

NO-FLUSH™ URINALS AND RESTROOM HYGIENE

The Waterless Advantage No-Flush™ Urinal works completely without water. Perhaps surprisingly, this feature achieves sanitary advantages not feasible with conventional water-flushed fixtures. This discussion assumes the reader is informed how the EcoTrap® and BlueSeal® replace the customary water-filled trap seal. Note that the BlueSeal® layer effectively bars both sewer gases and urine odors from entering the room.

Urine is normally sterile water, in which is dissolved 2.4% urea, 1.0% salt, and 0.3% various acids, plus 0.3% "casts" or body cells. When fresh it has a mild odor and a bitter saline taste. The typical pungent odor of stale urine is caused by ammonia evolving from a gradual decomposition of the urea. Carbon dioxide also evolves, if this occurs in flush water any water hardness present forms limestone encrustations.

Urine's sterility may be broken by host infections: cystitis, involving small amounts of intestinal bacteria, or venereal diseases whose microbes are very short-lived outside the body. Only three afflictions are transmitted via urine: schistosomiasis, typhoid, and leptospirosis, which are all rare in developed countries. To quote from Sanitation and Disease, v. 3, World Bank Studies in Water Supply and Sanitation: "A note on urinary pathogens: In general urine is a sterile and harmless substance." Other diseases, including hepatitis and HIV, are spread by other paths such as fecal matter or blood ingestion, or airborne microbes.

Intestinal waste, in contrast, is 95% bacteria and dead cells, normally part of the digestive process, but harmful if ingested in sufficient quantity. It carries many sorts of pathogenic microbes. This waste is commonly transported by flush water, and is the major burden for sewage treatment.

Bacteria and viruses, like all living matter, need water to exist. When dry they die, some quickly, others over a matter of hours. Confirmed studies in toilets facilities have shown that toilet bowl surfaces retain adsorbed bacteria despite repeated flushings. Further, bacterial colonies are found on moist surfaces throughout the room. These consist of intestinal bacteria and virus growths that are seeded by air-borne microbe containing aerosols ejected from flush toilets. The highest bacteria counts, higher than those in toilet bowls, have been found in the overflow passages of wash basins and in flush urinals. Localized colonies were even found in isolated damp spots under lotion jars.

The atmosphere of the typical rest room thus has been shown to carry bacteria laden aerosols that originated from flushed toilets and were almost certainly reinforced by flush urinals as secondary sources.

Waterless urinals with surfaces that are predominantly dry or drying inhibit bacterial growths. Totally free of flushing turbulence, any spread of bacteria from them by aerosol formation is eliminated. The effects on restroom hygiene of this innovative fixture are expected to be beneficial.