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In the event of any doubts arising as to the contents,
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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 Thermal Spraying Society (JTSS) /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Consequently **JIS H 8303:2004** and **JIS H 9304:2005** have been revised and withdrawn, respectively, and are replaced with this Standard.

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Thermal spraying of self-fluxing alloys

Introduction

This Japanese Industrial Standard has been prepared based on the first edition of ISO 14920 published in 1999 with some modifications of the technical contents.

The portions given sidelines or dotted underlines are the matters in which the contents of the corresponding International Standard have been modified. A list of modifications with the explanations is given in Annex JA.

1 Scope

This Standard specifies the thermal spraying of self-fluxing alloys principally applied on products, parts, etc. in order to provide them with wear resistance, corrosion resistance, heat resistance and the like.

NOTE : The International Standard corresponding to this Standard and the symbol of degree of correspondence are as follows.

ISO 14920 : 1999 *Thermal spraying — Spraying and fusing of self-fluxing alloys* (MOD)

In addition, symbols which denote the degree of correspondence in the contents between the relevant International Standard and JIS are IDT (identical), MOD (modified), and NEQ (not equivalent) according to ISO/IEC Guide 21-1.

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) listed below shall be applied.

JIS B 7725 *Vickers hardness test — Verification and calibration of testing machines*

JIS B 7734 *Knoop hardness test — Verification of testing machines*

JIS H 8200 *Thermal spraying terms*

JIS H 8250 *Graphical symbol for thermal spraying*

JIS H 8260 *Powders for thermal spraying*

JIS H 8401 *Methods of thickness measurement for sprayed coatings*

JIS Z 2244 *Vickers hardness test — Test method*

JIS Z 2251 *Knoop hardness test — Test method*

JIS Z 8401 *Guide to the rounding of numbers*

3 Terms and definitions

For the purposes of this Standard, the terms and definitions given in JIS H 8200 shall apply.

4 Types and symbols

The types and symbols of sprayed coatings shall be as follows.

- a) The symbols of thermal spraying method, sprayed coating type, sprayed coating thickness, etc. shall be in accordance with **JIS H 8250**.
- b) For the symbols indicating the sprayed coating type, the symbols indicating self-fluxing alloy powders and composite powders thereof in table 2 of **JIS H 8260** shall be used as they are.

NOTE : The symbols indicating the types of self-fluxing alloys shall be listed in table 1 together with the chemical compositions, previous symbols (**JIS H 8303: 2004**) and hardness.

5 Thermal spraying work

5.1 Design considerations

To ascertain whether the sprayed coating formed by the thermal spraying and fusing is suitable for the intended application, the following matters shall be specified.

5.1.1 Substrate

5.1.1.1 As the process requires the heat application for the thermal spraying and fusing, consideration should be given to the possible effects of such heating on the substrate shown below.

- a) Distortion, strain
- b) Scaling
- c) Need to stress relieve
- d) Transformation of mechanical and/or metallurgical properties

NOTE : Martensitic steels are susceptible to stress cracking and may render the substrate liable to stress cracking. Alloys containing significant amounts of C, Al, Ti, Mg, S, P, and N render the substrate liable to stress cracking and also may create porosity in the sprayed coating.

5.1.1.2 When adopting the sprayed coating formed by the thermal spraying of self-fluxing alloys, consideration should be given to the reduction of design dimensions. Also, consideration should be given to the change in mechanical properties during the

thermal spraying and fusing process and the fact that the sprayed coating formed by fusing may have different properties of those of the substrate.

5.1.1.3 Consideration should be given to the fact that the fatigue strength, shock resistance and other physical properties and chemical properties of the substrate may be affected by the application of the thermal spraying and fusing.

5.2 Self-fluxing alloy selection

5.2.1 Selection

The selection of thermal spraying material will determine the following properties of the sprayed coating formed by the thermal spraying and fusing.

- a) Hardness
- b) Resistance to wear and resistance to corrosion
- c) Machining properties (cutting, grinding, workability, etc.)
- d) Suitability for intended application

5.2.2 Chemical composition

5.2.2.1 The chemical composition of the thermal spraying material will determine the properties of the sprayed coating. Consideration for selection shall be given to the environmental conditions on the application.

5.2.2.2 For the substrate subjected to a martensitic change, the thermal spraying material with high ductility shall be selected. Consideration should also be given to the need for post heat treatment after the thermal spraying and fusing.