



PipeSak® Pipeline Protection

## Guidelines

This specification defines the **minimum requirements** for the design, manufacture, and supply of Engineered Pipeline Lagging (EPL), designed to protect steel pipelines from extreme rock impacts in harsh backfilling conditions, rocky trench bottoms, and mechanical damage from construction equipment.

### 1.0 Design and Manufacturing

- 1.1 Manufacturer must be ISO:9001 registered.
- 1.2 Design should incorporate a corrugated pattern of peaks and valleys which allow absorption of impacts through deformation.
- 1.3 Design must be proven to protect 20" and larger diameter pipelines from rock impacts as large as 60 lb (27kg) drop from 6..6' (2m), and protect smaller diameter pipelines from 20 lb (9 kg) rock impacts dropped from 6.5' (2m).
- 1.4 Design shall incorporate multi-directional drainage to allow the flow of water into and out of the EPL and be compatible with cathodic protection systems.
- 1.5 Drainage locations must not compromise the impact strength of the EPL panel.
- 1.6 EPL panels must fasten circumferentially around the pipe, as well as along the longitudinal direction of the pipe.
- 1.7 EPL panel weight should be limited to 24 lbs (10.9 kg) per panel for ease of installation and handling.
- 1.8 EPL must be proven to sustain large compressive loads without significant deformation such that the possibility of denting is greatly reduced. Minimum compressive strength of 50 psi or 345 kN/m<sup>2</sup> at 25% strain.

## 2.0 Material

### 2.1 Panel Material

- a) EPL should be made from a non-biodegradable, UV-resistant, High-impact strength polyethylene.
- b) Material hardness must be lower than that of most pipeline coatings such that it does not create coating damage.
- c) Material should have a low coefficient of friction (<0.15).

### 2.2 Strapping Material

- a) Strapping used to secure EPL to the pipe must be made from a woven fabric and have a minimum tensile strength of 1000 lb. (4.45 kN).

## 3.0 Delivery, Storage, and Handling

- 3.1 To be delivered on pallets with UV protective covers for ease of handling and long-term storage.
- 3.2 Until use, protective covers or separate tarps must be maintained to ensure proper protection from the elements (oil, dirt, sunlight, etc).





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## Technical Notes

# PipeDefender® General Specifications

### 4.0 Installation

- 4.1 Engineered Pipeline Lagging (EPL) shall be installed on elevated pipe by a minimum of two workers.
- 4.2 A minimum of 8 fasteners shall be used to connect adjacent and circumferential panels.
- 4.3 EPL strapping must be installed 8" (203mm) from the ends of each panel section that sag around the pipe is eliminated.

### 5.0 Bedding and Backfilling

- 5.1 Use of the EPL shall eliminate the need for sand padding and/or bedding.
- 5.2 Pipe bedding may consist of native rock up to 3" (76 mm) in diameter.
- 5.3 In areas of more severe rock in deep trenches, Structured Pipeline Supports shall be used.
- 5.4 For 20" diameter pipes and larger, backfill may consist of rock up to 12" (305 mm) in diameter, limited to a drop height of 6.5' (2 m) until 12" (305 mm) of cover above the pipe is established. Afterward, larger rock may be backfilled with a limited drop height of 10' (3m).
- 5.5 For 16" diameter pipe and smaller, backfill may consist of rock up to 8" (203 mm) in diameter, limited to a drop height of 6.5' (2 m) until 12" (305 mm) of cover above the pipe is established. Afterward, larger rock may be backfilled with a limited drop height of 10' (3m).
- 5.6 Geotextile Rock Shield may be utilized on the exterior of EPL to elevate protection in extreme areas where drop heights are less controlled.
- 5.7 Panels may be field cut to fit tight bends or to accommodate pipe features such as valves.

### 6.0 Additional Technical Requirements

- 6.1 All material supplied by the manufacturer should be as per the American Society for Testing and Materials (ASTM) or equivalent unless approved by Company.
- 6.2 Manufacturer shall make skilled personnel available for assistance and training for the proper installation and use of the EPL.
- 6.3 EPL may be used to protect the pipeline against mechanical damage, such as protecting foreign pipelines during under crossing installation.
- 6.4 EPL can be used to electronically isolate pipelines when installed in a casing pipe.

