

CLEANING WITH ULTRASOUND

### **USER REPORT**

## CLEANING TESTS FOR INDIVIDUAL SOLUTIONS

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The K100 system equipped with the fourth generation of the SonoPower 3S enables professional cleaning tests with various frequencies.

### SYSTEM FOR QUALIFIED CLEANING TESTS

HIGHLY FLEXIBLE ULTRASONIC SOLUTION OPTIMISES SYSTEM DESIGN FOR EFFICIENT PROCESS DEVELOPMENT

Increasing demands with regard to part cleanliness and the efficiency of industrial component cleaning make an optimum system and process design indispensable. In the expanded test lab of AdunaTec, highly flexible systems equipped with innovative ultrasonic solutions perform qualified cleaning tests, thereby ensuring that the most suitable cleaning solution is chosen in terms of both technology and costeffectiveness.

### 25/50 kHz

With the innovative SonoPower 3S Dual, the power output of one generator can be used for two frequencies.

#### FINDING THE RIGHT SOLUTION FOR A WIDE RANGE OF CLEANING TASKS

There is a varied range of systems and processes for industrial component cleaning. The use of automated solutions and the integration of cleaning tasks in production lines are growing in importance. This makes it difficult for the user to find the optimum solution for their task while meeting all technical and economical requirements – regardless of whether component manufacturers are confronted with residual dirt regulations for the first time, increasing cleanliness specifications have to be met or a new parts range requires a modified and efficient cleaning process.

On the basis of qualified cleaning tests it is possible to determine precisely which technical equipment is required.

In addition, all relevant process parameters can be matched to the respective cleaning task and conclusions drawn on cost-effectiveness.

#### REQUIREMENT 01 - ABILITY TO COVER MANY DIF-FERENT CLEANING APPLICATIONS

To enable cleaning tests for a very wide range of applications, system manufacturer AdunaTec uses an expanded version of the K100 in its technical centre. This is a spray-flood chamber cleaning system for water-based media, which can be equipped with five tanks for cleaning and rinsing/passivation. Thanks to the large number of tanks, a wide variety of applications can be tested.

#### **REQUIREMENT 02 - INDUSTRY 4.0 STANDARD**

Because the expandable cleaning system has a Siemens control system with PROFINET interface, it is compatible with Industry 4.0. It can therefore be integrated into networked production lines easily at the user's premises and can be equipped with customer-specific, automated component placing – with transponder if desired.

#### THE SOLUTION - FLEXIBLE FREQUENCY AND POWER OUTPUT WITH INNOVATIVE ULTRASONIC TECHNOLOGY

The high flexibility of the new technical system is primarily due to the integrated ultrasonic solution from Weber Ultrasonics. This consists of the innovative fourth-generation SonoPower 3S generator, which is available in the power classes from 1000 to 3000 watts and as a single-, dual- and multifrequency system, and the matching ultrasonic transducers. The two frequencies of 25 and 50 kHz allow the cleaning tests performed by the K100 to be ideally adapted to the respective material of the components as well as to the type and severity of soiling.

## SOUND QUALITY: THE BEST CAVITATION EFFECT IN A TANK

Combined frequency and amplitude modulation – the patent-pending SonoPower modulation – delivers homogeneous sound fields and prevents standing waves. Furthermore, this unique feature ensures that the entire power output of 3000 watts reaches the cleaning tank. Cleaning requirements are met more quickly and efficiently as a result.



# INTELLIGENT GENERATOR FACILITATES HANDLING IN THE CLEANING PROCESS

The also patent-pending SonoScan function contributes to the constant ultrasonic output that is indispensable for stable cleaning processes with reproducible results.

Prior to ultrasonic output, SonoScan automatically determines the right operating frequency and sets the system accordingly. During the process the frequency is continually monitored and automatically adjusted.

This ensures that the most efficient power output is always used, even in the event of changing operating conditions such as temperature fluctuations or when changing cleaning and rinsing media. Adaptations and frequency changes take place during operation, meaning that the cleaning process is not interrupted.



#### PROFINET - THE INTERFACE FOR DIGITAL CONTROL AND DOCUMENTATION

The optional PROFINET interface integrated into the generator not only enables the precise control of ultrasound-specific process parameters during the cleaning tests, but also allows them to be documented. Moreover, it makes the generator compatible with Industry 4.0.

#### THE SOLUTION FOR TESTS FROM INTERMEDIATE TO FINE CLEANING WITH ULTRASOUND

Thanks to the high flexibility achieved through the interplay of the cleaning unit and ultrasonic system, the K100 can be used for a wide range of cleaning tests. The spectrum ranges from system and process design for relatively simple intermediate cleaning tasks to final cleaning operations in which cleanliness requirements of "no particle larger than 200  $\mu$ m" are to be met, depending on the component and the initial state.

The key factor here is that the user includes all components to be cleaned in the system in the tests, ideally with maximum soiling. It is thereby possible to ensure that the cleanliness specification required for series production can be met consistently using the process designed in the technical centre.



K100 cleaning unit - compatible with Industry 4.0 thanks to Siemens control system and PROFINET interface.



SonoPower 3S Dual – this integration of the ultrasonic generator enables easy access and thus also simple manual operation.

Image source: Aduna-Tec/Weber Ultrasonics





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