

Airfree TSS technology

Airfree is a complementary precaution to keep a low level of microorganisms in indoor environments. WHO's standard recommendations for individual protection, reducing exposure and cross transmission are to be followed.

Airfree cannot warrant that all room viruses will be destroyed before being inhaled.



In all those cases, the temperatures were below the Airfree's ceramic core internal temperature of 400°F. Since 1977, studies have shown that the higher the temperature, the faster the proteins get denatured⁷. Therefore, we may infer that Airfree purifiers are effective in the inactivation of viruses proteins in most cases.

Airfree additional advantages



Patented and environmentally friendly technology



Maintenance-free



Totally silent



Low energy consumption



Small and portable



Ozone-free

*Check the available models.

Sources:

- A - Inczea, K., Kormendy, L., Kormendy, I., Zsarnoczaya, G. (1999). Considerations of critical microorganisms and indicator enzymes in connection with the pasteurization of meat products. *Meat Science* 51, 115-121
- B - https://www.who.int/influenza/resources/documents/food_risk_h5n1_11_2005/en/
- C - India Leclercq et al. (2014) Heat inactivation of the Middle East respiratory syndrome coronavirus. *Influenza and Other Respiratory Viruses* 8(5), 585-586.
- D - Maschmann, J., Müller, D., Lazar, K., Goelz, R., Hamprecht, K. (2019). New short-term heat inactivation method of cytomegalovirus (CMV) in breast milk: impact on CMV inactivation, CMV antibodies and enzyme activities. *ARCHIVES OF DISEASE IN CHILDHOOD-FETAL AND NEONATAL EDITION* Volume: 104 Issue: 6 Pages: F604-F608.
- 1 - Charm SE, Landau S, Williams B, Horowitz B, Prince AM, Pascual D. High-temperature short-time heat inactivation of HIV and other viruses in human blood plasma. *Vox Sang.* 1992;62(1):12-20.
- 2 - Lelie PN, Reesink HW, Lucas CJ. Inactivation of 12 viruses by heating steps applied during manufacture of a hepatitis B vaccine. *J Med Virol.* 1987 Nov;23(3):297-301.
- 3 - Morrison EE, Wang YF, Meredith DM. Phosphorylation of structural components promotes dissociation of the herpes simplex virus type 1 tegument. *J Virol.* 1998 Sep;72(9):7108-14.
- 4 - Jaovisidha P, Peeples ME, Brees AA, Carpenter LR, Moy JN. Respiratory syncytial virus stimulates neutrophil degranulation and chemokine release. *J Immunol.* 1999 Sep 1;163(5):2816-20.
- 5 - Wang Y, Wu X, Wang Y, Li B, Zhou H, Yuan G, Fu Y, Luo Y. Low stability of nucleocapsid protein in SARS virus. *Biochemistry.* 2004 Aug 31;43(34):11103-8.
- 6 - Epand RM, Epand RF. The Thermal Denaturation of Influenza Virus and its Relationship to Membrane Fusion. *Biochemical Journal Immediate Publication.* Published on 7 May 2002 as manuscript BJ20020290.
- 7 - Palumbo SA, Smith JL, Kissinger JC. Destruction of *Staphylococcus aureus* During Frankfurter Processing. *Applied and environmental microbiology*, 1977:740-744.



Airfree destroys viruses

Virus

Viruses and heat inactivation

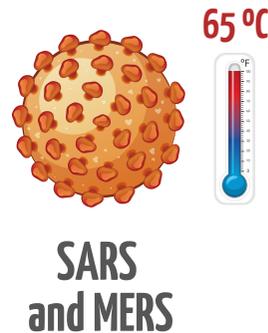
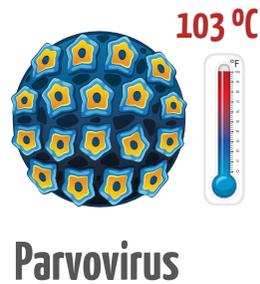
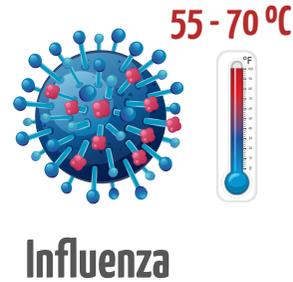
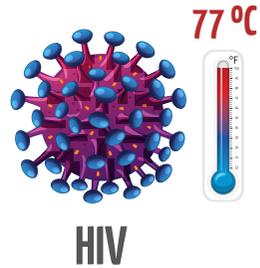
While viruses are not considered living organisms by part of the scientific community, they depend upon living cells to replicate. The structure of the virus includes an envelope constituted by proteins and genetic material of DNA or RNA.

All of these components are thermo-sensible. The genetic material and the proteins have complex structures regulating their function, and any change in this structure may result in a loss of function known as denaturation. There are two basic means by which denaturing occurs: a change in PH or temperature.



Examples of virus inactivation by heat

Numerous studies confirm the inactivation of viruses with the application of heat. For example, the HIV virus in the blood will die when exposed to 77°C for just 0.006 seconds¹. In another study², the “parvovirus” and “phage phiX174” viruses were completely inactivated when exposed to 103°C. The SARS and MERS viruses (coronaviruses that cause Severe Acute Respiratory Syndrome or Middle East Respiratory Syndrome) have temperature sensitive proteins in their envelopes, which can be totally denatured at temperatures above 65°C, and remain inactive^{5c}. Similarly, proteins essential for the transmission of the influenza virus are sensitive to temperatures between 55°C and 70°C⁶.



Airfree destroys rather than holds viruses

