

Standard Practice

Cathodic Protection to Control External Corrosion of Concrete Pressure Pipelines and Mortar-Coated Steel Pipelines for Water or Waste Water Service

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 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 assumes no responsibility for the interpretation or use of this standard by other parties and accepts responsibility for only those official NACE interpretations issued by NACE in accordance with its governing procedures and policies which preclude the issuance of interpretations by individual volunteers.

Users of this NACE 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 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 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CAUTIONARY NOTICE: NACE standards are subject to periodic review, and may be revised or withdrawn at any time in accordance with NACE technical committee procedures. NACE requires that action be taken to reaffirm, revise, or withdraw this standard no later than five years from the date of initial publication and subsequently from the date of each reaffirmation or revision. The user is cautioned to obtain the latest edition. Purchasers of NACE standards may receive current information on all standards and other NACE publications by contacting the NACE FirstService Department, 15835 Park Ten Place, Houston, TX 77084-5145 (telephone +1 281-228-6200).

Revised 2014-06-26
Revised 2008-11-07
Reaffirmed 2004-09-15
Approved 2000-01-14
NACE International
15835 Park Ten Place
Houston, Texas 77084-5145
+1 281-228-6200

ISBN 1-57590-096-3
© 2014 NACE International

Foreword

The purpose of this standard practice is to furnish guidelines that provide corrosion control personnel, owners, operators, designers, manufacturers, and contractors with information on controlling external corrosion of embedded steel in concrete pressure pipelines and mortar-coated steel pipelines for water or waste water service through the application of cathodic protection (CP). The guidelines presented are applicable to new or existing buried pipelines with or without a supplemental coating.

The provisions of this standard should be applied under the direction of competent persons who are qualified to engage in the practice of corrosion control on buried or submerged metallic pipelines. Such persons may be licensed professional engineers or persons recognized as corrosion specialists or CP specialists by NACE. The professional experience of such persons should include suitable experience in CP of prestressed concrete structures, if protection of that type of structure is being planned.

This standard was originally prepared in 2000 by NACE Task Group T-10A-28, a component of Unit Committee T-10A on Cathodic Protection. To provide the necessary expertise on all aspects of the subject and in order to receive input from all interested parties, Task Group T-10A-28 was composed of corrosion consultants, consulting engineers, architect-engineers, CP engineers, researchers, pipeline owners, and representatives from both industry and government. The standard was reaffirmed in 2004 by Specific Technology Group (STG) 05, "Cathodic/Anodic Protection" and revised in 2008 and 2014 by Task Group (TG) 019, "Mortar-Coated Pipes: Cathodic Protection Criteria." This standard is issued by NACE under the auspices of STG 05.

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.

Cathodic Protection to Control External Corrosion of Concrete Pressure Pipelines and Mortar-Coated Steel Pipelines for Water or Waste Water Service

Contents

1. General.....	1
2. Definitions.....	2
3. Types of Concrete Pressure Pipe and Mortar-Coated Steel Pipe	3
4. Determination of Need for CP.....	4
5. CP Criteria.....	5
6. Design of CP Systems	6
7. Installation of CP Systems	13
8. Energizing and System Adjustment.....	15
9. Operation and Maintenance of CP Systems	17
10. CP Records	19
References.....	21
Bibliography.....	22
FIGURES	
Figure 1: Polarization diagram.....	1
Figure 2: Typical Polarization Development and Decay Curves.....	6
Figure 3(a): Bonding Cable on Inside.....	11
Figure 3(b): Bonding Clip	11
Figure 3(c): Bonding Cable on Outside Using Steel Plate	11
Figure 3(d): Bonding Cable on Outside Using Modified Anchor Blocks	11
Figure 3(e): Bonding Clip	12
Figure 3(f): Bonding Bar	12
Figure 3(g): Bonding Cable.....	12
Figure 3(h): Bonding detail for steel pipe.....	12
