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**Evaluation methods for pitting
corrosion of anodic oxide
coatings on aluminium and
aluminium alloys—
Part 1 : Chart method**

ICS 25.220.20; 77.060

Descriptors : aluminium, aluminium alloys, anodic coating, pitting corrosion, anodizing,
oxidation methods, protective coatings, corrosion tests, corrosion

Reference number : JIS H 8679-1 : 1999 (E)

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Foreword

This translation has been made based on the original Japanese Industrial Standard established by the Minister of International Trade and Industry through deliberations at the Japanese Industrial Standards Committee in accordance with the Industrial Standardization Law:

This establishment, for the purpose of making it easy to compare Japanese Industrial Standards with International Standards, to prepare the Japanese Industrial Standard which conforms to International Standards, and to propose a draft for International Standard on the basis of Japanese Industrial Standard, has provided the following two standards which specify the evaluation methods of pitting corrosion not listed in the traditional Japanese Industrial Standards but has been specified in the corresponding International Standards.

JIS H 8679-1 *Evaluation methods for pitting corrosion of anodic oxide coatings on aluminium and aluminium alloys—Part 1 : Chart method*

JIS H 8679-2 *Evaluation methods for pitting corrosion of anodic oxide coatings on aluminium and aluminium alloys—Part 2 : Grid method*

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Evaluation methods for pitting corrosion of anodic oxide coatings on aluminium and aluminium alloys— Part 1 : Chart method

Introduction This Japanese Industrial Standard has been prepared based on the first edition of **ISO 8993** *Anodized aluminium and aluminium alloys—Rating system for the evaluation of pitting corrosion—Chart method*, published in 1989, without any modification in technical contents, but the contents (normative references, summary), which are not mentioned in the corresponding International Standard, have been supplemented in this Standard.

The Standards specifying the rating for the evaluation of pitting corrosion of anodic oxide coatings on aluminium and aluminium alloys, are composed of the two parts, a chart method and grit method, and the selection of them is left to the agreement between the parties concerned with delivery.

In this Standard, the portions underlined with dots are the items which are not specified in the corresponding International Standard.

1 Scope This Japanese Industrial Standard specifies the charting method for evaluation of pitting corrosion of anodic oxide coatings (hereafter referred to as “coatings”) performed on the products of aluminium or aluminium alloy (hereafter referred to as “products”).

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

ISO 8993 : 1989 *Anodized aluminium and aluminium alloys—Rating system for the evaluation of pitting corrosion—Chart method*

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 8688 *Test method for determination of mass per unit area of anodic oxide coatings on aluminium and aluminium alloys—Gravimetric method*

JIS K 8180 *Hydrochloric acid*

JIS K 8541 *Nitric acid*

3 Definitions For the purpose of this Standard, the definitions in **JIS H 0201** apply.

4 Summary The evaluation method shall be the rating by comparison of the degree of pitting corrosion⁽¹⁾ resulting from the accelerated test, the exposure test to corrosive environments, or the practical service test with the standard charts for rating designation (charts which show 7 stages in accordance with the ratio of corroded area to the whole area).

Note (1) Pitting corrosion refers to only the corrosion which penetrates a coating to reach its substrate, and the surface corrosion not penetrating a coating is out of the evaluation.

5 Standard charts for rating designation Standard charts for rating designation are shown in Fig. 1 to Fig. 7.

The relation between the evaluation number, that is rating number, and percentage area covered by corrosion pits shall be as shown in Table 1.

Table 1 Relation between rating number and percentage area covered by corrosion pits

Rating number (RN)	Reference rating	Percentage area covered by corrosion pits A (%)
10	A	No pitting corrosion
9.8	B	0.02 or less
9.5	C	over 0.02 up to and incl. 0.05
9.3	D	over 0.05 up to and incl. 0.07
9	E	over 0.07 up to and incl. 0.10
8	F	over 0.10 up to and incl. 0.25
7	G	over 0.25 up to and incl. 0.5
6 to 0	H	over 0.5

Remarks : The relation between rating number (RN) and percentage area covered by corrosion pits (A) is formulated as follows.

$$RN = 3(2 - \log_{10} A)$$

Provided, when rating number (RN) is from 9.3 to 9.8, the following formula shall be employed.

$$RN = 10 - A/0.1$$

6 Adjustment of significant surface In order to make the recognition of pitting corrosion clear, remove the corrosion by-products or deposition in water on the significant surface according to one of the following methods.

It is preferable to prepare the significant surface of 5 000 mm² or larger.

- Dip a soft cloth in a slurry containing suitable abrasives for dirt, wipe the significant surface with the cloth, rinse it with clean water, and dry it in air.