GSE’s Experience

GSE’s history is epitomized by some of the lining industry’s most celebrated technical advances, boldest innovations and impressive success stories. It is not surprising that GSE has brought these same achievements to the complex business of the membrane lining of tunnels. From standard setting membrane materials and inventive leak detection systems to proven installation techniques and welding procedures, GSE has emerged as the world leader in total tunnel membrane expertise and experience. And as our commitment to excellence continues to expand to new frontiers, look for GSE to remain at the forefront of tunnel membrane technology.

GSE Waterproofing Geomembranes

The demanding requirements of today’s tunnel designs include sophisticated waterproofing membrane materials that are nonporous, chemically inert and completely waterproof. Full encapsulation of tunnels with such materials will ensure the tunnel remains dry at all times, thereby allowing for continued construction activities and an extended useful life.

A variety of tunnel geomembrane materials are available from GSE. High density polyethylene (HDPE) has seen widespread popularity as a tunnel membrane. Linear low density polyethylene (LLDPE), which has greater flexibility than HDPE, may also be used. GSE geomembranes are manufactured from the highest quality resins, carbon black, antioxidants and thermal stabilizers. Superior resins that make up GSE geomembranes are especially important in tunnel lining applications since underground deposits of hydrocarbons and methane gas can break down many other types of membranes.

To ensure every sheet meets GSE’s high standards of quality and performance, a battery of tests are conducted on the resins and the finished product before shipping. All results are recorded on Quality Assurance Certificates that accompany each roll when delivered to the site. Widths of GSE geomembrane rolls are standard 6.86 m (22.5 ft), ranging in thickness from 0.50 mm (20 mils) to 3.0 mm (120 mils) and available with a white surface.
GSE WHITE ENHANCES INSPECTION
Co-extrusion technology is behind a GSE innovation that improves visual inspection: GSE White. This state-of-the-art geomembrane is a white surfaced (HDPE or LLDPE) membrane with thickness of 0.75 to 3.0 mm (30 to 120 mil). This material provides substantial benefits to the tunnel engineer.

Damage detection is the most significant advantage. With GSE White, score marks and punctures from above or beneath are more visible than with conventional geomembranes. The result is an extra measure of leak prevention assurance. This is especially meaningful to regulators, inspectors and those concerned with the integrity of the geomembrane.

When GSE White is installed inside tunnels, the white surface acts as a light enhancer, reflecting all artificial light within the tunnel. In any application, GSE White adds to the quality and aesthetics of the installation.

GSE White meets all the material specifications of GSE HDPE and LLDPE geomembranes. This innovative, white surfaced waterproofing geomembrane technology is also available in combination with spark testable electrically conductive surfaces.

TYPICAL TUNNEL LINING SYSTEMS
All of today’s modern tunnels utilize lining systems with waterproofing geomembranes. The most widely used configuration, concrete/geomembrane/concrete, is employed for almost any type of tunnel construction. During construction the outer layer of concrete holds the tunnel open until the waterproofing geomembrane can be installed. The inner layer of concrete, which acts as the main structure of the tunnel, is then placed over the geomembrane.

WEDGE WELDING
GSE combines the most reliable membranes with the industry’s state-of-the-art seaming method. Known as “hot wedge” welding, this proven technique consists of melting opposing surfaces of membrane using a hot metal wedge. The hot wedge passes between the sheets, followed by pressure rollers which press the molten sheets together.

Nondestructive testing is also made more efficient because of air pressure testing for the “split” or “dual” track wedge of the hot wedge welder system. The dual wedge system leaves a space between two separate weld tracks which is then pressurized with air during QC testing. Continuity through the air space is ensured by the ability of the core section to hold air pressure during the test.

ENGINEERING SUPPORT
The GSE Engineering Support Staff is comprised of multidisciplinary product professionals to support you across a range of project requirements. This includes knowledge in geomembrane, geosynthetic clay liners, geonet, geocomposite, nonwoven geotextile and concrete protection products and application solutions. Rely on our technical staff to help you solve your project issues.

Custom Fabrication
The GSE Custom Fabrication Group builds products to your exact specifications. We have extensive experience in prefabricated polyethylene products and components. A few examples of our custom fabricated products are Aqua Tanks, Quick Containment, concrete protection liners, boots, sumps, pads, pipes, daily covers, temporary containment, containment boom and other products to fulfill your fabrication needs.

INSTALLER NETWORK
The GSE Installer Network leads the industry with the most experienced, large, and flexible crews available around the world to meet your installation requirements. Each installer is equipped with state-of-the-art welding and testing equipment to ensure a successful installation. Selecting a qualified installer with the right product knowledge is critical to your success. Let GSE connect you to the right installer to handle your installation project of any size from start to finish.