

Product Comparison Files: Mix-I-Go® vs. The Marketplace

The first fuel additive on record was invented by Bell Performance in 1909 – more specifically, by Bell Performance's founder, Robert J. Bell. Bell Performance has been formulating effective fuel treatment solutions to enhance gasoline ever since that time. In 1927, Robert Bell mastered the riddle of suspending water in petroleum fuel, spawning the multifunction product Mix-I-Go®, which has been continuously manufactured by Bell Performance ever since that time. In this document, we will compare and contrast the main functions and benefits of prominent gasoline fuel additives on the market today and see how these options compare with the benefits offered by Mix-I-Go®.

Introduction

Consumer demand for fuel additives seems to track the rise and fall of gas prices. Today, the marketplace is saturated with hundreds, even thousands, of competing gasoline additive products. Most of them make

the same or similar benefits claims – better gas mileage, fewer emissions, long lasting cars. Consumers see rows upon rows of additives vying for their money, all claiming to do the same things while, at the same time, all claiming to be the best. Or revolutionary. Or whatever they need to claim to stand out from the competition and convince the consumer to part with their money.

This is less than ideal for the average Joe and Josephine who are not chemists or marketing experts. They do not have in-depth knowledge of the industry to be able to distinguish between false claims and legitimate ones. All they hear is white noise. That's a big problem which may ultimately lead, for them, either to making a bad choice or no choice at all. A bad choice is, well, bad, because it wastes their money and leads to disappointment that colors their view of the entire industry ("they're all snake oil"). And no choice at all can sometimes be just as bad because it



fails to address a problem that led the consumer to consider looking at a fuel treatment in the first place.

What consumers need is something to act as a guide to help them navigate this very muddy marketplace. A road map to help them interpret the claims and jargon they might have to wade through in order to arrive at the best decision for them. *Mix-I-Go® vs. The Marketplace* aims to do just that. In the following pages, we'll explain the most important things you (the consumer) need to know in order to arrive at the best gas/fuel additive decision for you. We'll cover essential topics like:

- What gas additives are used for
- What to look for in a gas treatment
- What some well-known brand names in the marketplace do, as well as what they don't do



Gasoline Fuel Additives – Why People Buy Them

Any decision to spend money or resource on a product or service is driven by an expectation that the result will be worth more than is paid for it. That could be seen in terms of a financial return of some sort, or it could be something as simple as the perceived value (by the purchaser) of the removal of some kind of pain or problem they are experiencing. Perhaps they have a particular problem and they make the decision to buy a product or service with the expectation that it will solve that problem. This has value in the mind of the purchaser. And studies show that people place a higher value on the removal or avoidance of pain than they do for increasing pleasure.

What does this look like when it comes to gas additives? Why do people buy them? They purchase them because of certain expectations they have, which are informed both by what they observe with their engines/equipment, what they think they should be seeing, and how they perceive the additive claims interface with either of those.

The expectations of the customer are the most important consideration here. If the customer buys a gas additive because they have unrealistic expectations, the situation is set up for disappointment from the start. Where do these unrealistic expectations come from? They might result from the consumer thinking the additive does something it can't or won't. They might result from the consumer not knowing what they really should be seeing.

On the other hand, if the customer knows what they should be looking for, knows what to expect, and makes a good purchasing decision of a gas additive that actually works, they're probably going to have a positive experience. How can they ensure that this happens? By knowing what gas additives can and cannot do. Which is the purpose of what we're talking about here.

What To Look For In A Gasoline Additive

To help wade through the myriad of product claims, it's helpful to know the most essential functions a gas additive should accomplish. What you really need it to do. The most important attributes of a good gasoline fuel additive are:

Provide detergency to clean injectors, combustion chambers and fuel system

Detergency, especially injector cleaning, is the single most important function a fuel additive can offer. Injector deposits directly affect the essential links in the internal combustion chain, including the proper atomization of the fuel into the combustion chamber. Keeping the injectors, the combustion chamber and fuel system clean and free of deposits offers the greatest potential toward improving vehicle/equipment performance, as well as keeping them performing at a high level.

Improve mileage and power (within reason)

Gas mileage is consistently the biggest concern drivers have; the one thing consumers pay the most attention to. There are legitimate ways to improve fuel efficiency and increase power in gasoline engines. These ways typically center around adding a package of active ingredients to the fuel that will improve combustion of the fuel, and that will change the conditions within the engine such that it functions closer to the level it was functioning at while it was new.



Overpromising on gas mileage claims is a significant problem in the fuel additive industry. Improving mileage has a lot to do with the condition of the engine at the start. Older, dirty engines have the greatest room for improvement, while new engines are difficult to achieve significant improvement on. In fact, this is a key point to understand. Fuel additives will have very little effect on new vehicles in the area of gas mileage improvement because new vehicles are already operating the closest to peak efficiency that they will ever run. It is only with age and use that these vehicles drop off from this peak efficiency level, and that's why a gas additive can deliver the kind of improvement the buyer is looking for.

It is reasonable for a gas additive to talk about improving fuel mileage by 6-8% or more. But not that much more. Additives guaranteeing significant mileage improvements well into the double-digits (i.e. 18-19% or more) are not to be trusted.

Remove water without alcohol

Controlling water in gasoline is important for several reasons. The presence of water (which can result from any number of environmental factors over the course of the fuel's life) can accelerate its destabilization. More importantly, most gasoline you can get today contains some level of ethanol content. Ethanol's ability to attract and absorb water is a major problem that leads to multiple costly problems. For business users, water presence in ethanol fuels contributes to corrosive storage tank damage over time. For both business and consumer users, excessive water absorption leads to phase separation of the ethanol fuel, which destroys the fuel quality and can render it unusable. So, a quality gas additive for ethanol should improve the fuel's ability to tolerate water absorption and extend its ability to withstand phase separation. The fuel additive should be able to do both of these without using an alcohol constituent to execute the function. Lower quality fuel additives will add alcohol to their formulations to be able to make this claim, but this additional alcohol only further contributes to the overall problem ("you can't solve an alcohol problem with more alcohol").

Protect against ethanol solvency damage and damage to 2-stroke engines

As noted above, virtually all on-road gasoline contains 10% ethanol content, sometimes more. The vast majority of consumers will use this gasoline in their small equipment – lawn mowers, gas-powered trimmers, chainsaws. And it stands to reason that you should be able to treat this small equipment fuel with the same gas additive you put in your car, truck or boat. Small equipment users have long complained about damage to their equipment linked to ethanol-blended gasoline. Exposure to ethanol gasoline over time leads to softening and damage of polymer parts (rubber and plastic) as the fuel dissolves the polymers. This can render the equipment inoperable. Other forms of damage linked to the action of ethanol gasoline include corrosion of carburetor parts and catastrophic damage to 2-stroke engines through ethanol's interference with fuel-oil lubrication. Given these serious concerns, a quality gas additive should contain constituents that protect equipment parts from solvency damage and corrosion, while also protecting 2-stroke engines from any interference with lubrication by the fuel.

Stabilize fuel

The concept of fuel stabilization is a related, but broader concept than the aforementioned function of preventing phase separation in gas containing ethanol (which could be argued to be a form of stabilization itself). In this context, talk of stabilizing gasoline is meant in the very same sense as stabilizing diesel fuel – something that anyone who stores diesel fuel for any length of time is well familiar. All petroleum fuels – gas, diesel, fuel oil – are inherently unstable and will degrade over time. How quickly they degrade depends on the content of precursors (unstable molecules) they start out with when leaving the refinery, and their exposure over their lifetime to "environmental actors" that have been shown to accelerate the chemical reactions that make fuel unstable. In this case, these environmental actors are oxygen (air), light, heat, water, and certain "catalytic" metals.



A good gas additive should contain active ingredients that slow this process down. Stabilizing ingredients typically work by negating the start of chain reactions that, otherwise, would lead to the darkening of the fuel and the formation of sediment - both signs that the fuel is unstable and in process of losing its combustion quality. The benefit for the user lies in their fuel's quality being protected and preserved for longer periods of time, allowing them a longer time to use the fuel without ill effects for their engine or equipment.

In addition to these important functions, the following should also be true of a good ethanol fuel additive.

Low Treat Rate (But Not Too Low)

Treat rate directly determines how much a fuel additive costs to use. A "single-treat" additive might only cost \$5.00 a bottle, but if that bottle only treats one tank of fuel (15-20 gallons), the cost to use it would approach 30 cents per gallon. Such a high cost-to-treat would make it very difficult to recoup in any cost-benefit analysis.

On the other hand, a concentrated multi-function additive might cost \$20.00 for a bottle treating 150 gallons or more. Its cost-to-treat is below 13 cents a gallon – less than half of the other one. Smart consumers will consider the cost-to-treat on a per-gallon of fuel basis, not the initial cost of the additive itself. It doesn't matter if a fuel additive turns straw into gold if it costs more to use than you can afford to pay.

EPA-Registered

By law, all on-road fuel additives must be registered with the Fuel Additives division of the United States EPA. This includes re-labels and re-names of existing additives (of which, there are many). There's no requirement to put a registration statement on the product label, so you can't tell just by looking at that if the fuel additive is EPA-registered. The full list of registered fuel additives, whether gasoline or diesel, can be found simply by googling "EPA list of registered fuel additives". If an on-road fuel additive is not EPA-registered, it's not legal to sell it in the United States. The requirement for EPA-registration is intended to ensure that a given fuel additive doesn't contain ingredients that would overtly damage an engine. That's a good thing.

For point of reference, keep in mind that this requirement only applies to "on-road" fuel additives. These are the kind of fuel additives you would be considering to treat fuel that's going to go into your vehicle, whether or not you also use that fuel in, say, your boat or your lawn mower. The registration requirement doesn't apply to marine fuel additives, or fuel additives specifically for small equipment, or even fuel additives to treat something like home heating oil. These aren't on-road uses, so their additives aren't legally required to be EPA-registered.

That's to say nothing of whether the additive will actually work or not. An additive maker that hasn't taken the time to comply with the simple additive registration process (it's free) is not likely to be taking the time to formulate an additive that really works, whatever the additive's claims may be.

It is also important to keep in mind that EPA-registration does not mean that the EPA or the United States government is endorsing an additive or even that it works. EPA-registration is concerned with the contents of the formulation. They do not care what claims of greatness are made about it.

You always want to buy gasoline additives that are EPA-registered, to give you piece of mind and confidence.

Backed By Long Sales History

Any time a business opportunity surfaces, you can bet any number of proposed "answers" will come out of the woodwork. In any given year, there are hundreds of new entrants into the fuel additive marketplace, all claiming to be the best. In the absence of evidence enabling the consumer to distinguish the good ones from



the bad ones, it is a good idea to look for a robust company history backing up the product. It's easy to make a product, throw up a web site or Facebook page, maybe even manufacture some "testimonials". But it's impossible to manufacture decades of successful business practice. A gas additive backed by a long history of customer satisfaction is a lot more likely to be legitimate and worth your consideration.

Mix-I-Go® vs. Other Competing Gas Additives In The Marketplace

Now that we have a clearer picture of what separates good gas additives from ones of lesser quality, let's see how Mix-I-Go® from Bell Performance compares to some of the other notable additive names in the marketplace. The comparison formulations were selected based on consumer familiarity and market penetration of their brand names – how recognizable are they? Chances are, you remember seeing all of these at one time or another. There are many others that could have been included in the comparison, but space limitations prevail.



Sta-Bil 360 Performance® (Gold Eagle) - Gold Eagle is best known for its Diesel Formula Sta-Bil® Fuel Stabilizer formulation, one of the top fuel stabilizers for diesel fuel. Gold Eagle also recently introduced a formulation to treat gasoline and ethanol fuels. The Gold Eagle company was started in 1932 and has significant market presence in the automotive aftermarket arena. They have a broad range of products including HEET for gasoline, starter fluid, washer fluid deicer and octane improvers (technically not street-legal). For the purposes for this comparison, Mix-I-Go® will be compared with Gold Eagle's Sta-Bil 360® Performance fuel additive for ethanol.



Star Tron® (Star brite) – Star brite (with a lower-case 'b') markets itself primarily as a marine product company. It was started in 1973 to promote one single product, an auto polish. In the 1980s, Star brite branched out into the marine sector, promoting boat polishes, waxes and appearance-care products. Today, Star brite also promotes oil, lubes and winterization products. For this comparison, Mix-I-Go® will be compared to the Star Tron® Small Engine enzyme fuel treatment for gasoline.



Sea Foam® (Sea Foam Sales Co.) – Sea Foam Sales Co. of Eden Prarie, MN, originally formulated Sea Foam in the 1930s as a product for the marine and outboard motor markets. Its original inventor was a District Manager for the Sinclair Refining Company. Though its product line has long been defined by its multifunction motor treatment, today Sea Foam has products for the auto, diesel, marine, power sports and small engine market sectors. For the purposes of this comparison, Mix-I-Go® will be compared to the Sea Foam® Motor Treatment fuel additive.



Amsoil Quickshot® (Amsoil Inc.) – Amsoil Inc., based in Superior, Wisconsin, cut its teeth in 1972 in the lubricants business. Over the years, Amsoil has sold synthetic oil formulations primarily through a multi-level marketing business plan. Today, Amsoil's diversified product line includes motor oils, grease, transmission fluid, filters and, more recently, fuel additives for gasoline and diesel. For the purposes of this comparison, Mix-I-Go® will be compared to the Amsoil Quickshot® fuel treatment.





STP® Gas Treatment (Armored AutoGroup®) – STP started in 1953 as a motor oil treatment created by the Chemical Compounds company in Missouri. STP originally stood for "Scientifically Treated Petroleum". STP became most well-known in the 1970s for sponsoring race car drivers Richard Petty and Mario Andretti. Today, STP is part of the Armored AutoGroup® along with Prestone® and Simoniz®. For the purposes of this comparison, Mix-I-Go® will be compared to the STP® Gas Treatment product, known by name by millions of consumers around the world.

Comparative Infographic - Mix-I-Go® vs. The Marketplace





When faced with the task of summarizing a large number of claims across multiple products, we find it's most useful to codify them with a comparative infographic. The infographic above lists the legitimate claims made by each additive in yes/no form. Do they actually improve gas mileage? Yes or no? Do they actually clean the engine? Yes or no? The goal is to provide you a clearer picture of the effectiveness of each fuel additive product as compared to its actual product claims, to help you answer the question "Does it do what it's supposed to do?"

Now, let's examine how these fuel additives compare with respect to their specific benefit claims.

Improves Mileage & Power – Five out of the six formulations compared – Mix-I-Go®, Star Tron, Sea Foam®, Amsoil Quickshot®, Sta-Bil 360® Performance – show evidence of having a positive effect on fuel mileage.

STP® Gas Treatment does not contain any ingredients shown to have a beneficial effect on gas mileage.

Improves/Claims	Improves/Claims To Improve Mileage & Power			
Mix-I-Go®	Contains a combination of multiple detergents and combustion improvers. Typical mileage improvement is about 6-9%, which is near the top of the industry.	\checkmark		
Star Tron	Claims fuel economy increase and carbon removal, indicating a possible combustion improvement and detergency effect.	\checkmark		
Sea Foam®	Cleans and dissolves deposits in fuel injectors, which can have a beneficial effect on fuel mileage.	\checkmark		
Amsoil Quickshot®	Contains detergents to clean injectors, resulting in improvement in fuel mileage.	\checkmark		
Sta-Bil 360 Performance®	Contains injector detergents which can yield a mileage improvement.	\checkmark		
Does Not Improve	Does Not Improve Mileage & Power			
STP® Gas Treatment	An analysis of its SDS indicates no ingredients shown to have a positive effect on mileage.	X		



Cleans Injectors & Engine Deposits - All six formulations claim to contain ingredients that dissolve engine deposits and/or injector deposits. Normally, this would also result in fuel mileage improvements. The exception in the group is STP, which contains solvents in its formulation which can dissolve some kind of injector deposits, but the formulation overall has not been shown to improve fuel mileage enough to sustain a marketing claim of such.

Cleans Fuel Injec	tors & Engine Deposits	
Mix-I-Go®	Contains a package of multiple detergents for injectors (PFI), valves and combustion chambers, along with a non-alcoholic surfactant package to clean deposits in stored fuel.	\checkmark
Star Tron	Provides satisfactory added detergency for injectors	\checkmark
Sea Foam®	Provides satisfactory added detergency for injectors.	
Amsoil Quickshot®	Provides satisfactory added detergency for injectors.	
Sta-Bil 360 Performance®	Provides satisfactory added detergency for injectors.	\checkmark
STP® Gas Treatment	Provides satisfactory added detergency for injectors.	\checkmark



Controls/Removes Water – Three formulas – Mix-I-Go®, STP® Gas Treatment and Sta-Bil 360 Performance® – contain non-alcoholic water removal constituents.

The other three products – Star Tron, Sea Foam® and Amsoil Quickshot® – do not contain water-removal ingredients that are non-alcoholic in nature. Star Tron and Sea Foam®, in particular, imply that they control water, yet, water will not mix with their formulations in laboratory tests.

Controls & Removes Water		
Mix-I-Go®	Contains both a non-alcoholic water absorber and a fluorosurfactant water controlling package based on Robert Bell's surfactant technology first developed in 1927.	\checkmark
STP® Gas Treatment	Contains a non-alcoholic water dispersant	\checkmark
Sta-Bil 360® Performance	Contains a non-alcoholic water dispersant	\checkmark
Does Not Control Wa	ter	
Star Tron	Does not contain any water-control ingredients. In fact, water cannot mix with the Star Tron formulation.	X
Sea Foam®	Makes claims of suitability for marine use, yet water cannot mix with its formulation	X
Amsoil Quickshot®	Does not contain a non-alcoholic water controller.	X



Prevents Ethanol Damage – Mix-I-Go®, Sta-Bil 360 Performance® and Amsoil Quickshot® all contain ingredients that can be shown to slow or prevent ethanol damage in fuel systems.

Star Tron, Sea Foam® and STP® Gas Treatment do not contain any ingredients to prevent ethanol fuel damage.

Prevents Ethanol Damage		
Mix-I-Go®	Formulated with a fuel-soluble protectant that provides boundary-layer protection against ethanol damage on polymer surfaces	\checkmark
Amsoil Quickshot®	Claims to protect against "damaging corrosion"	\checkmark
Sta-Bil 360 Performance®	Contains a unique vapor ingredient that claims to provide protection against vapor corrosion above the fuel line in ethanol tanks and delivery systems.	\checkmark
Does Not Prevent Eth	anol Damage	
Star Tron	Does not contain ingredients to protect against ethanol solvency damage	X
Sea Foam®	Does not contain ingredients to protect against ethanol solvency damage	X
STP® Gas Treatment	Does not contain ingredients to protect against ethanol solvency damage	×



Stabilizes fuel – Mix-I-Go®, Amsoil® and Sta-Bil 360 Performance® show evidence of containing ingredients that stabilize gasoline and extend its storage life. Star Tron, Sea Foam® and STP® Gas Treatment do not help in this critical regard.

Stabilizes Fuel			
Mix-I-Go®	Formulated with stabilization package to retard destabilizing chemical reactions in gasoline	\checkmark	
Amsoil Quickshot®	Contains effective stabilizing ingredients for gasoline		
Sta-Bil 360® Performance	Contains effective stabilization ingredients, which stand to reason as the Sta-Bil product family is most well-known for its diesel stabilizing additives		
Does Not Influence Fu	uel Stabilization		
Sea Foam®	There is no evidence that Sea Foam has the ability to improve ethanol fuel's ability to resist phase separation.		
Star Tron	There is no evidence that Star Tron has the ability to improve ethanol fuel's ability to resist phase separation.		
STP® Gas Treatment	There is no evidence that STP® has the ability to improve ethanol fuel's ability to resist phase separation.		

Comparisons of Treat Rate Relative To Claimed Benefits

Treat rate ultimately determines both the cost of use and sheds light on the likelihood that a product can do what it claims. While we cannot examine exact retail pricing here (because product pricing changes over time), we would advise anyone considering the purchase of a fuel additive to take into account the cost-to-treat of the product.

Some fuel additives use concentrated formulations that are the most economical to use from a cost-totreat perspective. These may cost less than 10 cents per gallon to use.

Other competitors can be far more expensive to use once treat rate is considered. These can cost upwards of 20-25 cents per gallon to use. And some may approach \$1.00 per gallon to use, which normally would be prohibitively expensive to use. So we would advise the consumer to examine the treat cost differences before making a buying decision.



To summarize these findings and reconcile them with benefits, we've listed all six formulations compared, their total number of benefits, and the claimed treat rates recommended to achieve those benefits.

Product	# of Benefits	Benefits Claimed	Treat Rate
Mix-I-Go®	7	Mileage improvement, Prevents ethanol damage, Removes water w/o alcohol, Cleans injectors, Prevents phase separation, Backed by 100 years experience, Low cost to treat	1 oz: 10 gallons (1:1280)
Sta-Bil 360 Performance®	6	Mileage improvement, Prevents ethanol damage, Removes water w/o alcohol, Cleans injectors, Prevents phase separation, Low cost to treat	1 oz: 5 gallons (1:640)
Star Tron	4	Mileage improvement, Cleans injectors, Prevents phase separation, Low cost to treat	1 oz: 10 gallons (1:1280)
Amsoil Quickshot®	4	Mileage improvement, Prevents ethanol damage, Cleans injectors, Prevents phase separation	8 oz: 10 gallons (1:160)
Sea Foam®	2	Mileage improvement, Cleans Injectors	2 oz: 1 gallon (1:64)
STP® Gas Treatment	2	Removes water, Cleans injectors	1 oz: 2.3 gallons (1:300)

Armed with this information, there are some important observations we can make about each product relative to this balancing act of benefits vs. cost:

Mix-I-Go® – Has the best combination of doing the most number of beneficial things (7) at a competitive treat rate of 1:1280.

Sta-Bil 360 Performance® – Gives the second-highest number of benefits (6), but at a 2x higher treat rate than that of Mix-I-Go®.

Star Tron – Does four (4) important things, and at a competitive treat rate (1:1280). Still does not do as much as Sta-Bil or Mix-I-Go®.

Amsoil Quickshot® – Does as many things (4) as Star Tron, but not as much as other formulations.

Sea Foam® – Despite its reputation in the marine market, Sea Foam® gives very few benefits.

STP (*Gas Treatment* – The most well-known fuel additive of the group does the least number of things – only two clear benefits. Treat rate is less than Sea Foam, which is the only reason it places ahead in the value rankings below.



Conclusions

When the decision is made to use a gas treatment, the customer is faced with a plethora of choices. Many of these choices claim to do the same things. When performance in areas critical to gasoline additives is weighed against the cost of that performance (cost to treat), we can rank the gas additives in order of best to worst:

- *Mix-I-Go*®: see below
- *Sta-Bil 360*® *Performance* is a very good choice, probably the second-best choice of the additives surveyed. It does more things than almost any other additive, while being very cost-effective to use.
- *Star Tron* is a good combination of benefits imparted and economical treat rate. In our assessment, it is not as good as Sta-Bil 360 or Mix-I-Go® because it does not provide as many benefits. But it is clearly better than the additives later in this list.
- *Amsoil Quickshot*® causes a dilemma for the user. It provides four benefits, including the important benefit of preventing ethanol damage that Star Tron does not. But it is very expensive to use, so the consumer must weigh its high cost-to-use compared to other additives. It does not do as much as Sta-Bil 360 or Mix-I-Go®.
- *STP*® *Gas Treatment* only does a few beneficial things and would not be a recommended choice to treat ethanol fuels, as it fails to do several important things that a good ethanol additive should do. But its saving grace is that it does not cost a lot to use.
- *Sea Foam*® wins the dubious honor of being the worst ethanol additive in our list. It only provides two benefits, neither of which are uniquely required for ethanol fuels. And its high treat rate means it can be expensive to use.

The final overall conclusion is that **Mix-I-Go® from Bell Performance is the best combination of value and performance among gasoline additives on the market today**. It does the most while comparing favorably in its treat rate. That is why we believe that Mix-I-Go® is your best gasoline fuel additive choice.