LEISTER

PLASTIC WELDING

Success Story

October 2013

Civil engineering

"Second" Louvre in Abu Dhabi, UAE

Museum construction with Leister

The island of Saadiyat off the coast of Abu Dhabi in the United Arab Emirates is expanding to become a cultural center for locals and tourists. The „Louvre Abu Dhabi", the first of several museums, will be constructed by 2015. The ambitious project from the French star architect Jean Nouvel will have a large white dome with a diameter of 180 meters that covers the building like a canopy of foliage. Since the entire complex will be in the water, the sealing system in the subsoil will be of significant importance.

Sophisticated system design

The Abu Dhabi Louvre will be surrounded by water. The grounds will not be flooded until after the completion of the construction. Therefore, protecting the cement foundation is the highest priority. To ensure water-tightness, a two-layered system was selected. A 1.6 mm thick Sikaplan on a TPO basis will be used as the lower geomembrane. The two meter-wide geomembrane is connected with the TWINNY S welder from Leister. This machine welds a double seam with its special nozzle. This way, after the welding process, the water-tightness can be tested in the groove created between the seams using a testing needle and compressed air.

Sector-by-sector welding

The upper layer of the system consists of Sikaplan TPO 2.5 mm. As with the lower layer, it is first connected track-by-track and then welded to the lower layer at the edges sector-by-sector. This tasks is handled by the VARIMAT V2. The high-performance hot air welder from Leister welds with a peak speed of up to 12 m/min. With its „e-Drive" control unit, all of the relevant welding parameters can be controlled and saved. The air between the two connected layers is removed. A vacuum is created. Later, installed sensors monitor the air-tightness.

Overview of the sealing system.

"Waterstops" for additional safety

So-called waterstops are laid on the two already installed layers as a third safety measure. This allows the safety of the construction to be additionally increased. They are welded on to the geomembranes in defined sectors. They prevent additional dispersion of water than may get in. The following applies: The more sectors that are planned and thus the more waterstops are used, the smaller the surface that will need repair if water gets in. The waterstops are processed using the TRIACE DRIVE AT from Leister. The easy-to-handle semiautomatic welder is equipped with hard steel rollers especially for this application. This way, the relatively rigid

tapes can be welded on with enough pressure on the geomembranes below.

All details are welded with TRIAC AT hot air hand tools.

Preparation is decisive

With these three measures – connecting the geomembranes with a double welding seam, vacuum between the two system layers and the use of waterstops – absolute water-tightness is achieved. Without a clean seam preparation, perfectly welded seams are not possible. Under such conditions as those here in Abu Dhabi, the seam areas absolutely must be cleaned prior to welding. All of the seams are cleaned meticulously with T-Prep. In addition to the dust, the unstable power supply at the construction site leads to problems. To prevent voltage fluctuations and be able to weld continuously, a power supply that is not connected to the grid is used.

Details by hand

The cement beams that jut from the foundation are encased with 1.6 mm and 2.5 mm Sikaplan TPO and connected with the sealing system. The laying crews use the reliable hot air hand tool TRIAC AT from Leister for this task and the many details throughout the entire system. It is excellently suited for outdoor use. The set temperature reaches its level automatically and voltage fluctuations are compensated. In addition, the thermal probe installed upstream from the heating element guarantees precise, constant temperatures.

Welding of the upper layer with Leister's VARIMAT V2.

Achieving an ambitious mission by using Leister

In total the laying crew processes 250,000 m^2 geomembranes. This results in a welding seam length of 150,000 m (!). There's no question: In such a large project, the laying crew must be able to trust to the reliability of the welding machines, especially since very harsh outdoor conditions prevail here

in Abu Dhabi. By using Leister equipment, the laying crew not only has a guarantee of working with the absolute, most reliable tools. – It also has a partner nearby in the Leister Sales and Service Office BMC Gulf which can quickly provide assistance at any time in severe cases. Only Leister has such a dense network of excellently trained specialists with over 120 branch offices worldwide.

The ambitious project Louvre Abu Dhabi.

Project:	Louvre Abu Dhabi
Geomembrane:	Sikaplan TPO, double layer.6 / 2.5 mm and waterstops
Installer company and Leister Sales Partner:	BMC Gulf Traiding LLC, Dubai, www.bmc-plasticwedling.com
Equipment manufacturer:	Leister Technologies AG, Switzerland, www.leister.com
Text:	Christophe von Arx, Leister AG
Photos:	BMC Gulf

Leister devices in use

VARIMAT V2

- 12 m/min maximum welding speed
- Ergonomic handling
- User-friendly display with “e-Drive” (press and turn control) to recall preset and saved welding settings
- Constant drive with regulated electronics

TWINNY T

- Simple operation
- High welding speed
- Digital display of temperature and speed
- Closed-loop control of temperature and drive

TRIAC DRIVE AT

- More consistent and up to three times faster than manual welding
- Unique semiautomatic welding tool
- Automatic welding in areas inaccessible to other tools

TRIAC AT

- Suitable for the work site
- Closed loop controlled temperature
- Open loop controlled air volume
- Intelligent «e-Drive» operating unit
- Ergonomic handling
- Modern design

LEISTER®

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