



COOLING SYSTEM FILTERS

PENRAY NEED-RELEASE® EXTENDED LIFE COOLING SYSTEM TREATMENT

- Releases Supplemental Coolant Additives (SCAs) only when your cooling system needs them
- Senses the corrosivity of the coolant and keeps your cooling system protected at all times
- Synthetic media
- Lasts 150,000 miles, 15 months, or 3,000 hours
- Saves on labor costs
- Reduces filter inventory
- Replaces eight to ten ordinary filters

Part #	Quantity	Treats	Specifications
NF2088SM	12/Case	8–20 gals.	Standard filter bracket- Detroit Diesel, Caterpillar, Cummins, International, etc. engines
NF20891	12/Case	8–20 gals.	Mack Mid-Liner, Mack V-8, 65, and Econo-Dyne series engines
NF2095	12/Case	8–20 gals.	Cummins ISX engine
NF2096SM	12/Case	8–20 gals.	Mack MP7, MP8, Volvo D11, D13, and D16
NF2091SM	12/Case	1–8 gals.	Mid-Range vehicles, standard filter bracket – Detroit Diesel, Caterpillar, Cummins, International, etc. engines



PENCOOL® WITH STABIL-AID® COOLING SYSTEM FILTER WITH CORROSION INHIBITOR AND COOLANT STABILIZER

- One pint of Pencool® 3000 cooling system corrosion inhibitor and coolant stabilizer in a high quality filter
- Stops coolant gel formation
- Accepted for use by major engine manufacturers
- Compatible with all types of antifreeze

Part #	Quantity	Specifications
NF3000	12/Case	Standard filter bracket- Detroit Diesel, Caterpillar, Cummins, International, etc. engines



NF2999SM COOLANT FILTER

- High quality, long-life filter
- Compatible with all types of antifreezes
- Synthetic media
- Lasts 50,000 miles between changes
- Features inner shell with durable epoxy coating
- Specially designed for use with liquid cooling system treatment
- Guards against rust caused by corrosion/ low inhibitor protection

Part #	Quantity	Specifications
NF2999	12/Case	Standard filter bracket: Detroit Diesel, Caterpillar, Cummins, International, etc. engines



PENRAY IS AVAILABLE TO PROVIDE TRAINING AND HELP RESOLVE ANY COOLANT QUESTIONS AND PROBLEMS.

Penray has been providing cooling system solutions for decades. Automotive, Dexcool®, Conventional, Fully Formulated, Extended Life – we can help you safely and properly treat all of these coolants. Penray offers liquid inhibitors, filters, additives, cleaners, and test strips. We will spend time to train you and your technical team. With our patented formulations and billions of miles of proven service, let Penray be your Coolant Solutions Experts!



WHY IS IT THAT ONE COOLING SYSTEM FILTER CONTINUOUSLY RISES ABOVE THE REST?

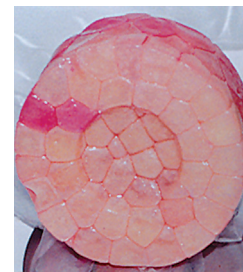
Need-Release® Has Had More Than 500 Billion Miles Of Proven Service!



Penray Need-Release® Technology

The Penray Need-Release® Extended Service Interval filter contains patented technology that delivers chemical additives to your system exactly when you NEED them. Dump truck, city delivery, long-range hauler or anything in between, it doesn't matter. The filter monitors the coolant and keeps the protection levels stable. The corrosivity of the coolant eats a tiny hole in the patented membrane and dissolves the coolant additive into the system. No messy globs to stop the flow of coolant or prevent the additive from entering the system. The Penray Need-Release offers maximum protection for the life of the engine.

All the others use pellets (shown above) to deliver chemicals on timed increments, regardless of your truck type, use or need. This means that, despite the concentration of additives in the coolant, whether they are needed or not, these time-release filters will deliver additives to the system. In ASTM testing, at 50,000 miles all of the separate, individual pellet-shaped capsules melded into a single, solid, gelatinous clod. (See inset at right) The clod completely blocked the flow of coolant through the filter, resisting even the full pressure produced by the system's water pump. From 50,000 miles and on there are no more chemicals to protect the coolant, rendering the filter completely useless.



Individual Pellet Capsules after 50,000 miles of use.

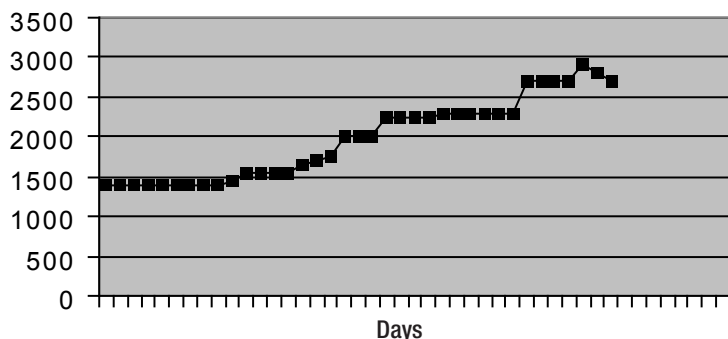
Choose Cooling System Protection That Actually Works!

A competitive coolant filter was installed on a stationary "Simulated Service" rig (used in ASTM D 2570). The condition of the coolant was monitored frequently. After forty-five days of operation, the filter was cold to the touch, indicating that it had become plugged and that there was no coolant flow through the filter. The filter was removed from the rig and carefully opened to investigate the cause of the failure.

1. All of the individual pellet-shaped capsules melded into a single, solid, gelatinous clod. The clod completely blocked the flow of coolant through the filter, resisting even the full pressure produced by the system's water pump.
2. After less than 5 weeks of action, equivalent to about 44,000 miles, the filter reached its swelled state. At this point the entire contents, all the SCAs, had been dumped into the system.

The idea of a time-release filter is to add SCA to the system when it is required. Fully formulated coolant takes time to deplete. It is at this point when the coolant needs the chemical addition to ensure engine protection. The chart below demonstrates the concentration, measured in PPM, of nitrite versus time, at which SCAs are distributed from the competitive filter. Within 38 days, the filter dumped most of the chemical charge into the system. Dumping all of the SCA's into the system so quickly could lead to drop-out, radiator plugging, and water pump seal failure. Furthermore, with no more SCA's to offer, the entire cooling system is left unprotected after 50,000 miles.

Nitrite Levels From Baldwin BW5200



Individual pellet capsules after 50,000 miles of use meld into a single, gelatinous clod blocking the flow of coolant through the filter.

Penray Need-Release® has over 500 billion of miles of service behind it, proving that our cooling system programs offer maximum protection for the life of the engine. The Need-Release® senses the condition of the coolant and releases the proper chemical additives only when needed.

(Penray Need-Release® results are documented in an SAE Publication No. 960642.)