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C & S Scientific Corp / PARKE HILL

WHY/WHEN/WHERE/WHAT: THE FOUR W's OF HEATING OIL ADDITIVES

By Jerome P. Sava

Perhaps one of the most critical decisions that must be made by a fuel oil dealer is whether or not to chemically treat the heating oil. The dealer must weigh the expected future benefits that would be derived from additizing the product against the immediate incremental cost for such a chemical program. Despite the fact that introducing an additive into the fuel supply can dramatically affect the performance and handling of that fuel, and in so doing can have a direct impact on customer relations and customer goodwill, many dealers have no basis of experience by which to make an informed decision. All too often, the dealer either decides not to get involved at all with chemicals since it is a misunderstood concept to him, or decides to initiate a chemical program without really being confident about the choice of additive company. This situation is not new but has existed in the industry for decades; admittedly fostered in great part by the chemical suppliers themselves. Historically, unfortunately, individuals that were long on claims but short on facts have dominated the additive industry. Today, however, companies like C & S SCIENTIFIC CORP. are creating a new trend to demystify the mechanisms by which additives perform, and to clearly spell out the benefits and the limitations of chemical treatments. Such progressive companies recognize that although chemicals can be a very effective tool in the dealer's overall service and marketing efforts, their true value can not be determined unless there is a clear understanding of the why, when, where and what, of additives. In the following paragraphs, these questions are explored.

WHY ADDITIVES?

In recent years, the use of chemical additives has become an accepted and integral part of the oil industry. As testament to that, even some of the majors who had previously never accepted the concept of additive treatment, have now developed campaigns focusing on premium heating oil to promote their retail services. This increase in additive acceptance and awareness can be attributed to two factors. First, there have been significant technological advances that have provided chemical manufacturers with a plethora of new and highly effective components to control many of the typical potential

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problems associated with oil storage and combustion. Second, refinery processing geared toward satisfying the environmental factors and increasing supply demands for low sulfur diesel, have brought about reservoirs of unstable, high carbon residue, #2 heating oils. In other words, the recent spate of technological advancements have provided an effective means of curtailing many of the potential problems associated with the types of heating oil products that are currently available. Specifically, a properly formulated additive can minimize the likelihood of fuel degradation and resultant sludge accumulations caused by fuel instability, through the use of newly developed stabilizers, penetrants, wetting agents and dispersants. Also, the adverse effects of higher carbon residues can now be neutralized through the introduction of combustion catalysts that reduce the autoignition temperature of the unburned hydrocarbons, and thereby eliminate any detrimental soot and carbon deposits. By improving the stability and the combustion characteristics of the heating fuel, it is obvious that service calls will be significantly decreased. This benefit has, indeed, allowed many oil dealers to realize their once unattainable dreams of seeing their service departments become profit centers. And it goes without saying, that less service calls mean more customer good will and more reason for the customer to remain a loyal user of fuel oil.

WHEN ADDITIVES?

A long-standing belief has been that chemical treatment is only needed when the temperatures become severely cold. Certainly, if a pour point depressant is required, then the temperature does become critical. However, since one of the most effective types of treatments that can be used is one geared for preventative maintenance on a continual treatment basis, then the actual temperature is not critical. It is interesting to observe that, in fact, fuels tend to generate a higher incidence of problems when temperatures are not cold since the oils tend to lay dormant for longer periods allowing for the breeding and growth of organic slime, hydrocarbon fractionation, and sediment precipitation. Multifunctional products like C & S' additive, PMT, for example, are designed to inhibit sludge, water and corrosion, while simultaneously stabilizing the fuel, improving combustion efficiency, and minimizing objectionable flue gas particulate emissions. Obviously, all these phenomena are possible at any time, and are dependent upon such variables as fuel/air ratio, aging history of the fuel, storage conditions, integrity of lines and tanks, chemistry of starting crude product, commingling history, and overall housekeeping procedures. Since these variables are often unknown and/or uncontrollable, it logically follows that additive treatment should always be continually and routinely used to help ensure a trouble-free oil operation.

To paraphrase a well-known quote, the best defense to stop oil-related problems is a good offense using an effective preventative maintenance chemical. Another critically important time to use additives is when a serious, ongoing problem of sludge-related service calls exists. Often, the introduction of chemicals will stop the immediate service problems and will gradually result in dramatic decreases in the frequency of service callbacks through the gradual but steady dissolution of existing sludge deposits. This is one area, however, where dealing with a scientifically competent additive company is essential. When a specific problem exists, there should not be any guesswork as to what type of chemical treatment should be used. The only true way of answering that question is to physically sample relevant tanks, collect and analyze the oil and filters, and then

determine the remedial chemicals necessary. Any reliable, scientifically oriented chemical supplier should have the means and the desire to perform such tests.

WHERE ADDITIVES?

Once an additive program has been decided upon, the question arises over where in the system the additive should actually be added. Since the most acceptable types of chemical treatment are those that provide benefits in all stages of the oil system, from terminal storage tank to rack to homeowner tank to lines to burner to stack, then the ideal initial point of treatment should be at the earliest possible site within this sequence. For most companies, that site would be at the terminal storage tanks with the chemical being added at the time of incoming transport deliveries. To facilitate the injection of the additive, it is best to deal with a company that has the capability of designing and installing blending equipment to permit the automatic addition of the chemical directly into the fuel oil. The only situation that may cast doubt on this point of treatment is when the dealer is involved with a large throughput business as well. In such a case, many dealers have set up separate storage tanks for treated and non-treated fuels, or have installed injection devices for use at the rack rather than into the tank. In the latter case, this has permitted several dealers to offer the alternative of a premium grade of heating oil to the throughputters; often at a handling charge which more than compensates for the dealer's own chemical treatment cost. One other situation where there may be some doubt as to how to introduce the additive is when a dealer does not have his own storage, but picks up at a nearby facility. In this case, some of the more mechanically aware additive suppliers are able to offer unique injection systems that can be mounted on the individual oil trucks to allow chemical blending while making the home delivery.

WHAT ADDITIVES?

Hopefully, the above answers to why, when, and where additives, can now permit the dealer to make a more educated and informed decision concerning his own need for heating oil treatment. If that decision is a positive one, then the final and most crucial stage of the process has begun – that of determining which additive supplier to use. There are several guidelines one may follow in evaluating suppliers, and many of these are the same common sense ones you would typically follow when making any purchasing decisions. Examples of such guidelines are itemized as follows:

- You must have full trust and confidence in the honesty and integrity of the company. Since many of the proven benefits of chemical treatment are subjective and may not be immediately provable, you should only deal with a company that views your company as a long-term association and not as a one-time sale.
- The company should have technically competent staffing, well versed in all phases of the oil business – not just the chemical aspect. With today's sophisticated refinery techniques, coupled with the ever-increasing conservation and environmental demands, an effective additive program inevitably becomes intertwined with many other concerns of the oil industry. It is essential, therefore, that the chemical supplier has a knowledge and background of all these facets.
- The chemical supplier should have the expertise to become a consultant-at-large for your company. Modern companies are not just supplying additives but are offering a variety of services to complement their programs. C&S SCIENTIFIC, for example,

provides extensive technical services including on-site tank samplings, laboratory analyses, regulatory report and document assistance, troubleshooting investigations, and customer support, often at no cost to the dealer.

- The cost for the treatment should be reasonable for the type of benefits claimed. If the cost, either per gallon for the product itself or per gallon of treated oil, is unusually low then you can safely assume that the chemical is not going to perform all the benefits desired of an effective preventative treatment. Conversely, if the cost is excessively high, then it can be safely assumed that the product is overpriced. A good rule of thumb to follow is that the average incremental per gallon cost for an effective conventional preventative maintenance treatment is 25-30 points. Please note that the use of cold flow improvers, organocides, or other specific supplementary components added to the above conventional additives will tend to increase treatment cost. Because of these increased costs for specific added features, it again points out the need to be dealing with a reliable company- one that you know will be adding all the components that you are paying for.
- Listen and read between the lines. To promote additives, many companies have found it useful to seize upon catchwords or concepts that may initially sound startlingly innovative but are really only new ways of presenting well-known ideas. For example, fuel stabilizers to prevent fuel degradation and sludge coalescence have always been a staple of any good additive; but now some companies use the term “polymerization” instead of “stabilization” to imply that this is a new concept that demands a new chemical approach. Such a promotion is misleading since it emphasizes, as new technology, information that has long been incorporated into the additive formulation of every reputable chemical supplier. For the same reason, companies that almost exclusively urge maintenance programs using shock treatment sludge and rust control agents are also simply rehashing methods that have been tried in the past; simulating such early programs as the tank insurance incentives and the one-shot encapsulated rust inhibitors. At times shock treatments may be beneficial for specific tanks and specific problems but, because of the new developments in additive chemistry, such an approach is much more costly and much less effective than a well-planned and continual preventative maintenance program developed to treat all the fuel being delivered. This continual treatment method not only remedies existing problems but also acts to ensure a clean and efficient total oil system.
- Throughout the screening process with possible chemical suppliers: Ask questions; Determine types and extent of services available, including technical, mechanical, and marketing support; Evaluate their scientific competence; Establish availability of primary and secondary products; Consider your comfort level in future dealings with their personnel; Research their responsiveness and reliability; Check references; then Weigh all factors including cost, expertise, service, support, and additive type, to determine the best program for your needs.

Deciding on a chemical additive program can provide the typical fuel oil dealer with an effective and cost-economical means of reducing service costs, improving customer goodwill, optimizing combustion efficiency, and favorably promoting his product and his

company. Hopefully, this review of the additive industry will permit the dealer to make a more informed decision.
