

*Memorandum***To**

Mr. Walter Boekestein

From

Mr. Jos van der Vossen

Copy toMargreet Heerikhuisen
Secretariat MSB**Subject**

Statement validity test results CLEAN EDGE

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Our reference

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The GRIPFACTORY (GF), Woerden, requested TNO, Zeist to review the studies on disinfecting activity of the CLEAN EDGE lightbox.

The CLEAN EDGE lightbox, produced in Korea by Maltani Corporation is a fusion type of light source with an additional disinfecting feature represented by an incorporated 405 nm light emitting strip. The antibacterial efficacy of the light strip has been studied and reported by Korea Conformity Laboratories (KCL).

GF requested TNO to provide a second opinion on the KCL reports concerning the antimicrobial activity of the CLEAN EDGE lightbox. For this, TNO studied first of all the KCL reports (CT20-038992E, CT20-038993E, CT20-038994E and CT20-038995E) and searched for additional supportive evidence in peer reviewed scientific journals.

KCL adequately demonstrated the antimicrobial effects of the light emitted by the CLEAN EDGE lightbox on the following bacterial species:

Escherichia coli ATCC 25922*Klebsiella pneumoniae* ATCC 4352*Staphylococcus aureus* ATCC 6538*Staphylococcus aureus* subsp. *aureus* (MRSA) ATCC 33591

In the absence of 405 nm light during a period of 24 hours, these bacteria showed growth on the agar media at levels of about 10⁴ colony forming units (cfu)/mL. However, 24 hours of exposure to the light of the CLEAN EDGE lightbox present at a distance of 1m above all illuminated viable bacterial cells, resulted in a strong reduction of the viable counts of these bacterial strains to less than 10 cfu/mL. This implies a reduction rate of at least 99.9% by the action of the 405 nm light that was present.

The findings of this work align well with previous observations made with bacteria exposed to 405 nm visible light (Murdoch. et al. 2012; McKenzie K. et al. 2013) . Antiviral effects of 405 nm visible light have been described by Tomb et al. (2017). Efficacy of virus inactivation depends highly on the dose and matrix in which the

viruses are present. De Santis et al. (2020) also showed viricidal effects on SARS-CoV-2.

In conclusion, the CLEAN EDGE lightbox supports the reduction of viable bacteria when illuminated by the 405 nm light. The efficiency of bactericidal action depends on the distance from this light source. The KCL reports only provide data on bactericidal action concerning a distance of 1 meter from the CLEAN EDGE lightbox and an exposure time of 24 hours.

Furthermore, the viricidal action of the CLEAN EDGE lightbox is likely. However, its efficacy need to be studied in detail to draw conclusions whether it has added value in room disinfection, thereby preventing the spread of the SARS-CoV-2 virus, when a COVID 19 patient is present among the public.

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