

Australian Standard[®]

**Protective clothing for firefighters—
Requirements and test methods for
protective clothing used for structural
firefighting**



This Australian Standard® was prepared by Committee SF-049, Firefighters Personal Protective Equipment. It was approved on behalf of the Council of Standards Australia on 14 August 2006.

This Standard was published on 8 November 2006.

The following are represented on Committee SF-049:

- Association of Accredited Certification Bodies
 - Australasian Fire Authorities Council
 - Australian Chamber of Commerce and Industry
 - Australian Industry Group
 - Certification Interests (Australia)
 - CSIRO Textile and Fibre Technology
 - Council of Textile and Fashion Industries of Australia
 - Department of Defence Australia
 - Footwear Manufacturers Association of Australia
 - New Zealand Fire Service
 - New Zealand Footwear Industry Association
 - New Zealand Leather and Shoe Research Association
 - New Zealand Manufacturing Interests
 - Suppliers of Helmets
 - Testing Interests (Australia)
 - United Firefighters Union of Australia
 - University of Otago New Zealand
-

Standards Australia wishes to acknowledge the participation of the expert individuals that contributed to the development of this Standard through their representation on the Committee and through the public comment period.

Keeping Standards up-to-date

Australian Standards® are living documents that reflect progress in science, technology and systems. To maintain their currency, all Standards are periodically reviewed, and new editions are published. Between editions, amendments may be issued.

Standards may also be withdrawn. It is important that readers assure themselves they are using a current Standard, which should include any amendments that may have been published since the Standard was published.

Detailed information about Australian Standards, drafts, amendments and new projects can be found by visiting **www.standards.org.au**

Standards Australia welcomes suggestions for improvements, and encourages readers to notify us immediately of any apparent inaccuracies or ambiguities. Contact us via email at **mail@standards.org.au**, or write to Standards Australia, GPO Box 476, Sydney, NSW 2001.

Australian Standard[®]

**Protective clothing for firefighters—
Requirements and test methods for
protective clothing used for structural
firefighting**

Originated as AS 4967(Int)—2001.
Previous edition AS 4967(Int)—2002.
Revised and designated as AS 4967—2006.
Reissued incorporating Amendment No. 1 (August 2007).

COPYRIGHT

© Standards Australia

All rights are reserved. No part of this work may be reproduced or copied in any form or by any means, electronic or mechanical, including photocopying, without the written permission of the publisher.

Published by Standards Australia, GPO Box 476, Sydney, NSW 2001, Australia

ISBN 0 7337 7835 6

PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee SF-049, Firefighters Personal Protective Equipment to supersede AS 4967(Int)—2002. After consultation with stakeholders in both countries, Standards Australia and Standards New Zealand decided to develop this Standard as an Australian Standard rather than an Australian/New Zealand Standard.

This Standard incorporates Amendment No. 1 (August 2007). The changes required by the Amendment are indicated in the text by a marginal bar and amendment number against the clause, note, table, figure or part thereof affected.

Changes to this edition include:

- (a) Replacement of references to EN 366 with ISO 6942.
- (b) Replacement of references to EN 367 with ISO 9151.
- (c) Update of requirements for penetration by liquids, including addition of o-xylene and replacement of the test method of EN 368 with that of AS/NZS ISO 6530.

This Standard is based on ISO 11613, *Protective clothing for firefighters—Laboratory test methods and performance requirements*, but has been extensively re-written to suit Australian conditions.

The Committee is committed to the development of a standard with a single level of protection that ensures a minimum safety level. It is envisaged that this would be achieved at the next revision and will form the basis of Australia's response to ISO DIS 11613.

In the longer term, the Committee is committed to developing a single standard for all items of personal protective equipment used for structural firefighting.

AS/NZS 4360, *Risk management* should be referred to when references to risk assessments are made.

The term 'normative' has been used in this Standard to define the application of the Appendix to which it applies. A 'normative' appendix is an integral part of this Standard.

CONTENTS

	<i>Page</i>
FOREWORD.....	4
SECTION 1 SCOPE AND GENERAL	
1.1 SCOPE	5
1.2 OBJECTIVE.....	5
1.3 APPLICATION	5
1.4 REFERENCED DOCUMENTS	5
1.5 DEFINITIONS	6
SECTION 2 DETERMINATION OF REQUIREMENTS FOR FIREFIGHTERS’ PROTECTIVE CLOTHING.....	10
SECTION 3 DESIGN AND PERFORMANCE REQUIREMENTS	
3.1 GENERAL	11
3.2 DESIGN REQUIREMENTS	11
3.3 SAMPLING AND PRETREATMENT.....	12
3.4 BASIC SAFETY REQUIREMENTS.....	13
3.5 HEAT TRANSFER (FLAME).....	13
3.6 HEAT TRANSFER (RADIATION)	13
3.7 RESIDUAL STRENGTH OF MATERIAL WHEN EXPOSED TO RADIANT HEAT.....	14
3.8 HEAT RESISTANCE.....	14
3.9 TENSILE STRENGTH.....	14
3.10 TEAR STRENGTH	14
3.11 ABRASION RESISTANCE	15
3.12 RESISTANCE TO WATER AND LIQUID CHEMICALS	15
3.13 DIMENSIONAL CHANGE	16
3.14 RETRO-REFLECTIVE/FLUORESCENT MATERIAL.....	16
3.15 ADDITIONAL GARMENT TESTING	16
SECTION 4 MARKING	
4.1 GENERAL	17
4.2 MARKING REQUIREMENTS	17
4.3 MANUFACTURERS’ INFORMATION.....	17
APPENDIX A RETRO-REFLECTIVE/FLUORESCENT MATERIALS.....	19

FOREWORD

Whilst the command and control procedures employed, the tactics used and the duties and responsibilities of firefighters may vary from one jurisdiction to another, in general terms the objectives of a firefighter on reaching an incident can be summarized as follows:

- (a) The saving of life and provision of humanitarian services.
- (b) The prevention or minimization of damage to property.
- (c) The prevention or minimization of damage to the environment.

The function of personal protective equipment (PPE) is to protect the firefighter whilst enabling the firefighter to achieve these objectives. In addition, in emergency situations where it is impossible to achieve the objectives, the PPE should safeguard the firefighter, allowing him or her to escape safely to a place of safety. The purpose of this Standard is to provide levels of performance requirements for firefighters' protective clothing that enable the above-mentioned criteria to be met, with the levels selected being based on the results of a risk assessment.

Employers have a responsibility to carry out a risk assessment before deciding on the type of PPE that is most suitable to protect the personnel under their control in their 'work place'. The duties and responsibilities of firefighters should be taken into account when assessing the risk and the appropriate PPE selected using the Standards required. In this way, operational procedures and different concepts of safety will both play a part in leading to the levels of performance chosen. It must be remembered that risk assessments are a starting point for action, not an objective in themselves.

Additional PPE to protect the head, face, hands and feet of firefighters should also be worn along with appropriate respiratory protection, where necessary. Currently, the relevant Standards for this PPE are as follows: head – AS/NZS 4067, hands – AS/NZS 2161, feet – AS/NZS 4821 and respiratory protection – AS/NZS 1716.

The specified controlled laboratory tests used to determine compliance with the performance requirements of this Standard do not replicate the situations to which firefighting personnel may be, exposed. During an incident, hazards other than those against which clothing to this Standard is intended to protect may be encountered e.g. chemical, biological, radiation or electrical. If the risk assessment identifies that exposure to such hazards is likely, protection by more appropriate PPE may be required either instead of or in addition to the protective clothing covered by this Standard.

It is essential that firefighters are trained in the use, care and maintenance of all PPE. This training should include an understanding of its limitations and of the necessity to remove PPE as soon as practical after an incident, mainly for physiological reasons.

Contamination or degradation of protective clothing will effect its performance. Protective clothing should be cleaned frequently following the manufacturer's recommended instructions. All repairs or alterations to the clothing should only be carried out by qualified personnel in accordance with the manufacturer's instructions.

Nothing in this Standard is intended to restrict any jurisdiction, purchaser or manufacturer from exceeding these minimum requirements.

STANDARDS AUSTRALIA

Australian Standard

Protective clothing for firefighters—Requirements and test methods for protective clothing used for structural firefighting

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE

This Standard specifies the minimum requirements and test methods for assessing protective clothing that is intended to be worn during structural firefighting and associated activities where there is a risk of heat and/or flame.

1.2 OBJECTIVE

The objective of this Standard is to provide manufacturers and suppliers with a clear statement of the minimum requirements for structural firefighters' apparel.

1.3 APPLICATION

This Standard covers the general clothing design, the minimum performance levels of the materials used, and the methods of test for determining these performance levels.

This Standard does not cover special clothing for use in other high risk situations such as specialized firefighting, or clothing for use in long term firefighting operations in high ambient temperature, e.g. brush, wildland, or forest firefighting. It does not address protection for the head, hands and feet or protection against other hazards, e.g. chemical, biological, radiation and electrical hazards. These aspects may be dealt with in other Standards.

1.4 REFERENCED DOCUMENTS

The following documents are referred to in this Standard:

AS/NZS

- | | |
|--------|---|
| 1906 | Retroreflective materials and devices for road traffic control purposes |
| 1906.1 | Part 1: Retroreflective materials |
| 1957 | Textiles—Care labelling |
| 4360 | Risk management |
| 4804 | Occupational health and safety management systems—General guidelines on principles, systems and supporting techniques |

AS/NZS ISO

- | | |
|------|---|
| 6530 | Protective clothing—Protection against liquid chemicals—Test method for resistance of materials to penetration by liquids |
|------|---|

ISO

- | | |
|------|---|
| 3146 | Plastics—Determination of melting behaviour (melting temperature or melting range) of semi-crystalline polymers by capillary tube and polarizing-microscope methods |
|------|---|