

Bellacide[®] 355

high performance, multifunctional in fracturing applications compared to THPS

Challenge

The downhole wellbore temperatures and pressures that biocides are exposed to can cause THPS 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 APBs at high temperatures and pressures. Effectiveness of Bellacide 355 versus THPS in these conditions can be seen in Table 1.

Conclusion

Bellacide 355 performs at typical downhole temperatures and pressures at which THPS 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)

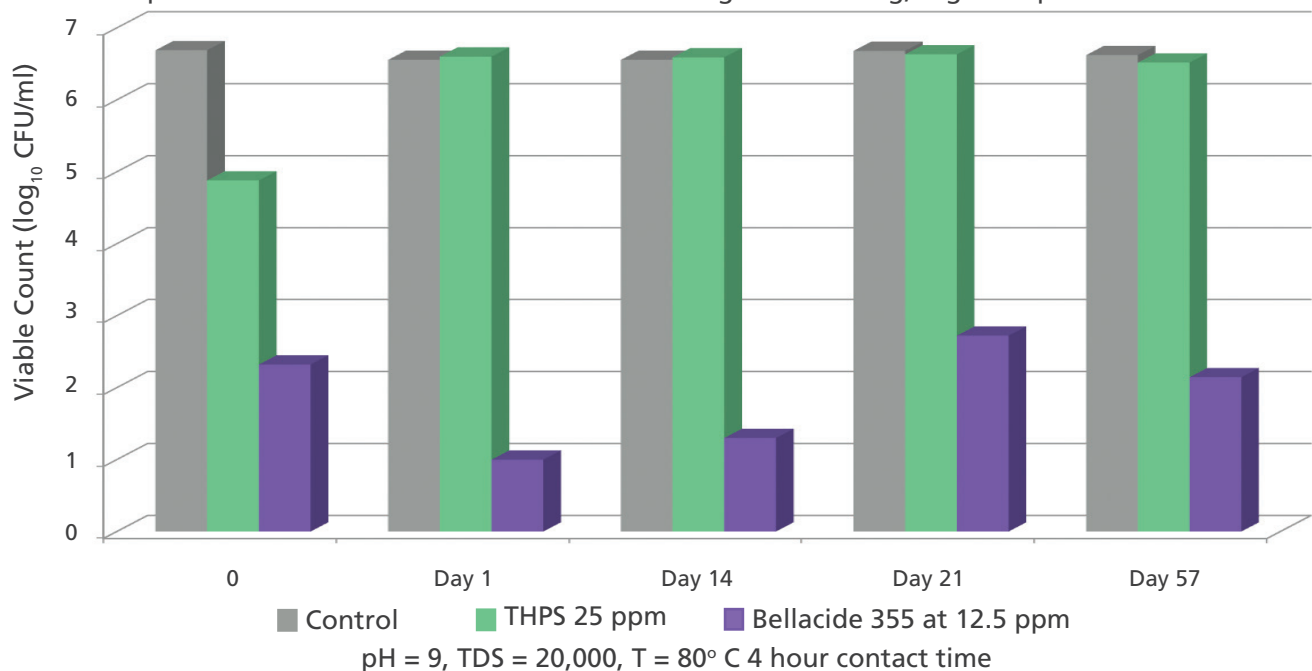
- Procedure - Cell disruption through membrane wall
- Operational – No persistent foaming
- Operational – Provides >80% corrosion inhibition

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

Table 1 - Biocide Comparison

	Bellacide 355	75% THPS
Dosage	250 ppm	300 ppm
Use Cost	1X	1.2X
Kill Speed	Fast	Slow
SRB Performance	Excellent	Poor
Biofilm Removal	Excellent	Poor
Thermal Stability	Very Stable	Unknown
Persistency	>28 days	<7 days
Safe Handling	Excellent	Average
Gel Breaker Compatibility	Excellent	Deleterious
Reducing Agent Compatibility	Excellent	Excellent

Health and Safety Comparison

	TTPC	THPS
Eyes	May cause eye burns.	May cause significant irritation resulting in permanent injury.
Skin	Not a skin sensitizer. Prolonged contact may cause burns.	Prolonged contact may cause irritation. Skin contact may cause sensitization
Inhalation	Non-Volatile.	Harmful if inhaled. May cause coughing, shortness of breath, chest pain.
Ingestion	May be harmful if swallowed. May cause burns.	Harmful if ingested. May cause nausea, vomiting.
Carcinogenic	No	Contains a component (Formaldehyde) that is regulated under California Proposition 65.



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

Patents:

BWA Water Additives (BWA) owns or is the licensee of patents and patent applications, which may cover the products and/or uses described in this case study. The following are registered trademarks of BWA Bellacide, Drop and Swirl logo. © Registered US Patent and Trademark Office. © 2014 BWA, All rights reserved.

The information contained in this case study is based on data available to BWA Water Additives and is thought to be correct. Since BWA has no control over the use of this information by others, BWA does not guarantee the same results described herein will be obtained, and makes no warranty of merchantability or fitness for a particular purpose or any express or implied warranty. This information is intended for use by technically trained personnel at their discretion and risk.

BWA Water Additives UK Limited is a private limited company registered in England and Wales at 2 Brightgate Way, Manchester M32 0TB, Registered No.5657343.