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Foreword

This translation has been made based on the original Japanese Industrial Standard revised by the Minister of International Trade and Industry through deliberations at Japanese Industrial Standards Committee in accordance with the Industrial Standardization Law. Consequently **JIS H 8603 : 1995** is replaced with **JIS H 8603 : 1999**.

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Hard anodic oxide coatings on aluminium and its alloys

Introduction This Japanese Industrial Standard has been prepared based on the first edition of **ISO 10074** *Specification for hard anodic oxidation coatings on aluminium and its alloys*, published in 1994, without any modification in technical contents. The items not specified in the corresponding International Standard (such as Marking) have been additionally contained herein as Japanese Industrial Standard.

The parts with sidelines or dotted underlines are the matters not included in the corresponding International Standard.

1 Scope This Japanese Industrial Standard specifies the significant surface of hard anodic oxidation coatings (hereafter referred to as “coatings”) on the basis metal of malleable materials, castings, etc. of aluminium and its alloys for the purposes of abrasion resistance or the like.

Remarks : The International Standard corresponding to this Standard is given as follows.

ISO 10074 : 1994 *Specification for hard anodic oxidation coatings on aluminium and its alloys*

2 Normative references The following standards contain provisions which, through reference in this Standard, constitute provisions of this Standard. The most recent editions of the standards indicated below shall be applied.

JIS H 0201 *Glossary of terms used in the surface treatment of aluminium*

JIS H 4000 *Aluminium and aluminium alloy sheets and plates, strip and coiled sheets*

JIS H 4040 *Aluminium and aluminium alloy rods, bars and wires*

JIS H 4080 *Aluminium and aluminium alloy seamless pipes and tubes*

JIS H 4100 *Aluminium and aluminium alloy extruded shapes*

JIS H 4140 *Aluminium and aluminium alloy forgings*

JIS H 5202 *Aluminium alloy castings*

JIS H 5302 *Aluminium alloys die castings*

JIS H 8503 *Methods of wear resistance test for metallic coatings*

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 8682-1 *Test methods for abrasion resistance of anodic oxide coatings on aluminium and aluminium alloys—Part 1 : Wheel wear test*

JIS H 8682-2 *Test methods for abrasion resistance of anodic oxide coatings on aluminium and aluminium alloys—Part 2 : Abrasive jet test*

- JIS H 8687 *Test methods for dielectric strength of anodic oxidation coatings on aluminium and aluminium alloys*
- JIS H 8688 *Test method for determination of mass per unit area of anodic oxide coatings on aluminium and aluminium alloys—Gravimetric method*
- JIS K 6253 *Hardness testing methods for rubber, vulcanized or thermoplastic*
- JIS R 6001 *Bonded abrasive grain sizes*
- JIS R 6111 *Artificial abrasives*
- JIS R 6210 *Vitrified grinding wheels*
- JIS R 6252 *Abrasive papers*
- JIS Z 2244 *Vickers hardness test—Test method*
- JIS Z 2371 *Methods of neutral salt spray testing*

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

- a) **hard anodic oxidation coatings** Anodic oxidation coatings on aluminium materials processed by using an electrolytic bath at low temperatures or a particular electrolytic bath to which various kinds of organic acid are added. They are characteristically harder and excellent in abrasion resistance in comparison with coatings processed by an ordinary method. They are generally not processed by sealing of anodic oxide coating.

When corrosion resistance is required, sealing of anodic oxide coating is carried out. However, the abrasion resistance is apt to be decreased in that case.

- b) **abrasion resistant standard specimen** A specimen prepared by following the specification given in Annex 1 (normative), in order to correlate the results of abrasion resistance tests carried out at respective test places.

4 Classification Coatings shall be classified⁽¹⁾ as given in Table 1 according to the materials of basis metal.

Table 1 Classification

Classification	Materials
Class 1	Malleable materials except alloys belonging to class 2 among malleable materials specified in JIS H 4000 , JIS H 4040 , JIS H 4080 , JIS H 4100 , and JIS H 4140 .
Class 2—(a)	Malleable materials of the 2000 series
Class 2—(b)	Malleable materials of the 7000 series and those of the 5000 series containing at least 2 % of magnesium
Class 3—(a)	Alloys containing under 2 % copper or under 8 % silicon among castings specified in JIS H 5202 and JIS H 5302
Class 3—(b)	Other castings except class 3—(a)

Note ⁽¹⁾ When it is disagreeable to apply Table 1 on alloy components, the corresponding class may be changed with the agreement between the purchaser and supplier.

5 Quality

5.1 Appearance The appearance of coatings shall be subjected to the test specified in 6.1. The surface shall be uniform and free from defects detrimental in practical use such as spalling, blister, powdering, etc. However, microcracking of anodic oxide coating generated by a difference in expansion coefficient between the basis metal and the coating, shall not be taken as defects.

5.2 Coating thickness A coating thickness shall be, as a rule, an average coating thickness. The test shall be carried out in accordance with 6.2, and the coating thickness and the degree of its uniformity shall be determined with the agreement between the purchaser and supplier.

Remarks : The average coating thickness herein refers to the average of the coating thickness at several measuring points measured in accordance with JIS H 8680-1 or JIS H 8680-2.

5.3 Microhardness The microhardness shall be subjected to the test specified in 6.3, and the results shall conform to the requirements specified in Table 2.

Table 2 Microhardness

Classification	Microhardness HV 0.05
Class 1	400 min.
Class 2—(a)	250 min.
Class 2—(b)	300 min.
Class 3—(a)	250 min.
Class 3—(b)	Based on the agreement between the purchaser and supplier.

5.4 Abrasion resistance The abrasion resistance of coatings shall be subjected to any one of 6.4 a) to c), and the result shall respectively conform to Table 3, Table 4, and Table 5.

Further, the test shall be selected by the agreement between the purchaser and supplier.