

# Verza360® Series\*

## Bio-Based Biocide Potentiators

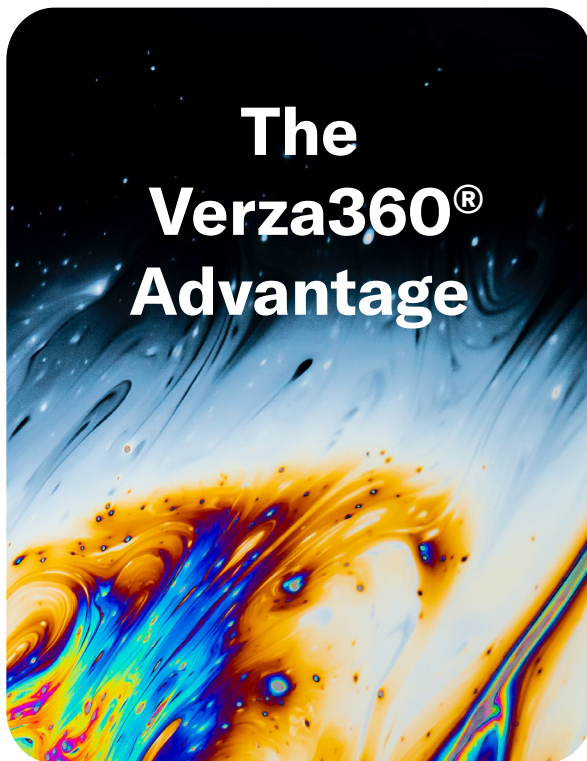
### The Problem

Biocides are well-known additives used for microbial control in oil and gas (O&G) to mitigate costly issues, such as poor heat transfer, microbially induced corrosion (MIC), plugging and fouling. However, biocides are toxic by definition and often added in excess, potentially compromising asset integrity.

With increased interest in sustainability, companies across industries are seeking less-toxic, lower-cost alternatives with reduced environmental impact and without sacrificing performance.

### The Solution – Verza360® (Verza)

Verza does not exhibit any pesticidal activity when used alone. When co-fed with biocides, Verza helps achieve consistent microbial control by reducing interference from inorganic environmental contaminants, such as naturally occurring minerals and metals that interfere with active biocides.



#### Lowers use of active biocide and related treatment costs

Verza improves the efficacy of biocidal applications, such as glutaraldehyde, glut/quat mixtures, and THPS, allowing for lower use of active biocide and related treatment costs.

#### Multifunctional iron control agent

Verza is a proven solution for iron control in water treatment applications within O&G, providing multifunctional performance benefits.

#### Sustainable US supply

Verza is manufactured in the US via a carbon-negative chemenzymatic process. It is non-toxic, biodegradable, and lowers safety risks associated with high levels of biocide use, such as discharge water toxicity.

\*Solugen's Verza360® series are not registered according to FIFRA and therefore have no associated FIFRA claims.



## Verza Enables **Reduced Biocide Use** and **Improved Performance**

Across three test cases where Verza was evaluated by itself and co-fed with common biocides used in O&G, Verza demonstrated no pesticidal effect by itself and a potentiation effect when co-fed, enabling a significant reduction in biocide use while maintaining or improving performance (Figure 1).

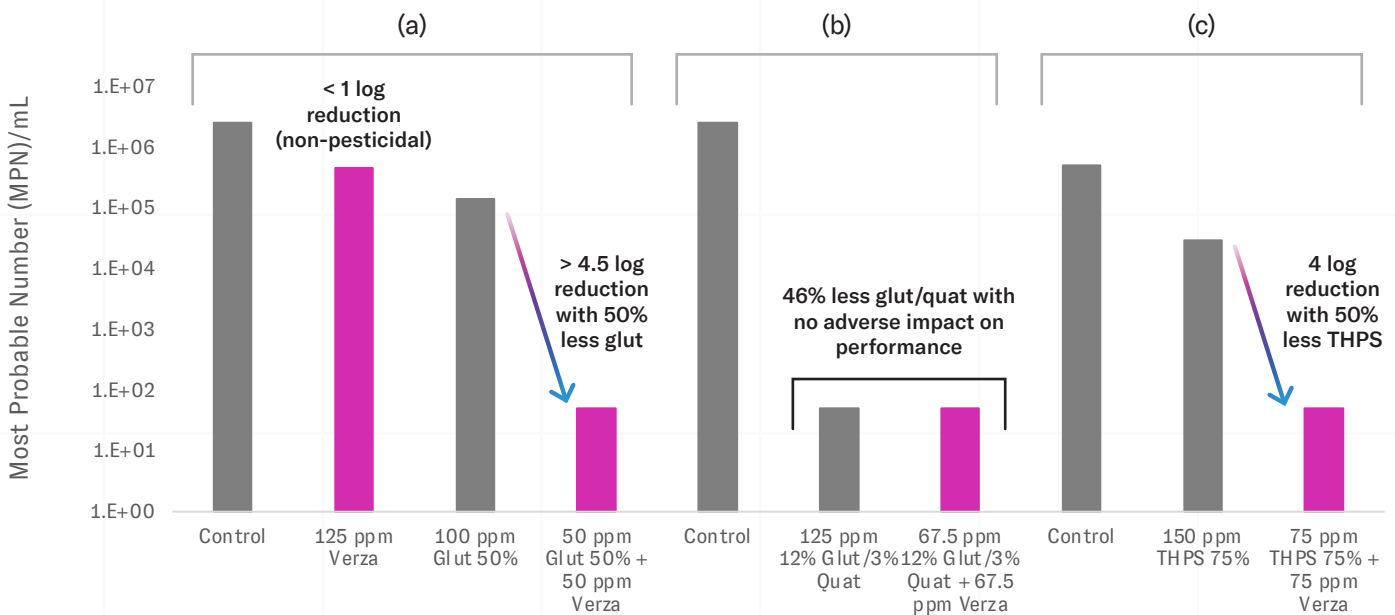


Figure 1. Potentiation Effect of Verza with (a) Glutaraldehyde, (b) Glut/Quat, and (c) THPS

### Test Conditions

All three laboratory tests were conducted in triplicate using a 96-well microtiter plate at rm. temp. and mixed bacterial inoculum in Permian fresh water. The bacterial inoculum for tests (a) and (b) was a mixture of GHB and APB with a 4-hr. contact time while the inoculum for test (c) was a mixture of SRBs with a 24-hr. contact time.

### About Solugen

Solugen is a bio-based specialty chemicals manufacturer and supplier whose mission is to decarbonize the chemical industry by revolutionizing the way chemicals are made for use across a variety of markets and applications.