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JAPANESE INDUSTRIAL STANDARD

Test method for continuous oxidation test at elevated temperatures for metallic materials

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Test method for continuous oxidation test
at elevated temperatures for metallic materials

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1. Scope This Japanese Industrial Standard specifies the method for continuous oxidation test of metallic materials at elevated temperature.

Remarks: The following standards are cited in this Standard:

JIS B 7502 Micrometer callipers for external measurement
JIS B 7507 Vernier, dial and digital callipers
JIS C 1602 Thermocouples
JIS L 0204 Glossary of terms used in fiber
JIS R 6251 Abrasive cloths
JIS R 6252 Abrasive papers
JIS R 6254 Endless abrasive belts
JIS Z 8401 Rules for rounding off of numerical values

2. Definition The definition of the main terms used in this Standard shall be as follows:

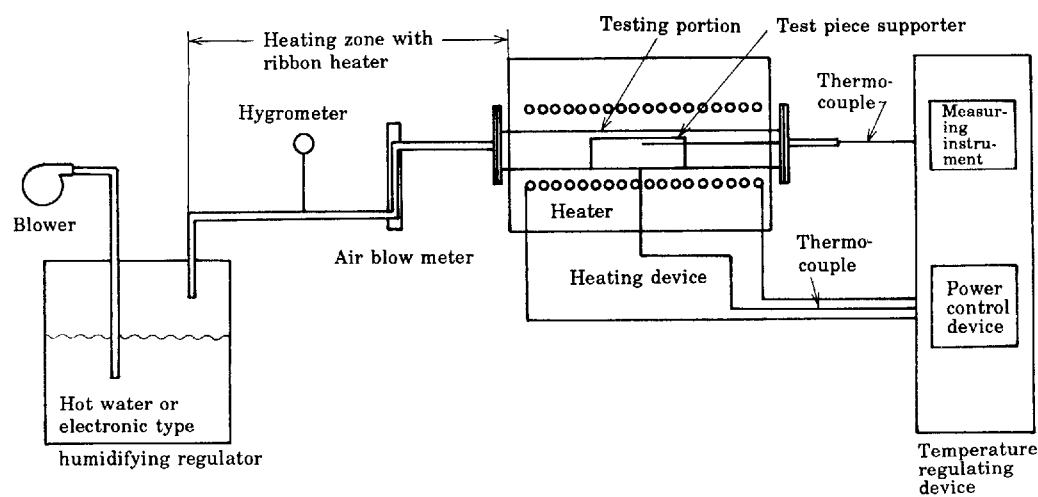
- (1) scale Oxide film and oxidized products produced on the surface of test piece by oxidation.
- (2) adherent scale Scale adhering to the test piece even after rubbing the surface of test piece after oxidation test by means of the nylon brush specified in JIS L 0204.
- (3) spalled scale Scale flaked from the test piece after the oxidation test and the scale flaked from the surface of test piece when rubbing the surface of test piece by using the nylon brush specified in JIS L 0204.
- (4) altered layer Zone changed in quality by oxidation.
- (5) maximum erosion depth The maximum depth of the oxidized part from the surface.

3. Test apparatus

3.1 Construction of apparatus The apparatus shall be composed as a whole of the temperature regulating device for heating the test piece uniformly at a constant temperature, the heating device equipped with the testing portion for separating test piece from outside air, the humidifying regulator for supplying continuously the air kept at a constant humidity, the blower, the air blow meter and the hygrometer.

The basic construction of the apparatus is shown in Fig. 1.

Fig. 1. Basic construction of apparatus



3.2 Heating device The heating device shall be as follows:

- (1) The heating device shall be of the structure having the down-end cylindrical testing portion shielded from outside air.
- (2) In heating a test piece, the temperature regulating device equipped with the down-end cylindrical heating furnace which is capable of heating evenly at a constant temperature all over the test piece within the permissible tolerance given in Table 1 all the time during the test. If the temperature of test piece is 573 K or lower and higher than 1273 K, the permissible tolerance shall be in accordance with the agreement between the parties concerned with delivery.

Table 1. Permissible tolerance of temperature of test piece
Unit: K

Exceeding 573 up to and including 873	Exceeding 873 up to and including 1073	Exceeding 1073 up to and including 1273
± 3	± 4	± 5

3.3 Temperature regulating device

3.3.1 Measuring instrument The measuring instrument shall be capable enough to guarantee that the temperature of test piece is kept within the permissible range given in 3.2 (2) ranging over the entire measuring temperature.

3.3.2 Thermocouple The thermocouple shall be as follows:

- (1) The material for thermocouple shall withstand fully the test temperature.
Moreover, the diameter of wire is recommended to be as small as possible, within the limit where the thermoelectric power does not change in servicing.