

APPLICATION SOLUTION 03

Buried Pipeline Protection and Repair

Problem, corrosion mechanism, recommended system, product combination and application procedure.

4

Tape systems

-45 °C

Viscoelastic low limit

15 J

Impact with outer wrap

Cold

Applied



01 The Problem

Buried Pipeline Corrosion Protection

Buried steel pipelines fail at the joints and the repairs, not in the mill-applied coating. Field joints, fittings and locally damaged 3PE or FBE coating are completed on site, in trench conditions, often in weather that a liquid coating cannot tolerate. Soil stress then works on whatever was applied, and cathodic protection current is wasted wherever the barrier is discontinuous.

Corrosion risk

- Coating disbondment at field joints and cutbacks, with water ingress behind the coating.
- Soil-stress creep, indentation and impact damage during backfilling.
- Shielding of cathodic protection current under a disbonded coating, combined with under-film corrosion.
- Microbiologically influenced corrosion in wet, poorly drained ground.
- Weather and temperature windows that liquid-applied systems cannot meet.



Field joint wrapping



Buried pipeline construction



Distribution main

02

Recommended System

Why this configuration

Zhuohuang offers two distinct answers and the correct one depends on the job. For **new construction**, bitumen-adhesive polyolefin tape is the economical continuous wrap, with PP mesh-reinforced tape where soil stress and backfill are severe. For **rehabilitation and complex geometry**, viscoelastic tape is applied without primer, cold-flows into the surface profile, bonds to steel, PE and FBE alike, and does not shield cathodic protection.

System structure



Product combination and application procedure

Stage	Product	Procedure
Prepare	—	Remove oil, dirt and unstable corrosion products. Prepare to the project-specified cleanliness; St2 is sufficient for the viscoelastic system.
Prime	Modified bitumen primer (polyolefin system only)	Apply uniformly and allow to reach the specified condition. The viscoelastic system requires no primer.
Profile	Viscoelastic paste (repair systems)	Fill weld caps, coating cutbacks, pits and step transitions to a smooth profile.
Seal	PE tape / PP fibre-reinforced tape / viscoelastic tape	Spiral wrap under controlled tension with the specified overlap, keeping the adhesive in continuous contact with the steel and pressing around weld profiles.
Protect	PVC cold-wrap or heat-shrink outer layer	Install the mechanical outer layer. The tested viscoelastic system with a pressure-sensitive heat-shrink outer wrap withstands 15 J impact with no holiday at 15 kV.

Zhuohuang systems are modular. Overlap, tape width, number of layers and the protective outer wrap are confirmed for each asset, and components are added or omitted according to substrate condition, geometry and exposure. Where a project specification or acceptance standard applies, its requirements take precedence over this general sequence.

Choosing the protective outer layer

The outer wrap is selected for the exposure, not fixed by the primary tape. Three outer wrap materials are manufactured in-house, so the outer layer can be matched to ultraviolet, soil stress and handling risk.

Outer wrap option	When it is selected
PE outer wrap	Buried service with normal backfill — a continuous, moisture-excluding and electrically insulating outer layer.
PP fibre-reinforced outer wrap	Rocky or stony backfill, road and rail crossings, directional drilling pull-in, high soil stress.
PVC cold-wrap or heat-shrink outer layer	Field joints where the tested viscoelastic system configuration is specified.

03

Key Benefits and Evidence

What the customer gets, and what supports it

- Peel strength to steel 34.06 N/cm and to backing 33.08 N/cm on the PE system (GB/T 2792-2014).
- PP mesh reinforcement resists soil-stress creep, indentation and abrasion; backing tensile strength 77.6 MPa.
- Viscoelastic tape bonds to steel, PE and FBE; adhesive coverage 100 % from -45 °C to +70 °C.
- Cathodic disbondment 1.00 mm at 23 °C / 24 h / -3.5 V.
- Water absorption 0.018 % on the viscoelastic tape (SY/T 0414-2017).
- No hot work on the viscoelastic system — usable in hazardous areas.

Typical applications

- Field joints and cutbacks on new buried pipelines
- Rehabilitation of damaged 3PE and FBE coatings
- Bends, tees, tappings and buried fittings
- Gas distribution mains and municipal water networks

Supporting documents

- PE Anti-Corrosion Tape TDS
- PP Fibre-Reinforced Anti-Corrosion Tape TDS
- Viscoelastic Anti-Corrosion Tape and Paste TDS
- Test reports CTG2409251378A_SR177AC, CTG2410221378A_SR176AC, CTG2410221378A_SR180AC

TECHNICAL & COMMERCIAL CONTACT

Send us your asset information

Send asset photographs, dimensions, operating temperature and exposure conditions. We will return a system configuration, an estimated material quantity and the supporting documents.

- Product and system selection
- Technical data sheets and safety data sheets
- Third-party test reports and certificates
- Installation sequence and application guidance
- Samples, packaging and private-label discussion

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DISCLAIMER

The information in this document is based on Zhuohuang product records, manufacturer data and third-party test reports available at the date of issue. Values are typical or standard configurations and are not universal acceptance limits. Product performance depends on substrate condition, surface preparation, geometry, operating temperature and exposure. Confirm the applicable grade, current packaging, project acceptance criteria and the relevant safety data sheet before order and application.