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## TECHNICAL SPECIFICATION

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**Rev. 1**

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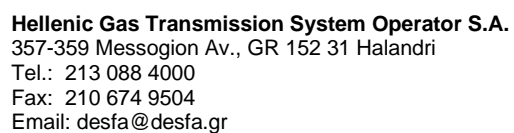
### HIGH PRESSURE (HP) TRANSMISSION SYSTEMS

# PLANT APPLIED INTERNAL EPOXY LINE PIPE COATING

**JUNE 2021**

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## 1. INTRODUCTION

## 2. SCOPE AND OBJECTIVES

### 2.1 ITEM

This specification defines the minimum requirements for the surface preparation, coating application, inspection and handling of plant-applied internal epoxy coating of line pipes. Primary objective of the coating is to reduce frictional losses and thereby improve pipeline transport capacity.

Secondary benefits are to reduce internal corrosion and fouling during storage and construction and to facilitate later cleaning operations.

The coating shall be liquid epoxy type and shall be selected according to **EN 10301**.

### 2.2 SERVICE TEMPERATURE

The service temperature of the pipeline will be from -15°C to +50°C. However, coated pipes may be stored at temperatures down to -20°C and with a surface temperature up to 80°C in the sun.

## 3. REFERENCES

### 3.1 Reference Documents

### 3.2 Reference Codes and Standards

- **EN 10301** [Steel tubes and fittings for on and offshore pipelines - Internal coating for the reduction of friction for conveyance of non-corrosive gas]
- **EN 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]

All standards or codes mentioned in this specification are valid in their latest version or by the relative superseded edition.

## 4. ACRONYMS

## 5. GENERAL REQUIREMENTS



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### **5.1 GENERAL**

A record of pipe serial numbers shall be kept for the Owner's information. This record shall contain all information on the delivered pipes, i.e. lengths, damages, cuts, repairs, transfer of serial numbers, coated stock, bare stock, scrap.

These records shall be available at all times for review by the Owner's Representative. At the completion of coating operations the Contractor shall satisfactorily account for all materials or shall reimburse the Owner for the full cost of any materials not so accountable.

All coating materials, production and repair procedures as well as test methods shall be approved by the Owner or his substitute before coating starts.

Coating application procedures shall be documented and monitored by the Contractor. Written records shall be maintained by qualified personnel.

The procedures shall include:

- Surface preparation, including grades and types of abrasive, removal of steel defects, cleanliness, surface profile and methods of measurement.
- Complete details of the coating materials, together with quality control and Contractor's certification sheets and materials storage, which shall be in accordance with the Manufacturer's recommendations.
- Application of coating, including details of application temperatures, curing times and methods, and acceptable prevailing working conditions (humidity, dust and temperature).
- Inspection and testing, including instrument and equipment types, makes and uses.
- Details of instrument and equipment calibration methods, including relevant standards and examples of calibration certificates.
- Coating defect repair methods and materials.

### **5.2 STANDARDS AND RECOMMENDATIONS**

Coating shall conform to **EN 10301**, **EN ISO 8501-1** and the requirements specified herein.

## **6. SURFACE PREPARATION**


The internal surface shall be cleaned, shot-blasted and subjected to dust removal in accordance with **EN 10301**.

The resulting surface finish shall conform to SA 2 1/2 according to **EN ISO 8501-1**.

The surface profile measured from peak to trough shall be in the range 25-50 µm.

## **7. COATING MATERIALS AND APPLICATION**

In accordance with **ELOT EN 10301**. Contractor's recommendations concerning storage, handling, use of materials shall be followed.

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Prior to the commencement of full production, the Contractor shall carry out a qualification test on lengths of line pipe to be coated to demonstrate that the coating applied in accordance with the Contractor's proposed procedures will comply with the requirements of this specification.

The pipes shall be coated on a continuous coating line without any risk of damage to the pipe (external pipe wall, bevels and coating) during the various heating, coating, curing and quenching operations.

Dry film thickness shall be minimum 60 µm and maximum 150 µm (100µm as per table 3 of **EN 10301**)

All weld preparations and a distance of 20 mm from each pipe end shall be free of coating. These parts may either be protected before application or the coating may subsequently be removed.

## 8. TESTING

### 8.1 GENERAL

An office and all necessary facilities required for the performance of his work shall be made available to the Owner's Representative by the Contractor.

Inspection shall be carried out by the Contractor and, unless otherwise agreed, in the presence of the Owner's representative.

Methods, frequencies and acceptance criteria as per **EN 10301** and as specified below. Any test not fulfilling specified requirements shall constitute that all pipes represented by the failed test specimen shall be rejected.

### 8.2 SURFACE PREPARATION

Each pipe shall be visually inspected to verify cleanliness after blast cleaning.

### 8.3 PIPE ENDS

The cutback length and the absence of coating on weld preparations and pipe-ends shall be inspected regularly, at least once per shift.

## 9. MARKING

The identification of the pipes shall be guaranteed during coating.

Any internal identification markings shall be carefully recorded before surface preparation begins and shall be repeated on the completed coating with weather resistant paint of a contrasting color, unless otherwise agreed with the Owner's Representative.

## 10. HANDLING, STORAGE AND TRANSPORT

In addition to fulfilling the requirements of **ELOT EN 10301**, all procedures for handling, storage, and transportation shall be approved by the Owner.



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Care shall be taken to prevent damage to the pipe.

Externally coated pipe may, under no circumstances be dragged, or rolled over the ground.

When handling the pipes non-metallic slings, spreader bars, protected hooks, etc, shall be used. Large diameter pipe shall preferably be transported by the use of vacuum spreader beams.

The pipes shall be stored on even and firm ground and be placed on wooden supports which keep the pipes clear of the ground and in such a way that water and mud cannot accumulate inside the pipe. The pipes shall be self-draining.

Supports and stacking shall be according to approved drawings/procedures.

The coated pipe shall be stacked in such a manner that any external coating does not contact a hard surface, which may damage the coating.

During transportation the pipes shall be stacked and secured such that they cannot be damaged (abrasion, penning). **EN 10301** shall be taken into consideration concerning transportation.

All coated pipes ready for transportation shall be provided with end caps. The pipes must be dry inside before mounting the caps.

Stockpiling of externally coated pipes shall be made so as to avoid any deterioration of the polyethylene coating. In particular, the coated pipes shall, if necessary, be shielded from the harmful effects of ultraviolet rays.

## **11. TECHNICAL DOCUMENTATION**

### **11.1 WITH TENDER**

- Raw material Suppliers' data sheets.
- Written quality assurance procedures, standard operating procedures, and repair procedures.
- Request for approval of coating materials, production and repair procedures as well as test methods not otherwise defined.
- Statement of temperature of pipe surface at time of application.
- Statement of maximum permissible in-service temperature of coating, if higher than +50°C.

### **11.2 AFTER AWARD OF CONTRACT**

- Records of performance testing as per **EN 10301**.

### **11.3 ON DELIVERY**

Manufacturer's Certified Test Report i.e. certified by Manufacturer's Authorized Representative, independent from the manufacturing department, containing the results of performed production testing.



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Pipes shall be referred to by their pipe mill assigned numbers.