L'energia dell'aria.

CMT CLIMA "THE ENERGY OF AIR"

FIGHTING AND CONTAINING INFECTIOUS RESPIRATORY DISEASES

CMT Clima, starting from a consolidated experience in the heating and ventilation of large work and sports environments with its research team and the involvement of an important national analysis laboratory, carried out an analytical survey with the aim of determining the impact of its own warm air heaters on the microbiological quality of the air, even in the hypothesis of reduction and containment of the spread of Covid-19 in closed work and sports environments.

The aim of the research was to determine the effect of the heat exchange of its **X, G series** warm air heaters **and their variants**, in light of recent research by the French University Aix-Marseille on tests related to the effect of temperature, against SARS-CoV-2 and environmental microbial pollution in general.

The air samplings were carried out using an orthogonal impact active sampler (Surface Air System: SAS), in accordance with the provisions of the INAIL GUIDELINES of 2010.

The choice of microbiological pollutants to be researched was made taking into account the purpose of the survey (i.e. determining the microbiological quality of the air) and the fact that there were no specific microbiological contamination sources in the sampling areas.

It was therefore decided to search for generic contamination indices, in particular:

- ✓ *total bacterial load at 22°C (psychrophilic bacterial load)*: group of microorganisms with a growth temperature around 22°C (range 15°C-30°C), considered as indicators of environmental contamination;
- ✓ *total bacterial load at 37°C (mesophilic bacterial load)*: group of microorganisms with a growth temperature around 37°C (range 25°C-40°C) considered as indicators of contamination of human or animal origin that may include conventional or opportunistic pathogens;
- ✓ *total mycotic load (moulds and yeasts)*: an indicator often related to high humidity and dustiness, reduced ventilation, and poor air quality.

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Following the result of the monitoring, C.M.T S.r.l. declares that:

The warm air heaters of X, G series and their variants in all operating conditions guarantee a reduction of 40-50% of the ***GIMC (Global Index of Microbial Contamination)*** environmental microbial pollution, reaching 60-70% with the installation of the filter module.

The above data is also confirmed by the trend of the **AI** indicator **(amplification index)**, which is less than 1 in all air supply points.

Regarding the human-to-human transmission of the **SARS-CoV-2** virus and the possible impact of temperature and humidity of the air, the stability of the virus at different temperatures was analysed: SARS-CoV-2 was found to be highly stable at 4°C (with a reduction of 0.7 logarithmic units of the virus quantification after 14 days), while, by increasing the incubation temperature to 56°C, a significant decrease in viral infectivity was detected within 10 minutes and after 30 minutes the virus was no longer detectable. By increasing the temperature up to 70°C the virus was no longer detectable after just 5 minutes.

By virtue of the foregoing, in consideration of the heat exchange values and the air supply temperatures during the normal operating heating cycle, we declare that our X, G series warm air heaters and their variants contribute to the decrease of viral infectivity regarding the fighting and containment of the spread of *SARS-CoV-2*.

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Parabiago, 09/2020

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Notes:

Human-to-human transmission occurs mainly through droplets, i.e. the small drops of saliva emitted by coughing, sneezing, or animated speech by a contagious subject. The infectious particles, carried through the air, can be single units of viral infectious charge, or aggregates of single viral units, or within Flügge droplets, deriving from saliva or nasal mucus or pharyngeal sputum. In the air, SARS-CoV-2 is conveyed through large droplets, which, by virtue of their diameter (ranging from 200 microns to 1000 microns), quickly fall to the ground and evaporate in a variable time between 60 seconds and 21 minutes; in smaller quantities it is also emitted through medium and small droplets, which can persist in the air for a longer time given their smaller size but, on the other hand, evaporate much more easily.

Although there is no unambiguous literature on the relevance of temperature and humidity to the survival of the virus, we can hypothesize that a reduced humidity can favour and speed up the evaporation of the droplets deposited on the surfaces.

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