

SmartDitch Product Specification

Section I - General

- A. Description:** SmartDitch Channel / Lining Systems are designed to improve reliable water flow, reduce water loss, and reduce maintenance requirements for earthen irrigation ditches utilized for storm water management and public works, erosion and sediment control, and agriculture/irrigation applications.
- B. Reference Specifications:** There currently is not an ASTM standard for the SmartDitch Lining System. The following documents can be referenced to indicate specific manufacturing and material performance capabilities:

ASTM

- D618 Practice for Conditioning Plastics for Testing
- D638 Test Method for Tensile Properties of Plastics
- D746 Test Method for Brittleness Temperature of Plastics and Elastomers by Impact
- D883 Terminology Relating to Plastics
- D1238 Test Method for Melt Flow Rates of Thermoplastics by Extrusion Plastometer
- D1505 Test Method for Density of Plastics by the Density-Gradient Technique
- D1506 Test Method for Carbon Black – Ash Content
- D1693 Test Method for Environmental Stress-Cracking of Ethylene Plastics
- D5420 Standard Test Method for Impact Resistance of Flat, Rigid Plastic Specimen by Means of a Striker Impacted by a Falling Weight

Section II – Material Properties

- A.** Liner Segments are manufactured from high molecular weight high density polyethylene. (HDPE)
- B.** Additives: Resin additives, such as curing agents, pigments, dyes, fillers, thixotropic agents, etc., when used, shall not detrimentally effect the performance of the product.
- C.** Foam Gaskets: The foam gaskets shall be supplied by qualified gasket manufacturers and be suitable for the service intended.

Section III – Manufacture

- A.** The liner segments shall be manufactured using vacuum thermoforming.
- B.** Fittings: All fittings shall be fabricated from material meeting the requirements of these standards.
- C.** Acceptable Manufacturer or Supplier: Penda Corporation

Section IV - Nominal Dimensions:

- A.** Nominal Dimensions shall be per the manufacturer's design.

- B. Lengths: Liner Sections shall be supplied in nominal lengths per the manufacturer's design. Shorter and custom lengths will be supplied as defined by the project requirements.
- C. Wall Thickness: The average wall thickness shall be per the manufacturer's design.
- D. The minimum Manning's coefficient of friction for the lining system shall be $n=0.022$.

Section V – Material Testing:

- A. Segments shall be manufactured and tested in accordance with applicable ASTM standards.

Section VI – Design Criteria

- A. Capacity: Lined ditch shall have enough capacity to meet the requirements as part of the planned irrigation water distribution/conveyance system without overflow. The maximum freeboard allowed is 2". The minimum Manning's coefficient of friction for the lining system is $n=0.022$.
- B. Velocity: The velocity in ditches lined with the liner shall be sufficient to carry the required flow. Velocity may vary dependent on slope of existing ditch, lateral, or other water work. Minimum slope requirement for installation of SmartDitch liner system is 1/2 percent.
- C. Side Slopes/Bottom: Side slopes and bottom of the earthen ditch shall be free of debris, rocks and other sharp objects that may damage the liner system once installed.
- D. Leak Rate: The average exfiltration rate shall not exceed 0.039 cfs/1000 ft.

Section VII – Installation Procedures

- A. Bedding backfill and general installation requirements shall be in accordance with project plans and specifications and manufacturer's recommendations.
- B. Refer to SmartDitch Installation Guidelines as stated in the SmartDitch Technical Manual.

Section VIII – Maintenance

- A. Field Inspect lined irrigation ditches, laterals, or other components of the water distribution system regularly to ensure proper operation and delivery of water. Remove any rocks, debris, or other obstructions from liner system to ensure maximum flow and efficiency.