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TECHNICAL SPECIFICATION

HIGH PRESSURE (HP) TRANSMISSION SYSTEMS

INSULATING COATING FOR M/R STATIONS

JUNE 2021

1	Second Issue	30-06-2021	MP	DK	TPI
0	First Issue	05-04-2011	PQ DPT.		V.G.
REV	**DESCRIPTION**	**DATE**	**PRPD**	**CHKD**	**APVD**

REVISION HISTORICAL SHEET

Rev.	Date	Description
0	05/04/2011	First Issue (as Specs 831/1 & 831/2)
1	30/06/2021	Second Issue validated from TPI

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REFERENCES DOCUMENTS

EN 12068
[Cathodic protection - External organic coatings for the corrosion protection of buried or immersed steel pipelines used in conjunction with cathodic protection - Tapes and shrinkable materials]

ISO 21809-4
[Petroleum and natural gas industries - External coatings for buried or submerged pipelines used in pipeline transportation systems - Part 4: Polyethylene coatings (2-Layer PE)]

1. INTRODUCTION

1.1 SCOPE

This specification covers insulating coating materials for site application on piping systems in Metering and Regulating Stations and Compressor Stations and site application of insulating coating of buried steel pipes and components in natural gas piping systems as well as in M/R Stations.

The requirements of the following, listed in order of precedence, are valid for the manufacture of these materials:

- this specification

- EN 12068

- ISO 21809-4

1.2 STANDARDS

- EN 12068

- ISO 21809-4

All standards or codes mentioned in this specification are valid in their latest version or by the relative superseded edition.

2. MATERIALS

The materials used for corrosion protection are divided into the following two classes according to temperature rating:

- For Standard Temperatures: operating temperature between -10 °C and 50 °C

- For Elevated Temperatures: operating temperature between -10 °C and 80 °C

The choice of materials shall be approved by the Owner's Representative.

In general, the protection consists of primer, anticorrosion tape and protective tape. Anti-corrosion tape and protective tape may, however, be combined.

The materials shall be proof against operating temperatures between -10 °C and 50 °C, however, down to -20 °C ambient/outdoor conditions during storage. Special coating systems are to be used at pipe sections for which the operating temperature exceeds +50 °C (medium density polyethylene (MD-PE)). The systems shall be applied according to the manufacturer's instructions.

2.1 MATERIAL TYPES

Wrapping materials shall be designed for cold application.

The materials for standard temperatures shall consist of two layers, which may be combined as a single tape. The inner layer, providing the electrical insulation, shall be of a butyl rubber or bituminous rubber compound. The outer layer, providing the mechanical protection shall be of PE.

Contractor has the right (in case of EPC contract) to suggest an alternative insulation method. In this case it shall be written proven that this method/material has at a minimum the same efficiency and no impact in the functionality and safety of the project.

The materials for high temperatures shall be built up in the same manner as for standard temperatures, with additional layers as necessary to render the materials resistant to high temperatures, or usage of medium Density polyethylene (MD-PE) for temperatures up to 80°C.

Primers to be applied before the application of wrapping materials shall be compatible with the wrapping materials used.

Materials that will be used will be sufficient (chemical and mechanical properties) for an outdoor exposure under the sun, at maximum temperature 80°C.

2.2 QUALITY CONTROL OF MATERIALS

The Manufacturer is, under all circumstances, responsible for ensuring that the materials ordered are manufactured in compliance with this specification and, in case of doubt, shall be able to provide proof thereof.

Quality requirements and test methods for the materials shall satisfy the conditions of ELOT EN 12068 for Class B.

Control certificates shall be issued by Manufacturer. Manufacturer shall declare that the materials supplied are following the requirements of the order and he also attaches the chemical analysis or any other test results based on non-specific inspection and testing.

Any time during the work process of the above materials ordered, Owner or his Representative shall have free access for inspection at those parts of the Manufacturer's premises where manufacturing and testing of the materials ordered takes place.

The Manufacturer shall, without charge, provide Owner or their Representative with all reasonable facilities necessary to satisfy them that the product is being produced in compliance with this specification.

3. APPLICATION OF COATING

3.1 GENERAL

The contractor shall coat all below-ground pipeline components which have not been coated from the works, all joints as well as all damages to and defects on items already coated. Damages to the pipe beneath the insulation shall be brought to the attention of the Owner's Representative.

Coaters shall be approved by the Owner.

Any piping coming above ground level shall be coated to 150 mm over final ground level.

Any piping which will not later be protected by the cathodic protection system shall be "double-coated".

This will normally cover piping between insulating couplings and a near-by point where the pipe comes above-ground.

3.2 SURFACE PREPARATION

The surface to be insulated shall be cleaned thoroughly with abrading blasting to remove dust, millscale, weld spatter, dirt, etc. immediately before the application of primer.

Adjoining coating edges shall be beveled, thus providing a smooth crossover from full to zero thickness in a length of 20-30 mm.

3.3 APPLICATION OF PRIMER

Immediately after the blasting, the cleaned parts shall be primed as specified by the Manufacturer of the wrapping material.

Priming may be applied only to dry surfaces.

3.4 APPLICATION OF COATING

Immediately after the priming, the coating shall be applied.

All materials shall be supplied by the Contractor and applied in accordance with the Manufacturer's instruction and shall furthermore satisfy the following requirements:

- The P.E. coating thickness shall be as per ISO 21809-4.

In order to reach the above-mentioned thicknesses, the coating may be applied in one or more layers.

- Where "double coating" is required, this shall be understood as comprising a total thickness of twice the above-mentioned normal thicknesses.

- The overlap both between two wraps and between a wrap and possible PE-coating shall be at least 30 mm.

- No air may be trapped beneath the insulation.

- A tight seal between wraps and between a wrap and the PE-coating shall be ensured.

Other insulating coating such as shrink sleeves may be used only after the Owner's approval.

Fittings, tees, and field made joints etc. will not be coated until the hydrostatic test has been completed and the items proved to be free of leaks. When cleaning these items, any shop-primer should not be removed.

Where valves are mounted on foundation blocks, the insulation shall extend at least 100 mm below the upper edge of the concrete. Valves and any other pipeline parts which are to be supported by concrete foundation blocks or to be cast in concrete shall be double- coated.

3.5 REPAIR OF DAMAGED WORKS COATING

All damages to the coating, whether discovered visually or during the holiday detection test, shall be repaired.

3.5.1 Extruded Or Sintered Pe-Coating

The damaged area shall be cleaned of foreign matters and loose bits of insulating material. The area shall be heated with a propane burner (welding equipment shall not be used) until the insulating material starts to melt.

Hereafter PE powder shall be strewn on the area and the area shall be reheated lightly until the powder has melted smoothly together with the PE insulation. This procedure shall be repeated until the original thickness has been obtained. Repairs shall be carried out carefully, avoiding any overheating of the PE material.

As an alternative to PE powder, the Contractor may use tape coating.

3.5.2 TAPE COATINGS

The repair of damages shall be made in accordance with the following procedure:

- coating which does not adhere strongly to the pipe shall be removed.

- protective tape shall be removed 100-150 mm to each side of the area to be repaired. The ends of the remaining coating shall be secured with tape, so that tension is maintained.

- the surface shall be cleaned with wire brushes.

- primer shall be applied to the cleaned area and 100- 150 mm across the existing anti-corrosion coating.

- new anti-corrosion coating shall be applied and secured with tape, protective tape shall be applied in the same way and secured with tape.

3.6 HOLIDAY DETECTION

The completed coating shall be tested by the Contractor.

This control shall be made twice, once immediately on completion of the wrapping work and once during pipe- lowering. The second control shall be made in the presence of the Owner's Representative.

The Contractor shall use a high-voltage test apparatus (e.g. a Holiday Detector) which has been approved by the Owner. The entire surface shall be tested with a test voltage of 5 kV + 5 kV/mm for PE coating, according to ISO 21809-4 and the test probe shall be in contact with the coating. Pipes shall be in checked with a ring-coil, valves, etc. with a rod or brush.

The Contractor shall provide all necessary equipment and operating personnel. Any damages or "holidays" shall be repaired as specified in para 3.5.

Repaired sections of coating shall be retested following the completion of repair work.

3.7 GUARANTEE

The Contractor is liable for any damages to the coating irrespective of the time of discovery (i.e. during or after the working period). If any damages are located (e.g. with electrical measurement) during the guarantee period, the Contractor shall excavate the area and repair the coating.

The costs for excavating repair and testing shall be borne by the contractor. If the Contractor fails to carry out this work within a reasonable time, the Owner has the right to employ another company to carry out the work at the Contractor's expense.