

Internal Painting of Water Pipelines

Procedure

This Standard replaces and cancels its previous revision.

The CONTEC - Authoring Subcommittee provides guidance on the interpretation of this Standard when questions arise regarding its contents. The Department of PETROBRAS that uses this Standard is responsible for adopting and applying the sections, subsections and enumerates thereof.

Technical Requirement: A provision established as the most adequate and which shall be used strictly in accordance with this Standard. If a decision is taken not to follow the requirement ("non-conformity" to this Standard) it shall be based on well-founded economic and management reasons, and be approved and registered by the Department of PETROBRAS that uses this Standard. It is characterized by imperative nature.

Recommended Practice: A provision that may be adopted under the conditions of this Standard, but which admits (and draws attention to) the possibility of there being a more adequate alternative (not written in this Standard) to the particular application. The alternative adopted shall be approved and registered by the Department of PETROBRAS that uses this Standard. It is characterized by verbs of a nonmandatory nature. It is indicated by the expression: **[Recommended Practice]**.

Copies of the registered "non-conformities" to this Standard that may contribute to the improvement thereof shall be submitted to the CONTEC - Authoring Subcommittee.

Proposed revisions to this Standard shall be submitted to the CONTEC - Authoring Subcommittee, indicating the alphanumeric identification and revision of the Standard, the section, subsection and enumerate to be revised, the proposed text, and technical/economic justification for revision. The proposals are evaluated during the work for alteration of this Standard.

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Introduction

PETROBRAS Technical Standards are prepared by Working Groups - WG (consisting specialized of Technical Collaborators from Company and its Subsidiaries), are commented by Company Units and its Subsidiaries, are approved by the Authoring Subcommittees - SCs (consisting of technicians from the same specialty, representing the various Company Units and its Subsidiaries), and ratified by the Executive Nucleus (consisting of representatives of the Company Units and its Subsidiaries). A PETROBRAS Technical Standard is subject to revision at any time by its Authoring Subcommittee and shall be reviewed every 5 years to be revalidated, revised or cancelled. PETROBRAS Technical Standards are prepared in accordance with PETROBRAS Technical Standard N-1. For complete information about PETROBRAS Technical Standards see PETROBRAS Technical Standards Catalog.

CONTEC

Comissão de Normalização
Técnica

SC - 14

Painting and Anticorrosive
Coatings

Foreword

This Standard is the English version (issued in 04/2009) of PETROBRAS N-1849 REV. B 07/2008. In case of doubt, the Portuguese version, which is the valid document for all intents and purposes, shall be used.

1 Scope

1.1 This Standard specifies the conditions required for internal painting of water pipelines built with carbon-steel pipe. It applies to freshwater pipelines.

1.2 This Standard shall not be applied to potable water and salt water pipelines.

1.3 The field of application for the coating of water pipelines using coal-tar paint is as follows:

- a) piping up to 101,6 mm (4") in diameter: not applicable;
- b) piping larger than 101,6 mm (4") and up to 406,4 mm (16") in diameter: applicable only to flanged piping;
- c) piping larger than 406,4 mm (16") in diameter: applicable to welded or flanged piping.

1.4 This Standard applies to procedures started as of its date of issuance.

1.5 This Standard contains Technical Requirements and Recommended Practices.

2 Normative References

The following referenced documents are indispensable for the application of this Standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

PETROBRAS [N-9](#) - Tratamento de Superfícies de Aço com Jato Abrasivo e Hidrojateamento;

PETROBRAS [N-13](#) - Technical Requirements for Paintwork;

PETROBRAS [N-1202](#) - Iron Oxide-Epoxy Paint;

PETROBRAS [N-1265](#) - Tinta de Alcatrão Hulha-Epóxi Poliamida;

ABNT [NBR 14847](#) - Inspeção de Serviços de Pintura em Superfícies Metálicas - Procedimento;

ABNT [NBR 15158](#) - Limpeza de Superfícies de Aço por Compostos Químicos;

ABNT [NBR 15185](#) - Inspeção Visual de Superfícies para Pintura Industrial;

ABNT [NBR 15239](#) - Tratamento de Superfícies de Aço com Ferramentas Manuais e Mecânicas;

ISO [8501-1](#) - Preparation of Steel Substrates Before Application of Paints and Related Products - Visual Assessment of Surface Cleanliness - Part 1: Rust Grades and Preparation Grades of Uncoated Steel Substrates and of Steel Substrates After Overall Removal of Previous Coatings.

NOTE For documents referred in this Standard and for which only the Portuguese version is available, the PETROBRAS department that uses this Standard should be consulted for any information required for the specific application.

3 General Conditions

3.1 Paint Application

3.1.1 Paint application shall comply with the recommendations of PETROBRAS [N-13](#).

3.1.2 Pipes shall be handled using accessories that do not damage the paint.

3.2 Maintenance Touch-ups

In case of touch-ups to the existing paint, repeat the original system.

3.3 Weld Preparation

When burrs, spatters, lack of penetration or similar defects are found on longitudinal or spiral welds performed automatically, projections shall be ground and rounded.

3.4 Pipe Ends to be Welded

When paint is applied before assembly, a 5 cm strip at each end of the pipes shall not be painted with coal-tar epoxy paint. Apply instead one coat of iron oxide epoxy paint according to PETROBRAS [N-1202](#) with a dry film thickness of 20 µm to 25 µm.

3.5 Repairs During Application

3.5.1 In the case of mechanical damages that have not exposed the metal surface, sanding and solvent cleaning shall be performed and the film shall be restored to the specified original thickness.

3.5.2 When the damage affects the metal surface, abrasive blasting shall be performed to ISO [8501-1](#) Sa 2 1/2 or, in case blasting is not possible, surface cleaning with a mechanical tool according to ABNT [NBR 15239](#) to ISO [8501-1](#) grade St 3, solvent cleaning and application of as many coats as necessary to reach the specified thickness.

3.5.3 If discontinuities such as cracking, blistering, dripping or peeling occur, these defective areas shall be restored according to 3.5.2.

3.5.4 In those cases where touchups or the holiday detector test cannot be performed as specified in this Standard, a complementary cathodic protection system should be used. **[Recommended Practice]**

4 Specific Conditions

4.1 Paint Application on Piping

4.1.1 Inspection

A careful visual inspection shall be performed on the entire surface to be painted, according to ABNT [NBR 14847](#) and ABNT [NBR 15185](#). Write down the points presenting traces of oil, grease or fat, the corrosion grade of the surface (A, B, C or D, according to ISO [8501-1](#)), as well as the points where the paint, if any, is damaged.

4.1.2 Surface Preparation

The surface to be painted shall be subjected to a solvent cleaning process, according to ABNT [NBR 15158](#), only in the regions where traces of oil, grease or fat were found during the inspection. Apply abrasive blasting to near-white metal on the entire surface to be painted, according to PETROBRAS [N-9](#) grade Sa 2 1/2. A finish corresponding to at least one of the pictures of Sa 2 1/2 of ISO [8501-1](#) shall be obtained.

4.1.3 Paint Application

At first, three coats of two-component epoxy coal tar paint with high chemical resistance shall be applied on weld beads using a wide paint brush according to PETROBRAS [N-1265](#), with a minimum dry film thickness of 125 µm per coat and a width of 150 mm. An airless gun shall then be used to apply on the entire surface three coats of the same paint, with a minimum dry film thickness of 125 µm per coat. The time interval between coats shall be at least 16 hours and 48 hours at most.

NOTE The film continuity shall be controlled using a holiday detector.

4.2 Painting of Field Joints

4.2.1 On girth welds presenting spatters, burrs and similar defects, such projections shall be ground and rounded.

4.2.2 Oil or grease contaminations on the surface of the joint shall be cleaned with solvent according to ABNT [NBR 15158](#).

4.2.3 Before the application of the paint abrasive blasting shall be performed to ISO [8501-1](#) grade Sa 2 1/2. In case it is not possible to apply this treatment, clean the surface with a mechanical tool according to ABNT [NBR 15239](#) to ISO [8501-1](#) grade St 3.

4.2.4 The joint shall be painted using a wide paint brush or airless gun with the application of at least four coats of two-component epoxy coal tar paint of high chemical resistance, according to PETROBRAS [N-1265](#), with a minimum dry film thickness of 125 µm per coat.

NOTE Film continuity shall be controlled using a holiday detector.

4.2.5 Mechanical damages that may possibly occur shall be repaired as specified in 3.5.

5 Inspection

Inspection shall be conducted according to the provisions in PETROBRAS [N-13](#).

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