

INTERNATIONAL  
STANDARD

ISO  
10289

First edition  
1999-10-15

---

---

**Methods for corrosion testing of metallic  
and other inorganic coatings on metallic  
substrates — Rating of test specimens and  
manufactured articles subjected to  
corrosion tests**

*Méthodes d'essai de corrosion des revêtements métalliques et  
inorganiques sur substrats métalliques — Cotation des éprouvettes et des  
articles manufacturés soumis aux essais de corrosion*



Reference number  
ISO 10289:1999(E)

<b>Contents</b>	<b>Page</b>
<b>1 Scope .....</b>	<b>1</b>
<b>2 Terms and definitions .....</b>	<b>1</b>
<b>3 Principle.....</b>	<b>2</b>
<b>4 Types of defect.....</b>	<b>2</b>
<b>5 Method of inspection.....</b>	<b>3</b>
<b>6 Assignment of ratings .....</b>	<b>3</b>
<b>7 Test report .....</b>	<b>5</b>
<b>Annex A (informative) Dot charts and colour photographs for coatings cathodic to the basis metal.....</b>	<b>7</b>
<b>Annex B (informative) Dot charts for coatings anodic to the basis metal.....</b>	<b>17</b>
<b>Bibliography .....</b>	<b>22</b>

© ISO 1999

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the publisher.

International Organization for Standardization  
Case postale 56 • CH-1211 Genève 20 • Switzerland  
Internet iso@iso.ch

Printed in Switzerland

## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

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 10289 was prepared by Technical Committee ISO/TC 107, *Metallic and other inorganic coatings*, Subcommittee SC 7, *Corrosion tests*.

This first edition cancels and replaces ISO 1462:1973, ISO 4540:1980 and ISO 8403:1991.

Annexes A and B of this International Standard are for information only.

## Introduction

The rating method described in this International Standard recognizes that decorative and protective metallic and inorganic coatings on metallic substrates can be either anodic or cathodic to the substrate. In rating these coatings for the effects of corrosion, two evaluations shall be made:

- the ability of the coating to protect the substrate from corrosion and thus prevent degradation of the base metal;
- the ability of the coating to retain its integrity and thus maintain a satisfactory appearance.

Although these functions overlap, they can be evaluated separately in terms of:

- a protection rating ( $R_p$ ) relating to the corrosion of the basis metal;
- an appearance rating ( $R_A$ ) relating to the deterioration of the coating.

The protection rating ( $R_p$ ) assigns a number representing the ability of the coating to protect the basis metal from corrosion.

The appearance rating ( $R_A$ ) assigns a sequence of letters and numbers to the overall appearance of the specimen which includes all deterioration caused by the corrosion test or environment.

NOTE 1 Imperfections on a panel or article before exposure testing should be noted and given due consideration when evaluating the results of the examination. Deliberate imperfections may also be introduced as part of a test programme.

The coating system has to be known and reported if this rating system is applied. It is especially important to know, if possible, whether the coating is anodic or cathodic to the base metal.

NOTE 2 Determination of the anodic and cathodic corrosive mechanisms can be extremely difficult in some cases (chromated zinc on steel or multiple coatings). For the purposes of this document knowledge of these mechanisms is not necessary.



# Methods for corrosion testing of metallic and other inorganic coatings on metallic substrates — Rating of test specimens and manufactured articles subjected to corrosion tests

## 1 Scope

This International Standard gives a method of evaluating the condition of decorative and protective metallic and inorganic coated panels or articles which have been exposed to corrosive environments for test or for other purposes.

It is applicable to test panels or components exposed to natural atmospheres, in mobile or static conditions, or subjected to accelerated tests.

NOTE 1 Examples of such tests are given in the Bibliography.

This International Standard recognizes that the protection rating can be assessed objectively in accordance with clause 6. However, the assessment of appearance depends on many subjective factors (see 6.2).

NOTE 2 The edges of test panels or components may be protected, e.g. by tape or wax (paraffin), if this is an agreed part of the test and is recorded in the test report. This is essential if the specimens are cut from larger pieces and have exposed uncoated edges.

## 2 Terms and definitions

### 2.1

#### protection rating

$R_p$

rating number (see Table 1) assigned to the ability of the coating to protect the basis metal from corrosion

### 2.2

#### protection defect

defect used to assess the protection rating, including crater corrosion, pin-hole corrosion, corrosion stain due to corrosion from the substrate, blisters and other defects that involve basis metal corrosion

NOTE Blisters on electroplated aluminium and zinc alloy die castings usually signify base metal corrosion, but the inspector's judgement may be required to decide whether a blister does or does not arise at the substrate-coating interface.

### 2.3

#### appearance rating

$R_A$

rating number and symbols (see Table 2) assigned to describe the overall appearance of the specimen, including all defects caused by exposure

### 2.4

#### appearance defect

defect that detracts from the appearance of the specimen (see Table 2)