



JAPANESE
INDUSTRIAL
STANDARD

Translated and Published by
Japanese Standards Association

JIS K 5674 : 2008

(JPMA/JSA)

**Lead-free, chromium-free
anticorrosive paints**

ICS 25.220.60; 87.040

Reference number : JIS K 5674 : 2008 (E)

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Date of Establishment: 2003-11-20

Date of Revision: 2008-01-20

Date of Public Notice in Official Gazette: 2008-01-21

Investigated by: Japanese Industrial Standards Committee
Standards Board

Technical Committee on Chemical Products

JIS K 5674:2008, First English edition published in 2008-07

Translated and published by: Japanese Standards Association
4-1-24, Akasaka, Minato-ku, Tokyo, 107-8440 JAPAN

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Printed in Japan

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Foreword

This translation has been made based on the original Japanese Industrial Standard revised by the Minister of Economy, Trade and Industry, through deliberations at the Japanese Industrial Standards Committee as the result of proposal for revision of Japanese Industrial Standard submitted by Japan Paint Manufacturers Association (JPMA)/Japanese Standards Association (JSA) with the draft being attached, based on the provision of Article 12 Clause 1 of the Industrial Standardization Law applicable to the case of revision by the provision of Article 14.

Consequently **JIS K 5674**:2003 is replaced with this Standard.

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Lead-free, chromium-free anticorrosive paints

1 Scope

This Japanese Industrial Standard specifies the lead-free, chromium-free anticorrosive paints used for primary coat of steel products and steel structures, etc. under general environmental conditions.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this Standard. The most recent editions of the standards (including amendments) indicated below shall be applied.

JIS G 3141 *Cold-reduced carbon steel sheets and strip*

JIS G 3303 *Tinplate and blackplate*

JIS G 4401 *Carbon tool steels*

JIS K 0121 *General rules for atomic absorption spectrometry*

JIS K 0557 *Water used for industrial water and wastewater analysis*

JIS K 5108 *Red lead (pigment)*

JIS K 5421 *Boiled oil and boiled linseed oil*

JIS K 5500 *Glossary of terms for coating materials*

JIS K 5516 *Ready mixed paints (Synthetic resin type)*

JIS K 5600-1-1 *Testing methods for paints—Part 1: General rule—Section 1: General test methods (conditions and methods)*

JIS K 5600-1-2 *Testing methods for paints—Part 1: General rules—Section 2: Sampling*

JIS K 5600-1-3 *Testing methods for paints—Part 1: General rule—Section 3: Examination and preparation of samples for testing*

JIS K 5600-1-4 *Testing methods for paints—Part 1: General rule—Section 4: Standard panels for testing*

JIS K 5600-1-5 *Testing methods for paints—Part 1: General rule—Section 5: Coating of test panel (brush application)*

JIS K 5600-1-6 *Testing methods for paints—Part 1: General rule—Section 6: Temperatures and humidities for conditioning and testing*

JIS K 5600-1-7 *Testing methods for paints—Part 1: General rule—Section 7: Determination of film thickness*

JIS K 5600-1-8 *Testing methods for paints—Part 1: General rule—Section 8: Reference sample*

JIS K 5600-2-7 *Testing methods for paints—Part 2: Characteristics and stability of paints Section 7: Storage stability*

- JIS K 5600-3-2 *Testing methods for paints—Part 3: Film formability—Section 2: Surface-drying test (Ballotini method)*
- JIS K 5600-4-3 *Testing methods for paints—Part 4: Visual characteristics of film—Section 3: Visual comparison of the colour of paints*
- JIS K 5600-5-1 *Testing methods for paints—Part 5: Mechanical property of film—Section 1: Bend test (cylindrical mandrel)*
- JIS K 5600-6-1 *Testing methods for paints—Part 6: Chemical property of film—Section 1: Resistance to liquids (General methods)*
- JIS K 5600-7-6 *Testing methods for paints—Part 7: Long-period performance of film—Section 6: Natural weathering*
- JIS K 5600-7-7 *Testing methods for paints—Part 7: Long-period performance of film—Section 7: Accelerated weathering (Exposure to filtered xenon-arc radiation)*
- JIS K 5600-7-9 *Testing methods for paints—Part 7: Determination of resistance to cyclic corrosion conditions—Section 9: Salt fog / dry / humidity*
- JIS K 5600-8-3 *Testing methods for paints—Part 8: Evaluation of degradation of paint coatings—Section 3: Designation of degree of rusting*
- JIS K 5601-1-2 *Testing methods for paint components—Part 1: General rule—Section 2: Determination of non-volatile matter*
- JIS K 5601-4-1 *Testing methods for paint components—Part 4: Analysis for components emitted from film—Section 1: Formaldehyde*
- JIS K 5660 *Synthetic resin emulsion paints, glossy type*
- JIS K 5960 *Household paint for interior wall*
- JIS K 8180 *Hydrochloric acid (Reagent)*
- JIS K 8247 *Potassium permanganate (Reagent)*
- JIS K 8312 *Potassium chromate (Reagent)*
- JIS K 8563 *Lead (II) nitrate (Reagent)*
- JIS K 8951 *Sulfuric acid (Reagent)*
- JIS P 3801 *Filter paper (for chemical analysis)*
- JIS R 3202 *Float glass and polished plate glass*
- JIS R 6253 *Waterproof abrasive papers*
- JIS S 6050 *Plastics erasers*
- JIS Z 1522 *Pressure sensitive adhesive cellophane tapes*

3 Terms and definitions

For the purpose of this Standard, the terms and definitions given in **JIS K 5500** apply.

4 Classification

The anticorrosive paints shall be classified as follows.

- a) **Class 1** Liquid and air-drying type anticorrosive paints in which organic solvent is the volatile component.
- b) **Class 2** Liquid and air-drying type anticorrosive paints in which water is the main volatile component.

5 Quality

5.1 Quality

The quality, when tested in accordance with clause 7, shall be as given in table 1.

Table 1 Quality

Item	Quality		Test clause No.
	Class 1	Class 2	
Condition inside a container	Paint shall be uniform without hard lump when stirred.		7.4
Low temperature stability (-5 °C)	— ^{a)}	Deterioration shall not occur.	7.5
Coating workability	Work of brush coating shall be performed without trouble.		7.6
Surface dry	The surface shall dry.		7.7
Appearance of film	Appearance of film shall be normal.		7.8
Overcoatability	Over coating shall be suitable without trouble.		7.9
Flexibility	Bend shall be withstood.		7.10
Adhesion stability	Peeling shall not be accepted.		7.11
Cycle corrosion proof	Blisters, peeling and rusting shall not be found.		7.12
Non-volatile matter (mass fraction %)	75 min.	50 min.	7.13
Lead in film (mass fraction %)	0.06 max.		7.14
Chromium in film (mass fraction %)	0.03 max.		7.15
Rust prevention	The film shall have the rust prevention.		7.16
Note ^{a)} Not applicable.			

5.2 Class of formaldehyde emissions

The class of formaldehyde emissions, when tested in accordance with 7.17, shall be as given in table 2.

Table 2 Class of formaldehyde emission

Symbol of class of formaldehyde emissions	F☆☆☆☆	F☆☆☆	F☆☆	— ^{a)}
Amount of emissions	0.12 mg/L max.	0.35 mg/L max.	1.8 mg/L max.	Over 1.8 mg/L
Note ^{a)} Not specified. Those which are not to be tested according to 7.17 shall fall into this category.				

6 Reference sample

The reference sample shall be as given in **JIS K 5600-1-8**.

7 Test method

In the case of deviation of test procedure specified in this Standard from those in **JIS K 5600** standard series, the provision in this Standard shall be given preference.

NOTE : The material, dimensions and number of test panels, and number of test days necessary for the test of items given in the quality requirements of this Standard shall be as given in Annex C. The volume of sample needed for this test is about 1 L.

7.1 Sampling

The sampling shall be in accordance with **JIS K 5600-1-2**.

7.2 Examination and preparation of samples for testing

The examination and preparation of samples for testing shall be performed in accordance with **JIS K 5600-1-3**.

7.3 General conditions of test

The general conditions of test shall be as follows.

a) Site for testing

- 1) The conditioning and testing shall be conducted in a room under the conditions as specified in **4.1** of **JIS K 5600-1-6** [temperature $23\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$, relative humidity $(50 \pm 5)\%$], which is free from direct radiation of sunlight, and from gases, steam, dust, etc. that may affect the conditioning and testing, and which has minimum draft. However, in **7.5**, **7.11**, **7.12** and **7.16**, in which the test site with other conditions can be used, specification in this Standard shall be applied.
- 2) The light source for observation shall be the diffused daylight specified in **5.2** of **JIS K 5600-4-3**. The booth for colour observation specified in **5.3** of **JIS K 5600-4-3** may also be used.

b) Preparation of test piece The preparation of test piece shall be as follows.

- 1) **Test panel** The test panel to be used shall be steel sheets of SPCC-SB specified in **JIS G 3141**, which shall have been adjusted by polishing in accordance with **5.1.5** of **JIS K 5600-1-4**. The abrasive papers to be used for this adjustment polishing shall be the waterproof abrasive paper P280 specified in **JIS R 6253**. However, in **7.7** and **7.9**, where other test panels can be used, the specification in this Standard shall be applied.
- 2) **Preparation of sample** The sample shall be agitated until a uniform liquid is obtained. If necessary, it may be diluted in not more than 10 % (mass ratio) by using the thinner designated by the manufacturer.
- 3) **Coating of sample** The sample shall be applied by brush coating so that the amount applied of each time is 30 μm to 40 μm in dried film thickness in accordance with **JIS K 5600-1-5**. The measurement of dried film thickness