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Chemistry Clears The Clogs

Cleaning services from Ultimate Chemicals keep cooling systems running efficiently



■ Potent, readily biodegradable chemicals and fresh water are the key weapons Ultimate Chemicals uses against the buildup of grime and sludge both inside and outside engine and compressor cooling systems.

BY MARK THAYER

Kevin Heidebrecht got a curious call one day from a friend, an engine and compressor mechanic who worked in western Oklahoma. He said, “Man, I’ve got this stuff that’s almost like tar in my cooling system. We have no idea what it is or how it got there or what to do.”

Heidebrecht was on his way back to Moore, Oklahoma, from Amarillo, Texas, so he stopped by and got a sample. For two weeks, Heidebrecht, chemist and owner of Ultimate Chemicals, worked on creating a chemical solution that would clean out the sludge.

He developed a formula that was effective on the sample, which he then took back to the station. They drained the cool-

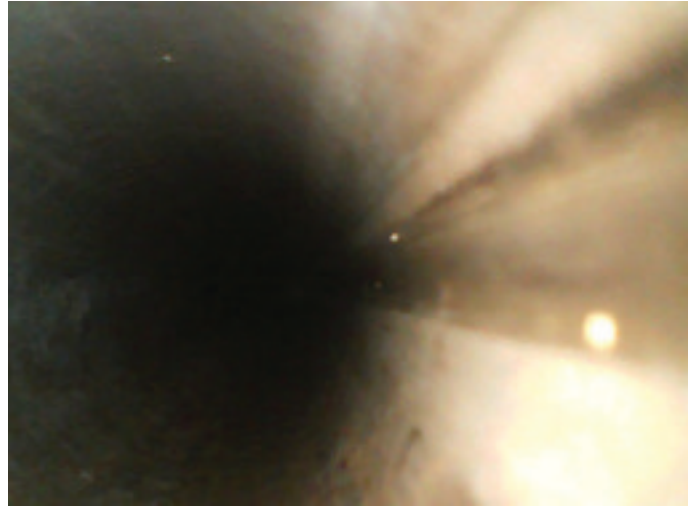
ing system, pumped in the chemicals and ran the engine. They rinsed and repeated and were satisfied that the mixture had thoroughly cleaned the system and fixed the problem.

Having never seen the situation before, Heidebrecht assumed this was an isolated incident. “We really thought that was just a fluke, and odd, one-of-a-kind deal,” he said. “I never really thought much about it, but I kept the samples.”

As a point of interest, he took the samples to an oil & gas expo and displayed them at his booth. “I bet we had 50 people come by and say, ‘I’ve got that exact problem!’” he said.

The experience was true to Ultimate Chemicals’ pattern of product development: discover a customer need, develop the right chemical mix and release it as a product. In

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■ Over time, the lining of an engine's cooling system can become layered and clogged with impurities that rob the system's efficiency. Properly flushed, the system disperses heat effectively and helps avoid costly problems.

business since 2010, the company has a number of standard cleaning products and also produces custom mixes to suit specific conditions.

"There are so many factors involved that contaminate cooling systems," Heidebrecht said. Exhaust contaminants, oil, carbon deposits, silicon and even detergents like Cascade from previous attempts to clean the system can slowly build up on the walls of the system. "That engine is running 24/7 for years," he said. "It's like arterial sclerosis for your cooling system."

When the system's cooling ability is compromised, it starts a cascade of potential problems. "It all starts with when the cooler wasn't cleaned properly, and now the engine starts getting hotter and hotter," he said. "That makes your exhaust temperatures go up. It thins out your oil. It creates so many other issues where the heat keeps building. It starts damaging the hoses so they start flaking off on the inside and clogging up some of your cooling system.

"When you don't get good cooling system flow, you start cooking the antifreeze. The rust inhibitors and silicates in

the antifreeze start coating the system on the inside. By the time you start cracking heads, you know you have a problem, but you don't know how to fix it. There have been so many little factors that add to it, it's hard to get a quick fix. So you keep replacing heads and exhaust manifolds and turbo housings."

Heidebrecht said frequently replacing parts and unscheduled downtime are serious problems for operators, and a properly functioning cooling system can help prevent many of those problems.

Ultimate Chemicals offers an optimization flush for preventative maintenance and a normalization flush to return a system to normal conditions. For severe cases, the company's restoration service uses a heavy-duty flush. All three services are done in place, typically in less than a day. The chemical blend can be customized based on samples taken from the glycol, the bottom of the surge tank and from the wall of the tubing.

"Sometimes the coolant looks fine, but we pull a header off and put a borescope in there and see all the stuff



■ Dirt, dust, bugs, salt and other environmental contaminants get caked and baked onto fin tubes and trap heat, preventing the cooling system from doing its job well. Ultimate Chemicals' exterior wash solution dissolves the crud without damaging the aluminum fins.

that has built up,” said David Vannostran, vice president of sales. “We drain it all out and put our flush in and run it. In five or 10 minutes, the sight glass turns black. That stuff comes out and everyone’s jaws hit the floor when they see how much dirt and junk comes out of that unit. You know you’re ripping the heart right out of the chest of a mechanic who wants that machine to run great. They had no idea it was so sick. These guys want these things to run — that’s their reputation.”

Vannostran said that although Ultimate Chemicals’ products are potent, they are readily biodegradable and non-corrosive. “We’re machinery safe,” he said. “The products won’t damage any sensitive metals, such as aluminum, copper, brass or steel. They won’t cause rubber seal damage. When we’re flushing an engine, there’s nothing internal that would be damaged by our product.”

Ultimate Chemicals offers other cleaning products and services, including CC-300, a ready-to-use liquid synthesized for removing the grime from the exterior of the fin tubes of a cooling system.

“These coolers pull in huge amounts of dirt and bugs,” Heidebrecht said. “Every 1 mm of external dirt is a 10% loss of efficiency. The unit is running at close to 200°F (93°C), so the dirt and bugs get baked on. Just regular soap and water will knock the loose stuff off, but it won’t get the baked layer off. Every year it gets a little less efficient. It gets to a point where it won’t keep running.”

Ultimate Chemicals’ teams of technicians use a combination of pressure, foaming and volume to deliver CC-300 to be sure all fins are covered. The pressure is low enough that it won’t bend any fins, and foaming is achieved with a special foaming spray tip; there’s no foaming additive. The chemicals break down the layers of grime on the coils.

“Once we fully saturate and make sure it’s working, we wait about 15-20 minutes for it to react,” Vannostran said. “If the heat is extreme enough, we may need to reapply some more chemical to reactivate it. Then we go back and rinse it. We bring our own clean rinse water. We don’t haul off any of the residue that comes off because it’s just dust and bugs and environmental grime.

“Using a strong degreaser or cleaner that is not designed for aluminum can compromise the integrity of the aluminum. If you use a caustic, it turns it gray and black. It will actually change the molecular metallurgy of the aluminum to where it becomes brittle. The weakened fins can separate and snap off.

“We created our chemicals to help restore surfaces to the optimum functional capability. They reduce mechanical breakdowns, increase energy output of equipment and prevent overheating.”

Engines have protective controls that will automatically shut them down if temperatures get threateningly high. Heidebrecht tells of cleaning the cooling system of an engine and compressor in the Texas panhandle that would shut down every afternoon around 4:30 or 5 and couldn’t be restarted until the ambient temperature dropped.



■ Kevin Heidebrecht, chemist and owner of Ultimate Chemicals.

“We got there at 7:30 in the morning, June 30. The system was running at 212°F (100°C) and had already reached the limits to keep it running. We shut it down and started cleaning. We took our time and explained the process. Then we started it back up after we finished and said we’d like to hang around a few hours to see how it did. We left at 2:30 in the afternoon, and it had been going at 192°F (89°C). All of July, all of August and all of September, it never got above 192°F (89°C). They kept it running 24/7 after that.”

Every time the engine was shut down, there was a blow down, releasing natural gas into the atmosphere — an event that has to be reported. “They get fined if they release too much gas into the atmosphere,” Heidebrecht said. “But they don’t have a choice if they have to shut down every day.”

Vannostran said, “Everyone wants a cleaner, more efficient cooling system operating at optimum efficiency. People want less downtime, repair, and maintenance costs. If you’re spending more than 13% of your budget on emergency maintenance, you’re doing something wrong. The more you put into preventative maintenance, the better.”

Ultimate Chemicals has experienced steady growth in the last few years, adding work crews as needed; but Heidebrecht is satisfied to do a lot of the cleaning himself. “I really enjoy the work,” he said. “It’s just a great sense of accomplishment. To see what it looked like before, and in an hour or two to see how much better it works — I just never get tired of seeing that.” **CT2**