

# WATER BULLETIN

Water Quality Program, College of Human Ecology, Cornell University

## The influence of RV chemicals in marina or campground septic tanks

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January 2005

Chemicals to reduce smells coming from either boat or RV holding tanks can be of influence on the delicate bacteriologic balance in a septic tank on a campground or at a marina. Therefore it is important to choose the chemical with the least influencing effects. But what are the chemicals to mind and what are the safety measures to take?

### The chemicals used

Over the years a number of different chemicals have been used. Formaldehyde, para-formaldehyde, and quarternary ammonium are the most important known active species. In table 1 the different ingredients are shown:<sup>1</sup>

Although most of these ingredients are biodegradable if diluted properly, they have been proven to be a nuisance, especially when an RV tank is emptied when only half-full. The dosage of the de-odorizing agents that is shown on the label is for a full tank. When a tank containing less is emptied, the concentration of chemicals is higher. This makes it more difficult for the septic tank bacteria to cope.

Another problem with the chemicals mentioned in the above table is that fact that they can also be a threat to human health. Formaldehyde is a good example. In the MSDS (Material safety datasheets) it is mentioned that it is poisonous when ingested and can cause burns on the skins. Although formaldehyde is diluted (to 37%) in the final product, it is still something that can give grave irritation

Table 1. Active ingredients you should avoid using in your RV holding tank deodorizers.

Active Ingredient	Threats to Human and Environmental Health
Bronopol (chemical name: bromo-nitropropane-diol)	bacterial pesticide
Dowicil (chemical name: 1-(3-chlorallyl)-3,4,7-triaza-1-azoniaadamantane chloride)	bacterial pesticide (EPA states "Do not discharge effluent containing this product to sewer systems without previously notifying the local sewage treatment plant authority.")
Formaldehyde (also known as Formalin; degradate of bronopol)	kills or retards bacterial growth, recognized by EPA as probable carcinogen <sup>2</sup> ; moderately toxic to humans <sup>2</sup>
Glutaraldehyde (also known as embalming fluid)	Retards bacterial growth and covers sewage odor, eye/inhalation irritant
Paraformaldehyde (polymerized formaldehyde)	very toxic to humans <sup>3</sup> (see formaldehyde)
Para-dichlorobenzene (common ingredient in mothballs, urinal cakes, and toilet bowl fresheners)	known carcinogen <sup>1</sup> and drinking water contaminant; moderately toxic to humans <sup>2</sup>

<sup>1</sup> a carcinogen causes cancer

<sup>2</sup> lethal dose for 150 lb person is between 1 ounce to 1 pint

<sup>3</sup> lethal dose for 150 lb person is between 1 teaspoon to 1 ounce

### The manufacturers

There are a great number of manufacturers for RV chemicals.<sup>2</sup> Almost all different products say that they are 100% biodegradable. As active species only formaldehyde and enzymes could be found on the current products. The important thing for a consumer to do is read the label. Only then can you make sure if any of the above mentioned active species are present.

### The influence on septic tanks

The result from these chemicals in septic tanks can be threefold:<sup>3</sup>

1. The degradation process in the septic tank can be slowed down to the point that the sludge contents will increase and a larger risk exists of overflow of solids into the drain field.
2. If the concentration of the product chemicals is too high, it can reduce the drain field's ability to degrade waste.

The toxic chemicals might migrate from the drain field to the groundwater.

Although these risks exist, a study by Novak et al.<sup>4</sup> shows that campgrounds in Virginia (with seasonal occupation) show no signs of septic tank failure. And a study by Pearson et al.<sup>5</sup> shows that a septic tank will have a lot of problems with large amounts of formaldehyde, zinc and phenol. But these large amounts are not realistic and the septic tanks still managed to go back to normal within 2 days.

### Conclusions

- Only full tanks should be emptied in septic tanks
- Read the label on the de-odorizing product carefully for the presence of active species
- Follow the directions for applying the product to your tank.
- When in doubt ask the campground/marina owner what kind of de-odorizer you should use.

### References

1. University of Arizona fact sheet on "RV holding-tank treatments and de-odorizers in septic systems" <http://ag.arizona.edu/pubs/water/az1233.pdf>
2. Several sellers' sites: [www.thetford.com](http://www.thetford.com), [www.odorlos.com](http://www.odorlos.com), [www.valterra.com](http://www.valterra.com), [www.dyersonline.com](http://www.dyersonline.com), [www.jcwhitney.com](http://www.jcwhitney.com)
3. "Effects of deodorants on treatment of boat holding-tank waste" Walker WR, Haley CJ, Bridgeman P, Goldstein SH.; *Environmental management* 15 (3): 441-449 MAY-JUN 1991
4. "The effect of boat holding tank chemicals on treatment plant performance" Novak, J.T., McDaniel, C.R., Howard, S.C.; *Research journal of the water pollution control federation* 62(3), 288-295 (1990)
5. "Pilot scale septic tank treatment of preservative-laden waste" Pearson FH, McLean HR, Klein SA; *Research journal of the water pollution control federation*, 63 (7): 999-1011 NOV-DEC 1991

