INTERNATIONAL STANDARD

ISO 9400

First edition
1990-12-01

Nickel-based alloys — Determination of resistance to intergranular corrosion

Alliages à base de nickel — Détermination de la résistance à la corrosion intergranulaire

Reference number
ISO 9400:1990(E)

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 9400 was prepared by Technical Committee ISO/TC 156, *Corrosion of metals and alloys*.

Annex A of this International Standard is for information only.

International Organization for Standardization
Case Postale 56 • CH-1211 Genève 20 • Switzerland

Printed in Switzerland

Nickel-based alloys — Determination of resistance to intergranular corrosion

Section 1: General

1.1 Scope

This International Standard specifies four methods for determination of the susceptibility of nickel-based alloys to intergranular corrosion.

These methods are for laboratory testing of susceptibility only, and a direct correlation with intergranular corrosion in actual service may not occur unless the service medium is the same as the test medium.

The methods covered are as follows:

— **Method A:** iron(III) sulfate — sulfuric acid test (section 2);

— **Method B:** copper — copper-sulfate — 16 % sulfuric acid test (section 3);

— **Method C:** hydrochloric acid test (section 4);

— **Method D:** nitric acid test (section 5);

The appropriate method for use with a given alloy, the selection of sensitizing treatment, and the acceptance criteria to be used in any evaluation have to be agreed between the buyer and seller of the alloy. As a guide, the methods specified in this International Standard should be applicable to those nickel-based alloys used for corrosion service and listed in ISO 6207[1].

1.2 Definition

For the purposes of this International Standard, the following definition applies.

nickel-based alloy: An alloy which includes nickel as the predominant element.

NOTE 1 This definition is consistent with that given in ISO 6372-1[2].

1.3 Apparatus

The recommended apparatus is shown in figure 1. The cold-finger type of condenser with standard Erlenmeyer flasks should not be used except for method D.

The following items are required.

1.3.1 Four-bulb Allihn or Soxhlet condenser with 45/50 ground glass joint.

1.3.2 Erlenmeyer flask, capacity 1 dm^3, with 45/50 ground glass joint.

NOTE 2 The use of round flasks with a heating jacket is also acceptable.

1.3.3 Glass cradle or other equivalent means of specimen support, such as glass hooks or stirrups. The cradle should have three or four holes in it, to increase circulation of the test solution around the specimen (see figure 1).

1.3.4 Boiling chips to promote uniform boiling and to prevent bumping.

For method A, these boiling chips should be made of pure alundum.

1.3.5 Silicone grease for application to the ground glass joint of the condenser and flask.

A PTFE sleeve for the joint is also acceptable.

1.3.6 Heating device such as an electrically heated hot-plate, for continuous boiling of the test solution.