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

GB/T 21526-2025

Replacing GB/T 21526-2008

**Structural adhesives - Directives for the surface preparation of
metals and plastics prior to adhesive bonding**

结构胶粘剂 粘接前金属和塑料表面处理导则

(English Translation)

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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 for standardization documents" Drafting.

This document replaces GB/T 21526-2008 "Guidelines for surface preparation of metals and plastics before bonding with structural adhesives" and is in line with GB/T 21526-Compared with 2008, in addition to structural adjustments and editorial changes, the main technical changes are as follows.

- a) The "Scope" has been changed (see Chapter 1 and Appendix C, 1.2 and 1.3 of the 2008 edition);
 - b) "Terms and Definitions" has been modified (see Chapter 3, Chapter 3 of the 2008 edition);
 - c) Change "dry air" to "clean, dry, oil-free air" (see 6.1.1, 2008 edition);
 - d) Added notes on the polishing part of the physical method (see 6.1.1, 6.1.1 of the 2008 edition);
 - e) The particle size of wet sandblasting abrasives in the sandblasting section of the physical method has been changed (see 6.1.2, 6.1.2 of the 2008 edition);
 - f) Added the abbreviations of some materials in Table 2 of 6.3.1 (see Table 2 of 6.3.1, 2008 edition);
 - g) Modified the following section of Chapter 7, Metal Material Processing Methods and Technologies.
- Changed Method 4 for aluminum and its alloys and added Method 5 (see 7.2.1.1, 7.2.1.1 of the 2008 edition).

--- Changed the handling methods and warnings for magnesium and its alloys (see 7.2.1.5, 7.2.1.5 of the 2008 edition).

--- Changed the third method for steel (stainless steel), cleaning solution, and deleted the chromic acid etching solution (see 7.2.1.8, 7.2.1.8 of the 2008 edition).

--- Changed Method 2 for titanium and its alloys, detergent, etching solution and anodizing solution, and added Method 3 (see 7.2.1.10, 7.2.1.10 of the 2008 edition);

h) Modified the technical part of Chapter 7 on plastic material processing methods.

--- Changed the treatment method of acrylonitrile-butadiene-styrene copolymer and deleted the etching solution part (see 7.2.2.1, 2008 Version 7.2.2.1),

--- Deleted the second treatment method for polyethylene (see 7.2.2.5.2 of the 2008 edition).

--- Changed the treatment method of polypropylene (see 7.2.2.6, 7.2.2.6 of the 2008 edition),

--- Changed the treatment method of polytetrafluoroethylene (see 7.2.2.7, 7.2.2.7 of the 2008 edition).

This document is modified to adopt ISO 17212:2012 "Guide for surface preparation of metals and plastics before bonding with structural adhesives".

Compared with ISO 17212:2012, this document has some structural adjustments.

See Appendix A.

This document has some technical differences compared to ISO 17212:2012.

A list of technical differences and their causes is provided in Appendix B.

The following editorial changes have been made to this document.

--- Change the name of the standard to "Guidelines for Surface Preparation of Metals and Plastics Before Bonding with Structural Adhesives".

Introduction

The bonding effect of different materials is different. Some materials cannot be bonded without special treatment. The effect of surface bonding depends on the surface treatment process.

The strength, joint design, function to be achieved (bonding, sealing, etc.) and the environment in which it is used.

Most adhesives require a certain degree of surface treatment before bonding.

Surfaces that are susceptible to corrosion or attack by solvents often require special

treatment.

Most common metals bond well when properly prepared. Unless there are contaminants or residual release agents, thermoset plastics Composites such as epoxy and polyester usually bond well without treatment. Most thermoplastics, however, require treatment due to their low surface energy.

Special surface treatment.

Some coatings can provide excellent surface adhesion, especially water-based cationic electrophoretic primers used in the automotive industry.

The stability of the interface needs to be checked. The surface of the coating, even a fresh surface, needs to be treated to increase the free energy and make it easier to wet.

Some adhesives have the ability to dissolve light oils and certain polymer materials. For joints that do not involve "safety requirements", some the surface does not require any treatment before bonding.

To achieve the best environmental durability of the joint, the traditional treatment method usually consists of the following three steps, but not every step is necessary.

Required.

---Remove pollutants;

---Physically induced surface modification;

---Chemical treatment.

However, legal requirements are driving the development and introduction of new methods, guiding the combination of the above steps and gradually eliminating some harmful More potent chemicals.

Some common treatment methods, although there will be some differences in the details, but most of the surface treatment of thermosetting and thermoplastic plastics can be applied.

In contrast, different metal and alloy surfaces usually require different treatment methods. In order to achieve the best durability of metal joints, Often complex and special processing methods need to be introduced.

This document describes some basic methods for the surface treatment of metals, alloys and plastics (see Chapter 7).

Structural adhesives for bonding metal and plastic surfaces Processing Guidelines

1 Scope

This document provides and describes a general method for surface preparation of components prior to bonding, for use in laboratory evaluation or during construction.

This document applies to common metal, alloy and plastic surfaces.

The materials applicable to this document are listed in Appendix C.

NOTE: The various methods described in this document for surface cleaning and modification may be combined to form the most effective treatment to achieve the desired result for the adhesive joint.

Required environmental durability.

2 Normative references

The contents of the following documents constitute the essential clauses of this document through normative references in this document.

For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced documents without a date, the latest version (including all amendments) applies to this document.

GB/T 2035 Plastics Terminology (GB/T 2035-2024, ISO 472:2013, NEQ) GB/T 2943 Adhesive Terminology EN2243-5 Aerospace series non-metallic structural adhesives test methods aging test
(Aerospace series-Non-metallic materials-Structural adhesives-Test method-Part 5: Ageing tests)

3 Terms and Definitions

The terms and definitions defined in GB/T 2035, GB/T 2943 and the following apply to this document.

plastic

A material with polymer as the main component, which is formed into the final product through flow molding.

NOTE: Due to the special requirements of this document, "plastic" also includes coatings. In the following text, only a few coated surfaces can withstand overload loads, but they are used in automotive industry.

The exceptions are water-based electrochemical coatings for the industrial sector and acrylic, epoxy and polyester based coatings for pre-coating of metal sheets.

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