



Fire Soaps™

Detergents and Anti-Bacterial Products for Fire & EMS Departments
Industry Tested...Industry Approved

HAND SANITIZER

ALCOHOL-FREE
HAND & SKIN
SANITIZING FOAM



Frequently Asked Questions

What is Fire Soaps Alcohol-Free, Foam Hand & Skin Sanitizer?

FS HAND SANITIZER is an **Alcohol-Free**, Foam Hand & Skin Sanitizer, based on the active ingredient Benzalkonium chloride, is a unique, Patented formulation featuring exceptional skin feel, conditioning and moisturizing properties. The efficacy of this product has been confirmed to reduce *S. aureus* 99.999% in as little as 15 seconds. Without ethyl alcohol, our product is **non-flammable** and **non-drying**. In addition, unlike alcohol-based products, **FS HAND SANITIZER** does not require polymers or thickeners and as a result you skin does not feel sticky and your pores do not become clogged.

FS HAND SANITIZER Foam is in compliance with the FDA Final Tentative Monograph for OTC Hand Sanitizer preparations (leave-on sanitizers not requiring a rinse). **FS HAND SANITIZER** Foam is shipped from our FDA Registered Establishment. **FS HAND SANITIZER** is **NSF Registered** and Approved under Category E2 & E3 for Food Handlers and is effective on **MRSA & CA-MRSA**.

Why Benzalkonium chloride-based Hand Sanitizers?

Benzalkonium chloride-based Hand Sanitizers have distinct advantages over gelled alcohol hand sanitizers. While both product forms are FDA Monograph for “leave on” products, fast acting and allow for use without water or towels, Benzalkonium chloride based products are non-flammable, less drying to skin, and will not stain clothing. Published studies report that gelled alcohol gel hand sanitizers actually make the skin more contaminated, not cleaner, due to removal of protective natural skin oils and entrapment of dead skin cells by the polymer thickeners used in the gelled alcohol products. Benzalkonium chloride is a quaternary active ingredient with a history of use in leave-on, FDA Monograph anti-bacterial skin treatment products. Leave-on Hand Sanitizers should not be used as a substitute for proper hand washing and hygiene practices.

What makes FIRE SOAPS HAND SANITIZER™ unique?

Patented **FS HAND SANITIZER** Foam produces a fast drying, non-sticky foam that contains unique conditioning and moisturizing ingredients, leaves the skin with a soft, silky after-feel, and does not contain polymer thickeners or silicones.



How Safe is FIRE SOAPS HAND SANITIZER™ ?

FS HAND SANITIZER Foam is very effective at reducing bacteria on the skin, yet very gentle on the skin and eyes as the Toxicity Profile below indicates:

Toxicity Profile for Fire Soaps™ Hand & Skin Sanitizer Foam

Acute Oral LD50	>5.0 g/kg, <i>Category IV</i>
Acute Dermal LD50	>2.0 g/kg, <i>Category III</i>
Eye Irritation	<i>Category III</i>
Skin Irritation	<i>Category IV</i>
Sensitization	Not a Skin Sensitizer

What are the affects of long-term, repeated use?

In published studies, Benzalkonium chloride based Hand Sanitizers outperform alcohol-based products for long-term effectiveness. Alcohol-based products evaporate very quickly and are no longer effective after they are dry. **Benzalkonium chloride remains active on the surface of the skin, continuing to kill bacteria for hours. FS HAND SANITIZER actually gets better with repeated use!**



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What about efficacy?

FS HAND SANITIZER Foam is very effective against a broad range of pathogenic bacteria in as little as 15 seconds as the **Chlorine Equivalency** and **Time Kill Data** illustrate (*see attached*).

CHLORINE EQUIVALENCY TEST – FS Hand Sanitizer

The object of this test is to determine the available chlorine germicidal equivalent concentration of the product as compared to the 200, 100 and 50 ppm available chlorine in the NaOCl standard controls.

Initial suspension Population

Staphylococcus aureus ATCC #6538 7.6 X 10⁸ CFU/mL
Salmonella typhi ATCC #6539 1.2 X 10⁸ CFU/mL

TEST SUBSTANCE	CONC.	SUBCULTURE SERIES									
		1	2	3	4	5	6	7	8	9	10
TEST ORGANISM: S. aureus											
NaOCl (Control)	200 ppm	0	0	0	0	0	+	+	+	+	+
	100 ppm	0	0	+	+	+	+	+	+	+	+
	50 ppm	0	+	+	+	+	+	+	+	+	+
FIRE SOAPS™ HAND SANITIZER Foaming Hand & Skin Sanitizer		0	0	0	0	0	0	0	0	0	0
TEST ORGANISM: S. typhi											
NaOCl (Control)	200 ppm	0	0	0	0	0	0	+	+	+	+
	100 ppm	0	0	0	+	+	+	+	+	+	+
	50 ppm	0	0	+	+	+	+	+	+	+	+
FIRE SOAPS™ HAND SANITIZER Foaming Hand & Skin Sanitizer		0	0	0	0	0	0	0	0	0	0

+ = Growth of Organism, 0 = No Growth of Organism

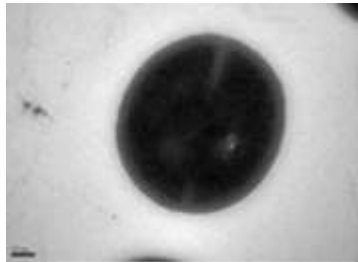
The subcultures of positive broths (tubes showing Growth) demonstrated pure cultures of the test organism.

EFFICACY RESULTS – FS HAND SANITIZER Foam

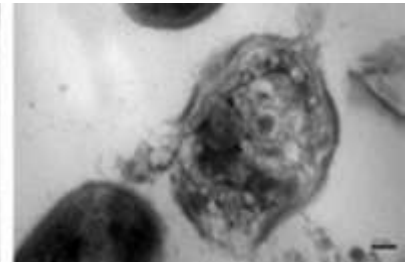
FS HAND SANITIZER Foam demonstrated an available chlorine equivalent to greater than the 200 ppm NaOCl standard control when tested against *Staphylococcus aureus* and *Salmonella typhi*.

Don't hand sanitizers increase the likelihood of antibiotic resistance?

FS HAND SANITIZER Foam is a broad-spectrum sanitizer with efficacy proven across a wide range of bacteria. Unlike antibiotics, topical sanitizers do not attempt to selectively eliminate only certain bacteria. The active ingredient in **FS HAND SANITIZER** causes the cell wall to lose electromagnetic bonds – rupturing the cell wall. This is very important because most in the medical community today believe that the recent proliferation of the “super bugs” and the antibiotic resistant strains of bacteria are directly a result of this attempt to be selective in the elimination of some bacteria while sparing others. **FS HAND SANITIZER** is designed to eliminate all bacteria on the skin. While some useful or harmless bacteria may be removed, this is essential in preventing mutations into “super bugs”.



Normal bacteria cell



Bacteria cell with cell wall ruptured

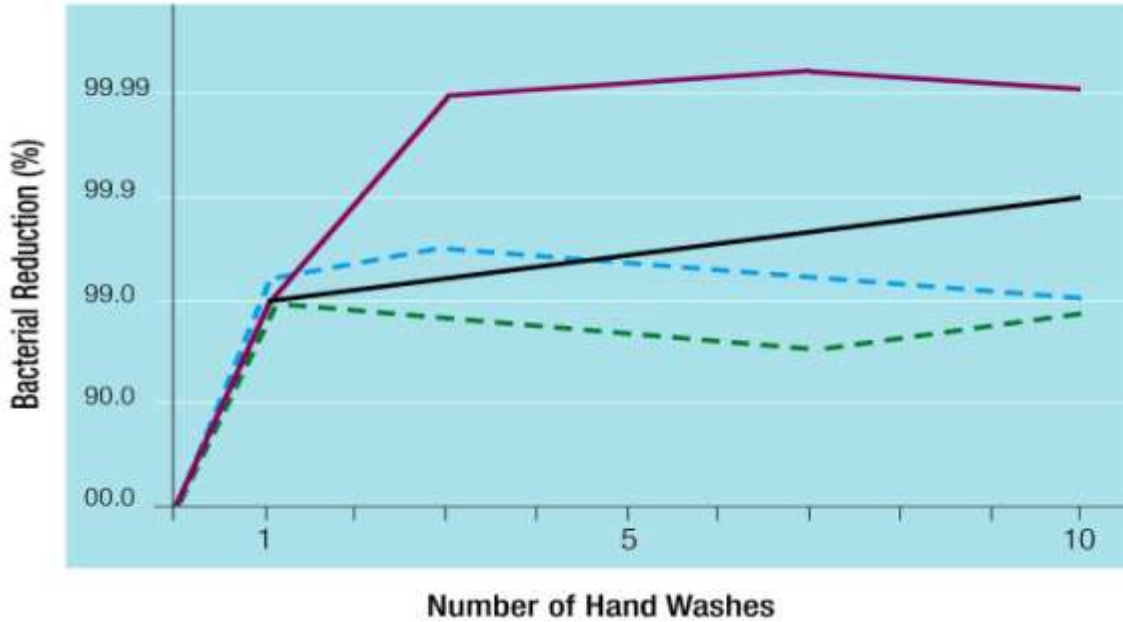


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Active Ingredient Effectiveness*

Benzalkonium Chloride vs. Ethyl Alcohol



- FDA Minimum Standard
- Benzalkonium Chloride
- - - 62% Ethyl Alcohol
- - - 70% Ethyl Alcohol

*SOURCE: AORN Journal, August 1998

Benzalkonium Chloride, a quaternary ammonium compound used for decades as a topical anti-microbial, is proven to be effective against a wide range of bacteria, fungi and viruses such as Staph, E. Coli, Athlete's Foot Fungus, Influenza, HIV and Hepatitis.

Any special handling considerations?

FS HAND SANITIZER Foam is a stable, water-based system. Care should be taken to avoid freezing. The shelf life of the product exceeds 24 months if keep in moderate conditions.

How is it sold?

FS HAND SANITIZER Foam is sold in;

- ◆ 1.7oz (50mL) bottles with foam pump (24/case) **approx. 120 uses**
- ◆ 7.0 oz (210mL) bottles with foam pump (12/case) **approx. 500 uses**
- ◆ 1,000mL cart. wall-mounted foam dispensers (6/case) **approx. 2,400 uses**



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Time Kill Study for FS Hand Sanitizer

This study is designed to examine the rate of kill of a test substance after inoculation with a test organism. Results are expressed in percent reduction and log reduction of the test organism. Exposure time = 15 seconds.


ORGANISM	TEST POPULATION CONTROL (CFU/ml)	NUMBER OF SURVIVORS	% REDUCTION	LOG REDUCTION
Campylobacter jejuni ATCC 29428	1.02 X 10 ⁷	< 1.0 X 10 ²	> 99.999	> 5.00 Log ¹⁰
Candida albicans ATCC 10231	1.60 X 10 ⁵	6.0 X 10 ³	96.30	1.42 Log ¹⁰
Clostridium difficile (C. Diff. Veg) ATCC 9689	3.40 X 10 ⁶	< 2.0	> 99.9999	> 6.20 Log ¹⁰
Enterococcus faecalis (VRE) ATCC 51575 (Vancomycin Resistant)	1.12 X 10 ⁶	3.2 X 10 ¹	99.99	4.54 Log ¹⁰
Escherichia coli ATCC 11229	3.80 X 10 ⁶	4.0	99.999	6.00 Log ¹⁰
Escherichia coli 0157:H7 ATCC 35150	1.26 X 10 ⁶	< 2.0	> 99.999	> 5.80 Log ¹⁰
Klebsiella pneumoniae ATCC 4352	1.10 X 10 ⁶	2.0	99.999	5.70 Log ¹⁰
Klebsiella pneumoniae (NDM-1 positive) CDC 1000527 ("New Delhi" superstrain)	7.40 X 10 ⁵	< 5.0	> 99.9999	> 5.20 Log ¹⁰
Listeria monocytogenes ATCC 19117	4.70 X 10 ⁶	1.9 X 10 ³	99.90	3.39 Log ¹⁰
Pseudomonas aeruginosa ATCC 15442	3.50 X 10 ⁶	< 2.0	99.9999	> 6.20 Log ¹⁰
Salmonella choleraesuis serotype enteritidis ATCC 4931	6.80 X 10 ⁵	2.0	> 99.999	> 5.50 Log ¹⁰
Salmonella choleraesuis serotype paratyphi ATCC 8759	5.60 X 10 ⁵	< 2.0	> 99.999	> 5.50 Log ¹⁰
Salmonella choleraesuis serotype pullorum ATCC 19945	8.90 X 10 ⁵	< 2.0	> 99.999	> 5.70 Log ¹⁰
Salmonella choleraesuis serotype typhimurium ATCC 23564	7.70 X 10 ⁵	6.0	> 99.999	> 5.10 Log ¹⁰
Salmonella typhi ATCC 6539	1.27 X 10 ⁶	2.0	99.999	> 5.80 Log ¹⁰
Shigella dysenteriae ATCC 13313	1.30 X 10 ⁶	< 2.0	> 99.999	5.80 Log ¹⁰
Shigella flexneri ATCC 12022	1.39 X 10 ⁶	2.8 X 10 ¹	99.99	4.69 Log ¹⁰
Shigella sonnei ATCC 25931	2.43 X 10 ⁷	< 2.0 X 10 ¹	99.9999	6.09 Log ¹⁰
Staphylococcus aureus ATCC 6538	6.70 X 10 ⁶	< 2.0	> 99.9999	> 6.53 Log ¹⁰
Staphylococcus aureus (MRSA) ATCC 33592 (Methicillin Resistant, aka HA-MRSA)	1.23 X 10 ⁷	3.8 X 10 ³	> 99.9	3.51 Log ¹⁰
Staphylococcus aureus (CA-MRSA) Community Acquired Methicillin Resistant (USA 400)	1.18 X 10 ⁶	5.8 X 10 ²	> 99.9	> 3.30 Log ¹⁰
Staphylococcus epidermidis ATCC 12228	7.20 X 10 ⁵	< 2.0	99.999	> 5.56 Log ¹⁰
Streptococcus pneumonia ATCC 6305	6.40 X 10 ⁵	< 2.0	> 99.999	> 5.51 Log ¹⁰
Streptococcus pyogenes ATCC 19615	1.77 X 10 ⁶	< 2.0	> 99.999	> 5.90 Log ¹⁰
Vibrio cholera ATCC 11623	4.70 X 10 ⁵	< 2.0	> 99.999	> 5.40 Log ¹⁰
Xanthomonas axonopodis ATCC 49118 (Citrus Canker)	1.28 X 10 ⁶	3.6 X 10 ¹	> 99.99	4.55 Log ¹⁰
Yersinia enterocolitica ATCC 23715	2.23 X 10 ⁶	3.8 X 10 ¹	99.99	4.77 Log ¹⁰



HAND SANITIZER ALCOHOL-FREE,
 HAND & SKIN
 SANITIZING FOAM



is available in the following sizes;

- | <u>SIZE</u> | <u>Approx # Uses
Per Bottle</u> |
|--|--|
| <ul style="list-style-type: none"> • 50mL (1.7oz) Personal size
 <u>TSA Compliant</u>  Transportation Security Administration | ▶ <u>120</u> |
| <ul style="list-style-type: none"> • 210mL (7.1oz) Table-top size | ▶ <u>500</u> |
| <ul style="list-style-type: none"> • 1,000mL (34 oz) Wall dispenser | ▶ <u>2,400</u> |



Why is FS Hand Sanitizer Foam a Better Value than Alcohol-Based Gel Sanitizers?

How many uses are in a 2 fl oz. bottle of the average alcohol-based hand sanitizer gel?

- For Alcohol-based gels, if used as directed, which is to apply enough Instant Hand Sanitizer to thoroughly wet hands, a consumer can get about 30 uses out of a 2 fl oz bottle. ⁽¹⁾

(1) Source:<http://www.purell.com/page.jhtml?id=/purell/include/facts.inc>

- A 1.7 oz bottle of FS Hand Sanitizer will normally yield up to 110 uses

# of Uses per Liquid oz.	Alcohol-gel	<u>FireSoaps™ Hand Sanitizer</u>
	15 uses/oz	<u>60+ uses/oz</u>

FS HAND SANITIZER - MORE THAN 4 TIMES AS MANY APPLICATIONS PER OZ!

- ✓ NON-DRYING & NO STING
- ✓ RESIDUAL EFFICACY
- ✓ **NON-FLAMMABLE**
- ✓ NO-DRIP FOAM
- ✓ BETTER VALUE!