

# ZT PRO Brewery Cleaner

*A Safer, More Universal Cleaner for the Brewing Industry and the Planet*



December 2018

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# Executive Summary

The brewing industry requires cleaning services for areas ranging from brew tanks and spigots to facility floors and restrooms. Although all facilities want clean floors and restrooms, the challenges brewers face in cleaning their equipment are unlike those in other industries. Looking clean is not good enough. The product suffers when tanks and other facility fixtures are not cleaned correctly. Only truly clean tanks and fixtures, without lingering odors or residues and without unwanted organisms, can produce the highest-quality brew.

ZolaTerra's ZT PRO Brewery Cleaner has come on the scene to provide this level of cleanliness without harming the environment, personnel or the tanks themselves. Certified by NSF, USDA, Leaping Bunny and PETA, this green cleaner has passed test after test to prove it can remove the toughest soils and odors while protecting the environment and people.

We developed ZT PRO Brewery Cleaner with specific goals in mind:

- Make cleaning safer for brewery personnel
- Completely clean brewery equipment with existing CIP (clean-in-place) systems
- Clean any surface in a brewery
- Remove unwanted odors
- Reduce energy costs and carbon footprint
- Reduce chemical and biological load on local sewerage districts

In March 2018, we undertook a test of ZT PRO Brewery Cleaner at the Craft Beverage Institute of the Southeast<sup>®</sup> at Asheville-Buncombe Technical Community College in Asheville, North Carolina, to determine whether we had achieved our goals.

## The Test

Following industry standards for testing chemical effectiveness, ZolaTerra set out to prove the safe and thorough cleaning abilities of ZT PRO Brewery Cleaner (see Technical Appendix for details). The test was designed to answer four critical questions:

1. Is the vessel visually clean?
2. Is odor removal achieved?
3. Is any cleaning solution or residue left behind?
4. Are unwanted residue and soils reduced?

All four factors are essential to a clean and profitable brewery. ZT PRO would need to clear these if we were going to have the positive impact on the brewing and tank-cleaning industries that we desired.

The trial was performed following the standard operating procedure (SOP) for a clean-in-place (CIP) of a ten hectoliter (8.52 barrels) fermentation vessel (CCV). Odor and residue tests were performed and swab samples were taken inside the vessel.

## The Findings

After cleaning with ZT PRO Brewery Cleaner:

- The vessel exhibited no remaining odor of fermented product or yeast.
- The vessel showed no cleaner remaining based on touch test.
- The Krausen ring within the vessel was cleaned and no residue was present.
- Swab samples taken at the bottom valve, racking valve and vessel wall showed a reduction in organisms.

The testing results showed ZT PRO cleaned the fermentation vessel based upon lab cultures completed by the Craft Beverage Institute of the Southeast. While effective cleaning is essential, the test also revealed several other important benefits for brewery owners, staff and cleaning personnel. These benefits set ZT PRO apart from all other cleaning products, thus replacing one of the most detrimental and hazardous materials within a brewing facility.

## The ZT Difference

The goals of ZT PRO Brewery Cleaner go beyond getting brewery equipment clean. They also include reducing energy costs, lowering a company’s carbon footprint and reducing waste. Some of these result in tangible, money-saving opportunities that will directly impact the bottom line (Figure 1). Others are “soft,” or intangible, benefits, which are not always quantifiable (Figure 2). However, with good marketing and promotion that is both inward and outward facing, companies can use these soft benefits to improve their financial health right along with the health of people and the planet.

Figure 1. Tangible Benefits of ZT PRO Brewery Cleaner

Innovation	Cost Savings Opportunity
Multipurpose cleaning capabilities, can be used anywhere in the facility	Lowers chemical and storage costs
Noncaustic, alkaline formula	Eliminates the risk of pitting stainless steel, protecting expensive equipment* <sup>1 2</sup>
Lower water temperature when cleaning	25% savings in energy (Based upon heating 100 gal. (378 L) of water w/electric or natural gas)* <sup>3</sup>
Requires only goggles and gloves	Reduces safety equipment costs
Is safer for cleaning crews and the environment	Potentially reduces workers’ compensation costs
No water flush at end of cleaning*	Reduces water and sewage costs

\* Craft Beverage Institute of the Southeast did not test for this claim

<sup>1</sup> Dow Chemical Company. “Product Safety Assessment, DOW Octylpenol Ethoxylate Surfactants.” Oct 21, 2015. P. 2.

<sup>2</sup> <https://www.probrewer.com/library/stupid-stuff/cleaning-and-sanitation/>

<sup>3</sup> <https://www.e-education.psu.edu/egee102/node/2003>

Figure 2. Intangible Benefits of ZT PRO Brewery Cleaner

Feature	Soft Benefit
Noncaustic, alkaline formula	Reduces exposure to dangerous chemicals for a safer work environment
Lower cleaning water temperature	Reduces carbon footprint
Reduced overall odor	Creates safer work environment, ensures no lingering odors in the product
Zero VOCs (volatile organic compounds)	Will not affect sensory, improves workplace safety and productivity
Rapidly and extensively biodegraded	Reduces wastewater COD (chemical oxygen demand)*
Improved holding tank degradation of yeast organisms, allowing faster holding tank emptying*	Reduces wastewater BOD (biological oxygen demand) and facility downtime* <sup>4</sup>

\* Craft Beverage Institute of the Southeast did not test for this claim

Leaving potential cost savings to wither on the vine is not the way of an effective business owner. The most recent trial of ZT PRO Brewery Cleaner illustrates just how much difference having the right cleaner can make for a business.

## Product Certifications

ZolaTerra made a conscious decision to seek the most-respected, well-documented and verifiable certifications regarding product safety for humans, animals and the environment. All ZolaTerra products are certified by the following bodies:

- NSF Non-Food Compound Product Registration. ZolaTerra products can be used directly on food contact surfaces such as plates, utensils, brewing systems, and cookware.
- USDA Bio Preferred Plant Based Product.
- The Leaping Bunny program by the Coalition for Consumer Information on Cosmetics (CCIC). The Leaping Bunny standard means neither ZolaTerra nor any of our suppliers will conduct, commission or be a party to any animal testing with any of the ingredients in our products.
- Cruelty Free and Vegan (PETA Beauty without Bunnies), PETA (People for the Ethical Treatment of Animals). ZolaTerra has pledged to produce only vegan products, which means we do not use beeswax, lanolin or other products that animals make.

## Conclusion

ZT PRO Brewery Cleaner is a multi-certified, tested and proven green cleaner that is more effective than traditional cleaning products. Energy savings from a lower cleaning temperature, reduced water usage and decreased labor costs combined with a safer work environment and a reduced carbon footprint set ZT PRO apart from all other brewery cleaners. With this latest trial, ZT PRO Brewery Cleaner has demonstrated that it is possible to achieve the triple aim of business: healthy people, profits, and planet.

# ZT PRO Brewery Cleaner

*A Safer, More Universal Cleaner for the Brewing Industry and the Planet*

## *In This Report*

- How the right cleaning product can reduce a company's energy costs and carbon footprint
- Why companies should always choose cleaning products that have been tested and certified
- What makes ZT PRO Brewery Cleaner safer and more effective at cleaning brew tanks and facilities than other products

## Background

The brewing industry faces cleaning challenges unlike those found in other industries. Although all manufacturers require clean restrooms and floors, the specialized equipment found in a brewery, no matter the size, demands a cleaning regimen that can remove strong odors and residues but will not harm vessels, spigots and other sensitive machinery.

Most breweries follow the clean-in-place (CIP) method of cleaning. This method has seemed to serve the brewing and tank cleaning industries well, but there have been many hidden costs. The caustic nature of traditional cleaners has been shown to be harmful to humans and the planet. With significant levels of volatile organic compounds (VOCs), these chemicals can lead to respiratory problems, headaches, and even cancer.<sup>5</sup> Plants and animals are impacted by runoff and inefficient disposal methods, and costs to facility owners climb with increased workers' compensation insurance and decreased productivity.

Further, in some cases traditional cleaners have not been up to the cleaning challenges found in a brewery. Some malodors have proven particularly difficult to remove, which can lead to lower product quality or wasted batches.

At ZolaTerra, we identified these problems and set out to solve them. We formulated ZT PRO Brewery Cleaner to provide the highest level of cleanliness without harming the environment, personnel or the tanks themselves. Certified by NSF, USDA, Leaping Bunny and PETA, this green cleaner has passed test after test to prove it can remove the toughest soils and odors while reducing environmental and people impact.

We developed ZT PRO Brewery Cleaner with specific goals in mind:

- Make cleaning safer for brewery personnel
- Completely clean brewery equipment with existing CIP (clean-in-place) systems
- Clean any surface in a brewery
- Reduce unwanted odors
- Reduce energy costs and carbon footprint
- Reduce chemical and biological load on local sewerage districts

In March 2018, ZolaTerra undertook a test of ZT PRO Brewery Cleaner at the Craft Beverage Institute of the Southeast at Asheville-Buncombe Technical Community College in Asheville, North Carolina, to determine whether we had achieved our goals.

## The Test

Trial 1 for ZT PRO Brewery Cleaner was conducted following industry standards for testing chemical effectiveness. The test was designed to answer four critical questions:

1. Is the vessel visually clean?
2. Is odor removal achieved?
3. Is any cleaning solution or residue left behind?
4. Are unwanted organisms reduced?

As discussed later, these four factors are of particular concern to brewers. ZT PRO Brewery Cleaner would have to clear these hurdles to have a positive impact on the brewing and tank-cleaning industries.

## Testing Procedures

Trial 1 was performed on an emptied 10- hectoliter (8.52 barrels) fermentation vessel after attenuated beer was transferred to a new vessel. To conduct the trial, the operator first donned safety goggles and cleaning gloves. The bottom valve, racking valve and vessel wall were swabbed for bacteria, to establish a benchmark before cleaning began. The Krausen ring inside the fermentation vessel was left intact without prescrubbing.

Next, the operator filled a separate container with 25 to 30 gallons (94-113 L) of water heated to 149° F (65° C). At 1 ounce per gallon, ZT PRO Brewery Cleaner was added to the water. The solution was then pumped into the vessel via a cart-mounted pump.

A 15-minute CIP was used to clean the bottom valve and the racking valve. At the end of the CIP, the solution was 134° F (56.7° C). Once the valves were cleaned, the ZT PRO Brewery cleaning solution was redirected to a CIP arm to spray ball, and a coat was applied to the upper portions of the vessel. The cleaning solution temperature had dropped to 131° F (55° C).

After making some adjustments to clear foaming (see Technical Appendix for details), the operator conducted a 20-minute CIP using the CIP arm to clean the interior of the vessel. The final solution temperature was 122° F (50° C).

## The Results

After the fermentation vessel was cleaned with ZT PRO Brewery Cleaner, the vessel was tested for residue, odor and swabbed for microorganisms. For brewers, these markers have direct impact on their products. The post-test results revealed the following:

- The vessel exhibited no remaining odor of fermented product or yeast. Lingering odors can transfer to the next batch through the equipment. In some cases, a batch may need to be discarded if the odor cannot be removed effectively.
- The vessel showed no cleaner remaining based on touch test. Residues from cleaners negatively impact the quality of beer and other brewed products.
- The Krausen ring within the vessel was cleaned and no visual residue was present. ZT PRO Brewery Cleaner appeared to have thoroughly cleaned the Krausen ring.
- Swab samples taken at the bottom valve, racking valve and vessel wall before and after cleaning showed a reduction in organisms based on lab cultures completed by the Craft Beverage Institute of the Southeast. These are troublesome locations for bacterial growth, even with a sanitizing step.

These tests proved that with ZT PRO Brewery Cleaner, we at ZolaTerra had achieved our goal to be a more effective and thorough cleaner for the brewing industry. ZT PRO's numerous additional benefits also became clear as a result of this trial.

## What ZT Brings to the Brewer's Table

ZT PRO Brewery Cleaner was created to be safer and more thorough than traditional cleaners. To achieve this goal, ZT PRO was formulated as an alkaline, noncaustic cleaner that can be used on any surface. These basic features of ZT PRO result in a wide range of benefits for brewers, their staff and the environment. The tangible benefits represent cost savings opportunities for brewers and tank cleaners. Other, soft benefits, such as improved morale and increased safety, can have an indirect, positive impact on the bottom line.

### Tangible Benefits

Most brewery owners want to run their businesses efficiently and save on costs wherever possible. While cleaning chemicals may seem like a fixed cost, there are many ways they can raise or lower other costs around a facility. The innovative formula of ZT PRO offers cost savings that range from lower chemical costs to reduced wastewater removal charges (Figure 1).

Figure 1. Tangible Benefits of ZT PRO Brewery Cleaner

Innovation	Cost Savings Opportunity
Multipurpose cleaning capabilities, can be used anywhere in the facility	Lowers chemical and storage costs
Noncaustic, alkaline formula	Eliminates the risk of pitting stainless steel, protecting expensive equipment* <sup>1 2</sup>
Lower water temperature when cleaning	25% savings in energy (Based upon heating 100 gal. (378 L) of water w/electric or natural gas)* <sup>3</sup>
Requires only goggles and gloves	Reduces safety equipment costs
Is safer for cleaning crews and the environment	Potentially reduces workers' compensation costs

No water flush at end of cleaning*	Reduces water and sewage costs
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\* Craft Beverage Institute of the Southeast did not test for this claim

<sup>1</sup> Dow Chemical Company. "Product Safety Assessment, DOW Octylpenol Ethoxylate Surfactants." Oct 21, 2015. P. 2.

<sup>2</sup> <https://www.probrewer.com/library/stupid-stuff/cleaning-and-sanitation/>

<sup>3</sup> <https://www.e-education.psu.edu/egee102/node/2003>

For example, ZT PRO requires a lower water temperature than traditional cleaners. In fact, it's nearly 30° F (17° C) lower. That translates to a 25% energy savings<sup>3</sup>, a significant assist to the bottom line. An alkaline, noncaustic, safe cleaner, ZT PRO can be used to clean many different surfaces, from tanks and spigots to floors and restrooms. Combined, these features mean lower chemical costs, reduced storage costs, and less time spent on ordering and managing inventory.

With ZT PRO, brewers' equipment also benefits. The cleaner is formulated so it will not pit stainless steel vessels or other equipment. Anecdotally, we have observed no pitting or ill effects upon stainless steel or other materials commonly used in the brewing process. This guards against employee mistakes as well as inattention that can lead to costly damage to equipment. That means labor costs, traditionally the most expensive part of cleaning, as well as cleaning time are reduced.

Another time saver is the improved degradation of yeast in the wastewater holding tank.<sup>4</sup> This innovation allows faster emptying of the holding tank. A more efficient cleaning process means the facility can return to full capacity faster.

Some companies may also see reduced costs for safety equipment, as only eye goggles and gloves are required. Cleaning crews that use ZT PRO have reduced exposure to dangerous chemicals, improving safety and potentially lowering worker's compensation costs for business owners.

## Soft Benefits

Several features of ZT provide indirect benefits for brewers and tank-cleaning companies. With good marketing and promotion, both inward facing and external, these indirect benefits can also improve the bottom line (Figure 2).

Figure 2. Intangible Benefits of ZT PRO Brewery Cleaner

Feature	Soft Benefit
Noncaustic, alkaline formula	Reduces exposure to dangerous chemicals for a safer work environment
Lower cleaning water temperature	Reduces carbon footprint
Reduced overall odor	Creates safer work environment, ensures no lingering odors in the product
Zero VOCs (volatile organic compounds)	Will not affect sensory, improves workplace safety and productivity
Rapidly and extensively biodegraded	Reduces wastewater COD (chemical oxygen demand) <sup>*4</sup>

Improved holding tank degradation of yeast organisms, allowing faster holding tank emptying*	Reduces wastewater BOD (biological oxygen demand) and facility downtime* <sup>4</sup>
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\* Craft Beverage Institute of the Southeast did not test for this claim

Soft benefits, such as a reduced carbon footprint because of the lower cleaning water temperature, have been shown to lead to tangible benefits like reduced worker turnover and attracting better recruits. Reduced greenhouse gas emissions can also be used in marketing materials. [At least one brewery](#) has used its lower carbon footprint to distinguish itself from its competitors.

ZT PRO is rapidly and extensively biodegraded. With a biodegradable cleaner, brewers reduce wastewater chemical oxygen demand (COD) as well as biological oxygen demand (BOD). Lower COD and BOD are safer for aquatic life and communities.

Less odor, another intangible benefit, is good for workers in the brewery as well as cleaning crews. Strong odors can lead to headaches, which can hinder worker productivity. Lingering odors can also affect the quality of the product. Both of these factors indirectly affect the profits a business accrues.

Further, ZT PRO gives off zero volatile organic compounds (VOCs), which according to the Environmental Protection Agency have been shown to cause eye, nose and throat irritation, headaches, liver damage, and in some cases, cancer. Conversely, reduced VOCs have been connected to increased worker productivity and improved morale.

## Certifications Overview & Importance

ZolaTerra made a conscious decision to seek the most respected, well-documented and verifiable certifications regarding product safety for humans, animals and the environment. While we know how safe and pure our products are, we believe independent certification of the safety and content of ZolaTerra demonstrates our commitment to safe products. We want our world to be clean *and* safe. Our products have received the following certifications:

- NSF Non-Food Compound Product Registration. ZolaTerra cleaner is acceptable for all surfaces in and around food-processing areas, where its use is not intended for direct food contact. Use of this product in food processing or handling facilities requires all food products and packaging materials be removed or protected prior to product use. A potable water rinse of cleaned surfaces is required after use of this product. When used according to manufacturer’s instructions, the cleaner “shall neither exhibit a noticeable odor nor leave a visible residue.” Simply stated, ZolaTerra can be used directly on food contact surfaces such as plates, utensils, brewing systems, cookware, and toys for kids and pets/animals, etc.
- USDA Bio Preferred Plant Based Product: General Purpose Cleaner. ZolaTerra meets the bio based (or plant based) requirement for the “general purpose cleaner” category set by the USDA.

- The Leaping Bunny program represents the Coalition for Consumer Information on Cosmetics (CCIC), a large global alliance between animal rights and cruelty-free groups. This alliance has established an international standard for the term “cruelty free” on cosmetic and cleaning products. The Leaping Bunny standard means neither ZolaTerra nor any of our suppliers will conduct, commission or be a party to any animal testing with any of the ingredients in our products.
- Cruelty Free and Vegan (PETA Beauty without Bunnies), PETA (People for the Ethical Treatment of Animals). This program is designed to partner with companies who make products without harming any animals or using anything from animals. ZolaTerra has gone one step further and pledged to produce only vegan products, which means we use no beeswax, lanolin or other products that animals make.

## Conclusion

Brewers have many challenges in addition to keeping their facilities and equipment clean. Competition is fierce, and formulating the best recipes for their brew has to be at the forefront of everything they do. But to ensure the highest-quality product, the equipment and facility must be cleaned to the highest standards.

In the past, most brewers have used traditional, caustic cleaners, believing this was the best way to get their equipment clean. Today, ZT PRO Brewery Cleaner is changing that traditional method. At ZolaTerra we have created a cleaner that is more thorough, more efficient and better for the environment than any other product for cleaning breweries.

ZT PRO Brewery Cleaner can be used throughout the brewery, cutting down on chemical costs, shipping and storage. The lower water temperature requirement represents a 25% savings in energy costs<sup>3</sup>, and the noncaustic formula makes it safe for users, the equipment and the environment.

We have demonstrated our commitment to safer cleaning by earning not one but four certifications that assure customers our products are created in a responsible way. Our products have passed test after test, proving our claims of safer, more thorough cleaning power. The latest trial of ZT PRO Brewery Cleaner shows once again that ZT PRO delivers on our promises.

We believe the world should be not only clean but also safe. ZT PRO Brewery Cleaner is another step in that direction.

# Technical Appendix: Testing Procedures

## Trial 1

ZolaTerra®, Division of SuperSimple, LLC  
Product: ZT PRO Brewery Cleaner

## Location

Craft Beverage Institute of the Southeast®, Asheville, NC  
Thursday, March 29, 2018  
Fermentation Vessel #3 (10-hectoliter/264-gallon vessel)

## Participants

Craft Beverage Institute of the Southeast: Jeff 'Puff' Irvin (Institute chair); Eric, Jordan, Mike (students)  
ZolaTerra: Brodie Levadnuk (President/CEO), Tim Ammons, BSc, ND, DC (Vice President of Quality and Operations)

## Summary

The brewing industry currently utilizes toxic cleaners, such as caustic and acidic cleaners, to clean brewery equipment between batches of products. These toxic cleaners expose both brewery personnel and the environment (via wastewater) to harmful chemicals. While these may be effective cleaners, ZT PRO Brewery Cleaner will more effectively clean the entire brewery (equipment and facilities), increase personnel safety, reduce energy costs and reduce carbon footprint.

## Purpose

The purpose of this trial was to test ZT PRO Brewery Cleaner vs. the current cleaning method with a caustic cleaner. The trial was performed on an emptied fermentation vessel after attenuated beer was transferred to a new vessel.

## Trial Critical Control Points

- Is the vessel visually clean after the trial?
- Was odor removal achieved after the trial?
- Was any cleaning solution or residue left behind after the trial?
- Were unwanted organisms removed after the trial?
  - Bacterial cultures collected: Aerobic (need oxygen) species

## Current Cleaning Method

1. Operator collects and wears all appropriate safety gear. (Safety Goggles, Heavy Rubber Gloves, Heavy Rubber Apron, Heavy Rubber Boots)
2. Collect 25-30 gallons (94-113 L) water at 180°F (82.2°C) + in CIP cart/vessel.
3. Add caustic cleaner to water at recommended amount (1oz per gallon).
4. Water with caustic cleaner introduced to vessel via cart mounted pump.
5. 15 min CIP to clear bottom valve and racking valve.
  - a. Vessel lid is ¼" - ½" open and sampling valve is open during this flush.
6. Caustic cleaning solution then redirected to CIP (clean in place) arm to spray ball to coat upper portions of vessel.
7. 20 min CIP via CIP arm to clean interior of vessel.
  - a. Vessel lid is ¼"-1/2" open and sampling valve is open during this flush.
8. Water flush performed to remove any remaining caustic cleaner.

## ZT PRO Brewery Trial #1 Cleaning Method/Data Collection

1. Operator collects and wears safety goggles and cleaning gloves.
2. Swab samples (before cleaning) taken at bottom valve, racking valve and vessel wall.
3. Collect 25-30 gallons (94-113 L) water at 149°F (65° C) in separate vessel.
4. Add ZT PRO Brewery Cleaner to water at 1oz per gallon.
5. Water with ZT PRO Brewery Cleaner introduced to vessel via cart mounted pump.
6. 15 min CIP to clear bottom valve and racking valve.
  - a. Vessel lid is 1/4" to 1/2" open and sampling valve is open during this flush.
7. Start temp 149° F (65° C). Finish temp 134° F (56.7° C).
8. ZT PRO Brewery cleaning solution then redirected to CIP (Clean in Place) arm to spray ball to coat upper portions of vessel. Start temp 131° F (55° C).
9. CIP began at 100% pump power.
10. After 3 mins, foam began to exit through elbow at sampling port.
11. Stopped pump at 3 mins, allowed 10-minute break for cleaning solution foam to die down within vessel. (See Observations later in this document.)
12. Closed sampling arm elbow with valve, left vessel lid open ¼" to ½".
13. 20 min CIP via CIP arm to clean interior of vessel.
14. Restart temp 125° F (51.7° C). Final temp 122° F (50° C).
15. Swab samples taken (after cleaning) at bottom valve, racking valve and vessel wall.

## Cleaning Method Differences

- ZT PRO Brewery Cleaner requires only safety goggles and cleaning gloves. No heavy rubber cleaning wear is needed.
- Water is introduced at 149°F (65° C) and primary cleaning is accomplished between 122°-131°F (50 - 55° C)
- Sampling arm is closed during CIP arm flush to preserve foam within vessel.

## Observations

1. After the ZT PRO Brewery Cleaning
  - a. Vessel had no remaining odor of fermented product or yeast.
  - b. Vessel had no remaining cleaner present based upon touch test.
2. Krausen ring within vessel was cleaned and no visual residue was present.
3. Brewery personnel have practically eliminated exposure to harmful chemicals during cleaning, such as skin contact and off-gassing.
4. Upon the initial presence of foam exiting the sampling port, the test team considered that the vessel may over flow with foam. After the 10-minute rest period and resumption of the CIP (Clean in Place) arm flush cycle, the test team found that the foam abated with the CIP arm's spray. The presence of the foam, in the opinion of the test team, contributed to the cleaning cycle with a positive effect, rather than inhibiting it.
5. The cleaning was performed at temperatures ranging from 131 to 158° F (55 - 70° C) below the current standard of 160° F (71.1° C).

## Laboratory Results

Swab samples taken at the bottom valve, racking valve and vessel wall before and after cleaning showed a reduction in Gram-negative and Gram-positive microbiological growth based on lab cultures.

## Recommendations for Trial #2

- Starting water temperature at 145° F (62.8° C).
- Close the sampling valve during CIP arm flush.
- *No 10-minute rest for the foam. This is to determine if the 10-minute rest improved the cleaning process.*

## Acknowledgments

The ZT PRO Brewery Cleaner Team expresses gratitude and thanks to the Faculty and current Cohort of the Craft Beverage Institute of the Southeast for granting unprecedented access to personnel and equipment for the ZT PRO Brewery Cleaner trials. Additional thanks to Eric for his meticulous documentation, and Jordan for his patience with our questions about the equipment and process. Finally, without the consent of Jeff 'Puff' Irvin and John Lyda, and their willingness to test, learn and grow with our product, none of the preceding information would be available.

## References

<sup>1</sup> Dow Chemical Company. "Product Safety Assessment, DOW Octylpenol Ethoxylate Surfactants." Oct 21, 2015. P. 2.

<sup>2</sup> <https://www.probrewer.com/library/stupid-stuff/cleaning-and-sanitation/>

<sup>3</sup> <https://www.e-education.psu.edu/egee102/node/2003>

<sup>4</sup> Based upon tests completed by Pace Analytical Services, Inc. in Asheville NC.

<sup>5</sup> <https://www.epa.gov/indoor-air-quality-iaq/volatile-organic-compounds-impact-indoor-air-quality>

# About ZolaTerra®

ZolaTerra® is a brand created, owned and operated by SuperSimple LLC. ZolaTerra products are biodegradable, safe to the touch and safe for plants. Our goal is to provide healthy and environmentally safe cleaning products for all people, plants and animals. ZolaTerra offers more than 200 unique products that are safe, yet highly effective, plant-based cleaners and deodorizers. Products range from household cleaners, concrete cleaner, paint brush cleaner, boat cleaner, roof mold cleaner, degreaser, permanent marker remover, window cleaner, pet stain and odor removers, spot removers, deodorizers many more. All ZolaTerra products are Family Made in the USA.

ZolaTerra products are certified by NSF, USDA as a Bio Preferred Plant Based Product, Leaping Bunny, PETA Cruelty Free and Vegan, and meets all OSHA and EPA regulations.

## How ZolaTerra Works

ZolaTerra works on a microscopic level using a combination of plant-based solvents, micelles and de-scalers, to safely remove all types of grime, from a surface or substrate. ZolaTerra effectively cleans while near or practically at neutral pH. Simply stated, ZolaTerra lifts grime to easily wipe, scrub and rinse it away; ZolaTerra works even when you're not scrubbing.

## ZolaTerra Product Benefits

ZolaTerra is a plant-based cleaner that is non-flammable, non-corrosive, and does not contain any caustic or abrasive materials. ZolaTerra products, even in their concentrated state, do not require gloves, respirators, or special handling. ZolaTerra products are safe for the skin with very low or no odor. ZolaTerra products can replace one of the most detrimental and hazardous materials within a brewing facility.

Visit our website to review some of our "Product Test Cases," which can be found at <https://zolaterra.com/pages/product-test-cases> .

## About SuperSimple, LLC

SuperSimple, LLC. was founded in 2015 and is located in Matthews, North Carolina.

Our Mission is simple: help brands and businesses grow through creative solutions.

Our Values: Simplicity - Integrity - Trust - Creativity - Efficiency - Partnership - Environmentally Friendly