COAL DRAIN
GEOCOMPOSITE

(FAQ)
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1. What is CoalDrain?

GSE recognized the need to improve the performance characteristics of geotextiles in order to retain very fine particles of fly ash and FGD gypsum typically encountered in CCR containment projects and to still allow water to pass through the geotextile. CoalDrain is an innovative GSE drainage geocomposite consisting of an engineered hybrid geotextile that has been developed specifically for CCR projects. CCRs, both dry and wet, can be placed directly on CoalDrain eliminating the need for select and graded earthen materials.

2. What are the main components of CoalDrain?

CoalDrain consists of a GSE biplanar geonet with a 6 oz. nonwoven needlepunched (NW-NP) geotextile on one side and a woven-NW hybrid geotextile on the other. The product is intended to be installed with the hybrid geotextile facing upwards, i.e., against overburden material.

3. Tell us more about the hybrid geotextile?

The woven-NW hybrid geotextile has been developed by GSE to act as a filter for very fine particles of ash, gypsum, silt and clay. The geotextile has been developed based on the concept of a graded filter such that it can be effective in those challenging conditions where a standard geotextile may not be adequate.

4. What testing has been performed on CoalDrain?

The hybrid filter on CoalDrain has been tested extensively including apparent opening size (AOS), filtration opening size (FOS), pore size distribution, filter press, gradient ratio, hydraulic conductivity ratio and large-scale field tests. Test reports can be obtained from the engineering department at GSE by calling 800-435-2008.

5. What can you tell us about CoalDrain based on the testing to-date?

The AOS and FOS of the hybrid geotextile is less than 0.088 mm and 0.06 mm, respectively. The gradient ratio and hydraulic conductivity ratio tests have shown that the geotextile forms a stable filter against fine CCRs. Field tests have shown that fly ash and FGD gypsum neither clog nor pass through the geotextile. Hydraulic conductivity of the hybrid geotextile is 0.1 cm/sec which is several orders of magnitude higher than the typical hydraulic conductivity of ash and gypsum.

6. How does CoalDrain hybrid geotextile compare with standard geotextiles?

Conventional drainage geocomposites use a NW-NP geotextile of mass per unit area of 6 to 8 oz./yd2 with an apparent opening size of 0.212 mm. This opening size should be compared with an opening size of 0.088 mm for the geotextile on CoalDrain. Many research articles have shown that standard geotextiles do not form a good filter for very fine materials. The geotextile on CoalDrain has been developed for silt-like materials, such as coal ash and gypsum, while standard geotextiles are best for sand-like materials.

7. Why can't we use a heavy geotextile, like a 16 oz. NW-NP, instead of the hybrid geotextile?

Heavy NW-NP geotextiles, like a 16 oz. or 20 oz., are produced as puncture protection materials and may or may not have the required structure to work as a filter. Moreover, a heavy NW-NP geotextile suffocates a geonet and deprives it of the drainage function. The CoalDrain geocomposite has the woven side of the hybrid geotextile bonded to the geonet which ensures excellent filtration as well as drainage performance.
8. **What are interface shear strength properties of CoalDrain?**
   The exposed surface on both sides of CoalDrain is that of a NW-NP geotextile. As such, the shear strength of CoalDrain against geomembranes soils and CCRs is the same as for standard double-sided drainage geocomposites.

9. **Can GSE manufacture CoalDrain with a variety of geonets?**
   Yes, GSE can manufacture CoalDrain geocomposite with any GSE geonets including PermaNet and TRx products. We anticipate the CoalDrain geocomposite with a 300 mil HyperNet UF geonet to be adequate for most of the projects.

10. **What installation instructions are necessary?**
    CoalDrain geocomposite must be installed with the hybrid geotextile facing up. This will require some instructions or signs that are supplied with the product rolls. The seaming of the hybrid geotextile can be done either by sewing or hot-wedge methods.

11. **Where can we find additional information about CoalDrain geocomposite?**
    Application sheet and data sheets are available online at www.gseworld.com. Test reports can be obtained by contacting the engineering or sales departments at GSE. The phone number to reach GSE is 800-435-2008.