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### THE BIOCIDAL ACTIVITY OF FPC<sup>®</sup>

Microbial growth in distillate fuels can be a significant problem to diesel fleet operators. The microbial colonies propagate at the fuel-water interface and, if fuel water can be totally eliminated, the problem of microbial growth is also eliminated. However, total elimination of water is difficult to obtain in practice.

One of the active components of FPC<sup>®</sup> Fuel Performance Catalyst is a recognized anti-microbial agent (phenol coefficient = 6). At the recommended mixing ratio for the FPC product being used, fuel treated with FPC<sup>®</sup> contains approximately 1.5 to 3 parts per million (ppm) of this biocide.

Laboratory tests on simulated samples and filters used in the field show the biocide in FPC<sup>®</sup> concentrates in any water present in the fuel and/or filter, and can attain levels that eradicate microbial colonies. Once the microbes are killed, the same chemical becomes a biostat, preventing renewed propagation of microbial colonies in the fuel system. The concentration of the biocide ingredient in FPC<sup>®</sup> taken from filters and submitted for analysis was in the range of 75 ppm to 300 ppm, depending upon the water content of the filter.

A recent report demonstrates the effect of the biocide under controlled laboratory conditions. Three aqueous solutions containing 88, 176, and 294 ppm of the FPC<sup>®</sup> biocide were made up and tested for biocidal effectiveness. These concentrations correspond to the probable range of biocide accumulation encountered in actual practice.

The concentration of the biocidal component in the fuel varies depending upon the FPC<sup>®</sup> product chosen (FPC-1<sup>®</sup> or FPC-2<sup>®</sup>). The biocidal component from FPC-1<sup>®</sup> will be about 3 parts per million where as the concentration of the biocidal component from FPC-2<sup>®</sup> will be about 1.5 parts per million. This does not change the result in either case because the biocidal component tends to concentrate itself in the water layer and over time the resulting levels of about 300 ppm will be achieved from either product. The table below shows that this level of biocide is sufficient to completely eliminate microbial growth.

Samples of distilled water were inoculated with bacteria and treated with varying amounts of the FPC<sup>®</sup> biocide ingredient. The results are tabled below:

<u>Sample</u>	<u>Biocide PPM</u>	<u>Total Bacteria/ml</u>
Control Sample A	0	8200

Control Sample B	0	8300
Control Sample A*	0	8800
Control Sample B*	0	9500
Test Sample 1 A*	88	720
Test Sample 1 B*	88	630
Test Sample 2 A*	176	1
Test Sample 2 B*	176	3
Test Sample 3 A*	294	0
Test Sample 3 B*	294	1

·After one hour of contact, solution plated, incubated and reading taken.

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