How does Spectra DF-200 work?

Spectra DF-200 is an aqueous-based disinfectant that can rapidly neutralize highly toxic chemical and biological materials. The formulation:

- is effective for killing pathogenic organisms including bacteria, viruses, algae, and fungi;
- neutralizes highly toxic chemicals;
- utilizes very mild ingredients that gives it very low toxicity and corrosivity;
- applied as a foam, liquid spray, or mist;
- works onporous and non-porous surfaces for disinfection.

Spectra DF-200 contains surfactants, mild solvents, inorganic salts, hydrogen peroxide, a hydrogen peroxide activator, and water. The surfactants soften the cell walls of pathogens which allows the activated peroxide to penetrate to the interior for complete destruction. This unique combination of mild ingredients works synergistically to kill persistent biological pathogens which has been demonstrated in testing at government and private facilities and in many field applications.

Spectra DF-200 can effectively inactivate Coronaviruses. In tests at Kansas State University, Spectra DF-200 proved to kill Bovine Coronavirus within 1 minute even at dilutions as low as 12.5%. (https://prod-ng.sandia.gov/techlib-noauth/access-control.cgi/2004/041120.pdf.)

Why is Spectra DF-200 a superior disinfectant for SARS-CoV-2 compared to other products?

The detergents and mild solvents in Spectra DF-200 cut through the organic material, soils, bodily fluids, and lipid and protein envelope to allow the hydrogen peroxide in Spectra DF-200 to reach the actual virus and destroy it. Because SARS-CoV-2 transmission and survivability is exceptional, Spectra DF-200's ability to penetrate organic soils and bodily fluids allows the Hydrogen Peroxide to penetrate to the virus for the complete kill. Spectra DF-200 has unique properties that are not found in other commonly used disinfectants. While other disinfectants perform well in controlled laboratory environments, Spectra DF-200 outperforms the competition in real-world applications and gets results.

The mild ingredients in Spectra DF-200 give it very **low toxicity and corrosivity** properties. It is **odor-free** after application, making it **safe for people and property**. Spectra DF-200 is also **biodegradable** so it does not harm the environment. An example of the difference in corrosion properties between Spectra DF-200 and 10% chlorine bleach is shown below.

Steel Coupons

Deionized Water
24 Hour Exposure

Spectra DF-200
Formulation
24 Hour Exposure

10% Bleach
24 Hour Exposure

Finally, Spectra DF-200 can also be deployed by wetting microfiber towels and wiping touch points (e.g., door knobs, hand rails, escalator rails, etc.) where SARS-CoV-2 likely resides. Once Spectra DF-200 comes into contact with the virus, either in the air or on surfaces, it is quickly destroyed reducing the risk of infections to people in the area and reducing the potential for fomite transport. **Most importantly, when Spectra DF-200 is deployed using any one of these methods, it eliminates SARS-CoV-2 even when it is embedded in soil, organic material, and bodily fluids which renders other disinfectants ineffective.**

Spectra DF-200 deployed as a stable foam

Spectra DF-200 deployed as a fog (mist)

Figure 3: Multiple deployments for Spectra DF-200 make it highly effective for many scenarios.

In summary, Spectra DF-200 is superior to other products for SARS-CoV-2 disinfection applications because of the following reasons:

- The detergency and low surface tension in Spectra DF-200 allow it to penetrate organic material, bodily fluids, and the lipid envelope enabling it to reach the virus and destroy it, whereas most other disinfectants are repelled by these materials and don't actually reach the virus.
- The high efficacy of Spectra DF-200 (99.99999%) allow it to completely destroy large numbers of SARS-CoV-2 viruses whereas other lower efficacy disinfectants are overwhelmed and fail.
- It has very low toxicity and corrosivity properties, low odor (i.e., off-gassing) properties, and is biodegradable.
- The multiple deployment options of Spectra DF-200 enable it to work in many scenarios both in enclosed and unenclosed spaces.

For these reasons, Spectra DF-200 should be the primary choice for SARS-CoV-2 disinfection operations. A summary and comparison of properties important to consider for use of disinfectants against SARS-CoV-2 is shown in Table 3.

Disinfectant	Achieves high efficacy in laboratory testing	Contains detergents and low surface tension to penetrate organic matter for real-world effectiveness using multiple reactive species	Has low toxicity, low corrosivity, low odor and off-gassing properties and is biodegradable	Can be used in both enclosed (sealed) and unenclosed (unsealed) spaces	Can be deployed using multiple methods (spray, fog, wipes, etc.)
Spectra DF-200	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
10% Chlorine Bleach (and other chlorine containing compounds)	Yes	No	No	Yes (ventilation may be needed before re-use)	Yes (low contact times possible due to fast run-off)
Peracetic Acid	Yes	No	No	Yes (ventilation may be needed before re-use)	Yes (low contact times possible due to fast run-off)
Ozone (gas)	Yes	No	No	No	No
Chlorine Dioxide (gas)	Yes	No	No	No	No
Chlorine Dioxide (liquid)	Yes	No	No	Yes (ventilation may be needed before re-use)	Yes (low contact times possible due to fast run-off)
Vapor-phase Hydrogen Peroxide	Yes	No	Yes (some corrosivity possible)	No	No
Liquid Hydrogen Peroxide/Peracetic Acid	Yes	No	Yes (some corrosivity possible)	Yes (ventilation may be needed before re-use)	Yes (low contact times possible due to fast run-off)
Ethyl Alcohol	No	No	Yes	Yes	No
Quaternary Ammonium	No	No	Yes (biodegradability may be an issue for some compounds)	Yes	No
Phenolic	No	No	No	Yes (ventilation may be needed before re-use)	No
Citric Acid (and other mild acids such as vinegar, lactic acid, glycolic acid)	No	No	Yes	Yes	No

Table 3: Comparison of disinfectants for SARS-CoV-2 applications.