

## APPLICATION DATA

### EQO GEL ANTIBACTERIAL IN ANTI-MICROBIAL CLEANING FORMULATIONS

#### GENERAL

EQO GEL ANTIBACTERIAL is the natural L-Lactic acid, which is produced by fermentation of carbohydrates. It is used in many applications in the food, chemical, pharmaceutical, cosmetic and detergent industry. The main functions of EQO GEL ANTIBACTERIAL in cleaning formulations are decalcification, pH-regulation and bacterial control.

#### PRODUCT FEATURES

- Q Anti-microbial properties
- Q Good cleaning properties (decalcifying)
- Q Good material compatibility (metals and plastics)
- Q Biodegradable
- Q Toxicologically and environmentally safe
- Q Mild odor
- Q Produced from renewable sources

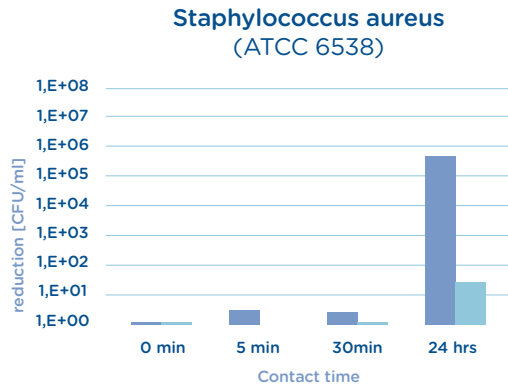
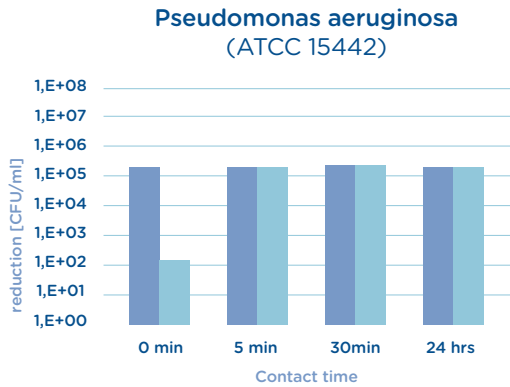
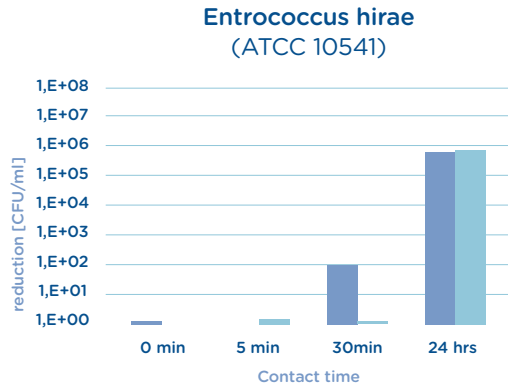
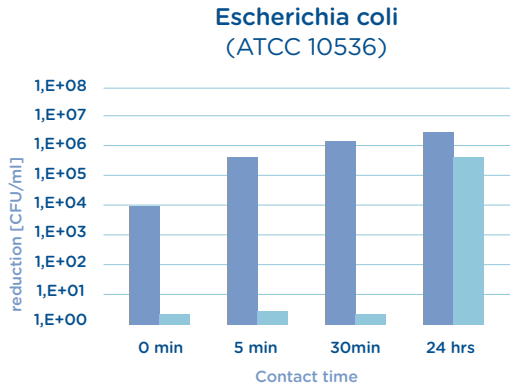
#### PROPERTIES

EQO GEL ANTIBACTERIAL possesses anti-microbial properties; more important it shows synergistic effects with other anti-microbial agents, like ethanol or hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>). When compared with citric acid the anti microbial properties of EQO GEL ANTIBACTERIAL has superior efficacy. A test carried out with EQO GEL ANTIBACTERIAL versus citric acid gave the results as described in experiment 1.

#### EXPERIMENT 1

Test method: EN 1276: Quantitative suspension test for the evaluation of bacterial activity of chemical disinfectants and antiseptics used in food, industrial, domestic and institutional areas.

- Q Test samples: 10% acid, pH 3
- Q Interfering substance: 3 g/l bovine albumin (0.3 g/l final conc.)
- Q Neutralizing agent: phosphate buffer 0.25 mol/l
- Q Test temperature: 20°C ± 1°C



Q Lactic acid      Q Citric acid

In combination with surfactants like sodium lauryl sulfate (SLS) the anti-microbial effect of EQO GEL ANTIBACTERIAL is enhanced as described in

### EXPERIMENT 2

Test method: EN 1276 (European suspension test)

- Q Test samples: 3% and 5% acid + 2% SLS (Texapon K12)
- Q Interfering substance: 3 g/l bovine albumin (0.3 g/l final conc.)
- Q Neutralizing agent: phosphate buffer 0.25 mol/l
- Q Test temperature: 20°C ± 1°C
- Q Contact time: 5 minutes

log reduction acc. to EN 1276	E. coli	P. aeruginosa	P. hirae	S. aureus
5% Lactic acid + 2% SLS	>5	>5	>5	>5
3% Lactic acid + 2% SLS	>5	>5	>5	>5

From literature it is also known that the combination of EQO GEL ANTIBACTERIAL Sanilac and ethanol is effective against different types of bacteria (experiment 3).

- contact time 30 seconds

lactic acid conc. (%)	concentration ethanol (%)								
	70	60	50	40	30	20	15	10	0
20	+	+	+	+	+	+	+	+	-
10	+	+	+	+	+	+	+	+	-
5	+	+	+	+	+	+	+	-	-
3	+	+	+	+	+	+	+	-	-
1	+	+	+	+	+	+	-	-	-
0,5	+	+	+	+	+	+	-	-	-
0	+	+	+	+	-	-	-	-	-

+complete sterilization possible

- sterilization impossible

Mixtures of EQO GEL ANTIBACTERIAL anilac and H<sub>2</sub>O<sub>2</sub> are also very effective anti-microbial compositions;  
also in this case a synergistic effect has been found.

#### APPLICATIONS

EQO GEL ANTIBACTERIAL as an anti-microbial agent and/or as a natural preservative can be used in, for example, the following products:

- Q Bathroom cleaners
- Q Toilet cleaners
- Q Vegetable washes
- Q Kitchen cleaners
- Q Liquid dishwashing products

#### CONCLUSION

EQO GEL ANTIBACTERIAL is a safe, biodegradable and versatile product, which shows strong anti-microbial action, especially on gram negative bacteria.

The anti-microbial properties of EQO GEL ANTIBACTERIAL, compared to citric acid, are superior, particularly on Escherichia coli.

EQO GEL ANTIBACTERIAL in combination with surfactants (SLS), ethanol or H<sub>2</sub>O<sub>2</sub> shows strong synergistic effects.