



Washing water treatment system

The challenge

Water is becoming an ever-scarcer resource. It is a basic necessity for all life and is also used in a wide variety of production processes. However, washing water that has been used to clean workpieces in machining processes may contain contaminants such as emulsion drilling fluid. When the washing medium has reached its maximum level of saturation, no more contaminants can be absorbed. The dirty, unusable washing water is not allowed into the sewer system, and so, up to now, it has been collected and removed by special disposal companies.

The solution: Washing water treatment

Kunststofftechnik Weißbach GmbH, in collaboration with other companies, has developed an innovative approach for the treatment of contaminated washing water in a system using electrolysis. The OH radicals produced in the electrolytic process destroy the hydrocarbon groups in the emulsion drilling fluid as well as other organic components in the washing water. The sole waste product is CO₂. This means the washing water does not have to be disposed of; instead 100% of the washing water can be returned to the production circuit. This cuts costs and protects the environment.



The functional principle

The dirty washing water is first fed into the system's dirty water tank. A screen skims off coarser dirt particles, and oil floating on the surface is separated off. The emulsion is then pumped into a recirculation tank. As soon as a predefined level is reached in this tank, a pump forces the emulsion through two electrolytic cells. There, the individual diamond electrodes in the electrode stacks are supplied with current, which triggers an electrochemical reaction in the medium. This reaction results in the decomposition of oils and organic components at low temperatures. The electrolytic process continues until the desired water quality is attained.

The treated water remains usable in production and can be pumped from a collection tank back into the production circuit of the wash tunnel. Also, during the recirculation in the electrolytic process, a heat exchanger removes the resultant process heat from the foul water. This is used in the downstream process to heat the wash tunnel, or it can be used for other purposes.

As the electrodes become dirtier, their conductivity becomes impaired. For this reason, the electrode stacks are automatically rinsed with citric acid after each electrolytic process. This removes lime deposits and oil residues from the electrodes and ensures a long service life for the system.

The benefits

The treatment system cleans the washing water directly on site, thus completely eliminating the need for its collection and removal by specialist disposal companies. As a result, 100% of the treated process water can be returned to the production circuit. Furthermore, the process heat generated during electrolysis is used to heat the wash tunnel or other systems.



Kunststofftechnik Weißbach GmbH

The medium-sized company has been producing custom plastic solutions for 20 years.

Production has steadily expanded with the assistance of superbly trained skilled workers and the use of continually updated machinery. At first, the company specialized in plant and swimming pool construction, but increasingly its focus shifted to the processing of semi-finished plastic products for technical parts, containers, and machinery for the manufacturing industry.

Today, 45 employees in Gornau produce a wide range of components and containers, right the way through to large-scale, complex mechanical and plant engineering systems, medical and environmental technology, and the semiconductor industry.

An in-house development department works on innovations and increasing efficiency. This expertise, the company's own engineering office, and its technically and technologically cutting-edge production processes ensure all-round, high-quality support for clients. An ever-increasing number of international customers are also coming to trust the "Made by KTW" label, from the initial concept to the final product.



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► Technical information

Connected load	37 kVA
Maximum fuse protection	45 A
Both rectifiers	34,7 kW, 1200 A at 25 V DC
Centrifugal chemical pump	M15 H2 150 l/min max. flow rate 70°C max. thermal resistance 1.1 kW, 400 V / 50 Hz Material: PVDF
Noise emission	< 67 dB(A)
Weight	approx. 400 kg
Electrolytic cell	70°C max. thermal resistance Material: PP
Diamond electrodes	"Barbara" type Size: 500 mm x 150 mm x 3 mm Layer thickness: >12 µm 100 mA/cm ² Electrode gap: 1 mm 0,075 m ² active surface area / electrode Coated on both sides Base material: niobium – niobium sheet 3 mm
Connections	DN 25 screwed connections for inflow and discharge of the electrolyte
Container	Variable, plastic or stainless steel