

Viropac™ COMPARISON CHART

There are numerous issues to consider when selecting a pandemic ready virucide. A direct comparison of the properties of household bleach (usually containing about 5% sodium hypochlorite), alcohol sprays (usually between 70-100% ethyl or iso-propyl alcohol) are made against Viropac.

| PROPERTY | Viropac™ | HOUSEHOLD BLEACH | ALCOHOL SANITISERS |
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| CHEMICAL DANGERS | <p>Viropac is chemically stable and non-reactive.</p> <p>Viropac poses no threats to users or the environment.</p> <p>Viropac is stable at elevated temperatures (up to 100°C) and the product's efficacy increases with elevated temperatures.</p> | <p>Bleach decomposes on heating (higher than 50°C), on contact with acids and under influence of light, producing toxic and corrosive gases including chlorine.</p> <p>The substance is a strong oxidant and reacts violently with combustible and reducing materials, causing fire and explosion hazard.</p> <p>The solution in water is a strong base; it reacts violently with acid and is corrosive.</p> | <p>Flammability.</p> <p>Flash point of ethyl alcohol = 14°C.</p> <p>Flash point of iso-propyl alcohol = 12°C.</p> <p>Exposure to high concentrations of alcohol vapours can lead to causes central nervous system depression.</p> |
| STORAGE ISSUES | <p>There are no special requirements or hazards associated with the storage of Viropac.</p> <p>Sensible hygiene practices dictate that Viropac (as with any detergent/sanitiser) be stored below food items.</p> | <p>Bleach must be separated from combustible and reducing substances, acids and foodstuffs.</p> | <p>Alcohols must be stored away from potential ignition sources.</p> <p>Large quantities must be stored in dangerous goods cupboards or cabinets.</p> <p>Ethyl & iso-propyl alcohols have high evaporation rates, & as such must be stored in cool areas.</p> |
| REACTIVITY | <p>Viropac is pH neutral (pH 7).</p> <p>Viropac does not react with metals (i.e. aluminium or stainless steel) and in its diluted form is suitable for wiping onto the external surfaces of telephones, switches, lift control pads etc.</p> <p>There are no known issues with the formation of toxic by-products when mixing Viropac with other cleaning products.</p> | <p>Bleaches normally have pH levels of between 11 – 13 and as such will react with aluminium components frequently found in electronic equipment.</p> <p>The application of bleach onto computer equipment, telephones, faxes, intercoms and any electronic containing devices (e.g. lift control pads, switches etc.) should be strongly discouraged.</p> <p>A major hazard with bleaches is the formation of toxic, acrid chloramine fumes when hypochlorite bleach comes into contact with ammonia or urine, which can cause severe respiratory distress.</p> <p>Bleach must therefore not be mixed with any ammonia compounds (commonly used in glass cleaners and many household & industrial cleaning materials).</p> <p>If allowed to become acidic, then bleach can cause severe pitting of stainless steel surfaces.</p> | <p>Ethyl & iso-propyl alcohols are extremely flammable.</p> <p>Alcohols will attack some forms of plastic, rubber and surface coatings.</p> <p>Alcohols should be stored separately from strong oxidizers, acetaldehyde, chlorine, ethylene oxide, acids, and isocyanates.</p> |

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| PERSONAL DANGERS | <p>Viropac is virtually non-odourless, non-corrosive and when used in accordance with the manufacturer's instructions is non-irritating and has a very low toxicity.</p> <p>When applied at concentrations below 200 ppm, Viropac is USFDA approved as a non-rinse off hard surface sanitiser in food preparation areas.</p> | <p>Effects of short-term exposure - bleach is corrosive to the eyes, the skin and the respiratory tract.</p> <p>Corrosive on ingestion.</p> <p>Inhalation of aerosol may cause lung oedema.</p> <p>The symptoms of lung oedema often do not become manifest until a few hours have passed and they are aggravated by physical effort.</p> <p>Bleach attacks the mucus membranes and burns the skin.</p> <p>As little as 3.5 ppm can be detected as an odour, and 1000 ppm is likely to be fatal after a few deep breaths.</p> <p>Exposure to chlorine should not exceed 0.5 ppm (8-hour time-weighted average - 40 hour week).</p> <p>Assuming that a 5% bleach solution is purchased (equivalent to 50,000 ppm) and is diluted 1:99 with water, then the resultant solution will give a 500 ppm bleach concentration.</p> <p>Components that come into frequent contact with the hands or face (e.g. hand sets, computer keyboards) will have bleach residues that could potentially irritate the users eyes, skin and mucus membranes.</p> | <p>Ethyl & iso-propyl alcohols are irritants to the eyes and mucous membranes.</p> <p>Exposure to 400 ppm isopropyl alcohol for 3 to 5 minutes resulted in mild irritation of the eyes.</p> <p>Repeated skin contact can result in dermatitis.</p> <p>Exposure to high concentrations can result in giddiness, headache, dizziness and / or nausea.</p> |
| PERSONAL PROTECTIVE EQUIPMENT | <p>Viropac is, non-corrosive virtually non-odourless and when used in accordance with the manufacturer's instructions is non-irritating with a very low toxicity.</p> | <p>Surgical masks will not prevent bleach vapours irritating the mucous membranes.</p> <p>Chemical respirators should be used when handling bleach in both concentrated and diluted forms when used on a repeated basis (90 days, 3-4 times a day).</p> | <p>If alcohol based sanitisers are to be used on an on-going basis then the wearing of gloves is recommended.</p> <p>Alcohol based sanitisers should be used in well-ventilated areas.</p> |
| DAMAGE TO FABRICS | <p>Viropac is non-bleaching and does not react with fabrics.</p> | <p>Bleach will discolour many fabrics and repeated use could also severely weaken many synthetic materials.</p> <p>This is particularly true for the bleach concentrate, but is also true with repeated applications of dilute beach solutions.</p> <p>Possible reluctance from personnel may be experienced for fear of damaging personal clothing.</p> | <p>Due to the flammability of alcohol sanitisers and the risk of sparking from static electricity, their use on fabrics is not recommended.</p> |

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| APPLICATION | <p>Viropac can be applied via a hand held spray bottle, making surface cleaning simple, quick and effective.</p> | <p>Since bleach is so irritating, it can only be applied by a sponge or mop, it should not be applied via a spray applicator.</p> <p>This results in less effective and longer cleaning.</p> <p>Strong residual chlorine odours will make the work environment unpleasant to work in.</p> | <p>Alcohol sanitisers can be applied by hand held spray bottles, wipes or cloths.</p> <p>Due to the highly flammable nature of alcohol wipes volumes used should be kept to a minimum.</p> |
| SHELF LIFE | <p>Viropac concentrate has a shelf life of 10+ years.</p> <p>Diluted solutions of Viropac are stable, so large quantities can be prepared at a single time for future use.</p> | <p>Liquid chlorine has a shelf life of between 6-12 months, this may be significantly shorter if the bleach is not stored appropriately and is allowed to warm.</p> <p>If quantities of bleach are to be stored as part of a pandemic response kit, then frequent stock rotation will have to be considered.</p> <p>Diluted solutions of bleach break down rapidly, so fresh solutions must be prepared each day.</p> | <p>Manufacturers of alcohol sanitisers place a 2-year shelf life on their products.</p> <p>While the alcohols themselves do not decompose, they have a high evaporation rate.</p> <p>Over extended storage there is a risk of product loss through evaporation.</p> |
| POOR SURFACE WETTING | <p>Viropac has excellent wetting and cleaning properties, aiding the effective penetration of surfaces and removal of dirt and organic matter.</p> | <p>Bleach solutions have poor wetting properties and as such will not effectively permeate into many surfaces, particularly synthetic fabrics.</p> | <p>Ethyl & iso-propyl alcohols have good surface wetting properties.</p> |
| POOR PERFORMANCE WITH HIGH ORGANIC LOADINGS | <p>Effective in the presence of high organic loadings.</p> | <p>Bleach solutions are rapidly inactivated in the presence of organic debris, so surfaces should be ideally pre-cleaned before the application of bleach to ensure effective sanitation.</p> | <p>Effective in the presence of high organic loadings.</p> |
| RESIDUAL EFFECTIVENESS | <p>Residual effectiveness for up to 4 hours.</p> <p>Previously sanitised surfaces exposed to a bacteria/virus/fungi will deactivate the organism for over 4 hours.</p> | <p>Poor residual activity – minutes rather than hours.</p> <p>Previously sanitised surfaces when exposed to a bacteria/virus/fungi will not deactivate the micro-organism.</p> | <p>Poor residual activity – minutes rather than hours.</p> <p>As soon as the alcohol has evaporated from the surface, there is no residual protection.</p> |