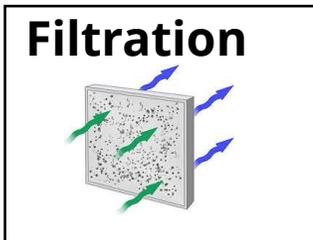


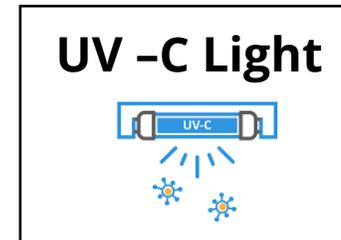


HEPA FILTRATION & UV-C TECHNOLOGY



Filters work by removing particles from the air and trapping them.

- *Potentially cheaper upfront purchase cost than other technologies;*
- *Clogged filters are 100% **ineffective**. Fine filters **clog quickly** and require maintenance. Unless it's an intelligent solution that monitors the effectiveness of the filter performance then it's a text book application for maintenance interventions, however, not all indoor environments are the same, some are dirtier than others and will require more frequent filter changes to ensure its effectiveness, making it a more expensive solution in the long term;*
- *The performance of HEPA filter systems depends on its setting and position;*
- **Multiple filters** required to remove smaller particles;
- *Only **expensive TRUE HEPA** filters (€80-100) can remove particles as small as Covid-19;*
- *TRUE HEPA filters are difficult to source due to a shortage in supply;*
- *TRUE HEPA filters **capture** many of the harmful pollutants from the air and keep them trapped inside the filter, they do not kill them;*
- *Size must be matched to volume of air;*
- *There are different tiers of HEPA filters, which are marked with E/H/U+ number. The higher the number = the higher the tier = better air cleaning capabilities = higher purchase cost;*
- *Requires a **powerful fan** to push air through this very fine filter material (minimum thickness 100mm), resulting in generation of more **noise** when compared to other technologies.*



Air disinfection using 254 nm UV-C is an effective tool for inactivating viral aerosols. Air microbes, genetic materials and protein absorption of the UV light, results in severe cellular damage to the organism. UV-C is directly absorbed by the virus which leads to viral inactivation via DNA or RNA damage.



RNA & DNA VIRUSES

- *Potentially a more expensive upfront purchase cost but lower long-term running costs when compared to other solutions, proving to be a **more cost-effective investment**;*
- *UVC downright changes the genetic material of pathogens such as viruses and bacteria, **destroying airborne pathogens and pollutants**;*
- *Proven to be an effective solution in a hospital environment;*
- *Direct **exposure to UV radiation** can cause skin irritation and damage your eyes, therefore the solution must utilise concealed UV-C;*
- *The virus must have a **minimum exposure** over a set period of time (UV Dosage * Dwell Time = Exposure) to inactivate/kill the virus;*
- *Potentially a larger appliance to permit the 'holding' of the air for a set period to ensure adequate UV-C direct exposure;*
- *The virus must have direct contact with the UV light i.e. pre-filters are required to remove larger particulates where the virus can potentially hide behind.*

CONCLUSION:

1. **UV-C** air purifiers are technologically and practically superior to filters.
2. A **HEPA** filter only collect active viruses instead of destroying them, resulting in clogged filters needing to be replaced regularly.
3. UV air purifiers inactivate the viruses immediately, including all SARS-CoV-2 mutations.
4. Due to the long life of the UV lamps, maintenance is much less.
5. UV-C air purifiers are quieter and can be used during continuous operation.