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NATIONAL IRANIAN OIL REFINING & DISTRIBUTION COMPANY
NATIONAL IRANIAN OIL ENGINEERING
& CONSTRUCTION COMPANY

NIOEC SP

NIOEC SPECIFICATION

FOR

FACTORY-APPLIED COATINGS FOR BURIED AND SUBMERGED PIPES

Three-Layer Polyethylene Coatings

FIRST EDITION

June, 2017

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IN THE NAME OF GOD**FOREWORD**

By their very nature, technical Specifications are continuously subject to modifications and revisions. To strengthen their merit and usefulness, continuous improvements, addendum, deletion of disparate information and consequently provision of updated revisions are to be made in order to ascertain that such Specifications meet the current requirements, inclusive of Iranian Petroleum Standards (IPS) and the recognized and acceptable national and international Standards, as well as the optimal codes and practices based on the accumulated in-house know-how and plant knowledge and experiences.

However, in reality, due to several reasons, not to mention the complexity of the matter, the ultimate goal of continuous direct embedment of the required changes on the relevant Specifications may be far reaching. Therefore, in the interim periods between the officially issued revisions, the required changes will appear in other documents related to the engineering and design work of the ongoing projects.

In response to the initiative of the Design and Engineering Directorate, and considering that the task of the execution of several important and mega projects for the realization of the new oil refineries, pipelines and oil terminals as well as improvements of the existing facilities, has been assigned to NIOEC, it was decided to update the NIOEC Specifications and to issue new official revisions.

The Design and Engineering Directorate was itself entrusted to carry out this important task, and as such by forming several special technical committees, working in close co-operation and cohesion and sharing their expertise and knowledge, the updated and revised NIOEC Specifications were successfully prepared and complied.

These Specifications are intended to be used for Oil Refineries, Distribution Depots, Oil Terminals, Pipelines and Pump Stations within NIOEC's projects, and have been proven to be of high value for such purposes. It must however be appreciated that these Specifications represent the minimum requirements and should in no way be interpreted as a restriction on the use of better procedures, engineering and design practices or materials.

We encourage and highly appreciate the users and other clear sighted and experts to send their comments on the Specifications to the Design and Engineering Director of NIOEC for evaluation and approval.

REVISION INDEX

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NOTES:

- 1) THIS SHEET IS A RECORD OF ALL REVISIONS TO THIS SPECIFICATION.
- 2) WHEN APPROVED EACH REVISION SHALL BE CONSIDERED AS A PART OF THE ORIGINAL DOCUMENT.
- 3) NUMBER OF PAGES EXCLUDES THIS SHEET AND THE COVER SHEET.

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0	JUNE 2017	M.DARABI	J.KHOSRAVI	M.R.FARZAM	M.KARGAR NAJAFI
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1. SCOPE

- 1.1. This Specification covers the minimum requirements for design, manufacturing, tests, application and handling of factory-applied three-layer polyethylene coatings (3LPE) as external coatings for corrosion protection of buried and submerged bare steel pipes.
- 1.2. Through this specification, the previous three layer specification (NIOEC-SP-50-51) is outdated and its contents are thoroughly replaced with this specification.
- 1.3. The coating in this specification can be applied to longitudinally welded and seamless steel pipes and tubes used for construction of pipeline or piping systems for conveying liquid or gas.
- 1.4. It should be noted that the word “Manufacturer” refers to coating applicator hereinafter in this specification.
- 1.5. For pipes with design temperature in excess of +80°C, polypropylene and associated high temperature FBE with the relevant copolymer adhesive may be used.
- 1.6. Resolution on cases not explicitly stipulated in this specification, or on cases where conflicts may arise among the requirements of the referenced / relevant IPS and international standards shall be made through written consent and approval of NIOEC.
- 1.7. Deviations from this specification will only be permitted in obtaining written approval from NIOEC.

2. REFERENCES

The following standards, codes and specifications, to the extent specified hereinafter, shall constitute a part of this NIOEC specification. Latest edition of the undated referenced documents and the cited edition of the dated references shall apply. The applicability of changes made to the dated references, after the cited date shall be mutually agreed upon between NIOEC and the vendor/contractor.

API (AMERICAN PETROLEUM INSTITUTE)

API PR5L9	"Recommended practice for External Fusion Bonded Epoxy Coating of line Pipe"
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ASTM (AMERICAN SOCIETY FOR TESTING AND MATERIALS)

ASTM D 1693	“Standard Test Method for Environmental Stress-Cracking of Ethylene Plastics”
ASTM D 4940	“Standard Test method for conductimetric analysis of water soluble ionic contamination of blasting abrasives”
ASTM D792	“Standard Test Methods for Density and Specific Gravity”
ASTM 1505	“Standard Test Method for Density of Plastics by the Density-Gradient Technique”

BSI (BRITISH STANDARD INSTITUTION)

BS EN ISO 21809-1	"Petroleum and Natural Gas Industries – External Coatings for Buried or Submerged Pipelines used in Pipeline Transportation Systems"
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CSA (CANADIAN STANDARD ASSOCIATION)

CSA Z245.20	"External Fusion Bonded Epoxy Coating for Steel Pipe"
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DIN (DEUTCHES INSTITUT FÜR NORMUNG)

DIN 30670	"Polyethylene Sheathing of Steel Tubes and Steel Pipes and Fittings"
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EN (EUROPEAN NORMS)

EN 10204	"Metallic products – types of inspection documents"
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ISO (INTERNATIONAL STANDARD ORGANIZATION)

ISO 8501(1-5)	"Preparation of steel substrates before application of paints and related products-Visual assessment of surface cleanliness"
ISO 8502(1-9)	"Preparation of steel substrates before application of paints and related products -Tests for the assessment of surface cleanliness"
ISO 8503(1-5)	"Preparation of steel substrates before application of paints and related products — Surface roughness characteristics of blast-cleaned steel substrates"
ISO 10474	"Steel and steel products-inspection document"
ISO 527-2	"Plastics: Determination of tensile properties — Part 2: Test conditions for molding and extrusion plastics"
ISO 527-3	"Plastics: Determination of tensile properties — Part 3: Test conditions for films and sheets"
ISO 1133	"Plastics: Determination of the melt mass-flow rate (MFR) and the melt volume-flow rate (MVR) of thermoplastics"
ISO 1873-2	"Plastics: Polypropylene (PP) molding and extrusion materials – Part 2: Preparation of test specimens and determination of properties"
ISO 179-1	"Plastics: Determination of Charpy impact properties – Part 1: Non- instrumented impact test"