Lutz-Jesco Journal

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SALT WATER LIGHT® in Obernkirchen

Isotonic adjusted Swimming Pool Water

An appropriate Pump Selection is crucial

Enlarged Training Program 2006

Water - Precious Good

Dosing Conveying Control | *Liquids Gases Systems*

Isotonic adjusted Swimming Pool Water at Sonnenbrinkbad

Sonnenbrinkbad in Obernkirchen (Schaumburg County) counts on the Technopool flow-through electrolysis process SALT WATER LIGHT® and metering technology from Lutz-Jesco GmbH.

Flow-through electrolysis process

This process – as it was customized for the Sonnenbrinkbad in Obernkirchen by Technopool Schwimmbadtechnologie GmbH – allows for swimming in light salty water. The aim is not to strive for the highest possible concentration of salt in the pool water as it is done at sea water pools and/or brine spas, but to adjust the salt content to a concentration optimal for human beings. Salt (NaCl), as we know it from our daily life is added to the pool water and dissolves. When the pool water circulates through the flow-through electrolysis cell as part of the water conditioning system, this dissolved salt is used to generate hypochlorous acid (HOCl), an effective disinfectant. And since no pure chlorine (Cl_2) is involved anywhere in the process, pool owners and operators don't have to bother any longer about storage, transportation and handling of hazardous chlorine substances.

Due to the design of the electrolysis cell and the direct use of pool water for the generation of hypochlorous acid, with the simultaneous occurring of an "anodic oxidation" another strong disinfection potential can be used. This double disinfection effect can be seen only with the flow-through electrolysis in swimming pool water. The coincidence of these two disinfection methods explains the high reduction-oxidation-potential of the swimming pool water, an indicator for the water's power to destroy germs.

Two Technostar 4000AT saltwater systems with the appropriate electrolysis cells are applied in Obernkirchen.

Sonnenbrinkbad Obernkirchen

The outdoor pool Sonnenbrinkbad consists of three pools - one for swimmers, one for non-swimmers and one for children – with a total volume of 2,000 m^3 and a total water circulation of 200 m^3/h.
Applied are two flow-through electrolysis systems model Technostar 4000AT as well as one cleaning station ABS 4000.
Both Technostar 4000 AT systems together generate a disinfection performance of 2,000 gram Cl_2 per hour. The integrated electrolysis cells are applied in DC mode that means power runs only in one direction. Lime residues arising at the cathodes are automatically removed by cleaning station ABS 4000.

Measuring and Control Technology

In order to identify and adjust the hygienic status of the pool water, parameters as free/residual chlorine, pH value and reduction-oxidation potential have to be measured and controlled. All the instrumentation required to do so is provided with the water sampling station PM01 as manufactured by Lutz-Jesco GmbH.
This sampling station hosts also a sensor that measures the pool water's salt content. If necessary, i.e. after the replacement of pool water with fresh water, the sampling station controls a dosing pump to add high concentrated brine from a supply tank, thus the salt concentration of i.e. 0.4% is kept steady. This salt, dissolved in the pool water, is consumed during the electrolytic process. Hypochlorous acid as the product of this process disinfects the pool water. The power for the electrolysis is controlled via the measured concentration of free chlorine, which depends on the pool water's load of germs and bacteria. The Technopool system generates only as much disinfectant as actually needed. That is, why it is so gentle on the skin and less irritating to the mucosa.

Environmental-friendly Alternative

The Technopool process SALT WATER LIGHT® applied in Sonnenbrinkbad in Obernkirchen is free of hazardous substances and thus an environmental-friendly alternative to conventional disinfection systems, combined with a feeling of comfort for pool users.

Please contact us for further information on the Technopool process SALT WATER LIGHT®.

A solenoid driven dosing pump MAGDOS LT is applied in conjunction with the multi-function valve PENTABLOC for the adjustment of pH value.

An appropriate Pump Selection is crucial

Lutz-Jesco was notified by customer NALCO Deutschland GmbH about a pump failure at one of its end-users' plants. An immediate visit at the site lead to the following diagnosis: the applied dosing pump, brand: Lutz-Jesco, model MAGDOS E12 was destroyed at the dosing head, due to a clogged discharge valve. The dosing pump was part of a shredder plant that prepares car wreckages for further recycling. It was located outdoors in a heated cabinet. The dosing system operated pressurelessly into an open reservoir with no injection nozzle applied.

Destroyed solenoid-driven diaphragm dosing pump MAGDOS E.

The cause was obvious: the hardening of the metered anti-foaming agent NALCO 71D5 PLUS in the discharge valve. The NALCO datasheet lists 20oC (68oF) as storage temperature for the anti-foaming agent. NALCO advises about the hardening of its product below this temperature. However, in cold weather conditions the product's temperature dropped below that required temperature when traveling from supply tank to dosing head, even with the heated cabinet. The solenoid-driven dosing pump was applied without any safety device (i.e. pressure relief valve). Excessive pressure was built up in the dosing head, due to the clogged discharge valve. The temperature difference between the inside and the outside of the plastic dosing head added further stress that lead finally to its destruction.

Two different dosing pumps were available to avoid the hardening of the anti-foaming agent inside the discharge valve in the future, both equipped with a heated stainless steel dosing head.

1. Model MEMDOS E
   a motor-driven diaphragm dosing pump with gear drive and infinitely adjustable stroke length from 0-100% in sturdy industry quality
2. Model MAGDOS LT
   a solenoid-driven diaphragm dosing pump with a powerful stroke solenoid in simple industry quality (similar to the MAGDOS E12, applied so far)

The metering accuracy of diaphragm dosing pumps is dependent on the system back pressure, especially in the range of up to 1 bar (14.5 psig). If dosing pumps are operated in pressureless systems, uncontrolled and excessive discharging may occur, due to the momentum of the accelerated process fluid (siphoning effect). Furthermore, dosing pumps must be protected from overpressure (i.e. generated by clogged discharge valves or discharge lines).
In order to make the chemical feed system work more efficiently and safer in the future, it is advisable to add a back pressure valve and a pressure relief valve, when installing the dosing pump. These two functions are covered with the offered multifunction valve PENTABLOC. Its integrated pressure relief valve has been set to 5 bar (72.5 psig), the back pressure valve to 3 bar (43.5 psig). With PVDF as the material of construction the process fluid temperature of 40°C (104oF) has been taken into consideration.

The customer chose the more sturdy, yet more expensive option:
Motor-driven diaphragm dosing pump MEMDOS E15 with stainless steel head, equipped with heating, stainless steel double-ball check valves DN4 and multifunction valve PENTABLOC in PVDF with stainless steel union nut.
Since the installation of the new dosing pump and the multifunction valve does the anti-foaming agent dosing system work flawlessly, even at deep outside temperatures.

Conclusion: the least expensive option is not always the best. Therefore: ask the experts from Lutz-Jesco for advice, if you face challenging dosing tasks!

Now applied: special MEMDOS E with heated dosing head.

Enlarged Training Program 2006

As in the past, in 2006 Lutz-Jesco will offer a number of praxis-oriented german seminars regarding swimming pool technology and industrial applications.
For further information concerning a specific seminar please contact us directly. Let us know, if we can support you with a seminar held in English.

- Stuttgart, Jan. 30 - Feb. 01, 2006
  Metering Technology:
  Dosing – Conveying – Controlling
- Wuerzburg, Feb. 23, 2006
  Lutz-Jesco Seminar
  "Pumps in the Industry"
- Mecklenburger Seenplatte,
  March 09 - 10, 2006
  Lutz-Jesco Seminar
  "Swimming Pool Technology"
- Oberhausen, March 24, 2006
  Technopool Seminar
  "Hazardous-free Disinfection of Brine Pools"
- Sauerland, March, 30, 2006
  Lutz-Jesco Seminar Electro-plating Technology
- Bergisches Land, Sept. 07, 2006
  Lutz-Jesco Seminar
  "Fighting of Legionella"
- 800 m down in a pit, Sept. 14 -15, 2006
  Lutz-Jesco Seminar
  "Planning a Pool – Fit for the Future"
- Koblenz, Oct. 26, 2006
  Lutz-Jesco Seminar
  "Swimming Pool Technology"
- Wedemark, Nov. 28 - 30, 2006
  Metering Technology:
  Dosing – Conveying – Controlling

Water – Precious Good

Neutralization plants contribute to the reuse of water

Today almost all industries are affected by regulations that become more and more restrictive, from the mid-size electro-plating company to the chemical industry to the waste management: No matter, whether it concerns the discharge of wastewater into the public sewage system and so the transfer to a wastewater treatment plant, or a company receives permission to drain directly into public waters, legal limits become tighter and tighter. While a majority of old wastewater treatment plants struggle to reach those legal limitations set by the German Federal Water Act (WHG), new plants treat wastewater accordingly that it may even be reused, i.e. as water in boiler systems.

Germany's waste management industry is forced – according to most recent regulations – to incinerate all waste that can not be reused or recycled. Since waste is in general not dry – it contains all kinds of liquids – different wastewaters arise throughout the waste handling process. Although a great part of the moisture evaporates during the incineration process, enough wastewater arises that can't simply be dumped into the public sewage system.

How can those wastewaters be handled?

How can those liquids ever be used again?

Let's focus primarily on the treatment of such wastewaters. Most important, those aggressive wastewaters have to be stored in containers appropriate for the task. Such containers can be made from different materials, i.e. plastics as PE and PP or from concrete or steel that are coated with protective materials. When planning a storage system, it has to be paid attention that the containers are appropriate in size. Containers should always be oversized to accommodate for a buffer volume, taking the process time into consideration. This buffer volume doesn't include the treatment volume. Treatment tanks are kept separate to accommodate the neutralization process.

Pre-Treatment

In order to design and size a treatment process, the chemical composition of the wastewater should be determined. Depending on the wastewater's content, certain process steps are required to treat the wastewater, i.e. a decontamination unit, a precipitation unit, etc. Chemicals as coagulants and flocculants are added to the wastewater that is processed through a chain of treatment units as rapid settling tank, filter press, sand filter, activated carbon filter and centrifuge.

At the end of this process stands the neutralization of the wastewater's pH value. It is important that the measurement and control technology is capable to work in an automatic two-side control mode that doesn't require any manual assistance. Lutz-Jesco GmbH has developed the controller TOPAX Industry for exactly such a situation. The controller monitors – with the support of pH sensors – the wastewater's pH value and controls the addition of acid and lye. TOPAX Industry plays a key role for a well functioning treatment plant.

The addition of chemicals happens to 95% by the means of diaphragm dosing pumps, model MAGDOS DE/DX or model MEMDOS DX. Important for an effective neutralization is that during and after the adding of chemicals turbulent conditions exists in the process tank. If the installation of turbulences generating devices is neglected, the mixing of wastewater and chemicals may be partial and may result in an excessive use of chemicals. Mixers are an effective means to achieve those conditions. TOPAX Industry is equipped in such a way that a process can not only be controlled, but also important process parameters (i.e. pH value) may be recorded. In order to do so, pH values measured by sensors are amplified and forwarded to a recording device. A continuous recording is important to proof the flawless operation of a treatment plant to authorities.

Once the neutralization process has been completed, the process tank should be emptied as soon as possible, thus it can be refilled with another charge of non-treated wastewater. A quick discharge of the treated wastewater to a public sewage system or to a post-treatment storage tank is crucial in order to avoid distractions or even the ceasing of the main process, the incineration of waste. Centrifugal pumps support a fast and uncomplicated discharge. Their sizing is based on the parameters capacity and head.

Chemical feed station with MEMDOS diaphragm dosing pumps and a pulsation dampener for the almost pulseless dosing of chemicals.

Maintenance personnel are – among others – in charge of monitoring the different processes including the calibration of the measuring process. Furthermore the supply tanks have to be checked regarding the remaining volume of acid and lye. This monitoring could also be performed by suction lines with level switches or by programmable logic controller (PLC) technology.

A properly operating neutralization plant is paramount for continuous monitoring and controlling of parameters applied by the German Federal Water Act (WHG). If the specific parameters for water and wastewater are not within the legal limitations, chemicals can easily be added as required. Stable parameters are most important for the reuse of the treated wastewater.

The Lutz-Jesco Team would like to assist you, if you have questions regarding above topic.

Controller TOPAX Industry

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