

Puro ultraviolet light efficacy against microbes at Breckenridge Grand Vacations (BGV)

Puro high intensity, broad-spectrum UV disinfection fixtures antimicrobial effectiveness were evaluated in “real world” conditions in Breckenridge Grand Vacations’ Family of Resorts on 5/18/2020. The sampling and testing sites were specifically selected to include “high touch” or “high traffic” conditions in public spaces, as well as private spaces (fractional real estate condominiums). Multiple surfaces were selected to define a sample set indicative of surfaces throughout the property. The sample set included carpeting, drapes, sofa cushions, polymeric materials, granite countertops, wood tabletops, and porcelain.

In the lobby, several locations and types of surfaces were tested; they included sofa cushions, end tables, desktop tools (keyboard, etc.). Air samples were taken in the center of the lobby.

Various surfaces and air were tested in restrooms, locker rooms, and fitness centers. These included benches, toilet (tank and flush handle), countertops, and yoga mats.

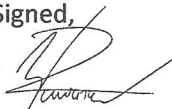
A condominium, which is indicative of most residences onsite, was selected for private space testing. Air samples were taken in the condominium; surfaces tested included a dining room tabletop, couch cushion, headboard, nightstand, drapery, and bathroom doorknobs.

23 sites were sampled (air and surfaces); the sites were sampled twice – before and after ultraviolet disinfection treatment, with a total of 46 samplings. Of the 23 “after” site samples, 18 showed zero positive microbial results (representing a 99.99% kill rate). The 5 remaining sites had reduction of microbial presence of up to 99.9%.

The types of bacteria that were collected in air and/or surface testing before the UV disinfection were identified as *Bacillus sp.* which have a much higher resistance to antimicrobial treatments

The UV disinfection at BGV exhibited a kill rate on these species of bacteria of up to 99.99%. The kill rate on these *Bacillus sp* indicates that the UV disinfection will also be effective against the corona virus family (which includes COVID-19), as well as many types of viruses that cause colds, flu and gastrointestinal distress.

Signed,



Webb Lawrence, Chief Operating Officer - Puro Lighting

Signed,



Terry Mistalski, Clinical Consultant