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

GB/Z 42842.4-2026

**Fine bubble technology - Cleaning applications - Part 4: Test
method for oil removal from polyester-based textile
(English Translation)**

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Foreword ...

Foreword

This document is a standard or guiding technical document.

This document conforms to GB/T 1.1-2020 "Standardization Work Guidelines Part 1. Structure and Drafting Rules of Standardization Documents".

Drafting is scheduled.

This document is Part 4 of GB/T (Z) 42842 "Application of Microbubble Technology in Cleaning". GB/T (Z) 42842 has been published.

The following section.

--Part 1. Test methods for cleaning surface salt (sodium chloride) stains;

--Part 2. Test methods for cleaning mechanical oil stains on the surface of machined metal parts;

--Part 3. Test methods for cleaning hard floors;

This document is modified to adopt ISO /TS 21256-4.2023 "Microbubble technology for cleaning applications - Part 4. Degreasing of polyester fabrics".

The document type has been changed from an ISO technical specification to a national standardization guidance technical document of my country.

This document has undergone significant structural adjustments compared to ISO /TS 21256-4.2023. The structural numbering changes between the two documents are shown below.

See Appendix A for a list.

The technical differences between this document and ISO /TS 21256-4.2023, and the reasons therefor, are as follows.

-- Added normative references to GB/T 41914.1 and GB/T 41914.2 (see Chapter 3) to improve operability;

--An experimental schematic diagram has been added (see Chapter 4) to improve operability;

--The requirement for the range of electronic balances (see 5.1.2 of ISO /TS 21256-4.2023)

has been removed to improve operability;

--A magnet was added [see 5.1.1 f)] to improve operability;

--Increased resolution requirements for whiteness meters [see 5.1.1 g)] to improve operability;

--Added requirements for substrate specifications [see 5.1.1 j)] to improve operability;

--The equipment tripod (see 5.1.8 of ISO /TS 21256-4.2023) has been removed to improve operability;

--Added experimental steps including substrate cutting, substrate quality screening, brightness screening, microbubble water preparation, sample fixation, and repeat measurement.

Steps [see 5.2 a), 5.2 d), 5.2 i), 5.2 j), 5.2 k) and 5.2 p)] to improve operability;

--The test procedures for substrate drying, substrate contamination, sample immersion, final mass weighing, and final ISO brightness measurement of the sample have been modified.

[See 5.2b), 5.2f), 5.2m), 5.2n) and 5.2o), ISO /TS 21256-4.2023, 5.2] to improve operability;

--Added symbols for the measurement results [see 5.2 c), 5.2 f) and 5.2 n)] to improve operability;

--Added sources of uncertainty (see 5.4) to improve operability;

--The operating procedures have been modified (see Appendix B.2, ISO /TS 21256-4.2023 Appendix A.3) to improve operability.

--The equipment was adjusted before the materials were prepared [see 5.1a) to 5.1j), 5.1.1 to 5.1.10 of ISO /TS 21256-4.2023];

--The stirring rod is corrected to a water distributor [see 5.1 e)];

--The relevant properties of polyester textiles have been expanded to include fabric density [see 5.1.1 j)];

--An informative appendix, "Structure Number Comparison Table" (see Appendix A), has been added.

--Figures 1-6, A.1, A.2, A.4, A.5, and A.7 of ISO /TS 21256-4.2023 have been removed.

Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents.

This document was proposed by the Chinese Academy of Sciences.

This document is under the jurisdiction of the National Technical Committee on

Standardization of Microbubble Technology (SAC/TC 584).

Introduction

In recent years, microbubble technology has been applied on a large scale in many industrial and civilian fields, especially in the textile dyeing and finishing industry.

Significant technological advantages and application potential. In large-scale textile production processes and civilian cleaning procedures, microbubble water, with its high specific surface area, is highly effective.

With its strong interfacial activity and excellent mass transfer efficiency, it can effectively remove residual spinning oils, weaving auxiliaries, and other oil stains from the surface of polyester fabrics.

This significantly improves the efficiency and uniformity of the cleaning process, thereby ensuring the stability of subsequent dyeing and finishing processes and the quality of the final product. Polyester-based fabrics

As a cleaning method, it can significantly reduce the amount of chemical detergents used and reduce washing wastewater while improving the cleaning effect on polyester fabrics.

This reduces pollutant emissions and aligns with the green and low-carbon development trend of the textile industry. However, the industry currently lacks solutions specifically for cleaning polyester using microbubble water.

The lack of a unified evaluation standard for the effectiveness of base fabrics has led to a lack of comparability in the oil removal performance of different technical solutions, thus hindering the standardized promotion of this technology.

For industrial applications, it is necessary to establish a scientific and universal testing method for textile manufacturers, the civilian cleaning industry, and related researchers.

Precisely assessing the cleaning effect of microbubble water on polyester fabrics provides a technical basis and has significant practical implications and application value.

To adapt to the complex usage scenarios in large-scale textile manufacturing and the civilian cleaning industry, this document proposes a method for measuring pre-washing conditions.

The method of characterizing the cleaning effect by measuring the quality of oil stains on polyester fabrics, and supplementing it with ISO brightness (R457)[1] as a quantitative indicator of cleanliness.

This method is simple, reproducible, and versatile, and can compare or test the oil removal performance of bubble water with different bubble sizes and concentrations.

Performance differences. Furthermore, the widespread adoption of this method will further

promote the civilian and industrial applications of microbubble technology in textile degreasing.

Applications include, for example, cleaning during fabric recycling or achieving cleaning processes with less detergent.

GB/T (Z) 42842 "Application of Microbubble Technology in Cleaning" aims to standardize the universal applicability of microbubble technology in cleaning applications.

The requirements will be standardized and will consist of four parts.

--Part 1. Test Method for Cleaning Surface Salt (Sodium Chloride) Stains. The aim is to provide a method for evaluating the effectiveness of ultrafine bubble water cleaning.

Test method for the staining performance of flour salt.

--Part 2. Test Method for Cleaning Mechanical Oil Stains from Machined Metal Parts. The aim is to provide a microbubble water cleaning method.

Test method for cleaning mechanical oil stains from corrosion-resistant metal surfaces.

--Part 3. Test Method for Cleaning Hard Floors. The purpose is to provide a test method for cleaning hard floors using microbubble water.

--Part 4. Test Method for Oil Removal from Polyester Fabrics. The aim is to provide a method for evaluating the use of microbubble water for oil removal from polyester fabrics.

Test methods for oil properties.

Part 4. Oil Removal Test Methods for Polyester Fabrics

1 Scope

This document describes the principle and experimental method of removing grease from the surface of polyester fabrics using microbubble technology.

This document is applicable to the evaluation of the effectiveness of microbubble technology in removing surface grease from polyester fabrics.

2 Normative references

The contents of the following documents, through normative references within the text, constitute essential provisions of this document. Dated citations are listed below.

For references to documents, only the version corresponding to that date applies to this document; for undated references, the latest version (including all amendments) applies.

This document.

GB/T 41914.1 Microbubble Technology - General Rules for the Use and Measurement of