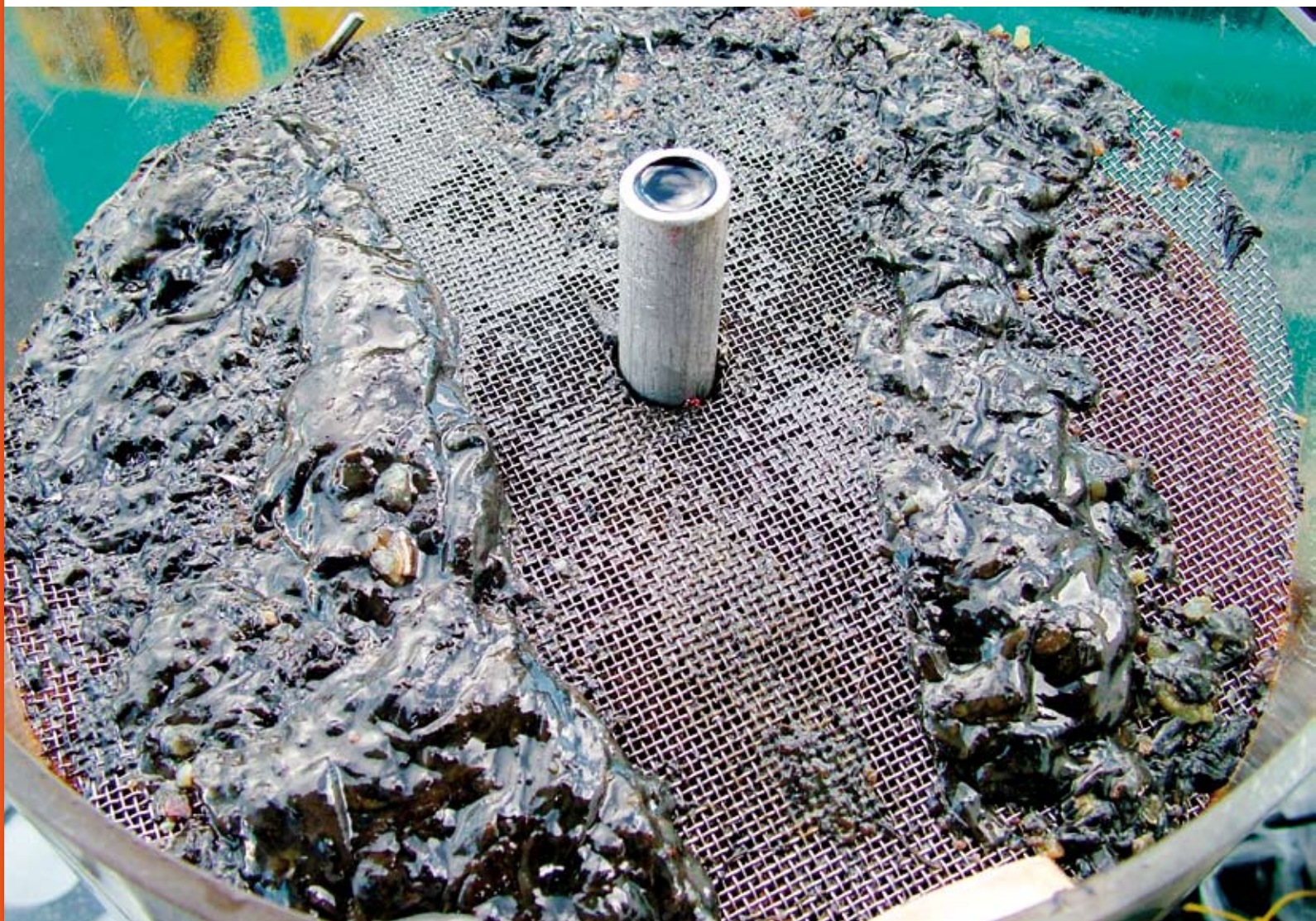


# Death by magnet

One of the boat owner's recurring frustrations, diesel bug, affects hundreds of vessels every year, typically clogging filters and starving the engine of fuel. But sometimes it also damages high-pressure pumps and injectors. There are various diesel bug antidotes – including, would you believe, magnetism?

**Lawrence Schäffler** reports.





**M**ost boat owners are aware that the diesel bug micro-organism can grow inside the fuel tank, feeding on the diesel fuel itself, especially if the vessel isn't used much.

Condensation in the tank contributes to the problem. Some reports claim that under optimum conditions, aerobic diesel bugs can grow from a single cell weighing one millionth of a gram into a slimy algae mat weighing 10kg within 24 hours.

Other diesel-thirsty bugs grow more slowly but create problems during their development. For example, anaerobic or sulphur-reducing bacteria produce hydrogen sulfide as a by-product of their metabolism. Combined with moisture, this forms sulphuric acid.

Treatments for fighting diesel bug range from physically cleaning tanks, filters and components on a regular basis, to the addition of biocides into the fuel. But these latter solutions may actually cause more problems, as dead cells collecting on the bottom of the tank can still find their way into the fuel system, potentially leading to blocked filters.

And then there's the magnetic option.

There's an old (apocryphal?) story about a Scottish marine engineer who observed that the fuel oil supply line and filters to his port generator had fewer clogging problems than to his starboard generator. He determined that the difference was that the port fuel line passed through a magnetic flux field, and he concluded that this somehow limited the filter clogging.

True or not, today the use of magnetism to keep fuel free of diesel bug has become a fully-fledged business for Jon Drumm of Christchurch's DE-BUG Advanced Diesel Solutions, with resellers all over New Zealand. He says his worldwide patented technology has been used with good effect on vessels (and vehicles) all over the world, including fishing trawlers, emergency generators, 4WDs, tractors, yacht engines, gensets and ships.

It's a simple unit that can be installed by any competent DIYer into the fuel line (however Drumm recommends using approved resellers and installers). Recent subscribers are on the NIWA-owned vessel the *Kaharoa*, the *GeoBay* (construction support vessel) and numerous privately-owned

yachts. A DE-BUG system has just been installed for the emergency generator at the Te Papa museum. Existing users are the Armed Forces (the units carry NATO part numbers), the New Zealand Fire Service, Tranz Rail, Shell Oil, and the Mana Coastguard.

Drumm concedes that many boaters will view any diesel bug antidote relying on magnetism and changing polarities with scepticism. But he insists the technology works – and here’s why.



### How it works

Micro-organisms are vulnerable to magnetic waves. The organisms are single-celled, with a membrane surrounding each cell, and the electrically-charged ions travelling across the membranes are essential for the organism’s life.

“Exposing the microbes to a strong, changing magnetic field disrupts the flow of ions, leading to the destruction of the cells,” says Drumm. “We create the magnetic field in the DE-BUG unit by stacking three annular-shaped permanent magnets on top of each

other – what we call a Tri-Mag stack. It’s a stack of three, ferrite-metal, ceramic-coated permanent magnets, and they have a service life of 20-50+ years.”

When microbe-contaminated fuel flows between the magnets, the cells experience intense levels of magnetic flux density from several different angles. There are 24 changes in polarity of the magnetic field.

“This disrupts the cell immediately,” says Drumm, “meaning some bugs will die instantly, while the rest die off over a period of time. DE-BUG has been

shown to have a 97.5 percent efficiency in destroying the bugs in a single pass.”

The treated particles (microscopic) then pass through the diesel filter and burn up in the combustion process. Additional benefits of the technology, he says, are improved fuel efficiency, reduced emissions, better protection of engine, filters, pumps and injectors, extended service life of filters and a more reliable engine. ⚓

For more information, call Jon Drumm at 021 223 2781 or visit [www.dieselsolutions.co.nz](http://www.dieselsolutions.co.nz)

## TRUE DIESEL BUG STORY

Over the years I have heard a lot of diesel bug stories, here is mine:

We were catching plenty of red cod that day on a small trawler just off Banks Peninsula.

We hauled a bag to run home and beat the weather but had trouble with the gear. The weather hit and we started taking waves over the bulwarks so we put the boat into gear and turned for home.

As I put the accelerator down, the engine unexpectedly died. Quickly checking the engine, I discovered the Racor filters were choked up with black gunk I later found out to be “diesel bug”. I changed the Racors and re-primed the fuel system by sucking some diesel through the line. A couple of acrid mouthfuls later we finally got the motor running and endured a journey that took us twice as long as it should. We had to keep away from the rocks or shore in case the bug struck again; the thought of engine failure close to rocks in an angry sea was a very grave threat. With a bad taste of diesel in my mouth, we were relieved to eventually make it in through Godley Head around 3am. It could have been worse...much worse, and the situation was character building to say the least.

I take diesel bug seriously and after reading about DE-BUG and seeing them installed on small boats, trawlers and ferries, I am convinced that our dangerous experience could have been avoided had a DE-BUG been installed. I understand that these units offer monetary savings as well as promote responsible safe ship practice. I am always reassured to see a DE-BUG installed on a vessel I go to sea on.

**Skipper** ⚓

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