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Standard Practice

Definition of Set Soluble Salt Levels by Conductivity Measurements

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Foreword

The purpose of this standard is to present a relevant and reasonably achievable set of soluble salt contamination values obtained from surface conductivity measurements and based on known common industry-specified values. This standard provides a method to clearly describe specific levels of soluble salt contamination from testing for the purpose of specifying surface cleanliness prior to coating. It is not the intent of this standard to preclude measurements of soluble salt contamination by other methods. This standard's intent is to define and clarify the selected salt level values, and describe how those values are to be obtained.

The salt contamination values in Table 1 are derived from empirically measured values collected worldwide from several sources. They are given in mg/m^2 as equivalent sodium chloride (NaCl) as if the conductivity measured were all from NaCl. This provides a consistent weight value per unit area. Increased soluble salt values may increase the potential for coating system failure when compared in identical environmental exposures.

This standard is intended for use by engineers, specification writers, test equipment suppliers, contractors, and anyone who wishes to specify maximum acceptable amounts of soluble salts on surfaces to be coated. It further refers the user to a separate standard for determining the equivalence of other measurement procedures that can be used under this standard.

The user may consider using one of the soluble salt levels in Table 1 in a specification. The specifier should determine the most suitable level from the set of soluble salt contamination values found in Table 1.

This standard was developed by NACE International Task Group 418, "Risk Assessment for Salt Contamination," which is administered by Specific Technology Group (STG) STG 04, "Coatings and Linings, Protective: Surface Preparation." It is sponsored by STG 02, "Coatings and Linings, Protective—Atmospheric," STG 03, "Coatings and Linings, Protective—Immersion and Buried Service," and STG 44, "Marine Corrosion: Ships and Structures." This standard is issued by NACE under the auspices of STG 04.

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.

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Section 1: General

1.1 Numerical Salt Level Values

1.1.1 The assessment and determination of surface contamination (by salts) prior to application of protective coatings can be critical to estimating and attaining the desired service life of the coating system in a given environment.

1.1.2 Application of protective coatings over salt contamination may cause degradation of the coating system and substrate. This may lead to breakdown of the corrosion protection provided by the coating system. These effects can reduce the expected service life of the coating.

1.1.3 It is the intent of this standard to provide a set of defined salt levels that can be used by the industry. In any given environment, salts are usually present on surfaces to some degree. It is not the intent of this standard to provide guidance to the industry on how to mitigate soluble salt contamination.

1.1.4 This standard does not suggest what level of salt is acceptable in any given application. It provides a set of defined soluble salt values currently utilized in the marketplace. The user may use these to specify surface cleanliness requirements before coating.

1.2 Determining Numerical Surface Salt Values

1.2.1 Numerical determination of the quantity (level, in accordance with Table 1) of surface nonvisible soluble salt shall be performed using a field method for the conductometric determination of water-soluble salts in accordance with ISO(1) 8502-9[1] or an equivalent method as determined by NACE SP0508.[3] The "Bresle method" for extraction of soluble salt contaminants is performed in accordance with ISO 8502-6.[2] The field execution of ISO 8502-6 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 (µS/cm), ISO 8502-9 provides a procedure to calculate the NaCl equivalent weight of the surface concentration as total surface density of the salts (in mg/m^2).

1.2.2 It is not the intent of this standard to preclude measurement of soluble salt contamination by other methods as long as the values generated are equivalent to those generated by ISO 8502-9. Any equivalent tools, methods, or procedures must demonstrate they meet the criteria defined in NACE SP0508.

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