INTERNATIONAL STANDARD

ISO 9185

Second edition
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Protective clothing — Assessment of resistance of materials to molten metal splash

Vêtements de protection — Évaluation de la résistance des matériaux aux projections de métal fondu

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. 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.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 9185 was prepared by the European Committee for Standardization (CEN) Technical Committee CEN/TC 162, *Protective clothing including hand and arm protection and lifejackets*, in collaboration with Technical Committee ISO/TC 94, *Personal safety — Protective clothing and equipment*, Subcommittee SC 13, *Protective clothing*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (ISO 9185:1990), which has been technically revised.

This second edition includes the following significant technical changes compared to the first edition:

a) new PVC sensor film included;

b) Cryolite included as test metal.

Introduction

ISO 9185:1990 and EN 373:1995 have been used up until now with reasonable success as the principle test methods for materials used in the manufacture of clothing to protect against large splashes of molten metals. EN and ISO specifications cite these test methods and set levels of performance in terms of the mass of iron or aluminium that can be splashed onto test materials without producing damage to the heat sensor film.

The revision of the test methods contained within this International Standard incorporates changes based on experience that are intended to improve reproducibility and to respond to incident data from the aluminium smelter industry. A test procedure is therefore introduced to determine the protection provided by materials when splashed with molten cryolite. This revision also harmonises into one test procedure the previously slightly different procedures in ISO 9185 and EN 373 for testing with molten aluminium.

A new supply of PVC sensor film has been established together with a new world-wide distributor – see note in the text. One single specification for PVC film replaces the previously different ones in ISO 9185 and EN 373.

The test method in this International Standard is distinct from that in ISO 9150, which assesses the protective performance of materials intended to be manufactured into protective clothing for welding activities.

Protective clothing — Assessment of resistance of materials to molten metal splash

1 Scope

This International Standard specifies a method for assessing the heat penetration resistance of materials intended for use in clothing to protect against large splashes of molten metal. It provides specific procedures for assessing the effects of splashes of molten aluminium, molten cryolite, molten copper, molten iron and molten mild steel.

The principle of the test method is applicable to a wider range of hot molten materials than those for which specific procedures are set out, provided that appropriate measures are applied to protect the test operator. It is important to note that good resistance of a material to a pure molten metal does not guarantee a good performance against any slag that can be present in a manufacturing process.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 683-1:1987, *Heat-treatable steels, alloy steels and free-cutting steels — Part 1: Direct-hardening unalloyed and low-alloyed wrought steel in form of different black products*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
damage
⟨PVC sensor film⟩ any smoothing or modification to the embossing or pinholing of the PVC sensor film, extending in total for at least 5 mm across its width

NOTE Where the visual change in appearance is in discrete spots, damage occurs when the summation of the width of each spot exceeds 5 mm across any horizontal section. For cryolite, experience indicates that damage can be defined as less than 5 mm in width, but greater than 10 mm in length.

3.2
molten metal splash index
figure equal to the minimum mass of molten metal poured which just causes damage to the PVC sensor film

4 Principle

Materials are tested by pouring quantities of molten metal onto the test specimen supported at an angle to the horizontal on a pin frame. Damage is assessed by placing an embossed thermoplastic PVC sensor film directly behind, and in contact with, the test specimen and noting changes to the film after pouring. Any adherence of the metal to the test specimen surface is also noted. Depending on the result, the test is repeated, using a greater or smaller mass of metal, until the minimum quantity to cause damage to the film is observed.