



Featured Technical Topic Summary

FGI Monthly Members Meeting

Friday, February 21, 2025



TOPIC: Use of Coatings in Conjunction with Flexible Geomembranes

Each month Tim Stark introduces a new technical topic for discussion and possible action. This month's topic is: **"Use of Coatings in Conjunction with Flexible Geomembranes"**. This topic generated significant discussion with the main "take-aways" listed below:

What are Coatings for Flexible Geomembranes?

- Discussion started with discussion of a spray applied polyurea geomembrane used for a water reservoir in Castle Rock, Colorado
- Pat Elliott showed photos of a failed polyurea spray-on geomembrane – the coating is still intact below water but not above water
- 2011 polyurea was degraded down to the underlying nonwoven geotextile
- Specified minimum thickness was 80 mil
- Polyurea outbid a 45 mil thick polypropylene geomembrane that was proposed by CLI in 2011
- Hard to CQA 80 mil thickness of a spray-on geomembrane – push stick rule in with soft geotextile underlying it makes thickness be larger so accurate measurement is hard
- Easier to check spray thickness on a concrete subgrade
- Should heat bond top of nonwoven geotextile b/c filaments can stick above spray-on polyurea so hard to determine its thickness
- Water is getting under spray-on geomembrane via seepage through nonwoven geotextile causing water bulges below the water line
- Spray-on geomembrane only lasted only 5 – 6 years and losing water
- Some of the tan polyurea is still visible where the spray was thicker and indicates significant variability in the spray-on process
- City is now going to expand reservoir and replace the polyurea geomembrane
- Polyurea did not break up into small chips; it disintegrated into dust and blew away, which means the polymer degraded due to UV exposure
- Usually a short-term coating, i.e., life-span of less than 10 years
- FGI does not recommend a coating as the only containment barrier, i.e., use only for details and penetrations
- Safety is important because of spraying chemicals so airborne and chemicals can be hazardous

How are Coatings Used for Flexible Geomembranes?

- Used to coat/seal old concrete
- Sealing concrete stairway in a water reservoir
- Use CIM (Chevron Industrial Membrane) to seal around penetrations –
- Used CIM on batten bars at El Toro Water Reservoir
- hard to remove 20 year old CIM from concrete penetrations at El Toro
- Brian Fraser – large tank ring
- 60 mil thick polyurethane to seal around numerous penetrations & attached a 60 mil HDPE GM to the spray-on polyurethane
- used 6 inch wide polyethylene cap strip to connect the geomembrane to the spray-on coating

- Used a lot at oil and gas development sites
- Also can be fire resistant
- Used a lot for methane barriers

What are Types of Coatings Used With Flexible Geomembranes?

- Polyurea
- Polyurethane = good chemical resistance to hydrocarbons
- Bitumen comprised coating
- Polyurea and Polyurethane = two most common
- CIM – Chevron Industrial Membrane = urethane – 2 part mix and mix in the field – hard to place and has good durability – has NSF approval
 - must apply a primer (clear) before CIM is applied with brush and/or roller and must be applied as temperature is declining