

IGS-TP-010-2(0)

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National Iranian Gas Co.

مدیریت پژوهش و فناوری

Research and Technology Management

امور تدوین استانداردها

Standardization Division

IGS

Iranian Gas Standards

Specification for :

مشخصات فنی :

**3 LAYER POLYETHYLENE & ASSOCIATED
COATING SYSTEM Part (2)**

.

APPROVED

IGS-TP-010 PART 2

FOREWORD

THIS STANDARD IS PART 2 OF A THREE-PART SPECIFICATION AND DEALS WITH THE FACTORY APPLICATION AND REPAIR OF EXTERNAL COATINGS APPLIED AS PROTECTION TO LINE PIPE.

THE OTHER PARTS IN THE SERIES ARE:

PART 1- REQUIREMENTS FOR COATING MATERIALS AND METHODS OF TEST.

PART 3- FIELD APPLIED COATINGS.

NIGC ENGINEERING CONSTRUCTION STANDARD

SPECIFICATION FOR THE EXTERNAL PROTECTION OF STEEL LINE PIPE AND FITTINGS FOR SERVICE TEMPERATURE -30°C TO +80°C , USING 3 LAYER POLYETHYLENE AND ASSOCIATED COATING SYSTEMS.

PART 2- FACTORY APPLIED COATINGS

SECTION ONE – GENERAL REQUIREMENTS

INTRODUCTION

SECTION ONE IS APPLICABLE, TO SECTION TWO INCLUDED IN THIS ENGINEERING CONSTRUCTION STANDARD.

SECTION TWO DEALS WITH THE APPLICATION OF EPOXY RESIN POWDER, ADHESIVE AND POLYETHYLENE AS AN ANTI – CORROSION 3 LAYER POLYETHYLENE COATING ON STEEL PIPE AND SHALL BE READ IN CONJUNCTION WITH SECTION ONE.

1. SCOPE

THIS PART 2 OF NIGC ENGINEERING STANDARD IGS-ES-TP-010 SPECIFIES THE OPERATIONS AND REQUIREMENTS FOR THE FACTORY APPLICATION OF MATERIALS IDENTIFIED IN NIGC ENGINEERING CONSTRUCTION STANDARD IGS-ES-TP-010 PART1 , TO BURIED STEEL PIPES PROVIDING A FINISHED PRODUCT CAPABLE OF PIPE LAYING AND OPERATING AT UP TO 80°C .

2. REFERENCES

THE CODES AND STANDARDS REFERRED TO IN THIS ENGINEERING CONSTRUCTION STANDARD ARE LISTED BELOW.

UNLESS OTHERWISE SPECIFIED, THE LATEST EDITIONS OF THESE CODES AND STANDARDS INCLUDING ALL ADDENDA AND REVISIONS SHALL APPLY.

AMERICAN SOCIETY FOR TESTING AND MATERIALS

ASTM D 1693

ASTM G 8

BRITISH STANDARDS INSTITUTION

B.S.5750

DEUSCHE INSTITUT FUR NORMUNG

DIN 30670

DIN 50049

SWEDISH STANDARD

SIS 055900

AMERICAN PETROLIUM INSTITUTE

API RP 515

IRANIAN PETROLIUM STD. FOR SURFACE PREPARATION

IPS-C-TP-101

3. DEFINITIONS

FOR THE PURPOSES OF THIS SPECIFICATION FOLLOWING DEFINITION APPLY:

N.I.G.C : NATIONAL IRANIAN GAS COMPANY .

CONTRACTOR: THE COMPANY WITH WHOM N.I.G.C ENTERS IN TO A CONTRACT TO WHICH THIS N.I.G.C STANDARD APPLIES , INCLUDING THE CONTRACTOR'S PERSONAL REPRESENTATIVES.

INSPECTOR: THE PERSON APPOINTED FROM TIME TO TIME BY N.I.G.C AND NOTIFIED IN WRITING TO THE CONTRACTOR TO ACT AS ENGINEER FOR THE PURPOSES OF THE CONTRACT.

MANUFACTURER: THE PRODUCER OF THE COATING MATERIAL BEING OFFERED FOR TEST.

4. MATERIAL - GENERAL

4.1 ACCEPTABLE MATERIALS

4.1.1 ONLY POLYMER SYSTEMS CONFORMING TO THIS STANDARD SHALL BE CONSIDERED FOR USE AS COATINGS APPLIED IN ACCORDANCE WITH PART 2 OR PART 3 OF THIS STANDARD.

4.1.2 THE CONTRACTOR SHALL BE RESPONSIBLE FOR WITH THE REQUIREMENTS OF NIGC ENGINEERING CONSTRUCTION STANDARD IGS-ES-TP-010 PART 1. THE CONTRACTOR SHALL OBTAIN AND RETAIN ALL CERTIFICATES (SEE 4.2.)AND MANUFACTURER'S DATA SHEETS. CERTIFICATES SHALL BE MADE AVAILABLE ON REQUEST TO NIGC.

4.2 IDENTIFICATION OF COATING MATERIALS

THE CONTRACTOR SHALL ENSURE THAT ALL MATERIALS SUPPLIED FOR COATING OPERATIONS ARE CLEARLY MARKED WITH THE FOLLOWING INFORMATION:

- A) MANUFACTURER'S NAME , TRADE MARK AND ADDRESS**
- B) NAME OF MATERIAL , ORDER NUMBER AND L/E NUMBER**
- C) BATCH NUMBER**
- D) DATE OF MANUFACTURER, AND EXPIRY DATE FOR USE**
- E) SAFETY DATA SHEET**

4.3 STORAGE OF COATING MATERIALS

TO ENSURE THAT THE PROPERTIES OF ALL COATING MATERIALS ARE MAINTAINED IN COMPLIANCE WITH THE RELEVANT SECTION OF NIGC ENGINEERING CONSTRUCTION STANDARD IGS-ES-TP-010 PART 1 ALL COATING MATERIALS CONSIGNED TO THE COATING PLANT SHALL BE PROPERLY STORED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AT ALL TIMES TO PREVENT DAMAGE AND DETERIORATION PRIOR TO USE. MATERIALS SHALL BE USED IN THE ORDER IN WHICH THEY ARE DELIVERED.

5. PIPES IDENTIFICATION

5.1 ALL IDENTIFICATION MARKINGS, WHETHER INTERNAL OR EXTERNAL TO THE PIPES SHALL BE CAREFULLY RECORDED BEFORE SURFACE PREPARATIONS BEGIN.

5.2 THE DATE OF COATING FINISH AND THE COATING FACTORY MARKINGS INCLUDING PIPE IDENTIFICATION SHALL BE LEGIBLY MARKED ON COATING SURFACE OF EACH PIPE.

6. PROTECTION OF WELD PREPARATIONS

- 6.1 WELD END PREPARATIONS SHALL BE PROTECTED FROM MECHANICAL DAMAGE DURING HANDLING, STORAGE, SURFACE PREPARATION AND THE COATING PROCESSES . THE METHODS USED SHALL ALSO ENSURE THAT NO DAMAGE OCCURS TO THE INTERNAL SURFACE OF THE PIPE.
- 6.2 WELD END PREPARATIONS SHALL BE PROTECTED FROM COATING DURING THE PROCESS BY A SUITABLE METHOD.
- 6.3 FOR TECHNICAL WELDING REASONS THE ENDS OF THE PIPES SHALL BE FREE OF ANY COATING LAYER (CUT BACK) OVER A LENGTH OF 100MM UP TO SIZE DN 500 (20 IN.) INCLUSIVE AND OVER A LENGTH OF 150MM FOR SIZES OVER DN500 , UNLESS OTHERWISE SPECIFIED BY NIGC.
- 6.4 THE UNCOATED ENDS OF PIPES SHALL NOT EXCEED 150MM UNLESS OTHERWISE SPECIFIED BY NIGC.
- 6.5 THE UNCOATED ENDS OF PIPES SHALL BE TEMPORARILY PROTECTED AGAINST ATMOSPHERIC CORROSION BY A TEMPORARY PAINT EASILY REMOVABLE BY BRUSHING.

7. SURFACE PREPARATION

THE METHOD OF SURFACE CLEANING AND SURFACE PREPARATION SHALL BE SPECIFIED BY THE CONTRACTOR AS PART OF THE COATING PROCEDURE QUALIFICATION AND SHALL TAKE INTO ACCOUNT THE REQUIREMENTS SPECIFIED IN 7.1 TO 7.4 INCLUSIVE , IN ACCORDANCE WITH IRANIAN PETROLIUM STD. FOR SURFACE PREPARATION (IPS-C-TP-101) IN PREPARATION FOR THE APPLICATION OF THE COATING , THE SURFACE PREPARATION SHALL BE PERFORMED IN

ACCORDANCE WITH THE REQUIREMENTS OF 7.1 TO 7.4 INCLUSIVE.

- 7.1 WHERE OIL , GREASE OR OTHER CONTAMINANTS ARE PRESENT THEY SHALL BE REMOVED , WITHOUT SPREADING THEM OVER THE SURFACE , WITH A SUITABLE SOLVENT. FOR PIPES WHICH HAVE BEEN SUBJECTED TO CONTAMINATION , THE CONTAMINANT SHALL BE REMOVED BY WASHING EITHER WITH POTABLE WATER OR AN APPROVED CHEMICAL CLEANER. IF A CHEMICAL CLEANER IS USED , SUBSEQUENT WASHING WITH POTABLE WATER WILL BE NECESSARY . THE PIPE SHALL BE DRIED BEFORE BLAST CLEANING. ALL PROCESSES SHALL BE AGREED WITH NIGC.**
- 7.2 PIPES SHALL BE BLAST CLEANED TO A MINIMU STANDARD OF SIS 055900- SA2½ FINISH . THE BLAST PROFILE SHALL BE BETWEEN 40um AND 100um HEIGHT, MEASURED BY AN AGREED METHOD. THE BLAST CLEANING MEDIUM USED SHALL BE AGREED WITH NIGC.**
- 7.3 THE METAL SURFACE SHALL BE INSPECTED IMMEDIATELY AFTER BALST CLEANING AND ALL SLIVERS , SCABS, ETC . , MADE VISIBLE BY BLAST CLEANING AND DETRIMENTAL TO THE COATING PROCESS SHALL BE REMOVED .**

USING A METHOD APPROVED BY NIGC . AFTER THE REMOVAL OF DEFECTS , THE REMAINING WALL THICKNESS SHALL COMPLY WITH THE RELEVANT PIPE SPECIFICATION . ANY RECTIFIED AREAS SHALL BE BLAST CLEANED TO MEET THE REQUIREMENTS OF 7.2 .

7.4 ANY PIPE FOUND TO HAVE DEFECTS WHICH EXCEED THE LEVELS PERMITTED IN THE RELEVANT PIPE SPECIFICATION SHALL BE SET ASIDE FOR EXAMINATION BY AN AUTHORISED NIGC REPRESENTATIVE AND NO SUBSEQUENT ACTION TAKEN WITHOUT THE AGREEMENT OF NIGC.

7.5 DIRECTLY BEFORE COATING, ANY DUST , GRIT OR OTHER CONTAMINANTS SHALL BE REMOVED FROM THE PIPE SURFACE BY A METHOD ESTABLISHED AS ACCEPTABLE BY THE RELEVANT COATING PROCEDURE TEST AND RECORDED IN THE RELEVANT COATING PROCEDURE.

7.6 WHERE RUST BLOOMING OR FURTHER SURFACE CONTAMINATION (SEE 7.1) HAS OCCURRED , THE PIPE SHALL BE CLEANED AGAIN IN ACCORDANCE WITH 7.1 AND AGAIN BLAST CLEANED IN ACCORDANCE WITH 7.2 COATING SHALL TAKE PLACE BEFORE ANY FURTHER CONTAMINATION OR RUST BLOOMING APPEARS.

8. COATING PROCEDURE TESTS

THE COATING PROCESS SHALL COMPLY WITH THE PROCEDURE ESTABLISHED IN THE RELEVANT COATING PROCEDURE QUALIFICATION . ANY CHANGES IN COATING MATERIALS , PIPE DIMENSIONS , PIPE MANUFACTURING PROCESS OR THE COATING PROCESS MAY , AT THE

DISCRETION OF NIGC , NECESSITATE A NEW COATING PROCEDURE APPROVAL TESTS.

ADDITIONALLY , APPROVED PROCEDURE TESTS SHALL BE CONFIRMED AS PROVING TESTS , AT INTERVALS OF NOT MORE THAN 1 YEAR FOR EACH TYPE OF POWDER , ADHESIVE AND POLYETHYLENE USED BY THE CONTRACTOR AND FOR EACH SIZE OF PIPE AND PIPE MANUFACTURING PROCESS AS REQUESTED BY NIGC.

9. INSPECTION AND TESTING (QUALITY CONTROL)

9.1 THE QUALITY CONTROL SYSTEM SHALL INCLUDE AS A MINIMUM THE REQUIREMENTS LISTED IN TABLE 1.

9.2 ALL INSPECTIONS AND TESTINGS LISTED IN TABLE 3 SHALL BE MADE BY THE CONTRACTOR AND WITNESSED AND CERTIFIED BY THE INSPECTOR.

9.3 AFTER EXAMINATION OR TEST , SHOULD THE INSPECTOR FIND OUT THAT ANY PIPE HAS NOT BEEN CLEAND OR COATED IN ACCORDANCE WITH THIS ENGINEERING STANDARD , THE CONTRACTOR SHALL BE REQUIRED TO REMOVE THE COATING WHICH IS CONSIDERED DEFECTIVE OR INADEQUATE , AND TO RECLEAN AND RECOAT THE PIPE TO THE REQUIREMENTS FOR APPROVAL OF THE INSPECTOR.

9.4 THE INSPECTOR SHALL HAVE ACCESS AT ANY TIME TO THE CONSTRUCTION SITE AND TO THOSE PARTS OF ALL PLANTS THAT ARE CONCERNED WITH THE PERFORMANCE OF WORK UNDER THIS STANDARD.