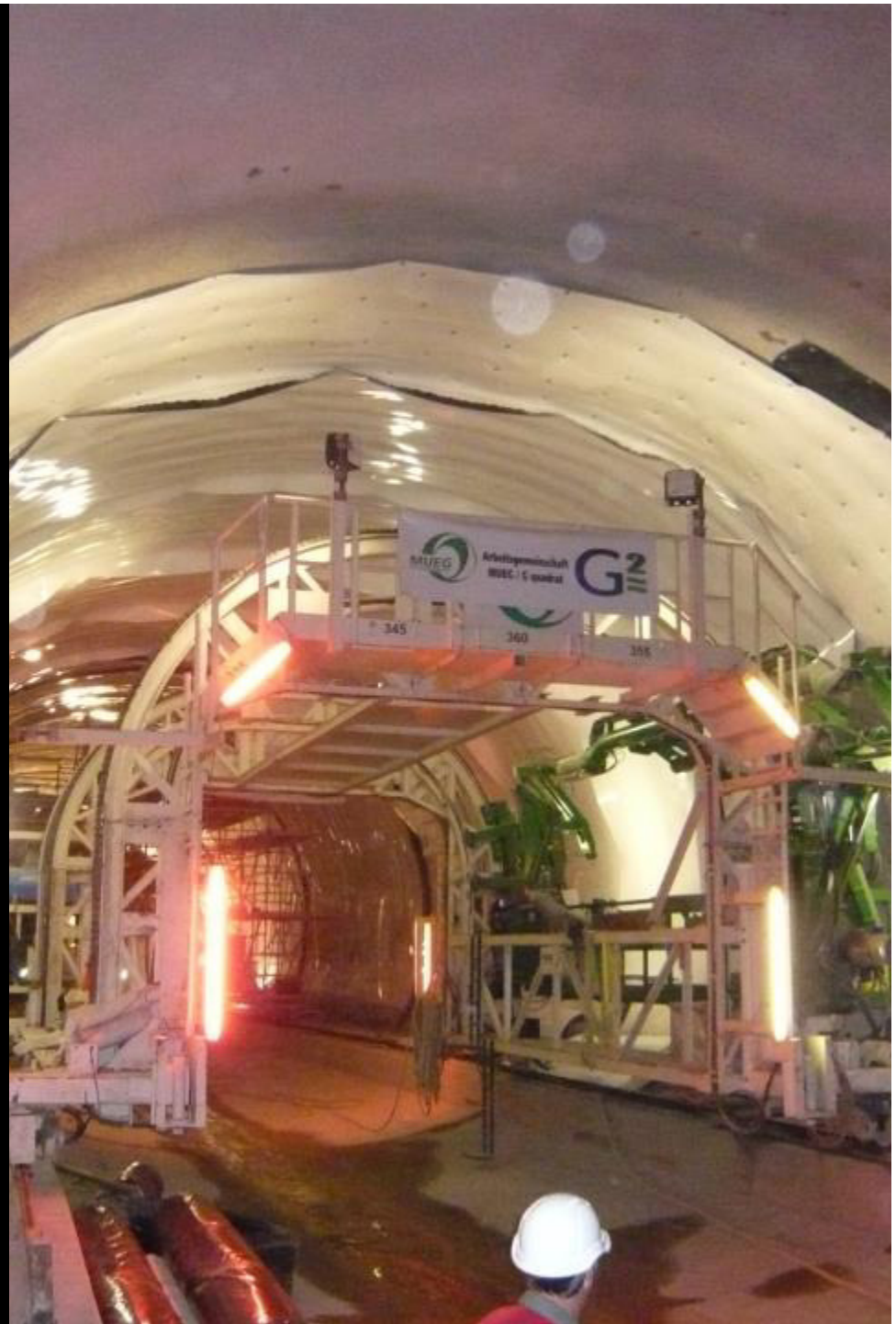




GEO Applications

FURRER Thomas
21.05.2015

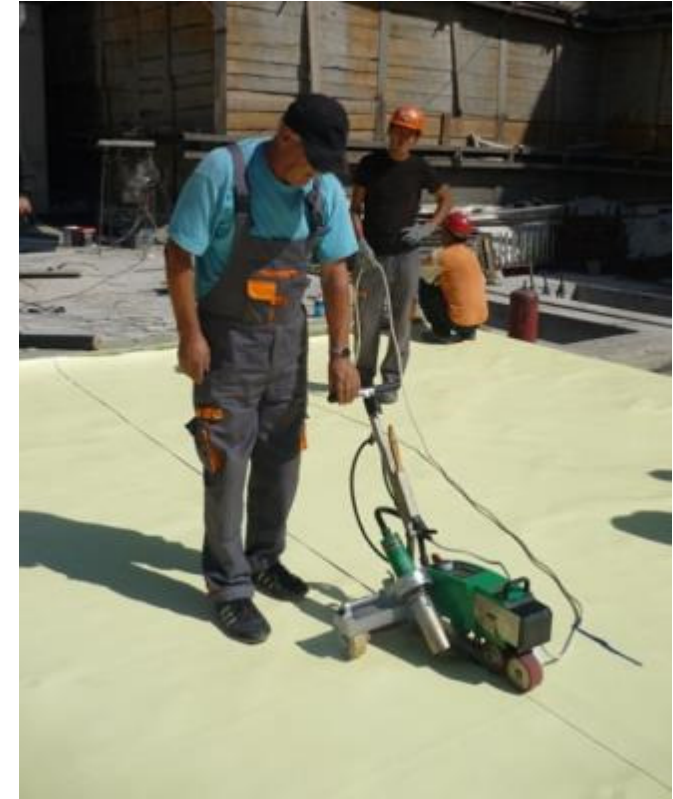
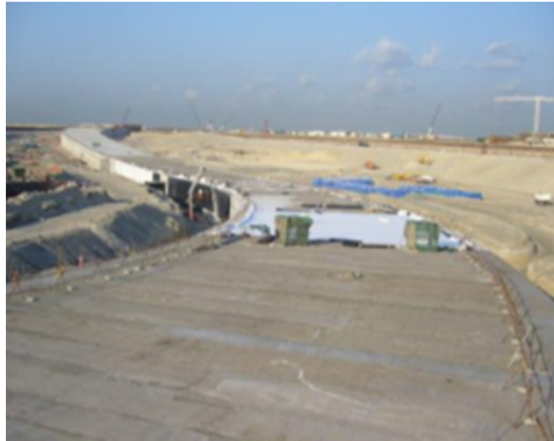


Tunnel-Sealing (underground)



<p>Description: Tunnels are sealed from inside, depends on conditions 360° or only an angel from 8h-4h. Mostly flexible membranes are used like LLD-PE, PVC-P or TPO/FPO. Depending on country and regulations membranes of 0.8-3mm thickness are used.</p>	<p>Leister-tools: Twinny S/T, Comet, Triac Drive, Triac ST, Weldplast S2-TPO/PVC</p>
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Tunnel-Sealing (open pitch)



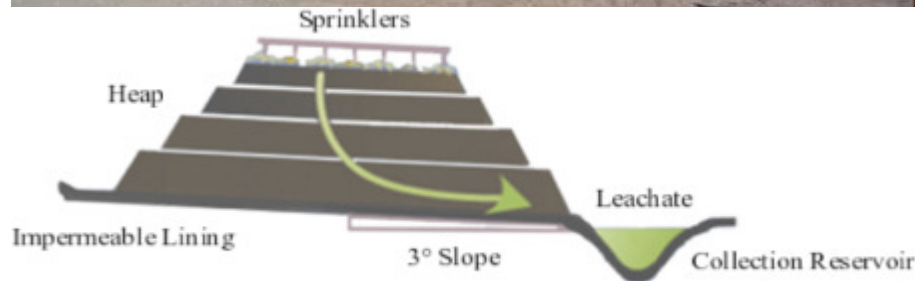
Description:

Open pitch tunnels are sealed from outside. Mostly HD-PE is used or also more flexible membranes like LD-PE, PVC-P or TPO/FPO. For the walls sometimes also concrete protection liner is used.

Leister-tools:

Twinny S/T, Comet, Triac Drive, Triac ST, Weldplast S2
Sometimes also Varimat V2

Mining (Copper, Gold,...) Heap Leaching Process



Description:

Copper, gold and other metals are obtained by using a Heap Leaching Process. For this large areas have to be sealed then gravel/crushed stone are stored on and flushed using sprinklers with chemical liquids. The chemicals dissolve out the metals. In a follow-up process, the metal is recovered from the liquids.

Materials: HDPE 1.5-2.5mm

Leister-tools:

Geostar, Astro, Comet
Weldplast S4/S6, Fusion 3
Triac AT/ST
Examo

Salt mines



Description:

In salt mines large pools are built which are flooded with salt water. After evaporation only the salt remains . This process is repeated several times.

Materials: HDPE 1.0-1.5mm , PVC - P 0.75-1.5mm

Leister-tools:

Geostar, Twinny, Comet
Weldplast S4/S6, Fusion 3
Triac AT/ST, Examo

Welding or tacking of geotextiles



Description:

As a mechanical protection for the geomembranes or as drainage geotextiles are used. In order for the fabrics to remain in the right place and not slip away they are welded or tacked. This happens in overlap welding or tacking. Geotextiles are water-permeable fabrics made of PA, PP etc.

Leister-tools:

Twinny S/T,
Triac AT/ST

Landfill (basic sealing)



Description:

Landfills are usually sealed at the base with slanting side walls. Most these are single layer, sometimes also double layer, in combination with geotextiles and bentonite or clay under the membrane. Additionally there are also normally connections like tubes, gas wells and so on. to evacuate landfill gas or water.

Example: 2014 Landfill Durban , South Africa Material: HD-PE 2.0mm

Leister-tools:

Geostar, Astro, Comet,
Twinny
Triac AT/ST, Examo

Landfill caps



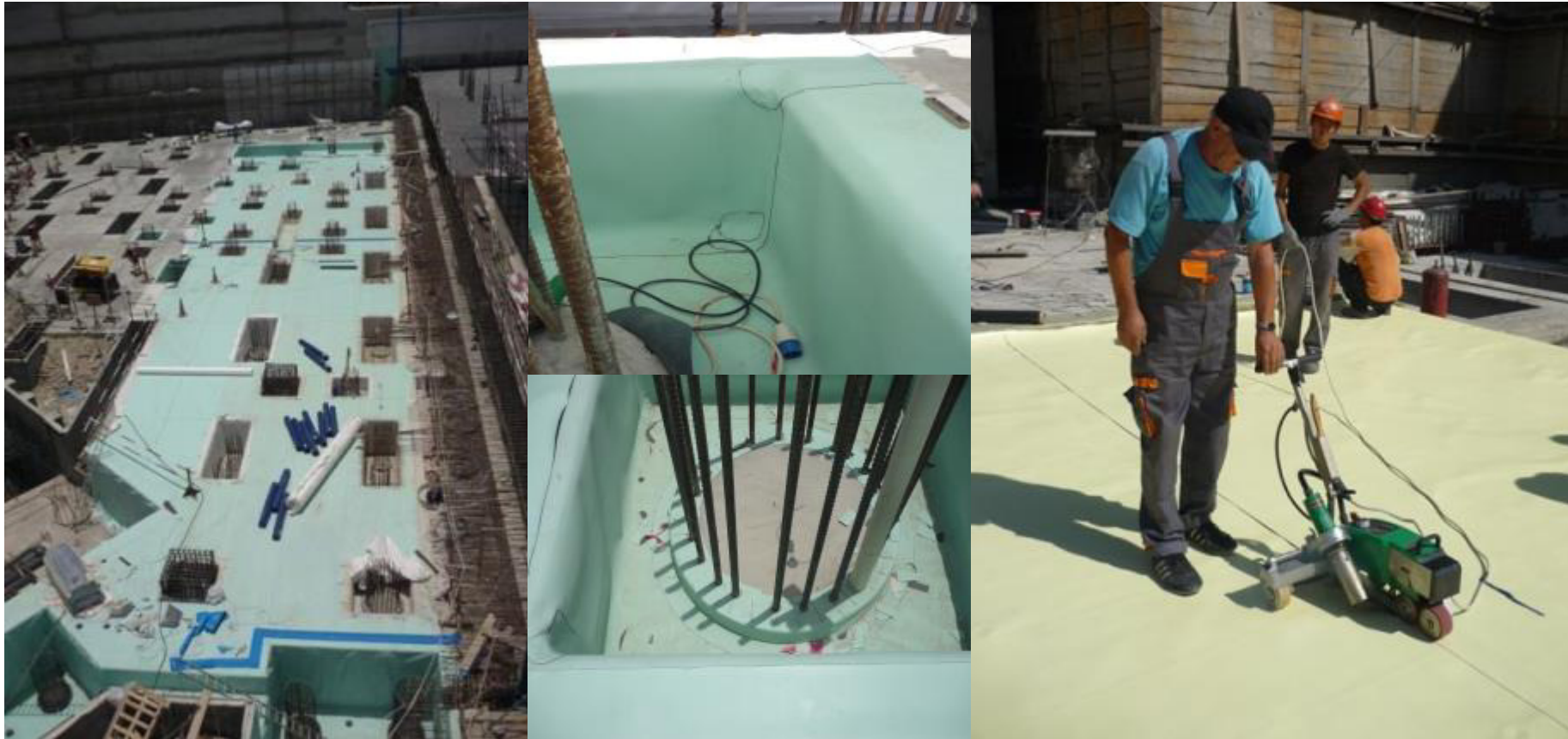
Description:

If the landfill is finally filled it is sealed with a surface seal (landfill cap) so rainwater can't wash out more toxic substances. After that, the hills are often planted to improve the optical look. Material: HD-PE 1.5-2.5mm
Example: left Landfill NL and right landfill UK

Leister-tools:

Geostar, Astro, Comet,
Twinny
TriaC AT/ST, Examo

Sealing of foundations



Description:

Buildings are protected against groundwater. For this they are sealed under the main fundament. This is usually done using costly handwork.

Materials: PVC-P , TPO , PE-VLD

Leister-tools:

Triac AT/ST, Triac Drive, Twinny S/T, Uniplan or Varimat

Welding of water stop profiles



Description:

Water stop profiles are used to seal concrete expansion joints. This is needed in tunnels or in foundation seals.

Materials: PVC-P , TPO, PE-VLD

Leister-tools:

TRIAC DRIVE AT/ST

Handextruder

Triac AT/ST

Floor sealing of factories and warehouses.



Description:

In industry and commerce, the floors are quite often sealed. This is for groundwater protection and also against rising gases from the ground like Radon.

Materials: HDPE , partly multi-layer membranes made of aluminum and plastics, PVC or HDPE membranes.

Example : 2014 Germany Aldi warehouse HDPE 3.0mm

Leister-tools:

Astro, Geostar,
Weldplast, Fusion 3,
Examo

Sealing of dams and walls



Description:

Old dams are refreshed by sealing from the wet side. Most often this is done with PVC membranes. They are welded by hand with Triac.

Example Silvretta reservoir in 2010

Material: PVC 2.0mm from Flag.

Leister-tools:

Triac ST/AT
Triac Drive AT
Examo

Sealing of rivers



Description:

Worldwide large hydro projects are under construction. Sometimes rivers are sealed over hundreds of kilometers.

Materials: HDPE, PP , PVC etc. 1.0-2.0mm

Pictures source: Carpitech, Internet

Project: 2012 water Tekapo Canal, New Zealand

Leister-tools:

Twinny, Comet
Weldplast S4, FUSION 3,
Examo, Triac

Lakes – Water storage for snow making machines



Description:

In order to provide the ski resorts with snow, the snow-making equipment needs a lot of water. For that reason reservoirs are built.

Materials: LDPE , PVC - P , TPO , HDPE etc.

Example : 2009 Arosa, Switzerland

Leister-tools:

Comet, Twinny S/T
Weldplast S2/S4, Fusion 3,
Examo
Triac AT/ST

Lakes for agricultural watering



Description:

In dry areas reservoirs are needed to supply the agricultural irrigation systems.

Materials: HDPE 1.5-2.0mm

Example : 2014 Tunisia

Leister-tools:

Comet, Twinny S/T, Geostar
Weldplast S2/S4/S6,
Fusion 3, Examo
Triac AT/ST

Lakes for potable water - Reservoirs



Description:

Big cities are needing a lot of drinking water. For that reason often lakes are build.

Example: Water reservoir Columbus Ohio US 2012

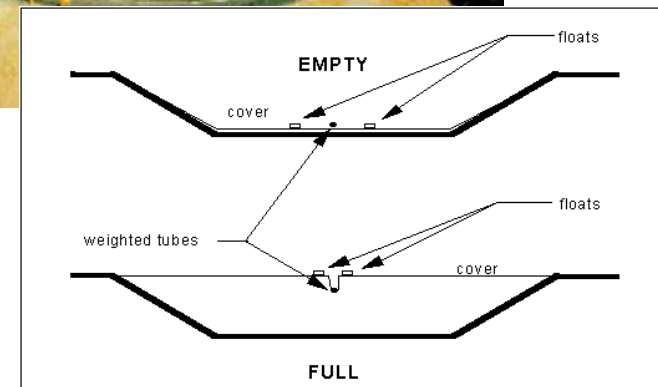
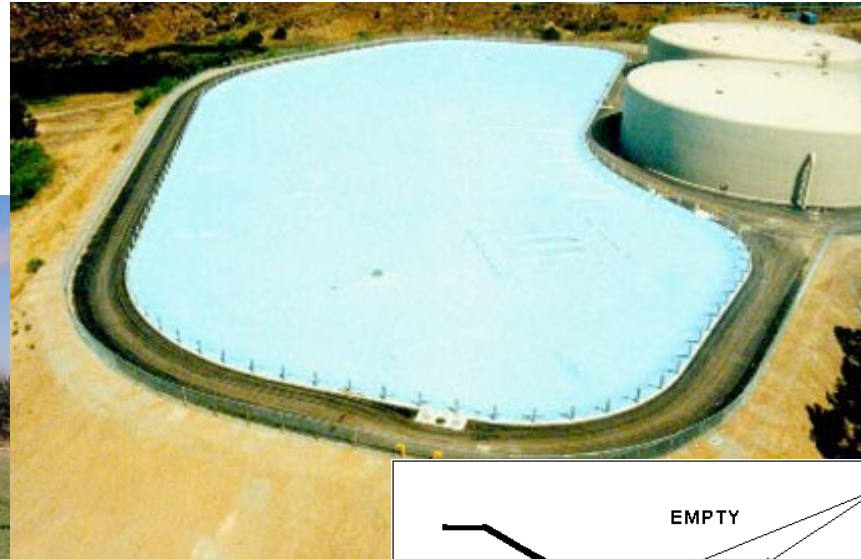
Photo: Internet source

Material: PP Firestone 40 mil (1mm), 3.4km²

Leister-tools:

Comet, Twinny T,
Triac AT/ST, Examo

Floating Covers



Description:

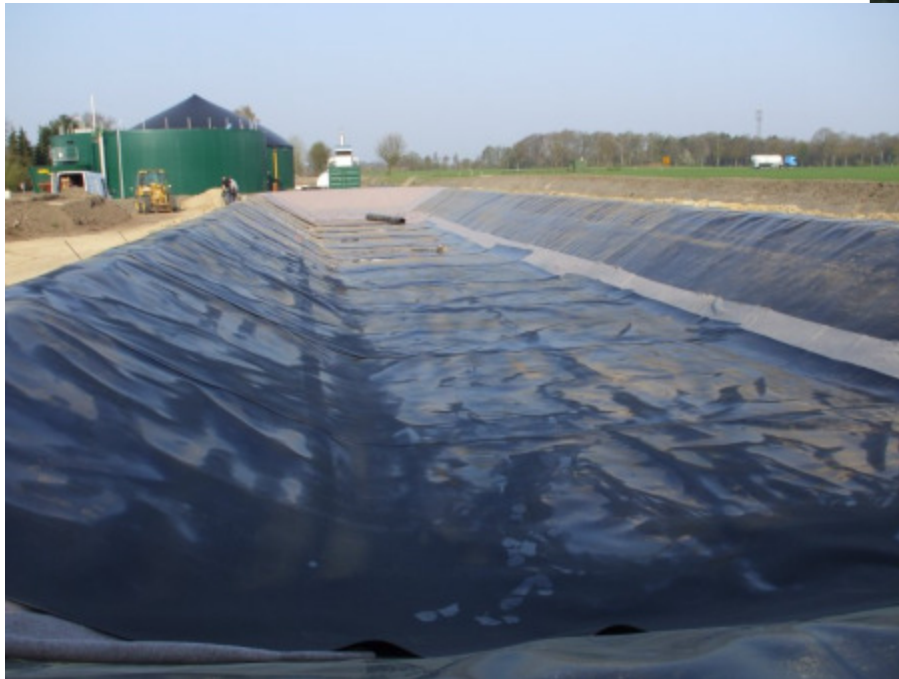
Drinking water basins are covered to protect them against contamination (rain, animals, dust, and so on). This is done with membranes which are stretched or floating on top of the water. Depending on the version, the installations can be rather complicated. Partly 3inch wide welds are required.

Materials: PVC - P , PE - LD , etc. Picturer: Source Internet

Leister-tools:

Twinyy, Comet
Geostar
Triac AT/ST

Slurry ponds (animal waste)



Description:

Because where animals are kept in stables, the manure is collected in storage tanks and used as fertilizer spread over the fields. In some counties the slurry is used for bio gas.

Materials: HDPE 1.5-2.5mm

Example: Animal waste containment Germany

Source: www.erdbecken.de

Leister-tools:

Comet, Twinny S/T

Weldplast S2/S4, Fusion 3

Examo

Triac AT/ST

Parks and Gardening



Description:

In Parks and garden design often artificial lakes and rivers are created. The substrate must be sealed.

Materials: HDPE, PP, PVC etc. 0.5-1.5mm

Picturers: left side park in Chennai India 2009, right: Internet

Leister-tools:

Twinny, Astro
Weldplast S2/S4, Fusion 3,
Examo
Triac AT/ST

Swimming Pools, Swimming ponds



Description:

Swimming ponds are a mix between habitats and swimming pool. One zone is used for swimming while another zone is used for landscaping. These are also sealed with welding machines which can operate independently of ground surface.

Materials: PVC-P , EPDM , LDPE etc. 0.8-1.5.mm

Images : Source Internet

Leister-tolls:

Twinny S/T, X84

Triac AT/ST

Artificial Lagoons



Description:

The company realized crystal-lagoons.com artificial lagoons incl. hotel properties worldwide .
On the wild coast where swimming is not possible tourism can be developed. This means that large areas must be sealed .

Materials: HDPE and LLDPE 0.75 mm 1.0mm

Example : Cristal Lagoons Chile 2008

Leister-tools:

Twinny T/S

Fusion 3

Examo

Triac AT/ST

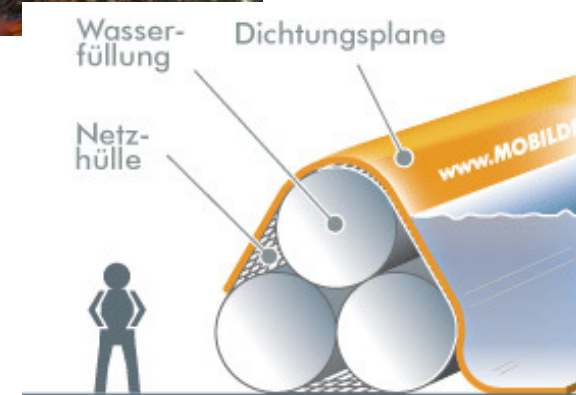
Secondary containment



Description:
Our example shows a secondary seal for an oil storage plant. Mostly this is done with HD-PE 1.5-2.5mm or similar materials. Many connections are needed requiring much detail work by hand. Some of the tanks are also lined with membranes inside.
Example: Venezuela 2009

Leister-tools:
ASTRO, COMET,
TWINNY S/T, Fusion 3/3C,
WELDPLAST S4/S6
EXAMO, TRIAC ST

Temporary dikes and water barriers



Description:

As a temporary flood protection plastic tubes are filled with water, stacked and partially covered with additional membranes. These are all pre-made products. Task forces (army, civil defense, fire fighters etc.) are the users. The products are manufactured indoor.

Materials: PVC-P , TPO, PUR etc.

Pictures : Source Internet mobildeich.de

Leister-tools:

Twinny S/T
Comet
Triac AT/ST
Examo

Biogas farms



Description:

To produce biogas slurry tanks or silos are covered with membranes.

Materials: LD -PE 0.5-1.0mm or other materials

Example: left Vietnam in 2014 , right above: Germany, bottom right: Pakistan

Leister-tools:

Twinny, Fusion 3

Triac ST/AT

Algae production



Description:

A fast-growing business is the production of algae. Algae are required for bio- fuel, food additives or cosmetics manufacture. There are various methods, one of them needs big ponds.

Materials: HDPE , LDPE etc. 1.0-2.0mm; Pictures: source Internet

Leister-tools:

Astro, Twinny, Comet,
Weldplast S2/S4/S6,
Fusion 3, Examo
Triac

Shrimps and fish farms



Description:

Industrial food production is booming in some, mainly Asian countries. For shrimp and fish production tanks or ponds are used.

Materials: HDPE 0.65-1.0mm, LD-PE 0.75-1.0mm

Example: Malaysia 2014

Leister-tools:

Twinny, Comet, FUSION 3

Triac ST/AT

Green houses



Description:

In agriculture often foil tunnels are used. Depending on the standard, the films have to be welded and partly repaired.

Materials: LDPE 0.3-0.8mm

Pictures: Source Internet

Leister-tools:

Twinny S/T

Triac ST/AT

Temporary food and grain storage



Description:

Grains often have to be stored between harvesting and further processing. This can be done by using simple film packaging, this can be realized at low cost. On the market you can find complete systems or it can be done with very basic technology.

Materials: LD -PE 0.5-0.8mm

Pictures: Source Internet

Leister-tools:

Twinny S/T

Triac AT/ST

Cool applications ?



Do you know more cool applications?
Please let me know, it would be a pleasure to enlarge
this collection.

→ thomas.furrer@leister.com

Thank you!

LEISTER

Thank you!

21.05.2015

Furrer Thomas

Head of Business Line Geo

