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МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ

Materials for equipment used in gas welding, cutting and allied processes

Matériaux utilisés pour les matériels de soudage aux gaz, coupage et techniques connexes

ITEH STANDARD PREVIEW

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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 approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 9539 was prepared by Technical Committee ISO/TC 44, *Welding and allied processes*.

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Materials for equipment used in gas welding, cutting and allied processes

1 Scope

This International Standard specifies the general and special requirements on materials used for the construction of equipment used in gas welding, cutting and allied processes. It does not deal with materials used for the construction of welding hoses which are specified in ISO 3821: 1977, *Welding — Flexible hoses for gas welding and allied processes*.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards listed below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 554: 1976, *Standard atmospheres for conditioning and/or testing — Specifications*.

ISO 1817: 1985, *Rubber, vulcanized — Determination of the effect of liquids*.

3 General requirements

Materials liable to come into contact with the process gases shall be adequately resistant to the chemical, mechanical and thermal action of these gases under all operating conditions.

Where dissimilar materials are in direct contact, steps shall be taken to prevent corrosion.

3.1 Resistance to temperature

The properties of the materials shall be such that the function for which they are intended can be performed correctly within the temperature range from $-20\text{ }^{\circ}\text{C}$ to $+60\text{ }^{\circ}\text{C}$.

4 Specific requirements

4.1 Metallic materials

4.1.1 For use with acetylene and gases with similar chemical properties

The copper content of materials liable to come into contact with such gases shall not exceed 70 % (*m/m*); nozzles and necks of blowpipes are an exception to this requirement.

Metal flame-arresting elements (including sintered metal elements) shall be manufactured from copper-free materials.

Where brazing alloys containing silver and copper are used, the silver content shall not exceed 46 % (*m/m*) and the copper content shall not exceed 37 % (*m/m*). The brazing connection shall be designed and completed in such a way that, as far as practicable, the area where acetylene is liable to come into contact with the brazing alloy will be small and all residues of flux will be removed.

4.1.2 For use with oxygen

All components in contact with oxygen shall be free of oil and grease. Springs and other moving parts liable to come into contact with oxygen shall be made of materials which resist oxidation and they shall not be coated.

4.2 Non-metallic materials

4.2.1 Resistance to solvents

Non-metallic materials (e.g. those used for seals and lubricants) liable to come into contact with acetylene shall be adequately resistant to the solvents acetone and dimethylformamide (DMF).

For the purposes of this International Standard, the term adequate resistance (to solvents) will be taken to mean that the material shall fulfil the following conditions.

After the material has been stored

- a) 168 h \pm 2 h (i.e. 7 days) in an atmosphere saturated with solvent vapour at 23 °C \pm 2 °C,
- b) a subsequent period in air for 70 h \pm 2 h at 40 °C \pm 2 °C, and
- c) 24 h \pm 2 h at standard atmosphere 23/50 as specified in ISO 554,

the change in mass (resistance to swelling) shall not exceed 15 % and the change in hardness shall not exceed \pm 15 IRHD.

These tests shall be carried out in accordance with ISO 1817.

4.2.2 Resistance to *n*-pentane

Non-metallic materials (e.g. those used for seals and lubricants) liable to come into contact with propane, butane and methylacetylene-propadiene mixtures shall be adequately resistant to *n*-pentane.

For the purposes of this International Standard, the term adequate resistance (to *n*-pentane) will be taken to mean that the material shall fulfil the following conditions.

After the material has been stored for

- a) 168 h \pm 2 h (i.e. 7 days) in liquid *n*-pentane at 23 °C \pm 2 °C,
- b) a subsequent period in air for 70 h \pm 2 h at 40 °C \pm 2 °C, and
- c) 24 h \pm 2 h at standard atmosphere 23/50 as specified in ISO 554,

the change in mass (resistance to swelling) shall not exceed 15 % and the change in hardness shall not exceed \pm 15 IRHD.

These tests shall be carried out in accordance with ISO 1817.

4.2.3 Resistance to oxygen

All components in contact with oxygen shall be free from substances that may react violently with oxygen under normal operating conditions, e.g. hydrocarbon-based solvents, oils and greases.

Only lubricants suitable for use in oxygen at maximum operating pressure and temperature shall be used.

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