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Polycoat Geotextile and Polyurea Delivers A Seamless Secondary Containment Solution for 100,000-Gallon Methanol Tanks In Alaska’s Prudhoe Bay

Project: Provide 37,000 sq. ft. secondary containment lining for BP’s 100,000-gallon methanol tanks in Prudhoe Bay, Alaska. Utilize 40,000 square feet of 8-mil geotextile fabric over the entire pit area and spray 80 55-gallon drums of Polyeuro® 5502 polyurea at 80-100 mils thickness creating a seamless ground protection barrier against the possibility of any methanol leaking from the tank.

Customer: British Petroleum (BP)

Overview:

British Petroleum (BP) is one of the world’s largest petroleum companies and has one of the largest oil drilling operations in the North Slopes of Alaska. The region comes in Tundra and wetlands areas above the Arctic Circle and has very harsh climatic conditions all year round. Outside spray applications typically have only a 90 day window.

Very stringent EPA laws in Alaska requires all oiling companies to provide some type of impermeable monolithic secondary containment lining systems to prevent any fuel spill by storage tanks from contaminating the soil and ground. Environmental regulations require that such a unit must be able to hold 110% of what the vessel/tank holds.

The BP job involved lining three 350x350 foot Pits (37,000 sq. ft.) around the methanol storage tanks for the secondary containment. BP’s engineering consultants looked at various options including polyethylene sheets to address the issues but could not find one to their satisfaction. After extensive research and evaluation of several elastomeric coating systems, Polycoat Products Polyeuro® 5502 was tested and found to be the best solution for the problem.

POLYEURO® 5502
Fast Setting, 100% Solids, Aromatic
Polyurea Protective Coating

FEATURES:

- Zero VOC (100% Solids) * Seamless
- Excellent Thermal Stability * Odorless
- Low Temperature Flexibility * Meets USDA Criteria
- Good Chemical Resistance
- Coats Carbon or Mild Steel Metals without Primer
- Installed With or Without Reinforcement in Transitional Areas

POLYEURO® 5502

Technical Data:

- Mix Ratio by Volume 1A : 1B
- Pot Life @ 150°F 4-8 secs
- Tack Free Time 45-60 secs
- Recoat Time 0 – 6 hrs.
- Viscosity at 150-160°F, Brookfield
 - Part-A..... 50 ± 20 cps
 - Part-B..... 50 ± 20 cps
- Density (A & B Combined)..... 8.81 lbs/gal
- Flash Point > 200°F
- Hardness, ASTM D-2240..... 50 ± 5D
- Tensile Strength, ASTM D-412 3500 ± 200 psi
- Elongation, ASTM D-412 450% ± 50%
- Tear Strength, ASTM D-412 450 ± 50 pli
- Service Temperature -40°F to 250°F
- VOC Content 0 gm/liter
- Recommended Applied Thickness > 2mm
- Return to Service: Foot Traffic 1-4 hrs.
- Return to Service: Full Service > 24 hrs.



Polycoat Polyeuro® 5502 polyurea applied at 80-100 mils over 8-mil geotextile fabric sheets

Problem / Solution:

Working in the Alaskan Tundra weather was a real challenge. In order to span wet or swam areas, the geotextile fabric was sprayed off site, returned to the site, and then seamed in place. The contractor also had to use polyethylene reinforced sheet goods under the liner to keep the ground water from rising into the pit. They had to have 1-2 semi-tractor trailer vacuum trucks and pumps running 24 hours per day to keep up with the water inflow to the pit.

After the pits were vacuumed, the crew unrolled the 18 ft. sheets of geotextile fabric, taking care to overlap each of the seams and cover the base of the pilings that support the tank. To contain any possible leak, the fabric had to be carried up the sides of the berm, and its edges firmly secured with a 2 ft.-wide, 2 ft.-deep trench that would be covered with gravel.

To provide the monolithic membrane over the ground, a geotextile fabric was first laid out and then sprayed with Polyeuro® 5502 polyurea coating. The contractor used the Mirafi 180N Geo textile fabric which is a non woven Polypropylene fabric manufactured by Mirafi. A minimum of 80 mils (2mm) of polyurea coating was sprayed over the fabric resulting in a puncture proof seamless membrane.

Laying the fabric took several hours. While the fabric was being laid in place, another contractor pre-heated the polyurea to ready it for application in the fringed environment. The Polyeuro® 5502 polyurea spray process took several passes to give them the specified 80-100 mil layer, about half of which penetrated into the base of the geotextile fabric layer.

Polycoat Polyeuro® 5502 is 100% solids, Zero VOC aromatic pure Polyurea spray coating system. It has good to excellent chemical resistance and is used for secondary and as well as primary containment of many chemicals. The coating has been tested for the 'Glass Transition Temp' to ensure its application and performance in extreme cold environmental conditions.

Results:

The job started in July 2001, but in August the weather turned to heavy snow which presented several unique problems for the crew. Due to the weather conditions, the project was shut down and workers had to wait until the Spring of 2002 to resume the project.

The contractor also provided some expansion loops to address the problem of contraction associated with polyurea systems. The ends of the fabric were mechanically anchored in the ground at the Berms by making 2-3 feet trench and back fill with the dirt. Around the tank pillars the fabric was overlapped and firmly sealed with the Polyeuro® 5502.

After almost 12 years, the Polycoat geotextile / Polyeuro® 5502 polyurea system is still delivering its protective secondary containment barrier solution for British Petroleum's 100,000 gallon methanol tanks In Prudhoe Bay, Alaska.

