

To

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Certificate

**on the virucidal effectiveness of the processing procedure of
rack type dishwashing machines and flight type machines (continuous
systems, meeting the NSF-standard) from Meiko against enveloped viruses,
especially against the new Coronavirus (COVID-19)**

Introduction

Rack and flight type dishwashing machines for the processing of dishes have to process crockery properly. To do this, they have to bring dishes into that highly clean condition which can be experienced by the consumer. In addition, however, they must also treat these items in such a way that they cannot pose any risks of infections because dishes can be contaminated with a large number of problematic germs during their previous use.

The technology includes machines that can differ considerably in their technical detail. For example they can work with a different number of water tanks (single-tank dishwashers / multi-tank machines). To protect consumers against the transmission of pathogens through poorly processed crockery, the processing conditions, prevailing on the wash ware itself, and some other special technological details are decisive.

Above all, these are:

- The mechanics, i.e. the standardised supply of water and cleaning solution during cleaning, rinsing and of course also during pre-rinsing
- the correct dosage of all chemical components - detergent as well as rinse aids

- A dosing system that not only ensures the exact application concentrations of the products, but also the standardised preparation of the application solution and their availability on the wash ware, especially during a short contact time,
- the exact temperature control on the wash ware,
- the constant and safe maintenance of the required minimum temperature on the items to be washed during the single processing phases.

Cleaning and disinfection process

For the rack and flight type dishwashing machines from MEIKO, these requirements are met, among others, by the special nozzle technology and the application system of water with detergents or rinse aids in the washing arms of the machines. In addition the special double-walled thermal insulation of the rinsing chambers helps to maintain the required temperature level.

All rack and flight type dishwashing machines from Meiko have one reprocessing cycle in common, which adheres to the following minimum parameters:

- Pre-cleaning with water of at least 50 °C
- Main cleaning with the detergents, recommended by Meiko at pH 9 to pH 13 and a surface temperature of at least 65 °C on the wash ware
- Rinse aid with a rinse aid recommended by MEIKO on the dishes with a surface temperature of 60 °C to 70 °C (which requires a water temperature at the nozzle outlet of at least 82 °C),
- If necessary, post-drying (at a decreasing temperature from 70 °C to 50 °C)
- The total duration of the process is at least 70 seconds and is specified by the respective program.

Products to use in the processing procedure

The products used in the preparation cycle must meet the following minimum requirements:

Detregent:

- Highly alkaline, based on potassium hydroxide, disodium metasilicate and sodium hypochlorite
- Concentration of at least 2.5 g / l
- pH 9 to pH 13 in the application solution
- Temperature and contact time are program controlled

Rinse aid:

Concentration of at least 0.1 g / l

- Alcoholalkoxylate
 - Sodiumcumolsulfonate
 - 2-phosphonobutane 1,2,4, tricarboxylic acid
 - Fatty alcoholethoxylate
 - Isotridecanol
- Concentration of at least 0.1 g / l
 - pH 5 to pH 7 in the application solution (in the concentrate ~ pH 2 - pH 3)
 - The temperature and contact time are program controlled.

Virucidal activity against enveloped viruses

Corona viruses belong to the group of enveloped viruses. They usually cause mild respiratory and intestinal infections in humans. The newly emerging strain is an exception in this point because it can also cause a life-threatening respiratory infection. In terms of its dangerousness, it roughly corresponds to the classic flu caused by the Influenza A virus.

As an enveloped virus, however, the new pathogen is no more resistant to disinfectants and processes or heat exposure than all other enveloped viruses. Nor is there any special thermal resistance for it, as is known for all corona viruses.

On the contrary, it can be assumed that corona viruses exposed to temperatures of 60 °C to 70 °C are already sensitive. The high effectiveness of alkaline detergents against enveloped viruses has been proven in numerous studies. This applies particularly to detergents with a high fat-solving capacity and to cleaning solutions in the temperature range of 50 °C and higher.

Basket and belt transport machines from MEIKO therefore fulfill the prerequisites for inactivating Corona viruses as well as all other enveloped viruses, provided that they are used as intended and function perfectly, as well as maintenance and repair according to the manufacturer's specifications.

Conclusion

Due to the known properties of Corona viruses and other enveloped viruses, if the rack and flight type dishwashing machines from Meiko are used as intended and the detergents and rinse aids recommended by Meiko are taken, a virucidal activity against enveloped viruses can be assumed if the following minimum parameters are observed:

- Use of rack and flight type dishwashing machines maintained according to the manufacturer's specifications
- Use of the specified washing program with a total washing time of at least 70 seconds
- Maintaining a cleaning temperature of at least 65 °C on the wash ware
- Maintaining a temperature of at least 60 °C to 70 °C in the rinse cycle on the wash ware
- Use of the alkaline detergents and rinse aids recommended by Meiko

A handwritten signature in blue ink, reading 'F. v. Rheinbaben'.

PD. Dr. Dr. F. v. Rheinbaben