

# Bellacide<sup>®</sup> 355

high performance, multifunctional in fracturing applications compared to Glutaraldehyde mixtures

## Challenge

The downhole wellbore temperatures and pressures that biocides are exposed to can cause glutaraldehyde based biocides to become ineffective in less than 24 hours as seen in Graph 1.

## Solution

Using Bellacide 355 delivers fast kill, while providing stable, long lasting control against biofouling bacteria at high temperatures and pressures. Effectiveness of Bellacide 355 versus glutaraldehyde in these conditions can be seen in Table 1.

## Conclusion

At 250 ppm Bellacide 355 outperforms at typical downhole temperatures & pressures vs. competitive products that will break down.

**Bellacide 355** is a fast acting, long lasting broad spectrum biocide with superior activity compared to other non-oxidizing biocides. Highly

effective against problematic organisms, Bellacide 355 MMC (minimum microbicidal concentration) against sulfate reducing bacteria (SRB) is 100 ppm in 1 hour.

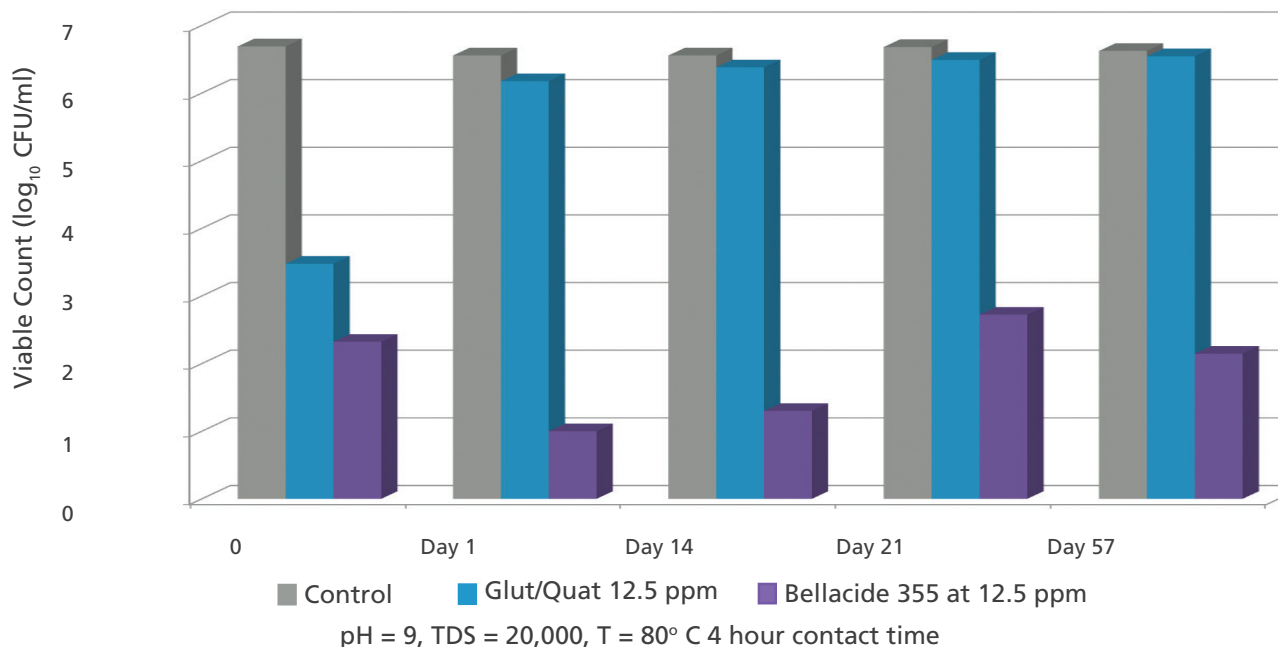
Benefits of Bellacide 355 (TTPC)

- Procedure - Cell disruption through membrane wall
- Operational – No persistent foaming
- Operational – Provides >80% corrosion inhibition

Bellacide 355 is a 5% aqueous solution of tributyl tetradecyl phosphonium chloride (TTPC).

Bellacide 355 - Fast acting, long lasting	
Appearance	Clear, colorless liquid
Specific gravity at 20° C	0.98
pH	6.0 – 8.0
Odor	Slight to none
Boiling Point	100° C (212° F)
Solubility	
- Water	Completely miscible
- Methanol	>50%
- Isopropanol	>50%
- Ethylene glycol	>50%

Graph 1 - Bellacide 355 Controls Corrosion-Causing APBs at Long, High Temperature Incubation



Our wide selection of biocide chemistry can be tailored for any treatment scenario.

**Learn more at [www.wateradditives.com](http://www.wateradditives.com)**

Table 1 - Biocide Comparison

	Bellacide 355	25% Glut / 12% Quat
Dosage	250 ppm	250 ppm
Use Cost	1X	1.25X
Kill Speed	Fast	Fast
SRB Performance	Excellent	Good
Biofilm Removal	Excellent	Good
Thermal Stability	Very Stable	Breaks Down
Persistency	>28 days	<7 days
Safe Handling	Excellent	Poor
Gel Breaker Compatibility	Excellent	Deleterious
Reducing Agent Compatibility	Excellent	Not Compatible

Health and Safety Comparison

	TTPC	Glut/Quat
Eyes	May cause eye burns.	Causes irreversible eye damage. Vapor may cause eye irritation.
Skin	Not a skin sensitizer. Prolonged contact may cause burns.	Can be absorbed through skin. Skin sensitizer. May cause skin burns.
Inhalation	Non-Volatile.	Harmful if inhaled. Inhalation may result in skin sensitization. Can cause respiratory asthma.
Ingestion	May be harmful if swallowed. May cause burns.	Harmful if swallowed. May result in irritations or burns of mouth, through and gastrointestinal tract.
Carcinogenic	No	No



[www.wateradditives.com](http://www.wateradditives.com)

**Americas**

1979 Lakeside Parkway,  
Suite 925  
Tucker, GA 30084, USA  
Phone +1 678 802 3050  
Or 800 600 4523  
Fax +1 678 802 3024  
Americas@wateradditives.com

**Asia Pacific**

60, Robinson Road, #12-01  
BEA Building  
Singapore 068982  
Phone +65 9745 3227  
Fax +65 6234 3606  
AsiaPacific@wateradditives.com

**Europe & Africa**

2 Brightgate Way  
Stretford, Manchester M32 0TB  
United Kingdom  
Phone +44 161 864 6699  
Fax +44 161 864 6666  
Europe@wateradditives.com

**Middle East**

FZE Dubai Branch  
TechnoPark Jebel Ali  
Block B, Level 1, Office 107  
PO Box 263164  
Dubai, United Arab Emirates  
Phone +971 4 880 7336  
Fax +971 4 880 7404  
MiddleEast@wateradditives.com

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