delivered complete in English translation.

This document specifies the principle, equipment, equipment and reagents, inspection materials and methods of the metallographic analysis method for the technical identification method of electrical fire traces. Steps, characteristics of metallographic organization and comprehensive judgment. This document is applicable to the identification of the nature of

the fire based on the metallographic characteristics of the fire traces in the fire scene during the fire investigation.

2 Normative references

The contents of the following documents constitute the indispensable clauses of this document through normative references in the text. Among them, dated quotations Only the version corresponding to that date is applicable to this document; for undated reference documents, the latest version (including all amendments) is applicable to This document.

GB/T 16840.1 Technical Appraisal Method of Electrical Fire Trace Material Evidence Part

3 Terms and definitions

The following terms and definitions defined in GB/T 16840.1 apply to this document.

3.1 Short circuit melt mark meltedmarkcausedbyshortcircuit Copper and aluminum wires are short-circuited and formed melting marks on the wires.

Note. Short-circuit melting marks include primary short-circuit melting marks and secondary short-circuit melting marks.

3.2 Short circuit splashes molten beads splashdownmeltedbeadcausedbyshortcircuit Copper and aluminum conductors are melted and splashed at the moment of short-circuit or arcing, and splashed and adhered to other carriers. track.

3.3 Electric heating meltedmarkcausedbyelectriceheating Under the action of high temperature and heat of electric arc or electric current, melting traces formed on metal surface or copper and aluminum wires.

Note. Including but not limited to short-circuit melting marks, overload melting marks, local overheating melting marks caused by poor contact, and the discharge of wires and other metals of different potentials. Melt marks formed during electricity, short-circuit to ground weld marks, and weld marks formed by contact discharge between charged metals of different potentials, etc.

3.4 Non-electric heating markcaused by non-electricheating Traces formed by non-arc or current thermal effects such as fire heat, machining or stress.

Note. Including but not limited to traces formed by fire, friction, cutting, drawing, extrusion, high pressure impact, etc.

4 Principle

For the metal or copper, aluminum wire and other physical evidence extracted at the scene of the fire, whether it is caused by the heat of the fire or the high temperature melting of the short-circuit arc, except for all