

INTERNATIONAL STANDARD

ISO
12127

First edition
1996-02-15

Clothing for protection against heat and flame — Determination of contact heat transmission through protective clothing or constituent materials

*Vêtements de protection contre la chaleur et la flamme — Détermination
de la transmission thermique par contact à travers les vêtements de
protection ou leurs matériaux constitutifs*



Reference number
ISO 12127:1996(E)



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Foreword

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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 12127 was prepared by Technical Committee ISO/TC 94, *Personal safety – Protective clothing and equipment*, Subcommittee SC 13, *Protective clothing*.

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Case Postale 56 • CH-1211 Genève 20 • Switzerland

Printed in Switzerland

Clothing for protection against heat and flame — Determination of contact heat transmission through protective clothing or constituent materials

1 Scope

This International Standard specifies a test method for the determination of contact heat transmission. It is applicable to protective clothing (including hand protectors) and its constituent materials intended to protect against high contact temperatures.

Application of this International Standard is restricted to contact temperatures between 100 °C and 500 °C.

2 Definitions

For the purposes of this International Standard, the following definitions apply.

2.1 contact temperature, T_c : Surface temperature of the contact area of the heating cylinder; this temperature is kept constant.

2.2 start of timing: Moment when the upper surface of the calorimeter and the bottom edge of the heating cylinder are within 10 mm of each other.

2.3 threshold time t_t : Time between the start of timing and the moment when the temperature of the calorimeter is 10 °C above its starting value.

2.4 contacting speed: Relative speed with which the heating cylinder and the calorimeter with the test specimen are brought into contact with each other.

2.5 contact force: Force acting on the test specimen and the calorimeter when they have been brought into contact with the heating cylinder.

3 Principle

The heating cylinder is heated to and maintained at the contact temperature and a test specimen is

placed on the calorimeter. The heating cylinder is lowered onto the test specimen supported by the calorimeter or, alternatively, the calorimeter with the specimen is lifted up to the heating cylinder. In either case the operation is carried out at a constant speed. The threshold time is determined by monitoring the temperature of the calorimeter.

4 Apparatus

4.1 Heating cylinder

The heating cylinder shall be constructed from a suitable metal which can withstand temperatures of over 500 °C (e.g. pure nickel). Figure 1 shows an example of the heating cylinder. The contact surface shall have a diameter of $(25,2 \pm 0,05)$ mm and shall be surface ground. There shall be a central boring which ends 3 mm above the lower surface of the heating cylinder. This boring is intended to hold the temperature sensor, which is necessary for regulation of the temperature of the heating cylinder, and its diameter should be chosen accordingly. A spiral slot of depth D , width B and pitch Z shall be machined in the upper part of the heating cylinder. The values of D , B and Z shall be chosen in such a way that the total heated length of a heating conductor can be placed in the slot. The heating cylinder shall be enclosed by heat-resistant insulation, leaving free the bottom contact surface.

4.2 Calorimeter

The calorimeter (as shown in figure 2) consists of a cylindrical disc of black anodized pure aluminium of $(25 \pm 0,05)$ mm diameter and $(5 \pm 0,02)$ mm thickness, which is fixed on a mounting made from polyamide 66. The upper contact surface of the calorimeter shall be surface ground before anodization