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Virologie, Mikrobiologie, Hygiene

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To  
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## **EXPERT OPINION**

**on the virucidal effectiveness of the processing procedure of  
rack type dishwashing machines and flight type machines (continuous systems) from  
Meiko against enveloped viruses,  
especially against the new Coronavirus (SARS-CoV-2)**

### **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 in the application solution and a surface temperature of at least 60°C on the wash ware
- 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 120 seconds and is specified by the respective program

## **Rack and flight type dishwashing machines from Meiko**

The following machines meet the previously required conditions for inactivating corona viruses if they are set correctly:

*MEIKO Flight Type Dishwashers at Operation Speed Setting I with or without CSS Top:*

MEIKO Upster B 190 P  
MEIKO Upster B 230 VAP  
MEIKO Upster B 460 VAP  
MEIKO Upster B 690 VAP

*MEIKO Rack Type Dishwashers at Operation Speed Setting I:*

— MEIKO Upster K-S160  
MEIKO Upster K-S200  
MEIKO Upster K-M250  
MEIKO Upster K-M280  
MEIKO Upster K-L340

— MEIKO K-Tronic K200C HS  
MEIKO K-Tronic K200PC HS  
MEIKO K-Tronic K260C HS  
— MEIKO K-Tronic K260PC HS

## **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 hydroxide
- Concentration of at least 2.5g/l for a liquid cleaner and 1.8 g/l for a solid cleaner
- pH 9 to pH 13 in the application solution
- Temperature and contact time are program controlled

### Rinse aid:

- Concentration of at least 0.1g/l based on non foaming detergents (e.g. Alcoholalkoxylate)
- pH 5 to pH 7 in the application solution
- 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 detregents 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 120 seconds
- Maintaining a cleaning temperature of at least 60°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



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