



ANSI/NACE SP0508-2010
Item No. 21134

Standard Practice

Methods of Validating Equivalence to ISO 8502-9 on Measurement of the Levels of Soluble Salts

This NACE International standard represents a consensus of those individual members who have reviewed this document, its scope, and provisions. Its acceptance does not in any respect preclude anyone, whether he or she has adopted the standard or not, from manufacturing, marketing, purchasing, or using products, processes, or procedures not in conformance with this standard. Nothing contained in this NACE International standard is to be construed as granting any right, by implication or otherwise, to manufacture, sell, or use in connection with any method, apparatus, or product covered by Letters patent, or as indemnifying or protecting anyone against liability for infringement of Letters Patent. This standard represents minimum requirements and should in no way be interpreted as a restriction on the use of better procedures or materials. Neither is this standard intended to apply in all cases relating to the subject. Unpredictable circumstances may negate the usefulness of this standard in specific instances. NACE International assumes no responsibility for the interpretation or use of this standard by other parties and accepts responsibility for only those official NACE International interpretations issued by NACE International in accordance with its governing procedures and policies which preclude the issuance of interpretations by individual volunteers.

Users of this NACE international standard are responsible for reviewing appropriate health, safety, environmental, and regulatory documents and for determining their applicability in relation to this standard prior to its use. This NACE International standard may not necessarily address all potential health and safety problems or environmental hazards associated with the use of materials, equipment, and/or operations detailed or referred to within this standard. Users of this NACE International standard are also responsible for establishing appropriate health, safety, and environmental protection practices, in consultation with appropriate regulatory authorities if necessary, to achieve compliance with any existing applicable regulatory requirements prior to the use of this standard.

CAUTIONARY NOTICE: NACE international standards are subject to periodic review, and may be revised or withdrawn at any time in accordance with NACE technical committee procedures. NACE International requires that action be taken to reaffirm, revise, or withdraw this standard no later than five years from the date of initial publication. The user is cautioned to obtain the latest edition. Purchasers of NACE International standards may receive current information on all standards and other NACE International publications by contacting the NACE International First Service Department, 1440 South Creek Dr., Houston, Texas 77084-4907 (telephone +1 281-228-6200).

Revised 2010-08-19
Approved 2008-11-07
NACE International
1440 South Creek Dr.
Houston, Texas 77084-4906
+1 281-228-6200
© 2010, NACE International
An American National Standard
Approved December 23, 2010

This is a preview of "ANSI/NACE Standard S...". Click [here](#) to purchase the full version from the ANSI store.

Foreword

The purpose of this standard practice is to define a method that shows equivalence of other methods for measuring the level of contamination of soluble salts on surfaces to the Bresle patch method defined by ISO⁽¹⁾ 8502-9.¹ This standard practice provides a way to establish equivalence by testing and comparing results of the tests to meet established criteria that would be achieved using the method specified in ISO 8502-9. Equivalence is evaluated at three salt levels (30 mg/m², 50 mg/m², and 85 mg/m²) on three surface conditions (grit blasted steel, zinc silicate preconstruction primer on steel, and rusted steel).

This standard is intended for use by engineers, specification writers, test equipment suppliers, contractors, and anyone testing for soluble salts on surfaces using ISO 8502-9 and considering use of equivalent methods for this purpose. It provides a standard method to show such equivalence to the results obtained using ISO 8502-9.

The definition of equivalence as used in this standard is "an alternative tool, method, or procedure that predictably and reliably provides the same measurement values as testing in full accordance with ISO 8502-9 would provide under the same circumstances, i.e., that measures the total salt contamination amount at an extraction rate equal to the method given in ISO 8502-9, and presents the result as total surface density of the salts as described in ISO 8502-9, expression of results, and accuracy of the determination."

The validation of the equivalence of a method must be made in a laboratory.

This standard was originally issued in 2008 and revised in 2010 by Task Group (TG) 392, "Measurement of Soluble Salts on Marine Structures." TG 392 is administered by Specific Technology Group (STG) 44, "Marine Corrosion: Ships and Structures," and sponsored by STG 04, "Coatings and Linings, Protective: Surface Preparation." It is issued by NACE International under the auspices of STG 44.

In NACE standards, the terms *shall*, *must*, *should*, and *may* are used in accordance with the definitions of these terms in the *NACE Publications Style Manual*. The terms *shall* and *must* are used to state a requirement, and are considered mandatory. The term *should* is used to state something good and is recommended, but is not considered mandatory. The term *may* is used to state something considered optional.

⁽¹⁾ International Organization for Standardization (ISO), 1 ch. de la Voie-Creuse, Case postale 56, CH-1211 Geneva 20, Switzerland.

SP0508-2010

**NACE International
Standard Practice**

**Methods of Validating Equivalence to ISO 8502-9
on Measurement of the Levels of Soluble Salts**

Contents

1. General	1
2. Test Methods	2
3. Reporting	5
References	5
Appendix A: Standard Method for Performance of Soluble Salts Testing in Accordance with ISO 8502-9 (Mandatory)	6
Appendix B: Rationale for Specification Limits (Nonmandatory)	9
Appendix C: Recommended Preparation of Test Panels and Methods for Applying Salt Solution to Test Panels (Nonmandatory)	11
Figures:	
Figure A1: Peeling Bresle Patch.....	7
Figure A2: Pressing Bresle Patch.....	7
Figure A3: Filled Syringe	8
Figure A4: Inserting Syringe Needle into Patch	8
Figure A5: Rubbing Bresle Patch	8
Figure A6: Reading Conductivity	8

Section 1: General

1.1 ISO 8502-9 Range of Variance

1.1.1 The assessment and determination of surface contamination (by salts) prior to application of protective coatings is critical to their service life expectancy. Determination of the level of surface cleanliness is performed using a field method for the conductometric determination of water-soluble salts in accordance with ISO 8502-9. As a part of that method, the extraction of soluble salt contaminants for analysis is performed in accordance with ISO 8502-6²—the Bresle method. The field execution of this method involves using a syringe to inject deionized water into the Bresle patch, washing the substrate surface inside the patch, then extracting the test water for direct measurement of conductivity. Details of this procedure are provided in Appendix A (mandatory). Once a conductivity value is determined by the conductivity meter, expressed as microsiemens per centimeter ($\mu\text{S}/\text{cm}$), ISO 8502-9 provides a procedure to calculate the equivalent mass of the surface concentration as total surface density of the salts.

1.1.2 Step-by-step execution of the ISO 8502-6 and ISO 8502-9 test methods introduces a number of potential variances during the field evaluation. Some examples include background salt contamination in the Bresle patch itself, the sensitivity and resolution of the conductivity meter, cycle time of the test water inside the Bresle patch, human errors in measuring and injecting the test water, and general operator experience. These individual process variances combine to create an overall variance in the ISO 8502-9 test method.

1.1.3 The test method defined in ISO 8502-9 allows certain execution parameters of the test (e.g., size of adhesive patch, volume of test solution, and time of dissolution of salts inside the adhesive patch—the dwell time) to vary. This standard adopted best practices and has set the parameters in Appendix A. With a dwell time at a minimum of 90 seconds, the variance from operator error was found to be reduced dramatically when the operator timing is not perfect. Hence, a dwell time of 90 seconds was adopted in Appendix A. For the purpose of defining equivalence, the procedure in Appendix A shall be used to create the reference values to which the candidate method will be validated.

1.1.4 Bresle patches from different manufacturers or manufacturing lots may have different levels of background contamination. Specifications for salt contamination include the contribution of this background contamination so that the operator in the field does not have to subtract a background value to report the test results. Appendix A therefore includes a provision to correct the ISO 8502-9 test results to a consistent offset contributed by Bresle patch background contamination so that this standard gives consistent results when tests are performed with Bresle patches from different manufacturers or manufacturing lots.

1.1.5 The range of variance in ISO 8502-6 and 8502-9 has been demonstrated by extensive laboratory tests.³ The precision of a single ISO 8502-9 test result was determined to be $\pm 8.2 \text{ mg}/\text{m}^2$ in the salt level range of 30 to 80 mg/m^2 . The absolute variance, and not the relative or percent variance, was found to be constant in this range. See Appendix B (nonmandatory) for details about these tests and the data analysis.

1.1.6 Any equivalent tools, methods, or procedures must show that they meet the same criteria, thereby providing the same measures of soluble salt level, and be within the same range of variance, as would be produced by following the procedure in ISO 8502-9.

1.1.7 The objective of this standard is to determine whether methods other than the Bresle method are suitable alternatives for measuring salt contamination in the field. Although tests may be performed on flat, horizontal surfaces for ease of use, each method should also be capable of performing measurements on vertical and overhead surfaces. When such measurements cannot be performed on vertical or overhead surfaces, this limitation must be noted in the validation report (Section 3).

1.2 Reasons for Salt Measurement