

Australian/New Zealand Standard™

**Guide to the protection of structural
steel against atmospheric corrosion by
the use of protective coatings**

AS/NZS 2312:2002

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee MT-014, Corrosion of Metals. It was approved on behalf of the Council of Standards Australia on 14 October 2002 and on behalf of the Council of Standards New Zealand on 12 November 2002. It was published on 28 November 2002.

The following are represented on Committee MT-014:

Australasian Corrosion Association
Australian Aluminium Council
Australian Chamber of Commerce and Industry
Australian Electrolysis Committee
Australian Gas Association
Australian Institute of Steel Construction
Australian Pipeline Industry Association
AUSTROADS
Bureau of Steel Manufacturers of Australia
Corrosion Prevention Centre
Department of Defence, Australia
Division of Building, Construction and Engineering, CSIRO
Galvanizers Association of Australia
Hunter Water Australia
Ministry of Economic Development (New Zealand)
New Zealand Abrasive Blasting Association
United Water International
Water Corporation Western Australia

Additional interests participating in the preparation of this Standard:

The Australian Paint Approval Scheme
Australian Paint Manufacturer's Federation
Building Research Association of New Zealand
Corrosion engineers and consultants
Metal spray suppliers
Paint manufacturers and suppliers
Steel Institute of Australia

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 Standards may also be withdrawn.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 Web Shop 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™

Guide to the protection of structural steel against atmospheric corrosion by the use of protective coatings

Originated as part of MA 1.5—1967.
Previous edition AS/NZS 2312:1994.
Fourth edition 2002.
Reissued incorporating Amendment No. 1 (August 2004)

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 4887 2

PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee MT-014, Corrosion of Metals, to supersede AS/NZS 2312:1994, *Guide to the protection of iron and steel against exterior atmospheric corrosion*.

This Standard incorporates Amendment 1 (August 2004). 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.

The objective of this Standard is to provide guidance for architects, engineers, builders, the surface coating industry and users of protective services in general, on coating systems for the protection of steel work against corrosion. The designer can choose from a selection of systems based on expected service life to first maintenance for various environments. The systems recommended herein are based on good industrial practice and usage; however, local knowledge of any corrosion problem should influence the decisions taken.

Many of the system options will provide equal performance in the field. The system chosen will depend on many factors including location, material supply, available equipment, labour and cost.

It is necessary to refer to each Section of this Standard when a specification for an appropriate system is being prepared.

This edition of the Standard has been expanded to cover non-atmospheric environments in addition to exterior atmospheric environments.

In providing recommendations on up-to-date protection systems, the Committee is aware of the large number of systems used commercially, but, to avoid confusion, has included only a limited range of systems for each type of environment.

The Committee acknowledges the developments which are taking place in the protection of structural steel work and will continue to monitor these in order to make changes to future editions of this Standard as may become necessary.

In preparing this revision, cognizance was taken of the International Standard ISO 9223:1992, *Corrosion of metals and alloys—Corrosivity of atmospheres—Classification*. Cognizance was also taken of a number of the draft International Standards being prepared to become part of the ISO 12944 series of Standards, *Paints and varnishes—Corrosion protection of steel structures by protective paint systems*. These Standards were not adopted as most of the paint systems they specify are not used in Australia and New Zealand.

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

CONTENTS

	<i>Page</i>
SECTION 1 SCOPE AND GENERAL	
1.1 SCOPE	6
1.2 NEED FOR CORROSION PROTECTION	7
1.3 USE OF THIS STANDARD.....	7
1.4 REFERENCED DOCUMENTS	7
1.5 DEFINITIONS	10
1.6 DURABILITY CONSIDERATIONS	11
1.7 DESIGNATION OF PROTECTION SYSTEMS.....	11
SECTION 2 CLASSIFICATION OF ENVIRONMENTS	
2.1 GENERAL	13
2.2 MICRO-ENVIRONMENTS	13
2.3 ATMOSPHERIC CORROSIVITY CATEGORIES	14
2.4 OTHER ENVIRONMENTS	15
SECTION 3 PLANNING AND DESIGN FOR CORROSION PROTECTION	
3.1 SCOPE AND GENERAL	16
3.2 PLANNING.....	17
3.3 DESIGN	17
SECTION 4 SURFACE PREPARATION TREATMENTS	
4.1 GENERAL	35
4.2 SURFACE PREPARATION TREATMENTS.....	35
4.3 THE PROTECTION OF STEEL DURING EXTENDED FABRICATION.....	40
4.4 RUST CONVERSION.....	40
SECTION 5 METALLIC COATINGS FOR CORROSION PROTECTION	
5.1 GENERAL	41
5.2 METAL SPRAY COATINGS	41
5.3 HOT-DIP GALVANIZED COATINGS (BATCH PROCESS).....	44
5.4 SECTIONS PRODUCED FROM PRE-GALVANIZED STRIP	47
5.5 SPECIALIZED HOT DIP GALVANIZED PRODUCTS	48
5.6 IN-LINE GALVANIZED PRODUCTS.....	49
5.7 STRUCTURE SECTIONS MANUFACTURED FROM ELECTROGALVANIZED STRIP	49
5.8 PAINT SYSTEMS FOR CONTINUOUSLY, SPECIALIZED AND ELECTROGALVANIZED PRODUCTS.....	50
5.9 THE USE OF ROOFING AND CLADDING MATERIALS.....	50
5.10 ELECTROPLATED COATINGS.....	50
SECTION 6 PAINT COATING SYSTEMS FOR CORROSION PROTECTION	
6.1 GENERAL	52
6.2 DURABILITY OF PAINT COATINGS	52
6.3 COATING SYSTEMS FOR ATMOSPHERIC ENVIRONMENTS	52

SECTION 7 FACTORS INFLUENCING COATING SELECTION	
7.1	GENERAL 63
7.2	SUBSTRATE AND SURFACE CONDITION 63
7.3	ENVIRONMENT 63
7.4	SYSTEM LIFE 64
7.5	DESIGN 64
7.6	SHOP OR SITE APPLICATION 65
7.7	COLOUR AND APPEARANCE 66
7.8	APPLICATION METHOD 66
7.9	CONDITIONS DURING APPLICATION 67
7.10	SURFACE PREPARATION 67
7.11	PREVIOUS EXPERIENCE 67
7.12	MAINTENANCE CONSIDERATIONS 67
7.13	INSPECTION 68
7.14	SAFETY AND ENVIRONMENTAL CONSTRAINTS 68
7.15	COST 68
SECTION 8 PAINTING AND PAINT APPLICATION METHODS	
8.1	GENERAL 69
8.2	PAINT STORAGE 69
8.3	MIXING AND THINNING OF PAINT 69
8.4	TYPE AND CONDITION OF THE SUBSTRATE 70
8.5	PAINTING CONDITIONS 70
8.6	SEQUENCE OF OPERATIONS 72
8.7	METHODS OF APPLICATION 72
8.8	STANDARD OF WORKMANSHIP 73
8.9	TIME REQUIREMENTS 73
8.10	PAINT SPREADING RATE AND THICKNESS 74
SECTION 9 OTHER SYSTEMS FOR CORROSION PROTECTION	
9.1	POWDER COATINGS 75
9.2	WRAPPING TAPES 75
SECTION 10 MAINTENANCE OF PROTECTIVE COATING SYSTEMS	
10.1	GENERAL 77
10.2	CRITERIA FOR ASSESSING WHEN TO PAINT OR REPAIR 77
10.3	PRETREATMENT BEFORE REPAINTING 78
10.4	REPAINTING 81
10.5	REPAIRS AND REPAINTING OF WELDED STRUCTURES 82
SECTION 11 INSPECTION AND TESTING	
11.1	GENERAL 85
11.2	REQUIREMENTS AND AUTHORITY OF INSPECTORS 85
11.3	PRELIMINARY DISCUSSIONS 85
11.4	DUTIES OF INSPECTORS 86
11.5	FINAL INSPECTION 88
11.6	RECORDS AND INSPECTION REPORT 89
11.7	GUIDANCE ON THE USE OF TESTING EQUIPMENT 89

Page

SECTION 12 PREPARATION OF COATING SPECIFICATIONS

12.1 GENERAL	90
12.2 CONTENT OF A SPECIFICATION	90

SECTION 13 HEALTH AND SAFETY

13.1 GENERAL	96
13.2 THE PAINTED SURFACE	96
13.3 FLAMMABILITY	96
13.4 EYE PROTECTION	96
13.5 RESPIRATORS	96
13.6 NOISE	97
13.7 HANDLING	97
13.8 WORKING IN A CONFINED SPACE	97
13.9 SURFACE PREPARATION	97
13.10 APPLICATION OF PAINT	97
13.11 STORAGE OF PAINT	98
13.12 WELDING	99
13.13 BURNING OF PAINTED SURFACES	99
13.14 COATINGS NOT RECOMMENDED	99

APPENDICES

A GUIDANCE ON THE USE OF THIS STANDARD	101
B ADVICE ON ATMOSPHERIC CORROSION OF STEEL IN AUSTRALASIAN CLIMATES	106
C NON-ATMOSPHERIC AND HOT ENVIRONMENTS	110
D DESCRIPTION OF PAINT TYPES	120
E INDEX	137

STANDARDS AUSTRALIA/STANDARDS NEW ZEALAND

Australian/New Zealand Standard**Guide to the protection of structural steel against atmospheric corrosion by the use of protective coatings**

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE

This Standard provides guidelines for the selection and specification of coating systems for the protection of structural steel work against interior and exterior atmospheric environments.

The Standard specifically covers the following subjects:

- (a) Guidance on the use of the Standard.
- (b) Classification of atmospheric and non-atmospheric environments.
- (c) Planning and design for corrosion protection.
- (d) Surface preparation treatments.
- (e) Metallic coatings.
- (f) Paint coating systems and methods of paint application.
- (g) Factors influencing coating selection.
- (h) Powder coatings and wrapping tapes for corrosion protection.
- (i) Maintenance of protective coating systems.
- (j) Inspection and testing.
- (k) Guidance on the preparation of coating specifications.
- (l) Health and safety requirements.
- (m) Economics of corrosion protection.

This Standard covers the protection of structural steel work against interior and exterior atmospheric corrosion and also the protection of items of equipment manufactured from steel which are exposed to exterior atmospheric conditions.

The Standard also covers, to a limited extent, the protection of steel work which is completely immersed in water or buried in soil, or which is subject to atmospheres severely contaminated with acidic or other chemical vapours such as may be encountered in some chemical manufacturing plants, and also the protection of ships. The systems recommended in this Standard can also be used on internal structures where wet or damp areas exist.

It is necessary to understand that the systems recommended have been selected for guidance only and that life expectancy to first major maintenance is an estimate only. In practice, some minor maintenance may be required.

Because particular coating formulations and micro-climates vary, the user of this Standard is advised to confirm with the manufacturer or supplier, that the selected system is suitable for the task and can be reasonably expected to protect the steel for a specified time.

This is a free preview. Purchase the entire publication at the link below:

-
- ▶ Looking for additional Standards? Visit [SAI Global Infostore](#)
 - ▶ Subscribe to our [Free Newsletters about Australian Standards® in Legislation; ISO, IEC, BSI and more](#)
 - ▶ Do you need to [Manage Standards Collections Online?](#)
 - ▶ Learn about [LexConnect, All Jurisdictions, Standards referenced in Australian legislation](#)
 - ▶ Do you want to [know when a Standard has changed?](#)
 - ▶ Want to [become an SAI Global Standards Sales Affiliate?](#)

Learn about other SAI Global Services:

- ▶ [LOGICOM Military Parts and Supplier Database](#)
- ▶ [Metals Infobase Database of Metal Grades, Standards and Manufacturers](#)
- ▶ [Materials Infobase Database of Materials, Standards and Suppliers](#)
- ▶ [Database of European Law, CELEX and Court Decisions](#)

Need to speak with a Customer Service Representative - [Contact Us](#)