

Australian/New Zealand Standard™

Spray painting booths, designated spray painting areas and paint mixing rooms

Part 1: Design, construction and testing

AS/NZS 4114.1:2003

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee EL-014, Electrical Equipment in Hazardous Areas. It was approved on behalf of the Council of Standards Australia on 30 December 2002 and on behalf of the Council of Standards New Zealand on 13 December 2002. It was published on 11 February 2003.

The following are represented on Committee EL-014:

Association of Consulting Engineers Australia
Auckland Regional Chamber of Commerce
Australian Association of Certification Bodies
Australian Chamber of Commerce and Industry
Australian Coal Association
Australian Electrical and Electronic Manufacturers Association
Australian Gas Association
Australian Industry Group
Australian Institute of Petroleum
Australian Institute of Refrigeration Air Conditioning and Heating
Department of Mineral Resources, N.S.W.
Department of Mines and Energy, Qld
Electricity Supply Association of Australia
Institute of Electrical Inspectors
Institute of Instrumentation and Control Australia
Institution of Engineers Australia
Ministry of Economic Development (New Zealand)
National Electrical and Communications Association
New Zealand Association of Marine, Aviation and Power Engineers
New Zealand Employers and Manufacturers Association
New Zealand Hazardous Areas Electrical Coordinating Committee
Regulatory authorities (electrical)
WorkCover New South Wales

Keeping Standards up-to-date

Standards are living documents which 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 Standards may also be withdrawn.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 which may have been published since the Standard was purchased.

Detailed information about joint Australian/New Zealand Standards can be found by visiting the Standards Australia web site at www.standards.com.au or Standards New Zealand web site at www.standards.co.nz and looking up the relevant Standard in the on-line catalogue.

Alternatively, both organizations publish an annual printed Catalogue with full details of all current Standards. For more frequent listings or notification of revisions, amendments and withdrawals, Standards Australia and Standards New Zealand offer a number of update options. For information about these services, users should contact their respective national Standards organization.

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 International or Standards New Zealand at the address shown on the back cover.

Australian/New Zealand Standard™

Spray painting booths, designated spray painting areas and paint mixing rooms

Part 1: Design, construction and testing

Originated as part of AS/NZS 4114(Int):1993.
Previous edition AS/NZS 4114.1:1995.
Second edition 2003.

COPYRIGHT

© Standards Australia/Standards New Zealand

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.

Jointly published by Standards Australia International Ltd, GPO Box 5420, Sydney, NSW 2001 and Standards New Zealand, Private Bag 2439, Wellington 6020

ISBN 0 7337 4269 6

PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee EL-014, Electrical Equipment in Hazardous Areas to supersede AS/NZS 4114.1:1995, *Spray painting booths*, Part 1: *Design, construction and testing*.

This Standard is intended for the guidance of manufacturers, designers, users, statutory authorities and others associated with the construction of spray painting booths.

Major changes to the 1995 edition incorporated in this revised edition are based on industry comments received and are as follows:

- (a) The title was reviewed and reads '*Spray painting booths, designated spray painting areas and paint mixing rooms*'.
- (b) New definitions were added.
- (c) Diagrams for the different airflow systems (Clause 1.6) were added.
- (d) Diagrams for external exhaust fans (Clause 2.10) were added.
- (e) Infrared heating (Clause 3.4.5) was added.
- (f) Diagrams for examples of air supply/exhaust systems (Clause 4.2.2.1) were added.
- (g) Spray cycle airflow rates (Clause 4.2.2.3) were fully reviewed.
- (h) Clause 5.3.2—*System requirements* was substantially expanded to include detailed requirements for heat exchangers and heat exchanger flues.
- (i) Method to determine airflow velocity (Clause 7.5) was added.
- (j) Appendix A—*Relevant authorities* was updated.
- (k) A new Appendix B—*Paint mixing rooms* was added; it contains all the requirements for the different types of such rooms.

This Standard is Part One of a Series which consists of the following:

AS/NZS

4114	Spray painting booths, designated spray painting areas and paint mixing rooms
4114.1	Part 1: Design, construction and testing (this Standard)
4114.2	Part 2: Selection, installation and maintenance

The terms 'normative' and 'informative' have been used in this Standard to define the application of the appendix to which they apply. A 'normative' appendix is an integral part of a Standard, whereas an 'informative' appendix is only for information and guidance.

CONTENTS

	<i>Page</i>
SECTION 1 SCOPE AND GENERAL	
1.1 SCOPE	5
1.2 APPLICATION.....	5
1.3 REFERENCED DOCUMENTS	6
1.4 DEFINITIONS.....	6
1.5 TYPES OF SPRAY PAINTING BOOTHS	7
1.6 AIRFLOW SYSTEMS.....	8
1.7 CLASSIFICATION OF HAZARDOUS AREAS	9
SECTION 2 DESIGN AND CONSTRUCTION	
2.1 GENERAL.....	11
2.2 MATERIALS.....	11
2.3 INTERIOR SURFACES	11
2.4 EXPANSION	11
2.5 DOORS	11
2.6 ENTRY/EXIT OF TUNNEL OR PRODUCTION BOOTHS.....	11
2.7 GUARDING OF MOVING PARTS	11
2.8 SHELVES	12
2.9 EQUIPOTENTIAL BONDING.....	12
2.10 DUCTS	12
SECTION 3 SPECIFIC REQUIREMENTS	
3.1 GENERAL	14
3.2 OPERATION	14
3.3 BOOTH CONSTRUCTION.....	14
3.4 ELECTRICAL APPARATUS.....	15
SECTION 4 VENTILATION OF SPRAY PAINTING BOOTHS	
4.1 GENERAL	17
4.2 AIRFLOW	17
4.3 CONTROL SYSTEMS	20
4.4 EXHAUST AIR	20
SECTION 5 SPRAY PAINTING BOOTH OPERATION	
5.1 GENERAL	22
5.2 CYCLE	22
5.3 HEATING SYSTEM.....	22
SECTION 6 MARKINGS	
6.1 GENERAL	25
6.2 ADDITIONAL INFORMATION.....	25
6.3 WARNING SIGN	25
SECTION 7 VERIFICATION AND TESTS	
7.1 GENERAL	26
7.2 VERIFICATION OF DOCUMENTS AND DESIGN	26
7.3 RUNNING TEST.....	26
7.4 VENTILATION SYSTEM TEST	26
7.5 AIRFLOW TESTING	26

APPENDICES

A	RELEVANT AUTHORITIES	27
B	PAINT MIXING ROOMS	29
C	SPRAY PAINTING BOOTH SAFETY DESIGN FORM	34

STANDARDS AUSTRALIA/STANDARDS NEW ZEALAND

Australian/New Zealand Standard

Spray painting booths, designated spray painting areas and paint mixing rooms

Part 1: Design, construction and testing

S E C T I O N 1 S C O P E A N D G E N E R A L

1.1 SCOPE

This Standard specifies requirements for the design, construction, and testing of spray painting booths, designated spray painting areas and paint mixing rooms, in which flammable liquids are used. It also covers booths incorporating baking or heating cycles, using either direct or indirect heating systems. For booths using direct fired heating systems, only those using fuels covered in Australian Standards, and in New Zealand, by the New Zealand Standards for gas installations referenced in the New Zealand Gas Regulations, are covered by this Standard.

The requirements contained in this Standard are supplementary to the requirements for electrical apparatus specified in AS/NZS 3000, Wiring Rules and the relevant requirements of the AS/NZS 2381 series.

NOTES:

- 1 Attention is drawn to other requirements that may be contained in the respective legislation.
- 2 Part 2 of this Standard details requirements for the installation and maintenance of spray painting booths, designated spray painting areas and paint mixing rooms.
- 3 Water-based paints contain flammable liquids in the form of organic solvents.

This Standard applies to all types of paints containing flammable liquids including water-based paints, since they also contain organic solvents.

This Standard does not apply to—

- (a) dry powder type spray booths or operations, the requirements for which are detailed in AS 3754; or
- (b) ovens used for the sole purpose of drying or baking.

1.2 APPLICATION

This Standard is intended for application by designers, manufacturers, regulatory authorities, owners and operators of spray painting booths, designated spray painting areas and paint mixing rooms.

NOTE: Appendix A contains a list of various authorities that may have a regulatory role regarding the use of spray painting booths, designated spray painting areas and paint mixing rooms.