Why is 70% Isopropyl Alcohol (IPA) a Good Disinfectant for J-Shield©?

The J-Shield has unique materials that promote efficient disinfection.

Jeff Barrett, CEO, J-Pac Medical

Background

Much is still being learned about the novel coronavirus (SARS-CoV-2) that causes COVID-19. Current studies confirm that the virus spreads most at close distances via respiratory droplets. On the other hand, transmission of the virus from person to person from surfaces is less clear. Current evidence indicates that the virus can stay alive on surfaces for hours to days. The CDC recommends that cleaning and disinfecting surfaces is a best practice for the prevention of COVID-19.

Cleaning vs Disinfection

What exactly do we mean by "Cleaning and Disinfecting" a J-Shield? It is helpful to think of cleaning as the removal of dirt, germs and impurities from surfaces. In general, it does not kill all the germs, but does reduce their level on the surface. Disinfecting, on the other hand, does kill germs and does so more effectively if the surface has been cleaned beforehand. Surface dirt can react with the chemicals in disinfectants, rendering them less effective. It's highly recommended to clean before disinfecting.

What is Isopropyl Alcohol?

Isopropyl alcohol (2-propanol), also known as isopropanol or IPA, is the most common and widely used disinfectant within pharmaceutics, hospitals, cleanrooms, and electronics or medical device manufacturing. There are different solutions, purity grades and concentrations that yield different results.

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The term, “70% IPA” means that the disinfectant solution has 70% Isopropyl Alcohol and 30% purified water. Likewise, “90% IPA” means the solution contains 90% Isopropyl Alcohol and 10% purified water.

IPA works by penetrating the cell walls of the organism and coagulating its proteins, after which the organism dies.

Isn’t a Higher Level of IPA Better?

Not necessarily. Higher concentrations of alcohol do not result in more desirable disinfection. Likewise, concentrations below 50% make the effectiveness of IPA dramatically less.

Water is a very important ingredient to help destroy bacteria, fungus, and viruses. It acts as a catalyst and plays a key role to denature the proteins of cell membranes, making them able to be destroyed. Once the cell wall has been penetrated by the IPA, the organism dies. Water helps this process go faster and more efficiently. One way it does this is by slowing down the evaporation of the alcohol, allowing it to stay on the surface of the J-Shield longer. A higher concentration of alcohol can actually hinder disinfection because it more quickly causes protein coagulation, which then forms a film that prevents further protein coagulation.

Non-Porous vs Porous Face Shield Materials

Because J-Shields are made from medical grade materials that are non-porous, they can be easily cleaned and disinfected as any other hard, non-porous surface such as tabletops and door-knobs. This makes J-Shield unique. Other shields may use open cell foam, elastic bands or Velcro that create a sponge-type property that complicates cleaning and disinfection. These materials absorb sweat, germs, dirt and cosmetics and cannot be quickly cleaned reliably.

How to Properly Clean and Disinfect the J-Shield

The cleaning process is simple. It consists of two steps:

1. Cleaning
    a. Don gloves
    b. Inspect the shield and discard if damage is found.
    c. Wash all surfaces in a warm soapy water solution.
    d. Wipe dry with a clean soft cloth or air dry. Air dry will reduce the chance of scratching the visor.

2. Disinfection
    a. Don gloves
    b. Wipe the shield from inside out using a 70% IPA solution.

c. Allow IPA to contact the shield materials for the recommended time specified by the IPA manufacturer. Contact time is very important and different brands claim different contact times.
d. Air dry.

Conclusions

Adding medical face shields to currently advised containment strategies appear to be an improvement that should be studied further. While not perfect, even vaccines for most infectious pathogens do not require 100% efficacy and the author urges that requiring medical face shields to meet 100% efficacy is not required to drive SARS-CoV-2 to manageable levels.

About J-Pac Medical

J-Pac Medical is a manufacturing outsourcing partner to medical device OEM's seeking a faster time-to-market and dependable long-term supply. We specialize in single-use medical devices, biomaterial implants, and lab-on-chip diagnostic consumables. J-Pac delivers a validated end-of-line solution for package design, cleanroom assembly, sterilization, and supply chain management. We are FDA registered and certified to ISO 13485:2016.

Additional References

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