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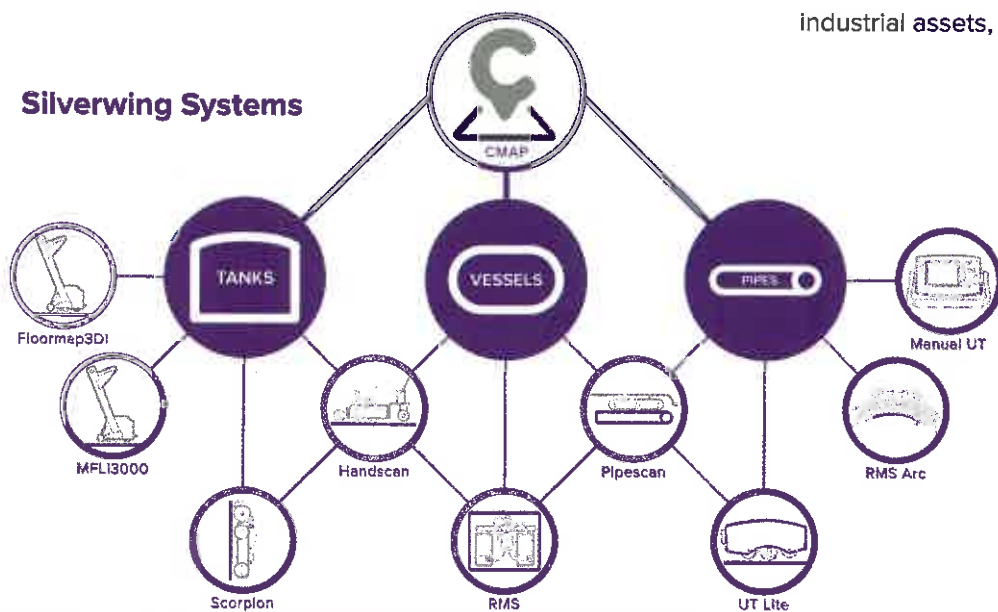
Silverwing is the leading manufacturer of NDE systems for storage tanks, pipes and vessels.

We are the original manufacturer of MFL tank bottom scanners backed by more than 30 year's experience in the MFL & UT inspection fields.

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Secondary containment

Just add water



Concrete Canvas was originally incorporated to manufacture its Concrete Canvas Shelters: a 'building in a bag.' By just using water and air, a solid building can be deployed by two people in less than two hours and is ready to use in under 24 hours. This provides a solid, waterproof and fire-proof portable structure ideal for use in remote regions such as disaster areas or war zones.

But the cement-impregnated fabric technology, Concrete Canvas (CC), soon caught the attention of the tank storage sector.

The material, which is a geosynthetic cementitious composite mat (GCCM) can be used to guard against the costly effects of wind, rain and long term degradation of terminal bunds. It can be installed up to 10 times faster than traditional methods of concrete and is much more environmentally friendly.

In October last year CC was installed at a refinery site in Washington, US, as a hard armour capping and erosion prevention method for a secondary containment berm. Industry safety protocols state that berms must maintain a minimum height in order to provide effective secondary containment, and due to erosion, the bund was no longer meeting these height requirements.

Previously, asphalt had been used to protect the berm, however this incurred high maintenance costs due to frequent re-coating every five to seven years to repair cracking, as well as patch repair work throughout the year. CC has a 50 year life-span and requires little to no maintenance, resulting in significant cost savings. Additionally CC offers a hydrocarbon resistance based on a 56 day immersion

test at 50°C and prevents vegetation growth, cutting costs and reducing the fire hazard that weeds can present. The concrete layer stops any UV degradation of the PVC backing, unlike asphalt, which cracks with long term exposure to UV, compromising the integrity of the bund.

Western Refinery Services completed the installation over a period of seven days with a team of eight. Bulk rolls were placed at the crest of the berm and spooled down one side before being unrolled down the other. This process was repeated along the berm, with a 100mm overlap being created between layers. Each overlap was screwed and sealed using 200mm self tapping screws placed at 300mm intervals and Sika 1-A sealant. On the inside of the bund, the cut edges of the CC were placed into an anchor trench before being captured with concrete paving.

On the outer edge of the bund, masonry bolts were used to fix the CC to the existing concrete infrastructure. In areas where the bund had eroded to the extent it no longer met the height requirements, sandbags were used to fill any voids before the CC was deployed.

Holes were cut for the pipes, and where needed an extra layer of CC was fitted around them and sealed. The CC was hydrated using a high volume mounted hose attached to a water hydrant.

The completion of this project has resulted in drastically reduced maintenance costs, improved impermeability and improved fire resistance of the berm.

Lagoon lining

CC's applications are certainly not limited



Completed section of bund

Spooling the CC down the bund

Secondary containment



Completed installation of a lagoon lining

to bund linings, however. In April 2014 an oil distribution terminal in the UK required an upgrade for its firewater runoff lagoon. It had reached the end of its serviceable life and had degraded as a result of 15 years of weathering, puncture and UV damage.

With a project such as this, impermeability is key. There were other alternatives for this job, such as shotcreting and geosynthetic clay liners, however the restricted site access and sensitive infrastructure prohibited sprayed concrete solutions. CC was chosen as a more cost-effective solution because it did not require excavation of the lagoon or removal of the existing liner.

CC is available in three thicknesses: CC5, CC8 and CC13 which are 5, 8 and 13mm thick respectively. CC5 is conventionally used for secondary containment applications, but due to the degree of traffic on the lagoon during cleaning and maintenance CC8 was selected in this case.

The project was completed over a nine week period, installed at an average rate of 250-300m² per day using a six man team. The CC lining will greatly increase the operational life span of the lagoon whilst significantly upgrading its permeability and fire protection, improving the overall safety and compliance of the site.

Remediation

In a similar example CC was also used to line an extinguishing lake to improve impermeability at PCK's refinery in Germany in August 2014. The original poured concrete structure had cracked, resulting in excessive water loss. Removing the incumbent basin and re-building it using poured concrete and form work

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was considered, however this would have been more time consuming and taken the basin out of operation for an extended period of time during construction.

900m² of CC was installed by five people in four days. The client subsequently instigated a bund lining trial and is planning to line a 6000m² extinguishing basin with CC. A poured concrete solution would have taken at least one month to complete, meaning a time saving of over 75%. Additionally CC needed far less labour and was more cost effective than a poured concrete solution.

What does the future hold?

CC has come a long way since it was introduced in 2005 and shows no sign of slowing down. It provides a cost-effective, fast and efficient way of maximising the life of the terminal so it is no surprise that it has now been used by seven out of the top 10 oil and gas companies in the world. S

For more information:
www.concretecanvas.com



Completed installation

U.S. EPA TANKS 4.09D:

"The TANKS model was developed using a software that is now outdated. Because of this, the model is not reliably functional on computers using certain operating systems such as Windows Vista or Windows 7. We are anticipating that additional problems will arise as PCs switch to the other operating systems. Therefore, we can no longer provide assistance to users of TANKS 4.09D. The model will remain on the website to be used at your discretion and at your own risk." -EPA Warning

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