

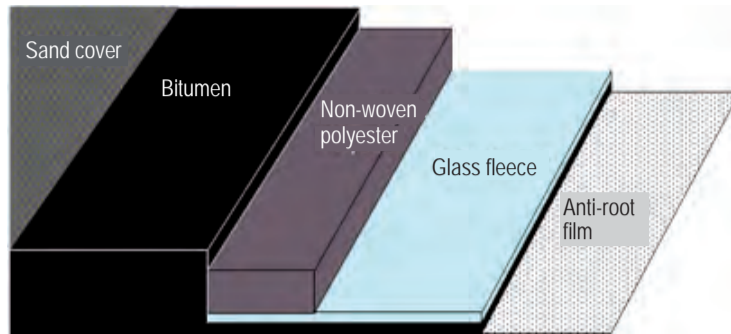
Events

- We attended Tailings and Mine Waste 2012 in Keystone Colorado on October 14-17, 2012 where we had a booth. Thank you to all who stopped at our table to chat with Bertrand
- We will be attending Geosynthetics 2013 in Long Beach, California on April 1-3 2013, Presenting 3 technical papers at a specialty session on Bituminous Geomembrane. We will be present at Exhibitor Booth 411

COLETANCHE® a manufactured product

COLETANCHE® is a robust bituminous geomembrane that does not require a protective cover such as soil or geotextile.

COLETANCHE® the subbase may consists of coarse materials, and it may be installed in windy and wet areas, under water, at altitude, and in cold climates. It has unique layered structure.



COLETANCHE® in secondary containment system

Requirements for secondary containment systems in petroleum products storage facilities vary from country to country, state to state, county to county, and even city to city. At the federal level in the USA, secondary containment system for aboveground storage tanks (AST) at terminals and refineries are regulated by the Clean Water Act as amended by the Oil Pollution Act of 1990. The requirements are detailed in the Spill Prevention, Control, and Countermeasures (SPCC) and Facility Response Plan regulations. Paragraph 112.7(c)(1)(i) recommends that the dikes and berms surrounding the facility be 'sufficiently impervious'.

Oregon, where the Willbridge terminal is located, has adopted the International Fire Code for AST's containing motor vehicle fuel. The requirements for secondary containment are detailed in the City of Portland Stormwater Design Manual (2004) which requires an "impervious floor" within all containment areas

Why choose COLETANCHE® ?

- The Chevron Willbridge Terminal, in service for over a 100 year, is located in Portland, Oregon near the Willamette River and stores refined petroleum products in 21 tanks of varying sizes and fabrication styles (from riveted to welded plates). Products are received and shipped via trucks, pipelines, and marine vessels.

Constraints	Why choose Coletanche??
<ul style="list-style-type: none"> Sandy gravel soil in yard 	<ul style="list-style-type: none"> High puncture resistance
<ul style="list-style-type: none"> No relief to grade site and existing stormwater collection system 	<ul style="list-style-type: none"> May remained exposed
<ul style="list-style-type: none"> In place pipes and numerous penetrations, pads, and footings 	<ul style="list-style-type: none"> Easy to construct boots of any size and shape
<ul style="list-style-type: none"> Limited work space 	<ul style="list-style-type: none"> Work around and under obstacles as it easy to splice
<ul style="list-style-type: none"> A piecemeal "stop and go" schedule for the liner installation 	<ul style="list-style-type: none"> No specialty installer use main contractor for full flexibility
<ul style="list-style-type: none"> Construction during wet , windy and cold season 	<ul style="list-style-type: none"> Coletanche can be installed in humid and windy conditions and by cold temperature
<ul style="list-style-type: none"> Working in lined area 	<ul style="list-style-type: none"> Typical maintenance related traffic such as pick-up trucks and small rubber-wheeled loaders acceptable



► Terminal before project began

• Chevron planned to replace two old riveted tanks with two larger tank and had per the City requirements to install an "impervious floor" over the gravelly soil.

Liner options were compared to choose the best solution in terms of Construction, Operations, and Maintenance performance, Economic, and Regulatory criteria. **Choice: Coletanche ES2**

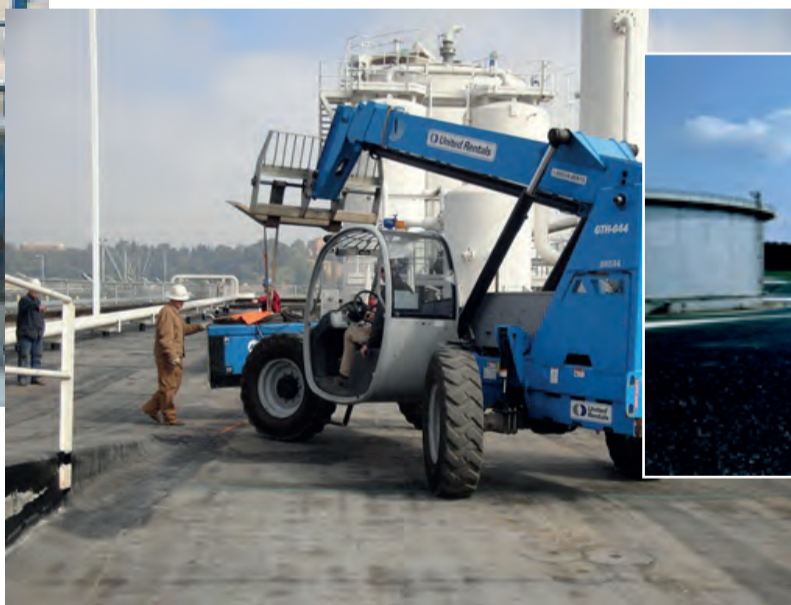


Construction



▲ Existing penetrations and obstacles

Connecting Coletanche to the concrete ring foundation of the tank ►



Loaded Telehandler driving on Coletanche ► Maintenance operations are not impacted by presence of liner



La Mède Total Refinery in France ▲ Asphalt was poured directly on top of Coletanche to provide a driving surface for heavy equipment.

Benefits



The benefits from using Coletanche rather than another flexible geomembrane are:

- Liner installation did not slow down construction activities of tanks
- Minimum earthwork was required since the geomembrane did not have to be buried
- Repairs can be performed by an on-call contractor or the maintenance people if trained.
- Liner is visible to operators and regulators
- The lined Willbridge Terminal meets or exceeds Federal, State, and City requirements

► Construction Quality Assurance
Liner installed with strict Construction Quality Assurance procedures. Each panel is numbered (red on photo) and each seam is tested with an ultrasound machine (yellow mark on photo)

Design and Construction Quality Assurance services were provided by Strategic Engineering and Science of Irvine California

