



JAPANESE
INDUSTRIAL
STANDARD

Translated and Published by
Japanese Standards Association

JIS H 8602 : 2010

(JAPA/JSA)

**Combined coatings of anodic oxide and
organic coatings on aluminium and
aluminium alloys**

ICS 25.220.20;77.120.10

Reference number : JIS H 8602 : 2010 (E)

PROTECTED BY COPYRIGHT

H 8602 : 2010

Date of Establishment: 1977-03-01

Date of Revision: 2010-01-20

Date of Public Notice in Official Gazette: 2010-01-20

Investigated by: Japanese Industrial Standards Committee

Standards Board

Technical Committee on Non-Ferrous Metals

JIS H 8602 : 2010, First English edition published in 2010-07

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

In the event of any doubts arising as to the contents,
the original JIS is to be the final authority.

© JSA 2010

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the publisher.

Printed in Japan

PROTECTED BY COPYRIGHT

NH/SW
 **Documents**
Document Sharing Hub

Contents

	Page
1 Scope	1
2 Normative references	1
3 Terms and definitions	2
4 Classification	2
5 Quality	3
5.1 Appearance	3
5.2 Performance	3
6 Tests	4
6.1 General matters	4
6.2 Test piece	5
6.3 Appearance test	5
6.4 Anodic oxide coating thickness test	5
6.5 CASS test	6
6.6 Adhesive property test of paint film	6
6.7 Solvent resistance test of paint film	7
6.8 Alkali resistance test	7
6.9 Combined corrosion resistance test	8
6.10 Accelerated weathering test	8
7 Inspections	10
8 Marking	11
9 Report	11
Annex A (normative) Rating number standard diagram used for evaluation of corrosion resistance test	12
Annex B (normative) Rating number standard diagram used for evaluation of alkali resistance test	18
Annex C (informative) Classification	20

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 Aluminium Products Association (JAPA)/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 H 8602 : 2006** is replaced with this Standard.

However, **JIS H 8602 : 2006** may be applied in the **JIS** mark certification based on the relevant provisions of Article 20 Clause 1, etc. of the Industrial Standardization Law until 19th July, 2010.

This **JIS** document is protected by the Copyright Law.

Attention is drawn to the possibility that some parts of this Standard may conflict with a patent right, application for a patent after opening to the public, utility model right or application for registration of utility model after opening to the public which have technical properties. The relevant Minister and the Japanese Industrial Standards Committee are not responsible for identifying the patent right, application for a patent after opening to the public, utility model right or application for registration of utility model after opening to the public which have the said technical properties.

Combined coatings of anodic oxide and organic coatings on aluminium and aluminium alloys

1 Scope

This Japanese Industrial Standard specifies the combined coatings of anodic oxide and organic coatings (hereafter referred to as "combined coatings") executed on the base metal of wrought product of aluminium and aluminium alloys for purposes of corrosion prevention, good appearance, etc.

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 B 7753 *Light-exposure and light-and-water-exposure apparatus (Open-flame carbon-arc type)*
- JIS H 0201 *Glossary of terms used in the surface treatment of aluminium*
- JIS H 8680-1 *Test methods for thickness of anodic oxide coatings on aluminium and aluminium alloys—Part 1: Microscopical method*
- JIS H 8680-2 *Test methods for thickness of anodic oxide coatings on aluminium and aluminium alloys—Part 2: Eddy current method*
- JIS H 8681-2 *Test methods for corrosion resistance of anodic oxide coatings on aluminium and aluminium alloys—Part 2: CASS test*
- JIS K 5600-5-4 *Testing methods for paints—Part 5: Mechanical property of film—Section 4: Scratch hardness (Pencil method)*
- JIS K 5600-5-6 *Testing methods for paints—Part 5: Mechanical property of film—Section 6: Adhesion test (Cross-cut test)*
- JIS K 5600-7-7 *Testing methods for paints—Part 7: Long-period performance of film—Section 7: Accelerated weathering and exposure to artificial radiation (Exposure to filtered xenon-arc radiation)*
- JIS K 5600-7-8 *Testing methods for paints—Part 7: Long-period performance of film—Section 8: Accelerated weathering (Exposure to fluorescent UV lamps)*
- JIS K 8271 *Xylene (Reagent)*
- JIS K 8576 *Sodium hydroxide (Reagent)*
- JIS Z 1522 *Pressure sensitive adhesive cellophane tapes*
- JIS Z 8401 *Guide to the rounding of numbers*
- JIS Z 8720 *Standard illuminants and sources for colorimetry*
- JIS Z 8741 *Specular glossiness—Method of measurement*
- JIS Z 9112 *Classification of fluorescent lamps by chromaticity and colour ren-*

*dering property***3 Terms and definitions**

For the purposes of this Standard, the terms and definitions given in JIS H 0201 and the following definitions apply.

3.1 combined coatings of anodic oxide and organic coatings

the coatings of which the qualities such as corrosion resistance, weathering resistance, decorative property, etc. are further improved by adding the performance of paint film to the performance of anodic oxide coating with painting on aluminium and aluminium alloys after anodizing of 5 µm or over in average coating thickness is performed

NOTE: The coating which is prepared so that a thin anodic oxide coating of under 5 µm in average coating thickness is carried out mainly as the substrate treatment to improve the adhesive property of paint film and painting is carried out on it, is not included in the combined coatings.

3.2 criteria sample

a sample to indicate the limit of quality to be non-defective or defective in appearance

4 Classification

The combined coatings shall be classified into four as shown in table 1 according to the combined corrosion resistance and the weathering resistance.

The classification shall satisfy both performances of combined corrosion resistance and weathering resistance.

Table 1 Classification of combined coatings of anodic oxide and organic coatings

Classification	Combined corrosion resistance		Weathering resistance ^{a)}		Informative
	Combined corrosion resistance test ^{b)}		Xenon lamp type accelerated weathering test	Open-flame sunshine carbon-arc lamp type accelerated weathering test	Applicable environment
	Fluorescent UV lamp type accelerated weathering test	CASS test			
	Testing time h				
A1	240	120	4 000	3 000	Outdoors of the area where is severe environment and exposed to much UV
A2	240	120	2 000	1 500	Outdoors of severe environment
B	240	72	1 000	750	Outdoors of general environment
C	—	—	350	250	Indoors
NOTE 1	The correspondence with the classification specified in JIS H 8602:1992 is as shown in Annex C.				
NOTE 2	In the applicable environment, the "severe environment" means the areas of severe corrosion and deterioration which are seaside and coast, and the "general environment" means the industrial area, city area and rural area. The seaside means the area within 300 m from the coast line (the area influenced most severely by flying sea salt particles). The coast means the area exceeding 300 m within 2 km from the coast line (the area influenced comparatively largely by flying sea salt particles. In the islands of the Southwest Islands, even if exceeding 2 km, all of them shall be included in this division.). The industrial area means the area where the air pollutants [sulfur oxide (SO _x), nitrogen oxide (NO _x), dust fall, etc.] are produced with the production activity. The city area means the area where the air pollutants are produced with commercial and living activity. The rural area means the area influenced less by air pollutants. The area of much UV exposure means the area resembling the subtropical oceanic weather.				
Notes ^{a)}	For the weathering resistance, either of the xenon lamp type accelerated weathering test or the open-flame sunshine carbon arc lamp type accelerated weathering test shall be carried out.				
^{b)}	For the combined corrosion resistance test, the fluorescent UV lamp type accelerated weathering test is carried out followed by the CASS test. This test is not applicable to Class C.				

5 Quality

5.1 Appearance

The appearance shall be tested according to 6.3, and shall be free from defects harmful to use such as flaws, unevenness, exfoliation, etc.

The judgment of defects to be the problem in using shall be in accordance with the agreement between the purchaser and the manufacturer. The degree of defects should be indicated by the criteria sample.

5.2 Performance

The performance of combined coatings shall be tested according to clause 6, and shall be in accordance with table 2.

Table 2 Performances of combined coatings of anodic oxide and organic coatings

Item				Performance				Testing method
				A1	A2	B	C	
Thickness of combined coatings of anodic oxide and organic coatings (average coating thickness) ^{a)} μm				5 min, and all of the coating thickness at each measuring point shall be 80 % or over of the average coating thickness				6.4
CASS corrosion resistance		Testing time h		120		72	24	6.5
		Rating number RN		9.5 min.				
Adhesive property of paint film	Lattice pattern cutting test			25/25				6.6.1
	Boiling water lattice pattern cutting test	Boiling water test	Testing time h	5				6.6.2
			Appearance	Wrinkle, crack, blister and noticeable discoloration shall not be produced on paint film.				
		Lattice pattern cutting test after boiling water test			25/25			
Solvent resistance of paint film				The degradation of pencil hardness of paint film before and after the test shall be one unit or under in the hardness scale specified in 6.2 of JIS K 5600-5-4.				6.7
Alkali resistance		Testing time h		24		8		6.8
		Rating number RN		9.5 min.				
Combined corrosion resistance	Fluorescent UV lamp type accelerated weathering test	Testing time h		240		—		6.9
	CASS test	Testing time h		120		72	—	
	Rating number RN		9 min.				—	
Accelerated weathering resistance	Xenon lamp type accelerated weathering test	Testing time h		4 000	2 000	1 000	350	6.10
		Appearance		The noticeable change in colour and noticeable chalking shall not be produced.				
		Gloss retention %		75 min.				
	Open-flame sunshine carbon-arc lamp type weathering test	Testing time h		3 000	1 500	750	250	
		Appearance		The noticeable change in colour and noticeable chalking shall not be produced.				
		Gloss retention %		75 min.				
Note ^{a)} When the anodic oxide coating thickness is measured, the thickness of combined coatings should also be measured. The measuring method shall be in accordance with 6.4.								

6 Tests

6.1 General matters

The product from which a test piece is sampled shall be usually left in room for 24 h or longer as it is after painted. However, the product using an air-drying paint should be left for 48 h or longer as it is after painted.

The place where the test is carried out shall be, unless especially specified, the ordinary temperature and ordinary humidity ¹⁾.

Note ¹⁾ The ordinary temperature means the range of temperature between 5 °C