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AS/NZS ISO 13994:2006

Australian/New Zealand Standard™

Clothing for protection against chemicals—Determination of the resistance of protective clothing materials to penetration by liquids under pressure

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee SF-004, Occupational Protective Clothing. It was approved on behalf of the Council of Standards Australia on 19 September 2006 and on behalf of the Council of Standards New Zealand on 13 October 2006.
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The following are represented on Committee SF-004:

AWTA Textile Testing
Apparel & Textile Federation of NZ Inc
Association of Accredited Certification Bodies
Australasian Fire Authorities Council
Australian Business Limited
Australian Chamber of Commerce and Industry
Australian Industry Group
Certification Interests
Communications, Electrical and Plumbing Union
Council of Textile and Fashion Industries of Australia Ltd
Department of Consumer & Employment Protection, Worksafe Division, WA
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Safety Institute of Australia
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Textile Clothing & Footwear Union of Australia
The Australian Assembly of Volunteer Fire Brigades Association
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We also welcome suggestions for improvement in our Standards, and especially encourage readers to notify us immediately of any apparent inaccuracies or ambiguities. Please address your comments to the Chief Executive of either Standards Australia or Standards New Zealand at the address shown on the back cover.

This Standard was issued in draft form for comment as DR 06435.

STANDARDS AUSTRALIA/STANDARDS NEW ZEALAND

RECONFIRMATION

OF

AS/NZS ISO 13994:2006

Clothing for protection against chemicals—Determination of the resistance of protective clothing materials to penetration by liquids under pressure

RECONFIRMATION NOTICE

Technical Committee SF-004 has reviewed the content of this publication and in accordance with Standards Australia procedures for reconfirmation, it has been determined that the publication is still valid and does not require change.

Certain documents referenced in the publication may have been amended since the original date of publication. Users are advised to ensure that they are using the latest versions of such documents as appropriate, unless advised otherwise in this Reconfirmation Notice.

Approved for reconfirmation in accordance with Standards Australia procedures for reconfirmation on 23 November 2016.

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The following are represented on Technical Committee SF-004:

Australasian Fire and Emergency Service Authorities Council
Australian Chamber of Commerce and Industry
Australian Industry Group
AWTA Textile Testing
Certification Interests (Australia)
Communications, Electrical and Plumbing Union - Electrical Division
Council of Textile and Fashion Industries of Australia
Department of Defence (Australian Government)
Energy Networks Association
New Zealand Road Safety Manufacturers Association
NSW Rural Fire Service Association
Safety Institute of Australia
Testing Interests (Australia)
Textile Clothing & Footwear Union of Australia
University of Otago New Zealand
University of Western Sydney

NOTES

Australian/New Zealand Standard™

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee SF-004, Occupational Protective Clothing. This Standard is identical with, and has been reproduced from ISO 13994:2005, *Clothing for protection against liquid chemicals—Determination of the resistance of protective clothing materials to penetration by liquids under pressure*.

The objective of this Standard is to describe a laboratory test method for the measurements of penetration resistance of protective clothing materials from liquids under pressure by the adoption of the current edition of ISO 13994.

As this Standard is reproduced from an international standard, the following applies:

(a) Its number appears on the cover and title page while the international standard number appears only on the cover

(b) In the source text 'this International Standard' should read 'this Australian/New Zealand Standard'.

(c) A full point substitutes for a comma when referring to a decimal marker.

(d) Attention is drawn to Figure 10 in which the protective cover is misnumbered '3' instead of '2'.

(e) The word 'gage' should read 'gauge'.

For Australian readers, reference to International Standards should be replaced by references to Australian or Australian/New Zealand Standards, as follows:

Reference to International Standard		*Australian/New Zealand Standard*	
ISO		AS	
139	Textile—Standard atmospheres for conditioning and testing	2001 2001.1	Method for test for textiles Part 1: Conditioning procedures
2286 2286-3	Rubber- or plastic-coated fabrics—Determination of roll characteristics Part 3: Method for determination of thickness	4878 4878.4	Methods of test for coated fabrics Method 4: Determination of thickness
2859 2859-1	Sampling procedures for inspection by attributes Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection	1199 1199.1	Sampling procedures for inspection by attributes Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection
3801	Textiles—Woven fabrics—Determination of mass per until length and mass per unit area	2001 2001.2.13	Method of test for textiles Method 2.13: Physical tests—Determination of mass per unit area and mass per unit length of fabrics
5084	Textiles—Determination of thickness of textiles and textile products	2001.2.15	Method 2.15: Physical tests—Determination of thickness of textile fabrics

In the course of considering adoption of this Standard, Committee SF-004 agreed that the reader's attention should be drawn to the following points:

(i) The issues of estimating and recording uncertainty in measurement are not addressed in this Standard. Users are encouraged to refer to 'G*uide to Expression of Uncertainty in Measurement*' issued by BIPM, IEC, IFCC, ISO, IUPAC, IUPAP and OIML.

(ii) Caution is urged as the differences between levels of performance are dependent on the precision of the measurement and may not accurately reflect conditions of use.

The term ‘informative’ has been used in this Standard to define the application of the annex to which it applies. An ‘informative’ annex is only for information and guidance.

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INTRODUCTION

Workers involved in the production, use, and transportation of liquid chemicals can be exposed to numerous compounds capable of causing harm upon contact with the human body. The deleterious effects of these chemicals can range from acute trauma (such as skin irritation and burn) to chronic degenerative disease (such as cancer). Since engineering controls may not eliminate all possible exposures, attention is often placed on reducing the potential for direct skin contact through use of protective clothing that resists permeation, penetration and degradation.

This test method determines the resistance to penetration by liquids under pressure only. It is necessary to use other methods to determine the resistance to permeation and degradation, as well as penetration resistance for liquids not under pressure.

NOTES

AUSTRALIAN/NEW ZEALAND STANDARD

Clothing for protection against liquid chemicals — Determination of the resistance of protective clothing materials to penetration by liquids under pressure

1 Scope

This International Standard describes a laboratory test method that enables determination of the resistance of materials used in protective clothing to visible penetration under the conditions of continuous liquid contact and pressure, for example, clothing that is exposed to repeated splashes of liquid spray under pressure. Protective clothing “pass/fail” determinations are based on visual detection of liquid penetration.

This test method is normally used to evaluate the barrier effectiveness against liquids of materials used for protective clothing and specimens from finished items of protective clothing.

NOTE Finished items of protective clothing include gloves, arm shields, aprons, suits, hoods, boots and the like. The phrase “specimens from finished items” encompasses seamed and other discontinuous regions as well as the usual continuous regions of protective clothing items.

This test method can be used to identify protective clothing materials and constructions that limit exposures to hazardous liquid chemicals under a variety of circumstances. This test method is particularly useful for demonstrating the liquid hold-out capabilities of microporous fabrics.

Significant amounts of hazardous materials can permeate specimens that pass penetration tests. More sensitive analysis of permeation can be carried out using ISO 6529.

Penetration resistance of protective clothing materials using less severe liquid challenges, without pressure, can be carried out using ISO 6530. ISO 6530 uses a relatively low-volume, short-duration liquid challenge which is appropriate for treated porous and other non-film-based or uncoated materials.

This International Standard addresses only the performance of materials or certain material constructions (e.g. seams) used in protective clothing. It does not address the design, overall construction and components, or interfaces of garments or other factors which may affect the overall protection offered by the protective clothing.

It is emphasized that the test method specified in this International Standard does not necessarily simulate conditions that clothing materials are likely to be exposed to in practice. Therefore the use of test data is to be restricted to broad comparative assessment of such materials according to their liquid penetration resistance characteristics.

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 139, *Textiles — Standard atmospheres for conditioning and testing*

ISO 2286-3, *Rubber- or plastics-coated fabrics — Determination of roll characteristics — Part 3: Method for determination of thickness*