Report on Tests Carried Out on the Odor Control System

Data Summary from 2021 to 2023

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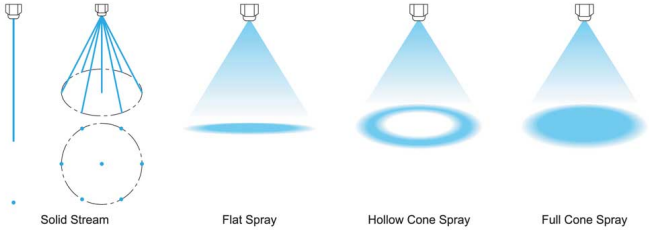
Report on tests carried out on the odor control system in waste containers and garbage rooms between January 2022 and March 2023.

The tests performed can be classified into different categories:

Use of different enzymes and bacteria:

Different types of enzyme molecules and bacteria (confidential) were used for odor control in waste containers and garbage rooms.

Use of different spray nozzles:



Tests were conducted with different spray nozzle projection patterns. It was concluded that full cone sprayers are the most effective for covering a larger surface area of garbage containers and their walls. It was determined that the optimal height for placing the sprayers is between 56 and 64 inches for spraying 74" x 52 x 62 STD garbage containers in residential buildings in the USA. Additionally, it was found that the enzyme seeps through the outer walls of the plastic bags and the container walls, gravitating to the bottom of the container, and mitigating possible garbage that may spill out of the bags and accumulate on the container floor.

Dispenser pressure tests:

Tests were conducted with a single spray nozzle and two nozzles simultaneously. The results showed no difference in the dispenser pressure or the conical spray projection, indicating that the current pump pressure is efficient for application within a maximum distance of 20ft from the container with the enzyme to the dispenser.

Maximum distance test for connection pipe:

A test was carried out to determine the maximum linear distance the connection pipe can have without affecting the system's effectiveness. The result indicated that up to 20 feet, the system maintains the same effectiveness, but from 25 feet, a reduction in dispenser pressure can be observed of approximately 10% to 15% for every 24 inches of extension, which also causes a variation in the conical spray pattern.

To represent the pump suction loss after 20 linear feet, we use the following formula:

$$P = (14 * H) / (20 + L) * (1 - D * (L - 20) / 100)$$

Where:

P is the pump pressure in ounces per minute
H is the height in feet of the liquid column
L is the linear distance in feet from the pump to the discharge point
D is the percentage of pressure loss for each additional 24 inches of distance, expressed as a decimal (e.g., 0.2 for a 20% loss)
20 is the limit distance in linear feet where pressure loss begins to occur.

We calculated the pump pressure at 60 linear feet with a 25% loss for every additional 24 inches:

P = (14 * 20) / (20 + 60) * (1 - 0.25 * (60 - 20) / 100)

P = 3.15 ounces per minute

As it was observed, the pump pressure decreases significantly after 22 linear feet, even with a 25% loss for every additional 24 inches. Therefore, it is important to consider these pressure losses when designing and operating pumping systems to ensure optimal pump performance.

Installation tests of dispensers in series:

Tests were carried out with the installation of 4 dispensers at 9 feet each, to be supplied from a 55-gallon tank. The result was satisfactory in terms of pressure and the cone spray pattern of the nozzles. It was observed that it is necessary to manually activate the last two dispensers through the test button until the supply lines are supplied with the enzyme, so that they can all dispense simultaneously. The 55-gallon tank was placed in the center of the 4 systems, and 2 systems were placed on each side of the tank, at an approximate distance of 9 feet from each other, thus maintaining the optimal distances for the dispensers at the ends, for the good functioning of the systems:

Bacterial presence tests in closed garbage bags:

Tests were carried out to determine the presence of bacteria inside closed garbage bags after the application of our formula. Subsequently, after 24 hours (time to incubate the bacteria poured with the enzyme), it was found on Petri dishes that approximately 78% of the bags tested positive for the presence of digestive bacterial colonies used in our formula. It is important to note that one gallon of our formulation of digestant enzyme, can produce up to 200 billion bacterial colonies, which can double their count per hour while finding decomposing organic matter for their food. In addition, our formula contains different types of bacteria, including aerobic ones, which once poured into the garbage container, can use the gases (CO2) they produce while decomposing the organic waste in the digestion process as a means of transportation as well as others shuttle systems. These results show that our enzymes can penetrate and act in the garbage inside closed bags (not sealed bags), which increases the effectiveness of the system in controlling odors in the garbage room.