


Determination of the hygiene efficacy of dishwashers
Awarding the certificate "Approved Hygiene"

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1 Background

In order to assess whether the hygiene performance of two different dishwashers (beko models DEN36X30W and DFN26425X) are meeting the requirements for the award of the certificate for “Approved Hygiene” of the Rhein-Waal University of Applied Sciences, tests in accordance to DIN 10512 were carried out.

The microbial load on the biomonitors was determined before and after the cleaning cycle with the standard cleaning program (program 1 ECO 50 °C) and used to assess the microbial effectiveness of the cleaning process of each device. Two additional runs were carried out by using the “intensive” washing program.

Apart from the tests according to 10512 the microbial count in the sump was determined before and one hour after the runs (ECO program).

The “intensive” program with activated “hygiene intense” function was also tested on both dishwashers. No microbial reductions were determined here but the results of the previous tests were used to make statements about the hygiene performance by comparing the temperature profiles.

2 Co-applicable documents

- Offer HM020005143D
- DIN 10512:2008-06
- DIN EN 50242/EN 60436:2008
- IEC 60436 Ed. 4

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Figure 2 depicts the LR after the additional runs with the “intensive” program (70 °C) of both examined devices and the maximum LR of 9.27. A complete microbial reduction took place at every run except for the second run of device DFN26425X.

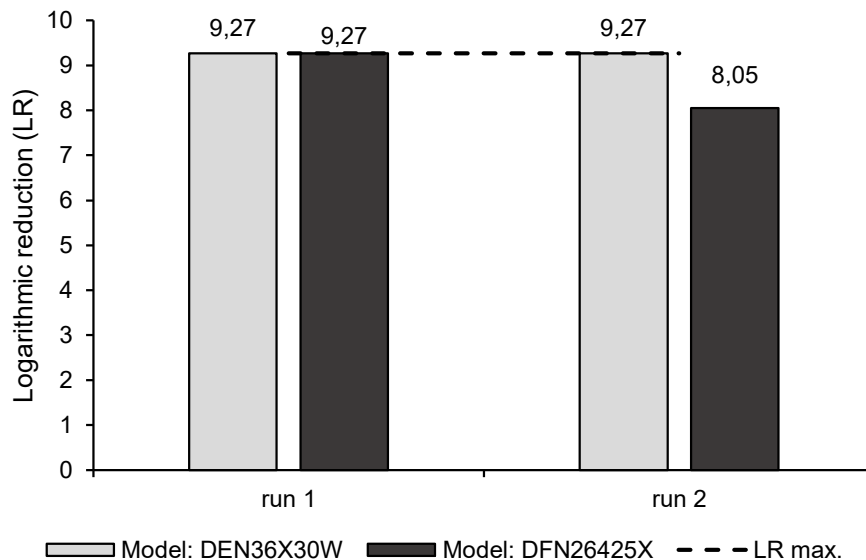


Figure 2: Logarithmic reduction values for “intensive” washing program and LR max. (complete microbial reduction)

Table 2 contains the initial microbial load and the load after each “intensive” run in CFU/ biomonitor. The average LR for DEN36X30W corresponds to the maximum LR of 9.27. The average LR for device DFN26425X by using the intensive program is 8.66.

Table 2: Initial microbial load, microbial load after washing cycle and mean LR values (Intensive program)

Run	Initial microbial load	Microbial load in CFU/ biomonitor after:	
		DEN36X30W	DFN26425X
1	1.88x10 ⁹	bdl.	bdl.
2		bdl.	1.67x10 ¹
Mean LR:		9.27	8.66

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6 Discussion and conclusion

6.1 ECO program

Both devices model DEN36X30W and DFN26425X meet the hygiene requirements for commercial dishwashers according to DIN 10512. Based on the available results, the certificate of “Approved Hygiene” can be awarded to the test devices. At the first run for both devices a total microbial reduction took place and at the third run at model DEN36X30W. The slightly lower LR at run two are still higher than the hygienic requirements for obtaining the certificate of Approved Hygiene.

The development of the bacterial load in the sump is ordinary. The higher bacterial counts in the sump at the beginning of run two (ECO program) are not unusual for longer periods without operation. After two consecutive runs, the total CFU in the sump decreases despite the ballast and the test organism in the soil matrix.

6.2 Intensive program

The 70 °C specified in the intensive program were not quite reached at the measured point. It cannot be excluded that the temperature in the entire interior reaches 70 °C on average. The microbial reduction is higher with the “intensive” program than with the “ECO” program. The additional runs with the intensive washing program are almost always showing a maximum microbial reduction. Therefore the examined devices by using the “intensive” program also meet the requirements for awarding the certificate of Approved Hygiene.

6.3 Intensive program with hygiene intense function

The “intensive” program already leads to an almost total microbial reduction. The activated “hygiene intense” function causes a longer rinse cycle with longer hot phases. The maximum temperature measured also slightly exceeds that of the “intensive” program. Based on these results, it can be clearly concluded that the microbial reduction by using the “intensive” program with “hygiene intense” function is at least as high as that of the intensive program.