



Canal<sup>3</sup>®

Geocomposite for Canals & Water Containment Applications

# Why Is Canal<sup>3</sup> The Preferred Choice?



## Canal<sup>3</sup><sup>®</sup>

Geocomposite for canals and water containment applications

Canal<sup>3</sup> is a multi-layer geosynthetic composite membrane designed for water containment applications offering an easy, reliable and cost-effective canal lining solution. Canal<sup>3</sup> provides superior puncture resistance and increased interface friction properties that allows the liner to be deployed directly in contact with most existing soils and steepened side slopes.

## Puncture Resistance

Canal<sup>3</sup> is comprised of a polyethylene membrane laminated between two nonwoven protection layers. The nonwovens can be designed for increased puncture protection if deemed necessary by site conditions, allowing onsite soils to be used as the subgrade material without the cost of placing an expensive bedding material or placement of separate nonwoven layers.

## Interface Friction

Lining an existing earthen canal typically requires reshaping the bottom and side slopes prior to installing the Canal<sup>3</sup> geocomposite. The side slopes can range from relatively flat to very steep depending on site conditions and property boundaries. The bottom nonwoven on Canal<sup>3</sup> provides a superior interface friction response with onsite soils which prevents Canal<sup>3</sup> from sliding. The top nonwoven layer also allows for soil or shotcrete to be used as cover material even for 1.5 H: 1 V slopes.

# Canal<sup>3</sup> Geocomposite. When Every Drop Counts.



BEFORE RESHAPING



PREPARED CANAL



CANAL<sup>3</sup> INSTALLATION

The demand for water and the high costs of delivery requires implementation of proven conservation practices. Lining canals with HUESKER's Canal<sup>3</sup> geocomposite is the most effective step towards water conservation. With high seepage rates greater than 40% in unlined canals, lining with Canal<sup>3</sup> reduces seepage losses and increases available water for delivery.

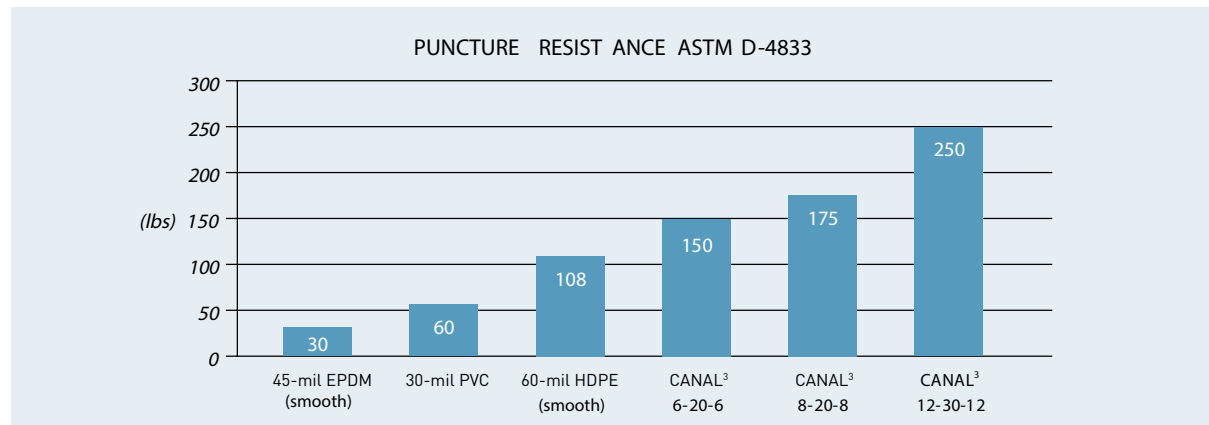
HUESKER's Canal<sup>3</sup> may be comprised of polyester or polypropylene nonwovens depending upon project specific design parameters. Manufactured to a standard width of 17 feet (5.18 m) and a custom width up to 25 feet (7.6 m), Canal<sup>3</sup> can be installed parallel or perpendicular to the centerline of the canal in order to minimize excess material in exposed, buried, or shotcreted applications.

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# Canal<sup>3</sup> Proven Performance.

Canal lining installations require cleaning and reshaping of the canal prior to the liner installation. Typically, other liners call for a sand bedding layer or a nonwoven cushion above the reshaped canal to provide puncture protection for the liner. **Canal<sup>3</sup>** is designed with a high puncture protective layer beneath and above the membrane liner, and can be placed directly on the existing reshaped soils eliminating the costs of placing a sand layer.

The following chart includes published ASTM D-4833 puncture index test values for typical canal liners. Recently, a thorough field assessment of various types of canals concluded, "Without question, liners with a protective barrier performed the best and have required no maintenance, while the performance on the liners without a protective barrier has varied significantly," (Evaluation of Canal Lining Projects in the Lower Rio Grande Valley of Texas, Karimov, Leigh, Fipps, P.E., 2009.)



**Canal<sup>3</sup>** provides superior puncture properties for various site conditions from smooth to rough subgrades and is available in several styles. Irrigation districts and contractors agree that the ease of installing **Canal<sup>3</sup>** over other liners is not only cost effective but also reduces installation time by using our wider width materials. Installations of **Canal<sup>3</sup>** can be performed by a subcontractor or by irrigation personnel with minimal instructions from a HUESKER technical representative. The following are recommendations for the proper selection of the **Canal<sup>3</sup>** products for various site conditions.

Material	Subgrade			Application		
	Smooth	Moderate	Rough	Buried	Exposed	Shotcreted
Canal <sup>3</sup> 6-20-6	✓			✓		
Canal <sup>3</sup> 8-20-8	✓	✓		✓	✓	✓
Canal <sup>3</sup> 12-30-12	✓	✓	✓	✓	✓	✓

# Installation

In order to achieve a successful installation, the first step is to deliver materials safely to the site. Each roll of **Canal<sup>3</sup>** is wrapped with heavy duty plastic for protection during shipment along with two lifting straps for ease of unloading at the jobsite. **Canal<sup>3</sup>** is typically shipped to the customer on flatbed trucks which allows easy unloading with slings or a lifting bar.

To aid in the deployment process, HUESKER supplies an installation guide which provides a detailed overview for installing **Canal<sup>3</sup>**. **Canal<sup>3</sup>** can be installed perpendicular or parallel to the centerline depending on the size of the canal and its alignment. Details of the typical anchoring methods are included in the Installation Manual for specific configurations of side slopes.

Recommended seaming methods include using a hot melt adhesive, standard wedge welding, or a combination of both. Laboratory test results are available for each of these methods of seaming.

When mechanical fastening is required, **Canal<sup>3</sup>** is easily attached to concrete structures by using batten strips which are anchored into the concrete using expansion anchors.

HUESKER's **Canal<sup>3</sup>** composite has been installed worldwide in various applications with successful results, and continues to be the designers first choice for canal lining applications. In today's water conservation environment, eliminating costly seepage is a priority to ensure that every drop counts today and for future generations.

For more information on **Canal<sup>3</sup>**, call HUESKER at (800) 942-9418 or visit our website at [www.HUESKER.com](http://www.HUESKER.com).





## Case Study

In 2007, the Porter Canal owned by the New Sweden Irrigation District located in Idaho Falls, Idaho was reshaped and lined with **Canal<sup>3</sup>** 12-30-12 by a commercial developer due to seepage onto a proposed commercial subdivision. The project consisted of reshaping 1,400 linear feet of the Porter Canal and installing 157,500 ft<sup>2</sup> of **Canal<sup>3</sup>** geocomposite liner by HK Contractors, Inc. The custom roll size of 25 feet wide x 300 feet long reduced the number of seams and expedited the installation process. The entire project took approximately 2 weeks; 1 week to reshape the existing canal, 4 days to install the **Canal<sup>3</sup>**, and another 3 days to seam and attach to a bridge structure. After construction, the Developer built on the now dry parcel adjacent to the canal.

**Project:** Lining of Porter Canal  
**Location:** Idaho Falls, Idaho  
**Owner:** New Sweden Irrigation District  
**Contractor:** HK Contractors, Inc.  
**Material:** Canal<sup>3</sup> 12-30-12



## Case Study

In 2004, after years of concrete repairs, and high seepage rates, Hidalgo County Irrigation District No. 2 located in San Juan, Texas decided to rehabilitate their Lateral "A" canal. The 7.26-mile lateral was drained, and cleaned of loose debris, as well as cracks filled prior to the installation of **Canal<sup>3</sup>** 8-20-8 geocomposite above the existing concrete canal. Approximately 850,000 ft<sup>2</sup> of **Canal<sup>3</sup>** were supplied in standard and custom roll widths to reduce waste along the entire reach of the canal. The Contractor employed a modified shotcreting method for placing the 3-inches of shotcrete above the **Canal<sup>3</sup>** which resulted in placing over 125 yd<sup>3</sup>/day. Incorporating the **Canal<sup>3</sup>** above the existing concrete canal with the shotcrete above provides a "secondary" containment layer beneath the shotcrete layer extending the life of the canal beyond 50 years, according to the 10-year Study written by the Bureau of Reclamation.

**Project:** Rehabilitation of Lateral "A" Canal  
**Location:** San Juan, Texas  
**Owner:** Hidalgo County Irrigation District No.2  
**Contractor:** McAllen Construction  
**Material:** Canal<sup>3</sup> 8-20-8



### Basetrac<sup>®</sup>

Engineered polypropylene biaxial geogrids provide tensile reinforcement, confinement and separation to the base and subbase aggregate layers for both paved and unpaved roads that are used to access canals for periodic maintenance. Basetrac<sup>®</sup> geogrids increase the bearing capacity of underlying soils by introducing a uniform tensile element into the roadway system that distributes the applied loads over a greater area. Lateral displacement of the aggregate is reduced with Basetrac<sup>®</sup> geogrids, thereby maintaining the base course thickness.



### Fortrac<sup>®</sup> 3D

Fortrac<sup>®</sup> 3D is a further development of the renowned Fortrac<sup>®</sup> geogrid and is used for slope stabilization, veneer stability and turf reinforcement to control soil erosion. Fortrac<sup>®</sup> 3D is a flexible, three-dimensional reinforcement grid manufactured from high tensile strength, creep resistant yarns with a three-dimensional structure that enhances its interaction with soil. The geogrid is given a special polymer coating to protect it from UV exposure and installation damaged. It is well understood long-term properties allow Fortrac<sup>®</sup> 3D to be designed for the specific period of use required for each project.



### Ultimat<sup>®</sup>

Ultimat<sup>®</sup> needle-punched nonwovens are manufactured using polypropylene or polyester staple fibers to produce the widest widths and heaviest weights available in many colors. Ultimat<sup>®</sup> heavyweight nonwovens provide excellent puncture protection when placed above and below membrane liners in reservoirs and landfill applications. The wide width greatly reduces the installation costs when compared with typical nonwoven widths. Ultimat<sup>®</sup> also provides superior separation between finer subgrade soils and typical base course extending the life of roadways. Using various denier staple fibers, Ultimat<sup>®</sup> can be designed for capping application where filtration of specific particle sizes are required.

**Canal<sup>3</sup>** is a lining solution for irrigation canals and other water containment applications. The top and bottom layers of the nonwovens not only provide increased puncture protection, but also increased interface friction. **Canal<sup>3</sup>** is neither affected by changing temperatures or frost which typically cause cracks in concrete lining solutions or by animals which often cause damage to membrane liners. This innovative canal liner can be installed in exposed or buried applications. Shotcrete can also be applied onto **Canal<sup>3</sup>** for additional protection from vandalism and ultraviolet light.



For more information about the application of **Canal<sup>3</sup>**, please contact us.

Canal<sup>3</sup>® is a registered trademark of HUESKER, Inc.  
HUESKER Synthetic is certified to ISO 9001, ISO 14001 and ISO 50001.



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Further Information:

