



Supplemental Coolant Additives (SCA) and inhibitor formulations protect cooling system components, minimize the chemical reactions that occur due to heat, control scale formation, prevent foaming and maintain pH. SCA and inhibitors are very concentrated packages that not only contain many of the same inhibitors found in antifreeze but also some that are much more sophisticated, such as:

- pH Buffers
- Dispersing Agents
 - water only coolant at 180°F can hold up to 15 ppm calcium hardness in a dissolved state
 - Water and 50% antifreeze can hold up to about 70 ppm total hardness in a dissolved state
 - Water, 50% antifreeze and proper levels of supplemental coolant inhibitors can hold up to about 200 ppm total hardness in a dissolved state
- Dissolved Gas Scavengers and Neutralizers
- Filming Agents
 - Prime Protection for Metal Pitting or Deposit

Ideally, nitrite-based formulas should contain between 1000 and 3200 ppm nitrite for adequate metal protection. Nitrite levels above 3400 ppm can cause precipitation that can plug the system.

A nitrite/molybdate formula should contain a combination of the two equal to no less than 780 ppm with nitrite at no lower than 300 ppm. This includes Extended Life formulations as well. Nitrite/molybdate combinations exceeding 3400 ppm can cause precipitation that can plug the system.

Always check your engine manufacturer's specifications before using any coolant formulation. Never use a water only coolant or a water and glycol only coolant as neither has the additives necessary for adequate engine metal protection.

SCA FUNCTIONS & LIMITATIONS		
Additive	Function	Limitations
Phosphate	Iron protection; pH control	Relatively rapid depletion rate; Poor stability at high temperatures
Borates	Iron protection; pH control	Corrosive to aluminum at high temperatures
Molybdate	Iron protection	
Dicarboxylate	Iron & aluminum protection	



SCA FUNCTIONS & LIMITATIONS		
Additive	Function	Limitations
Carboxylate	Iron & aluminum protection	
Mercaptobenzothiozole (MBT)	Copper & brass protection	Formulation of insoluble calcium salts
Tolytriazole (TT)	Copper & brass protection	
Nitrate	Aluminum & solder protection	
Silicate	Aluminum protection	Creates precipitates if pH drops or hard water enters system; can form hard, insulating scale
Nitrite	Cast iron, steel and liner cavitation protection	Rapid depletion rate; Nitrosamine formation when amines present
Silicones	Defoamant	
Block Polymers	Defoamant; Scale & deposit control	
Dispersants	Scale & deposit control	
Sufactants	Scale & deposit control	
Sebacates		Expensive; Poor aluminum protection