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**NATIONAL STANDARD OF THE  
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**Fine bubble technology - Cleaning applications - Part 1: Test  
method for cleaning salt(NaCl)-stained surfaces**

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## Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1. Structure and Drafting Rules of Standardization Documents"

Drafting.

This document is Part 1 of "Cleaning Applications of Fine Bubble Technology". "Fine Bubble Technology Cleaning Application" has released the following part.

---Part 2. Test methods for cleaning mechanical oil stains on the surface of machined metal parts (GB/T 42842.2-2023).

This document is modified to adopt ISO /T S21256-1.2020 "Cleaning Application of Fine Bubble Technology Part 1. Surface Salt (Sodium Chloride) Contamination

Test methods for stain cleaning. The document type was adjusted from ISO technical specifications to my country's guiding technical documents.

The technical differences between this document and ISO /T S21256-1.2020 and their reasons are as follows.

---Replaced ISO 20480-1 with normatively quoted GB/T 41914.1, and GB/T 41914.2 replaced ISO 20480-2 (see

Chapter 3, Chapter 3 of ISO /T S21256-1.2020), in order to adapt to my country's technical conditions and improve operability;

---The limits for blank water have been changed (see 3.2, 3.2 of ISO /T S21256-1.2020) to improve operability;

---Changed the description of the measurement content (see Chapter 4, Chapter 4 of ISO /T S21256-1.2020) to improve operability;

---Changed the type of clause expressing accuracy [see 5.2b), ISO /T S21256-1.2020

5.2b)] to improve operability;

---The document number and salt removal rate (see Chapter 9) have been added to the test report to improve operability.

The following editorial changes have been made to this document.

---Unify salt-containing stained steel test panels and steel test panels into "salt-containing stained steel test panels" (referred to as "steel test panels");

---Replaced ISO 8502-9 with the informative reference GB/T 18570.9;

---Move the reference to Appendix B in 8.1 of ISO /T S21256-1.2020 to 8.2;

---Change the specific name of the bridge in Appendix B to an abstract number;

---Deleted Figure B.2;

---Changed the title of Table C.1.

Please note that some content in this document may be subject to patents. The publisher of this document assumes no responsibility for identifying patents.

## Introduction

Salt and contaminants from other sources can over time coat the surface of the exterior of a steel structure. Highway bridges and other steel

Structures are particularly susceptible to the effects of anti-icing salt or marine salt spray. In order to prevent the increase of corrosion, these contaminants need to be removed to prolong the steel structure.

the service life of the structure. Scaffolding and platforms are generally installed during inspection and maintenance, so a quick and effective cleaning mechanism is crucial.

High-pressure water jet is a commonly used cleaning method due to its good hydraulic properties. However, it requires operators to work in harsh environments for a long time

Dangerous work.

Recent research shows that the addition of ultrafine bubbles (UFB) makes the high-pressure water jet cleaning process more effective and faster. Ultrafine bubble water

The market for and its generation systems is growing rapidly. This document is intended to provide users of such products and systems with information on the cleaning properties of ultrafine sparkling water.

provide objective information on performance and promote the improvement of ultra-fine sparkling water and its generation system.

"Cleaning Applications of Micro Bubble Technology" aims to standardize the generally

applicable principles and requirements in the field of cleaning applications of micro bubble technology.

, is intended to be composed of four parts.

---Part 1. Test methods for surface salt (sodium chloride) stain cleaning. The purpose is to establish an evaluation table for ultrafine sparkling water cleaning

Test method for surface salt stain performance.

---Part 2. Test methods for cleaning mechanical oil stains on the surface of machined metal parts. The purpose is to establish a fine bubble water purifier

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

---Part 3. Test methods for hard floor cleaning. The purpose is to establish a test method for cleaning hard floors with fine bubble water.

---Part 4. Test methods for oil removal from polyester-based fabrics. The purpose is to establish a method to evaluate the use of fine bubble water for cleaning polyester-based fabrics.

Test methods for oil properties.

Micro bubble technology cleaning application

Part 1. Surface salt (sodium chloride) stain cleaning

experiment method

## 1 Scope

This document describes a test method for evaluating the cleaning performance of ultrafine bubble water when cleaning salt-stained steel surfaces with high-pressure water jets.

This document is applicable to the salt staining on the surface of salt-containing steel test panels (hereinafter referred to as "steel test panels") by measuring and comparing ultrafine bubble water and control water.

The removal rate is used to evaluate the cleaning performance of ultrafine bubble water.

## 2 Normative reference documents

The contents of the following documents constitute essential provisions of this document through normative references in the text. Among them, the dated quotations

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

this document.

GB/T 41914.1 Microbubble Technology General Principles for the Use and Measurement of Microbubbles Part 1.Terminology (GB/T 41914.1-

2022,ISO 20480-1.2017,IDT)

GB/T 41914.2 Microbubble Technology General Principles for the Use and Measurement of Microbubbles Part 2.Classification of Microbubble Properties

(GB/T 41914.2-2022,ISO 20480-2.2018,MOD)

### 3 Terms and definitions

The terms and definitions defined in GB/T 41914.1 and GB/T 41914.2 and the following apply to this document.

#### 3.1

high-pressurewaterjet

A device that drains water through a small hole at high speed.

#### 3.2

control water controlwater

blankwaterblankwater

Used for comparative testing with ultra-fine sparkling water, water that does not contain ultra-fine bubbles.

### 4 Principles of cleaning performance testing

Use water with evenly distributed ultra-fine bubbles to clean salt stains.

The characteristics of ultrafine bubbles are defined by their particle size and frequency distribution.

The performance of the cleaning test depends in principle on the properties of ultrafine bubble water, the hydrodynamic properties of the high-pressure water jet, the salting properties and the test

environment.

In the test method, the characteristics of the high-pressure water jet, salting, and test environment were kept constant while the ultrafine bubble characteristics were changed to evaluate how

Can improve ultra-fine bubble performance.